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Depression and Suicidal Ideations among Older Persons Living with HIV/AIDS in Mbarara City, Southwest Uganda

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Abstract

Background: Due to the increase in longevity and use of antiretroviral treatment, Uganda has had a growing population of older persons living with HIV/AIDS. However, there is a paucity of information on the mental health of the elderly living with HIV/AIDS. In this cross-sectional study, we determined the prevalence of, and associated factors for depression and suicidal ideation among older persons living with HIV/AIDS in Mbarara city, southwest Uganda. **Methods:** Older persons (150 females, 115 males), with mean age = 64.2 (\pm 5.1) years, accessing health services from three purposively selected HIV/AIDS care centers in Mbarara city, southwest Uganda were recruited. Data on depression and suicidal ideation were collected using a Patient Health Questionnaire (PHQ-9) validated in Uganda, and a structured questionnaire was used to collect data on clinical and socio-demographic characteristics. Data were analysed using logistic regression. **Results:** Approximately 8.3% and 12.1% had depression and suicidal ideation, respectively. The factors associated with lowering the likelihood of depression were: an increase in the number of family members they stayed with and having no having any problems with their ARVs. On the other hand, earning more than 100,000 Uganda shillings was associated with reducing the risk of suicidal ideations among the participants. **Conclusion:** Approximately 8 to 12 in 100 older persons living with HIV/AIDS in Uganda have experienced depression or suicidal ideation. Family support and financial control were instrumental factors associated with depression and suicidal ideations, respectively. We recommended strengthening family structures and creating more avenues for

financial independence among older persons living with HIV/AIDS to reduce the burden of depression, and suicidal behaviours among this vulnerable population.

Keywords

Depression, Suicidal Ideation, Older Person, Family Members, Financial Control, HIV/AIDS

1. Introduction

Depression is one of the most common mental disorders, usually characterized by persistently low mood, loss of interest in pleasurable activities, feelings of hopelessness, disturbed sleep, poor concentration, worthlessness, failure, and self-blame [1]. In addition, depression presents with several somatic symptoms that can easily mimic a physical illness [2]. When depression occurs in the context of a physical illness, it may be challenging to distinguish it from the symptoms of a physical illness [3]. These chronic medical diseases are prevalent among older adults 50 years and above [4]. The most common physical illnesses associated with depression are chronic medical diseases, including cancer, cardiovascular, metabolic, inflammatory, neurological disorders, and HIV [3]. HIV and depression are prevalent among older populations in sub-Saharan Africa (SSA), and the prevalence ranges between 6% and 59% based on a systematic review of 25 studies about depression [5]. The prevalence of depression among older adults was more among women than men [6] [7] [8].

Depression is one of the strongest risk factors for suicide and suicidal behaviors among persons living with HIV [9]. Several factors have been identified to be associated with suicidal behaviors, including HIV encephalitis, other psychiatric illnesses, substance use, previous attempts, recent HIV infection (past two years), and transmission from none sexual means such as injection drug use [10]. Other factors that may increase the risk of depression and suicidal behaviors among older individuals include: ageism and stigma, loneliness, decreased social support, neurological changes, declining health, fatigue, changes in appearance, financial distress, and loss of peers [11]. Depression among older individuals living with HIV in sub-Sahara Africa has also been reported to be associated with those with declining socio-economic status, increasing disability scores, decreasing mean grip strength, back pain, urban residency, having an adult caregiver, receiving government grants, and hypertension [6] [8].

Most studies (13 studies) about the mental health and well-being of older persons living with HIV were from Uganda [5]. However, few of these studies are specifically about depression and suicidal behaviors. The prevalence of depression and suicidal behaviors among older persons living with depression in Uganda ranges between 9.2% to 14.3% [8] [12] [13] [14]. Most of these studies have been

conducted in the central part of the country—a region that has consistently had a higher prevalence of HIV, contributing approximately 25% of the cases in 2021/2022 [15]. However, individuals from the south-western region (have the third highest prevalence of HIV/AIDS) of the country have consistently been reported to have more viral load suppression (currently at 83%). They may have older individuals living with HIV/AIDS [15], due to the continuous increase in survival among older persons with good ARV adherence indicators such as viral load suppression [11]. In the south western region, especially Mbarara district (7.9% higher than the national prevalence), was ranked among the districts with the highest prevalence of HIV/AIDS infected individuals [16]. For better service provision among older individuals living with HIV, this study aimed at determining the prevalence of depression suicidal ideations, and their associated factors among the elderly living with HIV/AIDS and accessing care at selected healthcare facilities in Mbarara city, southwestern Uganda.

2. Methods

2.1. Study Design, Setting, and Population

This study was approved by Mbarara University of Science and Technology research ethics committee. It was a cross-sectional study among older persons aged 60 years and above living with HIV/AIDS in Uganda accessing health care services in purposively selected health facilities in Mbarara city, Southwestern Uganda. An older person is defined by the United Nations as a person who is over 60 years of age. The health facilities involved were TASO Mbarara, Mbarara City Health Centre IV, and Nyakayojo Centre IIIs.

2.2. Sample Size Calculation and Sampling

According to 2020 clinical records, the four combined Health facilities had 603 individuals living with HIV/AIDS aged 60 years and above. *i.e.*, TASO Mbarara = 426, Mbarara City Council HC IV = 156, and Nyakayojo health centre III = 11 clients. The study was conducted from May 2021 to December 2021.

The sample size was determined using T Yamane [17] formula of sample size determination which states that:

$$n = \frac{N}{1 + N(e)^2}$$

where n is the sample size, N is the total population, and e is the marginal significance level at 0.05. Using the formula above, the calculated sample was 241 participants with a non-acceptancy level of 10%, a margin error of 0.1, a total sample of 265 was considered. The sample was distributed based on a probability proportional to the size of the number of potential participants per facility, *i.e.*, 185, 70, 5, and 5 for TASO Mbarara, Mbarara City Council health center IV, and Nyakayojo HC III, respectively. The participants were recruited consecutively. Individuals who were critically ill (as determined by the research assistants with

previous medical training), and unable to sustain a 45-minute interview were excluded from the study.

Selection criteria

We enrolled elderly patients living with HIV/AIDS, aged 60 years and above accessing services at, The AIDS Support Organization (TASO) Mbarara and Mbarara City Council H/C IV, Nyakayojo and Kakoba health centre IIIs who consented to participate in the study. Lists of clients aged 60 years and above were made on each clinic day from the study sites and simple random sampling was used to select them.

2.3. Data Collection

The questionnaire captured participants' socio-demographic characteristics, clinical characteristics and data on the prevalence of depression, and suicidal ideation was captured using the Patient Health Questionnaire-9 (PHQ-9). For consistency, the PHQ-9 was researcher administered since some participants may not be able to read and write. The questionnaire was made in English but translated into the local language—Runyankole (language used by the individuals in the study area). For consistency of the translation, back-translation was employed to confirm that the meaning was not lost.

The PHQ-9 is a nine-item tool validated in Uganda and has excellent psychometric properties among individuals in Uganda [18]. The PHQ-9 was previously used in Uganda among people living with HIV [19] [20] [21]. Using the PHQ-9 scale, the cut-off points are: 1 - 4 minimal depression, 5 - 9 mild depression, 10 - 14 moderate depression 15 - 19 moderately severe depression and 20 - 27 severe depression. Depression is diagnosed when one scores 10 and above. In addition, as used in previous studies in the country, a score of one, two, or three on Item 9—“*Thoughts that you would be better off dead, or of hurting yourself*”, was used to indicate the presence of suicidal ideation [22].

Statistical Analysis

Stata version 17, StataCorp LLC 4905 Lakeway Drive College Station, Texas, USA was used for data analysis. Means and standard deviations were used to summarize continuous variables, while percentages and frequencies were used to summarize categorical variables. Chi-square tests were performed to identify differences between depression or suicidal ideations, and independent study variables. Logistic regression analysis was used to determine associations between independent variables of interest and depression, or with suicidal ideation. Two separate logistic regressions based on backward stepwise methods for factors significant on bivariate analysis were conducted to determine the factors associated with depression and the factors associated with suicidal ideation. Factors significant at $p < 0.1$ at bivariate logistic regression were considered for inclusion in a multivariable level analysis. Factors with a p value < 0.05 were kept in the final multivariable model and all effect measures were presented with a significance level of 5% with a 95% CI.

3. Results

A total of 265 older people living with HIV/AIDS were included in the final analysis. The age of the participants ranged from 60 to 84 years, with a mean of 64.2 (SD \pm 5.1) years. Most of the participants were females 150 (56.6%) (Table 1).

3.1. Prevalence of Depression

Approximately 22 (8.3%) of the participants had depression based on the PHQ-9 cut-off score of 10 out of 27. The median depression symptoms score was 3 [interquartile range (IQR) = 6]. Two out of five study participants had minimal symptoms for depression (40%, $n = 106/265$).

3.2. Prevalence of Suicidal Ideation

A total of 32 participants (12.1%) reported suicidal ideation and all those with moderate severe depressive symptoms had suicidal ideation. There was a statistically significant correlation between severity of depression and having suicidal ideation ($\chi^2 = 62.04$, $p < 0.001$) (Figure 1).

3.3. Relationship between Depression and Risk Factors

Depression (at a cut-off of 10) was significantly higher among older persons who; 1) stay with two or more family members compared to those who stay with none or one (29.1% vs. 0.0%, $\chi^2 = 8.81$, $p = 0.032$); 2) whose family members do not respect them than those who did (31.3% vs. 6.6%, $\chi^2 = 12.2$, $p < 0.001$); 3) currently have any problem with ARVs (21.1% vs. 6.8%, $\chi^2 = 4.96$, $p = 0.026$); 4) currently have a drug companion (11.7% vs. 5.0%, $\chi^2 = 3.80$, $p = 0.051$); and 5) visited the health facility and not get attended to (14.8% vs. 6.2%, $\chi^2 = 4.31$, $p = 0.038$) (Table 1(a) and Table 1(b)).

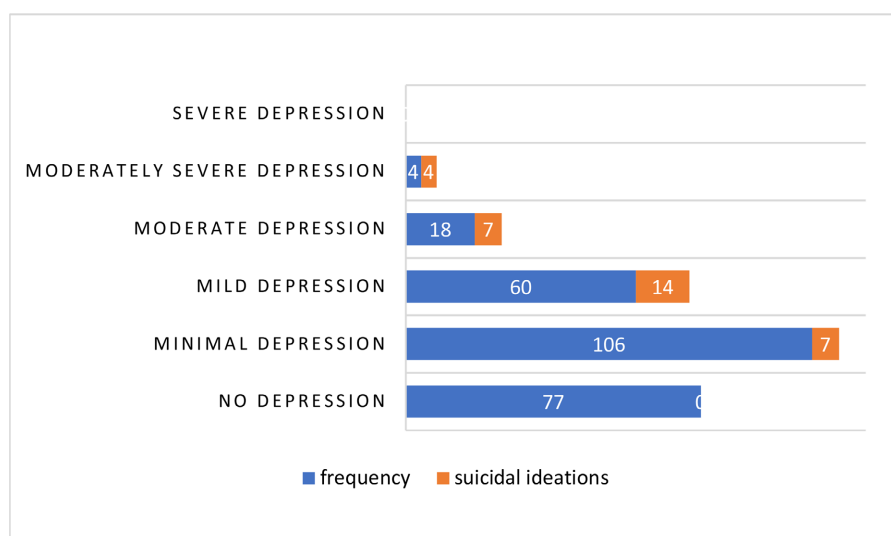


Figure 1. Severity of depression and suicidal ideation among older persons living with HIV/AIDS in Mbarara.

Table 1. (a) Depression and suicidal ideation by socio-behavioural characteristics of elderly persons living with HIV in Mbarara southwest Uganda (N = 265); (b) Depression and suicidal ideation by clinical characteristics of older persons living with HIV in Mbarara southwest Uganda (N = 265).

(a)							
Variable	n (%)	No depression (n = 243, 91.7%)	Depression (n = 22, 8.3%)	χ^2 (p-value)	No Suicidal Ideation (n = 233, 87.92%)	Suicidal Ideation (n = 32, 12.08%)	χ^2 (p-value)
Age (mean \pm SD)	64.2 \pm 5.06	64.1 \pm 4.98	65.5 \pm 5.91	24.7 (0.312)	64.35 \pm 5.1	63.5 \pm 5.2	31.5 (0.086)
Gender							
Male	115 (43.40)	107 (93.04)	8 (6.96)	0.48 (0.487)	106 (92.17)	9 (7.83)	3.46 (0.063)
Female	150 (56.60)	136 (90.67)	14 (9.33)		127 (84.67)	23 (15.33)	
Marital status							
Currently married	106 (40.00)	98 (92.45)	8 (7.55)	0.132 (0.716)	96 (90.57)	10 (9.43)	1.161 (0.281)
Not currently married	159 (60.00)	145 (91.19)	14 (8.81)		137 (86.16)	22 (13.84)	
Employed							
Yes	121 (45.66)	109 (90.08)	12 (9.92)	0.76 (0.382)	109 (90.08)	12 (9.92)	0.98 (0.323)
No	144 (54.34)	134 (93.06)	10 (6.94)		124 (86.11)	20 (13.89)	
Nature of your employment							
Self-employed	140 (87.50)	130 (92.86)	10 (7.14)	0.21 (0.650)	127 (90.71)	13 (9.29)	0.40 (0.526)
Employed by others	20 (12.50)	18 (90.00)	2 (10.00)		19 (95.00)	1 (5.00)	
Average monthly income							
less than or equal to UGX 100,000	181 (70.70)	164 (90.61)	17 (9.39)	1.16 (0.281)	154 (85.08)	27 (14.92)	4.58 (0.032)
100,001 and above	75 (29.30)	71 (94.67)	4 (5.33)		71 (94.67)	4 (5.33)	
Meals eaten daily							
One	12 (4.53)	10 (83.33)	2 (16.67)	2.56 (0.279)	11 (91.67)	1 (8.33)	1.04 (0.594)
Two	119 (44.91)	107 (89.92)	12 (10.08)		102 (85.71)	17 (14.29)	
Three or more	134 (50.57)	126 (94.03)	8 (5.97)		120 (89.55)	14 (10.45)	
Type of house							
Temporarily	71 (27.10)	68 (95.77)	3 (4.23)	1.64 (0.440)	61 (85.92)	10 (14.08)	0.96 (0.620)
Semi-permanent	86 (32.82)	78 (90.70)	8 (9.30)		75 (87.21)	11 (12.79)	
Permanent	105 (40.08)	96 (91.43)	9 (8.57)		95 (90.48)	10 (9.52)	
Nature of housing of residence							
Own house	216 (81.82)	202 (93.52)	14 (6.48)	3.52 (0.061)	189 (87.50)	27 (12.50)	0.66 (0.417)
Rented house	48 (18.18)	41 (85.42)	7 (14.58)		44 (91.67)	4 (8.33)	
Current place of residence							
Rural	189 (71.86)	175 (92.59)	14 (7.41)	0.31 (0.581)	166 (87.83)	23 (12.17)	0.09 (0.759)

Continued

Urban	74 (28.14)	67 (90.54)	7 (9.46)		66 (89.19)	8 (10.81)	
Number of Family members							
None	3 (1.15)	3 (100)	0		2 (66.67)	1 (33.33)	
Two	60 (22.90)	50 (83.33)	10 (16.67)	8.81 (0.032)	50 (83.33)	10 (16.67)	3.62 (0.306)
Three to Five	137 (52.29)	131 (95.62)	6 (4.38)		122 (89.05)	15 (10.95)	
Six and above	62 (23.66)	57 (91.94)	5 (8.06)		57 (91.94)	5 (8.06)	
Family members supportive financially							
Yes	92 (35.94)	86 (93.48)	6 (6.52)	0.54 (0.463)	86 (93.48)	6 (6.52)	3.30 (0.069)
No	164 (64.06)	149 (90.85)	15 (9.15)		141 (85.98)	23 (14.02)	
Family members often interact with you							
Yes	204 (79.4)	188 (92.16)	16 (7.84)	0.14 (0.706)	187 (91.67)	17 (8.33)	10.7 (0.001)
No	53 (20.62)	48 (90.57)	5 (9.43)		40 (75.47)	13 (24.53)	
Respect from Family members							
Yes	242 (93.80)	242 (93.80)	16 (6.61)	12.2 (<0.001)	214 (88.43)	28 (11.57)	0.01 (0.911)
No	16 (6.20)	11 (4.64)	5 (31.25)		14 (87.50)	2 (12.50)	
Family member who makes economic decisions							
Participant	200 (76.63)	186 (93.00)	14 (7.00)		178 (89.00)	22 (11.00)	
My spouse	13 (4.98)	10 (76.92)	3 (23.08)	4.27 (0.118)	9 (69.23)	4 (30.77)	5.27 (0.072)
Both of us	48 (18.39)	44 (91.67)	4 (8.33)		44 (91.67)	4 (8.33)	
Family member who controls resources							
Participant	195 (76.47)	181 (92.82)	14 (7.18)		174 (89.23)	21 (10.77)	
My spouse	13 (5.10)	10 (76.92)	3 (23.08)	4.10 (0.130)	9 (69.23)	4 (30.77)	6.23 (0.044)
Both of us	47 (18.43)	43 (91.49)	4 (8.51)		44 (93.62)	3 (6.38)	
Aggressive spouse							
Yes	15 (13.39)	12 (80.00)	3 (20.00)	2.03 (0.155)	13 (86.67)	2 (13.33)	0.41 (0.520)
No	97 (86.61)	89 (91.75)	8 (8.25)		89 (91.75)	8 (8.25)	
Spouse having another spouse							
Yes	8 (7.02)	7 (87.50)	1 (12.50)	0.08 (0.777)	7 (87.50)	1 (12.50)	0.15 (0.699)
No	106 (92.98)	96 (90.57)	10 (9.43)		97 (91.51)	9 (8.49)	
Alcohol use							
Yes	47 (18.15)	43 (91.49)	4 (8.51)	0.01 (0.910)	43 (91.49)	4 (8.51)	0.65 (0.419)
No	212 (81.85)	195 (91.98)	17 (8.02)		185 (87.26)	27 (12.74)	
Smoking tobacco							
Yes	13 (4.94)	11 (84.62)	2 (15.38)	1.02 (0.313)	11 (84.62)	2 (15.38)	0.17 (0.680)
No	250 (95.06)	231 (92.40)	19 (7.60)		221 (88.40)	29 (11.60)	

(b)							
Variable	n (%)	No depression (n = 243, 91.7%)	Depression (n = 22, 8.3%)	χ^2 (p-value)	No Suicidal Ideation (n = 233, 87.92%)	Suicidal Ideation (n = 32, 12.08%)	χ^2 (p-value)
HIV treating facility							
TASO	214 (80.75)	196 (91.59)	18 (8.41)		189 (88.32)	25 (11.68)	
Mbarara HC IV	49 (18.49)	45 (91.84)	4 (8.16)	0.19 (0.911)	42 (85.71)	7 (14.29)	0.53 (0.767)
Nyakayojo HC III	2 (0.75)	2 (100)	0		2 (100)	0	
Duration taking ARVs							
6 months to 2 years	10 (3.8)	8 (77.8)	2 (22.2)		8 (77.78)	2 (22.22)	
Above 2 years	253 (96.2)	234 (84.8)	19 (15.2)	2.65 (0.449)	225 (81.1)	28 (18.9)	1.35 (0.716)
No	208 (79.1)	192 (92.3)	16 (7.7)		187 (89.9)	21 (10.1)	
Currently having problems with ARVs							
Yes	19 (7.45)	15 (78.95)	4 (21.05)	4.96 (0.026)	15 (78.95)	4 (21.05)	2.13 (0.144)
No	236 (92.55)	220 (93.22)	16 (6.78)		212 (89.83)	24 (10.17)	
Taking other drugs apart from ARVs							
Yes	42 (16.09)	38 (90.48)	4 (9.52)	0.15 (0.701)	36 (85.71)	6 (14.29)	0.28 (0.598)
No	219 (83.91)	202 (92.24)	17 (7.76)		194 (88.58)	25 (11.42)	
Currently having a drug companion							
Yes	139 (53.7)	132 (94.96)	7 (5.04)	3.80 (0.051)	122 (87.77)	17 (12.23)	0.02 (0.889)
No	120 (46.33)	106 (88.33)	14 (11.67)		106 (88.33)	14 (11.67)	
Missed taking your ARVs in the last months							
Yes	35 (13.26)	30 (85.71)	5 (14.29)	2.21 (0.137)	30 (85.71)	5 (14.29)	0.25 (0.616)
No	229 (86.74)	213 (93.01)	16 (6.99)		203 (88.65)	26 (11.35)	
Viral load suppressed							
Yes	253 (96.93)	233 (92.09)	20 (7.91)	0.22 (0.638)	224 (88.54)	29 (11.46)	0.01 (0.928)
No	8 (3.07)	7 (87.50)	1 (12.50)		7 (87.50)	1 (12.50)	
Comorbidities							
Yes	47 (18.08)	40 (85.11)	7 (14.89)	3.59 (0.058)	40 (85.11)	7 (14.89)	0.81 (0.368)
No	213 (81.9)	199 (93.43)	14 (6.57)		191 (89.67)	22 (10.33)	
Visited the health facility and not get attended to							
Yes	54 (20.53)	46 (85.19)	8 (14.81)	4.31 (0.038)	43 (79.63)	11 (20.37)	4.82 (0.028)
No	209 (79.47)	196 (93.78)	13 (6.22)		189 (90.43)	20 (9.57)	
Visited the health facility and delayed to be attended to							
Yes	69 (26.24)	63 (91.30)	6 (8.70)	0.06 (0.800)	56 (81.16)	13 (18.84)	4.48 (0.034)
No	194 (73.8)	179 (92.27)	15 (7.73)		176 (90.72)	18 (9.28)	

Continued

Pays for the medical and counseling

Yes	69 (26.24)	63 (91.30)	6 (8.70)	0.06 (0.800)	59 (85.51)	10 (14.49)	0.66 (0.417)
No	194 (73.8)	179 (92.27)	15 (7.73)		173 (89.18)	21 (10.82)	

History of missing out on getting drugs from the health facility

Yes	55 (20.91)	50 (90.91)	5 (9.09)	0.12 (0.730)	45 (81.82)	10 (18.18)	2.735 (0.098)
No	208 (79.1)	192 (92.31)	16 (7.69)		187 (89.90)	21 (10.10)	

3.4. Factors Associated with Depression among Older Persons Living with HIV at Bivariate Analysis

Logistic regression at a bivariate level revealed that depression was significantly associated with the number of family members the participant stays with. Participants who stayed with 3 or more family members were 69% less likely to develop depression (UOR = 0.31, 95% CI (0.12 - 0.77), $p = 0.012$) compared with respondents who stays with less than 3 members in the family, having family members who do not give respect to the participants that is participants who were not respected by their family members were 6.4 times more likely to develop depression symptoms compared to those whose family members give them respect (UOR = 6.42; 95% CI (1.99 - 20.74); $p = 0.002$); Participants who had no problems with ARVs were 73% less likely to develop depression symptoms compared to participants who had problems with ARVs (UOR = 0.27; 95% CI (0.08 - 0.92); $p = 0.036$) and participants who visited the health facility and were attended to were 62% less likely to develop depression symptoms compared with those who visited the health facility and weren't attended to (UOR = 0.38; 95% CI (0.15 - 0.97); $p = 0.044$). Factors associated with suicidal ideation include: Participants who earned an average monthly income of UGX 100,000 and above were 68% less likely to develop suicidal ideation compared to those earned an average monthly income of less than UGX 100,000, also participants who often do not interact with their family members were approximately 4 fold more likely to develop suicidal ideation compared to those who often interact with their family members. The results further revealed that if the spouse of the respondents make the economic decision then the participants were 3.6 times more likely to develop suicidal ideation (UOR = 3.6; 95% CI (1.02 - 12.66); $p = 0.046$); again if the spouse controls the resources then the participants were 3.68 times more likely to develop suicidal ideation (UOR = 3.68; 95% CI (1.04 - 13.01); $p = 0.043$); Participants who visited health facility and were attended to were 59% less likely to develop suicidal ideation related to participants who visited the health facility and were not attended to (UOR = 0.41; 95% CI (0.02 - 0.93); $p = 0.032$), and participants who visited the health facility and were not delayed being attended to were 56% less likely to develop suicidal ideation compared to those who visited the health facility and were delayed to be attended to (UOR = 0.44; 95% CI (0.2 - 0.96); $p = 0.038$); other factors were not statistically significant as demonstrated in **Table 2**.

Table 2. Bivariate logistic regression analysis of factors associated with depression, and factors associated with suicidal ideation in older persons living with HIV.

Variable	Depression		Suicidal Ideation	
	Adjusted odds ratio (95% confidence interval)	<i>p</i> -value	Adjusted odds ratio (95% confidence interval)	<i>p</i> -value
Age (60+ continuous)	1.05 (.97 - 1.13)	0.198	0.96 (0.89 - 1.05)	0.394
Gender				
Male	1		1	
Female	1.37 (0.56 - 3.40)	0.488	2.13 (0.95 - 4.81)	0.068
Marital status				
Currently Married	1		1	
Not currently married	0.84 (0.34 - 2.09)	0.716	0.64 (0.29 - 1.43)	0.284
Employed				
Yes	1		1	
No	0.67 (0.28 - 1.63)	0.385	1.47 (0.68 - 3.13)	0.325
Average monthly income				
less than or equal to UGX 100,000	1		1	
100,001 and above	0.54 (0.17 - 1.67)	0.288	0.32 (0.11 - 0.95)	0.041
Meals eaten daily				
One	1		1	
Two	0.56 (0.11 - 2.87)	0.487	1.83 (0.22 - 15.13)	0.574
Three or more	0.32 (0.06 - 1.70)	0.18	1.28 (0.15 - 10.7)	0.818
Type of house				
Temporarily	1		1	
Semi-permanent	2.32 (0.59 - 9.11)	0.226	0.89 (0.36 - 2.25)	0.813
Permanent	2.13 (0.55 - 8.14)	0.271	0.64 (0.25 - 1.63)	0.352
Nature of your housing residence				
Own house	1		1	
Rented house	2.46 (0.93 - 6.48)	0.068	0.64 (0.21 - 1.91)	0.421
Current place of residence				
Rural	1		1	
Urban	1.31 (0.51 - 3.38)	0.582	0.87 (0.37 - 2.05)	0.759
Number of Family members stay with				
Less than three	1		1	
three and above	0.31 (0.12 - 0.77)	0.012	0.52 (0.23 - 1.17)	0.117
Family members supportive financially				
Yes	1		1	

Continued

No	1.44 (0.54 - 3.86)	0.465	2.34 (0.92 - 5.97)	0.076
Family members often interact with participant				
Yes	1		1	
No	1.22 (0.43 - 3.51)	0.707	3.58 (1.61 - 7.95)	0.002
Participant respected by Family member				
Yes	1			
No	6.42 (1.99 - 20.74)	0.002	1.09 (0.23 - 5.06)	0.911
Family member who makes economic decisions				
Participant	1		1	
Their spouse	3.99 (0.98 - 16.16)	0.053	3.60 (1.02 - 12.66)	0.046
Both of them	1.21 (0.38 - 3.85)	0.749	0.73 (0.24 - 2.24)	0.589
Family member who controls resources				
Participant	1		1	
Their spouse	3.88 (0.96 - 15.73)	0.058	3.68 (1.04 - 13.01)	0.043
Both of them	1.20 (0.38 - 3.84)	0.755	0.56 (0.16 - 1.98)	0.372
Spouse aggressive				
Yes	1		1	
No	0.36 (0.08 - 1.54)	0.169	0.58 (0.11 - 3.06)	0.525
Spouse having another spouse				
Yes	1		1	
No	0.73 (0.08 - 6.54)	0.778	0.65 (0.07 - 5.88)	0.701
Alcohol drinking				
Yes	1		1	
No	0.94 (0.30 - 2.92)	0.911	1.57 (0.52 - 4.72)	0.423
Smoke tobacco				
Yes	1		1	
No	0.45 (0.09 - 2.19)	0.324	0.72 (0.15 - 3.42)	0.681
Duration of taking ARVs				
less than 5 years	1		1	
5 years and above	0.54 (0.15 - 1.99)	0.356	0.85 (0.24 - 3.03)	0.796
Problems with ARVs				
Yes	1		1	
No	0.27 (0.08 - 0.92)	0.036	0.42 (0.13 - 1.38)	0.155
Taking other drugs apart from ARVs				
Yes	1		1	

Continued

No	0.80 (0.25 - 2.51)	0.701	0.77 (0.30 - 2.02)	0.599
Presence of a drug companion				
Yes	1		1	
No	2.49 (0.97 - 6.39)	0.058	0.95 (0.45 - 2.01)	0.889
Missed taking ARVs in last month				
Yes	1		1	
No	0.45 (0.15 - 1.32)	0.146	0.77 (0.27 - 2.15)	0.617
Viral load suppressed				
Yes	1		1	
No	1.66 (0.19 - 14.21)	0.642	1.10 (0.13 - 9.29)	0.928
Medical comorbidities				
Yes	1		1	
No	0.40 (0.15 - 1.06)	0.065	0.66 (0.26 - 1.65)	0.371
Visited the health facility and not get attended to				
Yes	1		1	
No	0.38 (0.15 - 0.97)	0.044	0.41 (0.18 - 0.93)	0.032
Visited the health facility and delayed being attended to				
Yes	1		1	
No	0.88 (0.33 - 2.37)	0.800	0.44 (0.20 - 0.96)	0.038
Pay for the medical and counseling services				
Yes	1		1	
No	0.87 (0.32 - 2.37)	0.800	0.71 (0.32 - 1.61)	0.419
Missed out on getting drugs from the health facility				
Yes	1		1	
No	0.83 (0.29 - 2.38)	0.734	0.51 (0.22 - 1.15)	0.103
HIV treating facility				
TASO	1		1	
Mbarara HC IV	0.97 (0.31 - 3.00)	0.955	1.26 (0.51 - 3.11)	0.616
Nyakayojo HC III	1 (omitted)		1 (omitted)	

3.5. Factors Associated with Depression among Older Persons Living with HIV at Multivariable Analysis

In the adjusted analysis, older persons living with HIV/AIDS who stay with three or more persons in a home were 65% less likely to develop depression than those who stayed with less than 3 family members (AOR = 0.36; 95% CI (0.13 - 0.95); $p = 0.04$); and participants currently do not have problems with taking their ARVs were 77% less likely to develop depression symptoms compared with

those who experience problems with ARVS (AOR = 0.23; 95% CI (0.06 - 0.89); $p = 0.034$).

Results further revealed factors associated with suicidal ideation. The average income of the participant associated with suicidal ideation. Participants who earned a monthly income of UGX 100,000 and above were 74% less likely to develop suicidal ideation compared to those earned less than UGX 100,000 (AOR = 0.26; 95% CI (0.07 - 0.99); $p = 0.048$). Other factors were not statistically significant as portrayed in (Table 3).

Table 3. Multivariable logistic regression analysis of factors associated with depression and suicidal ideation.

Variable	Depression		Suicidal Ideation	
	Adjusted odds ratio (95% CI)	<i>p</i> -value	Adjusted odds ratio (95% CI)	<i>p</i> -value
Average monthly income				
less than UGX 100,000 (approximately 27 USD)*			1	
100,001 and above			0.30 (0.08 - 1.08)	0.066
Number of Family members stay with				
Less than three	1			
three and above	0.35 (0.13 - 0.95)	0.04		
Family members often interact with you				
Yes			1	
No			2.20 (0.85 - 5.69)	0.103
Do Family members respect you				
Yes	1			
No	3.47 (0.92 - 13.07)	0.065		
Family member who controls resources				
Participant			1	
Their spouse			5.15 (1.30 - 20.40)	0.020
Both of them			0.79 (0.21 - 2.95)	0.729
Do you currently have any problem with ARVs				
Yes	1			
No	0.23 (0.06 - 0.89)	0.034		
Have you ever visited the health facility and not get attended to				
Yes	1		1	
No	0.38 (0.13 - 11.13)	0.083	0.73 (0.24 - 2.21)	0.587
Have you ever visited the health facility and delayed being attended to				
Yes			1	
No			0.75 (0.25 - 2.25)	0.615

*: Using Uganda Exchange rates as of July 3, 2023.

3.6. Factors Associated with Suicidal Ideation among Older Persons Living with HIV

Suicidal ideations were significantly higher among older persons 1) who did not often interact with their family members; 2) had their spouse (s) controlling their resources; and 3) who visited the health facility and did not get attended to; 4) who ever visited health facility and had a delay of being attended to; and earned above 100,000 UGX (approximately 27 USD) (**Table 3**). In the model analysis, the factors with a significant relationship at bivariate analysis, were tested for collinearity and the mean VIF was 3.26. Family member who makes economic decisions for the participant had the highest VIF = 7.06, and this was removed from further model building. The remaining variables were collinear, with all individual VIF below 2, and mean VIF of 1.31. The final model had goodness of fit, with a p-value of 0.757. The factors associated with having suicidal ideations, was having their spouse controlling their resources.

4. Discussion

This study aimed to determine the prevalence of depression, suicidal ideation and associated factors among older persons living with HIV/AIDS at selected health facilities in Mbarara city in southwestern Uganda. We found a depression prevalence was 8.3% and suicidal ideation was 12.1%. The likelihood of depression reduced when the older person living with HIV stayed with three or more people and had no problems with their current ARV regimen. However, the likelihood of suicidal ideations decreased when the individual earned more than 100,000 UGX.

The prevalence of depression in the present study (8.3%) was within the range of other findings from similar population in SSA (6% - 59%) [5]. However, the prevalence in the present study was lower compared to studies in SSA that used the same psychometric tool (PHQ-9) and the same cut-off (10) (*i.e.*, 16% - 45%) [5]. The lower prevalence may be attributed to the time when the studies were conducted, *i.e.*, the current study operating in an environment where recommendations from the previous studies may have been implemented. For example, having mental health services such as counselling incorporated with HIV programs and training of health workers in HIV clinic to screen, manage, and refer individuals with depression and other mental health conditions for professional psychiatry care [8] [12]. In addition, study conducted in a region with good viral load suppression [15], thus less complication due to HIV virus such as encephalitis, and opportunistic infection that may present with mental health complications. No wonder, individuals who had no concerns or issues with their ARVs in the present study were less likely to have depression. Also, the study was conducted during the COVID-19 pandemic, a period that had more people focused on their mental wellbeing following heightened numbers of individuals affected by mental health conditions such as depression [22] [23] [24]; and could have had better approaches to self care and mental wellbeing. Despite the lower

prevalence than previous studies, the prevalence of depression among older persons with depression is still high. We recommend more emphasis on mental health care integration into HIV care packages. In addition to promoting holistic multi-disciplinary care team approach involving mental health professionals such as psychiatrists and psychologists, to mitigate and manage depression and its complications, as well as mitigating the associated risk factors.

In the present study staying with more family members was associated with reducing the likelihood of depression among older persons living with HIV. Family is a major protective factor for depression in Uganda due to the integral roles played by family including social, emotional, financial, and physical support [25] [26]. Having family support from several members may help older individuals stay stimulated due to keeping track of the various individuals in their lives. Also, the family members may encourage the older person to adhere to medication and support them in having a good nutrition through cooking for them and assistances with other activities of daily living. Loneliness has consistently been reported to be a great challenge to older persons, especially those with chronic conditions, such as HIV [27]. Therefore, having many family members staying with the older person living with HIV may mitigate loneliness.

In the present study 12.1% of older persons living with HIV had experienced suicidal ideations. This was relatively more than 7.8% among older person in Entebbe, Uganda [28]. As identified by the current study, the difference may be due to the increase in economic hardship over time. Thus, individuals earning less than 27 USD per month have higher likelihood of depression. These individuals may not be able to afford the current living standards and may experience multiple challenges related to poverty. For example, they may not afford good nutrition, transport to health facilities to collect ARV medications, ability to support a large family or support structure, which may lead to depression and may not afford the cost of medications to manage depression or other co-infections. Many individuals aged 65 and above have retired from the common economic activity, *i.e.*, farming which is not accompanied by any pension, and have only supplementary government aid that is less than 10 USD per month [29]. However, this aid is only given to individuals who are over the age of 80 [29]. Providing adequate financial assistance to older persons in Uganda to an amount more than 27 USD may be helpful in reducing the burden of suicide in this vulnerable population. In addition, the government should develop innovative approaches to reduce poverty among older individual as recommended by Byaruhanga and Debesay, 2021 [30].

5. Limitations

This was a cross-sectional study with a small sample size from one region of the country and causality and generalisability to the whole country cannot be inferred. We recommend future studies to involve multinational, longitudinal, large sample size populations of older persons living with HIV. Also, the com-

monly used tool for assessing depression among older individuals in SSA was used in the present study despite the presence of population specific tools such as the geriatric depression scale [5]. Use of a non-population specific tool could introduce bias in the classification of individuals with depression, leading to over or under diagnosis of the condition. We recommend future researchers to use population-based tools in assessing for depression and suicidal behaviors. Lastly, we did not control for the cluster related factors due to the different health facilities which would have introduced bias due to participant selection.

6. Conclusion

Approximately 8 to 12 in 100 older persons living with HIV/AIDS in Uganda have experienced depression or suicidal ideation. Family support was an instrumental factor associated with depression and financial control was associated with suicidal ideation. We recommended strengthening family structures and creating more avenues for financial independence among older persons living with HIV/AIDS to reduce the burden of depression, and suicidal tendencies among this vulnerable population.

Ethical Approval and Consent to Participate

The study was performed in accordance with the international ethical standards of the Declaration of Helsinki. This study was approved by the Mbarara University of Science and Technology Research Ethics Committee and the Uganda National Council for Science and Technology (HS2331ES). All participants provided informed consent prior to participation in the study. Individuals with severe depression and suicidal ideations were referred to Mbarara Regional Referral Hospital for further management.

Data Availability Statement

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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