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Original Article

Depression and Alcohol Use Behaviours among Primary and Secondary School Teachers in Mwanza, Tanzania; A Cross-Sectional Study

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Depression, Alcohol Use, Mental Health, Teachers, Mwanza, Tanzania.

ABSTRACT

Background: Depressive disorders and alcohol use disorders are highly prevalent in the workplace and have an enormously negative impact on work performance, productivity, absenteeism, and disability costs. Little is known about the burden among primary and secondary school teachers in Tanzania. **Method**: A cross-sectional study was conducted at Mwanza City in the Lake and Western zones of the United Republic of Tanzania aimed at determining the prevalence and factors associated with depression and alcohol use behaviours among teachers where primary and secondary school teachers from both private and public schools were involved. A total of 300 teachers were recruited and interviewed using Patient Health Questionnaire-9 (PHQ-9) and Alcohol Use Disorder Identification Test (AUDIT). A systematic sampling approach was used to select both schools and participants. **Results**: The mean age of the participants was 36.1 (SD = 8.465), the majority of the participants were from primary and public schools, 60.67% and 55.67%, respectively. Using cut-off points of four and eight for PHQ-9 and AUDIT, respectively, 51% of the participants had symptoms of depression, and 16% had harmful alcohol use. While the male gender, being married, having a low number of children, and degree level of education was statistically less likely to be associated with depression, on the other hand, male gender, age group of 41-50, being married and having a high number of children were statistically more likely to be associated with harmful alcohol use. **Limitations**: A cross-sectional study was used, which relies on self-report of symptoms which could lead to recall bias. Despite that, the study was done among both public and private primary and secondary school teachers from

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the largest city in the lake and western zone of Tanzania, which serves a diverse population still, and regional differences could be there. **Conclusion**: Depression and alcohol use disorders are high among a sample of our teachers in Mwanza Tanzania; further studies are needed to explore and measure the incidence, causal inference and the association between outcomes and risk factors.

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INTRODUCTION

There has been considerable interest recently in the relationship between depression, substance use and the workplace. This interest is driven by the growing recognition that depressive disorders and substance use are highly prevalent in the workplace and have an enormously negative impact on performance, productivity, absenteeism, and disability costs (1). Currently, depression is the fourth leading cause of disease burden, accounting for 4.4% of total Disability Adjusted Life Years (DALYs) and almost 12% of all total years lived with disability worldwide (2). Illicit drug use is an important contributor to the global burden of disease accounting for more than a quarter of a billion DALYs in 2015(3). Alcoholism is among the most common psychiatric disorders observed and alcohol abuse and dependence can produce serious temporary psychological symptoms including depression (4).

Globally, the total number of people with depression was estimated to exceed 300 million in 2015, with more than 80% of this non-fatal disease burden occurring in low- and middle-income countries (5). In Tanzania, the prevalence of 32.89% was observed in a study involving academicians and medical personnel in 2020 (6). Nearly one-third of patients with the major depressive disorder also have substance use disorders. This comorbidity complicates the presentation of major depressive disorder, yielding higher rates of suicide, greater social and personal impairments, as well as other psychiatric conditions (7).

Gender, age, marital relationship, number of children, level of education, interpersonal conflict with supervisors or co-workers; heavy work-loads; unfair treatment regarding pay, benefits, and promotions; and job insecurity have been associated with depression at the workplace (6, 8) while the increased level of work-related stressors, job demands and low job control were related to higher

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levels of drinking to cope with negative effect (9). The effects of depression and alcohol use at the workplace may undermine employee health, productivity, and safety (10). Furthermore, alcohol use disorders and depression are associated with decreased workplace productivity, absenteeism, increased episodes of disciplinary action (11), decreased job productivity and attendance, increased health care costs and escalations of domestic violence and violent crimes (12).

METHODOLOGY

Study Design and Settings

A cross-sectional study was conducted at Mwanza City in the Lake and Western zones of the United Republic of Tanzania, where primary and secondary school teachers from both private and public schools were involved.

Sample Size, Participants' Enrolment and Data Collection

The study population involved all primary and secondary school teachers from both private and public schools in Mwanza City. A minimum sample size of 107 participants was estimated from the Kish-Lisle formula of cross-sectional studies, assuming about 7.5% of teachers will have depression (13). A systematic sampling approach was used to select both schools and participants from January to April 2020. Teachers were approached at their respective staff offices and invited to participate. The aim of the study was explained and consent to participate was requested. After signing an informed consent, participants were asked to complete self-administered research questionnaires, which included sociodemographic data (gender, age, level of education, marital status, number of children, type of school, primary employer if private or public, time of employment and income). This was followed by both the Patient Health Questionnaire-9 (PHQ-9) and Alcohol Use Disorder Identification Test (AUDIT).

The PHQ-9 is a self-report 9-item scale, which has empirically demonstrated good reliability (Cronbach's $\alpha = 0.78$)(14). This scale has been extensively tested and widely accepted for global populations (15). The PHQ-9 scale has been used and tested in various African countries and translated into many languages, including Swahili (14, 16). The Alcohol Use Disorder Identification Test (AUDIT) is a self-report scale which has demonstrated good reliability (Cronbach's $\alpha = 0.89$) and has been extensively tested and widely accepted for global populations (17, 18). Data entry was done using Epi Info Software. Participants were serially enrolled until the sample size was reached. Those doing fieldwork or volunteering were excluded from the study. Those who scored moderate or high on PHQ-9 and/or AUDIT was referred to the PI of this study, who is a psychiatrist, for review, and if further clinical evaluation and intervention were needed, referral arrangements to Psychiatry and mental health department at Bugando medical centre were organised.

Data Analysis

Data were analysed using Stata Version 13 software for Windows, where categorical variables were summarised using frequencies and percentages and continuous variables were summarised using medians with IQR. Descriptive analysis was conducted to describe the sociodemographic characteristics, the prevalence and severity of depression and alcohol use which was the primary outcome in this study and participants were regarded to have depression if scored above 4 on the PHQ-9 (19) while a score of 8 and more on AUDIT was associated with harmful or hazardous drinking (20).

Logistic regression was used to calculate the odds ratio and 95% CI to assess the association between different factors and the outcome of interest while controlling for possible confounders. Variables in the univariate analysis were considered for inclusion in the final multivariable logistic model if they had a $p<0.2$ and the level of significance in the final model were set at $p<0.05$.

Ethics

Ethics approval to conduct and publish the findings from this study was given by the Catholic University of Health and Allied Sciences/Bugando Medical Centre Joint Ethical Committee with an ethical clearance certificate number CREC/1395/2019 and further permission to conduct

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this study was granted by city medical officer and head of school was informed. The client's identifiers were not used in the analysis to further maintain confidentiality.

RESULTS

Sociodemographic Characteristics

A total of 300 teachers were recruited for this study. The mean age of the participants was 36.1 (*SD* = 8.465) years, with minimum and maximum ages of 22 years and 70 years, respectively, of which 60.67% (*n* = 182) of the participants were from primary schools and 55.67% (*n* = 167) of the participants were from public schools. Detailed social demographic characteristics are presented in *Table 1* below.

Table 1: Social demographic characteristics of study participants

Variable		Frequency	Percentage
Gender	Female	156	52.00
	Male	144	48.00
Age(years)	18-30	85	28.33
	31-40	149	49.67
	41-50	45	15.00
	>50 years	21	7.00
Type of school	Primary	182	60.67
	Secondary	118	39.33
Employer	Public	167	55.67
	Private	133	44.33
Marital status	Married	215	71.67
	Single	85	28.33
Number of Children	None	57	19.00
	One child	78	26.00
	2-5 Children	141	47.00
	>5 children	24	8.00
Housing/Residency	Lives in the family house	6	2.00
	Staff quarters	10	3.33
	Own house	130	43.33
	Rented house	154	51.33
Education level	Certificate	72	24.00
	Diploma	75	25.00
	Degree	148	49.33
	Masters	5	1.67
Duration of employment	<1 year	26	8.67
	1-5 years	86	28.67
	6-10 years	82	27.33
	>10 years	106	35.33
Means of transport to work	Staff car	10	3.33
	Own	87	29.00
	Public	203	67.67

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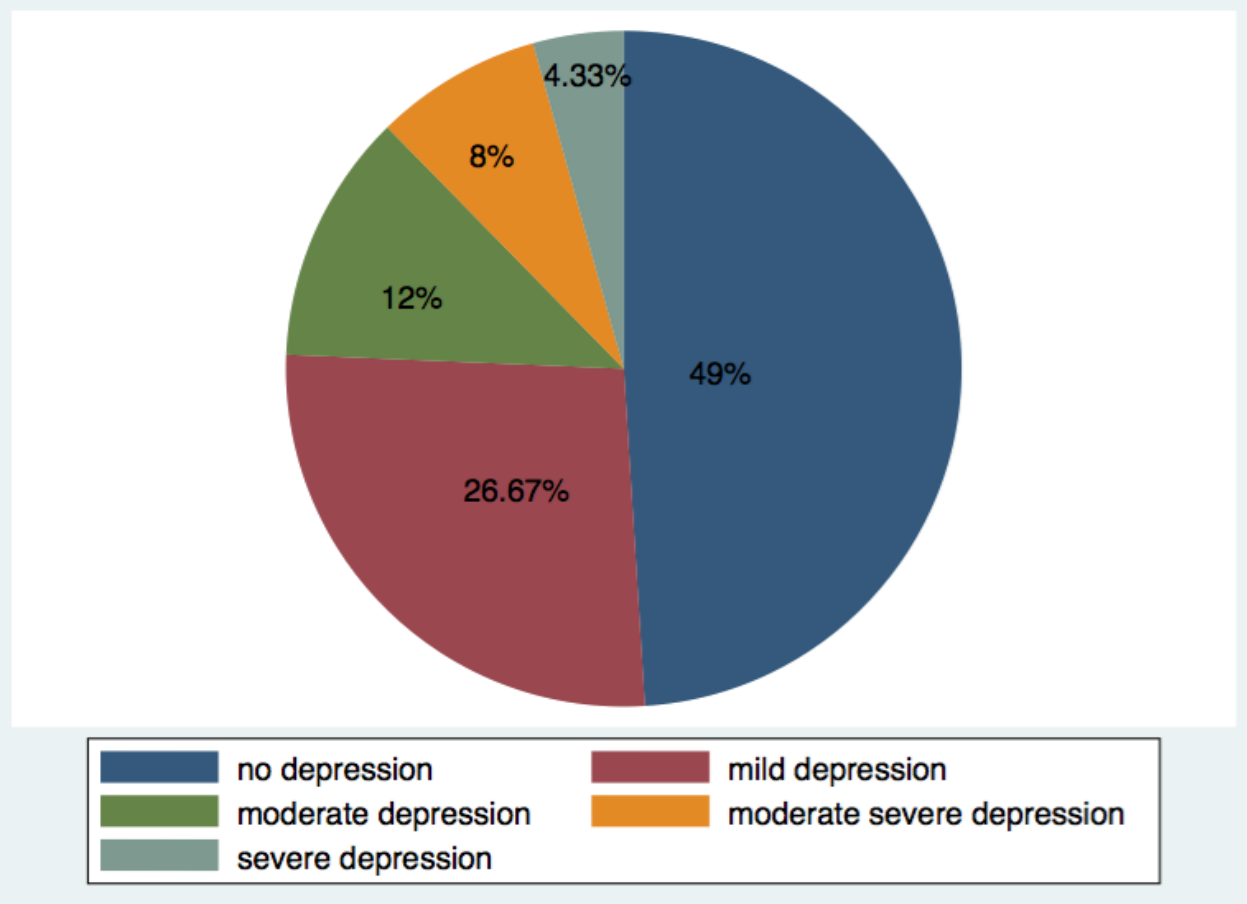
Prevalence of Depression and its Severity

Prevalence and severity of depression were classified using scores derived from the Patient Health Questionnaire-9 (PHQ-9). Out of the possible maximum score of 27, the 300 study participants had an average score of 6.5. The lowest score recorded in the sample was 0, and the highest score was 27. The prevalence of depression was found to be 51%, with 26.67%, 12.00%, 8% and 4.33% having mild depression, moderate depression, moderate-severe depression, and severe depression, respectively. *Figure 1* summarises the prevalence of depression among the study participants.

Figure 1: Prevalence of depression among the study participants



Association between Sociodemographic Characteristics and Depression

In an unadjusted model, number of children was significantly associated with depression. After adjusting for other covariates males were significantly less likely to develop depression (AOR 0.5, 95% CL: 0.2, 0.9, p-value 0.031) compared to females. Those who were married were significantly less likely to develop depression (AOR 0.4, 95% CL: 0.2, 0.9, p-value 0.029) compared to those who were single. Those having more than five children were significantly more likely to develop depression (AOR 6.9, 95% CL 1.5, 31.6, p-value 0.013) compared to those with no children. Those with a first-degree level of education were statistically more likely to develop depression (AOR 3.2, 95% CL: 1.3, 7.8, p-value 0.009) compared to those with a certificate level of education. Those who have been working for more than 10 years were statistically less likely to develop depression (AOR 0.2, 95% CL: 0.1, 0.9, p-value 0.040). *Table 2* summarises the association between sociodemographic characteristics and depression.

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Table 2: Association between sociodemographic characteristics and depression

Variable		Depression		Unadjusted estimates		Adjusted estimates	
		Yes (f, %)	No (f, %)	OR (95 CI)	p-value	OR (95% CI)	p-value
Gender	Female	81(51.92)	75(48.08)				
	Male	72(50.00)	72(50.00)	0.9(0.5-1.4)	0.739	0.5(0.2-0.9)	0.031
Age (years)	18-30	42(49.41)	43(50.59)				
	31-40	79(53.02)	70(46.98)	1.1(0.6-1.9)	0.595	1.1(0.6-2.1)	0.753
	41-50	25(55.56)	20(44.44)	1.2(0.6-2.6)	0.505	1.2(0.5-2.7)	0.599
	>50	14(66.67)	7(33.33)	0.5(0.1-1.3)	0.190	0.5(0.1-1.6)	0.290
Type of school	Primary	93(51.10)	89(48.90)				
	Secondary	60(50.85)	58(49.15)	0.9(0.6-1.5)	0.966	0.8(0.5-1.4)	0.644
Employer	Public	67(50.38)	66(49.62)				
	Private	86(51.50)	81(48.50)	1.1(0.6-1.6)	0.847	1.0(0.6-1.4)	0.805
Marital status	Single	44(51.76)	41(48.24)				
	Married	109(50.70)	106(49.30)	0.9(0.5-1.6)	0.868	0.4(0.2-0.9)	0.029
Number of Children	None	35(61.40)	22(38.60)				
	One child	45(57.69)	33(42.31)	0.8(0.4-1.7)	0.665	3.2(1.1-8.8)	0.021
	2-5 Children	61(43.26)	80(56.74)	0.4(0.2-0.8)	0.022	2.3(0.7-6.7)	0.126
	>5 children	12(50.00)	12(50.00)	0.6(0.2-1.6)	0.344	6.9(1.5-31.6)	0.013
House or Residency	Lives in the family house	1(16.67)	5(83.33)				
	Staff quarters	6(60.00)	4(40.00	7.4(0.6-90.6)	0.113	1.7(0.1-23.7)	0.668
	Own house	67(51.54)	63(48.46)	5.3(0.6-46.7)	0.132	0.8(0.0-7.5)	0.893
	Rented house	79(51.30)	75(48.70)	5.2(0.6-46.13)	0.133	1.3(0.1-10.9)	0.793
Education level	Certificate	39(54.17)	33(45.83)				
	Diploma	43(57.33)	32(42.67)	1.1(0.5-2.1)	0.699	1.6(0.7-3.5)	0.519
	Degree	69(46.62)	79(53.38	0.7(0.4-1.3)	0.294	3.2(1.3-7.8)	0.009
	Masters	2(40.00)	3(60.00)	0.5(0.0-3.5	0.544	0.6(0.4-49.3)	0.714
Duration of employment	<1 year	10(38.46)	16(61.54)				
	1-5 years	41(47.67)	45(52.33)	1.4(0.5-3.5)	0.410	0.4(0.1-1.2)	0.120
	6-10 years	53(64.63)	29(35.37)	2.9(1.1-7.2)	0.021	0.4(0.1-1.7)	0.265
	>10 years	49(46.23)	57(53.77)	1.3(0.5-3.3)	0.476	0.2(0.0-0.9)	0.040
Means of transport to work	Staff car	5(50.00)	5(50.00)				
	Own	44(50.57)	43(49.43)	1.1(0.2-3.7)	0.973	1.5(0.3-8.2)	0.581
	Public	104(51.23)	99(48.77)	0.2(0.2-3.7)	0.939	1.4(0.3-6.2)	0.594

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Table 3: Association between sociodemographic characteristics and alcohol use behaviours

Variable		Alcohol use behaviour		Unadjusted estimates		Adjusted estimates	
		Harmful use	Normal use	OR (95% CI)	p-value	OR (95% CI)	p-value
Gender	Female	26(16.67)	130(83.33)				
	Male	22(15.28)	122(84.72)	2.2(1.2-4.3)	0.014	2.4 (1.2-4.5)	0.011
Age (years)	18-30	13(15.29)	72(84.71)				
	31-40	26(17.45)	123(82.55)	1.1(0.5-2.4)	0.671	2.1(0.6-6.4)	0.207
	41-50	6(13.33)	39(86.67)	7.2(2.4-21.7)	0.000	5.1(1.4-17.9)	0.012
	>50	3(14.29)	18(85.71)	0.9(0.2-3.5)	0.908	5.1(1.1-22.3)	0.033
Type of school	Primary	30(16.48)	152(83.52)				
	Secondary	18(15.25)	100(84.75)	0.9(0.4-1.7)	0.777	0.7(0.3-1.6)	0.522
Employer	Public	20(15.04)	113(84.96)				
	Private	28(16.77)	139(83.23)	1.1(0.6-2.1)	0.685	0.8(0.6-1.7)	0.731
Marital status	Single	17(20.00)	68(80.00)				
	Married	31(14.42)	184(85.58)	0.6(0.3-1.2)	0.237	0.5(0.2-1.3)	0.187
Number of Children	None	7(12.28)	50(87.72)				
	One child	15(19.23)	63(80.77)	1.7(0.6-4.4)	0.284	1.5(0.4-5.4)	0.502
	2-5 Children	24(17.02)	117(82.98)	1.4(0.5-3.6)	0.408	3.5(1.2-10.6)	0.027
	>5 children	2(8.33)	22(91.67)	7.9(2.1-29.5)	0.002	7.7(2.1-28.9)	0.003
House or Residency	Live is family house	0(0.00)	6(100.00)	1			
	Staff quarters	2(20.00)	8(80.00)	1.3(0.2-6.7)	0.712	0.8(0.0-7.5)	0.893
	Own house	22(16.92)	108(83.08)	1.1(0.5-2.1)	0.58	1.3(0.1-10.9	0.793
	Rented house	24(15.58)	130(84.42)	1			
Education level	Certificate	11(15.28)	61(84.72)				
	Diploma	13(17.33)	62(82.67)	0.3(0.1-0.9)	0.036	1.3(0.1-1.1)	0.068
	Degree	24(16.22)	124(83.78)	1.1(0.4-2.3)	0.493	3.2(1.3-7.8)	0.009
	Masters	0(00.00)	5(100.00)	1			
Duration of employment	<1 year	4(15.38)	22(84.62)				
	1-4 years	9(10.47)	77(89.53)	0.6(0.2-2.2)	0.495	0.3(0.1-0.9)	0.031
	5-10 years	20(24.39)	62(75.61)	1.7(0.5-5.7)	0.340	0.4(0.1-1.7)	0.265
	>10 years	15(14.15)	91(85.85)	0.9(0.2-3.0)	0.877	0.2(0.0-0.9)	0.040
Means of transport to work	Staff car	2(20.00)	8(80.00)				
	Own	15(17.24)	72(82.76)	0.8(0.1-4.3)	0.828	1.5(0.3-8.2)	0.581
	Public	31(15.27)	172(84.73)	0.7(0.1-3.5)	0.688	1.4(0.3-6.2)	0.594

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Prevalence and Pattern of Alcohol Use

The mean AUDIT score (± SD) was 2.9 ± 5.9 (range = 0–34); and 32% (n = 96) were drinking. The prevalence of harmful alcohol use, using a cut-off of 8 on the AUDIT in the total population, was 16% (n = 48). The pattern of drinking and problems elicited by the AUDIT are shown in *Table 4*.

Table 4: patterns of alcohol use behaviours

Selected AUDIT item	f	%
Drinks at least three drinks on a typical day	45	15
Drinks six or more drinks on one occasion at least once a week	17	5.67
Unable to stop drinking once started at least once a month	11	3.67
Failed to do what was normally expected because of drinking at least monthly	24	8
Needed an early morning drink at least once a week	6	2
Been injured/injured someone else during the past year	11	3.67
Friend/relative/doctor concerned or suggested cutting down drinking in the past year	16	5.33

Association between Sociodemographic Characteristics and Alcohol Use Behaviours

In an unadjusted model, gender, age, number of children and educational level were significantly associated with alcohol use behaviours.

After adjusting for other covariates, males were significantly more likely to be involved in harmful alcohol use behaviour (AOR 2.4, 95% CL: 1.2, 4.5, p-value 0.011) compared to females. Those who were aged 41-50 years were significantly more likely to be involved in harmful alcohol use behaviour (AOR 5.1, 95% CL: 1.4, 17.9, p-value 0.012). Those having more than five children were significantly more likely to be involved in harmful alcohol use behaviour (AOR 7.7, 95%CL 2.1, 28.9, p-value 0.003) compared to those with no children. Those with a first-degree level of education were statistically more likely to be involved in harmful alcohol use behaviour (AOR 3.2, 95% CL: 1.3, 7.8, p-value 0.009) compared to those with a certificate level of education. Those who have been working for more than 10 years were statistically less likely to be involved in harmful alcohol use behaviour (AOR O.2, 95% CL: 0.0, 0.9, p-value 0.040). *Table 3* summarised the association between sociodemographic characteristics and alcohol use behaviour.

Association between Alcohol Use Behaviour and Depression

In associating alcohol use behaviour and depression, there was a significant association between harmful alcohol uses and depression, with those with harmful alcohol use more likely to develop depression (OR 2.9, 95% CL: 1.7, 6.5, p-value 0.006).

Table 5: Association between alcohol use behaviour and depression

Variable	Depression		Unadjusted estimates		Adjusted estimates	
	Yes (N %)	No (N %)	OR (95CI)	p-value	OR (95%CI)	p-value
Ever used Alcohol drink						
Never	94(46.08)	110(53.92)				
Monthly or less	21(65.63)	11(34.38)	2.2(1.1-4.8)	0.043	2.1 (1.9-3.7)	0.047
2-4 times a month	19(57.58)	14(42.42)	1.5(0.7-3.3)	0.223	0 .8(0.3-2.3)	0.752
2-3 times a week	13(59.09)	9(40.91)	1.6(0.6-4.1)	0.249	0.8(0.1-4.4)	0.878
4 or more times a week	6(66.67)	3(33.33)	2.3(0.5-9.6)	0.238	1.1(0.1-7.3)	0.889
Harmful alcohol use						
Normal use	120(47.62)	132(52.38)				

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Harmful use	33(68.75)	15(31.25)	2.42(1.3-4.6)	0.009	2.9(1.7-6.5)	0.006

DISCUSSION

Major depressive disorder and alcohol use disorders are highly prevalent in the general population, often co-occurring within the same individual, and the course of each seems to be complicated by the other (21). The association between alcohol use and depression is likely to be attributable to causal factors rather than a shared aetiology underlying both disorders (22).

Depression continues to be an alarming concern in the teaching profession in developing countries. In this study, a high prevalence of 51% was found among primary and secondary school teachers compared to the prevalence of 32.89% found among university academics in a similar study in Tanzania in 2020 (6). Low prevalence has also been reported in developed countries (23). In this study, females were more likely to develop depression when compared to males, a finding which has also been reported in other studies in sub-Saharan Africa (24, 25) and globally (8, 26, 27). In contrast, men may have some expressions of depression that are overlooked or not present in the clinical context justifying potentially the low prevalence of depression (28). The size of a family has been reported to be associated with depression, as was observed in this study and other study findings (29), where those with more than five children were more likely to develop depression.

Substance and illicit drug use in Tanzania continue to be a growing public health problem. In this study, about 32% were currently using alcohol, with 16% having harmful/hazardous alcohol use behaviour. This prevalence was higher than the prevalence rate of 17.2% for current alcohol use and 5.7% for hazardous alcohol use found in previous study settings in urban Tanzania (30). The findings from our current study are low compared to global statistics on alcohol, tobacco and illicit drug use, whereby in 2017, the global prevalence of heavy alcohol use among the adult population was 18.4% (3).

Major depressive disorder and comorbidity substance use continue to be an alarming concern as observed in this study and other previous studies, where nearly one-third of patients with the major depressive disorder also have substance use disorders, and the comorbidity complicates the presentation of each other, yields higher risk of suicide and greater social and personal impairment as well as other psychiatric conditions (7, 26). While the female gender predicted higher scores for depression, the male gender predicted higher scores on hazardous alcohol use (31).

Education, type of employment, working period at the present workplace, work time and job demand have been associated with work-related depression and alcohol use behaviours in previous studies (32) and our study. In this study, the higher the education level and those who have been working for more than ten years were more likely to get depression and become involved in alcohol use behaviours.

Limitations: A cross-sectional study was used, which relies on self-report of symptoms which could lead to recall bias. Despite that, the study was done among both public and private primary and secondary school teachers from the largest city in the lake and western zone of Tanzania, which serves a diverse population still, and regional differences could be there.

CONCLUSION

Depression and alcohol use disorders are high among a sample of our teachers in Mwanza, Tanzania, further studies are needed to explore and measure the incidence, causal inference and the association between outcomes and risk factors.

Conflict of interest

The authors declare no conflict of interest

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