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Cross-sectional Study

Prevalence of anxiety and depression among engineering students consuming cannabis

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ABSTRACT

Objective: Drug abuse is common among patients with mental disorder. The use of cannabis is likely to be associated with mental-health issues. The aim of this study is to investigate the prevalence of anxiety and depression among cannabis user in engineering college and associated demographic factors.

Methods: In this study, 100 cannabis-consuming engineering students of (XXX) were selected by snowball sampling. After confirmation of cannabis use and individual selection according to DSM-5 criteria, Beck anxiety and depression inventories were used to access prevalence and severity of anxiety and depression among the participants. Demographic information such as age, gender, education and town of residence were also filled in a research questionnaire for analysis.

Results: The overall frequency of people with anxiety in the population of cannabis users was 60% and the overall frequency of people with depression was 33%. The frequency of cannabis users was highest in the age range of 24–25, in men and participants with diploma. The prevalence and severity of anxiety and depression was not significantly associated with age, gender, education and town of residence among the participants, $p > 0.05$.

Conclusion: Due to the higher frequency of anxiety and depression disorders in cannabis users in this study compared to the general population, cannabis use is likely to be associated with anxiety and depression.

1. Introduction

Drug abuse and dependence is a major concern in today's world and affects that effect all the age groups and generations. In 2007, $193 billion was the estimated cost of illicit drug use, attributed to crime, health and productivity [1]. Cannabis is the most commonly used trafficking drug, with the peak of onset between adolescence and mid-adulthood and is more prevalent among young adults. In 2017, about 3.8% of world's population was reported to use cannabis. The rate of cannabis consumption has been increased in the United State between 2001 and 2002–2012 and form 10.5%–21.2% [2]. In Iran, the use of this drug is now widespread and over time, the age of onset of experience is decreasing. From 2016 to 2020, the prevalence of cannabis use in Iran was 4.9% [3].

Cannabis is known for its behavioral and psychological effects. These effects include feelings of happiness, relaxation, changes in perception of time, decreased concentration, and learning disabilities. In general, the effects of cannabis can be divided into short-term and long-term. Short-term effects include anxiety, panic attacks, memory loss, and an increased risk of symptoms of mental disorders [4]. The long-term effects of cannabis are usually physical effects, including coughing, excessiveness of chest sputum, severe mental, behavioral, cognitive, and depressive disorders [5]. Extensive studies have shown that people with mental illness are 2.7 times more likely to experience substance abuse than others. Since the use of cannabis is associated with cognitive and behavioral disorders and due to its progressive nature in all aspects of life (mental, physical, social, economic, political, cultural, etc.), it endangers the health of the individual, family and society [5–7]. In almost all addiction research, personality factors are considered as the factors that lead a person to addiction. Prominent features of addicts include psychopathy, depression, feelings of tension, insecurity, feelings of inadequacy, and difficulty in establishing warm and long-lasting social relationships. About 2% of drug addicts have a psychiatric disorder. The most common comorbid psychiatric diagnoses include major depressive disorder, alcohol-related disorders, antisocial personality disorder, schizophrenia, bipolar disorder and anxiety disorder, and about 5.9% of drug addicts attempt suicide at least once in their lifetime [8,9].

The aim of this study is to evaluate the prevalence of anxiety and

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depression among engineering college students consuming cannabis and its association with demographic factors.

2. Methods

This descriptive cross-sectional study was performed on 100 engineering students of (XXX) with a history of cannabis abuse, who were selected through snowball sampling. In this way, the first-person using cannabis was approved and selected based on DSM-5 criteria, and the next person was selected by introducing the first and last person. Participants were provided complete details of the study and written consent was obtained for the participation in this research.

Demographic information such as age, gender, education and place of residence and the status of their history of cannabis use was obtained from the participants. In order to assess the state of anxiety and depression, the student completed these two questionnaires, provided in Appendices 3 and 4, respectively. Inclusion criteria of the study were students studying in one of the technical-engineering fields at (XXX), having cannabis abuse based on DSM-5 criteria and consent to participate in the study. Students with family history of depression and anxiety, those who were unable to complete the questionnaire, history of other psychiatric disorders, alcohol or other substance abuse, and those who did not consent to participate in the study were excluded.

Diagnosis of cannabis abuse in students according to DSM-5 criteria was made by interview. Criteria for identifying substance abuse (cannabis) include 11 parameters. Having at least two of these symptoms over a 12-month period in a person indicates cannabis abuse in the person. 11 diagnostic parameters include: use more than one item of the planned amount, inability to reduce or stop consumption, spend a significant amount of the day gaining, using, or recovering from substance use, intense tendency to use, frequent use causing inability to meet important social or professional goals, continuous use causing frequent problems at work, school or home, inability to play a role in important social, professional or leisure activities due to overuse, having a serious physical condition or feeling traumatized, continue to do so despite the user being aware that his or her physical or mental condition is deteriorating (with continued use), need to use large amounts of material to achieve the desired effects and certain physical problems that increase with a decrease of substance in the body. After obtaining the necessary criteria by the individual to diagnose cannabis abuse, Beck Anxiety and Depression Inventories were completed by the students, participating in the study.

2.1. Beck Anxiety inventory

The Beck Anxiety Assessment Questionnaire has 21 questions, and the four options of each question are scored in a four-part ranging from 0 to 3. Each of the test items describes one of the most common symptoms of anxiety (mental, physical, panic symptoms). The total score is in the range of 0–63. Based on studies, this questionnaire has good validity and reliability in the population of our country. Based on the scores, the participants were categorized as 0–7 (no anxiety), 8–15 (mild anxiety), 16–25 (With moderate anxiety and above 25 (with severe anxiety).

2.2. Beck Depression Inventory

Beck Depression Inventory has 21 questions, and each question is divided into four grades based on its severity and scores from zero to three. A score of zero indicates the lowest rate and a score of 3 indicates the highest intensity of the experience, which is a sign of depression. The sum of the scores of each questionnaire can be between 0 and 63. This questionnaire is used to assess the severity of depression in people over 13 years old. The validity and reliability of this questionnaire has also been evaluated and confirmed in our country [10]. Based on the scores, the participants were divided into four categories: 0–13 (minimum depression), 19–14 (with mild depression), 20–28 (With moderate depression) and 29–63 (with severe depression). Subsequently, the association of the frequency of participants in these categories (related to anxiety and depression) was calculated with demographic parameters such as level of education, place of residence, age and gender.

100 cannabis users were descriptively analyzed in terms of mean age, gender distribution, location-based distribution, academic education, and the presence and severity of anxiety and depression. The data was statistically analyzed using SPSS v25. The association of participants' age with the presence and severity of anxiety and depression was analyzed by *t*-test and ANOVA test, respectively. Gender, education, and place of residence of consumers with the presence and severity of anxiety and depression were analyzed by Fisher exact test and Chi-square test, respectively. To perform all statistical tests and represent graphs, PRISM software version 8 was used. $P < 0.05$ was considered to be statistically significant.

This study was approved by the Research Ethics Board of (XXX).

Unique identifying number is: researchregistry:7600.

The methods are stated in line with STROCSS 2021 guidelines [11].

3. Results

Of 100 students included in the study, 68% were males and 32% were females. The mean age of the participants was 24.1 ± 3.75 years. 45% of the participants had diploma, 24% were graduates and 31% were doctorate. 50% of the participants were living in Tehran and 50% in other cities. 40% of the participants had no anxiety, 32% had mild, 19% moderate and 9% participants had severe anxiety. 67% participants did not have depression 9% had mild, 17% had moderate and 7% had severe depression, Table 1.

3.1. Prevalence of anxiety in our study compared to the global community

The frequency of anxiety in the population of cannabis users in general and by gender in comparison with the global community is presented in Fig. 1. The results show that the frequency of this disorder in our study population is significantly higher than the global statistics.

3.2. Prevalence of depression in our study compared to the global community

Fig. 2 shows the prevalence of depression in the population of cannabis users in general and by gender in comparison with the global community. The results show that the frequency of this disorder in our study population is significantly higher than the global statistics.

Table 1
Demographic characteristics of the participants in the study.

Parameter	Category	N (percentage %)
Gender	(Male)	68
	(Female)	32
Age	–	75/3 ± 1/24[a]
Education	(Diploma)	45
	(Expert)	24
	(Ph.D)	31
Address	(Tehran)	50
	(Others)	50
Anxiety	(None)	40
	(Mild)	32
	(Moderate)	19
	(Sever)	9
Depression	(None)	67
	(Mild)	9
	(Moderate)	17
	(Sever)	7

[a] Quantitative and qualitative variables are shown as mean ± standard deviation and number (percentage), respectively.

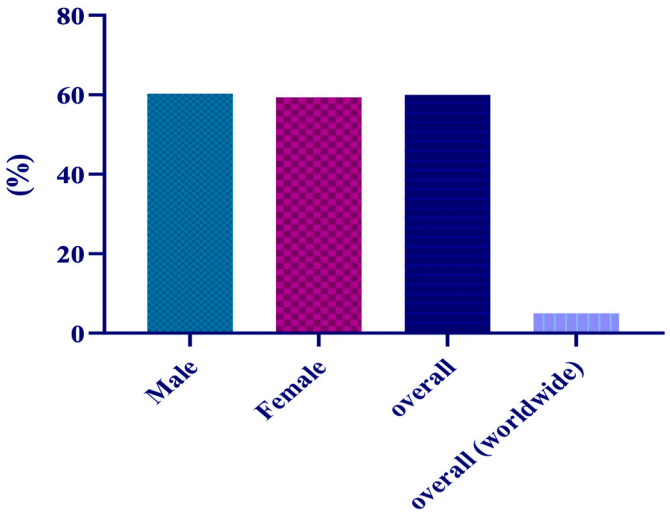

Fig. 1. Frequency of anxiety in the participants of this study and the global community.

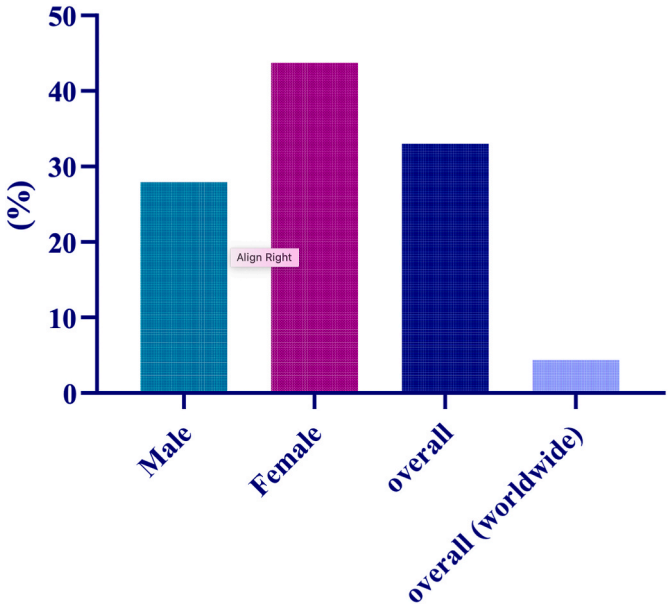

Fig. 2. Frequency of depression in study participants and the international community.

3.3. The relationship between age and anxiety and depression

It was observed that in the study population, people aged 25-24 had a higher frequency of anxiety and depression. However, prevalence of anxiety and the severity of anxiety were not significantly associated with the age of the participants, p = 0.21 and p = 0.17, respectively.

Similarly, prevalence and severity of depression was also not significantly associated with the age of the participants, p = 0.89 and p = 0.57, respectively (Fig. 3).

3.4. The relationship between gender and anxiety and depression

The overall prevalence of anxiety and depression was greater in males than female. Statistical analyzes showed that, the gender of the participants was not associated with prevalence and severity of anxiety, p > 0.9 (OR = 0.96, 95% CI = 0.41 to 2.21) and p = 0.38, respectively. Similarly, prevalence and severity of depression was also not associated with the gender of the participants, p = 0.25 (OR = 1.76, 95% CI = 0.76 to 4.40) and p = 0.25, respectively.

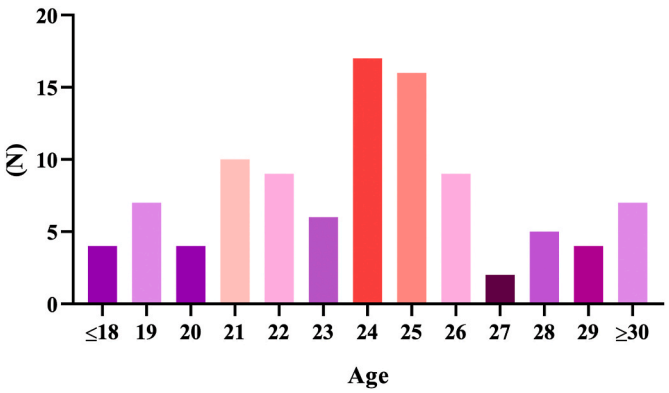

Fig. 3. Distribution chart of cannabis consumption participants by age.

3.5. The relationship between education and anxiety and depression

The overall prevalence of anxiety and depression was greatest among diploma students. The prevalence and severity of anxiety was not associated with the education of the participants, p = 0.66 and p = 0.74, respectively. Prevalence and severity of depression was also not associated with the education of the participants, p = 0.3 and p = 0.63, respectively (Fig. 4).

3.6. The relationship between town of residence and anxiety and depression

The prevalence of anxiety of same in participants living in Tehran and outside Tehran. The prevalence of anxiety and depression was not associated with the town of residence of the participants, p = 0.83 and p = 0.63, respectively. The prevalence and severity of depression was not associated with the area of residence, p > 0.99 and p = 0.84, respectively.

4. Discussion

Our study reports greater prevalence of anxiety and depression in these patients compared to other global studies, however, the prevalence and severity of anxiety and depression was not seen to be associated with the age, gender, education and the town of residence of the participants.

The number of drug users is increasing day by day among the youth and students. Considering the role of various biological, psychological

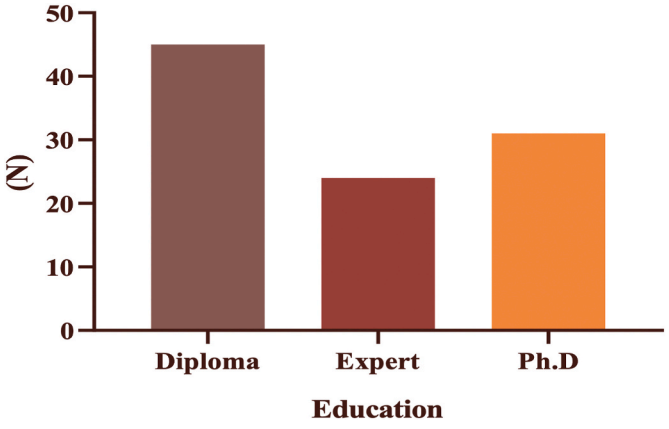

Fig. 4. Distribution chart of participants based on degree.

and social factors in the occurrence and persistence of drug dependence, identification and treatment of people with or on the verge of anxiety and depression, especially in students is important. The prevalence of anxiety disorders worldwide varies from 2.5 to 7.3% in different countries. Globally, it is estimated that 284 million people suffered from anxiety disorder in 2017, making it the most common mental illness or neurodevelopmental disorder (18), and in general, more women than men reported anxiety (19). The lifetime prevalence of psychological disorders in Iran has been 10.8% and anxiety disorders with a prevalence of 8.4% have been reported as the most common disease (20).

Depression is a common mental disorder. Worldwide, more than 264 million people of all ages, or 4.4% of the world's population suffer from depression. Depression is one of the major causes of disability and accounts for a large share of the overall burden of disease in the world. Women are more affected by depression than men. (21, 22). Based on studies in Iran, the total prevalence of depression is 4.1%. The prevalence is 4.8% in women and 2.3% in men, indicating its prevalence as 1.95 times more in female gender (23). As mentioned earlier, cannabis is the most common drug for youth abuse in the world. The effect of cannabis use in young people on mental disorders has been studied. Cannabis use in young people is associated with an increased risk of depression, anxiety, and suicide ideation (24–27). In a longitudinal cohort Swedish study including 8589 participants, it was reported that the use of cannabis was not associated with the increased risk or prevalence of depression and anxiety. The prevalence of cannabis use was reported to be 16.5% in this study. The study reported that the use of cannabis is significantly associated with age, gender, education, country of birth, childhood abuse, other substance and alcohol abuse, familial tension and financial pressure [12]. In a systematic review and meta-analysis, Gobbi, Atkin [2] reported that cannabis consumption in adolescence is positively associated with suicidal ideation and development of depression. It is also reported that 12-week reduction in cannabis use leads to improvement in anxiety, depression, and sleep quality. In another study that examined the association of cannabis use in people with anxiety, it was found that general anxiety symptoms showed a direct relationship with subsequent recurrence of cannabis use (OR: 1.23, 95% CI: 1.08–1.41). Anxiety was also associated with 25% increased risk of transmission from non-consumer to cannabis user (OR: 1.25, 95% CI: 1.09–1.44) [13]. Another study examined the trend of cannabis use among depressed youth from 2004 to 2016. The findings of this study showed that cannabis use has increased among young people with and without depression during these years. However, young people with depression were more than twice as likely to use cannabis as those without depression (12.86% vs. 6.40%) [14]. A review study was conducted to investigate the relationship between cannabis use and academic achievement among young people. There was a significant correlation between cannabis use and a wide range of functional measures including lower GPA, lower satisfaction with education, negative attitude towards education and poor academic performance [15]. In the present study, the views of cannabis consumers regarding education and the impact of this substance on academic achievement were not examined. However, the results of cross-sectional studies cannot be used to determine whether cannabis use causes poor educational performance, as it is not possible to determine whether poor educational performance is one of the causes of cannabis use or whether both outcomes are a set of common risk factors. The increasing prevalence of drug use among students underscores the importance of examining the impact of this issue on students' academic performance.

Our study does not report any significant difference in terms of prevalence of anxiety and depression among the two genders. Despite the use of cannabis is greater in men than women, the progression of cannabis use disorder is greater in female gender. Differences in the endocannabinoid system and its exposure in the brain of female due to larger amygdala volume, social anxiety disorders and early onset of schizophrenia are some known causes of these differences [16,10]. However, our study does not investigate in this respect.

Our study is limited to small sample size and factor such as childhood trauma or abuse can affect depression and anxiety in individuals, which is not evaluated in our study. Biochemical factors associated with anxiety and depression are also not reported and serum levels of tetrahydrocannabinol. Therefore, further studies are required in this area.

5. Conclusion

According to the results obtained in the present study, the overall frequency of people with anxiety in the cannabis population was 60% and the overall frequency of people with depression was 33%, which in both cases is higher than the global statistics and even our country. The frequency of cannabis users was higher in the age range of 24–25 and in men and those with diploma. Our study did not report significant correlation between anxiety and depression in cannabis user and age, gender, education, and town of residence. Increased prevalence of cannabis use and depression and anxiety might require psychological and psychiatric treatment, in addition to mental health awareness program.

Ethical approval

All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Sources of funding

No funding was secured for this study.

Author contribution

Dr. Roya Vaziri-harami: conceptualized and designed the study, drafted the initial manuscript, and reviewed and revised the manuscript. Dr. Mohammadreza Tarom: Designed the data collection instruments, collected data, carried out the initial analyses, and reviewed and revised the manuscript. Dr. Saharnaz Vaziri-harami: Coordinated and supervised data collection, and critically reviewed the manuscript for important intellectual content.

Trial registry number

1. Name of the registry: N/a
2. Unique Identifying number or registration ID: IR. SBMU.MSP.REC.1399.042

Hyperlink to the registration (must be publicly accessible): https://ethics.research.ac.ir/ProposalCertificateEn.php?id=131398&Print=true&NoPrintHeader=true&NoPrintFooter=true&NoPrintPageBorder=true&LetterPrint=true.

Consent

From the under 16 years old was given by a parent or legal guardian.

Guarantor

Roya Vaziri-harami.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Availability of data and material

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

Declaration of competing interest

The authors deny any conflict of interest in any terms or by any means during the study.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.amsu.2022.104144.

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