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Original Article

Marijuana Motivation Measure: Exploratory Factor Analysis among Iranian Young Adults

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Abstract

Background and Objective: The motivation for marijuana use can be a major predictor in actual marijuana use. This study focused on assessing the psychometric properties of the Marijuana Motives Measure (MMM) among young adult marijuana users in Iran.

Materials and Methods: This study was carried out in 2016, involving 166 young adults from Isfahan and Kermanshah, Iran. The study assessed the cultural acceptance, face validity, content validity, construct validity, exploratory factor analysis, and internal consistency of the MMM.

Results: The average age of the respondents was 20.51 years (95% CI: 20.19, 20.82), ranging from 17 to 25 years. Face validity was assessed and approved by a panel of experts. Additionally, content validity was verified using the results derived from the Lawshe table. Five factors were identified based on Eigenvalues of ≥ 1.00 and factor loadings of ≥ 0.40. The variances and the factor load ranges of the MMM factors were respectively as follows: "conformity": 24.860% and 0.635-0.894; "expansion": 16.481 and 0.618-0.823; "coping": 10.499% and 0.686-0.818; "social": 8.900% and 0.676-0.775; and "enhancement": 5.818% and 0.707-0.759. The questionnaire had a Cronbach's alpha of 0.833, with its components showing Cronbach's alpha values ranging from 0.717 to 0.850. This indicates satisfactory levels of internal consistency for each component.

Conclusion: Our findings suggested that the Persian version of MMM is a psychometrically sound questionnaire for measuring marijuana motivation use among Iranian young adults.

Keywords: Conformity, Exploratory factory analysis, Marijuana motives measure, Young adults

Background

Marijuana is the most commonly used substance among adolescents and young adults across the globe [1-3]. A review study in Iran found that from 2016 to 2020, the prevalence of marijuana use in the last 12 months was 4.9% among males and 0.3% among females in the youth population. The trend of marijuana use among males in the youth population and female university students increased significantly from 2000 to 2020 [4]. Another study focusing on young adults reported that mean marijuana use was 4.6 times per week [5].

Marijuana use seems to be on the rise despite being associated with several side effects, such as decreased memory, a higher likelihood of road accidents, increased bronchitis, the risk of psychological disorders (e.g., depression, schizophrenia, and anxiety), as well as social and educational issues, such as dropping out of school [3, 6].

A major concern of marijuana use among adolescents is the distortion of brain development, poor educational outcomes, a decrease in intelligence quotient, and increased risk of using other substances, as marijuana use can be considered a gateway to more dangerous substances [7]. Younger users are more likely to experience the negative psychological effects of regular marijuana use [8]. Moreover, high-risk behaviors, such as aggression and early sexual behavior, may be common among marijuana user [9, 10].

Early assessment of marijuana use is necessary for the development of timely prevention programs; meanwhile, identifying the predictive factors for the use of marijuana, especially psychological determinants, has significant value [11]. Screening scales can help identify susceptible individuals, and this knowledge can guide the development and assessment of public health policies [12]. Most psychometric tools measure disorders related to marijuana use [13]. Whilst this is crucial, it is equally important to assess the motivations behind marijuana use. Motive has a significant role in

marijuana use, especially among early adults. Therefore, assessing the motives for marijuana use can be useful in the development of programs to prevent marijuana use [14]. The Marijuana Motives Measure (MMM) questionnaire includes five factors: enhancement, conformity, expansion, coping, and social motives. This questionnaire has been studied among adolescents and young adults in the United States, France, and the Netherlands to understand its psychometric properties [15-17].

Objectives

In Iran, the use of marijuana is on the rise among adolescents and young adults. However, to the best of our knowledge, there appears to be limited evidence regarding the availability of standardized questionnaires designed to evaluate their motivations for using marijuana. This study aimed to assess the cultural appropriateness, validity, and reliability of the MMM among Iranian young adult marijuana users through various methods, such as exploratory factor analysis (EFA) and internal consistency testing.

Materials and Methods

The current study was performed in the following three phases: 1) cultural adoption of the MMM into the Persian language, 2) construct validity evaluation of the Persian version of the MMM, and 3) internal consistency of the Persian version of the MMM.

Phase 1: Cultural Adoption Evaluation

MMM is a 25-item standard questionnaire that measures five domains: 1) conformity, 2) expansion, 3) coping, 4) social, and 5) enhancement [18]. Each domain comprises five items, and each item is assessed on an ordinal five-point Likert scale. The MMM was translated and adapted into the Persian language according to the standardized technical suggestions [19]. For this purpose, MMM was independently translated from English to Persian by two bilingual health educators with ten years of experience in substance abuse research. These two versions were synthesized by a psychologist into a single Persian version of MMM. This final version of MMM was then back-translated by a native English translator.

Content validity was evaluated by an expert group comprising of five health educators and promoters, two health policymakers, two psychologists, one medical doctor, one addiction specialist, and one healthcare worker. Each person had more than five years of experience in substance abuse research. The group was expected to evaluate the English and Persian versions to determine if they were conceptually similar to the main questionnaire domains. The expert group was asked to rate each item as either completely necessary, useful but unnecessary, or unnecessary. The Content Validity Ratio (CVR) was then calculated based on the necessity and total item scores. The group was also asked if the items measured what they were supposed to measure in order to assess the Content Validity Index (CVI). According to the Lawshe table, the minimum acceptable values for CVR and CVI were 0.62 and 0.79, respectively [20].

To evaluate the face validity, a pilot study was conducted with a small group of experts consisting of 10 individuals. The experts included health educators and promoters, health policymakers, psychologists, medical doctors, addiction specialists, and a healthcare worker. They were responsible for evaluating how well the Persian version of the MMM questionnaire was understood, as well as assessing its difficulty, relevance, clarity, and ambiguity. After the questionnaire was approved by experts, it was distributed among 20 participants, who provided feedback on its items.

Phase 2: Construct Validity Evaluation of the Persian version of the MMM

Construct validity was assessed by calculating the Corrected Item-Total Correlation (CITC) and examining the Kurtosis of MMM items. Additionally, EFA was conducted using VARIMAX, Kaiser Meyer Olkin (KMO), Bartlett test, and Screen plot. Furthermore, the criterion for removing items is considered CITC less than 0.4, Kurtosis value upper than 3, and factor load upper than 0.4. This section was conducted on 166 Iranian early adult marijuana users. Subjects were eligible to participate in our research if they were early adults (17-25 years old) and had a history of marijuana use for at least one year. Participants were recruited at places where they typically used marijuana, such as cafes, bars, restaurants, and university campuses. The samples were selected using the snowball sampling method.

Phase 3: Internal Consistency Evaluation

The Persian version of the MMM was evaluated for reliability using internal consistency analysis with Cronbach's alpha coefficient [21].

Results

The average age of the respondents was 20.51 years (95% CI: 20.19, 20.82), with ages spanning from 17 to 25 years. Of the participants, 15.7% were female, while 84.3% were male. Additionally, 68.7% were university students. Among them, 54.2% indicated that they were in a favorable economic situation, and 10.2% mentioned that their parents were separated.

Face validity was assessed and approved by a panel of experts. Additionally, content validity was verified using the results derived from the Lawshe table.

During the process of quantitative content validity evaluation, all the items were acceptable. Thus, 25 items remained in the questionnaire in the aforementioned dimensions.

The 25-item marijuana motivation use was then subjected to CITC analysis, resulting in the removal of four items: "to celebrate a special occasion with friends," "to be sociable," "because it is exciting," and "to get high," due to acquiring a CITC score of less than 0.4 or a Kurtosis value of upper than 3.

Twenty-one items were used for both explanatory and confirmatory factor analysis. The KMO test, which measures sampling efficiency, resulted in a score of 0.737. Bartlett's Test was also significant ($P<0.001$), indicating that the data was appropriate for factor analysis. By considering Eigenvalues of ≥ 1.00 and factor loadings of ≥ 0.40, five factors were identified, explaining 66.557% of the variation.

The variances and the factor load ranges of the marijuana motivation use factors were as follows: "Conformity (24.860% and 0.635-0.894), expansion (16.481% and 0.618-0.823), coping (10.499% and 0.686-0.818), social (8.900% and 0.676-0.775), and enhancement (5.818% and 0.707-0.759). Additional information about EFA can be found in Table 2.

Additionally, the scree plot diagram displaying factors can be seen in Figure 1.

Table 1. Corrected Item-Total Correlation of the Questionnaire

Determinants	Items	Mean (Std. Deviation)	CITC	Kurtosis
Coping	To forget my worries	3.120	0.535	0.470
	I find it helpful when I am feeling depressed or anxious.	3.198	0.633	0.188
	To lift my spirits when I'm feeling bad.	3.325	0.514	0.219
	To commemorate a special event with friends.	3.361	0.186	-0.112
	To forget my problems.	3.126	0.600	-0.550
Conformity	My friends are pressuring me to use marijuana.	2.548	0.518	-0.823
	To avoid being teased by others for not using marijuana.	2.572	0.715	-0.733
	In order to be accepted by the group that I enjoy being a part of.	3.036	0.636	-0.341
	To be liked.	2.777	0.637	-0.838
	In order to avoid feeling excluded.	2.596	0.789	-0.794
Social	Because it helps me enjoy a party.	3.632	0.603	-0.131
	To be sociable.	3.048	0.291	-0.503
	Social gatherings are more enjoyable when this happens.	3.343	0.443	-0.271
	Hosting events and celebrations is enhanced by this.	3.524	0.680	-0.121
	I feel more self-confident and sure of myself.	3.355	0.634	0.106
Enhancement	Because I like the feeling.	3.614	0.528	-0.413
	Because it is exciting.	3.638	0.378	-0.494
	To get high.	3.325	0.348	-0.933
	I enjoy it because it makes me feel good.	3.506	0.546	0.168
	Because it is fun.	3.415	0.462	-0.266
Expansion	To know myself better.	2.933	0.419	-0.447
	Because it helps me be more creative and original.	3.379	0.650	-0.261
	To understand things differently.	3.445	0.753	-0.648
	To increase my knowledge.	3.319	0.761	-0.878
	To become more receptive to new experiences.	3.066	0.657	-1.251

Table 2. Findings from the exploratory factor analysis and assessment of internal consistency

Items	Component				
	1	2	3	4	5
	Conformity	Expansion	Coping	Social	Enhancement
To forget my worries.			0.779		
I find it helpful when I am feeling depressed or anxious.			0.769		
To lift my spirits when I'm feeling bad.			0.686		
To forget my problems.			0.818		
My friends are pressuring me to use marijuana.	0.635				
To avoid being teased by others for not using marijuana.	0.828				
In order to be accepted by the group that I enjoy being a part of.	0.758				
To be liked.	0.772				
In order to avoid feeling excluded.	0.894				
Because it helps me enjoy a party.				0.775	
Social gatherings are more enjoyable when this happens.				0.707	
Hosting events and celebrations is enhanced by this.				0.737	
I feel more self-confident and sure of myself.				0.676	
Because I like the feeling.					0.707
I enjoy it because it makes me feel good.					0.758
Because it is fun.					0.759
To know myself better.		0.618			
Because it helps me be more creative and original.		0.768			
To understand things differently.		0.823			

To increase my knowledge.		0.822			
To become more receptive to new experiences.		0.749			
Variance%	24.860	16.481	10.499	8.900	5.818
Cronbach's Alpha	0.850	0.838	0.788	0.796	0.717

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

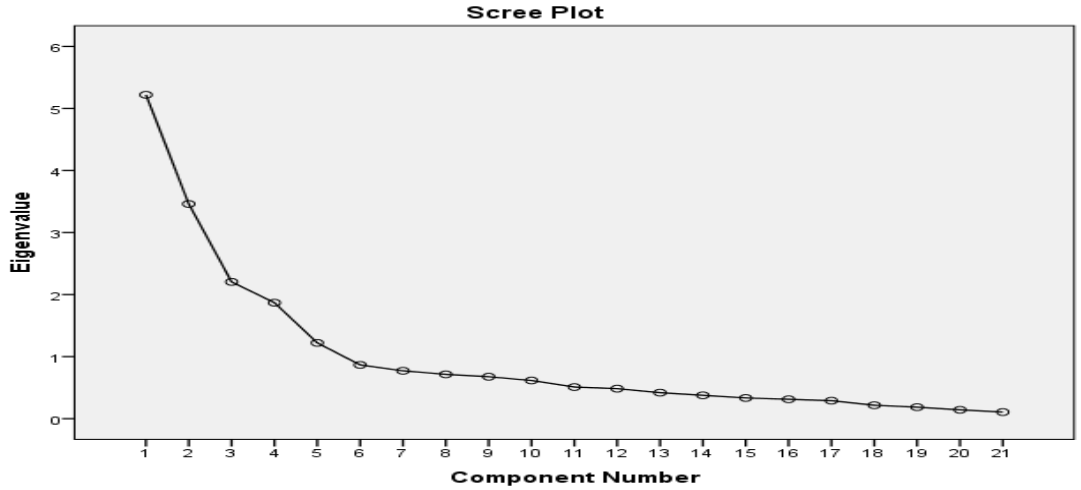

Fig 1. Scree plot of the structures studied among the participants

The reliability of the MMM was assessed by looking at its internal consistency. The questionnaire had a Cronbach's alpha of 0.833, and the Cronbach's alpha values for its components ranged from 0.717 to 0.850.

Discussion

The purpose of this study was to assess the psychometric properties of the MMM in Iranian young adults. The results indicated that the Persian version of the MMM was a valid and reliable tool for assessing motivation for marijuana use.

Our findings demonstrated that the Persian version of the MMM had an appropriate face, content, and construct validity. This finding aligns with those mentioned by other studies. Zvolensky et al. [17] found that the validity of MMM among young adult marijuana users was good. Benschop et al. [15] performed research on 600 young adult marijuana users in the Netherlands and reported that the MMM questionnaire was considered reliable and valid when used with a population of marijuana users. Lee et al. studied 346 marijuana-using college students with the aim of determining the psychometric validation of the MMM questionnaire. They indicated that all areas of the questionnaire had a satisfactory status in terms of validity and reliability [22].

However, it is noteworthy that four items in the original MMM questionnaire, including one item of coping (to commemorate a special event with friends), one item of social (to be sociable), and two items of enhancement (because it is exciting, and to get high) lacked validity in the current study. Therefore, it was deleted from the Persian version of MMM. Overall, the MMM is a valid questionnaire to measure marijuana motivation use among Iranian young adults.

Our research showed that the questionnaire had a Cronbach's alpha of 0.833. The Cronbach's alpha values for its components ranged from 0.717 to 0.850, which aligns with the findings of Zvolensky et al. [17]. They conducted a confirmatory test and assessment of the MMM with 227 young adult marijuana users from both the community and university in Vermont, located in the northeastern United States, and reported the internal consistency of MMM from 0.70 to 0.91 [17]. In addition, Cuttler and Spradlin [13] embarked on a research study with 2,062 marijuana users, and reported the reliability of marijuana frequency, quantity, and age of onset using Cronbach's alpha, yielding values of 0.95, 0.88, and 0.81, respectively. These findings indicated excellent internal consistency.

The findings of the study indicated that five factors were identified, explaining 66% of the variation in MMM, and the conformity component predicted a greater amount of variance in the hypothesized model. Zvolensky et al. [17] indicated that MMM could explain 30% of marijuana use variance, and the enhancement component was related to increased use. Items related to the enhancement component included feelings of pleasure, enjoyment, and fun, while items in the conformity component focused on peer pressure to use and group fitting. These findings indicated that Iranian adults who use marijuana are influenced by others, such as their friends. This finding aligns with

various studies on substance abuse that have recognized and forecasted the influence of peer pressure and subjective norms on behaviors such as cigarette smoking, anabolic-androgenic steroid use, and other forms of substance abuse among adolescents and young adults [23, 24]. This point should be considered in the design of substance abuse prevention interventions among Iranian early adulthood.

Our study has several limitations. This study was conducted only among marijuana users and cannot be extended to other population groups. Furthermore, convergent validity, predictive validity, and confirmatory factor analysis (CFA) were not investigated, and these are recommended to be addressed in future studies in Iran.

Conclusions

Our research indicated that the Persian version of the MMM is a reliable questionnaire for assessing marijuana use motivation in young adults. Our analysis confirmed five domains of MMM among Iranian young adults: coping, conformity, social, enhancement, and expansion. The promising psychometric properties demonstrated in this study suggest that the questionnaire is a valuable tool for assessing marijuana use motivations within this population. Nonetheless, as highlighted in the limitations, incorporating CFA into future research would further strengthen the findings.

Ethical Considerations

The research was authorized by the Ethics Committee at Kermanshah University of Medical Sciences (KUMS) in Kermanshah, Iran (IR.KUMS.REC.1398.1010).

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Authors' Contributions

The study was conceptualized and designed by F.J. and M.M.A. Data analysis and interpretation were done by F.J. and M.M.A. The manuscript was drafted by M.A. and critically revised for important intellectual content by F.J., M.A., and M.M.A. All authors provided comments and approved the final version of the manuscript.

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Conflicts of Interest

The authors confirm that they do not have any conflict of interest.

References

1. Gobbi G, Atkin T, Zytynski T, Wang S, Askari S, Boruff J, Ware M, et al. Association of cannabis use in adolescence and risk of depression, anxiety, and suicidality in young adulthood: a systematic review and meta-analysis. JAMA psychiatry. 2019; 76(4):426-34.[DOI::10.1001/jamapsychiatry.2018.4500] [PMID] [PMCID]
2. Palamar JJ, Le A, Han BH. Quarterly trends in past-month cannabis use in the United States, 2015-2019. Drug Alcohol Depend. 2021; 219:108494. [DOI: 10.1016/j.drugalcdep.2020.108494] [PMID] [PMCID]
3. Romm KF, West CD, Berg CJ. Mode of marijuana use among young adults: perceptions, use profiles, and future use. Subst Use Misuse. 2021; 56(12):1765-1775. [DOI: 10.1080/10826084.2021.1949724] [PMID] [PMCID]
4. Rostam-Abadi Y, Gholami J, Amin-Esmaeili M, Baheshmat S, Hamzehzadeh M, Rafiemanesh H, et al. Evidence for an increase in cannabis use in Iran–A systematic review and trend analysis. PloS one. 2021; 16(8): e0256563. [DOI: 10.1371/journal.pone.0256563] [PMID] [PMCID]
5. Jalilian F, Mirzaei-Alavijeh M, Ahmadpanah M, Mostafaei S, Kargar M, Pirouzeh R, et al. Extension of the theory of planned behavior (TPB) to predict patterns of marijuana use among young Iranian adults. Int J Environ Res Public Health. 2020; 17(6):1981. [DOI: 10.3390/ijerph17061981] [PMID] [PMCID]
6. Taylor M, Collin SM, Munafт MR, MacLeod J, Hickman M, Heron J. Patterns of cannabis use during adolescence and their association with harmful substance use behaviour: findings from a UK birth cohort. J Epidemiol Community Health. 2017; 71(8):764-770. [DOI 10.1136/jech-2016-208503] [PMID] [PMCID]
7. Hasin DS. US epidemiology of cannabis use and associated problems. Neuropsychopharmacology. 2018; 43(1):195-212. [DOI: 10.1038/npp.2017.198] [PMID] [PMCID]
8. Feeney KE, Kampman KM. Adverse effects of marijuana use. Linacre Q. 2016; 83(2):174-178. [DOI: 10.1080/00243639.2016.1175707] [PMID] [PMCID]
9. Ssekamatte T, Nalugya A, Mugambe RK, Wagaba B, Nakalembe D, Mutebi A, et al. Prevalence and predictors of sex under the influence of psychoactive substances among young people in informal settlements in Kampala, Uganda. BMC Public Health. 2023; 23(1):801. [DOI: 10.1186/s12889-023-15679-8] [PMID] [PMCID]
10. Tang Y, Abildso CG, Lilly CL, Winstanley EL, Rudisill TM. Risk factors associated with driving after marijuana use among US college students during the COVID-19 pandemic. J Adolesc Health. 2023; 72(4):544-552. [DOI:10.1016/j.jadohealth.2022.10.027] [PMID] [PMCID]
11. Piontek D, Kraus L, Klempova D. Short scales to assess cannabis-related problems: a review of psychometric properties. Subst abuse treat prev policy. 2008;3:25. [DOI:10.1186/1747-597X-3-25] [PMID] [PMCID]
12. Newton NC, Barrett EL, Castellanos-Ryan N, Kelly E, Champion KE, Stapinski L, et al. The validity of the substance use risk profile scale (SURPS) among Australian adolescents. Addict Behav. 2016 Feb;53:23-30. [DOI: 10.1016/j.addbeh.2015.09.015] [PMID]
13. Cuttler C, Spradlin A. Measuring cannabis consumption: psychometric properties of the daily sessions, frequency, age of onset, and quantity of cannabis use inventory (DFAQ-CU). PloS One. 2017; 12(5): e0178194. [DOI: 10.1371/journal.pone.0178194] [PMID] [PMCID]

14. Schmits E, Quertemont E, Guillem E, Mathys C. Validation of the marijuana effect expectancies questionnaire (MEEQ) in a non-clinical French-speaking adolescent sample. Psychol Belg. 2016; 56(1):23-41.[DOI: 10.5334/pb.263] [PMID] [PMCID]
15. Benschop A, Liebregts N, van der Pol P, Schaap R, Buisman R, van Laar M, et al. Reliability and validity of the Marijuana Motives Measure among young adult frequent cannabis users and associations with cannabis dependence. Addict Behav. 2015; 40:91-95. [DOI: 10.1016/j.addbeh.2014.09.003] [PMID]
16. Chabrol H, Ducongй E, Casas C, Roura C, Carey KB. Relations between cannabis use and dependence, motives for cannabis use and anxious, depressive and borderline symptomatology. Addict behav. 2005; 30(4):829-840. [DOI: 10.1016/j.addbeh.2004.08.027] [PMID]
17. Zvolensky MJ, Vujanovic AA, Bernstein A, Bonn-Miller MO, Marshall EC, Leyro TM. Marijuana use motives: a confirmatory test and evaluation among young adult marijuana users. Addict behav. 2007;32(12):3122-3130. [DOI: 10.1016/j.addbeh.2007.06.010] [PMID] [PMCID]
18. Simons J, Correia CJ, Carey KB, Borsari BE. Validating a five-factor marijuana motives measure: Relations with use, problems, and alcohol motives. J Counsel Psychol. 1998; 45(3):265-273. [DOI: 10.1037/0022-0167.45.3.265]
19. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. Spine (Phila Pa 1976). 2000; 25(24):3186-3191. [DOI: 10.1097/00007632-200012150-00014] [PMID]
20. Lawshe CH. A quantitative approach to content validity. Personnel psychology. 1975; 28(4): 563-575. [DOI: 10.1111/j.1744-6570.1975.tb01393.x]
21. Raykov T. Coefficient alpha and composite reliability with interrelated nonhomogeneous items. Appl Psychol Measurement. 1998; 22(4):375-385. [DOI: 10.1177/014662169802200407]
22. Lee CM, Neighbors C, Hendershot CS, Grossbard JR. Development and preliminary validation of a comprehensive marijuana motives questionnaire. J stud alcohol drugs. 2009 Mar; 70(2):279-87. [DOI: 10.15288/jsad.2009.70.279] [PMID] [PMCID]
23. Jalilian F, Matin BK, Ahmadpanah M, Ataee M, Jouybari TA, Eslami AA, et al. Socio-demographic characteristics associated with cigarettes smoking, drug abuse and alcohol drinking among male medical university students in Iran. J Res Health Sci. 2015; 15(1):42-46. [PMID]
24. Allahverdipour H, Jalilian F, Shaghaghi A. Vulnerability and the intention to anabolic steroids use among Iranian gym users: an application of the theory of planned behavior. Subst Use Misuse. 2012 ; 47(3):309-317. [DOI: 10.3109/10826084.2011.633296] [PMID]