Proportion of Depressive Symptoms and Its Predictors among Youth Living with HIV in Urban Thailand*

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Abstract

Purpose: This study sought to estimate the proportion of depressive symptoms and to examine predictors of depressive symptoms among youth living with HIV (YLHIV) who were receiving antiretroviral therapy (ART).

Design: A cross-sectional study with predictive analysis.

Methods: A total of 118 youth aged 15-24 years attending ART clinics at a university hospital in Bangkok, Thailand, were recruited through convenience sampling. Data were collected using the Patient Health Questionnaire-9, HIV Stigma Scale, Brief Family Relationship Scale, and HIV viral load. Predictors of depressive symptoms were examined using multiple linear regression analysis.

Main findings: The proportion of depressive symptoms was 25.4%. Multiple linear regression analysis revealed that family relationship quality (β = - .34, $p < .01$), perceived stigma (β = .27, $p < .01$), age (β = - .19, $p < .05$), and HIV viral load (β = .16, $p = .05$) could together explain 33% of the variance in depressive symptoms.

Conclusion and recommendations: Depressive symptoms were common among YLHIV. Family relationships and perceived stigma were significant predictors of depressive symptoms among YLHIV. Integrating mental health screening and family-centered psychosocial interventions with stigma-reduction initiatives into HIV care services may help reduce depressive symptoms in this vulnerable population.

Keywords: depressive symptoms, family relationships, HIV viral load, stigma, youth living with HIV

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อัตราการเกิดอาการซึมเศร้า และปัจจัยทำนายอาการซึมเศร้าในเยาวชนที่มีเชื้อเอชไอวี เขตเมือง ประเทศไทย*

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บทคัดย่อ

วัตถุประสงค์: เพื่อประมาณอัตราการเกิดอาการซึมเศร้า และปัจจัยทำนายอาการซึมเศร้าในเยาวชนที่ได้รับการรักษาด้วยยาต้านไวรัส

รูปแบบการวิจัย: การวิจัยภาคตัดขวางแบบวิเคราะห์เชิงทำนาย

วิธีดำเนินการวิจัย: กลุ่มตัวอย่างในการวิจัยนี้มีทั้งหมด 118 คน เป็นเยาวชนอายุ 15-24 ปี ที่เข้ารับบริการรักษาด้วยยาต้านไวรัส ณ คลินิกโรคติดเชื้อ โรงพยาบาลมหาวิทยาลัยแห่งหนึ่ง ในกรุงเทพมหานคร เลือกตัวอย่างแบบสะดวก เก็บรวบรวมข้อมูลโดยใช้แบบประเมินภาวะซึมเศร้า แบบวัดการรับรู้ตราบาปที่เกี่ยวข้องกับเอชไอวี แบบประเมินความสัมพันธ์ในครอบครัว และปริมาณไวรัสในเลือด วิเคราะห์ปัจจัยทำนายอาการซึมเศร้าโดยใช้สถิติถดถอยเชิงเส้นพหูคูณ

ผลการวิจัย: การศึกษาครั้งนี้พบอัตราการเกิดอาการซึมเศร้าในเยาวชนที่ติดเชื้อเอชไอวีร้อยละ 25.4 ความสัมพันธ์ในครอบครัว (β = - .34, p < .01) การรับรู้ตราบาป (β = .27, p < .01) อายุ (β = - .19, p < .05) และปริมาณไวรัสในเลือด (β = .16, p = .05) สามารถร่วมอธิบายความแปรปรวนของอาการซึมเศร้าได้ร้อยละ 33

สรุปและข้อเสนอแนะ: อาการซึมเศร้าพบได้ค่อนข้างสูงในกลุ่มเยาวชนที่ติดเชื้อเอชไอวี โดยความสัมพันธ์ในครอบครัวและการรับรู้ตราบาป เป็นปัจจัยทำนายที่สำคัญต่อแนวโน้มการเกิดอาการซึมเศร้า การบูรณาการการคัดกรองสุขภาพจิต และการจัดบริการช่วยเหลือด้านจิตสังคมที่เน้นครอบครัวเป็นศูนย์กลางและมาตรการป้องกันการเลือกปฏิบัติเข้ากับระบบบริการดูแลเยาวชนที่ติดเชื้อเอชไอวี อาจช่วยลดความรุนแรงของอาการซึมเศร้าในประชากรกลุ่มนี้ได้

คำสำคัญ: อาการซึมเศร้า ความสัมพันธ์ในครอบครัว ปริมาณไวรัสในเลือด การตีตรา เยาวชนที่มีเชื้อเอชไอวี

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Background and Significance

HIV infection and AIDS remain significant global and national public health challenges despite substantial advances in prevention and treatment.[1] According to recent data from the Joint United Nations Program on HIV/AIDS (UNAIDS), approximately 40.8 million people worldwide were living with HIV in 2024, with an estimated 1.3 million new infections occurring annually.[2] Youth, or adolescents and young adults who aged 15-24 years, continue to represent a disproportionately affected group with a substantial proportion of new HIV infections globally. Every week, approximately 4,000 female youth acquire HIV infection worldwide, highlighting the ongoing vulnerability of this population.[2]

In Thailand, remarkable progress has been achieved in HIV treatment and care through the expansion of antiretroviral therapy (ART) coverage and universal access to healthcare services.[3-4] Nevertheless, new HIV infections among youth remain a critical concern. National surveillance data indicate that a substantial proportion of newly diagnosed HIV cases occur among individuals aged 15-24 years, highlighting persistent vulnerabilities in this age group.[4] Although HIV-related morbidity and mortality have declined, the psychosocial consequences of living with HIV, particularly among young people, continue to pose significant challenges to long-term health outcomes.[5] Youth are critical developmental periods marked by profound physical, hormonal, cognitive, and psychosocial changes.[6] Managing these developmental transitions while living with a chronic, stigmatized, and lifelong condition such as HIV may heighten vulnerability to depressive symptoms.[5] In addition to psychosocial stressors, HIV infection may exert neurobiological effects through its impact on the central nervous system, potentially contributing to mood disturbances.[7] Although effective ART has substantially reduced HIV-related neurological complications, mental health concerns remain prominent among youth, particularly those who acquired HIV perinatally or during adolescence.[5,7]

Mental health problems are increasingly recognized as a major comorbidity among YLHIV.[5] Recent international studies have documented a high proportion of psychological distress, emotional and behavioral problems, and psychiatric disorders in this population.[8-9] Depressive symptoms are consistently reported as the most prevalent mental health condition among YLHIV, with proportions of depressive symptoms estimates ranging from approximately 20% to over 40%, depending on study context and assessment methods.[8-9] Depression in YLHIV has been associated with poorer ART adherence and suboptimal retention in care, with potential links to risk-related behaviors.[5,10]

Previous research has identified multiple predictors of depressive symptoms among YLHIV,

including age, perceived HIV-related stigma, family relationships, and viral load.[5,10] Younger age has been associated with higher levels of depressive symptoms among youth living with HIV.[5] In contrast, a meta-analysis estimated that the prevalence was highest amongst the older adolescents aged 15-19 years (37.1%) than the younger adolescents aged 10-14 years (29.8%).[11] Regarding HIV-related stigma, a previous study found that Internalized and perceived community stigma were associated with depressive symptoms [aRR 1.31 (CI: 1.21-1.40) and aRR 1.24 (CI: 1.13-1.36), respectively].[12] Perceived HIV-related stigma has emerged as a robust and consistent predictor of depressive symptoms.[5,12] HIV-related stigma may undermine self-esteem, social integration, and coping capacity, thereby exacerbating psychological distress.[13] In contrast, supportive family relationships and social support have been shown to function as protective factors associated with lower depressive symptoms among YLHIV.[5,14] Family cohesion, open communication, and emotional support are particularly salient in collectivist cultural contexts, where family plays a central role in adolescents' daily lives.[15-17] In addition, a previous meta-analysis reported that individuals without depression were more likely to achieve HIV viral suppression or undetectable viral load compared to individuals with depression (OR 1.30; 95%CI [1.15, 1.48]; I = 76%).[10]

The relationship between biological markers of HIV infection, such as viral load and CD4 count, and depressive symptoms remains inconclusive.[5,10] While earlier studies suggested potential neurobiological links between disease severity and depressive symptoms[7], more recent evidence indicates that psychosocial factors may play a more prominent role in severity of depressive symptoms among YLHIV receiving stable ART.[5,13]

In Thailand, specialized ART clinics provide comprehensive medical care for children, adolescents, and adults living with HIV.[3-4] However, systematic mental health screening and reporting of depressive symptoms among youth remain limited.[5] Given the developmental vulnerability of this age group and the enduring psychosocial burden of HIV-related stigma, updated evidence regarding the proportion and predictors of depressive symptoms among YLHIV in clinical settings is needed to support early identification and targeted mental health interventions.[5,12]

Objectives

1. To determine the proportion of depressive symptoms among YLHIV receiving antiretroviral therapy in an urban clinical setting in Thailand.

2. To identify predictors of depressive symptoms among YLHIV, including age, perceived HIV-related stigma, family relationships, and viral load.

Research Hypotheses

Age, perceived stigma, family relationships, and viral load could significantly predict depressive symptoms among YLHIV.

Methodology

A hospital-based cross-sectional study was conducted between January 2021 and September 2022. Data collection occurred during the COVID-19 pandemic, which may have influenced psychosocial stress and mental health experiences among YLHIV.

Population and sample

The study was conducted with YLHIV aged 15-24 years who were receiving antiretroviral therapy (ART) at a university-affiliated hospital in Bangkok, Thailand. Participants were recruited during routine follow-up visits at the ART clinic.

Participants with severe AIDS-related complications, HIV-associated dementia, brain infections, cognitive impairment, or an intelligence quotient score of 70 or lower were excluded because these conditions could affect their ability to provide informed consent and complete the questionnaires reliably.

The sample size was determined using two approaches. First, the sample size required to estimate the proportion of depressive symptoms was calculated using the finite population correction formula for proportion estimation in small populations, following the method described by Vanichbancha.[18] The estimated proportion of depressive symptoms among HIV-infected youth from previous research was 18.2%.[19] The estimated population size of YLHIV receiving treatment at the clinic was approximately 200 individuals. A 95% confidence level and a margin of error of 0.045 were used, resulting in a required sample size of 118 participants.

Second, a power analysis for multiple linear regression was conducted using G*Power to ensure adequate statistical power to identify predictors of depressive symptoms. A medium effect size ($f^2 = .15$), significance level of .05, power of .80, and four predictors were specified, resulting in a minimum sample size of 84 participants. The final sample size was determined by taking the larger of the two estimated sample sizes and considering the feasibility of participant recruitment in the study setting.

Research instruments

Demographic and clinical data, including age and viral load, were obtained from medical records and participant self-reports. Depressive symptoms among YLHIV were assessed using the Thai version of the nine-item Patient Health Questionnaire (PHQ-9).[20-21] Perceived HIV-related stigma was measured using the HIV Stigma Scale,[22-23] while family relationships were assessed using the Brief Family Relationship Scale.[24]

The Patient Health Questionnaire-9 (PHQ-9) was developed by Kroenke, Spitzer, and Williams[20]

and translated into Thai by Lotrakul, Sumrithe, and Saipanish.[21] The PHQ-9 is a self-administered questionnaire consisting of nine items based on the DSM-IV diagnostic criteria for depression. Each item is rated on a 4-point scale from 0 (not at all) to 3 (nearly every day), yielding a total score from 0 to 27. Higher scores indicate greater severity of depressive symptoms. The Thai version of the PHQ-9 has demonstrated acceptable validity and reliability among adolescents.[21,25] In this study, Cronbach's alpha was .84. A PHQ-9 score of 9 or higher was used as the cut-off point for depressive symptoms.[21,25] The severity of depressive symptoms was categorized as mild (10-14 points), moderate (15-19 points), and severe (20 points or higher).[20]

The HIV Stigma Scale (HSS) was developed by Berger, Ferrans, and Lashley[22] and translated into Thai by Suksatit.[23] The scale consists of 40 items assessing perceived HIV-related stigma, including personal experiences, public attitudes toward people living with HIV, and perceived societal reactions. Responses are rated on a 4-point Likert scale, resulting in total scores ranging from 40 to 160. Higher scores indicate higher levels of perceived HIV-related stigma. Of the 40 items, 38 are positively worded, and 2 are negatively worded (items 1 and 21). Negatively worded items were reverse-scored before analysis. The Thai version of the HSS demonstrated excellent reliability, with a Cronbach's alpha coefficient of .96.[23] In this study, the Cronbach's alpha coefficient was .96.

The Brief Family Relationship Scale (BFRS) was developed by Fok, Allen, and Henry[24] to assess family relationships across three domains: family cohesion, expressiveness, and conflict. The Thai version of the BFRS was translated using a forward–backward translation process by bilingual experts to ensure semantic equivalence and cultural appropriateness and was adapted for use among Thai youth living with HIV. The Thai version consists of 17 items, including 13 positively worded items and 4 negatively worded items (items 2, 5, 9, and 13). Negatively worded items were reverse-scored before analysis. Each item is scored dichotomously (0 or 1), resulting in total scores ranging from 0 to 17. Higher scores indicate better family relationships. The Thai version of the BFRS demonstrated acceptable reliability, with a Cronbach's alpha coefficient of .75 in a pilot study involving 30 youth living with HIV. In this study, Cronbach's alpha was .75.

Viral load among YLHIV

Viral load, the number of HIV viruses in 1 milliliter of blood, was measured and categorized as undetectable if it was less than 50 per milliliter. Viral loads were obtained from patient history reports within the past 12 months. Participants were classified into two groups: suppressed (< 50/mL) and unsuppressed (≥ 50/mL).

Ethical considerations

This study was approved by the Human Research Ethics Committee, Faculty of Medicine, Siriraj Hospital,

Mahidol University (COA no. Si 762/2020). The study received approval from the hospital's Human Research Ethics Committee to collect data from human participants before collecting data from participants under 18 years of age. Parental consent and informed consent were obtained from the research participants before data collection.

Data collection

Participants were recruited using convenience sampling during routine follow-up visits at the ART clinic of a university-affiliated hospital in Bangkok, Thailand. Eligible participants and their parents or legal guardians (for participants younger than 18 years) were informed about the study objectives, procedures, confidentiality, and voluntary participation before written informed consent was obtained.

Participants completed self-administered questionnaires assessing depressive symptoms, perceived HIV-related stigma, and family relationships. The researcher was available to provide clarification when needed. Completion of the questionnaires required approximately 45-60 minutes. Clinical data, including viral load, were retrieved from medical records with participants' permission.

After data collection, all questionnaires were reviewed for completeness and accuracy. Questionnaires with incomplete responses were handled appropriately and excluded from statistical analysis to minimize potential bias and maintain data quality.

Data analysis

Before analysis, data were screened for completeness, outliers, and normality to ensure that statistical assumptions were met. Prior to conducting multiple linear regression analysis, assumptions including normality, linearity, multicollinearity, independence of errors, and homoscedasticity were assessed. The results indicated that the data met the assumptions required for the analysis. Descriptive statistics were used to summarize demographic and clinical characteristics. The proportion of depressive symptoms was estimated using the Thai version of the PHQ-9. Bivariate analyses were conducted to examine associations between depressive symptom scores and independent variables. Pearson's correlation coefficients were used for continuous variables, whereas point-biserial correlation analysis was used for dichotomous variables. Variables demonstrating significant associations were subsequently entered into a multiple linear regression model to identify predictors of depressive symptoms among YLHIV receiving antiretroviral therapy. Statistical significance was set at $p < .05$. Data were analyzed using SPSS version 22.0.

Findings

Socio-demographic and clinical characteristics of the participants

A total of 118 youth aged 15-24 years were recruited for this study. The mean age of the participants was

19.7 years (SD = 2.7). Slightly more than half of the participants were female (51.7%), and the majority were single or widowed (96.6%). More than half were students (58.5%), and the most common highest educational attainment was high school level (30.5%).

Most participants resided with their relatives or caregivers (86.5%) and reported having adequate family income (86.4%). Regarding self-care behaviors, 60.2% of participants reported taking antiretroviral medications daily and on time. Correspondingly, 67.8% of participants had suppressed viral load, whereas 32.2% had unsuppressed viral load. Among the 118 participants, 30 (25.4%) had depressive symptoms, whereas 88 (74.6%) did not. Comparisons of socio-demographic and clinical characteristics between participants with and without depressive symptoms revealed no statistically significant differences in sex, age, marital status, educational level, current educational status, family income, household characteristics, medication adherence, or viral load (all $p > .05$). Detailed socio-demographic and clinical characteristics of the participants are presented in Table 1.

Table 1: Socio-demographic and clinical characteristics of participants with and without depressive symptoms (N = 118)

Variables	Total	Depressive symptoms		Statistic	p-value
	n (%)	Yes (n = 30) n (%)	No (n = 88) n (%)		
Sex				.043	.835[1]
Male	57 (48.3)	14 (46.7)	43 (48.9)		
Female	61 (51.7)	16 (53.3)	45 (51.1)		
Age					
< 18 years	32 (27.1)	11 (36.7)	21 (23.9)	1.856	.173[1]
≥ 18 years	86 (72.9)	19 (63.3)	67 (76.1)		
(minimum value = 15, maximum value = 24, average = 19.7, SD = 2.7)					
Marital Status				-	1.000[2]
Single & Widowed	114 (96.6)	29 (96.7)	85 (96.6)		
Married	4 (3.4)	1 (3.3)	3 (3.4)		
Highest level of education				2.548	.467[1]
Middle school	24 (20.3)	8 (26.7)	16 (18.2)		
High school	36 (30.5)	10 (33.3)	26 (29.5)		
Vocational diploma	26 (22.1)	7 (23.3)	19 (21.6)		
Bachelor's degree	32 (27.1)	5 (16.7)	27 (30.7)		

Table 1: (continue)

Variables	Total	Depressive symptoms		Statistic	p-value
	n (%)	Yes (n = 30) n (%)	No (n = 88) n (%)		
Current education				.039	.844[1]
Not studying	49 (41.5)	12 (40.0)	37 (42.0)		
Studying	69 (58.5)	18 (60.0)	51 (58.0)		
Family income				-	1.000[2]
Enough	102 (86.4)	26 (86.7)	76 (86.4)		
Inadequate	16 (13.6)	4 (13.3)	12 (13.6)		
Household				-	.847[2]
Caregivers/Relatives	102 (86.5)	28 (93.4)	74 (84.1)		
Lover	8 (6.8)	1 (3.3)	7 (8.0)		
Friend	5 (4.2)	1 (3.3)	4 (4.5)		
Alone	3 (2.5)	0 (0.0)	3 (3.4)		
Medication Adherence				.210	.901[1]
Daily, and on time	71 (60.2)	17 (56.7)	54 (61.3)		
Daily, but not on time	40 (33.9)	11 (36.7)	29 (33.0)		
Forgot to take med	7 (5.9)	2 (6.6)	5 (5.7)		
Last viral load count				1.120	.290[1]
suppressed	80 (67.8)	18 (60.0)	62 (70.5)		
unsuppressed	38 (32.2)	12 (40.0)	26 (29.5)		

[1]Chi-square test, [2]Fisher's exact test, *p < .05

Proportion of depressive symptoms among YLHIV

Based on a PHQ-9 cut-off score of ≥ 9, the proportion of depressive symptoms among youth living with HIV attending the ART clinic at the university hospital was 25.4%. Among participants with depressive symptoms, the majority had mild symptoms (86.7%), while 13.3% had moderate symptoms. No participants met the criteria for severe depressive symptoms.

Table 2: Descriptive statistics of variables included in the regression analysis (N = 118)

Variable	Possible range	Observed range	n (%)	$\overline{X}$ (SD)
Depressive symptoms score	0-27	0-18	-	5.59 (±4.17)
Age (years)	-	15-24	-	19.67 (±2.71)
Perceived stigma	40-160	46-149	-	83.53 (±22.02)
Family relationship	0-17	4-17	-	13.92 (±3.08)
Viral load				
0 = suppressed	-	-	80 (67.8)	-
1 = unsuppressed	-	-	38 (32.2)	-

Predictors of depressive symptoms among YLHIV

Bivariate correlation analysis revealed that depressive symptoms were significantly associated with several study variables. Age was negatively correlated with depressive scores ($r = -.22$, $p < .05$), indicating higher depressive symptom severity among younger participants. Perceived stigma showed a moderate positive correlation with depressive family relationships demonstrated a strong negative correlation with depressive symptoms ($r = -.44$, $p < .01$). Viral load was positively correlated with depressive symptoms scores ($r = .25$, $p < .05$). In addition, perceived stigma was significantly and inversely correlated with family relationships ($r = -.28$, $p < .01$). No significant correlations were observed between age and perceived stigma, family relationships, or viral load. (Table 3).

Table 3: Correlations of the age, perceived stigma, family relationship, viral load, and depressive symptoms scores

Variables	1	2	3	4	5
1. Age	1				
2. Perceived stigma	- .008	1			
3. Family relationships	.057	- .277**	1		
4. Viral load status	- .084	.116	- .146	1	
5. Depressive symptoms score	- .220*	.379**	- .443**	.251*	1

* $p < .05$, ** $p < .01$, Viral load was coded as 0 = suppressed and 1 = unsuppressed, with suppressed viral load as the reference group. Pearson's correlation coefficients were used for continuous variables, whereas point-biserial correlation coefficients were used for dichotomous variables

Variables significantly affecting depressive symptoms were subsequently entered into a multiple linear regression model. The overall model was statistically significant ($F = 13.88$, $p < .05$) and explained 33% of the variance in depressive symptoms (adjusted $R^2 = .31$). Family relationships emerged as the strongest independent predictor and was inversely associated with depressive symptoms ($\beta = -.34$, $p < .01$). Perceived stigma had a significant positive effect on depressive symptoms ($\beta = .27$, $p < .01$). Age also demonstrated a significant negative predictor ($\beta = -.19$, $p < .05$), indicating greater depressive symptoms among younger participants. Viral load was a borderline statistically significant predictor ($\beta = .16$, $p = .05$), indicating that participants with higher viral load tended to report higher depressive symptoms scores. (Table 4).

Table 4: Multiple linear regression influencing factors on the trend of depressive symptoms among YLHIV (N = 118)

Variables	b	SE_b	β	t	p-value	95%CI
Constant	12.86	3.21		4.01	< .001	6.51, 19.21
Age	- .29	.12	- .19	-2.40	.018	- .52, - .50
Perceived stigma	.05	.02	.27	3.31	.001	.02, .08
Family relationship	- .45	.11	- .34	-4.15	< .001	- .67, - .24
Viral load	1.38	.70	.16	1.98	.050	.00, 2.76
Ref = viral load < 50 copies/ml						

$R^2 = .33$, adjust $R^2 = .31$, $F = 13.88$, $p < .05$

Discussion

This study examined the proportion and predictors of depressive symptoms among YLHIV receiving antiretroviral therapy in an urban clinical setting in Thailand. The findings revealed that 25.4% of participants had depressive symptoms. Family relationships, perceived HIV-related stigma, age, and viral load were identified as significant predictors of depressive symptoms among YLHIV.

The proportion of depressive symptoms observed in this study was higher than that reported in earlier Thai studies conducted prior to the COVID-19 pandemic[1 9] but was consistent with more recent international findings among YLHIV.[8-9] Previous studies have reported that the proportion of depressive symptoms among YLHIV ranges from approximately 20% to over 40%, depending on assessment tools, cut-off scores, sociocultural contexts, and sample characteristics.[8-9] Data for the present study were collected during the COVID-19 pandemic, a period characterized by social isolation, school closures, and reduced peer interaction, which may have influenced psychosocial stress and mental health outcomes among YLHIV. Therefore, the findings should be interpreted within the context of the pandemic period.

Depressive symptoms among YLHIV may differ from those observed in adults living with HIV because youth experience unique developmental and psychosocial challenges.[5-6,11] In addition to managing a chronic and stigmatized condition, youth must navigate identity formation, peer acceptance, emotional regulation, and future uncertainty. These developmental demands may increase vulnerability to psychological distress and depressive symptoms. The findings of this study highlight the importance of early identification and timely mental health support for YLHIV to promote psychological well-being and treatment engagement.

Multiple linear regression analysis identified family relationships as the strongest predictor of depressive symptoms. Better family relationships were independently associated with lower depressive symptoms scores, consistent with previous studies emphasizing the protective role of supportive family environments in adolescent mental health.[5,14-17] In collectivist cultural contexts such as Thailand, family cohesion, emotional support, and caregiver involvement may play important roles in adolescents' coping and psychological adjustment. Many participants in this study had lived with HIV since childhood and resided with parents or relatives, which may have contributed to greater caregiver familiarity with long-term HIV care and psychosocial support needs. These findings underscore the importance of integrating family-centered psychosocial interventions into HIV care services for youth.

Perceived HIV-related stigma was positively associated with depressive symptoms scores, consistent with prior evidence indicating that stigma is an important psychosocial factor associated with adverse mental health outcomes among people living with HIV.[5,12-13] Adolescents and young adults may be particularly sensitive to peer perceptions, disclosure concerns, discrimination, and anticipated rejection, all of which may contribute to emotional distress. These findings support the importance of incorporating stigma-reduction strategies, psychosocial counseling, and peer-support interventions into HIV care services for youth.

Younger age was associated with higher depressive symptoms scores in this study. This finding may reflect developmental differences in emotional maturity, coping capacity, and stress management during adolescence. Younger adolescents may have fewer cognitive and psychosocial resources to manage the challenges associated with living with HIV, whereas older youth may possess greater adaptive coping skills and illness-related experience.[5-6,11]

Viral load was also positively associated with depressive symptoms scores, despite its predictability was borderline statistically significant. This finding is consistent with previous studies

suggesting that poorer virologic control may be associated with greater psychological distress among YLHIV.[10] However, psychosocial variables, particularly family relationships and perceived stigma, demonstrated stronger associations with depressive symptoms than clinical variables in the present study. This finding highlights the importance of psychosocial determinants in understanding mental health outcomes among YLHIV.

Taken together, these findings underscore the importance of integrating routine mental health screening into ART services for YLHIV. Interventions that strengthen family relationships, reduce HIV-related stigma, and enhance psychosocial support may help reduce depressive symptoms and improve psychological well-being among YLHIV. Multidisciplinary approaches integrating medical care and mental health support may be particularly beneficial for this population.

Conclusions and Recommendations

Depressive symptoms were prevalent among YLHIV receiving antiretroviral therapy, underscoring the need to prioritize mental health during this critical developmental stage. Family relationship quality, perceived HIV-related stigma, and age were significant predictors while viral load was a borderline statistically significant factor.

These findings highlight the central role of psychosocial determinants, particularly family support and stigma, in shaping mental health outcomes among YLHIV. Routine integration of mental health screening into ART services, alongside stigma-reduction initiatives and family-centered psychosocial interventions, is strongly recommended. Developmentally informed, multidisciplinary care models that combine biomedical management with structured psychosocial support are essential to improving long-term health outcomes and quality of life in this vulnerable population.

Limitation

This study has several limitations. First, the cross-sectional design limits the ability to determine causal relationships between predictors and depressive symptoms among YLHIV. Second, participants were recruited from a single urban hospital using convenience sampling, which may limit the generalizability of the findings to other settings and populations. Third, depressive symptoms, perceived HIV-related stigma, and family relationships were assessed using self-reported questionnaires, which may be subject to recall bias and social desirability bias. Finally, data were collected during the COVID-19 pandemic, which may have influenced psychosocial stress and mental health outcomes among participants. Therefore, the findings should be interpreted within the context of the pandemic period.

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