

Impulsivity and its connection with cannabis use among college students: The case of the University of Veracruz

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Research Article

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Abstract

Background

Cannabis is the most widely used drug in the world, and in Mexico, it has the highest usage rate among young people. This trend is particularly evident among university students who are in a stage of transition and exploration. Several factors contribute to this increase, including high social acceptance, a low perception of risk, a heavier academic workload, and less parental supervision. Impulsivity plays a crucial role in this context, as various studies have linked it to risky behaviors, including substance use. Therefore, the objective of this study was to examine the relationship between impulsivity and cannabis use among students at the University of Veracruz, Mexico.

Methods

This study employed a quantitative, correlational, cross-sectional, and nonexperimental methodology. The sampling technique was no probabilistic, and the instruments used were the UPPS-P (impulsivity) and CAST (cannabis use) scales.

Results

The sample comprised 101 participants, all of whom were active users. The sex distribution included 47 females, 49 males, and 5 nonbinary individuals, with a mean age of 21.7 years (± 2.5 years). The majors with the greatest number of users were psychology (39 participants) and medicine (27 participants). Just over half of the participants (55.4%) presented a low risk of addiction, whereas only 18.8% presented a severe risk. The highest mean scores were recorded in the Sensation Seeking and Positive Urgency dimensions, with scores of 10.2 and 9.7, respectively. However, statistically significant associations were found only between levels of addiction risk and two factors: lack of perseverance and lack of premeditation.

Conclusion

A lack of premeditation and perseverance is significantly linked to higher risk levels for cannabis addiction among students at the University of Veracruz Health Area. These findings underscore the importance of addressing specific aspects of impulsivity in prevention programs, student counseling, and future research on risk behaviors among young university students.

Background

Cannabis is currently the most widely used drug in the world, with 228 million users (UN, 2024). Within the Mexican context, it leads the way as the substance with the highest rate of experimentation among young people, according to data from the Ministry of Health (2023). In university settings, particularly, growth has been more evident, as reflected in figures from recent years (ENCODE, 2014).

In this sense, impulsivity is identified as a relevant factor within this context since it is considered a personality trait associated with the manifestation of risky behaviors, including substance use (Méndez et al., 2021). Some studies have shown a significant relationship between impulsivity levels and problematic drug use, including cannabis use (O'Donnell et al., 2021). Therefore, we consider it essential to demonstrate the correlation between the two variables in our research.

The complexity of impulsivity

Impulsivity is a complex concept defined as the tendency to react spontaneously to immediate stimuli. It is characterized by thoughtlessness and a lack of careful consideration, often leading to risky behaviors (WHO, 2019/2021). Impulsivity is recognized as a trait included in the diagnostic criteria for various disorders in the DSM-5-TR (American Psychiatric Association, 2024). It is primarily linked to difficulties in behavioral inhibition and self-control, which can result in a propensity to engage in risky activities and challenges in delaying immediate gratification (Sánchez, Giraldo, & Quiroz, 2013).

This trait can manifest through various biological, cognitive, and behavioral processes. Owing to its complexity, studying impulsivity requires a multifaceted approach. This work specifically focuses on the psychological perspective of impulsivity.

Whiteside and Lynam's multivariate model

Whiteside and Lynam (2001) view impulsivity not as a single, homogeneous trait but as a multifaceted construct. On the basis of Costa and McRae's (1995) NEO-PIR model, Whiteside and Lynam proposed a multifactorial model of impulsivity comprising the following factors: urgency, lack of premeditation, lack of perseverance, and sensation seeking (cited in Abella Pons et al., 2015; Squillace, Janeiro, & Schmidt, 2011; Sperry et al., 2016). A fifth factor was later added to the model: positive urgency (Sperry et al., 2016; Cándido et al., 2012). These are the dimensions used in the present study to evaluate the relationship between impulsivity and cannabis use.

The link between impulsivity and substance use

Although substance use is not strictly considered an impulsive behavior, certain factors, including a history of impulsivity, can lead to a more frequent and intense tendency in the individual who uses it, ignoring its possible repercussions (Moeller et al., 2001).

Chronic drug use can lead to impaired functioning of frontocortical areas, decreasing the ability to inhibit appropriate responses to certain stimuli (Tziraki, 2012), or generating significant alterations in frontostriatal, cingulate, and hippocampal regions, as well as changes in learning, motivation, and executive functions (Verdejo, 2011); planning; thinking flexibility; and decision-making (Ruiz & Prospero, 2014).

Research has shown several interesting patterns regarding cannabis use. For example, a study by O'Donnell (2021) revealed that cannabis users generally prefer immediate rewards over delayed rewards and tend to display higher levels of impulsivity than nonusers do. Additionally, the research conducted by Wagner, Oliveira, and Paloski (2022) indicated that individuals with cannabis use disorders who also consume alcohol experience more significant difficulties in inhibiting their responses and have trouble concentrating while completing tasks. This background motivated the present research to evaluate how specific dimensions of impulsivity relate to cannabis use in Mexican university students.

Methods

This research aimed to investigate the relationship between impulsivity and cannabis use among students in health sciences at the University of Veracruz, Mexico. A nonexperimental, cross-sectional, correlational quantitative study involving 101 participants who completed self-administered questionnaires that included the UPPS-P scale to measure impulsivity and the CAST scale to assess cannabis use was conducted.

Participants and recruitment

These 101 participants from a total of 285 were selected via nonprobability sampling, which employs the intentional technique. The inclusion criterion for this study was that students be actively enrolled in undergraduate programs related to the health field (specifically psychology, medicine, nursing, nutrition, and bioanalysis) from February to May 2025. The participants needed to accept the privacy terms outlined in the questionnaire, be of legal age, and have used cannabis within the last 12 months. Those who frequently used illicit substances other than cannabis were excluded from the study. Recruitment was conducted through posters and advertisements that briefly explained the research, with a QR code directly linking participants to the researcher to facilitate access to the study.

Measures

Two instruments were utilized to measure various aspects of impulsivity within the cannabis-using population. The short-span version of the UPPS-P Impulse Behavior Scale (Whiteside & Lynam, 2001) was used to assess impulsivity, whereas the Argentine version of the Cannabis Abuse Screening Test (CAST), developed by Legleye et al. (2007), was employed to evaluate cannabis consumption.

Table 1
Scales for assessing the dimensions of impulsivity

Scales	Overview	Reliability and validity
Impulse Behavior Scale (UPPS-P) de Whiteside y Lynam (2001).	This scale assesses five dimensions of impulsivity traits. It is an abbreviated version developed by Cándido et al. (2012), which is based on the brief French adaptation by Billieux et al. (2012). The scale consists of a total of 20 items divided into five dimensions: Negative Urgency, Lack of Premeditation, Lack of Perseverance, Sensation Seeking, and Positive Urgency. Responses are scored using a Likert-type scale.	The instrument demonstrated internal reliability, as indicated by Cronbach's alpha, which ranged from 0.61 to 0.81, suggesting acceptable consistency. In 2022, Pinter, González, and Resett re-evaluated its properties within the Argentine population and reported a Cronbach's alpha ranging from 0.69 to 0.79. Validity was assessed through an external approach, examining the associations between facets of impulsivity and emotional regulation strategies. Initially, validated by Cabello et al. (2009), the instrument was further assessed by Pinter, González, and Resett in the Argentine context. Additionally, two expert judges reviewed the terminology for equivalence, making minor adjustments as necessary.
Cannabis Abuse Screening Test (CAST) de Legleye et al. (2007).	The screening scale measures problematic cannabis use and was validated in Argentina by the Argentine Drug Observatory in 2016. It consists of six items based on the DSM-IV substance abuse criteria. The scale uses a Likert-type format for responses, which are then dichotomized to create a summation index ranging from 0 to 6. This index helps distinguish the risk level of cannabis consumption among users (Argentine Drug Observatory, 2016).	According to the Argentine Drug Observatory (2016), Cronbach's alpha was measured at 0.735. The validity of the measurement was assessed using Pearson's coefficient of association, which indicated generally "moderate" correlations, with a correlation coefficient of less than 0.30. Additionally, the overall discrimination index was found to be greater than or equal to 0.39 (Argentine Drug Observatory, 2016).

Results

Statistical analysis

Descriptive statistics included absolute numbers, frequencies, means, and standard deviations. Pearson's chi-square test was employed to analyze the correlation between the UPPS-P and CAST dimensions.

Table 2
Descriptive analysis of categorical variables

Variable	Category	Frequency (%) (n = 101)
Gender	Female	46.5
	Male	48.5
Career	Psychology	38.6
	Medicine	26.7
	Nutrition	10.9
	Bioanalysis	9.9
	Nursing	13.9
Tobacco use	Yes	12.9
	No	87.1
Alcohol consumption	Yes	24.8
	No	75.2
Caffeine consumption	Yes	22.8
	No	78.2
Cannabis use	Low risk of addiction	56
	Moderate risk of addiction	26
	Severe risk of addiction	19

A total of 285 participants responded to the instruments, with an average age of 21.1 ± 2.5 years and a gender distribution of 52.3% (n = 149) male, 43.5% (n = 124) female, 2.5% (n = 7) nonbinary, and 1.4% (n = 5) who preferred not to speak. Of these, 101 reported cannabis use and formed the primary focus of the study analysis, which will be described below. Within this subgroup, the average age was 21.7 ± 2.5 years. Regarding gender distribution, 48% (n = 49) were male, 47% (n = 47) were female, and 5% (n = 5) identified as nonbinary. With respect to substance use, the distribution was as follows: 24.8% consumed alcohol, while 75.2% did not; 22.8% consumed caffeine, while 78.2% did not; and 24.8% used tobacco, while 87.1% did not.

Since the sample consisted of university students in the health field, the distribution based on careers was 38.6% (n = 39) in psychology, 26.7% (n = 27) in medicine, 13.8% (n = 14) in nursing, 10.9% (n = 11) in nutrition, and 9.9% (n = 10) in bioanalysis. With respect to the risk of cannabis addiction, 55.4% (n = 56) had a low risk of addiction, 25.7% (n = 26) had a moderate risk of addiction, and only 18.8% (n = 19) had a severe risk of addiction.

Table 3
Descriptive analysis of continuous variables

Variable	Category	Average	SD	Min	Max
Age		21.7	2.5	18	33
Impulsivity	Negative urgency	9	3.1	4	16
	Lack of premeditation	7.9	3	4	16
	Lack of perseverance	8.5	3.1	4	16
	Sensation seeking	10.2	3	4	16
	Positive urgency	9.7	3.1	4	16

With respect to the impulsivity variable and its five respective dimensions, *Sensation Seeking* had the highest mean score, 10.2 (SD = 3), followed by *Positive Urgency* with 9.7 (SD = 3.1), *Negative Urgency* with 9 (SD = 3.1), and *Lack of Perseverance* with 8.5 (SD = 3.1). The dimension with the lowest mean score, 7.9 (SD = 3), was lack of premeditation.

Table 4
Correlation between Risk of Addiction and Lack of Perseverance

	Value	df	Asymptotic significance
Pearson's Chi square	17.24	6	.008
Reason	19.52	6	.003
Number of valid cases	101		

In the hypothesis test aimed at examining the relationships between impulsivity dimensions and the risk of cannabis addiction, Pearson chi-square tests were conducted for each of the five dimensions. Among these dimensions, two were particularly significant: lack of premeditation and lack of perseverance.

Table 5
Risk of addiction and lack of perseverance

	Value	df	Asymptotic significance
Pearson's Chi square	22.25	6	.001
Reason	24.40	6	.000
Number of valid cases	101		

Statistically significant associations were identified between addiction risk level and lack of premeditation, with $X^2(6) = 17.24$ and $p = 0.008$ (99.02% confidence interval). Similarly, when assessing addiction risk levels in relation to Lack of Perseverance, the results indicated $X^2(6) = 22.25$ and $p = 0.001$ (99.09% confidence interval).

These findings suggest a dependency between cannabis use and the dimensions of lack of premeditation and lack of perseverance within the impulsivity construct. This implies that impulsivity and cannabis use are not independent variables and that the observed differences in frequencies between the categories are not due to chance but rather reflect a genuine relationship between the two variables.

Discussion

Although this research focused on cannabis use, the relationship between impulsivity and cannabis use shows similar trends in previous research, such as that of Michelini, Rivarola and Pilatti (2021), whose results identified an association with a higher frequency of risky sexual behaviors in Argentine University students with recurrent substance use.

While this study focused only on trends in the consumption of legal substances such as caffeine, alcohol, and tobacco, it did not examine how these trends were related to impulsivity. However, research by Cedillo (2022) revealed that factors such as sex, the age at which consumption begins, and the frequency of excessive consumption episodes are associated with specific dimensions of impulsivity.

The examined relationship between cannabis use and lack of premeditation was statistically significant. While lack of premeditation is conceptually linked to inhibitory control, it contrasts with previous research findings. Studies by Cavalli and Cservenka (2020) and Lucchetta (2021) revealed no evidence of inhibitory control dysfunction or impaired processing speed among cannabis users. However, it is important to consider the differences between the population groups relevant to this study.

Furthermore, the results are consistent with Caballero and Quintero (2025), who suggested that cannabis use negatively impacts cognitive functions such as memory and attention, subsequently affecting academic performance in university students. Similarly, studies by Suárez (2019) and Áviles and Petrillo (2018) revealed inverse relationships between cannabis use and academic performance as well as between cannabis use and procrastination.

In contrast, research by Moraga et al. (2024) and Bohórquez et al. (2022) has linked cannabis use and other substances to emotional dysregulation or as coping strategies for negative emotions. In this study, however, no relationship was found between cannabis use and dimensions such as positive urgency or negative urgency, which are associated with impulsive behavior under intense emotional states.

The results indicated a significant relationship between cannabis use and both lack of premeditation and lack of perseverance; however, the analysis does not determine the direction of this association. It remains uncertain whether impulsivity leads to cannabis use or whether cannabis use contributes to impulsivity. This presents an opportunity for further research on whether cannabis use in specific university contexts is linked to coping mechanisms or emotional regulation.

These findings could help identify students at greater risk for problematic cannabis use and inform the design of university prevention programs. Such programs could focus on strengthening planning and perseverance strategies and skills, and they may also complement intervention plans for users facing challenges in these areas.

Among the main limitations of this study are the use of self-report instruments, the cross-sectional design, and the small sample size in certain groups, all of which affect the objectivity of the research and the generalizability of the results to other contexts. Additionally, there was insufficient control over extraneous variables, including a history of mental disorders related to impulsivity, the presence or absence of pharmacological or psychological treatment, socioeconomic background, and family history of substance use.

Conclusion

A lack of premeditation is associated with difficulty anticipating or preventing potential consequences of actions due to a lack of reflection. Moreover, a lack of perseverance implies an inability to maintain focus on tasks that require effort or perseverance. The finding of significant associations between these dimensions and cannabis use in university students indicates that, in neither case are the variables independent of each other, nor is their relationship due to chance.

These links may suggest that obstacles to planning tasks, anticipating consequences, or maintaining consistency in routine do not occur in isolation from use but are intertwined with it, generating risk patterns.

Declarations

Ethics declarations

Ethics approval and consent to participate

All students participating in the study provided their consent for the information obtained to be used for research purposes and for their data to be kept anonymous. Furthermore, pursuant to Article 17 of the Regulations of the General Health Law on Health Research in Mexico, the study is classified as risk-free research.

Also, the research was approved by the Research Coordination of the Faculty of Psychology at the University of Veracruz.

Consent for publication

All authors reviewed and approved the final version of the manuscript for submission.

Competing interests

The authors declare that they have no competing interests.

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