

Original article

Prevalence and Factors Related to Depression among Adolescents Living with HIV/AIDS, in Gasabo District, Rwanda

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Abstract

Background

Adolescents living with HIV are vulnerable to depression with a negative effect on treatment outcomes. However, there are little data on the factors associated with depression in adolescents with HIV infection in Rwanda.

Aim

This article aims to assess the prevalence and sociodemographic factors related to depression among adolescents living with HIV/AIDS.

Methodology

A cross sectional research was conducted with 102 adolescents living with HIV/AIDS. Depression was measured by Centre for Epidemiological Studies Depression Scale (CES-DC) in its latest version adapted to the context of Rwanda. Chi-square test and binary logistic regression were performed to determine the factors associated with depression.

Results

The prevalence of participants who had symptoms of depression was 31%. The risk to develop depression increased among HIV infected adolescent who did not attend school or who lived with another person who is not a parent or family member. Having both parents deceased increases the risk to develop depression by 25.07 times compared to when none of them is deceased.

Conclusion

The results have demonstrated that lack of social support is likely to raise the risk of development of depression symptoms among adolescent with HIV. It is clearly an urgent priority to implement programs that focus on provision

and maintenance of psychosocial support to this group in order to reverse the situation.

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Introduction

Adolescence is critical period due to the passage of childhood to adulthood. Physical, social and cognitive changes during this period inflict an important stress.[1] Some adolescents develop the symptoms of depression that can be liable to suicide. In the world, suicide is the third cause of morbidity after road traffic injuries, and HIV/AIDS.[2] It is estimated that about 2.1 million adolescents aged 10–19 years lived with HIV worldwide in 2016 of which 1.7 million (84%) were in Sub-Saharan-Africa. The number of adolescents living with HIV who died increased and this increase was more predominant in the African region, while deaths linked to HIV in other population groups decreased.[3] In addition, comorbidity of HIV/AIDS and psychiatric disorders are a major health challenge.[4] The HIV infected adolescents develop in an environment that exposes them to biological, economic, social, familial, genetic, ecological and psychological factors that may raise their risk of developing mental health problems.[5] Adolescence is a period during which the body, mind and social life change dramatically.[6] The thoughts and feelings of adolescents about their

body and appearance are essential to their health and well-being.[7] A teenage experience of a negative body image is not only associated with low self-esteem [8] adolescents health and well-being [9], it is also connected with severe long-term psychological consequences like eating disorders and depression in.[10] Since HIV-positive adolescents can develop lipodystrophy due to HIV infection or medication.[11] This body deformity can lead to mental health issues such as depression.

The findings from cross-sectional study conducted in Tanzania documented mental health challenges in a group of 182 adolescents between 12 and 24 years old, living with HIV/AIDS.[12] A study conducted in Uganda among 336 adolescents living with HIV aged 10 to 19-years old underscored that 46% of them reported depressive symptoms that were higher among adolescents above 15 years.[13] In Rwanda, among 683 adolescents living with HIV/AIDS aged 10 to 17 years, 20% reported suicide temptation or self-harm in the past 6 months and the adolescents living with HIV/AIDS had a significant high risk of developing depression and anxiety,

compared to adolescents non diagnosed with HIV.[14]

Analysis from a 2013 systematic review on mental health of HIV infected adolescents revealed that compare to non- infected adolescents, depression and anxiety were more prevalent among the perinatally HIV infected adolescents.[15] Different prevalence rates of depression among HIV-infected children and adolescents across the globe have been documented by several studies across the globe. A reviewed of the prevalence of DSM IV (Diagnostic and Statistical Manual of Mental Disorders) mental health disorders among adolescents living with HIV/AIDS showed that 25% of adolescents diagnosed with depression.[16] The findings from a study conducted in Kenya revealed the occurrence of one psychiatric diagnosis or suicidality at 49% with anxiety disorders at 32.3 1% followed by major depressive disorder at 17.8% among adolescents.[17] A study conducted in Uganda among 82 adolescents living with HIV/AIDS revealed a depression prevalence of 51% 12 and underscored that HIV and depression are linked; HIV is a major psychological stressor that increase psychological distress and beginning of psychiatric disorders.[18] A cross-sectional study of 562 adolescents living with HIV from Malawi underscored 18.9% of depression pre-valence

[19] A study conducted in Rwanda among 150 HIV-infected children aged between 7 and 14 years who received Antiretroviral treatment at least six months ago showed 25% prevalence of depression based on structured clinical interview.[20]

The high prevalence of depression among adolescents living with HIV in developing countries is reported to be linked with factors related to poverty, stressful life conditions and persons living with HIV who have low monthly income are likely to develop depression than those with high monthly income.[4] On other hand, living alone, joblessness, marital status, and low social support were reported to be significantly associated with the high prevalence of psychiatric disorders among people living with HIV/AIDS.[21] The results from a study done in a Nigerian Hospital demonstrated that lack social support play a major role in the development of depression in adolescent [22] Another 4-year longitudinal follow up done in south Africa on AIDS-orphaned children with control groups of other-orphans and non-orphans underscored that AIDS-orphaned children manifested higher depression, anxiety, and post-traumatic stress disorder (PTSD) scores compare to other-orphans and non-orphan.[23] Additionally, a study conducted in Malawi on depression among adolescents

living with HIV highlighted that being female, having fewer years of schooling, having a diseased family member, failing a school term/class, having a boyfriend/girlfriend, not disclosing your HIV status to anyone, having severe immunosuppression, and being bullied for medications were the variables that were significantly associated with a higher Beck Depression Inventory II (BDI-II) score.[19]

There are more differences related to biological sex among adolescents living with HIV/AIDS in low-income locations. For example, a study done in Kenya demonstrated that compared to females, being a male was associated with a higher risk of developing depression[17], while in Malawi the Beck Depression Inventory-II scores were higher in female HIV-infected adolescents than in males.[19] A study done in Rwanda with the aim of assessing the prevalence of depression among HIV infected children between seven and fourteen years of age found that depression was higher in female HIV-infected adolescents than males, nevertheless the difference was not significant, this study though, included younger children and adolescents in the same group.[20] The present study chose the category of adolescence as defined by the World Health Organization. The World Health Organization defines the adolescence as the life span from 10

to 19 years, divided into three stages: early (10-13 years), middle (14-16 years) and late (17-19 years) adolescence.[24] The present study targeted the group of HIV infected adolescents between 10 and 19 years old with the aim of determining the prevalence of depressive symptoms among them and its associated sociodemographic factors.

Methods

Study design and setting

A cross-sectional survey of Adolescents Living With HIV/AIDS (ALWHIV) in Gasabo district of Kigali city has been conducted between March and May 2017. Participants were recruited from HIV clinic at Kibagabaga Hospital, Remera and Kinyinya Health centers which are in urban health centers and that are among the first to start offering comprehensive HIV/AIDS care in Rwanda.

Population and sampling technique

The study population included 194 adolescents between 10 and 19 years of age, infected with HIV, registered in service of HIV in Kibagabaga Hospital, Remera and Kinyinya health centres. Convenience sampling was used to select 102 participants who visited the health facilities during the data collection period.

Data collection instrument

For assessing depressive symptoms among adolescents, the study used entirely the Centre for Epidemiological Studies Depression Scale (CES-DC) in its latest version adapted to the context of Rwanda.[25] The adapted scale contains 30 items. The 30 items scale have been obtained directly from these authors. The adapted scale includes 20 retained from the standardized scale and 10 items added delivered from locally mental health idioms to improve, according to the authors, the variability for evaluation purpose. Similarly, to the original scale, the adapted scale is scored in a 4-likert scale points ranging from 0 (Never), 1 (a little), 2 (sometimes), to 3 (often or a lot). The scoring of positive items is reversed. Possible range of scores is zero to 90, with the higher scores indicating the presence of more symptomatology.

Data analysis

Statistical data analysis was performed with STATA (StataCorp. 2019. *Stata Statistical Software: Release 16*. College Station, TX: Stata Corp LLC). Descriptive statistics have been performed for sociodemographic characteristics of participants namely age, gender, parent deceased, year in school, and with whom the participant is living. Bivariate analysis was performed using Chi-square to determine a relationship between

the above sociodemographic variables and depression among adolescents living with HIV/AIDS.

Factors statistically significant associated with depression were then investigated among adolescents with a reduced multivariable logistic regression model at a p-value less than 0.05. Adjusted odds ratios (OR) and 95% confidence intervals (95% CI) were estimated.

Ethical considerations

Before conducting data collection, ethical approval was provided to the researcher by the Institutional Review Board of University of Rwanda, College of Medicine and Health Sciences after submission of the research proposal and then the permission to conduct research was requested and granted from Kibagabaga Hospital which is the hospital supervising the Remera and Kinyinya Health Center. Remera and Kinyinya also have been informed and the permission to conduct a research was obtained. Adolescents above 16 years who accepted to participate signed the ascent and consent form and for those under 16 years their guardian signed ascent for them. Written parental informed consent and adolescent assent form were obtained prior to data collection, after explaining the purpose of the study, in the form, the researcher explains also that participation in research is voluntary and that the

participant has the right to withdraw from responding to the research at any time they wish and there would be no negative consequences on their treatment and care they are receiving, and also there would be no specific benefits to those who would participate in research but those who would be having depression would be screened and oriented to health care facilities for management.

Results

Sociodemographic characteristics of participants (n=102)

Results in Table 1 show that the respondents were predominantly female (62%) and (61%) of the participants had their parents alive. About 20% had lost their fathers, 10% their mothers and 9% both parents. 41% of adolescents were in primary school. Those who lived with both their parents comprised 29%, 47% with their mothers, 7% with their fathers while 13% stayed with other family members.

Table 1. Sociodemographic characteristics of participants (n=102).

Variables	Frequency	Percent (%)
Age		
10-14 years	35	34
14-17 years	43	42
17-19 years	24	24
Gender		
Female	63	62
Male	39	38
Parent deceased		
None	62	61
Father	21	20
Mother	10	10
Both	9	9
Year in school		
No formal school Attended	17	17
Primary	42	41
Senior 1-Senior 3	32	31
Senior 4-Senior 6	11	11
With whom he/she is living		
Both parents	30	29
Mother	48	47

Father	7	7
Family member	13	13
Other	4	4

Prevalence of depression among adolescents living with HIV/AIDS and its association with the respondents’ characteristics.

The prevalence of depression is presented in Table 2. The severity of depression was classified in three categories: mild, moderate, and severe depression. As can be seen, the overall prevalence of depression, as assessed by the adapted Center for Epidemiological Studies Depression Scale for Children (CES-DC) was 31.4%, 12% had mild depression, 9% moderate depression and 10.8% had severe depression. Table 2 shows highlights the severity of depression classified in three categories: mild, moderate, and severe depression. The majority of adolescents at the study site had symptoms of mild depression 11.8% and types of depression were quite close to one another.

Table 2. Levels of depression among adolescents living with HIV/AIDS.

Levels of depression	Frequency	Percent (%)
No depression	70	68.6
Mild depression	12	11.8
Moderate depression	9	8.8
Severe depression	11	10.8
Total	102	100

In Table 3, the findings show that there is a significant relationship between having a deceased parent and developing depression ($p < 0.01$), being an adolescent living with both parents had low likelihood of developing depression symptoms. It was found that there was no significant relationship between age of the participant (between 10 to 19 years of age) and developing depression among the adolescents with HIV ($p = 0.96$). The current study results show that there is a significant relationship between depression among adolescents and years of school attendance ($p = 0.01$), and no significant relationship developing depression symptoms with the adolescent’s gender ($p = 0.91$).

Table 3. Prevalence of depression among adolescents living with HIV/AIDS and its association with the respondents' characteristics.

Factors	No depression (n, %)	Depression (n, %)	P value
Parent deceased			<0.01
None	52(74.29)	10(31.25)	
Father	12(17.14)	9(28.13)	
Mother	5(7.14)	5(15.63)	
Both	1(1.43)	8(25.00)	
Total	70 (68.6)	32 (31.4%)	
With whom he/she is living			<0.01
Both parents	28(40.00)	2(6.25)	
Mother	33(47.14)	15(46.88)	
Father	4(5.71)	3(9.38)	
Family member	4(5.71)	9(28.13)	
Other	1(1.43)	3(9.38)	
Total	70 (68.6)	32 (31.4%)	
Age category (Years)			0.96
10-14	24(34.29)	11(34.38)	
14-17	29(41.43)	14(43.75)	
17-19	17(24.29)	7(21.88)	
Total	70 (68.6)	32 (31.4%)	
Years in school			<0.01
No school attended	6(8.57)	11(34.38)	
Primary	29(41.43)	13(40.63)	
S1-S3	26(37.14)	6(18.75)	
S3-S6	9(12.86)	2(6.25)	
Total	70 (68.6)	32 (31.4%)	
Gender			0.91
Female	43(61.43)	20(62.50)	
Male	27(38.57)	12(37.50)	
Total	70 (68.6)	32 (31.4%)	

Binary logistic regression analysis of variables associated with depression among adolescent living with HIV aged 10-19.

The regression analysis in Table 4 shows that the likelihood of development of depression symptoms among adolescents with HIV increases as the child loses both parents (OR=25.07; 95% CI=

[1.15-547.59]). Having one parent deceased is less likely to be associated with development of depression symptoms but the likelihood increased in the case of

father's death, although it was not statistically significant (OR=1.29; 95% CI= [0.31-5.34]).

Table 4. Multivariable analysis of factors associated with depression among adolescents living HIV aged between 10-19 years.

Factors	Full model		Reduced model	
	OR (CI at 95%)	p-value	OR (CI at 95%)	p-value
Parent deceased				
None	1		1	
Father	1.33(0.31-5.77)	0.7	1.29(0.31-5.34)	0.725
Mother	0.73(0.09-6.02)	0.769	0.58(0.076-4.38)	0.593
Both	30.61(1.30-721.67)	0.034	25.07(1.15-547.59)	0.041
Living with				
Both parents	1		1	
Mother	5.10(0.80-32.71)	0.085	3.71(0.66-20.89)	0.137
Father	18.61(1.46-236.90)	0.024	14.01(1.23-159.60)	0.033
Family member	5.12(0.36-72.59)	0.227	4.96(0.401-61.51)	0.212
Other	25.49(1.02-639.59)	0.049	23.87(1.03-553.88)	0.048
School attendance				
No	1		1	
Primary	0.07(0.00-0.57)	0.014	0.18(0.04-0.89)	0.036
S1-S3	0.07(0.00-0.52)	0.009	0.14(0.03-0.73)	0.02
S3-S6	0.08(0.00-1.52)	0.094	0.06(0.00-0.93)	0.044

The multivariable analysis shows that all three factors positively influenced the development of depression among the study population (parent deceased, the person living with the child and the school attendance). Table 4 shows that adolescents having a deceased father were 1.29 times more likely to develop depression compared to adolescents having both parents (OR=1.29; 95% CI= [0.31-5.34]); those who have a deceased mother were 42% less likely to develop depression compared to adolescents having both parents (OR=0.58; 95% CI= [0.076-4.38]); those who have both deceased parents were 25.07 times more likely to develop depression compared to adolescents having both parents (OR=25.07; 95% CI= [1.15-547.59]).

Still, Table 4 shows that the risk of developing depression is higher when an adolescent lives with people other than the family members (OR=23.87; 95% CI= [1.03-553.88]). On the other hand, living with their fathers was 14.1 times and significantly more likely for the adolescent to develop depression (OR=14.01, 95%CI= (1.23-159.60)). Living with their family member, though not statistically significant, was 4.96 times more for the adolescent to develop depression (OR=4.96, 95%CI= [0.401-61.51]). Compared to adolescents who did not attend school, adolescents who

attended school were less likely to develop depression (Primary (OR=0.18, 95%CI= [0.04-0.89]), S1-S3 (OR=0.14, 95%CI= [0.03-0.73]), S3-S6 (OR=0.06, 95%CI= [0.00-0.93])). The probability of the adolescent with HIV to develop the depression symptoms is inversely proportional to the adolescent school attendance, the higher the class at school attendance, the lower the chance to develop depression symptoms, as shown by decreasing odds ratios with increase in level of class.

Discussion

The results of this study highlight the weight of depressive symptoms in adolescents with HIV/AIDS in Rwanda. They indicate that the prevalence of depression among adolescents was 31%. The high prevalence of depression in the present study might be explained by the fact that about 38% of the participants are orphans. Among 102 participants 40 participants don't have both parents and being orphan has been identified as a factor associated with depression among adolescents living with HIV.[18]

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 [13] and Malawi reported a depression rate of 18.9%. The high prevalence of

depression among adolescents living with HIV in developing countries is reported to be linked with factors related to poverty, stressful life conditions and persons living with HIV who have low monthly income are likely to develop depression than those with high monthly income.[3] A history of trauma experience may also explain why the rate of depression is high among HIV-positive adolescents in Rwanda compared to other regions. It has been evidenced that in the community which experienced a traumatic event such a genocide, children of the next generation often manifest the psychological trauma symptoms.[26] Rwanda has experienced genocide against Tutsis, and depression has been documented in Rwandan children.[25] The adolescents who participated in the present study were raised by parents or guardians with a trauma history linked to genocide and at the risk of depression. This history may exacerbate the impact of HIV on adolescents in Rwanda.[27]

On other hand, the factors such as sex, level of education, having a unhealthy family member or household, failing a school, having a boyfriend/girlfriend, not disclosing HIV status with anybody, severe immunosuppression, and being bullied for drugs were significantly associated with higher Beck Depression Inventory II (BDI-II) score.[19]

The present study showed that three factors namely having both parent deceased, living with another person who is not a family member, and not attending school were positively associated with the development of depression among the study population. Lack of school attendance has also been identified as a factor associated with the development of depression among the study population. Adolescents who do not attend school were more likely to develop depression compared to adolescents who attend school. The higher the class at school attendance, the lower chance to develop depression symptoms. This corroborates a study done in Malawi where fewer years of schooling was significantly associated with higher Beck Depression Inventory II (BDI-II) score.[19] These findings may be explained by the fact that school connectedness constitutes protective factors. A study conducted in sub-Saharan Africa among 224 AIDS/HIV orphans, 276 non-AIDS/HIV showed a significant association between school connectedness and overall mental health regardless of group.[28]

The findings from bivariate analysis performed in the present study showed that having one or both parents dead was associated with the risk of developing depression. Likewise in a study that was done in South Africa it was revealed that

being an orphan living with HIV-AIDS increased the probability of being depressed.[18] In addition, it was reported that the risk to develop depression among adolescent with HIV-AIDS is higher when they live with people other than the family members. According to the respondents, the adolescent who lives with his/her mother is less likely to develop depression compared to living with the father. This may be explained by the fact that in a patriarchal society, in comparison with men, women still bear a much greater responsibility to care for the household and the children.

Demographic data like age and gender were not significantly associated with development of depression symptoms. A variation has been observed in the results related to biological sex among adolescents living with HIV/AIDS in low-income locations. Findings from one study conducted in Kenya reported that being male was associated with a higher risk of developing depression than being female [16] while in Malawi, it was the contrary.[18] In another study done in Rwanda among a group of children between 7 and 14 years, the difference in depression between males and females was not significant, although more females were depressed.[20]

The results from this study highlight the importance of school attendance and social support in preventing depression among HIV infected adolescents and are consist with findings from a study done in Nigerian Hospital which shows that social support is one of the factor to influence the development of depression among the adolescent.[4] However, the present study had some limitations. The study used a depressive symptom screening tool; this screening tool cannot determine the extent and the duration of depression. Given that the results of this study are generalizable to the population of Rwandan, they underline the contribution of social support in improving psychosocial well-being of adolescents with HIV.

Conclusion

As a conclusion, the results have demonstrated that adolescents with HIV/AIDS are likely to develop depression symptoms. The findings of this study show that the prevalence of depression among adolescent with HIV is high compared to the prevalence reported in developed countries. The socio-demographic factors associated with depression are mainly related to lack of family support where the child is supposed to get the psychosocial support. The risk to develop depression increases among adolescent with HIV as the child

lives alone and most likely not being able to attend school. The results of this study show that for better management of mental health problems of the HIV infected adolescents, the integration of mental health services in HIV/AIDs clinics has to be strengthened. Some factors like being orphan, not going to school and living with a person who is not a family member are likely to raise the risk of development of depression symptoms among adolescent living with HIV. It clearly an urgent priority to implement programs is targeting this group to provide and maintain psychosocial support that would reverse the situation.

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Authors' contributions

MP* and PM conceptualized and designed the study. MP*, NA, KI, MD and RJ collected data. MP, KC and RR analyzed the data. MP, NA, KC, and RR drafted the manuscript. PM*, KC, RR, NA, and MD made the Critical review of the manuscript. MP and PM made the final review before submission. All authors have read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

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