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Prevalence of depressive symptoms and associated factors among adolescents living with HIV/AIDS in South Western Uganda

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ABSTRACT

Adolescents living with HIV (ALHIV) are prone to depression, which can have detrimental effects including disease progression, poor treatment adherence and mortality. We aimed to determine the prevalence of depressive symptoms and their associated factors among ALHIV in Uganda. We conducted a cross-sectional survey among ALHIV (10–19 years) attending urban and rural clinics in Mbarara, Uganda between March and May 2017. Presence of depressive symptoms was assessed using the Centre for Epidemiological Studies' Depression scale. We interviewed 336 adolescents with a median age of 13 years, 62% of whom were female. A third (37%) had disclosed their HIV/AIDS status and 13% were sexually active. Overall, 154 (~46%, [95% CI: 40.5–51.2]) had depressive symptoms. On bivariate analysis, the odds of having depressive symptoms were higher among adolescents who were ≥ 15 years, had disclosed HIV status, traveled >30 min for routine care and had risky sexual practices. On multiple variable analysis, only travel time to the clinic of >30 min was independently associated with depressive symptoms (AOR = 1.6 [95% CI: 1.02–2.7]). With the high prevalence of depressive symptoms among ALHIV in Uganda, screening and prompt treatment of depression should be incorporated within their routine care.

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Adolescents; depressive symptoms; HIV/AIDS; Uganda

Introduction

Sub Saharan Africa (SSA) still bears a high burden of the HIV epidemic. In 2016, of the 2.1 million adolescents 10–19 years living with HIV worldwide, 1.7 million (84%) lived in SSA (UNICEF, 2016). Increasingly, comorbidity of HIV/AIDS and mental health disorders is a major health challenge. Although the prevalence of mental health challenges among young people living with HIV has been described to a great extent among high-income countries (Ciesla & Roberts, 2001; Mellins & Malee, 2013), there is still scanty literature on the extent of this problem among adolescents in SSA.

Adolescents with HIV are vulnerable to mental health disorders due to the effect of HIV on their immature brain, and the social, medical and psychological stressors associated with living with HIV/AIDS (Mellins & Malee, 2013; Nanni, Caruso, Mitchell, Meggiolaro, & Grassi, 2015). In the context of SSA, these disorders are an outstanding concern in the adolescent population which suffers a high incidence of adverse childhood experiences that include abuse, poverty, domestic violence, and death of loved ones (Cluver, Orkin, Boyes, & Sherr, 2015). Furthermore, cognitive, social and physical changes during the period of adolescence impose significant stress.

A recent systematic review involving 29 studies on depression in people living with HIV/AIDS estimated the occurrence of depressive symptoms at 31% and major depression at 18% (Nakimuli-Mpungu et al., 2012). However, most of these studies describe the adult population. One past study in Uganda reported a depression prevalence of 51% among a sample of 82 adolescents living with HIV/AIDS (ALWHIV) (Musisi & Kinyanda, 2009). HIV and depression have a bi-directional relationship; HIV is a strong psychological stressor that contributes to psychological distress and onset of mental health disorders, (Mutumba et al., 2016) while depression accelerates disease progression in people living with HIV/AIDS (Maria H Kim et al., 2015). It is important to recognize and treat depression among people living with HIV/AIDS because depression is associated with poor adherence to highly active antiretroviral therapy (HAART) (Lima et al., 2007; Shumba, Atukunda, Imakit, & Memiah, 2013), risky sexual practices (Maria H Kim et al., 2015; Lundberg et al., 2011)

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and suicidal ideation (Rukundo, Mishara, & Kinyanda, 2016).

Few studies document the prevalence of depression among ALHIV, especially in Uganda. Unfortunately, screening for depressive symptoms is not routinely done in most HIV care clinics in Uganda. In this study, we aimed to assess the prevalence of depressive symptoms and to describe how sociodemographic factors, medical history, and behavioral indicators, correlate to depressive symptoms among ALHIV so as to guide policy on integration of mental health care in HIV care among adolescents.

To study factors associated with depressive symptoms, we applied the social ecological model as a conceptual framework. The social ecological model has been frequently used to study health-related risk factors at the individual, interpersonal, social and structural levels (Sallis, Owen, & Fisher, 2015). This has been applied in the analysis of risk factors for depression (Gu et al., 2014). Among ALWHIV, factors associated with depression that have been described at the individual level include age, gender, HIV diagnosis and severity (Maria H Kim et al., 2015; Osok, Kigamwa, Stoep, Huang, & Kumar, 2018). Factors that have been described at the interpersonal level include family support (e.g. parents being alive or not) and social support from peers (e.g. bullying, support in taking medication) (Ashaba et al., 2018; Maria H Kim et al., 2015; Osok et al., 2018). Structural or social level factors such as poverty, access to health or education services have also been established as risk factors to the onset of depression (Abubakar et al., 2017; Bhatia & Munjal, 2014). Applying this model to our study, we investigated these factors in relation to HIV disease at the individual, interpersonal and environmental levels. Furthermore, we elaborated on possible consequences of depression that may lead to undesirable health-related or behavioral outcomes, including poor adherence to medication and sexual risk-taking, which may lead to disease progression or transmission that has been described in existing literature (Kim et al., 2017; Lowenthal et al., 2014; Lundberg et al., 2011).

Methods

Study design and setting

We conducted a cross-sectional survey of ALWHIV in the Mbarara district of South Western Uganda between March and May 2017. Study participants were recruited from Mbarara Municipal Council Health Centre IV and the Immune Suppression Syndrome (ISS) clinic at the Mbarara Regional Referral Hospital (MRRH) which are both urban centres that offer comprehensive HIV/AIDS care. MRRH is a tertiary care center and medical training facility, regarded as the main HIV care referral centre for rural communities in southwestern Uganda, and neighboring areas of Rwanda and Tanzania. Participants were also recruited through other peripheral rural centres in all the main administrative counties of Mbarara district.

Study population

ALWHIV who presented to these facilities were approached for enrollment if they were between 10 and 19 years of age, registered as a patient at an HIV care clinic, and accompanied by a parent or legal guardian if under the legal age of consent. Assent was obtained from adolescents below 18 years and informed consent was obtained from their parents or guardians. Adolescents between 18 and 19 years of age provided their own informed consent. Although the study intended to exclude adolescents who did not speak Runyankole or English, which were the languages spoken fluently by the research assistants (RAs), none of the screened participants were excluded due to the language barrier.

Study procedures

After consent was obtained, participants were interviewed in a private room by trained RAs using standardized questionnaires in Runyankole or English. RAs collected demographic data such as age, gender, and whether they resided in urban or rural settings, as well as information about disclosure and adherence. Adherence was reviewed with available HIV/AIDS cards from the ministry of health where adherence is estimated as the number of pills taken per total number of pills expected to be taken within a specified time. Regarding disclosure, participants were asked a yes or no question if they had ever told anyone about their HIV status and whether this person was a family member/relative or non-relative/non-family member.

RAs also collected data on sexual behavior and risky sexual practices. Participants were asked whether they had ever engaged in any sexual activity, defined as penetrative vaginal sex, in their lifetime. If the respondent said yes, they were specifically asked whether they had engaged in any of the following four risky behaviors: (1) engaged in sex with multiple partners in the last 6 months, (2) had unprotected sex during the most recent sexual encounter if unmarried, (3) had sex under the influence of alcohol or drugs in the last 12 months and (4) had ever exchanged sex for money or gifts. Given the young age and HIV status of these

participants, we considered engaging in any of these behaviors to be especially risky, and therefore defined risky sexual behavior as engaging in at least one of these four behaviors.

Assessment of depressive symptoms was done using the Centre for Epidemiological Studies Depression Scale (CES-DC) which is a 20 item self-report depression inventory scale with possible scores ranging from 0 to 60 with an established cut off of 15 for the presence of depressive symptoms (Weissman, Orvaschel, & Padian, 1980). This scale has been validated for use in this region (Betancourt et al., 2012). This tool was used to assess the presence of depressive or depression-associated symptoms, not to confirm or refute a diagnosis of clinical depression. The Cronbach alpha for internal reliability of this scale was 0.85. Participants were also asked if they had ever been diagnosed or treated for depression previously.

Statistical analysis

Statistical data analysis was done in Stata® (College Station, Texas, U.S.A.). For categorical variables, proportions were compared using Pearson Chi-square. A binary dependent variable for the presence or absence of depressive symptoms was generated and coded as 0 = no depressive symptoms and 1 = depressive symptoms. An adolescent was considered to have depressive symptoms if he/she had a minimum score of 15 based on the CES-DC scale (Weissman et al., 1980). Univariate and multivariate models were fitted using logistic regression to assess the association between the independent variables (sociodemographic, behavioral, medical and health service factors) and the presence of depressive symptoms.

Ethical statement

The study protocol was approved by the research ethics committee of the Mbarara University of Science and Technology (Reference MUREC 1/7), the Uganda National Council for Science and Technology (Reference SS 4240), and the Partner's/Massachusetts General Hospital Ethics Review Board (Reference 2017P000843). Privacy and confidentiality of the information collected were ensured by conducting interviews in a private room and keeping all study-related records locked up. Participants were free to choose whether or not to continue with the interview without consequences. One of the RAs was a resident psychiatry student, and offered immediate professional consultations for participants with severe psychological distress symptoms (cut off score >30) and those who reported suicidal ideation. Adolescents were not paid for participation, but were compensated for their time with a snack and given a refund for their transport fare.

Results

Participants' characteristics

Between March and May 2017, a total of 338 adolescents were approached for possible participation in the study. One did not consent and another was excluded at analysis due to age >19 years. A total of 336 adolescents between 10 and 19 years were included in the analysis. The median age was 13 years (IQR: 11, 16) and 222 (66%) respondents were between 10 and 14 years; 277 (82.4%) were primary school students (Table 1). We found that 161 (48%) had both parents alive while 52 (15%) were total orphans. A total of 150 (44.8%) lived in a permanent house, 134 (40%) lived in a semi-permanent house, and 51 (15.2) lived in a temporary mud and

Table 1. Socio-demographic and clinical characteristics of study participants.

Characteristic	Frequency	Percentage
Gender		
Male	127	37.8
Female	209	62.2
Age		
10–14	222	66.1
1519	114	33.9
Education level		
No formal education	3	0.9
Lower primary	142	42.3
Upper primary	135	40.2
Secondary and above	56	16.7
Religion		
Catholic	120	35.7
Anglican	127	37.8
Moslem	54	16.1
Pentecostal or other	35	10.4
Parents alive or not		
Both parents alive	161	47.9
Only father alive	50	14.9
Only mother alive	73	21.7
Both parents dead	52	15.5
Residence location		
Rural	197	58.8
Semi-urban/trading centre	55	16.4
Urban	83	24.8
Housing type		
Permanent	150	44.8
Semi-permanent	134	40.0
Temporally (grass/mud)	51	15.2
Ever been married/still married	23	6.9
Clinical and HIV-related factors		
Ever disclosed HIV status	123	36.8
WHO clinical		
Stage 1	273	84.0
Stage 2	41	12.6
Stage 3 or 4	11	3.4
HAART adherence(by MOH card)		
>95%	276	88.8
85–94%	13	4.1
<85%	22	7.1

wattle house. Only 37 (11.2%) owned a personal cell phone. Regarding transport to the clinic for care, 44 (13.1%) walked, 101 (30.1%) used a taxi/car and 191 (56.9%) used a hired motorcycle. The median travel time to the clinic was 0.7 h (IQR: 0.5, 1.5) with a median cost of 1.69 USD (IQR: 1.12, 2.81). Other participant characteristics are described in Table 1.

According to HIV treatment records, 320 (95.2%) ALWHIV were receiving antiretroviral (ARV) treatment, with a median period on the treatment of 5 years (IQR: 2, 8). Of these, 163 (48.5%) were on a nevirapine-based regimen, 109 (32.4%) were on Efavirenz-based regimen, and 48 (14.3%) were on other regimens. The remaining 16(4.8%) adolescents had missing data regarding treatment regimen. A total of 276 (88.8%) respondents had self-reported adherence of >95% and 273 (84%) were in WHO treatment stage 1. It was found that 123 (36.8%) had disclosed their HIV status to a friend or family member. HIV viral loads were undetectable in 212 (63.1%), detectable in 70 (20.8%) adolescents while 54 (16.1%) had missing data.

Only 44 (13.1%) adolescents were sexually active, among which 39 (88.6%) were female and 5 (11.4%) were male. The majority (80%) of sexually active adolescents were in the age group 18–19. The average age of sexual debut was 15.5 (IQR 14, 16) years. A total of 23 (6.8%) adolescents 15 years and above had ever been married, and 19 (5.7%) had ever had children. The average age at marriage was 16-years (SD 1.9). A total of 36 (10%) ALWHIV had engaged in risky sexual behaviors.

Prevalence of depressive symptoms and suicidal ideation

The median CES DC depressive symptoms score was 13.5 (IQR: 8, 21). The most frequently reported symptoms were "felt unhappy", "felt like crying" and "lack of appetite". Of the 336 adolescents, 154 (45.8%, [95% CI 40.5–51.2]) had depressive symptoms, meaning a CES DC score of 15 or more. Among these adolescents, 42.5% of boys and 47.8% of girls had depressive symptoms. More so, 37.4% of those aged 10–14 years and 62.3% of those aged 15–19 years had depressive symptoms. A total of 26 (7.7%) had thoughts of ending their own life in the last 6 months. Of these, 18 (69.2%) were female and 8 (30.8%) were male; among these, 5 were classified as having no current depressive symptoms (a score of <15) and 21 with depressive symptoms in the past two weeks (score range 20–40). None of the adolescents in this study had prior testing or treatment for depression.

Factors associated with depressive symptoms

In bivariate analysis, older age (≥15 years vs. <15 years), longer travel time to clinic (>30 min vs. <30 min), exhibiting risky sexual behavior, and ever disclosing HIV status were associated with higher odds of having depressive symptoms. Traveling to a clinic by taxi or motorcycle as opposed to walking was associated with lower odds of having depressive symptoms (Table 2).

Upon multivariate analysis, only travel time to the clinic of more than 30 min was independently associated with the occurrence of depressive symptoms. The odds of having depressive symptoms were 1.7 higher among adolescents who traveled for more than 30 min to visit the clinic compared to those who traveled for less than 30 min (AOR = 1.66 [95% CI: 1.02-2.70], $p = 0.041$).

Discussion

This study contributes to our understanding of the burden of depressive symptoms among adolescents living with HIV/AIDS in SSA. In this group of ALWHIV in Uganda, we found a high prevalence of depressive symptoms at 46%. Higher odds of having depressive symptoms were among adolescents who were 15–19 years old, had ever disclosed their HIV status, had travel time to the clinic of >30 min for routine care, and reported risky sexual behavior. On multiple variable analysis, only travel time to the clinic of >30 min was independently associated with depressive symptoms,

The prevalence of depressive symptoms among ALWHIV in our study is similar to the prevalence rates found in other such studies of ALWHIV (Ciesla & Roberts, 2001; Nakasujja et al., 2010; Nakimuli-Mpungu et al., 2012; Ramaiya et al., 2016). Despite the evidence of high prevalence of depressive symptoms among adolescents living with HIV/AIDS, there is no routine screening for depression among this group in Uganda. This may be due to a shortage of mental health professionals, limited medical resources especially for mental health services, and the societal perception that mental health care is not a priority (Kigozi, Ssebunnya, Kizza, Cooper, & Ndyanabangi, 2010; Odokonyero et al., 2015). However, depression among adolescents living with HIV is not only a debilitating outcome in itself, but also a risk factor for other negative health outcomes. There is evidence that depressive symptoms are associated with low adherence to HIV medication in the Sub-Saharan African context (Kim et al., 2017; Lima et al., 2007). Low adherence to medications allows the disease to progress rapidly in a patient, and also increases the likelihood that that patient will transmit the disease (CDC, 2018). Implementing routine screening for

Table 2. Factors associated with depressive symptoms among adolescents living with HIV/AIDS.

Variable	No depressive symptoms *n* (%)	Depressive symptoms *n* (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Gender				
Male	73 (40.1)	54 (35.1)	Ref	
Female	109 (59.9)	100 (64.9)	1.24 (0.80–1.93)	1.01 (0.61–1.67)
Mean Age in years				
10–14	139 (76.4)	83 (53.9)	Ref	
15–19	43 (23.6)	71 (46.1)	**2.76 (1.73–4.41)*****	1.63 (0.92–2.92)
Parents alive or not				
None of the parents alive	27 (14.8)	25 (16.2)		REF
Either one alive	64 (35.2)	59 (38.3)	0.99 (0.52–1.99)	0.94 (0.45–1.95)
Both alive	91 (50.0)	70 (44.5)	0.83 (0.44–1.86)	0.94 (0.46–1.92)
Transport means to clinic				
Walking	17 (9.3)	27 (17.5)	Ref	
Motorcycle/taxi	165 (90.7)	127 (82.5)	**0.48 (0.25–0.93)***	0.67 (1.33–1.39)
Time taken to travel to clinic				
Less than 30 min	85 (47.2)	56 (36.4)	Ref	
More than 30 min	95 (52.8)	98 (63.6)	**1.57 (1.01–2.43)***	**1.66 (1.02–2.70)***
WHO staging				
Stage 2–4	34 (19.2)	18 (12.2)	Ref	
Stage 1	143 (80.8)	130 (87.8)	1.71 (0.92–3.18)	1.38 (0.70–2.70)
Adherence				
>95%	158 (90.8)	118 (86.1)	Ref	
<95%	16 (9.2)	19 (13.9)	0.63 (0.31–1.27)	0.59 (0.27–1,25)
Risky sexual behavior				
No	172 (94.5)	128 (83.1)	Ref	
Yes	10 (5.5)	26 (16.9)	**3.49 (1.63–7.50)****	1.50 (0.58–3.91)
Ever disclosed HIV status				
No	130 (71.8)	81 (52.9)	Ref	
Yes	51 (28.2)	72 (47.1)	**2.26 (1.43–3.56)*****	1.64 (0.95–2.83)

**P* < .05, ***P* < .01 ****P* < .001

Bold are estimates for which the *p*-value was significant (less than 0.05).

depression among ALWHIV could allow this high-risk population to get the mental health treatment they need and to avoid the long-term risks associated with the comorbidity of depression and HIV.

On bivariate analysis, older age, ever disclosing HIV status and reporting risky sexual practices were associated with depressive symptoms, however these associations were absent on multivariable analysis. In this study, 13% of adolescents were sexually active, which is lower than previous research in Africa in this age group, ranging 20–48% (Bakeera-Kitaka et al., 2018; Pettifor et al., 2005). This could be due to the fact that 66% of the participants were young adolescents 10–14 years and similar low rates of sexual activity have been reported among this age group in Uganda (Bankole, Biddlecom, Singh, Guiella, & Zulu, 2007; Kemigisha et al., 2018). However, the study found a considerably high proportion of adolescents who had risky sexual practices (10% of the total) which calls for specific measures to provide effective preventive services and information to prevent HIV spread. It is not clear why the odds of having depressive symptoms were higher among adolescents who had ever disclosed their status, yet this is the recommended practice, qualitative inquiries on consequences of disclosure in this population would be more explanatory (Zgambo, Kalembo, & Mbakaya, 2018). Furthermore, given the evidence that the prevalence of depressive symptoms is higher among older adolescents, it is important that healthcare workers screen for the symptoms of depression early, before the symptoms become more severe.

Furthermore, longer transportation time to a clinic was associated with higher prevalence of depressive symptoms in this population. Similar findings have been reported in the general adult population of SSA, with one study showing that individuals living less than 6 km from a clinic had significantly lower rates of depression than those living 15 km or more from a clinic (Tomita et al., 2017). This could be related to the increased burden of attending clinical visits with long travel times. Patients who have to spend more time traveling to a clinic miss more of their normal daily lives, which could cause financial stress through missing work, and/or social anxiety through missing school, family responsibilities, and other events. Furthermore, walking long distances to a clinic as opposed to taking motorized transportation is often associated with poverty in this setting (Binagwaho & Ratnayake, 2009). Much existing evidence has shown that poverty is associated with negative mental health outcomes, especially among populations suffering from other health conditions (Mendenhall, Kohrt, Norris, Ndetei, & Prabhakaran, 2017). Care providers, families, and groups developing interventions for adolescents living with HIV/AIDS should be aware of the association between high prevalence of depressive symptoms and the burdens

of long travel times to reach clinics, especially given that this often reflects the added stressors of poverty.

This study had some key limitations. Because the study population was recruited from HIV clinics, it may be subject to selection bias. Additionally, this is a cross-sectional study, making it impossible to determine the directionality of some associations. Hence, the results of this study should not be taken as sufficient evidence of the described associations, but rather should be used to guide further areas of research among this population in related contexts in the region. Finally, this study used a screening tool for depressive symptoms present in the previous two weeks, which could not be used as a diagnostic tool for depression itself, nor could it determine actual duration of depression. Inability of determining the length of depression could possibly affect interpretations and associations with existing factors such as risky sexual behavior or disclosure of HIV status. The utility of this tool may be limited among younger adolescents as it has not been well validated among this group. This could under-estimate the presence of depressive symptoms in younger adolescents.

Conclusion

This study highlights the high burden of depressive symptoms among adolescents living with HIV/AIDS in Uganda. Depressive symptoms were also associated with longer travel times to clinics, which reflect the added financial and social burdens of the disease. Better screening and treatment of depression among adolescents living with HIV/AIDS is recommended. Additionally, bringing care services closer to the population served and providing education and resources like condoms to adolescents living with HIV/AIDS could improve their health outcomes and decrease transmission of the disease.

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