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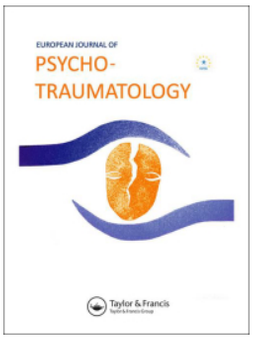

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BASIC RESEARCH ARTICLE

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Gender differences in substance use and associated factors among urban refugees in Uganda

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ABSTRACT

Background: Alcohol and other substances use related problems among refugees is a global public health concern. Although there is substantial research on the use of alcohol and other substances among the refugees, little is known about gender and other factors that might be associated with the use of alcohol and other substances. Our study aimed to assess the prevalence of alcohol and substance use across gender and other specific associated factors among urban refugees living in Mbarara city, Southwestern Uganda.

Methods: In a cross-sectional study, 343 refugees were interviewed on the use of alcohol and other substances using the Alcohol Use Disorder Identification Test and the Drug Abuse Screening Test. The associated factors included, age, marital status, occupation, duration (length of stay) in Uganda, educational levels, stigma and depression. Linear regression analysis was used to examine the associations between the predictor and outcome variables.

Results: No significant gender difference in alcohol use was found, and the overall prevalence of hazardous, harmful or dependent alcohol use among our sample of refugees living in Mbarara city was 43%. There were however, statistically significant gender differences in the use of other substances, with a significantly higher percentage of men than women reporting intermediate, substantial, or severe substance use (45% among men, 37% among women). Higher levels of depression and being separated from one's spouse were associated with higher levels of alcohol and substance use. In addition, higher age and being male were associated with the use of substances other than alcohol.

Conclusions: Our findings indicate a high prevalence of problematic alcohol and substance use among both male and female refugees. Clinical interventions focused on the treatment and prevention of alcohol and substance use among the refugee communities may benefit from focusing on depressive symptoms as well.

Diferencias de género en el usiko de substancias y factores asociados entre los refugiados en zonas urbanas de Uganda

Antecedentes: Los problemas relacionados con el uso de alcohol y otras sustancias entre los refugiados es un problema de salud pública mundial. Aunque existe sustantivas investigaciones en el uso de alcohol y otras sustancias entre los refugiados, se sabe poco sobre el género y otros factores que podrían asociarse con el uso de alcohol y otras sustancias. Nuestro estudio buscó evaluar la prevalencia del uso de alcohol y sustancias según el género y otros factores asociados específicos entre los refugiados que viven en zonas urbanas de la ciudad de Mbarara, en el Suroeste de Uganda.

Método: En un estudio transversal, 343 refugiados fueron entrevistados en el uso de alcohol y otras sustancias usando el Test de Identificación de los Trastornos por Consumo de Alcohol y la Prueba de Deteccion del Abuso de Drogas. Los factores asociados incluyeron, edad, estado civil, ocupación, duración (duración de la estadía) en Uganda, niveles educacionales, estigma y depresión. Se usaron análisis de regresiones lineales para examinar las asociaciones entre el predictor y las variables de resultado.

Resultados: No se encontraron diferencias de género significativas en el uso de alcohol, y la prevalencia general del consumo problemático, de riesgo o dependiente de alcohol en nuestra muestra de refugiados que vivían en la ciudad de Mbarara fue del 43%. Sin embargo, hubo diferencias de género significativas con el uso de otras sustancias, con un porcentaje significativamente más grande de hombres que mujeres que reportaron un uso de sustancias intermedio, sustancial o grave (45% entre hombres, 37% entre mujeres). Los niveles mas altos de depresión y la separacion del cónyuge se asociaron con niveles mas altos de consumo de alcohol y sustancias. Además, la mayor edad y el sexo masculino se asociaron con el consumo de sustancias distintas al alcohol.

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Alcohol; Substances; Urban Refugees; Uganda; Gender; Associated Factors

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Alcohol; Sustancias; Refugiados urbanos; Uganda

关键词
酒精，物质，城市难民，乌干达

HIGHLIGHTS

- Problematic use of alcohol and other substances was highly prevalent in both among male than female refugees.
- Problematic use of alcohol and other substances was associated with symptoms of depression.
- Interventions focused on the treatment of problematic use of alcohol and other substances may benefit from taking depressive symptoms into consideration.

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Conclusiones: Nuestros hallazgos indican una alta prevalencia de uso problemático de alcohol y sustancias entre hombres y mujeres refugiados. Intervenciones clínicas centradas en el tratamiento y la prevención del uso de alcohol y sustancias entre las comunidades de refugiados pueden beneficiarse si se centran también en los síntomas depresivos.

乌干达城市难民物质使用的性别差异及相关因素

背景：难民中酒精和其他物质使用相关的问题是一个全球公共卫生问题。尽管对难民中酒精和其他物质的使用情况进行了大量研究，但对性别和可能与酒精和其他物质使用有关的其他因素知之甚少。我们的研究旨在评估居住在乌干达西南部姆巴拉拉市的城市难民中不同性别的酒精和物质使用流行率以及其他特定相关因素。
方法：在一项横断面研究中，使用酒精使用障碍识别测试和药物滥用筛查测试对343名难民进行了关于酒精和其他物质使用情况的访谈。相关因素包括年龄、婚姻状况、职业、在乌干达的停留时间（居留时长）、教育水平、羞耻感和抑郁。使用线性回归分析考查预测变量和结果变量之间的关联。
结果：在酒精使用方面没有发现显著的性别差异，居住在姆巴拉拉市的难民样本中危险、有害或依赖酒精的总体流行率为 43%。 然而，其他物质的使用存在统计显著的性别差异，报告中度、大量或重度物质使用的男性比例显著高于女性（男性为 45%，女性为 37%）。较高水平的抑郁和与配偶分居与较高水平的酒精和物质使用有关。此外，年龄较大和男性与酒精以外的物质使用有关。
结论：我们的研究结果表明，男性和女性难民中酗酒和物质滥用普遍存在。专注于治疗和预防难民社区中酗酒和物质滥用的临床干预措施也可能受益于关注抑郁症状。

1. Background

Globally, alcohol and other substances use related problems are among the most significant causes of death and disability (Weaver & Roberts, 2010). Studies from high income countries (HICs) have documented close to 7% alcohol and other substance related deaths; with 6% among men and 1% among the women (Rehm et al., 2009). It is reasonable to believe that this is also a concern in low- and middle-income countries (LMIC). For example, studies of conflict and post conflict samples consistently show high prevalences of alcohol and other substance use (Horyniak et al., 2016; Weaver & Roberts, 2010).

Forcibly displaced men may be more susceptible to alcohol and substance use than forcibly displaced women. In line with this, a systematic review on harmful alcohol use among populations experiencing forced displacement showed gender as a risk factor for harmful alcohol use, with men drinking more and being more frequently diagnosed with harmful alcohol use than women (Weaver & Roberts, 2010). Similarly, a study of Lebanese refugee camps, found higher levels of substance use among men than among women (Abbas et al., 2021). Another study also indicated higher percentages of men identified within the risky categories of substance use (Ezard et al., 2012). In contrast, a study among the adolescent refugees in Sweden found that girls entering treatment appeared to have more problems related to substance use than boys (Anderberg & Dahlberg, 2018). Other studies have also found variations in the prevalence of alcohol and other substance use across gender (Kozarić-Kovacić et al., 2000; Puertas et al., 2006).

Although there is substantial research on the use of alcohol and other substances among the refugees, very little is known about the prevalence of these substances across gender and other associated factors among refugees (Kozarić-Kovacić et al., 2000). The use of alcohol and other substances could be due to underlying mental health problems related to refugee status or example stigma and discrimination (Horyniak et al., 2016; Im & George, 2022). Other findings indicate that refugees who struggle with overcoming acculturation challenges may get involved in alcohol and substance use in order to fit in the community (Ssebunnya et al., 2020). The use of alcohol and other substances has also been considered a coping mechanism for dealing with stress (Amaro et al., 2021).

In line with this, depression has been documented to be correlated with alcohol and substance use among the displaced population (Horyniak et al., 2016). Furthermore, a qualitative study that explored mental health and psycho social problems among the refugees living in Uganda and Rwanda found high existence of alcohol and substance use (Chiumento et al., 2020). Other factors that have been shown to correlate with substance use among refugee populations include demographic characteristics such as age, marital status, socio economic status, and education (Greene et al., 2019).

Little is known about the relationship between gender differences, alcohol and substance use among the refugee population generally in Africa and Uganda in particular. Our study aimed to determine prevalence of alcohol and substance use and the associated factors among urban refugees in Mbarara city southwestern Uganda. We aimed at answering the following questions (a). What is the prevalence of alcohol and substance use among the refugees living in Mbarara City, and are there gender differences in problematic

use of alcohol and other substances? (b). What are the factors associated with alcohol and substance use among the refugees living in Mbarara city?

2. Methods

2.1. Study settings

The study was conducted in Mbarara City, the third largest urban centre in Uganda after Kampala and Kira with a population of 419,000 people (UBOS, 2020). The city is the most important business hub in western Uganda. In addition, the city is a route for most refugees fleeing violence in Democratic Republic of Congo and Burundi. The city neighbours Isingiro district, where most refugees are resettled in either Oruchinga or Nakivale refugee settlements. Although the actual number of refugees living in the city is unknown to the Prime Minister's Office and UNHCR, it is estimated that the city is home to about 3,500 refugees, mostly from DRC, Rwanda, Burundi and Somalia as well as a few from South Sudan (UNHCR & OPM, 2020).

2.2. Study design, population and sample size

We conducted a descriptive cross-sectional study among 343 refugees residing in Mbarara City between the months of May 2019 and March 2020. Using snowball sampling technique, the first subjects recruited into the sample group provided several recommendations to potential other participants. Each new recommendation was evaluated as to whether it would meet the selection criteria. This process was repeated several times until the study sample size was reached. This technique was preferred because the subjects of the present study were undocumented refugees and therefore no records profiling the subjects in question were available. Our study participants were refugees who had lived in Mbarara City for at least 12 months prior to the study and were aged 14 years and above. Eligible participants with severe psychological disorders and identifiable symptoms of substance intoxication were referred to specialized hospital for further management, and excluded from the study.

To determine the sample size of this study, we adopted Saunders et al. (2012) method of sample size determination which is

$$n = \frac{pqz^2}{e^2}$$

Where n = minimum sample size; p = population proportion with a given characteristic; z = standard normal deviate at the given confidence level; e = error margin at a confidence level of 95% (Saunders et al., 2012). Due to the fact that we did not access any published data on gender differences in substance use and the associated factors among urban refugees in Uganda or East Africa and Africa as a whole, the present study considered a 50% population proportion to determine the sample size as recommended by Saunders et al. (2012). Therefore, the sample size was calculated as follows; $p = 50\% = 0.50$, $q = 50\% = (1–0.50) = 0.50$, $e = \pm 5\% = 0.05$, $z = 1.96$,

$$n = \frac{1.96^2 \times 0.50 \times 0.50}{(0.05)^2} = 384$$

However, during data cleaning, we found that 41 of the instruments were incomplete and we discarded them from the analysis thus giving us a sample size of 343.

2.3. Procedure

After getting permission to conduct the study from all the necessary authorities, the researchers located the various urban refugee community leaders in Mbarara City to solicit for their help in conducting this study. With the help of the refugee leadership with in the city, the researchers identified a team of refugee interpreters who were bilingual or multilingual in English, Kiswahili, Kinyarwanda and any other languages spoken by the different refugee communities. These interpreters were trained in the concepts of stigma, depression and drug use to equip them to conduct research interviews with members of the refugee community. Participants were offered a small token of five thousand shillings (5,000Shs/ =) an equivalent of one and half United Stated Dollars (1.5USD) as compensation for their time taken to participate in the study. They were also encouraged to call or meet the project leaders if they had any further questions. Participants were assured that the interview would be kept confidential and that they were free to withdraw from the study at any time without adverse consequences. Before data collection was conducted all participants of age eighteen (18) and above consented to take part in the study in writing. Those that were below the age of eighteen assented to the study but their parents / guardian consented on their behalf.

3. Measures

3.1. Primary outcome variables

Our main outcome variables were; alcohol use and the use of other substances. The Alcohol Use Disorders Identification Test (AUDIT – 10) (Saunders et al., 1993). This scale assessed the prevalence of alcohol use problems 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 1 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 – 10 had a 0.98 Cronbach's alpha. Other substance related problems other than alcohol were assessed using; the Drug Abuse Screening Test (DAST – 20) (Fatemi et al., 2022). This tool is comprised of 20 questions relating to drug/substance use during the last twelve months. A No response 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 follows; a total score of 1–5 is interpreted as low, 6–10 is intermediate or moderate, 11–15 is substantial and 16–20 score is severe (Moussas et al., 2009). The instrument has been widely used in Canada and other parts of North America, Europe, Africa and the Middle East (Roberts et al., 2011). The DAST – 20 possessed 0.97 Cronbach's alpha in the present study.

3.2. Predictor variables

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.

Stigma: The Discrimination and Stigma Scale (DISC-12) was used to measure characteristics of stigma. To suit our sample, the DISC-12 was modified and the words 'mental health problems' were substituted with words 'refugee status'. Note that 'Discrimination and stigma occur when people are treated unfairly because they are seen as being different from other'. The scale measures unfair treatment of people because they are seen as different from others for any reason (Ye et al., 2016). Therefore, the substitution of words did not affect the validity of the scale. The internal reliability for the modified DISC −12 had Cronbach's α of 0.93. The scale consists of 34 items, and scores on a 4-point-Likert type scale from 0 (not at all), 1 (a little), 2 (moderately) and 3 (a lot).

Depression: This was assessed using Patient Health Questionnaire (Kroenke et al., 2010). 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 ('Test Review: Patient Health Questionnaire–9 [PHQ-9],' 2014). This tool has been found to have good diagnostic validity with comparable sensitivity and specificity for major depression in adult populations based on the DSM-5 criteria (Kroenke et al., 2010). The internal reliability for PHQ-9 is reported in clinical studies with a Cronbach's Alpha of 0.89. In this study, the internal reliability for the PHQ-9 had a Cronbach's of 0.91.

4. Data analysis

Data were analyzed using Statistical Product and Service Solutions (SPSS), originally Statistical Package for Social Sciences (SPSS), version 23. Descriptive statistics, chi-square and t-tests were used to assess gender differences in the prevalence in alcohol and other substance use related problems. Linear regression models were used to estimate the associations between the predictor variables associated with alcohol use and other substance use related problems.

5. Results

5.1. Participant characteristics

Of the 343 participants, 198 were males and 145 females, with a mean age of 28.3 (SD = 11.2) years and 29.5 (SD = 10.5) years for males and female respectively. Few of the participants [16 (5%)] had no formal education and most of them were not married [169 (49%)]. Majority of the participants were from the Democratic Republic of Congo (DRC) and Rwanda [109 (34%) and 109 (32%)] respectively, and very few [17 (5%)] were from South Sudan. The mean duration of stay for all participants in Mbarara city was 6.4 (SD = 4.01) years. Most of the participants [171 (50%)] reported that their source of income was casual labour (Table 1).

5.2. Gender differences in the prevalence of alcohol use and other substance related problems

The overall prevalence of hazardous, harmful or dependent alcohol use among our sample of refugees living in Mbarara city was 43%. Even though the percentages seem to indicate that more men (46%) than women (39%) experienced such problematic alcohol use, the difference did not reach significance ($X^2 = 1.35$, p-value = 0.718). See Table 1. Results revealed statistically significant gender differences in the use of other substances other than alcohol among our participants ($X^2 = 12.80$, p-value = 0.012). Higher percentages of men than women reported intermediate, substantial, or severe substance use (45% among men, 37% among women; $X^2 = 12.80$, p-value = 0.012). See Table 1.

5.3. Factors associated with alcohol and substance use related problems

To examine factors associated with alcohol use, we regressed gender, education level, marital status,

Table 1. Differences in demographic characteristics across genders.

Characteristic		Total		Males(N = 198)		Females(N = 145)		X^2	p-value
		n	%	n	%	n	%		
Education level	No formal	16	5	11	6	5	3	4.94	.176
	Primary	131	38	67	34	64	44		
	Secondary	167	49	100	51	67	46		
	Tertiary	29	8	20	10	9	6		
Nationality	DRC	117	34	58	29	59	41	13.16	.010
	Rwanda	109	32	62	31	47	32		
	South Sudanese	17	5	15	8	2	1		
	Somali	52	15	29	15	23	16		
	Burundi	48	14	34	17	14	10		
Marital Status	Never married	169	49	111	56	58	40	15.11	.001
	Currently Married	141	41	77	39	64	44		
	Separated	33	10	10	5	23	16		
Occupation	Business	29	8	16	8	13	9	2.29	.515
	Casual labourer	171	50	98	49	73	50		
	Professional	3	1	3	2	0	0		
	Dependent	140	41	81	41	59	41		
Alcohol Categories	Low Risk	197	57	109	55	88	61	1.35	.718
	Hazardous	62	18	37	19	25	17		
	Harmful	26	8	17	9	9	6		
	Dependent	58	17	35	18	23	16		
Substances Categories	None	167	49	86	43	81	56	12.80	.012
	Low	32	9	23	12	9	6		
	Intermediate	29	8	17	9	12	8		
	Substantial	85	25	48	24	37	26		
	Severe	29	8	24	12	5	3		
		Mean	SD	Mean	SD	Mean	SD		
Duration of stay in Mbarara city		6.40	4.01	6.30	4.13	6.54	3.84		.340
Age		28.8	11.0	28.3	11.2	29.5	10.6		.457
Alcohol, Total Score		8.28	10.46	8.67	10.53	7.76	10.38		.853
Other Substances, Total Score		5.51	6.34	6.21	6.61	4.55	5.85		.119
Stigma, Total Score		41.03	15.0	40.38	14.92	41.92	15.05		.348
Depression Symptoms, Total Score		15.30	5.43	15.20	5.18	15.43	5.43		.539

occupation, age, duration (length of stay in Mbarara city), stigma, and depression on alcohol use. The model explained 35% of the variation in alcohol use disorder (adjusted-$R^2 = 0.35$, F (13,327) = 13.7, $p < .001$). In this regression model, only depressive symptoms had a statistically significant positive association with alcohol use disorder symptoms severity (b = 0.70; 95% CI, 0.51–0.90, $p < .001$). Participants whose marital status was separated had a statistically significant negative association with alcohol use symptoms severity (b = −4.63; 95% CI, −8.76 to −0.51, p-value = 0.028) compared to those who were never married. (Table 2)

Similarly, to examine factors associated with substance use, we regressed gender, education level, marital status, occupation, age, duration (length of stay in Mbarara city), stigma, and depression on substance use. The results of the regression model explained 42% of the variance in the use of other substance (adjusted-$R^2 = 0.42$, F (7,327) = 19.9, $p < .001$). Our results showed a statistically significant positive association between symptoms of depression (b = 0.38; 95% CI, 0.27–0.49, p-value = <0.001), age (b = 0.12; 95% CI, 0.04–0.19, p-value = 0.003), and being male (b = 1.94; 95% CI, 0.85–3.03, p-value = <0.001), and the use substances other than alcohol respectively. Participants who were separated had a statistically significant negative association with the use of other substances (b = −2.95; 95% CI, −5.27 to −0.63 p-value = 0.013). Table 2.

6. Discussion

Our study aimed to determine gender differences in the prevalence of substances use and associated factors among urban African refugees living in Mbarara city southwestern Uganda. The study found no evidence of gender difference in alcohol use among our participants. We argue that since alcohol use is a generally accepted behaviour 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 traumatic experiences, comorbid mental disorders, acculturation challenges, social and economic inequality (Johnson, 1996). However, our findings showed statistically significant gender differences in the use of other substances among our participants. This being in agreement with a study that screened females and males on their other substance use patterns which found higher percentages of men identified within the risky categories of substance use (Ezard et al., 2012). The above findings are also similar to a previous study that found high levels of use of

Table 2. Factors associated with alcohol use and substance related problems.

	Alcohol Use				Other Substances Use			
			95% CI				95% CI	
Factors associated	b	*p*	Lower	Upper	b	*p*	Lower	Upper
Gender (Male)	1.09	.269	−0.85	3.02	1.94	.001	0.85	3.03
Education Level								
No Education	Ref				Ref			
Primary	3.9	.102	−0.78	8.55	1.73	.197	−0.90	4.35
Secondary	−1.47	.541	−6.20	3.25	−0.79	.56	−3.45	1.87
Tertiary	−2.56	.368	−8.15	3.03	0.32	.839	−2.82	3.47
Marital Status								
Never Married	Ref				Ref			
Currently Married	−1.75	.213	−4.52	1.01	1.40	.078	−0.16	2.95
Separated	−4.63	.028	−8.76	−0.51	−2.95	.013	−5.27	−0.63
Occupation								
Business	Ref				Ref			
Professional	4.39	.439	−6.76	15.54	−2.89	.366	−9.16	3.39
Dependent	−3.26	.089	−7.02	0.50	−0.75	.489	−2.86	1.37
Casual labour	0.90	.617	−2.65	4.46	1.06	.299	−0.94	3.06
Age	0.05	.445	−0.08	0.19	0.12	.003	0.04	0.19
Duration	0.01	.941	−0.24	0.26	−0.02	.78	−0.16	0.12
Stigma, Total Score	0.04	.302	−0.04	0.11	0.02	.438	−0.03	0.06
Depression, Total Score	0.70	<.001	0.51	0.90	0.38	<.001	0.27	0.49

Note. b = unstandardized regression weight, *p* = probability value, CI = confidence interval.

other substances among Lebanese refugee men compared to women (Abbas et al., 2021). We propose clinical interventions focused on the treatment and prevention of substance use among refugee communities.

Other than being male or female, in this study, various other factors such as depressive symptom severity, being separated, and age were significantly associated with substance use related problems. Refugees are at risk of undergoing depression, abuse, trauma, and substance use seems a convenient coping mechanism for them (Crapanzano et al., 2019). Boden and Fergusson (2011) also found a significant association between depressive symptoms and the use of alcohol and other substances (Boden & Fergusson, 2011). Our findings are 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 substance use (Salama et al., 2018). Furthermore, our findings support the works of other studies which found that older refugees were more likely to use substances and alcohol than young ones (Boden & Fergusson, 2011; Lo et al., 2017). A systematic review of qualitative research on substance use among refugees by Saleh and colleagues (2023) found that older refugees were at an increased risk for substance use as compared to young ones (Saleh et al., 2023).

The above findings are particularly significant given the detrimental physical and psychological effects of excessive alcohol and other substance use on refugees, especially those who live in conflict and post conflict areas (Abbas et al., 2021; Ezard et al., 2012; Roberts et al., 2014). We believe it is important to close the scholarly gap, develop a public health strategy which lays the foundation for clinicians and policy makers to build interventions that reduce the use of substances among refugees. Future work, perhaps longitudinal studies, may focus on the interactions between targeted demographic factors and substance use to determine what predicts excessive substance use among refugee populations.

6.1. Limitations

Due to the cross-sectional nature of the design of our study and the limited sample size, the findings cannot be generalized to the majority of urban refugees. Our results do not establish a cause-and-effect relationship between gender and substance use, and therefore should be interpreted with caution. The findings of this study could have been affected by biases such as social desirability and recall challenges since responses were solely depended on participants' self-reports.

6.2. Conclusion

Our findings indicate that the use of alcohol and other substances among urban refugees is associated with the severity of symptoms of depression. Clinical interventions focused on the treatment and prevention of substance use among the refugee communities should focus on depressive symptoms as well. We propose further investigation into this phenomenon, to come up with interventions aimed at reducing substance use among refugees.

Abbreviations

DSM-5: Diagnostic and Statistical Manual of Mental Disorders Version 5; SUD: Substance Use Disorders;

UNHCR: United Nations High Commissioner for Refugees.

Ethics approval

Approval to conduct the study was obtained from Mbarara University of Science and Technology Research and Ethics Committee (MUST-REC 02/12 - 18). Further permission was sought from the Uganda National Council for Science and Technology (UNCST SS4922). Informed written consent was obtained from all study participants above the age of 18 years. Also written informed consent was obtained from parents or guardians for participants under the age of 18 years however these also provided written assents before data collection.

Authors contributions

BR, conceptualized the study, collected the data, analyzed the data and wrote the initial manuscript draft. CDS, GZR, and SA, supervised, guided the entire study and revised the manuscript back and forth. HEA participated in the conception of the study, supervised data analysis, and provided substantial revision of the manuscript. All authors read and approved the final manuscript for publication submission.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

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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.

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