

Problematic alcohol consumption, knowledge of recommended drinking limits, drinks, and health risks among future health professionals in Ifakara, Morogoro region, Tanzania

Theophilus Gbednet Kureh¹, Jacqueline Liseki², Witness Lubomba¹, Ebenezer Abimbola Morolahun³, and Jacqueline Mkisa Frugence⁴

¹Department of Internal Medicine and Clinical Pharmacology, St. Francis University College of Health and Allied Sciences, P. O. Box 175, Ifakara, Tanzania.

²Department of Microbiology and Parasitology, St. Francis University College of Health and Allied Sciences, P. O. Box 175, Ifakara, Tanzania.

³Department of Physiology, St. Francis University College of Health and Allied Sciences, P. O. Box 175, Ifakara, Tanzania.

⁴Tanzania Medicines and Medical Device Agency, P.O. Box 77150, Dar es Salaam, Tanzania.

Abstract

Aims: This study was conducted to determine the prevalence of reported current drinking and alcohol use disorder (AUD), level of knowledge of recommended drinking limits, knowledge of number of standard drinks in alcoholic beverages, and health risks associated with alcohol consumption among health and allied sciences students in the town of Ifakara in the Morogoro region of Tanzania.

Design: This study was a cross-sectional survey conducted between June and October 2020 among 372 health and allied sciences students. Participants were selected from three institutions using stratified random sampling. The Alcohol Use Disorders Identification Test (AUDIT) was used to screen for unhealthy alcohol use. Results are presented by descriptive statistics, and chi-square (χ^2) test for associations of drinking prevalence and logistic regression was used to estimate odds ratios (OR) and 95% confidence interval (CI) for alcohol use disorder among participants.

Results: The prevalence of reported current alcohol consumption was 39.2%, with males accounting for a higher prevalence among drinkers (63.7%). Participants aged 21–25 years accounted for the highest prevalence (65.8% of drinkers). There were associations between drinking and gender ($p = 0.002$), study institution ($p < 0.001$) and course of study ($p < 0.001$). Ever drinkers ($n = 156$) were 41.8% of respondents. The median age of first consumption was 20.0 years (*IQR*: 17–22). Prevalence of AUD (AUDIT score eight or greater) was 16.4% ($n = 73$) of the total sample. Women were significantly less likely than men to report AUD ($OR = 0.22$, 95% CI (0.11–0.47), $p < 0.001$). Over 60% of participants were not aware of the number of standard drinks in commonly sold alcoholic beverages in Tanzania.

Conclusions: There is a high prevalence of alcohol consumption and AUD among the medical and allied health sciences students assessed relative to students in other African countries. There is also inadequate knowledge of standard drinks and recommended drinking limits.

Introduction

Alcohol consumption is one of the leading preventable causes of death globally (Chrystoja et al., 2021). A 2020 World Health Organization (WHO) report estimates that alcohol-related deaths accounted for 13.5% deaths of people aged 20–39 and 5.3% of global deaths (WHO, 2018). Alcohol Use Disorder (AUD) is defined as problematic, hazardous or risky alcohol use within 12 months characterized by long drinking periods, dependence, withdrawal symptoms, and continuation of use even when it

causes problems to social life or harm to physical or psychological health. It is also defined by the National Institute of Alcohol Abuse and Alcoholism as an Alcohol Use Disorder Identification Test (AUDIT) score of eight or more (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2021). The prevalence of AUD is estimated to be 3% in Africa and 4% globally (WHO, 2018) and is associated with harmful consequences including intentional and unintentional injuries, decreased productivity, domestic alcohol-related violence, and unemployment (Cherpitel et al., 2012; Kendler et al., 2017), resulting in huge global losses in billions of dollars (Witkiewitz et al., 2019). AUD

has also been associated with liver disease (Donohue et al., 2017), cardiovascular disorders (Kozela et al., 2020), and bowel and breast cancers (Coronado et al., 2011; Liu et al., 2015; McCarty et al., 2012; Seitz et al., 2012).

In developed countries, alcohol use can begin as early as age 13 (Arnaud et al., 2012; Bellis et al., 2009; Gore et al., 2011; Swahn, Bossarte, Ashby, et al., 2010). Studies in North America, Europe, and sub-Saharan Africa reveal that risk factors associated with excessive alcohol use among young people include peer pressure, family history of alcohol abuse, male gender, poor social skills, unemployment, and increased availability of alcohol (Gowin et al., 2017; Howell et al., 2010; Nadkarni et al., 2022). A study in East Africa revealed that there is an increase in alcohol consumption among young people aged 15–24 years comprising mainly secondary school and college students and sex workers (Francis et al., 2014). Excessive alcohol use among university students is reported to be common in developing countries such as Nigeria and Ethiopia, and in developed countries such as Germany and China, with higher rates generally reported among students from developed countries (Ajayi et al., 2019; Chu et al., 2016; Mekonen et al., 2017). Previous studies among university and college students in the United States and the United Kingdom reported higher drinking rates among medical students compared to other university and college students (Gajda et al., 2021; Kurpas et al., 2012). Excessive drinking and substance use among medical students has been linked with efforts at reducing stress generally associated with the academic pressure and burnout in medical school (Bogowicz et al., 2018; Talih et al., 2018). Furthermore, previous findings from studies in the United States and Australia have also revealed that many university students have a poor knowledge of standard drinks and recommended drinking limits (Brunk et al., 2020; Corney & du Plessis, 2022).

Globally, members of the public rely on health professionals for information and advice on beneficial and health-modifying lifestyles. A current approach aimed at reducing alcohol-related harm and risks involves not only treating individuals who engage in hazardous drinking and are seeking help, but also targeting individuals who may be at risk as identified by healthcare professionals (Abidi et al., 2020; Karlsson et al., 2021). However, fewer successes have been recorded with the latter approach as studies have shown that healthcare workers report being poorly trained in identifying these individuals at risk (Nilsen, 2010).

While studies on the prevalence of alcohol consumption and AUD have been conducted in Tanzania (Francis et al., 2015; Mbatia et al., 2009; Mundenga et al., 2019), not much is known about the prevalence of drinking and AUD among students in the health and allied sciences, their level of knowledge about recommended standard drinks in alcoholic beverages, and health risks associated with hazardous drinking. It is generally expected that as these students are well aware of the risks associated with alcohol consumption and recommended drinking limits from their knowledge and training, the prevalence of drinking among them will be lower. This research was conducted to assess the prevalence of reported current drinking and AUD, the level of knowledge of recommended drinking limits, standard drinks

in alcoholic beverages, and health risks associated with alcohol consumption among these future healthcare professionals. Findings from this study will expose knowledge gaps and risky alcohol consumption behavior, as well as provide a basis for the design and inclusion of robust training for future healthcare professionals in implementing interventions for AUD and public health advocacy to control alcohol related morbidity and mortality in Tanzania.

Method

Study Design and Setting

This study was a cross-sectional survey conducted between June and October 2020 among health and allied sciences students studying in three institutions in the town of Ifakara in the Kilombero district, Morogoro region of Tanzania. The institutions included St. Francis University College of Health and Allied Sciences (SFUCHAS), offering a Doctor of Medicine degree, Diploma and Certificate in Pharmaceutical Science and a Diploma and Certificate in Medical Laboratory Sciences; the Tanzanian Training Centre for International Health (TTCIH), offering a Diploma and Certificate in Clinical Medicine; and the Edgar Maranta School of Nursing (EMSN), offering a Diploma and Certificate in Nursing. At the time of this study, the estimated total number of students in the three institutions was 1030. SFUCHAS had approximately 380 students, TTCIH had 300 students and EMSN had 350 students.

Sample Size and Sampling Procedures

The sample size was calculated based on an estimated prevalence of 30% alcohol use from literature, with a 95% confidence level and 5% precision. The calculated sample size was 230 and assuming a 40% non-response rate, an estimated representative sample size of 322 was obtained. A total of 420 questionnaires were issued to the study participants; 397 were returned, of which 25 were rejected due to a high volume of missing information (mainly demographic information), leaving 372 questionnaires for data entry and further analysis. Participants were selected from the aforementioned study institutions using stratified random sampling. Distribution of questionnaires took into consideration the number of programs offered by each institution. A total of 280 questionnaires were distributed to participants in SFUCHAS, which offers three of the five programs assessed; while 65 and 75 questionnaires were distributed to participants in TTCIH and EMSN respectively as each institution offered one program each. In each institution, questionnaires were distributed to participants across all years of study. Participants in each year of study were selected using simple random sampling. The questionnaire was designed based on review of the literature and its content was validated by lecturers in the Department of Internal Medicine and Clinical Pharmacology of SFUCHAS and pretested among 18 students of SFUCHAS. Data collection was done by members of the research team.

The questionnaire was divided into three sections. Section A contained demographic information including gender, course of study, level of study, year of study, and accommodation. Section B contained questions about

participants' alcohol consumption, whether or not they had ever consumed alcohol (ever-drinkers) and if they had done so within the last year (current drinkers). If current drinkers, participants were asked to answer the 10-question AUDIT (Babor et al., 2001) screening (added to Section B) for information about their drinking patterns and the subsequent calculation of their AUDIT score. Participants who had never consumed alcohol, or had not done so in the past year were asked to skip the AUDIT section of the questionnaire. Section C questions tested participants' knowledge about recommended alcohol consumption limits and the number of standard drinks contained in common alcoholic beverages (beers, lagers, wines and spirits, in each case with an example of commonly consumed brands in Tanzania). Questions about health risks associated with alcohol consumption were also asked in this section. The questionnaire contained mainly closed-ended questions and a few open-ended questions.

Data Analysis

The responses on the questionnaire were coded in SPSS version 20 and analyzed to generate descriptive statistics and results presented as median, interquartile range, figures and percentages. The coded independent variables included: gender (male = 1; female = 2), age (15–20 = 1; 21–25 = 2; 26–30 = 3; 31–35 = 4; 36 and older = 5), type of accommodation (hostel = 1, off-campus = 2), year of study (year 1 = 1; year 2 = 2; year 3 = 3; year 4 = 4; year 5 = 5); level of study (bachelor = 1; diploma/certificate = 2); institution (SFUCHAS = 1; TTCIH = 2, EMSN = 3); course

of study (Doctor of Medicine = 1; Pharmaceutical Sciences = 2; Medical Laboratory Sciences = 3, Nursing = 4; Clinical Medicine = 5); and age of first alcohol consumption (continuous). Other variables such as current consumption, reasons for alcohol consumption and alcohol consumption characteristics were also coded. AUDIT scores for each reported current drinker were calculated and recorded (continuous). Reported current drinkers with an AUDIT score of eight or more were categorized as 'AUD positive' (coded 1) while those with AUDIT score equal to seven or less were categorized as 'AUD negative' (coded 2). AUDIT scores were again sub-categorized (auditscreen.org, 2015) as low risk (range 0–7) coded 1, hazardous or harmful (range 8–14) coded 2, and likely dependence (range 15 and above) coded 3. Non-drinkers did not answer the AUDIT questions but were included in the denominators to produce AUD estimates among the total sample. A chi-square (χ^2) test was used to test associations of drinking prevalence among demographic groups. Binary logistic regression was performed and odds ratios (OR), with relative confidence intervals (CI) at 95% were obtained to determine associations with AUD with statistical significance (p-value) set at less than or equal to 0.05. Open-ended questions such as age of first alcohol consumption were analyzed using descriptive statistics such as median and interquartile range, while others such as recommended standard drinks per week were categorized into range and presented as bar charts. Bar charts were generated using Microsoft Excel.

Results

Table 1

Demographic Characteristics and Prevalence of Current Drinking and Alcohol Use Disorder

Variables	Categories	Frequency n (%)	Prevalence of Reported Current Drinking n (%)	p-value (χ^2)	AUD Prevalence n(%)	OR (95%CI) (AUD)
Gender	Male	199 (53.5)	93 (46.7)	0.002**	47 (23.6)	1.00 (Ref)
	Female	173 (46.5)	53 (30.6)		14 (8.1)	0.22*** (0.11-0.47)
Age	15-20	71 (19.1)	22 (30.0)	0.093	11 (15.5)	1.00 (Ref)
	21-25	249 (66.9)	96 (38.6)		38 (15.3)	1.38 (0.58-3.32)
	26-30	31 (8.3)	15 (48.4)		9 (29.0)	3.56 (1.02-12.23)
	31-35	12 (3.2)	8 (66.7)		2 (16.7)	1.82 (0.28-12.08)
	36 and above	9 (2.4)	5 (55.6)		1 (11.1)	1.52 (0.15-16.03)
Accommodation	Hostel	122 (32.8)	51 (38.0)	0.499	31 (25.4)	1.00 (Ref)
	Off-campus	250 (67.2)	95 (41.8)		30 (12.0)	0.24 (0.10-0.58)
Year of Study	First year	18 (4.8)	7 (38.9)	0.555	5 (27.8)	1.00 (Ref)
	Second year	58 (15.6)	19 (32.8)		10 (17.2)	0.77 (0.19-3.08)
	Third year	160 (43.0)	61 (38.1)		29 (18.1)	2.05 (0.55-7.68)
	Fifth year	136 (36.6)	59 (43.4)		17 (12.5)	1.01 (0.20-5.28)
Study Level	Bachelor	136 (36.6)	59 (43.4)	0.227	17 (12.5)	1.00 (Ref)
	Dip/Cert	236 (63.4)	86 (36.9)		44 (18.6)	1.60 (0.88-2.94)
Institution of Study	SFUCHAS	259 (69.6)	102(39.4)	<0.001***	33 (12.7)	1.00 (Ref)
	TTCIH	48 (12.9)	30 (62.5)		20 (41.7)	1.95 (0.58-6.73)
	EMSN	65 (17.5)	14 (21.5)		8 (12.3)	0.39 (0.11-1.42)
Course of Study	Doctor of Medicine	136 (36.6)	59 (43.4)	<0.001***	17 (20.5)	1.00 (Ref)
	Pharmaceutical sciences	80 (21.5)	31 (38.8)		8 (10.0)	0.56 (0.11-2.84)
	Medical Lab sciences	43 (11.6)	12 (27.9)		8 (18.6)	0.99 (0.19-5.14)
	Nursing	65 (17.5)	14 (21.5)		8 (12.3)	0.39 (0.08-1.96)
	Clinical Medicine	48 (12.9)	30 (62.5)		20 (41.7)	1.93 (0.44-8.50)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Socio-Demographic Characteristics of Participants and Prevalence of Reported Current Drinking

Table 1 shows that 53.5% of the 372 participants were males, while 46.5% were females. The prevalence of reported alcohol consumption was 39.2% with males showing higher prevalence (46.8%) compared to females (30.6%). Participants aged 26–30 years had the highest prevalence (48.4%) of alcohol consumption in the age category. There were associations between drinking and gender ($p = 0.002$), institution of study ($p < 0.001$) and course of study ($p < 0.001$). Ever-drinkers ($n=156$) consisted of 41.8% of respondents, and the median age of first consumption was 20.0 years (IQR: 17–22).

Prevalence and Odds Ratios for Alcohol Use Disorder

The prevalence of AUD (AUDIT score ≥ 8) was 16.4%, with women significantly less likely to report AUD compared to men (OR = 0.22, 95% CI (0.11 – 0.47), $p < 0.001$). There was a higher prevalence of AUD among students aged 26–30, students residing in hostels, study level of diploma/certificate and in those studying at TTCIH (Table 1).

AUDIT Score Ranking for Drinkers

Men showed higher rates of AUD than their female counterparts. Reported current drinkers ranked as low risk

(AUDIT score of 0–7) accounted for 58.2% of all reported current drinkers (31.5% males; 26.7% females), while 41.8% (32.2% males; 9.6% females) of all reported current drinkers had an AUD (AUDIT score ≥ 8 ; Figure 1).

Attitude and Pattern of Alcohol Use among Reported Current Drinkers

Table 2 shows that 37.5% of reported current drinkers said they started drinking because they felt like it, whereas 26% of drinkers cited peer pressure as the reason they started drinking. Over 80% of reported current drinkers said they felt they were healthy drinkers. Interestingly, 35.0% of reported current drinkers who felt they were healthy drinkers had an AUDIT score of eight or higher. The majority (55.6%) of reported current drinkers reported consuming alcohol once a month or less, followed by those who consumed alcohol two to four times a month (31.0%). The majority (55.9%) of reported current drinkers consumed one or two drinks containing alcohol, followed by 24.1% of current drinkers who consumed three or four drinks in a typical day. Interestingly 1.4% of reported current drinkers admitted to consuming 10 or more drinks in a typical day. Less than one percent (0.3%) of reported current drinkers consumed six or more drinks on one occasion while 1.3% did so weekly.

Table 2

Drinking Characteristics (Gender and Age)

Variables	Categories	Total n (%)	Gender n (%)		Age n (%)				
			Male	Female	15-20	20-25	26-30	31-35	36+
Why did you start drinking? <i>n</i> = 144	Peer pressure	38 (26.4)	25 (27.5)	13 (24.5)	7 (33.3)	26 (27.1)	2 (13.3)	2 (28.6)	1 (20.0)
	Curiosity	31 (21.5)	20 (22.0)	11 (20.8)	6 (28.6)	20 (20.8)	4 (26.7)	1 (14.3)	0 (0.0)
	I felt like it	54 (37.5)	35 (38.5)	19 (35.8)	5 (23.8)	40 (41.7)	4 (26.7)	2 (28.6)	3 (60.0)
	Adult's influence	21 (14.6)	11 (12.1)	10 (18.9)	3 (14.3)	10 (10.4)	5 (33.3)	2 (28.6)	1 (20.0)
Do you feel you are a healthy drinker? <i>n</i> = 145	Yes	117 (80.6)	80 (87.0)	37 (69.8)	16 (76.2)	77 (80.2)	13 (86.7)	8 (100)	3 (60.0)
	No	28 (19.4)	12 (13.0)	16 (30.2)	5 (23.8)	19 (19.8)	2 (13.3)	0 (0.0)	2 (40.0)
Frequency of alcohol consumption <i>n</i> = 145	Never	1 (0.7)	1 (1.1)	0 (0.0)	0 (0.0)	1 (1.1)	0 (0.0)	0 (0.0)	0 (0.0)
	Monthly or less	81 (55.9)	47 (50.5)	34 (65.4)	9 (40.9)	54 (56.8)	7 (46.7)	7 (87.5)	4 (80.0)
	2 to 4 times a month	45 (31.0)	30 (32.3)	15 (28.8)	11 (50.0)	27 (28.4)	5 (33.3)	1 (12.5)	1 (20.0)
	2 to 3 times a week	10 (6.8)	8 (8.6)	2 (3.8)	0 (0.0)	8 (8.4)	2 (13.3)	0 (0.0)	0 (0.0)
	4+ times a week	8 (5.5)	7 (7.5)	1 (1.9)	2 (9.1)	5 (5.3)	1 (6.7)	0 (0.0)	0 (0.0)
Drinks containing alcohol consumed in a typical day <i>n</i> = 145	1 or 2 drinks	81 (55.9)	47 (50.5)	34 (65.4)	15 (68.2)	53 (55.8)	5 (33.3)	5 (62.5)	3 (60.0)
	3 or 4 drinks	35 (24.1)	19 (20.4)	16 (30.8)	4 (18.2)	25 (26.3)	2 (13.3)	3 (37.5)	1 (20.0)
	5 or 6 drinks	22 (5.2)	22 (23.7)	0 (0.0)	2 (9.1)	11 (11.6)	8 (53.3)	0 (0.0)	1 (20.0)
	7,8 or 9 drinks	5 (3.4)	3 (3.2)	2 (3.8)	1 (4.5)	4 (4.2)	0 (0.0)	0 (0.0)	0 (0.0)
	10 or more drinks	2 (1.4)	2 (2.2)	0 (0.0)	0 (0.0)	2 (2.1)	0 (0.0)	0 (0.0)	0 (0.0)
Consume six or more drinks on one occasion <i>n</i> = 144	Never	71 (19.1)	41 (44.1)	30 (58.8)	12 (57.1)	46 (48.4)	5 (33.3)	6 (75.0)	2 (40.0)
	Less than monthly	29 (7.8)	20 (21.5)	9 (17.6)	5 (23.8)	21 (22.4)	1 (6.7)	0 (0.0)	2 (40.0)
	Monthly	38 (10.3)	27 (29.0)	11 (21.6)	4 (19.0)	23 (24.2)	8 (53.3)	2 (25.0)	1 (20.0)
	Weekly	5 (1.3)	4 (4.3)	1 (2.0)	0 (0.0)	4 (4.2)	1 (6.7)	0 (0.0)	0 (0.0)
	Almost daily	1 (0.3)	1 (1.1)	0 (0.0)	0 (0.0)	1 (1.1)	0 (0.0)	0 (0.0)	0 (0.0)
AUDIT Score <i>n</i> = 146	Low risk (0-7)	85 (58.1)	46 (49.5)	39 (73.6)	12 (52.2)	55 (59.1)	8 (47.1)	6 (75.0)	4 (80.0)
	Harmful (8-14)	49 (33.6)	40 (43.0)	9 (17.0)	6 (26.1)	32 (34.4)	8 (47.1)	2 (25.0)	1 (20.0)
	Likely dependence (15-40)	12 (8.2)	7 (7.5)	5 (9.4)	5 (21.7)	6 (64.5)	1 (5.8)	0 (0.0)	0 (0.0)

Understanding Standard Drinks and Health Risks

Only 0.54% (approximately 1 out of 200 participants) knew the right number of standard drinks in all four of the categories of drinks asked about. About 25.0% (1 in 4) of participants knew between one to three of the categories asked about, 24.5% (about 1 in 4) knew none of the categories, while about half of the participants (50.5%) reported that they did not know the correct number of standard drinks for any of the categories asked about (Table 3).

About three in twenty participants (14.2%) knew the correct recommended drinking limits for males according to the pre-

Table 3

Knowledge about Standard Drinks

How many standard drinks are contained in...	1 drink n (%)	2 drinks n (%)	3 drinks n (%)	Don't know n (%)
200ml wine (e.g. 1 glass Dompoo)	77 (20.7)	16 (4.3)*	13 (3.5)	266 (71.5)
500ml beer (e.g. 1 bottle Guinness)	29 (7.8)	47 (4.3)*	17 (4.6)	279 (75.0)
200ml lager (e.g., ½bottle Kilimanjaro)	42 (11.3)*	39 (10.5)	17 (4.6)	274 (73.7)
Single measure of spirit (e.g., Konyagi)	43 (11.6)*	14 (3.8)	22 (5.9)	293 (78.8)

*Indicates the correct answer

Figure 1

AUDIT Score ranking for male and female drinkers

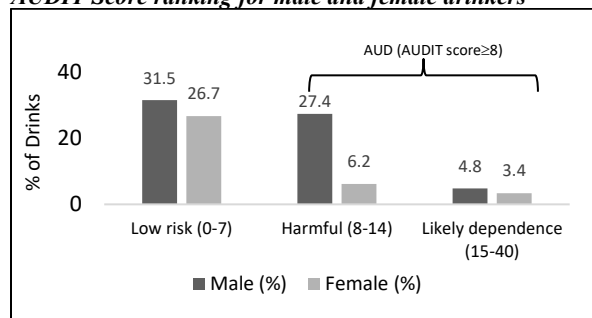
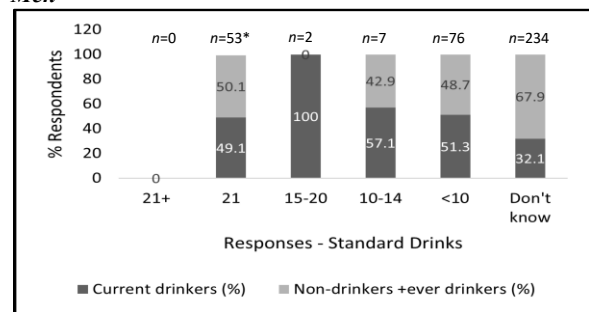


Figure 2

Knowledge of Recommended Standard Drink Limit for Men

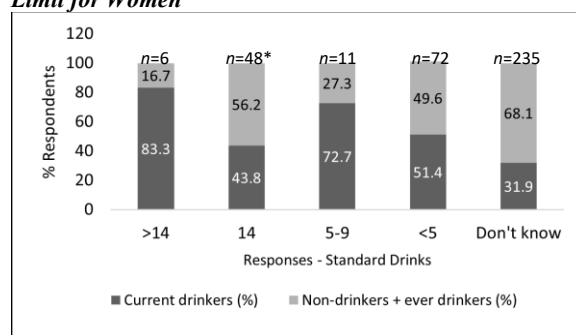


n=372; *Indicates the correct answer

2010 guidelines (Stringer & Williams, 2012). The majority (63.2%) did not know the recommended number of standard drinks an adult male should consume in a week. Similarly, only 12.9% of participants knew the maximum recommended standard drinks a woman should consume in a week, while 63.2% reported that they did not know the recommended standard drinks a woman could safely consume in a week (Figure 1). Drinkers and non-drinkers accounted for almost equal proportions of those who knew the correct recommended drinking limits for men (Figure 2). Interestingly, more non-drinkers knew the correct recommended standard drink limits for women (Figure 3).

Figure 3

Knowledge of the Recommended Weekly Standard Drink Limit for Women



n = 372; *Indicates the correct answer

Knowledge about Health Risks

The majority of the participants knew about the effects of alcohol consumption on the liver, pancreas, and blood pressure, and an increased risk of bowel cancer. However, the majority also held an erroneous view about the relationship between alcohol consumption and the risk of breast cancer (Table 4).

Table 4

Knowledge about Health Risks

Drinking more than the recommended number of standard drinks in a week can lead to...	True n (%)	False n (%)	Don't Know n (%)
Liver disease	310 (83.3)*	12 (3.2)	50 (13.4)
Pancreatitis	256 (68.8)*	39 (10.5)	77 (20.7)
Stomach ulcers	250 (67.2)	40 (10.8)*	80 (22.0)
High blood pressure	246 (66.1)*	42 (11.3)	84 (22.6)
Woman's risk of breast cancer	111 (29.8)*	135 (36.3)	126 (33.9)
Increased risk of skin cancer	78 (21.0)	166 (44.6)*	128 (34.4)
Increased risk of bowel cancer	194 (52.2)*	59 (15.9)	119 (31.9)

*Indicates the correct answer

Discussion

Prevalence of Reported Current Drinking and AUD

This study revealed that the prevalence of reported current drinking among the students during the year prior to this study was 39.2%, while the prevalence of AUD was 16.4%. Males, participants aged 26–30, those who resided in hostels, those in their fifth year of study, and participants studying diploma and certificate courses all reported higher AUD rates. The prevalence of current drinking in this study (39.2%) was higher than the 26% prevalence reported in the systematic review of drinking among young people in East Africa (Francis et al., 2014; WHO, 2022), but lower than the estimated prevalence of 69.5% in the United States and other developed countries (NIAAA, 2022). This study found that the median age of initiation of alcohol consumption was 20 years, and with the 25th percentile of drinkers reporting initiation at the age of 17 or less, this is suggestive of an early drinking trend similar to that reported in developed countries (Bellis et al., 2009; Gore et al., 2011; Swahn, Bossarte, Ashby, et al., 2010; Swahn, Bossarte, West, et al., 2010).

In this study, reported current drinking and AUD were more prevalent among hostel residents who made up the majority of the study participants. Significant associations ($p < 0.001$) were also observed for institution and course of study. The higher prevalence of reported alcohol consumption observed among the study participants could be due to poor coping skills, easy access to alcohol, and positive expectations regarding alcohol use (Gowin et al., 2017; Howell et al., 2010; Nadkarni et al., 2022).

The prevalence of AUD was found to be lower than those reported in the United States and Europe (Iconis, 2014; WHO, 2022), but higher than for previous studies conducted in Tanzania (Francis et al., 2015; Mbatia et al., 2009). Male participants and people aged 26–30 had a higher prevalence of AUD (AUDIT score ≥ 8). This is similar to reports from the WHO and other studies conducted in Tanzania (Mbatia et al., 2009; WHO, 2022).

Patterns of Drinking among Participants in the Last Year

The majority (about 80%) of reported current drinkers revealed that they felt they were healthy drinkers even though 35% of participants in this category screened positive for AUD according to their AUDIT score. This reflects a significant lack of knowledge of recommended drinking limits among these reported current drinkers. Over 60% of reported current drinkers also revealed that they started drinking either because they felt like it, or due to peer pressure. This corroborates findings from previous studies conducted in Africa and Europe (Gowin et al., 2017; Howell et al., 2010; Nadkarni et al., 2022). Similar studies in the United States and Australia revealed higher drinking and binge drinking among adolescents who have friends and peers who drink than those who did not have friends or peers who drink (Cheadle et al., 2015; Rützel et al., 2014). While the majority of reported current drinkers only drank once a month or less, a significant proportion (35%) consumed up to three or more drinks in one day, and a significant

proportion consumed six or more drinks on one occasion. This probably suggests why about 50.0% of reported current drinkers in this study screened positive for AUD.

Knowledge about Standard Drinks and Health Risks

The United Kingdom's pre-2010 drinking guidelines recommends a maximum of 21 units per week for men and 14 units per week for women (Stringer & Williams, 2012). Less than 15% percent of the students knew the recommended maximum standard drinks (in each case) for either males or females (Figures 2 and 3). When asked about standard drinks contained in popular brands in the country, the majority of students did not know. This too shows a lack of knowledge about drinking limits and probably contributes to the relatively higher prevalence of AUD observed in this study compared to other studies conducted in Africa. This result is similar to studies conducted in the United States and Australia (Brunk et al., 2020; Corney & du Plessis, 2022) where students did not know the recommended drinking limits. The lack of adequate understanding of the number of standard drinks in some of the most commonly sold or consumed alcoholic beverages in Tanzania further reveals the lack of knowledge about standard drinks, which perhaps also contributes to the high prevalence of AUD in this study.

The majority of the students were aware of the health risks associated with drinking. This suggests that students were more aware of the health risks associated with drinking when compared to their knowledge about the number of standard drinks contained in alcoholic beverages. Even though the majority of the participants were aware of the health risks associated with alcohol consumption, a significant proportion of these students were unaware of many health risks (Table 4).

Alcohol consumption, especially hazardous drinking, has been shown to be a strong underlying factor for at least 30 disease conditions, and a contributing factor to many other diseases, thereby adding to the global burden of disease (Rehm, 2011). Increased awareness about health risks associated with drinking through education as recommended by the WHO (WHO, 2018), especially among students in the medical and allied health sciences, will prove useful in the prevention of alcohol associated health risks among these future healthcare workers and by extension the general population of Tanzania.

Limitations of the Study

While every effort was made to ensure the content of the questionnaire was well understood by the participants, the data in this study was based on self-reported consumption of alcohol. There is therefore the probability of reporting incorrect consumption of alcohol, and the report may be subject to participant bias. Small cells may have sometimes added to the inability of the results to reach significance for variables such as course and institution of study. Also, the results did not contain data for fourth year Doctor of Medicine students because there were no students enrolled in the program for the 2016 university admissions.

Conclusions and Recommendations

The prevalence of alcohol consumption and hazardous drinking is high among health and allied students in Tanzania. There is also a poor awareness and understanding of standard drinks as well as recommended limits for consumption among those students. Health promotion and education on the dangers and risks of alcohol consumption should be implemented at all levels of tertiary education especially among medical and allied health sciences students during college years. We recommend a similar cross-sectional study in the future among young people within college and university years across other regions for a better appreciation of the alcohol consumption patterns across Tanzania. We also recommend further design and implementation of helpful health intervention programs for individuals with AUD to curb the rising prevalence of problematic alcohol consumption in Tanzania.

Ethical Considerations

This study was approved by the Ethics Committee of SFUCHAS with reference number SF2020R031. Participants in this study were voluntarily recruited and administered the questionnaire after informed consent and an assurance that information they provide will be handled with confidentiality. A consent form was attached to the questionnaire.

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