

Social Withdrawal, Anxiety and Depression Among Adolescent HIV Positive Patients Assessing ART Care at Enugu State University of Science and Technology Teaching Hospital, Parklane Enugu State Nigeria: A Cross-Sectional Study

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Abstract

Background: Human immunodeficiency virus (HIV) poses significant physical and psychological challenges to adolescents, often leading to mental health issues like social withdrawal, anxiety and depression. The aims of the study were to determine the prevalence and predictors of social withdrawal, anxiety and depression among adolescent HIV positive patients that access care at a tertiary health facility in Enugu State Nigeria.

Methods: The study employed a cross-sectional design. Patients were recruited consecutively as they present to the clinic. Data were collected using a self-administered questionnaire that comprised of the Hikikomori Scale (HS-25) for social withdrawal, the Generalized Anxiety Disorder 7-item Scale (GAD-7) for anxiety and the Patient Health Questionnaire-9 (PHQ-9).

Results: Of the 208 adolescents that were included in the study, a higher proportion of the participants (56.3%) were at risk of social withdrawal while 43.8% were not at risk. A higher proportion of the patients had anxiety with 18.8% having mild anxiety, 29.3% having moderate anxiety, 7.2% having severe anxiety while 44.7% had no anxiety. A higher also, proportion had depression with 17.8% having mild depression, 16.3% having moderate depression, 19.7% having moderately severe depression, 4.8% having severe depression while 41.3% were not depressed. The predictors of social withdrawal were age [$p < 0.001$; 95% CI (0.092-0.434)] and occupation of mothers: trader [$p = 0.011$; 95% CI (1.738-74.395)]; farmer [$p = 0.047$; 95% CI (1.028-38.574)]. Predictors of anxiety were place of residence [$p = 0.011$; 95% CI (1.301-7.871)]: educational level of father, secondary [$p = 0.050$; 95% CI (0.024-0.996)], primary [$p = 0.009$; 95% CI (0.015)0.554], none [$p = 0.042$; 95% CI (0.011-0.917)]: occupation of mother: trader, [$p = 0.001$; 95% CI (3.835-198.544)], farmer, [$p = 0.001$; 95% CI (2.992-99.567)] while the predictors of depression was gender [$p = 0.039$; 95%CI (1.037-4.107)].

Conclusions: the prevalence of social withdrawal, anxiety and depression was high among the patients with over half of them experiencing these mental health issues. Several socio-demographic characteristics predicted social withdrawal, anxiety and depression emphasizing their importance in these mental health challenges. The findings emphasized the need for targeted interventions to address mental health concerns, tailored to the needs of this vulnerable population.

1. Introduction

Human Immunodeficiency Virus (HIV) is a virus that attacks the body's immune system [1] Acquired Immunodeficiency Syndrome (AIDS) occurs at the advanced stage of infection.1 HIV targets the body's white blood cells, weakening the immune system. This makes getting sick with diseases like tuberculosis, infections, and some cancers easier.1 HIV is spread from the body fluids of an infected person, including blood, breast milk, semen and vaginal fluids. It can also spread from a mother to her unborn baby.1 HIV is preventable and treatable with Antiretroviral Therapy (ART)[1] .

Adolescence, from the Latin word "adolescere" meaning 'to mature' is a transitional stage of physical and psychological development that generally occurs during the period from puberty to adulthood (typically corresponding to the age of majority). [2] Adolescence is generally considered a time of moving away from parents and toward peers. [2] It is well established that peers provide an important and unique context for children's socio-emotional, social-cognitive, and academic development.2 However, peer experiences, including those involving friends, peer networks, and burgeoning romantic relationships, become increasingly influential on well-being and adjustment during the adolescent. [2] Moreover, time spent with peers increases steadily from middle childhood to late adolescence and is accompanied by increased pressures and expectations to socialize with friends and engage in social activities. [2] According to the World Health Organization (WHO), adolescents are defined as individuals in the 10-19 years age group, marking a period of significant physical, psychological, and social changes during the transition from childhood to adulthood. [3]Adolescents and young people represent a growing share of people living with HIV worldwide. 4 In 2022 alone, 480,000 young people between the ages of 10 to 24 were newly infected with HIV, of whom 140,000 were adolescents between the ages of 10 and 19. 5To compound this, most recent data indicate that only 25 percent of adolescent girls and 17 percent of adolescent boys aged 15-19 in Eastern and Southern Africa – the region most affected by HIV – have been tested for HIV in the past 12 months and received the result of the last test. [6]

Social withdrawal refers to the consistent (across situations and over time) display of solitary behavior when encountering familiar and/or unfamiliar peers. [7]Compared to their more sociable age-mates, socially withdrawn adolescents less frequently take advantage of available opportunities for social interaction and thus are observed to spend comparatively more time alone. [7]The societal reception of HIV and its patients is making strides, nevertheless, the psychological impact of this disease is still a concern. A Study have shown a high prevalence of psychological distress including but not limited to anxiety, depression, and social withdrawal in HIV-infected adolescents. [8] Social withdrawal among HIV-infected patients leads to an atypical surge in the number of people who are socially handicapped in our society, this increased number means there will be an ineluctable increase in associated factors of insularity which include drug abuse, introversion, apathy towards social obligations and work function, increased suicidal thoughts, major escalation in crime rates as there is a correlation between social isolation and criminal activity. [8]Anxiety refers to the anticipation of a future concern and is more associated with muscle tension and avoidance behavior. [9] According to Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) depression is a common mental disorder that presents with depressed mood, loss of interest (pleasure), decreased energy, feelings of guilt, or low self-worth, disturbed sleep or appetite, and poor concentration. [10] The prevalence of anxiety among adolescents with HIV was 40% and it was strongly linked to internalized stigma and fear of discrimination. [11] Another study from Nigeria reported that nearly 22% of the adolescents living with HIV had significant symptoms of depression. This high level of anxiety was attributed to the fear of social rejection, stigma and concerns about their health deteriorating. [12]

Psychiatric disorders occur in up to 50% of individuals with HIV. [13] The most commonly reported of these are depression, anxiety disorders, and substance use disorders.13 The role of these disorders in reducing quality of life and accelerating the progression of HIV disease is mediated through several factors, including an increased likelihood of suboptimal treatment adherence.[13] A study have shown that the global prevalence of depression among HIV-positive youth vary across the world. [14] Other studies in Malawi, [15, 16] and Kenya [17] revealed that the prevalence of depression among HIV-positive youth was 18.9%, and 48%, respectively. Mental health and HIV/AIDS are closely interlinked. [14] Living with HIV/AIDS can increase the risk of mental illness such as depression. While poor mental health can inspire behaviors that place individuals at risk for HIV/AIDS. [14] Depression negatively

affects HIV disease prognosis. It decreases CD4 T lymphocyte activity, increases viral load, and affects quality of life and medication adherence, which contributes to a greater risk of mortality.¹⁴ Studies across 38 countries show that 15% of adults and 25% of adolescents living with HIV reported depression or feeling overwhelmed, which could be a barrier to adherence to antiretroviral therapy.¹⁸ Most of these sociological and psychological factors make living with HIV, especially among adolescents aged 10–19 very challenging. [18] Unfortunately, careful attention is not given to most of these issues, which intricately affect the overall treatment outcomes of adolescents living with HIV. [18] If these issues are not carefully addressed, they may continue to result in serious deleterious consequences including dropping off treatment, morbidity, and mortality among adolescents. The aim of this study was to determine the prevalence and predictors of social withdrawal, anxiety and depression among adolescent HIV positive patients assessing care at a tertiary health institution in Enugu State Nigeria.

2. Materials And Methods

Study design

The study was a cross-sectional study descriptive design.

Study area

The study was conducted at the Anti-Retroviral Therapy (ART) clinic of Enugu State University of Science and Technology Teaching Hospital (ESUT-TH) Park Lane Enugu, Nigeria where patients with HIV access care. This clinic offers ART services for patients from within and outside Enugu State. It also accepts referral from primary and secondary health facilities within and outside the state. The facility is located at the Enugu North LGA of Enugu State. It is within the Enugu Metropolis. Enugu state is one of the states in Southeast Nigeria. Was the capital of East Central State before the further division of the region into five States. Data was collected for a period of 6 months (July 2024-December 2024).

Study population

HIV positive adolescents that accessed care at the ART clinic of a tertiary health facility.

Inclusion criteria

- A HIV positive adolescent that has been on antiretroviral therapy for at least 6 months.
- Assessing HIV care at the ART clinic of the hospital.

Exclusion criteria

- Participants were excluded if they were too sick to participate.

All the eligible adolescents were invited to participate. They were informed of the study's objectives and written informed consent obtained. Written assent and guardian consent were obtained from non-emancipated minors.

Data collection

Data was collected over a period of 3 months. All the patients that presented to the clinic within the 3 months period were included in the study. Data was collected consecutively as they present to the clinic with pretested self-administered questionnaires. A total of 208 patients participated in the study. The data collected included socio-demographic characteristics; social withdrawal collected with the Hikikomori Scale (HS-25). It assessed social withdrawal over the past 6 months; data on anxiety was collected with the Generalized Anxiety Disorder 7-item Scale (GASD-7) which assessed the severity of anxiety over the past 2 weeks and depression was assessed with the Patient Health Questionnaire 9 (PHQ-9) that also assessed the severity of depression over the past 2 weeks.

Statistical analyses

The primary outcomes were proportion of adolescent HIV positive patients that experience social withdrawal, anxiety and depression. Data was analyzed using SPSS version 25. Categorical variables were presented as proportions, while quantitative variables were summarised using means and standard deviation. Pearson's chi-squared test was used to determine association between the sociodemographic characteristics and social withdrawal, anxiety and depression. Statistically significant variables at $p \leq 0.05$ in the bivariate analysis were imputed into the logistic regression analysis. Logistic regression analysis was performed to examine the predictors of social withdrawal, anxiety and depression among the participants. Data were presented as adjusted odds ratio (AOR) with 95% Confidence Intervals (CI). The level of significance was set at $p \leq 0.05$.

3. Results

There was a total of 208 respondents, with a response rate of 100%. The data collected was systematically analyzed and presented in tables with corresponding prose.

Table 1: Socio-demographic Characteristics of participants

Variable	Frequency	Percentage	
Age	10--14	67	32.20%
Mean (SD) 16.67 ± 4.03	15 - 19	141	67.80%
Gender	Male	101	48.60%
	Female	107	51.40%
Place of residence	Urban	157	75.40%
	Rural	51	24.60%
Educational status	Primary	5	2.40%
	Secondary	177	85.10%
	Tertiary	14	6.70%
	Not attending school	12	5.80%
Duration of HIV diagnosis (in years)	≤ 5	162	77.90%
Mean (SD) 4.32 ± 4.02	06--10	19	9.10%
	11--15	22	10.60%
	>15	5	2.40%
	Parents relationship	Married	127
	Cohabiting	35	16.80%
	Divorced	22	10.60%
	Separated	24	11.50%
	You live with	Parents	93
Mother only		24	11.50%
Father only		20	9.60%
Guardian		28	13.50%
Family member		43	20.70%
Educational level of father	Tertiary	106	51.00%
	Secondary	63	30.30%
	Primary completed	10	4.80%
	None	29	13.90%
Educational level of mother	Tertiary	108	51.90%
	Secondary	42	20.20%
	Primary completed	15	7.20%
	None	43	20.70%
Occupation of father	Civil/public servant	85	40.90%
	Trader	41	19.70%
	Farmer	24	11.50%
	Artisan	34	16.40%
	Unemployed	16	7.70%
	others	8	3.80%
Occupation of mother	Civil/public servant	76	36.50%
	Trader	80	38.50%
	Farmer	24	11.50%
	Artisan	12	5.80%
	Unemployed	4	1.90%
	others	12	5.80%

Table 1 shows the socio-demographic characteristics of the participants. Majority of them (67.8%) were aged 15-19 years and reside in urban area (75.4%). Their mean age was 16.67 ± 4.03 years. A slightly higher proportion of females (51.4%) was observed. Majority had secondary education (82.2%) and were diagnosed of $HIV \leq 5$ years ago (77.9%). Majority of their parents were married (61.1%) and most of them reside with both parents (44.7%).

Prevalence of Social Withdrawal

Social withdrawal was assessed using multiple indicators from the Hikikomori Scale (HS-25) which measured the severity of social withdrawal symptoms over the previous 6 months. The data obtained were presented as frequencies and proportions presented in the table below.

Table 2: Prevalence of Social Withdrawal

The following statements accurately describe you over the last 6 months	Strongly Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Strongly Agree
	Freq %	Freq %	Freq %	Freq %	Freq %
1. I stay away from other people	82 (39.4%)	28 (13.5%)	29 (13.9%)	44 (21.2%)	25 (12.0%)
2. I spend most of my time at home	59 (28.4%)	13 (6.3%)	55 (26.4%)	52 (25.0%)	29 (13.9%)
3. There really isn't anyone with whom I can discuss matters of importance	52 (25.0%)	31 (14.9%)	47 (22.6%)	41 (19.7%)	37 (17.8%)
4. I love meeting new people	28 (13.5%)	40 (19.2%)	48 (23.1%)	32 (15.4%)	60 (28.8%)
5. I shut myself in my room	84 (40.4%)	20 (9.6%)	44 (21.2%)	40 (19.2%)	20 (9.6%)
6. People bother me	56 (26.9%)	36 (17.3%)	48 (23.1%)	36 (17.3%)	32 (15.4%)
7. There are people in my life who try to understand me	36 (17.3%)	16 (7.7%)	44 (21.2%)	44 (21.2%)	68 (32.7%)
8. I feel uncomfortable around other people	68 (32.7%)	28 (13.5%)	60 (28.8%)	20 (9.6%)	32 (15.4%)
9. I spend most of my time alone	76 (36.5%)	28 (13.5%)	36 (17.3%)	36 (17.3%)	32 (15.4%)
10. I can share my personal thoughts with several people	60 (28.8%)	28 (13.5%)	68 (32.7%)	28 (13.5%)	24 (11.5%)
11. I don't like to be seen by others	68 (32.7%)	48 (23.1%)	40 (19.2%)	36 (17.3%)	16 (7.7%)
12. I rarely meet people in-person	52 (25.0%)	40 (19.2%)	52 (25.0%)	36 (17.3%)	28 (13.5%)
13. It is hard for me to join in on groups	76 (36.5%)	32 (15.4%)	52 (25.0%)	16 (7.7%)	32 (15.4%)
14. There are few people I can discuss important issues with	20 (9.6%)	28 (13.5%)	68 (32.7%)	40 (19.2%)	52 (25.0%)
15. I enjoy being in social situations	28 (13.5%)	44 (21.2%)	56 (26.9%)	20 (9.6%)	60 (28.8%)
16. I do not live by society's rules and values	72 (34.6%)	16 (7.7%)	68 (32.7%)	32 (15.4%)	20 (9.6%)
17. There really isn't anyone very significant in my life	68 (32.7%)	24 (11.5%)	52 (25.0%)	40 (19.2%)	24 (11.5%)
18. I avoid talking with other people	68 (32.7%)	28 (13.5%)	44 (21.2%)	36 (17.3%)	32 (15.4%)
19. I have little contact with other people talking, writing, and so on	56 (26.9%)	20 (9.6%)	40 (19.2%)	56 (26.9%)	36 (17.3%)
20. I much prefer to be alone than with others	76 (36.5%)	40 (19.2%)	44 (21.2%)	28 (13.5%)	20 (9.6%)
21. I have someone I can trust with my problems	33 (15.9%)	27 (13.0%)	64 (30.8%)	33 (15.9%)	51 (24.5%)
22. I rarely spend time alone	56 (26.9%)	43 (20.7%)	36 (17.3%)	45 (21.6%)	28 (13.5%)
23. I don't enjoy social interactions	63 (30.3%)	28 (13.5%)	48 (23.1%)	33 (15.9%)	36 (17.3%)

24. I spend very little time interacting with other people	33 (15.9%)	43 (20.7%)	48 (23.1%)	52 (25.0%)	32 (15.4%)
25. I strongly prefer to be around other people	36 (17.3%)	36 (17.3%)	56 (26.9%)	36 (17.3%)	44 (21.2%)
Overall prevalence of social withdrawal	Not at Risk 91 (43.8%)				
	At Risk 117 (56.3%)				

Table 2 shows the prevalence of social withdrawal among the participants using the Hikikomori Scale (HS-25). Overall, a higher proportion of the participants (56.3%) were at risk of social withdrawal while 43.8% were not at risk.

Prevalence of anxiety

Anxiety symptoms were measured using indicators from the Generalized Anxiety Disorder 7-Item Scale (GAD-7) which measured the severity of anxiety symptoms over the previous two weeks. The data obtained were presented as frequencies and proportions presented in the table below.

Table 3: Prevalence of anxiety

You have often been bothered by the following problems over the last 2 weeks		Not at all	Several days	More than half the days	Nearly every day
		Freq (%)	Freq (%)	Freq (%)	Freq (%)
1. Feeling nervous, anxious, or on edge		83 (39.9%)	67 (32.2%)	41 (19.7%)	17 (8.2%)
2. Not being able to stop or control worrying		95 (47.5%)	48 (24.0%)	36 (18.0%)	21 (10.5%)
3. Worrying too much about different things		67 (32.2%)	41 (19.7%)	52 (25.0%)	48 (23.1%)
4. Trouble relaxing		107 (51.4%)	49 (23.6%)	32 (15.4%)	20 (9.6%)
5. Being so restless that it is hard to sit still		95 (46.6%)	46 (22.5%)	38 (18.6%)	25 (12.3%)
6. Becoming easily annoyed or irritable		88 (44.0%)	56 (28.0%)	34 (17.0%)	22 (11.0%)
7. Feeling afraid as if something awful might happen		88 (42.3%)	38 (18.3%)	53 (25.5%)	29 (13.9%)
Overall prevalence of anxiety	No anxiety	93 (44.7%)			
	Mild anxiety	39 (18.8%)			
	Moderate anxiety	61 (29.3%)			
	Severe anxiety	15 (7.2%)			
Anxiety	Yes	115 (55.3%)			
	No	93(44.7%)			

Table 3 shows the prevalence of anxiety among the patients using the Generalized Anxiety Disorder 7-item Scale (GAD-7). A higher proportion of the patients had anxiety with 18.8% having mild anxiety, 29.3% having moderate anxiety, 7.2% having severe anxiety while 44.7% had no anxiety.

Prevalence of depression

Depressive symptoms were assessed based on participant responses on the Patient Health Questionnaire-9 (PHQ-9) which evaluated depression symptom severity over the previous two weeks. The data obtained were presented as frequencies and proportions presented in the table below.

Table 4: Prevalence of depression

You have often been bothered by the following problems over the last 2 weeks	Not at all	Sever al days	More than half the days	Nearly every day	
	Freq (%)	Freq (%)	Freq (%)	Freq (%)	
1. Little interest or pleasure in doing things	92 (44.2 %)	51 (24.5 %)	57 (27.4%)	8 (3.8%)	
2. Feeling down, depressed or hopeless	106 (51.0 %)	37 (17.8 %)	51 (24.5%)	14 (6.7%)	
3. Trouble falling asleep, staying asleep, or sleeping too much	114 (55.6 %)	43 (21.0 %)	29 (14.1%)	19 (9.3%)	
4. Feeling tired or having little energy	68 (32.7 %)	62 (29.8 %)	51 (24.5%)	27 (13.0%)	
5. Poor appetite or overeating	78 (38.8 %)	53 (26.4 %)	43 (21.4%)	27 (13.4%)	
6. Feeling bad about yourself - or that you're a failure or have let yourself or your family down	106 (52.2 %)	27 (13.3 %)	50 (24.6%)	20 (9.9%)	
7. Trouble concentrating on things, such as reading the newspaper or watching television	80 (40.6 %)	44 (22.3 %)	43 (21.8%)	30 (15.2%)	
8. Moving or speaking so slowly that other people could have noticed. Or, the opposite - being so fidgety or restless that you have been moving around a lot more than usual	105 (52.8 %)	40 (20.1 %)	40 (20.1%)	14 (7.0%)	
9. Thoughts that you would be better off dead or hurting yourself in some way	99 (49.7 %)	38 (19.1 %)	50 (25.1%)	12 (6.0%)	
Overall prevalence of depression	No depression	86 (41.3%)			
	Mild depression	37 (17.8%)			
	Moderate depression	34 (16.3%)			
	Moderately severe depression	41 (19.7%)			
	Severe depression	10 (4.8%)			
Depression	Yes	122(58.7%)			
	No	86 (41.3%)			

Table 4 shows the prevalence of depression among the patients using Patient Health Questionnaire -9 (PHQ-9). A higher proportion had depression with 17.8% having mild depression, 16.3% having moderate depression, 19.7% having moderately severe depression, 4.8% having severe depression while 41.3% were not depressed.

Table 5: Bivariate analysis of sociodemographic characteristics and social withdrawal, anxiety and depression

Variable	Social withdrawal		X2	P value
	Not at risk	At risk		
Age				

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10--14	44	23	16.736	<0.001*
15 - 19	50	91		
Gender				
Male	46	55	0.01	0.921
Female	48	59		
Place of residence				
Urban	69	88	0.4	0.527
Rural	25	26		
Educational status				
Primary	4(80)	1(20)	3.658	0.301
Secondary	81(45.8)	96(54.2)		
Tertiary	5(35.7)	9(64.3)		
Not attending school	4(33.3)	8(66.7)		
Duration of HIV diagnosis (in years)				
≤ 5	73(45.1)	89(54.9)	0.092	0.993
06-Oct	9(47.4)	10(52.6)		
Nov-15	10(45.5)	12(54.5)		
>15	2(40.0)	3(60.0)		
Parents relationship				
Married	56(44.1)	71(55.9)	6.526	0.089
Cohabiting	22(62.9)	13(37.1)		
Divorced	8(36.4)	14(63.6)		
Separated	8(33.3)	16(66.7)		
You live with				
Parents	40(43.0)	53(57.0)	9.956	0.041*
Mother only	18(75.0)	6(25.0)		
Father only	8(40.0)	12(60.0)		
Guardian	11(39.3)	17(60.7)		
Family member	17(39.5)	26(60.5)		
Educational level of father				
Tertiary	41(38.7)	65(61.3)	5.603	0.133
Secondary	35(55.6)	28(44.4)		
Primary completed	6(60.0)	4(40.0)		
None	12(41.4)	17(58.6)		
Educational level of mother				
Tertiary	51(47.2)	57(52.8)	3.84	0.279
Secondary	22(52.4)	20(47.6)		
Primary completed	7(46.7)	8(53.3)		
None	14(32.6)	29(67.4)		
Occupation of father				
Civil/public servant	42(49.4)	43(50.6)	24.681	<0.001*
Trader	10(24.4)	31(75.6)		
Farmer	5(20.8)	19(79.2)		
Artisan	22(64.7)	12(35.3)		
Unemployed	12(75.0)	4(25.0)		
others	3(37.5)	5(62.5)		
Occupation of mother				
Civil/public servant	31(40.8)	45(59.2)	12.774	0.026*
Trader	30(37.5)	50(62.5)		

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Farmer	16(66.7)	8(33.3)		
Artisan	9(75.0)	3(25.0)		
Unemployed	1(25.0)	3(75.0)		
others	7(58.3)	5(41.7)		
Variable	Anxiety		X2	P value
	No	Yes		
Age				
10--14	22(32.8)	45(67.2)	2.077	0.15
15 - 19	33(23.4)	108(76.6)		
Gender				
Male	27(26.7)	74(73.3)	0.009	0.926
Female	28(26.2)	79(73.8)		
Place of residence				
Urban	36(22.9)	121(77.1)	4.061	0.044*
Rural	19(37.3)	32(62.7)		
Educational status				
Primary	2(40.0)	3(60.0)	0.965	0.81
Secondary	46(26.0)	131(74.0)		
Tertiary	3(21.4)	11(78.6)		
Not attending school	4(33.3)	8(66.7)		
Duration of HIV diagnosis (in years)				
≤ 5	35(21.6)	127(78.4)	8.906	0.031*
06-Oct	8(42.1)	11(57.9)		
Nov-15	10(45.5)	12(54.5)		
>15	2(40.0)	3(60.0)		
Parents relationship				
Married	38(29.9)	89(70.1)	2.902	0.407
Cohabiting	8(22.9)	27(77.1)		
Divorced	3(13.6)	19(86.4)		
Separated	6(25.0)	18(75.0)		
You live with				
Parents	23(24.7)	70(75.3)	3.479	0.481
Mother only	9(37.5)	15(62.5)		
Father only	3(15.0)	17(85.0)		
Guardian	9(32.1)	19(67.9)		
Family member	11(25.6)	32(74.4)		
Educational level of father				
Tertiary	22(20.8)	84(79.2)	11.335	0.010*
Secondary	26(41.3)	37(58.7)		
Primary completed	3(30.0)	7(70.0)		
None	4(13.8)	25(86.2)		
Educational level of mother				
Tertiary	24(22.2)	84(77.8)	6.01	0.111
Secondary	16(38.1)	26(61.9)		
Primary completed	6(40.0)	9(60.0)		
None	9(20.9)	34(79.1)		
Occupation of father				
Civil/public servant	19(22.2)	66(77.6)	10.936	0.053*
Trader	6(14.6)	35(85.4)		

Farmer	11(45.8)	13(54.2)		
Artisan	10(29.4)	24(70.6)		
Unemployed	7(43.8)	9(56.3)		
others	2(25.0)	6(75.0)		
Occupation of mother				
Civil/public servant	14(18.4)	62(81.6)	26.704	<0.001*
Trader	14(17.5)	66(82.5)		
Farmer	11(45.8)	13(54.2)		
Artisan	7(58.3)	5(41.7)		
Unemployed	1(25.0)	3(75.0)		
others	8(66.7)	4(33.3)		
Variable	Depression		X2	P value
	No	Yes		
Age				
Oct-14	21(31.3)	46(68.7)	1.489	0.222
15 - 19	33(23.4)	108(76.6)		
Gender				
Male	20(19.8)	81(80.2)	3.875	0.049*
Female	34(31.8)	73(68.2)		
Place of residence				
Urban	37(23.6)	120(76.4)	1.91	0.167
Rural	17(33.3)	34(66.7)		
Educational status				
Primary	3(60.0)	2(40.0)	8.488	0.037*
Secondary	49(27.7)	128(72.3)		
Tertiary	2(14.3)	12(85.7)		
Not attending school	0(0.0)	12(100.0)		
Duration of HIV diagnosis (in years)				
≤ 5	41(25.3)	121(74.7)	2.412	0.491
06-Oct	7(36.8)	12(63.2)		
Nov-15	4(18.2)	18(81.8)		
>15	2(40.0)	3(60.0)		
Parents relationship				
Married	35(27.6)	92(72.4)	2.78	0.427
Cohabiting	11(31.4)	24(68.6)		
Divorced	3(13.6)	19(86.4)		
Separated	5(20.8)	19(79.2)		
You live with				
Parents	29(31.2)	64(68.8)	10.6	0.031*
Mother only	10(41.7)	14(58.3)		
Father only	2(10.0)	18(90.0)		
Guardian	3(10.7)	25(89.3)		
Family member	10(23.3)	33(76.7)		
Educational level of father				
Tertiary	28(26.4)	78(73.6)	5.352	0.148
Secondary	21(33.3)	42(66.7)		
Primary completed	1(10.0)	9(90.0)		
None	4(13.8)	25(86.2)		
Educational level of mother				

Tertiary	27(25.0)	81(75.0)	1.755	0.625
Secondary	11(26.2)	31(73.8)		
Primary completed	6(40.0)	9(60.0)		
None	10(23.3)	33(76.7)		
Occupation of father				
Civil/public servant	23(27.1)	62(72.9)	7.837	0.165
Trader	6(14.6)	35(85.4)		
Farmer	11(45.8)	13(54.2)		
Artisan	8(23.5)	26(76.5)		
Unemployed	4(25.0)	12(75.0)		
others	2(25.0)	6(75.0)		
Occupation of mother				
Civil/public servant	24(31.6)	52(68.4)	7.573	0.181
Trader	15(18.8)	65(81.3)		
Farmer	8(33.3)	16(66.7)		
Artisan	5(41.7)	7(58.3)		
Unemployed	0(0.0)	4(100.0)		
others	2(16.7)	10(83.3)		

* statistically significant

Table 5 shows the bivariate analysis of socio-demographic characteristics and social withdrawal, anxiety and depression. Age [$p < 0.001$; $X^2 = 16.736$], who the adolescent lives with [$p = 0.041$; $X^2 = 9.956$], father's occupation [$p < 0.001$; $X^2 = 24.681$] and mother's occupation [$p = 0.026$; $X^2 = 12.774$] were associated with social withdrawal.

Place of residence [$p = 0.044$; $X^2 = 4.061$], duration of HIV diagnosis [$p = 0.031$; $X^2 = 8.906$], educational level of the father [$p = 0.010$; $X^2 = 11.335$], father's occupation [$p = 0.053$; $X^2 = 10.936$] and mother's occupation [$p < 0.001$, $X^2 = 26.704$] were associated with anxiety.

Gender [$p = 0.049$; $X^2 = 3.875$], educational level [$p = 0.037$; $X^2 = 8.488$] and who the adolescent lives with [$p = 0.031$; $X^2 = 10.600$] were associated with depression

Table 6: Predictors of social withdrawal, anxiety and depression among the participants

Social withdrawal				
Variable	Adjusted Odds ratio	P value	95% CI	
			Lower	Upper
Age				
10--14	1			
15 - 19	0.2	<0.001*	0.092	0.434
You live with				
Parents	1			
Mother only	0.559	0.187	0.236	1.325
Father only	0.402	0.179	0.107	1.518
Guardian	1.453	0.586	0.379	5.576
Family member	0.837	0.774	0.25	2.807
Occupation of father				
Civil/public servant	1			
Trader	0.279	0.216	0.037	2.111
Farmer	1.692	0.634	0.194	14.746
Artisan	5.849	0.122	0.623	54.936
Unemployed	0.335	0.321	0.039	2.907
others	0.141	0.107	0.013	1.522

Occupation of mother				
Civil/public servant	1			
Trader	11.372	0.011*	1.738	74.395
Farmer	6.296	0.047*	1.028	38.574
Artisan	1.117	0.914	0.151	8.247
Unemployed	3.766	0.256	0.382	37.168
others	4.394	0.361	0.184	105.106
Anxiety				
Place of residence				
Urban	1			
Rural	3.2	0.011*	1.301	7.871
Duration of HIV diagnosis (in years)				
≤ 5	1			
06-Oct	4.81	0.149	0.571	40.525
Nov-15	0.983	0.989	0.097	9.973
>15	2.378	0.471	0.226	25.05
Educational level of father				
Tertiary	1			
Secondary	0.156	0.050*	0.024	0.996
Primary completed	0.091	0.009*	0.015	0.554
None	0.102	0.042*	0.011	0.917
Occupation of father				
Civil/public servant	1			
Trader	0.665	0.694	0.087	5.096
Farmer	1.711	0.65	0.168	17.475
Artisan	0.559	0.627	0.053	5.84
Unemployed	1.567	0.709	0.149	16.501
others	0.092	0.042	0.009	0.918
Occupation of mother				
Civil/public servant	1			
Trader	27.593	0.001*	3.835	198.544
Farmer	17.261	0.001*	2.992	99.567
Artisan	5.089	0.105	0.711	36.445
Unemployed	2.248	0.483	0.234	21.582
others	15.465	0.079	0.729	328.036
Depression				
Gender				
Male	1			
Female	2.064	0.039*	1.037	4.107
Educational status				
Primary	1			
Secondary	1.345	0.186	0.456	1.247
Tertiary	1.762	0.467	0.238	2.876
Not attending school	2.348	0.086	0.786	1.987
You live with				
Parents	1			
Mother only	0.635	0.336	0.252	1.601
Father only	0.436	0.161	0.137	1.392
Guardian	2.243	0.353	0.408	12.336

Family member	2.499	0.223	0.572	10.912
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* Statistically significant

Table 6 shows the predictors of social withdrawal, anxiety and depression. The predictors of social withdrawal were age [$p < 0.001$; 95% CI (0.092-0.434)] and occupation of mothers: trader [$p = 0.011$; 95% CI (1.738-74.395)]; farmer [$p = 0.047$; 95% CI (1.028-38.574)]. Predictors of anxiety were place of residence [$p = 0.011$; 95% CI (1.301-7.871)]: educational level of father, secondary [$p = 0.050$; 95% CI (0.024-0.996)], primary [$p = 0.009$; 95% CI (0.015)0.554], none [$p = 0.042$; 95% CI (0.011-0.917)]: occupation of mother: trader, [$p = 0.001$; 95% CI (3.835-198.544)], farmer, [$p = 0.001$; 95% CI (2.992-99.567)] while the predictor of depression was gender [$p = 0.039$; 95%CI (1.037-4.107)].

4. Discussion

Mental health affects the ability to cope with problems, live in a changing society, and perform various tasks. [19]

Depression, anxiety disorder and social withdrawal are among the most significant mental health difficulties affecting the quality of life in most settings, including among individuals living with HIV. The burden of depression and anxiety and associated factors vary in different settings and different age groups. This study assessed the prevalence of social withdrawal, anxiety, and depression among adolescent HIV positive patients accessing ART care at ESUTH Parklane Enugu, Enugu State Nigeria. There were 208 participants in this study.

Social isolation is a condition in which an individual feels disconnected from others and lacks meaningful social relationships. It can be caused by a number of factors, including the stigma associated with HIV, the fear of transmission, the challenges of managing their health and the common perception of HIV being associated with an imminent death. The sense of feeling alone in managing HIV can impact profoundly on psychological and emotional well-being. [20]

The prevalence of social withdrawal in this study was 56.3% with significant proportions avoiding interactions, spending excessive time alone, and lacking confidants. This level of social withdrawal was high considering its consequences on the overall health of the patients. Research has consistently shown moderate levels of social withdrawal among PLHIV. [21, 22] Human interactions and communication are essential for understanding the significance of social life and coping with life challenges. [23] Strong social networks can reduce risky behaviors and prevent negative appraisals, making social support a protective factor against PLHIV. [24] The result of our finding was similar to the report of a systematic review of sub-Saharan African studies where 30-50% of adolescents with HIV experience emotional distress due to social withdrawal. [25] The observed similarity may be due to similar cultural and socio-demographic characteristics.

The result of our finding was higher than the report of global systematic review which reported a pooled prevalence of loneliness and social withdrawal of 33.9%. [26] In the systematic review, they used 8 studies in their meta-analysis for the pooled prevalence and all the studies were from developed countries (United States of America, 4; Canada, 2; China, 1; and Italy 1). African studies included in the systematic review did not report prevalence of social withdrawal and hence were not included in the meta-analysis. Based on cultural background, these countries will most likely have reduced stigma on the patients and better social support both from the families, communities and healthcare providers. These may explain the lower prevalence of social withdrawal.

A study conducted in China reported a higher prevalence of social withdrawal of over 60% among depressed patients. [27] The higher prevalence may be because it was assessed among depressed patients. Depression is another serious mental health problem that have a negative feedback effect on social withdrawal. The discrimination and negative judgements they often experience prevent them from disclosing their status. Stigma, discrimination, and psychological distress contribute to the isolation that adolescents and young adults living with HIV experience. The limited disclosure itself can lead to them becoming isolated and lonely. [28] A qualitative study conducted in Malawi reported that adolescents can experience both enacted stigma and self stigma and both can lead to social withdrawal. [29]

Generally different studies used different scales and methods to assess social withdrawal hence we cannot compare the different findings by scale but believe that the overall results correlate.

The prevalence of all forms of anxiety in our study was 55.3%. About 18.8% had mild anxiety, 29.3% experienced moderate anxiety and 7.2% reported severe anxiety. This shows a considerably high prevalence of anxiety among the studied adolescents. This can have dire consequences to their health.

Our findings are higher than that of a similar Nigerian study conducted in Maiduguri Borno state, where 22% of HIV-positive adolescents had significant anxiety symptoms attributed to stigma and fear of social rejection. [12] This suggests a greater psychological burden in our cohort, possibly due to regional differences in healthcare access and community support. Other African studies also reported lower prevalence of anxiety from Kenya (32.3%) [17], Uganda (9%) [30] and South Africa (25%) [31]. The Kenyan study suggests that school-related stigma and fear of status disclosure contributed significantly to anxiety levels. The observed differences can be due to differences in family and social support, knowledge of HIV and access to counselling and healthcare. The scale that was used to assess anxiety could also account for the differences in reported prevalence. Furthermore, in England, a study reported anxiety prevalence of 40% which was also high. Cultural differences and the understanding of anxiety may account for the differences. [11] Socio-demographic characteristics, time of the study, or sample size variation, differences in individual disease burden, and the socio-economic factors in the community can also explain the differences. These comparisons emphasize the need for targeted interventions to reduce stigma, improve family support, and enhance mental health resources for HIV-positive adolescents.

A higher proportion had depression (58.7%) with 17.8% having mild depression, 16.3% having moderate depression, 19.7% having moderately severe depression, 4.8% having severe depression while 41.3% were not depressed.

The results of this study highlight the weight of depressive symptoms in adolescents with HIV/AIDS in Nigeria. The high prevalence of depression in the present study might be explained by the fact that about 34.2% of the participants live with either a guardian or family member indicating that they may be orphaned. Being an orphan has been identified as a factor associated with depression among adolescents living with HIV. [8] Some other countries reported a higher or lower prevalence. For example, a study conducted in Uganda found a depression rate of 46% among adolescents aged from 15 to 19 years [32]. Rwanda 31% among adolescents with HIV/AIDS [33]. The high prevalence of depression among adolescents living with HIV in developing countries is reported to be linked with factors related to poverty, and stressful life conditions. [34] A history of trauma experience may also explain why the rate of depression is high among HIV-positive adolescents in Africa compared to other regions of the world. It has been evidenced that in the community which experienced a traumatic event such as genocide, social unrests, children of the next generation often manifest the psychological trauma symptoms. [33]

A similar study in Nigeria found a 16.9% prevalence of major depressive episodes, comparable to our findings of severe depression, suggesting a potential increase in depressive symptoms due to increasing ART burden. [35] Other studies reported overall lower prevalence of depression from South Africa (44.8%) [36], Uganda (20-40%) [37] and Ethiopia (35%) [14]. However, another study from the United States of America reported a much lower prevalence of depression (26.07%) [38]. This may be due to better coping mechanisms and support from both the society and government. The study also reported a higher prevalence among females thus, highlighting gender related disparities in mental health outcomes.

There are numerous factors contributing to high prevalence of depression among adolescents living with HIV. Stigma remains a significant barrier, leading to social isolation, low self-esteem and emotional distress.

A study in Uganda identified that adolescents who struggle with ART adherence often experience feelings of hopelessness and guilt which can lead to worsened or worsen depression. [37] The dual burden of managing a chronic illness while navigating the challenges of adolescence places HIV positive youth at a higher risk of developing mental health issues. [39] Depression in HIV positive adolescents is linked to both psychological and biological mechanisms. Psychologically, HIV creates a persistent state of emotional health due to its chronicity, the demands of treatment adherence, and the social challenges related to stigma and discrimination. [40] Biologically the virus may contribute to neurocognitive dysfunction, increasing the risk of mood disorders such as depression. [41] Neuroinflammation caused by HIV's impact on the central nervous system has been associated with depressive symptoms even among patients receiving ART. [42]

The predictors of social withdrawal were age of the patients where being aged between 15-19 years was protective of social withdrawal when compared to those aged 10-14 years and their mother's occupation where those that their mothers were traders and farmers had 11 times and 6 times odds of having social withdrawal when compared to those that their parents were civil servants. The younger adolescents may be prone to bullying both in school and at the community making it easier for them to withdraw socially. The older ones some of which are already in the higher institutions might have adjusted to living with HIV, hence no longer withdraws socially. A similar study from Ghana reported that having ≥ 13 years of schooling was associated with higher quality of life. [43] This can explain why the younger adolescents are more prone to social withdrawal. A similar Nigerian study also reported that age and being female was associated with social withdrawal. [44]

Mother being a trader or a farmer is associated with poverty because most of these women may just be petty traders or small-scale farmers. Poverty can lead to bullying with subsequent social withdrawal. There is evidence that lower socio-economic status is associated with higher prevalence of bullying. [45]

The predictors of anxiety were place of residence with rural dwellers having 3 times odds of having anxiety when compared to urban dwellers, fathers educational level, where having a father with secondary education or less was protective from anxiety when compared to patients that their father had tertiary education and mothers occupation with patients that their mother were traders and farmers having about 28 times odds and 17 times odds of having anxiety respectively when compared to those that their mothers were civil servants.

Residing in rural area and mother being a trader or farmer are both associated with poor income. Poor income has multifaceted influence on the mental health of individuals especially in developing countries like ours. It can lead to poor social support and neglect to the child's health challenges leading to anxiety. Some of these adolescents may be out of school due to poverty and the fear of their future may also lead to anxiety. Stigmatization can also lead to anxiety. A study reported that HIV perceived stigma was associated with anxiety. [46]

The predictor of depression was gender with females having 2 times odds of depression than the males. The physiological make up of females and the level of stigmatization they experience may explain the higher prevalence. Similar studies from Nigeria reported similar finding. [47, 48] Other studies outside Nigeria also corroborated our finding. [49, 50]

These findings underscore the need for targeted mental health interventions particularly in stigma reduction.

Future research should focus on longitudinal studies to track mental health changes over time, helping establish causality. Expanding studies across multiple healthcare facilities and regions will improve generalizability and capture diverse experiences. Intervention-based research on adherence counseling, peer support programs, and digital reminders could identify effective strategies for improving adherence. Further exploration of caregiver and family dynamics is needed to assess their role in supporting adolescents. Qualitative approaches, such as interviews and focus groups, could provide deeper insights into the lived experiences of adolescents with HIV. Research on integrating mental health support into ART programs will be crucial in addressing the high prevalence of anxiety, depression, and social withdrawal among adolescents living with HIV.

5. Limitations

1. The study employed only quantitative method in assessing social withdrawal, anxiety and depression. Qualitative approaches, such as interviews and focus groups, could provide deeper insights into the lived experiences of adolescents with HIV.
2. The study was cross-sectional, and stronger conclusions would be possible with a longitudinal cohort. Future research should focus on longitudinal studies to track mental health changes over time, helping to establish causality.
3. We did not examine coping mechanism that may be protective or provocative to these mental health challenges.

6. Conclusions

The prevalence of social withdrawal, anxiety and depression was high among the studied HIV positive adolescents. Several socio-demographic characteristics predicted social withdrawal, anxiety and depression emphasizing their importance in the management of these adolescents. More proactive measures should be put in place for early diagnosis and treatment of these mental health

challenges faced by HIV positive adolescents. Healthcare workers should be on alert concerning the mental state of their patients as this may adversely affect the overall management of the patients. Mental health checkups should be incorporated into the routine care of these patients.

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