Drug Use among a Moroccan Sample of College Students

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RESUMEN

Introducción: las presiones a las que se enfrentan los estudiantes universitarios y la sensibilidad de su edad los ponen en un riesgo significativo de desarrollar problemas relacionados con el consumo de drogas. **Objetivo:** este estudio buscó evaluar algunos de los factores asociados con el comportamiento de consumo de drogas en una muestra de estudiantes universitarios marroquíes. **Método:** el estudio incluyó a 1147 estudiantes (703 mujeres y 444 hombres) con una edad media de 20 años (DE = 2.6) que completaron un cuestionario sociodemográfico y la versión árabe del Test de Identificación de Trastornos por Uso de Drogas (DUDIT). **Resultados:** este estudio identificó el género, consumo de alcohol, tabaquismo, los juegos de azar y la medicación para la depresión, la ansiedad y los problemas de sueño como posibles factores de riesgo para el comportamiento de consumo de drogas. **Discusión y conclusiones:** se requiere más investigación sobre el uso de drogas en los estudiantes universitarios, y se deben desarrollar estrategias de intervención.

Palabras clave: DUDIT, consumo de drogas, estudiantes universitarios, problemas relacionados con las drogas.

ABSTRACT

Introduction: the pressures that college students face and the sensitivity of their age put them at a significant risk of developing drug use-related problems. **Objective:** this study aims to evaluate some of the associated factors with drug use behavior among a sample of Moroccan college students. **Method:** the study included 1147 students (703 females and 444 males) with a mean age of 20 (SD = 2.6) who completed a sociodemographic questionnaire and the Arabic version of the Drug Use Disorders Identification Test (DUDIT). **Results:** the results demonstrated that it identifies gender, alcohol consumption, smoking, gambling, and medication for depression, anxiety, and sleep problems as potential risk factors of drug use behavior. **Discussion and conclusions:** more research is required on college students' drug use, and intervention strategies must be developed.

Keywords: DUDIT, drug use, college students, drug-related problems.

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Received on: June 14th, 2024
Accepted on: August 7th, 2024
doi: 10.28931/riiad.2024.2.04

INTRODUCTION

College students constitute a crucial demographic group vulnerable to the development of drug-related problems, as extensively documented (Arria et al., 2017; Skidmore et al., 2016). The challenging college environment frequently subjects them to stress (Choi, 2020; Hunt & Eisenberg, 2010; Pedrelli et al., 2015; Wang et al., 2023), substantially elevating the risk of drug use-related problems. Consequently, students grappling with substance use issues often face severe repercussions in both their social lives and academic performance, as supported by numerous studies (Arria et al., 2017; 2013; El Omari & Toufiq, 2015; Jaouahir et al., 2015).

The significance of drug use among college students is highlighted by the prevalence of substance use disorders, which are among the most common issues faced by this demographic (Pedrelli et al., 2015). In the United States of America, substance use has become a significant concern for authorities. According to reports, rates of alcohol, cigarette, marijuana, and other drug use reach their peak during the college years, typically between the ages of 18 and 22 (Skidmore et al., 2016). Similarly, in Morocco, the limited number of studies focusing on drug use among students has unveiled alarming statistics. The prevalence of drug use rises significantly, reaching 13% among medical college students (Chelieh et al., 2019), 29.5% among students at vocational institutions (Jaouahir et al., 2015), and 32.9% among Mohammed V University in Rabat (Adouani et al., 2022).

Gender differences in terms of drug use are evident in vulnerability and relapse. Females exhibit a much higher vulnerability to transitioning from drug use to drug dependence and addiction than males, as well as a higher risk of relapse (Becker et al., 2016). Additionally, females are considered more vulnerable to psychiatric comorbidities than males due to metabolic and social differences between genders (Becker et al., 2016; McHugh et al., 2018). It is crucial, however, to recognize that males also face significant challenges. Studies indicate that males have higher overall rates of substance use and a higher risk of fatal overdoses (Carliner et al., 2017; Daly et al., 2020; El Omari et al., 2015; Jules et al., 2015). Furthermore, in terms of preferred drug types, males are three times more likely to use cannabis, cocaine, and amphetamines, while females are more likely to use prescription opioids and tranquilizers (Andrade et al., 2012; United Nations Office on Drugs and Crime [UNODC], 2015). Among Moroccan high school students, males tend to use alcohol and cannabis, whereas females are more inclined to use sedatives and hypnotics (El Omari & Toufiq, 2015). Additionally, another study conducted by the Ministry of Health in Morocco among high school students revealed that tobacco was the most frequently used substance in the past 30 days (11% of males and 2% of females), followed by cannabis (6.4% of males and 0.7% of females), then alcohol (3.9% of males and 1.2% of females), and psychoactive drugs (3.1% of males and 2.9% of females) (Observatoire National des Drogues et Addictions [ONDA], 2014).

Furthermore, mental health problems contribute significantly to drug use-related problems. For instance, prior mental health issues increase the risk of developing drug-related problems. Any previous lifetime mental disorder heightens the risk for adolescents who have never used alcohol and/or illicit drugs to become first-time users. It also increases the risk of transitioning from non-problematic use to problematic use for adolescents who use alcohol and/or illicit drugs (Conway et al., 2016). Specifically, it was found that individuals with mental health conditions such as anxiety, depression, or post-traumatic stress disorder (PTSD) face a heightened risk of engaging in substance use and developing substance use disorders (United States Department of Health and Human Services, 2021). Moreover, anxiety disorders heighten the risk of drug use disorders; disruptive behavior disorders increase the risk of alcohol and drug disorders, and attention deficit hyperactivity disorder heightens the risk of drug use disorders and any substance use disorders (Borges et al., 2018).

Nonetheless, other sociodemographic variables have been reported to make significant contributions to drug use related problems. Unemployment was found to be associated with a higher rate of substance use compared to employed individuals (Lee et al., 2015; Melchior et al., 2015). Additionally, alcohol consumption was linked to a greater risk of drug use-related problems (Fearn et al., 2016; Newton-Howes & Boden, 2016). Moreover, smokers exhibited significantly higher drug dependence rates than non-smokers (Newton-Howes & Boden, 2016; Strong et al., 2016). Sleep problems were highly correlated with an increased rate of drug dependence (Roehrs & Roth, 2015; Tang et al., 2015).

Study Aims

College students represent a vital segment of any population and are at high risk for drug-related issues. Research on the factors associated with these issues in Morocco is very limited. Therefore, this study aims to investigate the risk factors associated

with illicit drug use and prescription drug misuse among a large sample of Moroccan college students.

METHOD

Design

The sampling strategy for this cross-sectional study was a stratified cluster sampling.

Participants and Procedure

Primary data were collected during the academic year 2019-2020 from eight institutions within Abdelmalek Essaâdi University, distributed across four cities. For each institution, a specific sample size was randomly selected. Data were collected in classrooms and libraries, where participating students returned their questionnaires and consent forms into two separate closed boxes.

Sample size calculation was performed using Epi-Info 7 software's Stat Calc application, with the following parameters: 100 828 subjects (students of Abdelmalek Essaâdi University), maximum tolerated error margin fixed at 3%, stratified cluster sampling with three layers, expected frequency of the parameter fixed at 50%.

The final sample size was n = 1200 students including non-responses cases and unreturned questionnaires.

Of the 1200 questionnaires retained from participants, 53 questionnaires were eliminated due to incomplete answers. The final sample size for this study was 1147 participants.

Instrument

The administered questionnaires included an Arabic version of the Drug Use Disorders Identification Test (DUDIT) and a background questionnaire. The background questionnaire contained questions regarding the participants' sociodemographic status, such as "What is your marital status?" unhealthy behaviors, like "Do you smoke?", and health-related inquiries, for instance, "In the past month, have you taken medication for depression?" These questions were closed-ended, with responses being either multiple choice or yes/no.

The DUDIT is a self-report instrument designed to evaluate the level of drug consumption, including illicit drugs, prescription drugs, and non-prescription/over-the-counter (OTC) drugs, in both general and clinical populations. The test comprises 11 items aligned with DSM-IV diagnostic criteria. Items 1 through 9 are scored on a 5-point Likert scale, while items 10 and 11 use a 3-point Likert scale. The total score, which is the sum of all item scores, indicates the severity of drug use behavior, with higher scores reflecting more significant drug use (Berman et al., 2004). The DUDIT has been widely utilized, including in the USA (Voluse et al., 2012), Norway (Lobmaier et al., 2013), Hungary (Matuszka et al., 2014), and the Netherlands (Hildebrand & Noteborn, 2015). It has demonstrated good internal consistency (Berman et al., 2004; Martin et al., 2014) and excellent reliability (Hildebrand & Noteborn, 2015; Landheim et al., 2006; Nesvåg et al., 2010). The Arabic version of DUDIT was translated and validated by Sfendla et al. (2017) across three Moroccan samples: a clinical sample, a prison sample, and a high-school student sample, showing excellent internal consistency (.95). In this study, the DUDIT exhibited excellent internal consistency (.93).

Data Analysis

Since the data did not follow a normal distribution (skewness = 5.5 and kurtosis = 35.18), non-parametric tests were conducted to compare different groups' scores on the DUDIT. All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) 21.0 (IBM) software for Windows.

Ethical Considerations

The present study was conducted in agreement with the Declaration of Helsinki (World Medical Association, 2013). Participants were invited to participate voluntarily; they received an oral presentation of the study and its aims and had the right to withdraw from the study at any time without giving a reason. Those who agreed to participate in the study signed a written informed consent form.

A request to conduct the study was sent to the presidents and directors of every institution included in this study where a prior authorization was obtained before collecting the data.

RESULTS

Sociodemographic Characteristics of the Study Sample

The study sample consisted of n = 703 (61.1%) females and n = 444 (38.6%) males with a mean age of 20.00 (SD = 2.6) years (range: 17 to 49 years). Most of the participants reported to be single (88.8%), to live with their parents (70.2%), and to not work (90.6%). Additionally, 16.6% of the participants reported consulting the hospital because of a physical problem

during the past month. The medication with the highest use during the past month was anxiety medication while the lowest was sleep problems medication. Further, 9.4% participants were currently consuming alcohol, 13.1% of the participants were currently smoking, and 5.6% of the participants reported to gamble (Table 1).

Table 1
Sample description

	n	%
Gender		
Male	444	38.6%
Female	703	61.1%
Marital status		
Single	1021	88.8%
In a relationship	94	8.2%
No longer in a relationship	13	1.1%
Living arrangements		
With parents	807	70.2%
With father alone	17	1.5%
With mother alone	90	7.8%
Alone	134	11.7%
With other family member	74	6.4%
Employed students	108	9.4%
Medical record		
Somatic problem	191	16.6%
Depression medication	42	3.7%
Anxiety medication	87	7.6%
Sleep problems medication	53	4.6%
Lifestyle habits		
Alcohol consumption	108	9.4%
Smoking	151	13.1%
Gambling	64	5.6%

Drug Use and Associated Factors

The comparison of DUDIT scores among the different groups revealed significant differences: between male participants and female participants (Z = -10.28, p = .000), between participants who have a job and those who do not (Z = -4.06, p = .000), between participants who smoke and those who do not (Z = -18.80, p = .000), between participants who consume alcohol and those who do not (Z = -15.18, p = .000), between participants who gamble and those who do not (Z = -7.09, p = .000), between participants who reported taking medication for depression in the past month and those who did not (Z = -2.22, p = .026), between participants who reported taking medication for anxiety in the past month and those who did not (Z = -2.31, p = .021), and between participants who reported taking medication for sleep troubles

Table 2
Non-parametric tests of different groups scoring on DUDIT

	Mean (n)	*SD*	*Z*	*P*
Gender				
Male	1.81 (290)	5.01	-10.28	.000
Female	.2 (510)	1.33		
Having a job				
Yes	2.14 (51)	5.89	-4.06	.000
No	.68 (749)	3.02		
Consuming alcohol				
Yes	6.11 (66)	8.23	-15.18	.000
No	.29 (734)	1.73		
Smoking				
Yes	5.51 (94)	7.54	-18.80	.000
No	.18 (706)	1.33		
Gambling				
Yes	4.18 (33)	8.50	-7.09	.000
No	.62 (767)	2.78		
Taking medication for depression in the past month				
Yes	2.29 (21)	6.88	-2.22	.026
No	.73 (779)	3.13		
Taking medication for anxiety in the past month				
Yes	1.52 (44)	4.54	-2.31	.021
No	.72 (756)	3.20		
Taking medication for sleep in the past month				
Yes	2.61 (36)	6.30	-3.262	0.01
No	.68 (764)	3.05		
Living arrangements (a)				
With parents	.66 (571)	3.05	X^2 = 12.85	.012
With mother alone	.37 (59)	3.05		
With father alone	-	-		
Alone	1.83 (103)	5.45		
With other family member	.5 (54)	1.80		

Note: DUDIT = Drug Use Disorders Identification Test; a = the comparison test was conducted with the Kruskal-Wallis test; the P-value is significant at a 5% level.

in the past month and those who did not (Z = -3.262, p = .001). In addition, a significant difference was found when comparing DUDIT scores of participants reported different living arrangements ($X2(4)$ = 12.85, p = .012) (Table 2).

DISCUSSION AND CONCLUSIONS

Drug Dependence among Different Groups and Associated Risk Factors

In this study sample, it was found that male students use drugs more frequently than female students. This result aligns with several studies showing that males are more likely to use drugs than females (Carliner et al., 2017; Jules et al., 2015). This difference can be partially attributed to biological differences between males and females, including neurological and physiological distinctions. Additionally, differences in social roles between genders in the population may influence the prevalence of drug use (Becker et al., 2016). For instance, the societal and cultural structure of the Moroccan population can impact the gender difference found in DUDIT scores since female substance use behavior is not tolerated which may limit their drug use behavior (Herouach & el Bahraoui, 2020). Nonetheless, the same explanation can reflect that the female students who participated in this study provided biased information. However, future research should focus on studying social and environmental variables associated with this gender difference. Additionally, the development of intervention strategies and programs is important and should target both genders equally.

In terms of employment, we found that employed participants scored significantly higher on DUDIT than jobless students. This result is the opposite of what Lee et al. (2015) and Melchior et al. (2015) studies suggested, which indicated that unemployed young adults have a higher prevalence of drug use than employed young adults. This study result can be explained by the fact that, for college students, having a job brings more financial resources and independence, which facilitates the means and the conditions for drug use (Farrell et al., 2003; Humensky, 2010). Another possible explanation is that college students face a lot of stress, which could escalate because of employment, and stress is considered a main cause of drug use (Hunt & Eisenberg, 2010; Pedrelli et al., 2015).

In this study, alcohol consumption influences DUDIT scoring significantly, suggesting it can be a risk factor for developing drug-related problems. These results are in line with Fearn et al. (2016), Newton-Howes & Boden's (2016), and Caamaño-Isorna et al. (2011) studies, where alcohol consumption was highly related to the development of drug-related problems. In fact, alcohol consumption was found to provoke imbalances in several neurotransmitters such as serotonin, dopamine, gamma-aminobutyric acid, glutamate, and acetylcholine which dysregulate reward, motivation, and decision making processes in the brain (Yang et al., 2022). Furthermore, those dysregulations were suggested to increase the likelihood of using other substance, leading to other drug-related problems (Uhl et al., 2019).

Additionally, the findings of this study suggest that smoking can be a risk factor for developing drug-related problems as well. This claim is supported by several studies (Caamaño-Isorna et al., 2011; Delgado-Lobete et al., 2020; Newton-Howes & Boden, 2016; Strong et al., 2016). One possible explanation for this result is based on the gateway hypothesis, which posits that alcohol and smoking behavior often precede the use of illicit drugs (Kandel & Kandel, 2014). This theory suggests that substance use behavior follows a gradual pattern where individuals start with less harmful substances. These substances make the user's brain more receptive to other drugs, normalize drug-taking behavior, and reduce inhibition and increase impulsivity, thereby increasing the likelihood of using stronger drugs.

Moreover, this study's findings suggest that gambling can also be a risk factor for developing drug-related problems. This result was supported by several studies (Bischof et al., 2013; Peters et al., 2015). A possible explanation for this result can be based on the fact that gambling was found associated with several neurotransmitters that are imbalanced in alcohol consumption (Potenza, 2013). Furthermore, gambling is often associated with smoking and alcohol consumption, and for college students, social motivators for drinking (such as being accepted among peers) can also increase the risk of drug use problems (LaBrie et al., 2007). Therefore, it will be interesting for future studies to evaluate the degree of involvement of neurotransmitters and social learning theory in drug-related problems.

In terms of somatic and mental health problems, participants who reported to consult the hospital because of a physical problem during the past month and those who reported taking medication for depression and anxiety during the past month scored significantly higher on DUDIT than participants who did not. This result supports previous study results that suggested a strong association between prior physical

and mental health problems and drug use behavior (Degenhardt et al., 2018; Walters et al., 2018). However, this study could not determine whether the physical and mental health problems or drug use occurred first. Future research should address this limitation. Additionally, a significant association was found between sleep disturbances and higher DUDIT scores, consistent with Tang et al. (2015) study, which found that sleep problems are more common among drug users. Moreover, sleep disturbances may contribute directly to initial drug use and the development of drug use disorders (Roehrs & Roth, 2015).

This study highlights several factors associated with drug use behavior among a representative sample of college students from the Abdelmalek Essaâdi University. It identifies gender, alcohol consumption, smoking, gambling, and medication for depression, anxiety, and sleep problems as potential risk factors for drug use behavior. Future research should further explore these variables within the college student demographic to aid policymakers and university administrators in developing effective treatment and intervention strategies.

Limitations of the Study

The study has some limitations. The first one is the cross-sectional nature of the study, which did not allow us to investigate drug use behavior over a determined period of time in order to examine possible changes and associated factors. The second limitation is the specific nature of the study sample, which does not allow the generalization of the results for other populations.

FUNDING

No funding was received for the conduct of this research.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

ACKNOWLEDGEMENTS

Our special thanks to Ben Ayad Lamiae, who was a significant help.

AUTHORS CONTRIBUTION

HBA performed research design, data collection, data analysis, and manuscript formulation. AN performed research design, sample size calculation, and manuscript verification. MS carried out the conceptualization, research design, and verification of manuscript.

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