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Depression Predicts Substance Use among Forcibly Displaced Migrants: A Quantitative Study among Refugees Living in Mbarara City, Southwestern Uganda

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Abstract

Background: Depression has been recorded among forcibly displaced populations especially refugees. Conditions in which refugees find themselves make them predominantly susceptible to substance use as a coping mechanism. Our study aimed to determine the prevalence of depression, substance use and the association between depression and substance use among refugees living in Mbarara city, southwestern Uganda. **Methods:** African refugees who had settled in Mbarara city for at least twelve months before the study totaling 343 were assessed on the prevalence of depression and substance use. Depression was measured using the Patient Health Questionnaire (PHQ-9) while Substance use was measured using The Alcohol Use Disorders Identification Test (AUDIT-10) for alcohol and The Drug Abuse Screening Test (DAST-20) was used to measure the prevalence of other substances other than alcohol. Using SPSS-V26, descriptive statistics were calculated to determine the prevalence of refugee depression and substance use. Logistic regression analysis was used to examine the associations between the predictor and outcome variables in step1. **Results:** The prevalence of depression in the current study was 81% (n = 276). There were no gender differences in the prevalence of depression ($\chi 2 = 0.745$, $p = 0.389$). The prevalence of alcohol use was 43% (n = 146). The prevalence of other substance use other than alcohol was 42% (n = 143). Results showed a significant difference between male and females in the use of other substances

($\chi 2 = 8.227$, $p = 0.042$). However, there were no significant differences in alcohol use categories across gender ($\chi 2 = 1.348$, $p = 0.718$). Results indicated that participants who experienced depression were significantly associated with a higher likelihood of alcohol use ($p < 0.001$; OR = 1.24; 95% CI; 1.17 to 1.31) and use of other substances ($p < 0.001$; OR = 1.32; 95% CI; 1.23 to 1.41). **Conclusion:** The study results revealed that participants who had depression were significantly associated with a higher likelihood of substance use irrespective of the demographic characteristics. We also recommended that clinical interventions focused on the treatment of depression among refugee communities should focus on substance use as well.

Keywords

Depression, Substance Use, Refugees, Southwestern Uganda

1. Background

Depressive disorders are estimated to account for 4.4% of the global burden of disease and are the primary cause of loss of disability-adjusted life years in developed countries (Chisholm et al., 2014). Depression is the most common mental health outcome of exposure to war-related traumatic stressors (Blackmore et al., 2020). Major depression, impacts the daily quality of life and it is a psychiatric diagnosis most associated with suicide (Ainamani et al., 2017). Psychological distress, psychosomatic complaints and clinical mental disorders such as depression among refugees than in other populations (Hollifield et al., 2017). This is because refugees are at risk for mental health problems due to forced migration from their home countries and other traumatic experiences (Tahir et al., 2022).

Traumatic events related to harassment, lack of basic needs, and violence were associated with depression and anxiety among Karenni refugees residing along the Burmese-Thai border (Vonnahme et al., 2016). Similarly, 82.6% of Cambodian respondents living in Thailand-Cambodia border camps self-reported depression, characterized as "a deep sadness inside oneself" (Scott et al., 2018). Distress and psychiatric morbidity have been found to be high among refugees, with depression rates from 9.8% to over 67.4% (Henkelmann et al., 2020; Amir, & Lucas, 2021; Sanders et al., 2019). Studies conducted among refugees in Uganda and Southern Sudan identified a high prevalence of depression at 67.4% and 49.9% respectively (Roberts, Damundu, Lomoro, & Sondorp, 2009a; Roberts, Ocaka, Browne, Oyok, & Sondorp, 2008). The prevalence of depression was significantly higher among Ethiopian immigrants and refugees, at 69.8%, among those who were exposed to pre-migration trauma, refugee camp internment, and post-migration stressful life events (Fenta et al., 2015).

These conditions in which refugees find themselves make them predominantly susceptible to substance use as a coping mechanism. Different theories have been developed to justify the use of substances by refugees (Sharansky et al., 2019). The

acculturative stress model argues that substance use is a coping mechanism to the pre, during and post migration conditions accelerated by the stress from cultural conflict, and the lack of social and economic resources for coping (Chakraborty & Chattaraman, 2022). Investigations have demonstrated the relationship between depression and substance use disorders among urban refugees (Im et al., 2017). For example, 6,355 alcohol and drug dependent refugees from 41 sites within the European Union and the United Kingdom, indicated that 44% of these individuals had a lifetime history of major depression (Swendsen & Merikangas, 2020). A similar study of over 4,000 refugees in the United States, revealed strong associations of both alcohol and drug use disorders with depression (National Institutes of Health, 2021). A study exploring the mental health and psychosocial problems of Congolese refugees living in refugee settings in Rwanda and Uganda found that refugees who had major depressive symptoms were at an elevated risk of getting involved in substance use especially alcohol (Chiumento et al., 2020). Other factors that have been shown to correlate with substance use among refugee population include demographic characteristics such as age, marital status, socio-economic status, and education (Greene et al., 2018; Logie et al., 2022).

An analysis of most of the previous research examining the relationship between depression and substance use have involved primarily refugees in developed countries, which limits the generalizability to low- and middle-income countries. Indeed, most of the urban African refugees within the African continent are understudied despite being at a higher risk for illicit substance use disorders (UNODC, 2018). As such, a study examining the relationship between substance use and depression among refugees living in low-income countries would aid in a better understanding of the plight of this minority group but also guide in designing interventions that address the unique needs of especially urban refugees. It is against such a background that our study hypothesized that (a) There is a high prevalence of depression and substance use among refugees, (b) There is a significant positive association between depression and substance use among refugees in living in Mbarara city Uganda.

2. Methods

2.1. Study Setting and Design

This was a descriptive cross-sectional study among 343 African refugees residing in Mbarara City, Southwestern Uganda. Mbarara city is home of 261656 residents (Uganda Bureau of Statistics, 2024). The strategic location of Mbarara city makes it easily accessible by refugees from DRC, Rwanda, and Burundi. Though the actual number of refugees residing in city is unknown by the Office of the Prime Minister and the UNCHR, it is estimated that the city is home for about 3500 refugees mainly coming from the Oruchinga, Nakivale and Rwamwanja refugee settlements in Southwestern Uganda (UNHCR & OPM, 2020). Majority of the residents in Mbarara city ethnically identify as Banyankole, Bakiga and Baganda, whose economic livelihoods hinge on cattle keeping, agriculture, trading, and

causal labor (UBOS, 2020).

2.2. Participants

A total of 343 African refugees participated in our study. In this study, we considered all refugees who had lived in Mbarara city for at least twelve months before the study. We excluded participants with severe psychological disorders and identifiable symptoms of alcohol intoxication during the time of the questionnaire administration to avoid collecting distorted information.

2.3. Recruitment and Sampling Procedure

Snowball sampling technique was used to select the participants. The participants who we recruited provided referrals to potential other participants. With the help of refugee leaders in the city, we located the participants in their homes. Data were collected between June 2021 and May 2022. These four research assistants were selected first, because they spoke Swahili, Kinyarwanda/Kinyabwisha, and English the languages that are majorly spoken by most of the African refugees in Mbarara city. Two other persons who spoke Somali language were recruited to help with interpretation. The research assistants also offered psychosocial support to any participant who needed psychological help. These research assistants were trained for one week in data collection skills and research ethics before data collection was done. Each interview lasted between 45 - 60 minutes in psychologically private settings within the homes of the participants.

2.4. Ethical Considerations

Ethical clearance was obtained from the Mbarara University of Science and Technology Research Ethics Committee (# 02/12 - 18) and the study was cleared by the Uganda National Council for Science and Technology (# SS4922). Additionally, we sought permission from the Office of the Prime Minister (OPM), a government of Uganda department that is responsible for refugees in the country. All participants aged 18 years and above provided written informed consent after explaining the purpose of the study and clarifying that participation would be entirely voluntary. Similarly, participants below 18 years provided assent to participate in the study after their guardians or parents provided consent. Participants were offered a small token of ten thousand shillings-equivalent to 3 USD as compensation for their time taken to participate in the study. Participants were also encouraged to call or meet the project leaders in case they had additional questions. The participants were assured that the interview would be confidential and that they were free to withdraw from the interview at any time without any negative consequences.

2.5. Measures

All instruments were translated into Kinyarwanda/Kinyabwisha, Swahili and Somali, the languages that were spoken by most of the refugees and back translated

to English to ensure that the original meaning was not lost. The questionnaire was comprised of different section including the Patient Health Questionnaire (PHQ-9), the Alcohol Use Disorders Identification Test (AUDIT-10), the he Drug Abuse Screening Test (DAST-20) and a brief demographic questionnaire which captured participants' information concerning age, gender, educational level, place of residence, marital status, time spent in Mbarara city, and source of income was also included.

Our main predictor variable was depression which was assessed using the Patient Health Questionnaire (PHQ-9); The PHQ-9 is a brief, easily administered and scored screening questionnaire that can be used to improve the recognition rate of major depression and facilitate treatment (Spitzer et al., 2018). As a screener for depression, the questionnaire has been found to have good diagnostic validity with comparable sensitivity and specificity for major depression in adult populations (Kroenke et al., 2010). An advantage of the questionnaire is its exclusive focus on the nine diagnostic criteria for the newly revised DSM-5 depressive disorders (Baptiste, 2018). Internal reliability for the PHQ-9 is reported with a Cronbach's alpha of 0.89 in clinical studies. In this study the internal reliability for the PHQ-9 had Cronbach's α of 0.91. The scale is up to a score of up to 27 with each item with options of not all (0), several days (1), more than half the days (2) and nearly every day (3). A score of 0 - 4 is interpreted as minimal depression, 5 - 9 mild depression, 10 - 14 moderate depression, 15 - 19 moderately severe depression, and 20 - 27 severe depression. The PHQ-9 was used to determine the prevalence of depression among our participants. This study considered a depression score of 10 and above as recommended by Kroenke (2012).

Our main outcome variables were; alcohol use and use of other substances. The Alcohol Use Disorders Identification Test (AUDIT-10) assessed the prevalence of alcohol use in the past 12 months preceding the study. This scale was developed by the World Health Organization in 1993 as a screening instrument in primary health care with a validated threshold score of 8 for hazardous or harmful consumption and a score of 20 or greater for possible alcohol dependence. The AUDIT total scores were calculated by summing the ten items of the questionnaire that range from 0 to 40. The AUDIT-10 is consistent with a Cronbach's alpha of 0.80 (Moussas et al., 2009) and in the present study the AUDIT had a 0.98 Cronbach's alpha.

The Drug Abuse Screening Test (DAST-20) was used to measure the prevalence of other substances other than alcohol. This tool is comprised of 20 questions relating to drug/substance use during the last twelve months. A response of a No is scored as 0 and a Yes response is scored as 1 apart from questions 4 and 5 which are scored in the reverse. The problem severity is classified as; a score of 1 - 5 is interpreted as low, 6 - 10 is intermediate or moderate, 11 - 15 is substantial and 16 - 20 score is severe (Roberts et al., 2014a). The instrument has been widely used in Canada and other parts of North America, Europe, Africa and the Middle East (Information et al., 2018; Weber, 2008; Yitayih et al., 2018). The DAST-20 pos-

sessed 0.97 Cronbach's alpha in the present study.

Socio-demographic factors included, gender, age, education level, marital status, time spent in Mbarara city, and source of income. We administered all the instruments directly to the respondents in their own residences or places considered by both the research team and the selected participant as being safe and confidential.

2.6. Data Analysis

In order to achieve the study objectives, descriptive statistics including frequencies, percentages, means, standard deviations of the main study variables based on standard measures were calculated. These were the scores used in data analysis. Frequencies and percentages were used in determining the prevalence of depression and substance use among refugees living in Mbarara city. Each main study variable was grouped based on the scales provided in standardized tools. Frequencies, percentages, and p-values were presented. To investigate the association between depression and alcohol use, the categorized scores of AUDIT-10 scale were re categorized into a binary outcome variable (1 for drinkers and 0 for none drinkers) which was regressed against the PHQ-9 depression scores. To investigate the association between depression and use of other substances, the categorized scores of the DAST-20 were re categorized into a binary outcome variable (1 for other substance users and 0 for none users) which was regressed against the PHQ-9 depression scores. Logistic regression analysis was used to test the associations between substance use and depression in step one. We controlled for the socio-demographic characteristics of the study participants in step two as guided by Ssebunya and colleagues (2020). We presented Odds ratios (OR), confidence intervals and p-values.

3. Results

3.1. Descriptive Statistics

Of the 343 participants, 198 were males and 145 females, their mean age was 28.8 years (SD = 11.0). Most of the participants (95.3%) had attained formal education and almost half of them were not married 49.3%. Majority of the participants were from the Democratic Republic of Congo (DRC), and Rwanda (34.1%, 31.8%) respectively. Very few (5%) were from South Sudan and their mean duration of stay in Mbarara city was 6.4 years. Most of them (49.9%) reported that their source of income was casual labor. The mean total score of social support was 57 (SD = 18) and stigma was 41 (SD = 15) respectively. Details of the socio-demographic characteristics

3.2. Prevalence of Depression and Substance Stance Use among Refugees

The prevalence of depression in the current study was 81% (n = 276). Of these 120 (35%) were females and 102 (29%) were males. There were no gender differences

in the prevalence of depression ($\chi 2 = 0.745$, p = 0.389). However, when depression was categorized, results showed no significant differences across gender ($\chi 2 = 7.510$, p = 0.057). Results revealed that 17% (n = 59) had mild depression. Of these 31 (9%) were females and 28 (8%) were males. Similarly, 41% (n = 141) had moderate depression. Of these 51 (15%) were females and 90 (26%) were males. Lastly 22% (77) had severe depression and of these, 39 (11%) were females and another 38 (11%) were males.

The prevalence of alcohol use was 43% (n = 146). Of these, 57 (17%) were females, 89 (26%) were males. Results revealed no evidence of significant differences across gender in relation to alcohol use ($\chi 2 = 1.66$, p = 0.212). A further analysis of findings in to the AUDIT-10 categories revealed that 18% (n = 62) were hazardous alcohol drinkers. Of these, 25 (7%) were females and 37 (11%) were males. Also 8% (n = 26) were harmful alcohol drinkers. Of these, 9 (3%) were females and 17 (5%) were males. Lastly 17% (n = 58) were dependent alcohol drinkers. Of these 23 (7%) were females and 35 (10%) were males. Results revealed no significant differences in alcohol use categories across gender ($\chi 2 = 1.348$, p = 0.718).

The prevalence of other substance use other than alcohol was 42% (n = 143). Of these, 54 (16%) were females and 89 (26%) were males. A further analysis of the DAST-20 scores revealed that 8% (n = 29) of the participants were intermediate substance users. Of these, 12 (3%) were females and 17 (5%) were males. Results also revealed that 85 (n = 25%) were substantial substance users. Of these, 37 (11%) were females and 48 (14%) were males. Lastly 8% (n = 29) were severe substance users. Of these, 5 (1%) were females and 24 (7%) were males. Results showed a significant difference between male and females in the use of other substances ($\chi 2 = 8.227$, p = 0.042).

3.3. Association between Depression and Substance Use among Urban Refugees

To investigate the association between depression and alcohol use, the categorized scores of AUDIT-10 scale were re categorized into a binary outcome variable (1 for drinkers and 0 for none drinkers) which was regressed against the PHQ-9 depression scores. In step one depression was entered in the logistic regression model, the results indicated that participants who experienced depression were significantly associated with a higher likelihood of alcohol use (p < 0.001; OR = 1.24; 95% CI; 1.17 to 1.31).

In step two when age, education level, marital status, time spent in Mbarara city, occupation and sex were added in the model as confounding variables, the odds of alcohol use among participants as a result of depression were statistically also significant (p < 0.001; OR = 1.2; 95% CI; 1.12 to 1.28). Sigillary, results of the regression indicated that older participants were significantly more likely to use alcohol (p < 0.002; OR = 1.06; 95% CI; 1.02 to 1.11) compared to the young ones. Similarly, participants who were separated at the time of the study were significantly associated with a higher likelihood of alcohol use (p = 0.029; OR = 0.26;

95% CI; 0.08 to 0.87) compared to those who had never married.

To investigate the association between depression and use of other substances, the categorized scores of the DAST-20 were re categorized into a binary outcome variable (1 for other substance users and 0 for none users) which was regressed against the PHQ-9 depression scores. In step one depression was entered in the regression model, the results thereof indicated that participants who experienced depression were significantly ($p < 0.001$; OR = 1.32; 95% CI; 1.23 to 1.41) associated with a higher likelihood of use of other substances. In step two when age, education level, marital status, time spent in Mbarara city, occupation and sex were added as confounding variables in the model, the odds of use of other substances among participants as a result of depression were also statistically significant ($p =< 0.001$; OR 1.36; 95% CI; 1.25 to 1.49). Lastly results of the regression showed that married participants were significantly associated with a higher likelihood ($p =< 0.032$; OR = 2.63; 95% CI; 1.09 to 6.35) of use of other substances as a result of depression compared to the males (See Table 1).

Table 1. Hierarchical logistic regression for the association between depression and substance use among refugees living in Mbarara City.

	Alcohol use				Use of other substances			
Variables	OR	95% CI		p-value	OR	95% CI		p-value
Step 1								
Depression	1.24	1.17	1.31	<0.001	1.32	1.23	1.41	<0.001
Step 2								
Depression	1.2	1.12	1.28	<0.001	1.36	1.25	1.49	<0.001
Age	1.07	1.02	1.11	0.002	1.04	0.99	1.09	0.097
Education Level								
No education	Ref				Ref			
Primary	3.92	1.03	14.9	0.045	3.40	0.70	16.6	0.131
Secondary	1.03	0.27	3.97	0.961	0.92	0.19	4.51	0.914
Tertiary	1.09	0.23	5.27	0.915	1.63	0.27	9.98	0.597
Marital Status								
Never Married	Ref				Ref			
Married	0.84	0.38	1.89	0.682	2.63	1.09	6.35	0.032
Separated	0.26	0.08	0.87	0.029	0.28	0.07	1.07	0.063
Time spent	0.97	0.90	1.05	0.482	1.01	0.92	1.10	0.913
Occupation								
Business	Ref				Ref			
Dependent	0.94	0.29	3.07	0.915	0.19	0.05	0.75	0.018
Casual Labor	2.18	0.72	6.60	0.168	0.59	0.17	2.11	0.417
Sex								
Male	Ref				ref			
Female	0.59	0.32	1.07	0.08	0.40	0.20	0.79	0.008

OR = Odds Ratio, P = Probability value, CI = Confidence Interval.

4. Discussion

Results revealed higher prevalence of depression. The high prevalence reported in this study is in line with prior results among other refugee groups. For example higher levels of depression were reported in a study done among Syrian refugees living in Iraq reported 80% prevalence of depression (Mahmood et al., 2019). Studies conducted among refugees in Uganda and Southern Sudan identified high prevalence of depression at 67.4% and 49.9% respectively (Roberts et al., 2009a, 2009b). Also a study by Logie and colleagues (2020b) reported a 67.6% prevalence of depression symptoms ranging from mild to severe depression symptoms among urban refugees living in Kampala Uganda (Logie et al., 2020b). In the present study, there were no significant differences across gender in the experience of depression. Such results would explain the homogeneous nature of mental health burden of refugees across gender. Unlike other studies that report higher prevalence of depression among women (Mahmood et al., 2019), results revealed that urban refugee men experienced higher prevalence of depression. The current higher prevalence may be due to their (men) higher tendencies to migrate to town and cultural responsibility to bear the financial burden of head of household providing for their families in the midst of harsh urban conditions (Logie et al., 2020b; Sandvik, 2011; Swahn et al., 2020; Walnycki et al., 2019). Secondly women tend to have more social support systems and possibly face fewer acculturation challenges as compared to men.

Results also revealed higher prevalence of substance use among refugees living in Mbarara city. Almost half of the participants reported to have used alcohol and other substances in the last 12 months before the study. Many of the participants, were hazardous drinkers and substantial substance users according the AUDIT and DAST cutoff scores respectively. The high prevalence of alcohol and other substances use among participants is in in agreement with scholars who argue that conflict-affected civilian populations are often exposed to high levels of violent and traumatic events that are strongly associated with mental disorders (Bahati et al., 2023). The exposure to traumatic events and the experienced mental disorders are in turn associated with substance use disorders, with alcohol and other substances used as forms of self-medication to ameliorate symptoms of these disorders (Greene et al., 2018). Evidence of excessive alcohol and substance use has been reported in a number of refugee populations. For example, substance use was found to be common among refugee populations in Thailand, Uganda, Liberia, and Kenya, in fact, alcohol use was found to be widespread as was its production since it served as an income source for women who brewed it (Roberts et al., 2014a, 2014b; Ezard, 2016; Kane & Greene, 2018; Kane et al., 2019). The high prevalence of substance use in the present study could still be attributed to a desire for social acceptability by the natives. In fact Horyniak et al., (2016), argues that migrants who are highly engaged in the host culture may engage in substance use in order to adhere to mainstream norms and gain acceptance in their new communities (Horyniak et al., 2016).

The study revealed no significant differences across gender as far as the experience of alcohol use problems. This could have been due to the fact that alcohol is a generally acceptable drink for leisure, relaxation, and tradition in the Ugandan society and no one would be condemned for taking alcohol moreover alcohol is readily accessible to almost everyone (Kane et al., 2019; Roberts et al., 2014b). The results however, revealed significant differences in the use of other substances other than alcohol across gender with more men using substances as compared to women. We argue that this was expected since African men tend to have a higher purchasing power as compared to women so it could be true that the male participants got generally involved in substance use more often. Moreover previous studies among refugees show that men are more at risk of consuming alcohol and other elicit substances (Brown et al., 2019; Greene et al., 2018; Horyniak et al., 2016; Kane & Greene, 2018; Kane et al., 2019).

In agreement with the study hypothesis, there was a significant positive association between depression and substance use among urban refugees. This is in agreement with a study about alcohol and substance use disorders among refugees which found that unhealthy alcohol and other drug use was related to depression in many refugee communities worldwide (Kane & Greene, 2018). Similarly, Hyojin and colleagues in their study found depression to be higly correlated to alcohol and substance use disorders among urban Somali refugees in Nairobi (Im et al., 2017). Even when age, education level, marital status, time spent in Mbarara city, occupation and sex were added in the model as confounding variables, the odds of alcohol use and use of other substance among participants as a result of depression were still statistically significant. This is in agreement with a study about the contextual factors influencing depression among urban refugees in Kampala – Uganda, which revealed that substance use among urban refugees was highly associated with depression (Logie et al., 2020a).

A similar study of over 4,000 refugees living in the United States and Kampala revealed strong associations of both alcohol and drug use disorders with depression (National Institutes of Health, 2021; Swahn et al., 2020). Indicating the deep-rooted effect of depression on the mental health of refugees but also maladaptive copying mechanism available for refugee populations. Results of this study revealed that age as a confounding variable was associated with alcohol use. This is in line with a systematic review about the prevalence and associated factors of depression and alcohol and other substance use in Uganda which alluded to the fact that older migrants, IDPs and refugees were prone to alcohol use as compared to the young ones (Kaggwa et al., 2022). It can be argued that this trend might be due to the fact that older people are at liberty to for example use alcohol and, on many occasions, they are under limited severance concerning use of illicit drugs like opium, khat abuse of prescription drugs etc. Note that a systematic review of qualitative research on substance use among refugees by Saleh and colleagues (2022) found that older refugees were at an increased risk for substance use as compared to young ones (Saleh et al., 2022).

Similarly, participants who were separated were significantly associated with a higher likelihood of alcohol use compared to those who had never married. This is in agreement with a prevalence study of substance use among Russian, Somali and Kurdish refugees in Finland, which found that being divorced or separated increased the odds of both men and women getting involved in alcohol and substance use (Salama et al., 2018). The study found no evidence of gender difference in alcohol use among our participants. We argue that since alcohol use is a loosely accepted behavior in most African societies for both males and females this could have been responsible for the evidence of no significant gender differences in the use of alcohol (Ssebunnya et al., 2020). Besides our participants were conflict affected participants (refugees) who are generally thought to be at an increased risk for alcohol use (Greene et al., 2018). Indeed, both male and female refugees face many difficulties associated with such a major life change resort to the use of alcohol for reasons such as coping with depression, traumatic experiences, comorbid mental disorders, and acculturation challenges, social and economic inequality.

4.1. Limitations

The study adopted a cross-sectional design and conducted in one city therefore limiting us to make firm inferences from our findings. We recommend a longitudinal study to be conducted on a larger scope of refugees living in urban places for enhancing more concrete conclusions. The participants were undocumented, urban refugees who may have had safety and legal documentation related issues which may have increased participants' levels of anxiety and self-consciousness during data collection thus, affecting their responses about depression and substance use.

4.2. Conclusion

The study results revealed that participants who had depression were significantly associated with a higher likelihood of substance use. Even when confounding variables of age, education level, marital status, time spent in Mbarara city, occupation and sex were added in the regression model, the odds of substance use among participants as a result of depression remained statistically significant. Therefore, it is concluded that irrespective of the demographic characteristics, substance use is largely a product of depression among refugees. We recommended that interventions that improve the socioeconomic characteristics of refugees living in cities be designed. We also recommended that clinical interventions focused on the treatment of depression among refugee communities should focus on substance use as well.

Ethical Approval and Consent to Participate

Approval to conduct the study was obtained from Mbarara University of Science and Technology Research Ethics Committee (MUST-REC 02/12-18). The study

was also registered with the Uganda National Council for Science and Technology (UNCST SS4922). Written informed consent was also obtained from all study participants.

Authors Contributions

FT & RB conceptualized the study, collected data and wrote the initial manuscript draft. Whereas JN analyzed the data. HB & JK supervised and guided the entire study. All authors revised the manuscript back and forth. Moreover, all authors approved the final version of the manuscript for publication submission.

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Availability of Data and Materials

The datasets generated and/or analyzed during the current study are not publicly available due to research ethics board restrictions but are available from the corresponding author on reasonable request.

Conflicts of Interest

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

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