

The Prevalence of Substance Misuse and its Effects among Omani College Students: A Cross-sectional Study

Hazaa Al-Hinaai¹, Issa Al-Busaidi², Badriya Al Farsi³ and Yaqoub Al Saidi^{4*}

¹Al Hammra Primary Health Center, Muscat, Oman

²Department of Family Medicine, Royal Oman Police Hospital, Muscat, Oman

³Department of Family Medicine, Armed Forces Hospital, Muscat, Oman

⁴Department of Family Medicine, Sultan Qaboos University Hospital, Muscat, Oman

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ABSTRACT

Objectives: Many studies have confirmed that the use of alcohol, tobacco, and cannabis is prevalent among university students. This study aimed to assess the prevalence of substance misuse among college students in Oman, identifying the most commonly used substances, and reviewing the effect of substance misuse on the students' performance.

Methods: This cross-sectional study was conducted in a higher learning institution in an urban setting in Oman from April 2018 to December 2018. A descriptive, self-administered online questionnaire, the Alcohol, Smoking, and Substance Involvement Screening Test, version 3.0 (Arabic version), adapted from the World Health Organization was sent to 12 000 students at the college. The sample size was calculated using online software (Raosoft), with a margin of error of 5% and a confidence level of 95%. **Results:** A total of 375 students responded (response rate = 3.1%). The overall lifetime prevalence for any substance misuse (including tobacco and alcohol) among the participants was 41.3%, with the overall prevalence without tobacco or alcohol at 29.9%. Tobacco was the most common substance used, with a prevalence of around 23.5%, followed by alcohol at 10.7%. Male students had a significantly higher rate of substance abuse, for any substance, compared to female students ($p < 0.001$). There was a significant correlation between tobacco use, alcohol misuse, and misuse of other substances. Most of the adverse effects attributed to substance misuse reported by the respondents in this study were social (27.7%) and health-related (25.8%) problems. The impact of substance abuse on their performance was also high (23.8%). Furthermore, 15.4% of the respondents had financial problems, and 4.7% were struggling with legal issues. Notably, only 49.1% of the respondents perceived that substance misuse was a serious problem. **Conclusions:** Although college students are expected to be more aware of the negative impacts of substance misuse, this study found a high prevalence of smoking, alcohol, and other substance misuses among the group of Omani college students. Further research in this field is essential, and the results of this study have shed light on a critical problem among Omani college students. It is hoped that the findings of this study will be used and built on in future research to recognize students at risk of substance misuse from early school life, leading to early intervention, and potentially preventing the possible negative consequences.

Substance abuse is defined as the harmful use of psychoactive substances, including alcohol and illicit drugs, leading to a dependence syndrome. Worldwide, there are almost 2 billion consumers of alcohol, 1.3 billion smokers, and 185 million illicit drug users.¹

Globally, studies have shown the youth (15–24 years) to be at a higher risk for substance misuse compared to the rest of the population.^{2–4} College students are a societal group expected to have a

conscious approach to the use of addictive substances, though surveys have confirmed the widespread use of alcohol, tobacco, and cannabis among this group.⁵ College is a transitional period when students live independently with less direct parental supervision, rely on making their own decisions, face intense academic pressures, potentially share living quarters with strangers and form new social groups with less restrictive values from parental values. This may motivate young students to become involved in risky

*Corresponding author: ✉dr_yaqoub_saidi@hotmail.com

behaviors, such as smoking, alcohol, and substance misuse, which may negatively impact their health, social life, and education.^{6,7} This riskier behavior may also lead to serious consequences, including injuries, study and social impairment, violence, risky sexual behavior (increased risk of contracting HIV and other sexually transmitted diseases), absenteeism, violent crime, theft, loss of money, relationship problems with parents and friends, financial hardship, psychiatric disorders (such as depression, anxiety, schizophrenia, and insomnia), dropping out of college, and even death.^{6,8}

A study conducted among students in Italy showed that 28.0% of the participants smoked cigarettes regularly, and 23.2% admitted regular alcohol consumption. Around 50% of the students had already tried an illegal drug, with the most used substance being cannabis (46.7%), followed by cocaine (13.3%).⁹ The situation in the Arab world is similar, despite these substances not being as easily sourced; therefore, only a limited number of studies have been conducted. In Lebanon, a study of substance misuse among students concluded that the prevalence of ever having consumed alcohol was 20.9%, 12.3% had used cannabis, and 11% had used tranquilizers, whereas only 3.3% had used cocaine and 3.6% hallucinogens.¹⁰

The population in the Arabian Gulf has not previously been reported as showing signs of substance misuse.¹¹ Islam and its conservative practices may be the reason for this observation.¹² However, in recent decades, following the oil revolution in Gulf Cooperation Council (GCC) countries, this region has been transformed into a hub for international trade and has resulted in rapid modernization and acculturation. With the rise in demand from a growing expatriate population and an expanding tourism industry, the consumption of alcohol has also increased, as well as the use of other psychoactive substances in this region.^{11,13} Although substance misuse is believed to be a growing problem in GCC countries, few studies have been carried out in this field, particularly among university students. In Kuwait, drug use among male university students was found to be high and found to require attention and appropriate intervention.¹⁴

Huge demographic changes have occurred in Oman within the last few decades, causing increased employment opportunities and changes in social lives, which may weaken traditional family ties.^{15,16}

This, in turn, has been associated with increased levels of substance misuse.¹⁶⁻¹⁸ There has also been an increase in reported substance misuse cases and psychoactive substance overdose.¹⁹ The World Health Organization (WHO) ATLAS of Substance Use Disorders indicates that the prevalence of disorders related to substance use in Oman stands at 0.37% and 0.02% for alcohol and psychoactive substances, respectively.²⁰

There is a current lack of research from Oman on substance abuse. One related study looked at health-compromising behaviors among high school students who were asked about some risky behaviors in the month preceding the study. The results indicated that 4.6% of the students were current smokers, 4.3% had drunk alcohol, and 4.6% had taken drugs.²¹ A second study from Oman concluded that among high school students, the prevalence of tobacco use was 17%, alcohol 5%, and overall misuse of all other substances was 20.7%.²² There have been no studies carried out that have evaluated substance misuse among college students in Oman, so this study's main aim was to assess the prevalence of substance misuse among students in a higher learning institution in an urban setting in Oman. The secondary objective was to recognize the most common substance used and to review the effect that this substance abuse had on students.

METHODS

We conducted a descriptive cross-sectional study from April 2018 to December 2018 among students in a higher learning institution in an urban setting in Oman as the pool of participants would represent students from all areas of Oman. All Omani students were eligible to be included in the study, despite the age or year of study. The total number of students during the study was 12 000.

A self-administered questionnaire was formatted using Google Forms and emailed to all college students, but there was a poor response rate (1.1% = 127/12 000) despite a reminder being sent. Following this, the researchers attended the college to recruit subjects by approaching students randomly. The questionnaire link was sent to the approached students through email again. A total of 274 students accepted to participate in the study as a result of the college visits, and 248 completed questionnaires giving a response rate of 90.5% (248/274). The final

Table 1: The prevalence of substance misuse by gender (N = 375).

Variables	n (%)	Lifetime use (%)		p-value
		Male	Female	
Smoking	88 (23.5)	75 (41.4)	13 (6.7)	< 0.001
Alcohol	40 (10.7)	35 (19.3)	5 (2.6)	< 0.001
Cannabis	19 (5.1)	18 (9.9)	1 (0.5)	< 0.001
Cocaine	12 (3.2)	9 (5.0)	3 (1.5)	0.079
Amphetamine	31 (8.3)	20 (11.0)	11 (5.7)	0.063
Inhalants	37 (9.9)	15 (8.3)	22 (11.3)	0.387
Tranquilizers	56 (14.9)	28 (15.5)	28 (14.4)	0.885
Hallucinogens	5 (1.3)	4 (2.2)	1 (0.5)	0.201
Opiates	19 (5.1)	15 (8.3)	4 (2.1)	0.008
Others	23 (6.1)	15 (8.3)	8 (4.1)	0.130

sample size was 375, with 127 respondents from the first email and 248 respondents from the site visit.

The questionnaire used in this study was adapted from a validated WHO questionnaire; The Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) (Arabic version 3.0), which is a self-administered Model Core Questionnaire.²³ The adapted ASSIST questionnaire includes four sections: demographic data; lifetime prevalence of substance use (tobacco, alcohol, stimulants, cocaine, heroin, tranquilizers, and hallucinogens); frequency of substances used in the last three months (from never to daily use); and the effect of substance use on the student's academic performance, health, and life in terms of social, financial, and legal problems. The questionnaire also included a question asking the student's opinion on whether they perceived that substance abuse is a common problem and if it needs to be addressed and managed. The questionnaire average test-retest reliability coefficients (kappa) ranged from a high of 0.90 to a low of 0.58. Personal information; including name, telephone number, year of the study, and address was not required. This was to ensure confidentiality and to encourage participation and full disclosure of substance use.

The sample size needed for this study, which was calculated using online software (Raosoft), was 373 subjects with a 5% margin of error, 95% confidence interval (CI), and 50% response distribution to give the largest sample size.

The analysis was carried using the SPSS version 24 (IBM Corp., Armonk, NY, USA). A *p*-value < 0.050 was considered to be statistically significant. The prevalence, along with the 95% CI, was analyzed for overall substance use and specific drugs.

A chi-square test was used to test the significance between variables.

This study's proposal was reviewed and approved by the Research and Ethical Committee at the Directorate of Planning and Study, Muscat, Ministry of Health.

RESULTS

Of the 375 respondents (response rate = 3.1%), 181 (48.3%) were male, and the participants' mean age was 21.0±2.8 years old.

The overall lifetime prevalence of any substance misuse (including tobacco and alcohol) among the sample was 41.3% (95% CI: 36.32–46.28), with an overall prevalence of substance misuse discounting tobacco or alcohol of 29.9% (95% CI: 25.27–34.53). Table 1 shows that tobacco use was the most common substance abused by the students (23.5%; 95% CI: 19.21–27.79), and the lifetime smoking

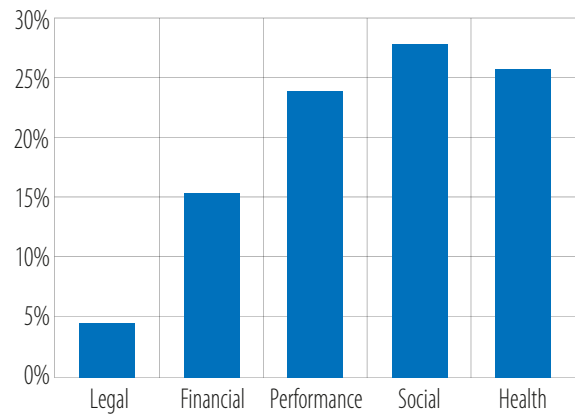
Table 2: The relationship between smoking and intake of other substances among participants of this study (N = 375).

Variables	Lifetime smoking use (%)	p-value
Alcohol	32 (36.4)	< 0.001
Cannabis	19 (21.6)	< 0.001
Cocaine	9 (10.2)	< 0.001
Amphetamines	12 (13.6)	0.046
Inhalants	16 (18.2)	0.007
Tranquilizers	24 (27.3)	< 0.001
Hallucinogens	4 (4.5)	0.012
Heroin and opiates	12 (13.6)	< 0.001
Others	14 (15.9)	< 0.001

Table 3: The relationship between alcohol consumption and intake of other substances among the study participants (N = 375).

Variables	Lifetime alcohol use (%)	p-value
Smoking	32 (80.0)	< 0.001
Cannabis	14 (35.0)	< 0.001
Cocaine	9 (22.5)	< 0.001
Amphetamines	7 (17.5)	0.035
Inhalants	13 (32.5)	< 0.001
Tranquilizers	16 (40.0)	< 0.001
Hallucinogens	4 (10.0)	0.001
Heroin and opiates	13 (32.5)	< 0.001
Others	10 (25.0)	< 0.001

prevalence rate was statistically higher among males compared to females (41.4% vs. 6.7%; $p < 0.001$). Our study found that 40 participants (10.7%; 95% CI: 7.57–13.83) had consumed alcohol in their life, and the prevalence was higher among males compared to females (19.3% vs. 2.6%; $p < 0.001$). Tranquilizers and sedatives were the most commonly used illicit drugs, with 56 participants (14.9%; 95% CI: 11.30–18.50) having taken them at least once. The lifetime prevalence of inhalant and amphetamine use was 9.9% (95% CI: 6.88–12.92) and 8.3% (95% CI: 5.51–11.09), respectively. Cannabis, heroin, and other opiate use were almost equal (5.1%; 95% CI: 3.19–7.81). Cocaine and hallucinogen use was the least prevalent substance abused among the respondents at 3.2% and 1.3%, respectively. Among all participants, 23 (6.1%; 95% CI: 3.68–8.52) admitted using different substances at least once in their lifetime. The prevalence of substance use was significantly higher in males compared to

**Figure 1:** The negative effects reported by the participants due to substance misuse (N = 375).

females for cannabis, heroin, and opiates with 9.9% vs. 0.5% ($p < 0.001$) and 8.3% vs. 2.1% ($p = 0.008$), respectively. There was no statistically significant variation between gender for tranquilizers (15.5% vs. 14.4%; $p = 0.885$), inhalants (8.35 vs. 11.3%; $p = 0.387$) amphetamines (11.0% vs. 5.7%; $p = 0.063$), and cocaine (5.0% vs. 51%; $p = 0.079$).

Most of the respondents who had used tobacco or alcohol also tried other substances, and there was a statistically significant association between them. Table 2 shows the relationship between smoking and other substances. Table 3 shows the relationship between alcohol and other substances.

Figure 1 illustrates the negative effects of substance misuse in the respondent's lifetime, with 27.7% reporting social problems and 25.8% indicating health problems. The negative impact of substance abuse on their academic performance was also high (23.8%). The financial and legal impacts were the lowest negative impacts following substance

Table 4: The frequency of substance use among those who used it in the last three months from never to daily.

Variables	Never	Once/Twice	Monthly	Weekly	Daily
Smoking	32	18	8	11	19
Alcohol	8	19	4	6	3
Cannabis	10	6	0	3	0
Cocaine	6	3	0	3	0
Amphetamine	13	9	4	3	2
Inhalants	16	14	4	3	0
Tranquilizers	26	18	6	4	2
Hallucinogen	2	1	0	2	0
Opiates	13	3	0	3	0
Other	11	7	2	2	1

misuse (15.4% and 4.7%, respectively). Despite these negative effects following substance misuse, only 49.1% of all respondents perceived substance misuse as a serious problem and needed to be considered and managed.

Table 4 shows the frequency of substances for those who had used substances in the last three months, ranging from never to daily. Tobacco was the most commonly used substance, and it was also the substance used most daily (21.6%), followed by alcohol consumption (7.5%). Most of those who drank alcohol reported drinking at least once/twice in the last three months. For those who used opioids, 68.4% had not used them in the last three months.

DISCUSSION

This study's main goal was to expand the literature about substance misuse among college students in Oman, as there were no reviews or studies conducted among this population in Oman to date. This study assessed the prevalence of substance misuse among college students, recognizing the most common substances used and reviewing the effects of substance misuse on the students' performance.

In general, substance abuse rates are increasing in Arab countries and globally, which is of great concern.^{18,19} The lifetime prevalence of smoking, alcohol, and substance misuse was higher among male students in this study, which may reflect a more tolerant social attitude in males than females, and a confirmation that sex (male) is one of the risk factors of substance misuse.²⁴

The prevalence of smoking was the highest among the participants of this study (23.5%; 95% CI: 19.21–27.79), and this prevalence is higher in comparison to the national prevalence of smoking in 2010 (17.9%) and higher than the WHO-predicted prevalence of smoking status in Oman: 21.4%, 26.9%, and 33.3% in 2015, 2020, 2025, respectively.²⁵ The prevalence of smoking among Omani female students is still low compared to the prevalence of smoking among males (6.7% vs. 41.4%) in this study. A similar prevalence has previously been noted among Saudi female students (5%).^{26,27}

Despite the acceptability of alcohol in Arab countries, drinking alcohol is rare because of social and religious beliefs.^{12,13} The lifetime prevalence of ever-consuming alcohol among the students in this study was 10.7% (more common in males compared

to females, 19.3% vs. 2.6%), which is similar to the prevalence noted among Iraqi students (9.7% total, 19.7% male and 0.8% female).²⁸

The prevalence of substance misuse in this study was 29.9%, whereas a previous study conducted among Kuwaiti male students found a prevalence of 14.4%.¹⁴ The results of this study indicated that the prevalence of illicit drug use was 29.9%, which is low compared to some Western countries. A previous study conducted among US college students noted that the prevalence of any illicit drug use was 38.5%, and one study of Italian college students indicated a prevalence of 50.4%.^{9,29}

This study found a higher prevalence of smoking, alcohol, and substance misuse compared to two previous studies conducted among high school students in Oman, with one study concluding that among their participants, 4.6% were smokers, 4.3% had drunk alcohol, and 4.6% had taken drugs.²¹ The second study showed a prevalence of tobacco use of 17%, alcohol 5%, and the overall substance misuse (excluding smoking and alcohol) was 20.7%.²² The increased prevalence we noted may be explained by the older age of the participants and might also be due to the transition of substance misuse through the education system.^{30,31}

The gateway drug theory suggests that legal substance use (tobacco, alcohol, and marijuana in some countries) can lead to illegal substance misuse. However, some controversy remains regarding which drugs (tobacco, alcohol, or marijuana) form this substance gateway. There was a significant correlation between the use of legal and illegal substances ($p < 0.001$).^{9,10} Smoking is a high-risk factor for other substance misuses, a finding noted in this study and confirmed by previous studies, with alcohol abuse being the most correlated with smoking. However, this study indicated that alcohol is the gateway to the use of other drugs. Interestingly, participants who consumed alcohol were more likely to misuse other substances also, and this correlation was higher than in those who smoked [Tables 2 and 3]. Heavy drinking and early onset of alcohol use are associated with a high prevalence of substance misuse, especially among females. The American School Health Association has noted similar findings.^{32–34}

Regarding the adverse effects attributed to substance misuse [Figure 1], health problems were reported by 25.8% of respondents, followed by social problems (27.7%). The negative impact of

substance abuse on academic performance was also high (23.8%). The financial and legal impacts were the lowest negative impacts of substance misuse (15.4% and 4.7%, respectively). Similarly, the adverse effects attributed to substance misuse as noted by the students were in line with those mentioned in other studies.^{6,31}

The most alarming result of this study, indicating a limited awareness of the adverse effects of substance misuse, was that among students in this study, more than half (50.9%) perceived that substance misuse is not a serious problem and they did not think it needed to be taken into consideration and managed. This is even though some of them admitted that substance misuse had led to negative impacts on their social life, health, academic performance, and economic and legal status [Figure 1]. Their opinions regarding substance misuse were moderate, and they had liberal attitudes regarding these substances. The same perceptions have been noted in different parts of the world, regardless of culture or religion. A study from Saudi Arabia reported that more than a third of students indicated that alcohol and other substance could have a beneficial effect as stress alleviation, a similar conclusion to that noted among US students. The US students felt that it was expected that college students would experiment with alcohol and drugs and noted that it was “part of going away to college.”^{35,36}

This study's main aim was to address the almost total lack of research on substance misuse among Omani college students, and we found a total lack of awareness regarding this issue. We believe that this study is just the beginning of further research on this subject. The conclusions and findings of this study will hopefully be utilized in future research. We believe that further research is needed to identify the students at high-risk of substance misuse, including the psychosocial characteristics of these students, the effects that substance misuse has on these students, the differences between infrequent versus frequent users, and the prevalence of substance misuse among these students after graduation.

We used a self-administered questionnaire and no other validating measures, which means there could have been a misrepresentation (under- or overestimation) of the population. Therefore, it is not possible to conclude that the information generated is an accurate representation that precludes generalization. A second limitation is that this

study focuses mainly on the prevalence and impact of substance misuse but did not look for other confounding factors that may affect the prevalence. Also, the sample in this study was limited to one college, and although we regard the college as typical with regards to other colleges, the results might not be generalizable to students in other colleges.

CONCLUSION

This study indicated almost a total lack of evidence within the currently available research on substance misuse among Omani college students and revealed a lack of awareness regarding this issue. This is even though this study's population of college students are expected to be more aware of the negative impacts of substance misuse. This study found a high prevalence of smoking, alcohol, and other substance misuses among college students. We believe our study is just the beginning of further research on this topic. We hope that this study's conclusions and findings will be used in future research to recognize students at risk of substance misuse and allow early intervention to alleviate the possibilities of negative effects using well-structured awareness programs.

Disclosure

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