



Tendency to use substances based on negative affectivity and sensation seeking with the mediating role of self-efficacy: Structural equation modeling

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Abstract

Introduction: The study aimed to investigate the mediating role of self-efficacy in the relationship between sensation seeking and negative affectivity in students' tendencies towards addiction.

Materials and Methods: The statistical population consisted of the students of Lorestan University, Iran, in the 2022-2023 academic year. We selected 384 individuals, and they fulfilled the General Self-Efficacy Scale, The Positive and Negative Affect Schedule (PANAS), Zuckerman's Sensation Seeking Scale, and the Iranian Addiction Preparedness Scale. Descriptive analysis was conducted using SPSS software, while analytical data was examined through the structural equation modeling approach with AMOS software.

Results: The positive relationship between sensation seeking and negative affectivity with the tendency to use substances, as well as the indirect relationship between sensation seeking and negative affectivity through self-efficacy and the tendency to use substances, was confirmed ($P= 0.001$).

Conclusion: Sensation-seeking and negative affectivity increase substance use, while self-efficacy reduces it. Experts should conduct training to discourage sensation-seeking and enhance self-efficacy among university students.

Keywords: Behavior, Negativism, Self-efficacy, Substance use

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Introduction

One of the main concerns is substance and alcohol consumption (1). Substance use has

become irreparable due to physical and psychological consequences, and it will leave destructive effects on the individual and society

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(2). Substance use changes a person's mood and behavior by creating lasting changes in the brain (3). Substance use disorders have wide connections with other disorders and are considered as their antecedents and consequences (4). It is important to identify the factors that increase addictive behavior and desire to consume. It is possible to prevent the harms of addiction by identifying these factors and planning to change and treat them.

Negative affectivity (NA) is a term introduced by Watson and Clark (1984) for an aspect of the mood context (5).

NA is considered a pervasive individual difference in negative sensationality and self-concept. Individuals with high NA are more likely to show increased levels of sensationality, including subjective feelings of agitation, tension, negative worry, and low self-esteem. Research has found that negative affectivity is significantly associated with alcohol consumption and issues in sensation regulation (6). Therefore, from the theoretical point of view and related research, the orthogonal relationship of negative affectivity as a character field and anxiety and depression as the fields and consequences of addiction on the one hand, and its relationship with addiction and alcohol and substance consumption on the other hand, justifies its entry into this the model. Sensation seeking is a significant aspect influencing the propensity toward risky behavior and substance abuse (3). In developmental psychology, sensation seeking is understood as behavior linked to a lack of perception of risk and is viewed as a reward-driven system that evolves (7).

Excitement comprises various facets, such as adventure, seeking new experiences, combating boredom, and avoiding inhibition (8). Numerous studies have explored the correlation between excitement seeking and the inclination towards risky behavior and substance use (3,7-9). Siraj et al.'s study, involving teenagers, exhibited a direct and notable impact of excitement seeking and peer influence on risky behavior (9). Self-efficacy is one of the constructs introduced by Albert Bandura (10). Self-efficacy is a person's belief in his/her general and specific abilities (11). In the case of addiction, self-efficacy refers to a person's belief about resistance to substance use (12). Self-efficacy follows the increase of effort, perseverance, and motivation of the individual (13). General self-efficacy refers to a person's ability to act in different situations (14), while specific self-efficacy refers to acting in special situations and tasks (10). Self-efficacy is a mechanism through which self-management can be achieved (15). Exploring the impact of the mentioned variables on substance use readiness can help prevent its actualization. Understanding effective mechanisms in this context enhances predictive power, fostering innovation in research. As pivotal figures in society's future, young individuals necessitate tailored prevention strategies.

Given the historical need for comprehensive approaches and studies on psychological factors like self-efficacy and negative affectivity, this research fills a crucial gap. The current study delves into the interplay of anxiety sensitivity, excitement seeking, and negative affectivity in university students' substance readiness, depicted in Figure 1.

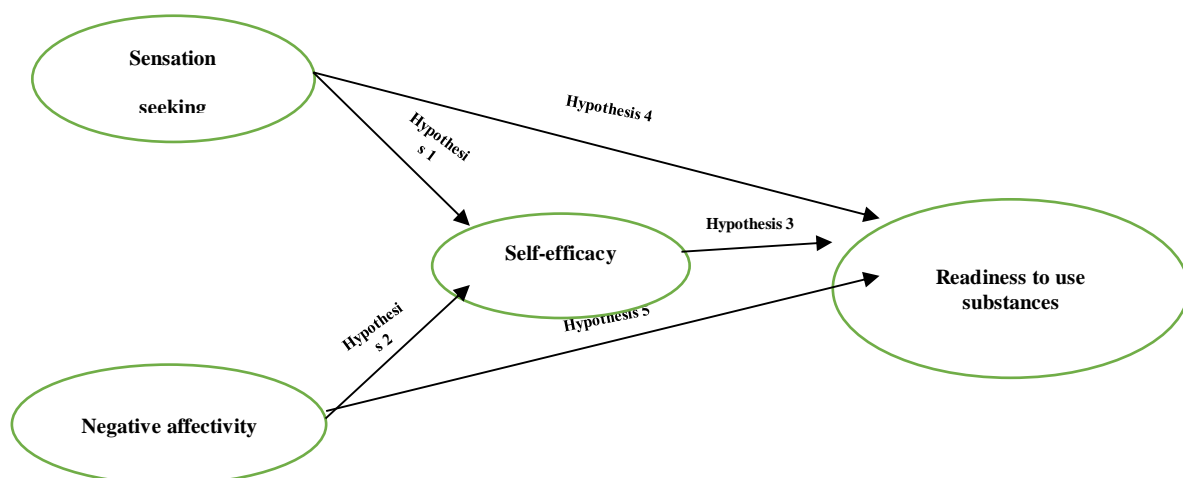


Figure 1. The initial conceptual model of tendency to addiction based on the characteristic of sensation seeking and negative affectivity with the mediating role of self-efficacy

Materials and Methods

The research is in the descriptive correlation modeling category regarding its practical objectives and data collection. Recent statistics indicated that 8998 students were studying at Lorestan University. We determined the sample size using Morgan's table, which recommended 368 participants based on the statistical population; however, 390 individuals were selected to ensure the robustness and reliability of the sample size. Factors such as cost-effectiveness, health considerations, disease prevention, and questionnaire completion ease led to the utilization of convenient sampling techniques and online surveys. The inclusion criteria included being a student at Lorestan University, voluntary informed consent, and the lack of psychiatric disorders. The exclusion criteria involved failure to complete the questionnaire. Following the specified criteria, 390 individuals initially participated, with six later excluded due to incomplete questionnaire responses. Consequently, the data related to 384 participants were analyzed.

Research instruments

A) The General Self-Efficacy Scale (GSE-17): It was designed by Sherer and Maddux (1982). The short version has 17 questions. The total score ranges from 17 to 85. The higher scores present higher levels of belief in one's self-efficacy, and lower scores indicate lower self-efficacy. Cronbach's alpha method obtained coefficients of 0.86 and 0.71 for general and social self-efficacy subscales (16,17). The validity and reliability of the Persian version were measured through correlation with similar and related scales and Cronbach's alpha, and its validity and reliability were emphasized (18).

B) The Positive and Negative Affect Schedule (PANAS): This scale was developed by Watson et al. (1988) (19). This scale has two subscales of 10 questions, measuring ten positive affect (items 1 to 10) and ten negative affect scales (items 11 to 20). The negative affect subscale was used in this research. This 5-point scale is scored from 1 to 5.

The maximum and minimum scores in each subscale are 10 and 50. Watson et al. mentioned the Cronbach's alpha coefficient of 0.70 for its reliability (19). In Iran, Sharifi et al. examined the validity and reliability of the mentioned scale and reported the reliability coefficient using Cronbach's alpha method of 0.77 (20). Its reliability was also measured through factor analysis. Also, Bakhshi et al. reported the convergent and divergent validity of both scales as appropriate (21).

C) Zuckerman's Sensation Seeking Scale (ZSSS): In this scale, each item contains two choices, and this scale is scored as zero and one; a score of 1 means a person's sensation seeking. The total score ranges from zero to 40. This scale has four items, each of which includes ten items. The components include disinhibition, experience-seeking, adventure-seeking, and boredom. In other countries, the reliability coefficients of 0.83 up to 0.86 are reported (22). Mahvi Shirazi validated the fifth form of this scale (23). Hatami Nejad et al. obtained a reliability coefficient of 0.83 (3).

D) Iranian Addiction Preparedness Scale (IAPS): Weed and Butcher (1992) developed this scale (24), and efforts have been made to validate it in Iran. The questionnaire consists of two factors and has 36 items and five lie detector items. The reliability of this scale with Cronbach's alpha method was 0.90 (25). Haji-Hasani et al. reported a reliability of 0.87 (26).

We analyzed the data using SPSS-22, Pearson correlation, descriptive statistics, and variable correlation analyses, while AMOS24 software facilitated the final research model development.

Results

The descriptive findings revealed that out of 384 university students, 146 were men (38%) and 238 were women (62%). Their mean age was 24.06 ± 5.05 years. Among them, 260 were undergraduates (67.7%), and 124 were master's students (32.3%). Most of them were single (79.9%). Table 1 presents the descriptive results.

Table 1. Descriptive statistics of the variables

Variables	Mean	SD
Experience seeking	8.11	2.26
Adventure seeking	9.22	2.04
Boredom	7.60	2.23
Disinhibition	8.19	4.17
Negative affectivity	25.01	8.86
Self-efficacy	61.91	11.55
Readiness to use substances	58.03	9.60

The mean and standard deviation of the scores are displayed in the table above. The skewness and kurtosis of the variables are within the range of -2 to +2, indicating normality and suitability for structural equation modeling analysis. Before data analysis, assumptions of

structural equation modeling and normality distribution of the variables were assessed using the Kolmogorov-Smirnov test ($P > 0.05$). The sample correlation matrix, fundamental to structural equation modeling, is presented in Table 2.

Table 2. Correlation between research variables

Variable	1	2	3	4	5	6	7
Experience seeking	1						
Adventure seeking	0.609*	1					
Boredom	0.570*	0.752*	1				
Disinhibition	0.598*	0.640*	0.697*	1			
Negative affectivity	0.398*	0.339*	0.341*	0.361*	1		
Self-efficacy	-0.369*	-0.422*	-0.460*	-0.497*	-0.441*	1	
Readiness to use substances	0.570*	0.574*	0.630*	0.625*	0.488*	-0.631*	1

* $P < 0.01$

Table 2 reveals a significant correlation among all research variables. The Durbin-Watson statistic of 1.84 was used to test the hypothesis of no autocorrelation in the research error. As the calculated value was within the range of 1.5 to 2.5, it confirmed the absence of autocorrelation assumption. Additionally, the assumption of collinearity for the exogenous variable was assessed using Tolerance and

Variance Inflation Factors (VIF). The results confirmed the collinearity assumption, as the tolerance coefficient in all variables was close to 1, and the VIF values were less than the critical limit of 2. The Kaiser-Meyer-Olkin (KMO) index (0.93) and Bartlett's test ($P < 0.01$) confirmed that the prerequisites for structural equation modeling were met (27).

Table 3. Fit indices and final model

Fit indicators	Recommended amount	Structural model
(CMIN)	-	26.385
(DF)	-	10.00
(X^2/Df)	1-3	2.683
(RFI)	≥ 0.90	0.961
(CFI)	≥ 0.90	0.988
(NFI)	≥ 0.90	0.982
(TLI)	≥ 0.90	0.976
(RMSEA)	> 0.08	0.065
(PClose)	> 0.05	0.178

According to the results of fitting the final model in Table 3, a non-significant Chi-square showed a favorable result. However, in this, the degree of freedom is also important.

The more the degree of freedom of the model is far from the degree of freedom of a saturated model, and the closer it is to the degree of freedom of an independent model, the more the model will be favorable. The goodness of fit indices of the model showed a number above the level of 0.9, which indicated a favorable situation.

The root mean square error of the model estimation was 0.008, less than 0.1, and finally, the Chi-square ratio on the degree of freedom between the values was acceptable.

Therefore, the model was a good fit based on the obtained results. Regarding the results of the final model of Figure 2, sensation seeking, negative affectivity, and self-efficacy predicted the behavior of readiness to use substances ($R^2 = 0.63$), and there was also a statistically significant relationship between the variables of sensation seeking and negative sensationality; they explained the changes in the variance of the self-efficacy variable to the extent of ($R^2 = 0.33$). Moreover, there was also a statistically significant relationship between sensation seeking ($\beta = 0.51, P = 0.001$) and self-efficacy ($\beta = -0.30, P = 0.001$), and negative affectivity ($\beta = 0.14, P = 0.001$), with the behavior of readiness to use substances.

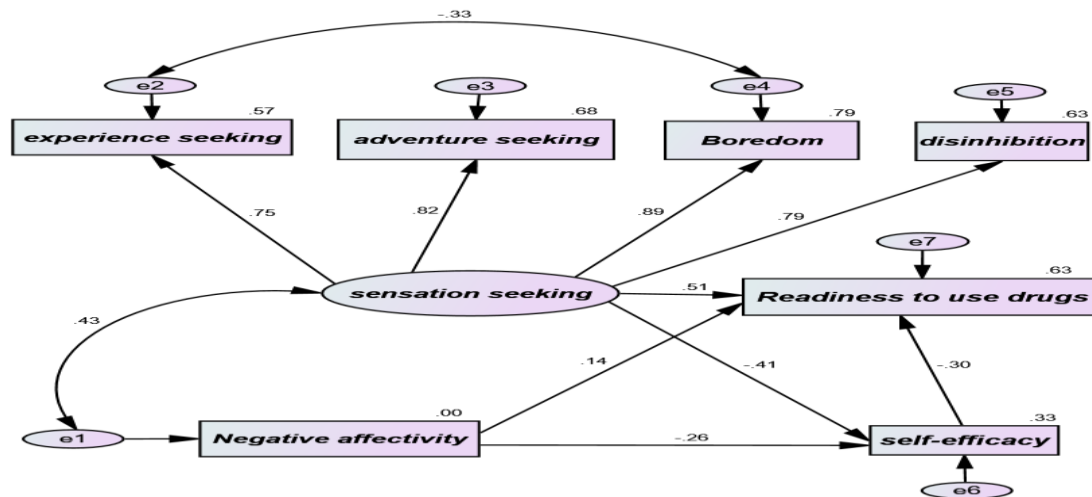


Figure 2. The final research model

Discussion

The findings indicated that the proposed model fits well. Since sensation seeking has been introduced as a factor in creating risky behavior, possible losses can be significantly reduced by improving self-efficacy. In explaining this hypothesis, sensation-seekers are more curious about internal and external experiences, and their life requires gaining new experiences.

These people enjoy unconventional and unusual values. On the other hand, self-efficacy means a person's belief in success in a particular matter, and it helps to overcome life's challenges. Considering that sensation seekers perform tasks out of curiosity or high adrenaline secretion, are always looking for new experiences, and forget past tasks, they have low performance in their efficiency field and need more tolerance for performing tasks.

By the results of this study, Darasian Salmasi and Rezakhani discovered that sensation seeking has a positive and significant direct impact on Internet addiction and a notable inverse relationship with self-efficacy. They assessed 240 female high school students. The research tools included Sherer's Self-Efficacy Questionnaire, Zuckerman's Sensation Seeking Scale, and Young's Internet Addiction Questionnaire (12).

In another study, Baretta, Greco, and Steca examined 129 divers and demonstrated an adverse and negative correlation between excitement-seeking and self-efficacy (28). The second result discusses the relationship between negative affectivity and self-efficacy.

In this line, Cohrdes and Mauz conducted a cohort study on children and adolescents in Germany. The results indicated that negative emotionality adversely impacts self-efficacy. Additionally, they identified self-efficacy as a protective factor (11). Meanwhile, Kiekens et al. studied 30 teenagers who had engaged in non-suicidal self-injury within the previous year. Their findings indicated that negative affect increased self-injurious behavior (30).

People with self-efficacy are more stable in facing stressful events and do not attribute negative and catastrophic thoughts to their abilities. Gázquez Linares et al. assessed 1287 students in Spain aged 14 to 18 in compulsory secondary school. They used the Drinking Refusal Self-Efficacy Questionnaire-Revised Adolescent Version (DRSEQ-RA), attitude towards substance use - basic BIP scale, and parents' attitude towards substance use. The results indicated that self-efficacy plays a protective role in shaping attitudes toward substance use, consistent with our findings (31).

Orr et al. studied 132 adult marijuana users to explore cannabis avoidance based on self-efficacy and anxiety sensitivity. Their results highlighted the direct impact of anxiety sensitivity on substance use, showing a significant reciprocal influence. Interestingly, they did not find a direct link between self-efficacy and substance use, contradicting our results (14). According to the findings, there was a positive and direct relationship between sensation-seeking and the tendency to use substances. Celik et al. conducted a cross-sectional study with 650 students, using personal

information forms, the South Oaks Gambling Scale (SOGS), the Zuckerman's Sensation Seeking Scale (ZSSS), and the Brief Resilience Scale (BRS). Their findings indicated a direct link between sensation seeking and gambling addiction (32). In another study, Dodig Hundric et al. examined 641 students aged 18 to 40, revealing a significant positive correlation between excitement-seeking and the frequency of gambling (33). Zhao et al. studied 1050 high school students, employing the sensation-seeking scale, parental control scale, and a risky behavior questionnaire concerning adolescent health. The results demonstrated a direct influence of sensation seeking on students' risky behavior (34). The finding shows a direct and significant relationship between negative affectivity and tendency to use substances. People use sensation-oriented or problem-oriented coping styles when facing life challenges (35). The problem-oriented style requires reflection and finding appropriate solutions to deal with the problem in question. However, in the sensation-oriented style, which has a faster effect, the problem is not solved, and the problem is forgotten temporarily. This style is used intermittently. If the person has not learned proper training in coping styles, the possibility of using sensational and temporary styles increases. Consumption of substances and alcohol is considered one of the most used sensation-oriented styles. Bakhshaie et al. carried out a study on 2080 young adults. Findings indicated a correlation between negative emotions, misuse of opioids, and self-reported addiction (36), which aligns with our findings. A significant aspect of this research is using a large student sample, detailed findings, and structural modeling methods to understand the results better. However, limitations include questionnaire length, potential bias, and self-assessment errors.

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Future research should incorporate qualitative methods, interviews, and clinical observations to address these limitations to enhance accuracy and comprehensiveness. Additionally, future studies should target diverse populations beyond just university students to generalize findings. Longitudinal studies are also recommended to establish causal relationships between risk factors and outcomes in addiction research.

Conclusion

Therefore, negative affectivity can increase substance use as a sensation-oriented strategy. This study explored the relationship between sensation seeking, negative affectivity, and self-efficacy about tendency to use substance.

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Conflicts of Interests

The authors declare no conflicts of interests.

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Ethical Considerations

The researchers introduced the objectives and guaranteed data confidentiality. The present study approved by the ethics committee of Lorestan University of Medical Sciences.

Code of Ethics

IR.LUMS.REC.1402.191

Authors' Contributions

MHN and FM: Concept, design, the definition of intellectual content, manuscript editing, and manuscript review. MHN, FM, MAS, and MO: Literature search, data gathering, data analysis, manuscript preparation, manuscript editing, and manuscript review. FM and MHN: Data analysis, manuscript preparation, editing, and review. MHN, FM, MAS, and MO: Manuscript editing.

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