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# Risk Factors for Harmful Alcohol Consumption Among University Students in Hanoi

Degree Project in Medicine

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## ABSTRACT

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**Background:** Excessive alcohol consumption is a risk factor for many non-communicable diseases and is considered an important target in reaching the sustainable development goals set by the UN. In Vietnam, alcohol consumption is increasing rapidly and is projected to increase further.

**Purpose:** To monitor the prevalence of alcohol consumption and harmful alcohol consumption among university students in Hanoi, as well as to investigate the relationship between sociodemographic factors and harmful alcohol consumption.

**Method:** A cross-sectional questionnaire based study conducted at three universities in Hanoi. Multivariable logistic regression was used to investigate the relationship between sociodemographic factors and harmful alcohol consumption.

**Results:** The prevalence of alcohol consumption was 86.8% among males and 68.8% for females. The prevalence of harmful alcohol consumption was 30.1% among males and 12.5% among females. The sociodemographic factors significantly associated with harmful alcohol consumption were age, sex and university.

**Conclusions:** The prevalence of alcohol consumption and harmful alcohol consumption among females was higher in the study than previously reported among females in Vietnam. Students at Hanoi University of National Resources and Environment had a higher odds of having harmful alcohol consumption, compared to the other two universities. Due to the study design and relatively small sample number, the results need to be verified in larger studies.

# INTRODUCTION

## Global perspective on alcohol

Excessive alcohol consumption is a well-known risk factor for numerous diseases such as cardiovascular disease, cancers, liver diseases as well as mental health conditions (1), intimate partner violence and traffic injuries (2, 3). Alcohol use is attributable for 5.3% of deaths globally, and for 5.1% of the global burden of disease (4) and is considered an obstacle for reaching several of the sustainable development goals set by the UN (4). The WHO standard for measuring alcohol consumption is in terms of liters (L) of pure alcohol per capita and year (5). Global consumption has increased from 5.9 to 6.5 L per capita between 1990 and 2017, with a projection for 2030 of a per capita consumption of 7.6 L (6). Although alcohol consumption is expected to actually decrease in Europe and North and South America, the projections of alcohol consumption for South East Asia are the highest, where consumption is expected to increase with 46.8% (6). Continuous monitoring is necessary in order to follow the trend and evaluate policy effectiveness.

## Alcohol consumption in Vietnam

Vietnam is a country in Southeast Asia that has made considerable economic progress in the last decades and has gone from being one of the poorest countries in the world in the 80's to reaching lower-middle income status in 2010. Together with a large population increase from 55 million in 1980 to 96 million in 2019, longer life expectancy and improved living standards, Vietnam has transitioned towards a disease burden of a larger proportion of non-communicable diseases (NCDs) (7).

Alcohol has a strong position in Vietnamese culture, and it is consumed during festive events as well as to facilitate business agreements and at everyday social gatherings (8). Alcoholic beverages are very cheap, and it is common for groups of men to get together at the local "bia hoi" (beer hall) for cheap beer and food. Conformity is important and it may be considered

rude to decline a drink when offered and peer pressure is reported as a common reason for young men to start consuming alcoholic beverages (9).

Beer constitutes 91% of the recorded pure alcohol per capita consumed, however home brewing practice is common and there is a large unrecorded rice-wine production in the country (4).

The WHO reports that Vietnamese alcohol consumption had increased by 77% between 2002 and 2016. Total alcohol consumption per capita in 2016 was estimated at 8.3 L which is one of the highest in the region and higher than the average of the Western Pacific Region at 7.3 L. The level of consumption is particularly high among men that consume alcohol; their per capita consumption is estimated at 14.5 L, compared to Vietnamese females estimated per capita consumption of 2.5 L. The proportion of adults drinking (defined as having consumed alcohol at least once in the last 12 months) in 2016 had risen from 46% to 77% amongst men and from 2% to 11% amongst women compared to 2002, and the prevalence of alcohol use disorders, including harmful alcohol use, were 9.8% and 1.2% respectively (4, 10).

Domestic violence is a problem in Vietnam, with reports of one third of ever-married women having been affected (11), and partner's alcohol consumption has been identified as strongly associated to domestic violence, with daily drinkers having an odds ratio of 7.06 compared to partners that do not drink (12).

The prevalence of road traffic injuries is high in Vietnam, estimated by the WHO at 26.4/100,000 population in 2016 (13). A study from 2012 found that 29.1% of hospitalized traffic accident patients had a blood alcohol level above the legal limit (14).

Illicit drug use is another rising issue in Vietnam. In 2008, the prevalence of drug addiction was 208/100,000 people, heroin addiction being the majority (15), although methamphetamine use is increasing, particularly in the younger population (16).

## Vietnamese students and alcohol

University students have been identified as an at-risk group regarding harmful patterns of alcohol consumption across different populations(17-19). There has been some previous research conducted on the Vietnamese student population, more particularly on medical students. A study from 2010 made on Vietnamese medical students reported that 84.8% of males and 47.3% of females were drinkers (reported drinking alcohol at least once in the last 12 months) (20). Another study on Vietnamese medical students from 2013 reported a prevalence of drinkers among males at 77.2% and among females at 37.7% (21). The prevalence of female drinkers in these studies are much higher than the reported national level at 11% (4) which calls for further research and monitoring of female students. A recent study from 2019 on Vietnamese medical students found that 6.8% of the respondents had harmful alcohol consumption (as defined by AUDIT) (22).

## Purpose

The purpose of this project was to monitor the prevalence and patterns of alcohol consumption and harmful drinking behavior among a sample of university students using the alcohol use disorders identification test (AUDIT), in order to compare with previously reported levels in the student population as well as reported national levels. This study also aims to investigate the relationship between possible sociodemographic risk factors and harmful consumption of alcohol as defined by the AUDIT, in order to suggest further research to identify at-risk groups to support future policy-making and interventions.

# METHODS

## Study design, study population and sample size

The study design was a small, cross-sectional pilot study of university students in Hanoi. It was questionnaire based and conducted at three universities; Hanoi Medical University (HMU), Hanoi University of Natural Resources and Environment (HUNRE) and Vietnam University of Fine Arts (VUFA). The sampling method used was convenience sampling. No sample size was calculated, the ambition was to get as many participants as possible during the time frame of 8 weeks, with the result of 284 participants. Equal sample numbers between the sexes were attempted to be achieved, resulting in 150 male and 126 female participants.

Two questionnaires were combined; one set of sociodemographic questions (age, sex, university, family background, living situation, marital status, psychiatric health problems, mental health problems, smoking prevalence) as well as the AUDIT in which the respondent answers questions about frequency and patterns of alcohol consumption including second hand effects/harms of drinking, resulting in a score reflecting harmful alcohol consumption.

## Data collection procedures

The data was collected from October to November 2019. The sociodemographic questionnaire was translated into Vietnamese by a university co-worker with a major in English. The AUDIT questionnaire was available in a Vietnamese version. The questionnaires were distributed in classrooms after lectures with help from university staff. The questionnaire had a front page with written information about consent, anonymity, and a code number in order to be able to withdraw participation at any time. Consent was obtained when students filled in the questionnaires. Some students chose to leave the classrooms and not fill in the questionnaires, while others chose to stay and complete it after reading the information sheet.

**The AUDIT questionnaire**

The AUDIT is a screening tool developed by the WHO for identifying excessive drinking and harmful alcohol consumption (23). It can be used as a self-administered questionnaire or as part of a structured interview. It is widely used as a means of screening for harmful alcohol consumption in primary health care, and has been shown to be of value in detecting alcohol use disorders according to DSM-5 in different populations, although it is not a diagnostic test (24-26).

It consists of ten questions, divided into three categories of questions; questions about quantity and frequency of alcohol consumption, questions about dependency, as well as questions about alcohol related harms. The responses are scored and a total of 0-40 points is obtained. Depending on the score, the respondent is placed into a risk group of I-IV where I indicates no risk of harmful alcohol consumption, II indicates a risk of harmful alcohol consumption but not necessarily alcohol use disorder, III indicates problematic alcohol habits and a likely alcohol use disorder, and IV indicates very problematic alcohol habits and a very likely alcohol use disorder. Different cut-off points are often used for men and women and may differ based on local practice and the purpose of screening. Particularly in low-middle income settings, cut-off points tend to vary and there is much need for validation (27). Using a lower cut-off point results in a higher sensitivity but lower specificity and vice-versa (28). In this study, the cut-off point for men is 7/8, which is a commonly used cut-off point that has been validated for a Vietnamese rural population (29). No cut-off point for Vietnamese women has been validated but based on previous studies (30, 31), the cut-off point for women in this study is 5/6. Participants with a score above the cut-off point are classified as having risky alcohol habits.

## Measures

In this study, participants that stated that they never drink alcohol were classified as abstainers. Participants that stated otherwise were classified as drinkers (from once per month or less). Participants that stated that they drink at least four standard drinks at least once per month were classified as binge-drinkers. Participants with an AUDIT-level of II or above were classified as having harmful alcohol consumption.

## Statistical analyses

All analyses were performed using SPSS statistics 25. Using logistic regression, the relationship between the dependent variable (presence of harmful alcohol use as defined by AUDIT) and potential risk factors (age, sex, university, family background, living situation, marital status, self-reported psychiatric and mental health problems, current smoker) were analyzed. Variable selection was made using univariate prefiltering; each variable was analyzed separately and qualified into a multivariable model if the p-value was $<0.05$. The included variables were checked for collinearity using Spearman's rho. Smoking was collinear with both sex and university and could not be included in the final multivariable model. Age was found to be collinear with university, although due to potential data collection bias based on participant age, age was added into the final model as a covariate.

## Ethics

The study was ethically approved by the Institute for Preventive Medicine and Public Health, Hanoi Medical University. Written approval was acquired by Hanoi University of National Resources and Environment and Vietnam University of Fine Arts. All participants were 18 years or older. The students all received oral and written information about consent, anonymity and the option to withdraw their participation at any time using a code. The study will not be published. The results will be made available to the supervising university (HMU).

# RESULTS

Participants were evenly distributed between males and females and across universities, as well as regarding living situation and family background. Regarding marital status, 81.9% of males and 88.9% of females stated that they were single (Table 1). The number of self-reported psychiatric health problems were 7.3% for males and 7.1% for females. Self-reported physical health problems were 8.0% for males and 17.5% for females (Table 1).

**Drinking behavior**

The number of participants classified as abstainers (stated that they never drink alcohol) were 13.2% for males and 27.9% for females, and the number classified as drinkers (stated that they consume alcohol at least monthly or less) were 86.8% for males and 68.8% for females. The number of participants that reported drinking 2-4 times/month or more were 27.9% for males and 10.7% for females (Table 1). Regarding binge drinking, 24.3% of males and 4.5% of females reported doing this at least monthly (Table 1). Regarding AUDIT level, 30.1% of males and 12.5% were classified as having harmful alcohol use. Among males, the number of participants in AUDIT levels III and IV were 2.9% and 2.9% respectively and the corresponding numbers for females were 1.8% and 0% (Table 1).

**Table 1. Sample sociodemographic and psychosocial factors and drinking behavior defined by AUDIT (N=284)**

| | Male (n = 150) | | Female (n = 126) | | Total (n = 276) | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| Median age (n = 273, range = 18-32) | 22 | | 21 | | 22 | |
| University (n = 273) | | | | | | |
| HMU | 50 | 33.8 | 58 | 46.4 | 108 | 39.6 |
| VUFA | 49 | 33.1 | 35 | 28.0 | 84 | 30.8 |
| HUNRE | 49 | 33.1 | 32 | 25.6 | 81 | 29.7 |
| Family background (n = 276) | | | | | | |
| Urban | 92 | 61.3 | 69 | 54.8 | 161 | 58.3 |
| Rural | 58 | 38.7 | 57 | 45.2 | 115 | 41.7 |
| Living situation (n = 276) | | | | | | |
| With parents/guardian | 70 | 46.7 | 61 | 48.4 | 131 | 47.5 |
| Not with parents/guardian | 80 | 53.3 | 65 | 51.6 | 145 | 52.5 |
| Marital status (n = 275) | | | | | | |
| Married/In a relationship | 22 | 14.8 | 14 | 11.1 | 36 | 13.1 |
| Separated/Divorced/Widowed | 5 | 3.4 | 0 | 0.0 | 5 | 1.8 |
| Single (Never married) | 122 | 81.9 | 112 | 88.9 | 234 | 85.1 |
| Psychiatric health problems (n = 276) | 11 | 7.3 | 9 | 7.1 | 20 | 7.2 |
| Physical health problems (n = 276) | 12 | 8.0 | 22 | 17.5 | 34 | 12.3 |
| Current smoker (n = 262) | 60 | 43.2 | 11 | 9.3 | 71 | 27.6 |
| Drinking behavior (n = 248) | | | | | | |
| Abstainers | 18 | 13.2 | 35 | 31.3 | 53 | 21.4 |
| Drinkers | 118 | 86.8 | 77 | 68.8 | 195 | 78.6 |
| Drinks at least 2-4 times/month | 38 | 27.9 | 12 | 10.7 | 50 | 20.2 |
| Monthly binge drink | 33 | 24.3 | 5 | 4.5 | 38 | 15.3 |
| AUDIT level (n = 248) | | | | | | |
| I | 95 | 69.9 | 98 | 87.5 | 193 | 77.8 |
| II | 33 | 24.3 | 12 | 10.7 | 45 | 18.1 |
| III | 4 | 2.9 | 2 | 1.8 | 6 | 2.4 |
| IV | 4 | 2.9 | 0 | 0 | 4 | 1.6 |
| Harmful alcohol consumption | 41 | 30.1 | 14 | 12.5 | 55 | 22.2 |

*Note: The variations in sample size are due to missing responses*

## Risk factors for harmful alcohol consumption

In the multivariable logistic regression model males, compared to females, had significantly higher odds of harmful alcohol consumption with an OR of 3.47 (95% CI: 1.69-7.12). Students at HUNRE and HMU, compared to students at VUFA, had higher odds of harmful alcohol consumption with an OR of 5.50 (95% CI: 2.14-14.15) and 1.27 (95% CI: 0.48-3.37) respectively, although this effect was not statistically significant for HMU (Table 2). A higher

age was significantly associated with higher odds of harmful alcohol consumption with an OR of 1.19 (95% CI: 1.00-1.42) (Table 2).

**Table 2. Logistic regression for harmful use of alcohol for risk factors sex, university and age (N=224)**

| | B | P-value | Unadj. OR | Adj. OR | 95% CI |
|---|---|---|---|---|---|
| Sex (ref = female) | | | | | |
| Male | 1.245 | 0.001 | 3.02 | 3.47 | 1.69-7.12 |
| University (ref = VUFA) | | | | | |
| HUNRE | 1.705 | <0.001 | 3.94 | 5.50 | 2.14-14.15 |
| HMU | 0.235 | 0.639 | 1.49 | 1.27 | 0.48-3.37 |
| Age | 0.175 | 0.049 | 1.06 | 1.19 | 1.00-1.42 |

*Dependent variable: Harmful use of alcohol.*

## DISCUSSION

The prevalence of alcohol consumption in this study was 86.8% for males and 68.8% for females. This is higher than the previously reported numbers in the student population of 84.8% for males and 47.3% for females(20) as well as 77.2% for males and 37.7% for females (21) and the findings support the projections of a further increasing alcohol consumption.

Together with previous studies on the Vietnamese student population, this study suggests a higher alcohol consumption among female students than the national estimate for females at 11%. The difference in prevalence of alcohol consumption among males is not as pronounced (4). The reasons for this could be that the female students are young, educated and living in an urban environment. Education is linked to a higher degree of gender equality (32).

Historically it has been less acceptable for women to drink alcohol in Vietnam, but traditional gender roles are shifting in concurrence with international influences, with higher expectations on and acceptance for women to participate in social activities and gatherings (8).

Regarding harmful alcohol consumption, the prevalence in this study were 30.1% among males and 12.5% among females. This can be compared to a rural setting (2009) where the corresponding numbers were 25.5% for males and 0.7% for females, as well as to the national estimates of 9.8% and 1.2% for males and females respectively. Even though the AUDIT is not a diagnostic tool for alcohol use disorders, and that most of the risk-drinkers were classified into the lesser risk category, this is an indication that there might be a need for specific interventions addressed at the student population.

Even though this study failed to find a significant relationship between other sociodemographic factors such as family background, living situation, self-reported physical and psychiatric health problems, it cannot be ruled out that these factors are relevant, but did not reach statistical significance due to the small sample size of this study.

The risk factors found to be significantly associated with higher odds of having harmful alcohol consumption were sex, university and higher age. Being male is a previously well-known risk factor and this study also finds that males have higher odds of harmful alcohol consumption compared to women. Higher age is also previously known to be a risk factor for harmful alcohol consumption which is also supported through this study. Even though 'university' was not initially considered a main point of interest in this study, the OR for HUNRE compared to VUFA was very high, at 5.50. A recent study of medical students in Hanoi found that males had an even higher OR of 14.3 of harmful alcohol consumption compared to women (20), although the same cut-off point was used for males and females (AUDIT >7), meaning that less females would be categorized as at-risk drinkers.

**Methodological considerations**

A limitation of this study is the convenience sampling method used, which led to a high level of sampling error and selection bias. Due to the time frame and regulations at the participating universities, only a few classrooms could be entered, and attending students were asked to

participate. This means that the results of the sampling are not representative for the target population.

At HMU, only 6th year medical students were asked to participate, while at the other two universities the year and educations varied, and therefore also the students ages. This caused the students at HMU to be older, as a group, which is an explanation to why age was collinear with university, and why age had to be added as a covariate in the final model.

The reason for the age discrepancy is due to an unclear study design at the beginning of the data collection. A selection bias based on participants age is the result, as the sample was initially intended to include 6th year students only, although this was found to be inconvenient and was later widened to include students of all academic years in the other participating universities.

Due to the sample size and the number of variables in the questionnaire, it was concluded that variable selection would be necessary even if the chosen selection method of univariate prefiltering has its limitations. It is a method that is unable to consider possible confounding. This could explain the fact that when the age variable was included in the univariate prefilter, it did not qualify into the final model. Although when included in the model as a covariate together with previously selected variables, it came out with a significance level of $p < 0.05$. This in turn could be explained by the discrepancy in age between the universities, where students at HMU were older as a group yet had lower odds of harmful alcohol consumption, thus masking the age effect.

It should be taken into consideration that definitions vary regarding abstainers and drinkers between studies. In many publications, alcohol consumers are defined as having had alcohol in the last 12 months, while the self-administered AUDIT questionnaire used offers no such definition. Instead, participants may answer the question of how often they drink alcohol with

"never", "monthly or less", "2-4 times/month", "2-3 times/week" and "4 or more times/week". In this study, participants that responded "monthly or less" or above were defined as drinkers, although this response does not exclude the option that the participant has not consumed alcohol in the last 12 months. This means that the participants defined as drinkers in this study might be overestimated compared to other studies, however had the response of "2-4 times/month" been chosen as a cut-off for defining drinkers, there would instead be a risk for underestimation.

The relatively large proportion (36 participants, 12%) of non-responders of the AUDIT may be explained by the layout of the questionnaire. The sociodemographic part and the AUDIT part were divided by an extensive multi-page questionnaire regarding a different study conducted at the same time. The AUDIT was placed on the back side of the last page, and it is possible that the participants failed to see that there was such a part altogether.

Another explanation could be that participants were uncomfortable completing the AUDIT. Participants were asked to answer potentially sensitive questions about alcohol consumption in close proximity to peers and limited options were available to ensure privacy in the classrooms. This entails a risk of nonresponse bias as it is possible that participants with a higher level of alcohol consumption would refrain from completing the AUDIT.

The reason why smoking was collinear with university may be that among the participants at HMU, there was only one current smoker. It could be argued since the students at HMU were all medical students, that because of health awareness related to their education, they were less inclined to smoke, thus potentially another result of the sampling bias problem since HMU in this study is only represented by medical students.

## CONCLUSIONS

This study reports a higher level of alcohol consumption as well as harmful alcohol consumption among the female students than previously reported among females in Vietnam. It also finds that a relatively large proportion of students overall have harmful alcohol consumption. More research is needed into the target population to further monitor the levels and patterns of alcohol consumption. Male students are still at higher risk of having harmful alcohol consumption, although continuous evaluation of female students is required as they may be approaching higher levels of harmful alcohol consumption. Moreover, larger studies are needed in order to investigate risk factors for harmful alcohol consumption.

Vietnam still faces challenges in halting the progress of the rising alcohol issue. In 2008, a legal drinking age was established although enforcement is still poor. Alcoholic beverages are highly accessible, affordable and heavily advertised and these are all key targets for cost-effective reduction of alcohol-related problems (33) and are recommended measures by the WHO, the so-called “best-buys”.

# POPULÄRVETENSKAPLIG SAMMANFATTNING

**Alkoholkonsumtion bland universitetsstudenter i Hanoi, Vietnam**

Alkohol orsakar 5,3% av alla dödsfall och 5,1% av alla sjukdomar i världen. I stora delar av västvärlden sjunker alkoholkonsumtionen, men i bl.a. Sydostasien ökar den kraftigt. Ett av de länder där alkoholkonsumtionen ökar mest är Vietnam, där alkoholen har en stark position i det sociala livet, framförallt hos män. Världshälsoorganisationen uppskattar att 77% av män och 11% av kvinnor i Vietnam konsumerar alkohol samt att 9,8% av män och 1,2% av kvinnor har en skadlig alkoholkonsumtion.

Studenter är en känd riskgrupp för att ha en skadlig alkoholkonsumtion i många länder, men lite forskning har gjorts på studenter i Vietnam och den som finns är gjord uteslutande på medicinstudenter.

Syftet med studien var att följa utvecklingen av alkoholkonsumtion hos studenter i Hanoi samt att undersöka om det finns en koppling mellan sociala faktorer och ett skadligt alkoholbruk. Studien innefattade 284 studenter och genomfördes med hjälp av en enkät om sociala faktorer och alkoholvanor på tre universitet i Hanoi.

Studien fann att 86,8% av männen och 68,8% av kvinnorna drack alkohol samt att 30,1% av männen och 12,5% av kvinnorna hade en skadlig alkoholkonsumtion. För männen liknar siffrorna tidigare uppmätta nivåer, men vad gäller kvinnorna så har sådana höga siffror tidigare inte rapporterats i landet. Det kan tyda på att kvinnliga studenter är en växande grupp vad gäller alkoholkonsumtion. De sociala faktorer som hade en koppling till en skadlig alkoholkonsumtion var manligt kön, högre ålder samt studerande vid ett av de tre universiteten, HUNRE. Det är möjligt att det finns fler riskfaktorer, men större studier behöver göras för att undersöka detta.

Det är viktigt att fortsätta följa utvecklingen för att identifiera riskgrupper och även för att kunna avgöra om införda lagar och regler har någon effekt. Alkohol är fortfarande billigt, lättåtkomligt och marknadsförs hårt i Vietnam och fler åtgärder behövs för att hejda utvecklingen.

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