Nigerian Medical Journal
NIGERIA MEDICAL ASSOCIATION
Print ISSN 0300-1652, E-ISSN 2229-774X

Original Research

Emotional and Behavioural Problems of HIV-infected Children: Findings from a Southeastern Nigeria Tertiary Healthcare Facility.

***Ikechukwu Frank Ogbonna[1], Nwaonu Chijioke Nwakanma[2], Joseph Ezeogu[3], Kelechi Kenneth Odinaka[3].**

[1]Department of Paediatrics, Federal Medical Centre, Umuahia, Nigeria. [2]Lancashire and South Cumbria NHS Foundation Trust, UK, [3]Department of Paediatrics, Federal Teaching Hospital, Owerri, Nigeria.

Abstract

Background: In children, HIV infection presents with grave consequences, including a predisposition to emotional and behavioural problems (EBP). These are mental health problems affecting thoughts, emotions, behaviours and relationships, and may be categorised into emotional problems (EP) and behavioural problems (BP). Studies have shown a high burden of EBP in children; however, knowledge gaps still exist regarding the burden of EBP on HIV-infected children. Our study seeks to address these gaps by determining the prevalence and type of EBP among HIV-infected children.

Methodology: This cross-sectional and comparative study enrolled 386 participants (193 subjects and 193 controls). The subjects were HIV-infected children aged 2-15 years attending the Paediatric HIV Clinic of Federal Medical Centre, Umuahia. The controls were age and sex-matched HIV-negative children attending primary or secondary schools in Umuahia. Sociodemographic characteristics were assessed, and EBP was determined using the strengths and difficulties questionnaire.

Results: Sixty-one subjects (31.6%) had EBP compared to 15 controls (7.8%) and this difference was significant (p<0.001). The subjects were three times more likely to have EBP than the controls (aOR=3.03; CI=1.17-7.82). The EBP type showed that, while there was no significant difference in the multivariate analysis of the behavioural problems, emotional problems were significantly higher in the subjects than in the controls (p = 0.001). The subjects were six times more likely to have emotional problems than the controls (aOR=6.26; CI=2.80-13.97).

Conclusion: There is a high burden of EBP among HIV-infected children in Umuahia with emotional problems as the common type.

Keywords: Emotional Problems; Behavioural Problems; HIV; Children.

***Correspondence:** Dr. Ikechukwu Frank Ogbonna. Department of Paediatrics, Federal Medical Centre, Umuahia, Nigeria.
Email: ifogbonna@yahoo.com.

How to cite: Ogbonna IF, Nwakanmma NC, Ezeogu J, Odinaka KK. Emotional and Behavioural Problems of HIV-infected Children: Findings from a Southeastern Nigeria Tertiary Healthcare Facility. Niger Med J 2025; 66 (1):117-126.https://doi.org/10.71480/nmj.v66i1.639.

Quick Response Code:

Introduction

HIV infection is more devastating in children than in adults [1] and has remained a public health hazard. [2-4] It poses as a stressor that negatively affect children [3,5-7] and predisposes them to emotional and behavioural problems (EBP). [6,8] An EBP is defined as a mental health problem that presents with varying symptoms due to abnormalities in thoughts, emotions, behaviours or relationships.[6,8] They are categorised into emotional (EP) and behavioural problems (BP).[6,7,9] An EP is expressed inwardly as the symptoms are directed at the individual.[6,7,9] Contrastingly, BP is expressed outwardly because the symptoms are directed at others (or the environment).[6,7,9] Examples of EP include anxiety, depression, and peer-relationship disorders[6,7,9-11] while BP examples include conduct, hyperactivity, and inattention disorders.[10,11] International [9,12-16] and local [17,18] studies have demonstrated high EBP prevalence among HIV-infected children. However, the findings may not be applied to HIV-infected children in Umuahia due to some knowledge gaps. These gaps include small sample sizes, [12-14,18] lack of controls, [15,17] study population choices [9,14,16] and geographical variations. [9,12-16]

Our study sought to address these gaps and hypothesised that HIV-infected children had higher EBP prevalence than HIV-negative children. The essence was to accept or refute this hypothesis by either rejecting or failing to reject a null hypothesis that stated no difference in the prevalence. Our study's outcome will add to the already existing body of knowledge concerning this discourse and provide some assistance to clinicians involved in the comprehensive management of HIV-infected children.

Methodology

Ethical Approval and Consent:

Ethical approval (Approval number: FMC/QEH/G.596/Vol.10/377) was obtained from the Health Research Ethics Committee of Federal Medical Centre (FMC), Umuahia and permission to include pupils/students in the study was sought from the Abia State Ministry of Education. Study details were explained to the caregivers. Only the children whose caregivers consented and those older than seven years who assented were enrolled.

Study Design:

This was an institutionalised cross-sectional comparative study.

Study Population:

This was categorised into subjects and controls. The subjects were confirmed HIV-infected children aged 2-15 years attending the Paediatric HIV Clinic (PHC) of FMC, Umuahia while the controls were age- and sex-matched HIV-negative children drawn from primary and secondary schools in Umuahia.

Study Sites:

The PHC of FMC, Umuahia served as the site for recruiting the subjects while primary and secondary schools in Umuahia served as sites for recruiting controls.

Sample Size Determination:

This was determined from the calculation for proportions [19] using a 95% confidence interval (1.96), tolerable error (0.05), the EBP prevalence of HIV-infected children from a previous study (50.7%),[16] and the total number of HIV-infected children attending the PHC (387). The sample size was 386, comprising 193 subjects and 193 controls.

Inclusion and Exclusion Criteria:

The children whose caregivers consented and those older than seven years who assented to the study were included. However, those with unconfirmed HIV status, evidence of any chronic disease or a family

history of a chronic disease were excluded. Also excluded were controls with evidence of any acute illness.

Sampling Method:
The children were enrolled using random sampling to ensure equal selection opportunities. The clinic registers were used to assign serial numbers to the subjects, and 193 were randomly selected. For the controls, the ratio of the number of private-to-public schools and those of primary-to-secondary schools in Umuahia was considered. For wider representation, only 6.3% of the total sample size was drawn from each of the selected schools. Thus, 193 controls were randomly selected from 16 schools comprising 10 private (7 primary and 3 secondary) and 6 public (5 primary and 1 secondary) schools.

Screening for HIV Infection:
The caregivers were offered HIV counselling and only the children of those who opted-in were screened. The screening was based on the Nigerian algorithm [20] and was done with Determine^{TM}, Uni-Gold^{TM} and Stat-Pak^{TM} kits. These kits have high sensitivity and specificity [21,22] and assay HIV antibodies. [1,3] The required number of children was sorted and enrolled based on the screening outcome. Caregivers of school children who were found to be HIV-positive were re-counselled and referred for further evaluation.

Questionnaire Administration:
A sociodemographic proforma was used to obtain the age, sex, socioeconomic class (SEC), and type of caregivers. The SEC was determined using Oyedeji's classification,[23] which uses parental education and occupation to categorise SEC into upper, middle and lower. The parent-report version of the Strength and Difficulties Questionnaire (SDQ) was used to determine EBP. It is used in children aged 2-17 years, [24] including HIV-infected children.[6,25] The SDQ has been administered internationally [24] and in Nigeria, [26,26] and found to have good psychometric properties.[24,27] It is easy to administer and has a short completion time.[24] It contains 25 items that are grouped into five domains and scored on a three-point scale.[24] Domain-1 assesses anxious and depressive states; Domain-2 assesses aggression and violation; Domain-3 assesses fidgeting, boredom, inattention and excessive physical activities, Domain-4 assesses social dysfunction and isolation while Domain-5 assesses positively helpful and socially acceptable behaviour.[27] However, Domain-5 plays no part in EBP determination.[24,27] Scores from Domains 1-4 were added to generate a Total Difficulty Score (TDS). A TDS greater than 16 in children aged 4-17 years and greater than 15 in those younger than four years signified EBP presence.[28] Additionally, abnormal scores for individual Domains were considered (>4 for Domain-1, >3 for Domain-2, >6 for Domain-3, and >3 for Domain-4).[24,25] Based on this, the children's EBPs were categorised into EP (abnormal scores in Domains 1 or 4) and BP (abnormal scores in Domains 2 or 3).[10,11,29,30] The children with EBP were referred for further evaluation.

Pre-testing of the Questionnaires:
The questionnaires were pre-tested to detect any ambiguity. The terminologies were understood as the participants involved answered the questions correctly. These participants were excluded from the main study.

Data Handling:
Data confidentiality was ensured as the questionnaires were coded, requiring only serial numbers. The electronic version was stored in a secure and password-protected personal computer.

Data Analysis:
Data was analysed using SPSS version 21. Frequencies and percentages were used to describe the age groups, sex, SEC, and EBP. A chi-squared test was used to determine whether there was a significant

difference between EBP and the study population, and a logistic regression analysis was used to determine the degree of the significant differences.

Statistical analysis with $p<0.05$ was considered significant, thus, the null hypothesis was rejected while the alternate was accepted. For $p\geq0.05$, this failed to reject the null while the alternate was rejected.

Results

The sociodemographic characteristics of the subjects and controls were comparable (See Table 1). In both groups, there were more children aged 2-5 years than children in other age categories, more males than females, more children in the middle socioeconomic class (SEC) than other SECs, and more children residing with biological caregivers than non-biological caregivers.

Table 1: Comparison of the sociodemographic characteristics of the subjects and controls

Variables	**Subjects (N=193)** **n (%)**	**Controls (N=193)** **n (%)**	χ^2	***p*-value**
Age group (years)				
2-5	64 (33.2)	64 (33.2)	0.00	>0.990
6-9	61 (31.6)	61 (31.6)		
10-13	50 (25.9)	50 (25.9)		
14/15	18 (9.3)	18 (9.3)		
Sex				
Male	104 (53.9)	104 (53.9)	0.00	>0.990
Female	89 (46.1)	89 (46.1)		
SEC				
Upper	46 (23.8)	49 (25.4)		
Middle	76 (39.4)	85 (44.0)	1.71	0.426
Lower	71 (36.8)	59 (30.6)		
Caregiver type				
Biologic	134 (69.4)	145 (75.1)		
Non-biologic	59 (30.6)	48 (24.9)	1.57	0.255

Subjects = HIV-infected children; Controls = HIV-negative children; SEC = Socioeconomic class.

Sixty-one (31.6%) of the subjects compared to 15 (7.8%) of the controls had abnormal TDS, reflecting a statistically significant difference in EBP prevalence between them ($p<0.001$). Thus, the null hypothesis was found to be false and was rejected while the alternate hypothesis was accepted. The degree of this difference in prevalence showed that the subjects were three times more likely to have EBP than the

controls (aOR = 3.03, CI = 1.17 – 7.82). Tables 2 and 3 respectively showed the comparison of the EBP prevalence and the degree of the difference in the prevalence.

Table 2: Comparison of the EBP prevalence between the subjects and controls.

EBP	Subjects (N=193) n (%)	Controls (N=193) n (%)	χ^2	*p*-value
Present	61 (31.6)	15 (7.8)	34.67	<0.001*
Absent	132 (68.4)	178 (92.2)		

**Significant difference (p-value), EBP = Emotional and behavioural problems, Subjects = HIV-infected children, Controls = HIV-negative children.*

Table 3: Degree of the difference in prevalence between the subjects and controls.

EBP	aOR	95% CI for aOR	*p*-value
Present	3.03	1.17 – 7.82	<0.02*
Absent	Reference	-	-

**Significant difference (p-value), EBP = Emotional and behavioural problems, aOR = Adjusted odds ratio, CI = Confidence interval, Subjects = HIV-infected children, Controls = HIV-negative children*

The EBP type showed that EP and BP were significantly higher in the subjects than in the controls (P<0.05). However, a multivariate analysis showed EP as the only significant type (EP: P=0.001; BP: P=0.213). The degree of this difference showed that the subjects were six times more likely to have EP than the controls (aOR = 6.26, CI = 2.80 – 13.97). Table 4 compares the EBP types while Table 5 shows the degree of the significant difference among the EBP types.

Table 4: Comparison of the EBP types of subjects and controls.

Type of EBP	Subjects (N=193) n (%)	Controls (N=193) n (%)	χ^2	*P*-value
Emotional problems (EP)				
Present	52 (26.9)	14 97.3)	26.39	<0.001*
Absent	141 (73.1)	179 (92.7)		
Behavioural Problems (BP)				
Present	21 (10.9)	11 (5.7)	3.41	0.048*
Absent	172 (89.1)	182 (94.3)		

**Significant difference (p-value), EBP = Emotional and behavioural problems, Subjects = HIV-infected children, Controls = HIV-negative children.*

Table 5: A multivariate analysis of the degree of the significant difference in EBP types.

Type of EBP	aOR	95% CI for aOR	*p*-value
Emotional problems			
Present	6.26	2.80 – 13.97	<0.001*
Absent	Reference	-	-
Behavioural problems			
Present	0.53	0.19 – 1.45	0.213
Absent	Reference	-	-

**Significant difference (p-value), EBP = Emotional and behavioural problems, aOR = Adjusted odds ratio, CI = Confidence interval, Subjects = HIV-infected children, Controls = HIV-negative children*

Discussion

The EBP prevalence of HIV-infected children in our study was significantly higher than that of HIV-negative children (31.6% versus 7.8%). This high prevalence was expected, possibly precipitated by constant stress from the daily burden of managing the illness's physical effects, chronic medication intake, stigma and discrimination, and social isolation. [6,7,25]

This high prevalence (31.6%) compares favourably with findings from Kalembo *et al* [15] in 2019 in Malawi (31.0%) and Menon *et al* [9]in 2009 in Zambia (29.1%), possibly due to similarities in sample sizes and deployed psychometric tools. The sample sizes were adequate to enable the true representation of HIV-infected children and the deployed psychometric tool (SDQ) has good psychometric properties and is widely used to determine EBP in children,[6] including HIV-infected children.[25] Furthermore, our study and that of Kalembo *et al*,[15] assessed EBP in both pre-adolescent and adolescent HIV-infected children, a possible reason for the proximity of their prevalence rates (31.6% versus 31.0%).

However, the EBP prevalence in our study varied from the findings of other studies. It was higher than those of Bankole *et al* [18] in 2017 in Calabar (20%), Adefalu *et al* [17] in 2018 in Ilorin (19.4%), and Das *et al* [13]in 2010 in India (7.3%). Conversely, it was lower than those of Musisi and Kiyanda [14] in 2009 in Uganda (51.2%), Degun *et al* [31] in 2011 in Zambia (37.3%), Lentoor *et al* [16] in 2016 in South Africa (50.7%) and Ananworanich *et al* [12] in 2008 in Thailand (42.0%). These variations may arise from differences in sample sizes, study populations and deployed psychometric tools.

The small sample sizes by Bankole *et al*,[18] Das *et al*,[13] Musisi and Kiyanda,[14] Degun *et al*,[31] and Ananworanich *et al*[12] may increase the margin of error, thereby, decreasing the ability to detect a complete effect.[31-33] Consequently, a false notion may be assumed to be true.[32] Lentoor *et al*[16] enrolled only preadolescents while Degun *et al*,[31] and Musisi and Kiyanda[14] enrolled only adolescents. Study population choices may vary study outcome, particularly if the chosen population is not the target population.[34] Enrolling preadolescents or adolescents may not provide a complete outcome compared to enrolling both. Thus, findings from preadolescents or adolescents may not be generalised as findings in all groups of children.

Also, the deployed psychometric tools in these studies, [12,13,17,18] may have influenced study outcomes. We used SDQ to assess EBP, Bankole *et al*[18] used MINI-International Neuropsychiatric Interview for children and adolescents (MINI-kid), Adefalu *et al*[17] used Child Behaviour Questionnaire (CBQ), Das *et al*[13] used Paediatrics Symptom Checklist (PSC), Musisi and Kiyanda [14] used Self-Report Questionnaire (SRQ), and Ananworanich *et al*[12] used Child Behaviour Checklist (CBCL).

These tools have good psychometric properties, but usage is age dependent. Thus, applying them outside their recommended age range may negatively influence the outcome. The SDQ used in our study is the most widely used as it is easier to administer and has a shorter completion rate compared to other tools. The MINI-kid used by Bankole *et al*,[18] assessed only depression and omitted children with other EBP types. The CBQ used by Adefalu *et al* [17] and the PSC used by Das *et al*,[13] are not recommended for use in children younger than six years. This may have limited their study population choices, resulting in EBP omission in this group. Thus, these studies [13,17] may not provide the actual EBP burden in children. The SRQ used by Musisi and Kiyanda [14] is only recommended for use in adult populations and may not give a true representation in children, especially preadolescents. Also, the CBCL used by Ananworanich *et al* [12] is complex and time-consuming and may result in informant bias, apathy, and improper filling.

The EBP prevalence of HIV-infected children from our study was significantly higher than that of HIV-negative controls. This was also observed by Bankole *et a l*[18] in 2017 in Calabar, Degun *et al* [31] in 2011 in Zambia, Lentoor *et al* [16]in 2016 in South Africa, and Das *et al* [13]in 2010 in India. However, our finding was at variance with that of Ananworanich *et al.*[12] While our study's controls were drawn across all socioeconomic classes (SEC), those of Ananworanich *et al*[12] were drawn from the lower SEC. Lower SEC poses greater stress to children compared to others, as the children may suffer worsening food insecurity, hunger, poor shelter, social isolation and diseases.[35,36] These stressors may increase EBP in their controls, resulting in a comparable prevalence.

Our study showed a significantly higher prevalence of Emotional problems (EP) and Behavioural Problems (BP) in the HIV-infected compared to the HIV-negative children. However, a multivariate analysis, which corrects for confounding variables revealed EP as the only significant type. The HIV-infected children had higher odds of developing EP than the HIV-negative children. These findings are in keeping with those of Menon *et al* [9] and Ananworanich *et al* [12] and likely due to difficulties coping with parental death, stigma and discrimination, HIV complications, and frequent medication intake. Emotional Problems (EP) are internalising disorders with symptoms directed at the child [6,7,9] and comprise anxiety, depression and peer-relationship disorders. [10,37] This study showed that HIV-infected children were prone to internalizing disorders [38,39] such as anxiety, depression and peer-relationship disorders, compared to other EBP types. The negative implications include poor quality of life, poor adherence to medications, poor school performance, school absenteeism, and school dropouts.

This study has some limitations which include the use of a single centre. A multi-centre study would have increased the generalisation of this study's findings. Also, this study's cross-sectional design highlights the EBP burden for a specific period only. A longitudinal study would have encouraged adequate follow-up of the participants. Furthermore, the SDQ deployed in this study is a screening tool and is not diagnostic. Thus, the children with EBP may require further evaluation by a psychiatrist. However, it is important to state that these limitations are unlikely to affect the findings of this study.

Conclusions

The EBP prevalence in HIV-infected children in Umuahia, South-East Nigeria, is high, and emotional problems are the most common. This highlights the need for continuous information dissemination and education among healthcare professionals regarding EBP in HIV-infected children, to increase awareness and screening. There is also a need for integrated family-centred mental health services that will incorporate mental health assessment and interventions into the already existing clinical services for HIV-infected children in FMC, Umuahia. Furthermore, it is important to attach clinical psychologists and psychiatrists to the HIV clinics and other units offering HIV care and support services for children, to enable early diagnosis and prompt intervention of cases of EBP.

References

1. Kronman MP, Crowell CS, Vora SB. Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome. In: Marcdante KJ, Kliegman RM, editors. Nelson Essentials of Pediatrics. 8th ed. Philadelphia: *Elsevier Inc*; 2019. p. 457-61.
2. UNAIDS Global HIV and AIDS statistics. Fact sheet, 2020. Available at https://www.unaids.org/sites/default/files/media_asset/UNAIDS_FactSheet_en.pdf. Accessed 10/12/2024.
3. Tindyebwa D, Kayita J, Musoke P, Eley B, Nduati R, Coovadia H, et al. editors. Handbook of Paediatric AIDS in Africa. 4th ed. Kampala: *Kluwer Academic Publishers*; 2017. p. 3-84.
4. Badru T, Nwaisaka J, Khamofu H, Agbakwuru C, Adedokun O, Pandey SR, et al. HIV comprehensive knowledge and prevalence among young adolescents in Nigeria: Evidence from Akwa Ibom AIDS indicator survey. *BMC Public Health.* 2020; **20**: 45.
5. Oderinde BS, Agbede OO, Mshelia JU, Medugu JT, Solomon AL, Bukbuk DN, *et al.* Prevalence of HIV infection among children of HIV positive mothers in a tertiary health facility in Maiduguri, Nigeria. *Sokoto J Med Lab Sci.* 2017; **2**(4): 53-62.
6. Marcus JL, Chao CR, Leyden WA, Xu L, Quesenberry CP, Klein DB, *et al.* Narrowing the gap in life expectancy between HIV-infected and HIV-uninfected individuals with access to care. *J Acquir Immune Defic Syndr.* 2016; **73**(1): 39-46.
7. Vreeman RC, McCoy BM, Lee S. Mental health challenges among adolescents living with HIV. *J Inter AIDS Soc.* 2017;**20**(3): 21497. DOI:http://dx.doi.org/10.7448/IAS.20.21497.
8. Mental disorders. Available at http://www.who.int/mental_health/management/en/. Accessed 06/12/2021.
9. Ramaiya MK, Sullivan KA, O'Donnell K, Cunningham CK, Shayo AM, Mmbaga BT, *et al*. A qualitative exploration of mental health and psychosocial context of HIV positive adolescents in Tanzania. *PLoS ONE.* 2016; **11**(11): e0165936. DOI: https://doi.org/10.1371/journal.pone.0165936.
10. Ogundele MO. Behavioural and emotional disorders in childhood: A brief overview for Paediatricians. *World J Clin Pediatr.* 2018; **7**(1): 9-26.
11. Niclasen J, Dammeyer J. Psychometric properties of the strengths and difficulties questionnaire and mental health problems among children with hearing loss. *J Deaf Stud Deaf Educ.* 2016; **21**(2): 129-40.
12. Ananworanich J, Jupimai T, Siangphoe U, Mekmullica J, Sosothikul D, Pancharoen C. Behavioral and emotional problems in Thai children with HIV infection compared to children with and without other chronic problems. *J. Int Assoc Physicians AIDS Care.* 2008; **7**(1): 52-3.
13. Das S, Mukherjee A, Lodha R, Vatsa M. Quality of life and psychosocial functioning of HIV infected children. *Ind J Pediatr.* 2010; **77**(6): 633-7.
14. Musisi S, Kiyanda E. Emotional and behavioural disorders in HIV seropositive adolescents in urban Uganda. *East Afr Med J.* 2009; **86**(1): 16-24.
15. Kalembo FW, Kendall GE, Ali M, Chimwaza A. Prevalence and factors associated with emotional and behavioural difficulties among children living with HIV in Malawi: A cross-sectional study. *BMC Psychiatry.* 2019; **19**(1): 60. DOI: 10.1186/s12888-019-2046-2 .
16. Lentoor AG, Asante KO, Govender K, Peterson I. Psychological functioning among vertically infected HIV-positive children and their primary caregivers. *AIDS Care.* 2016; **28**(6): 771-77.

17. Adefalu MO, Tunde-Ayinmode MF, Issa BA, Adefalu AA, Adepoju SA. Psychiatric morbidity in children with HIV/AIDS at a tertiary health institution in North-Central Nigeria. *J Trop Pediatr.* 2018; **64**(1): 38-44.
18. Bankole KO, Bakare MO, Edet BE, Igwe MN, Ewa AU, Bankole IA, *et al.* Psychological complications associated with HIV infection among children in South-South Nigeria, sub-Saharan Africa. *Cog Med.* 2017; **4**(1): 1372869DOI: 10.1080/2331205X.2017.1372869.
19. Araoye MO. Research methodology with statistics for health and social sciences. Ilorin: *Nathadex Publishers*; 2003. p.115-29.
20. National protocols for HIV testing services. NACA, Nigeria. 2019. Available at https://naca.gov.ng/wp-content/uploads/2019/10/protocols-for-HIV-Testing-Services-pdf. Accessed 14.12/2021.38 Lindberg S. How does your environment affect your mental health? *Very well Mind.* 2021. Available at https://www.verywellmind.com/how-your-environment-affects-your-mental-health-5093687. Accessed 18/12/21.
21. Alere Determine^{TM}HIV-1/2. Global point of care. Abbot. Available at https://www.globalpointofcare.abbot/en/product-details/determine-hiv-1-2.html. Accessed 14/12/2021.
22. HIV 1/2 STAT-PAK^{TM} dipstick. WHO prequalification of diagnostic programme: Public report. November, 2011. Available at https://www.who.int/diagnostis_laoratory/evaluations/111125_0008_006_00_public_report_final.pdf. Accessed 14/12/21.
23. Oyedeji GA. Socioeconomic and cultural health background of hospitalized children in Ilesa. *Niger J. Paediatr*1985; **12**: 111-7.
24. Hoosen N, Davids EL, de Vries, PJ, Shung-King M. The strengths and difficulties questionnaire (SDQ) in Africa: A scoping view of its application and validation. *Chlid Adolesc Psychiatry Ment Health.* 2018; **12**: 6. DOI: https://doi.org/10.1186/s13034-017-0212-1.
25. Orawan L, Peninnah O, Linda A, Virat S. Evaluation of Psychosocial adjustments and self-esteem in perinatally HIV-infected adolescents. *Biomed J Sci Tech Res.* 2018; **2**(1): 1-5. DOI: https://doi.org/10.26717/BJSTR.2018.02.000651.
26. Okewole AO, Adewuya AO, Ajuwon AJ, Bella-Awusah TT, Omigbodun OO. Maternal depression and child psychopathology among attendees at a child neuropsychiatric clinic in Abeokuta, Nigeria: A cross-sectional study. *Child Adolesc Psychiatry Ment Health.* 2016; **10**(1): 30.
27. Akpa OM, Afolabi RF, Fowobaje KR. Psychometric properties and the confirmatory structure of the strengths and difficulties questionnaire in a sample of adolescents in Nigeria. *Inter J Stat Applic.* 2016; **6**(3): 145-55.
28. Scoring the strengths and difficulties questionnaires. Available at http://www.ehcap.co.uk/content/sites/ehcap/uploads/NewsDocuments/236/SDQEnglishUK4-17scoring-1.PDF. Assessed 07/06/2018.
29. Goodman A, Lamping DL, Ploubidis GB. When to use broader internalizing and externalizing subscales instead of the hypothesized five subscales on the Strengths and Difficulties Questionnaires (SDQ): Data from British parents, teachers and children. *J Abn Child Psychol.* 2010; 38(8):1179-91.

30. Sekran VC, Prabhu V, Ashok L, D'Souza B, Shetty SD, Nair R. Predictors of Adolescent Internalising and externalizing mental health symptoms: A school-based study in Southern India. Int J Environ Res Public Health. 2024; 21(4):393. Doi: 10.3390/ijerph21040393
31. Degun S, Menon A, McPherson A, Ngoma M, Nair R, Andren J, *et al.* Factors influencing mental health in Zambian adolescents with HIV and AIDS. *Pediatr Res.* 2011; **70**: 444. DOI: https://doi.org/10.1038/pr.2011,669.
32. Faber J, Fonseca LM. How sample size influences research outcomes. *Dental Press J Orthod.* 2014; **19**(4): 27-9.
33. Deziel C. The effects of small sample size limitation. *Sciencing.* 2018. Available at https://sciencing.com/effects-small-sample-size-limitation-8545371.html. Accessed 17/12/2021.
34. Banerjee A, Chaudhury S. Statistics without tears: Population and samples. *Ind Psychiatr J.* 2010; **18**(1): 60-5.
35. Hailemichael Y, Hanlon C, Tirfessa K, Mental health problems and socioeconomic disadvantage: A controlled household study in rural Ethiopia. *Int J Equity Health.* 2019; 18: 121. DOI https://doi.org/10.1186/s12939-019-1020-4.
36. Hu X, Wang T, Huang D, Wang Y, Li Q. Impact of social class on health: The mediating role of health self-management. *PLoS ONE.* 2021. **16**(7): e0254692. DOI: https://doi.org/10.1371/journal.pone.0254692.
37. Price RB, Woody ML. Emotional disorders in development. *Ref Mod Neurosci Biobehav Psychol.* 2020; DOI: https://doi.org/10.1016/B978-0-12-819641-0.00024-4.
38. Li MS, Mukherjee J, Eustache E, Oswald C, Surkan PJ, Louis E, *et al.* Risk and protective factors for internalizing and externalizing outcomes among HIV-infected youth in Haiti. *AIDS Care.* 2009; **27**(8): DOI:10.1080/09540121.2015.1020751
39. Durbeej N, Sorman K, Selinus EN, Lundstrom S, Lichentstien P, Hellner C, *et al.* Trends in childhood and adolescents internalizing symptoms: Results from Swedish population-based twin cohorts. *BMC Psychol.* 2019; **7**: 50. DOI: https://doi.org/10.1186/s40359-019-0326-8.