Development and Psychometric Properties of Risk and Protective Factors of Substance Use Scale in Iran: An Application of Social Development Model

**Abedin Iranpour MSc[1], Ensiyeh Jamshidi MSc[2], Nouzar Nakhaee MD[3],
Ali Akbar Haghdoost MD, MPH[4], Davoud Shojaeizadeh PhD[5], Mehrdad Eftekhar-Ardabili MD[6],
Hassan Eftekhar-Ardabili MD,MPH[5]**

Original Article

Abstract

Background: Substance use is a growing public health problem among adolescents. In the lack of a valid and reliable instrument based on social development model (SDM), this study aimed to develop risk and protective factors of substance use scale based on SDM to determine risk and protective factors influencing substance use among adolescents.

Methods: A total of 235 male students from 9th and 10th grade (14-18 years old) of public high schools in Kerman, Iran, selected through multistage cluster sampling. Items pool extracted from the literature and focus groups with male adolescents. Face validity of the questionnaire assessed for readability and clarity of items. Then, an expert panel evaluated the items for content validity. Consequently, construct validity of questionnaire confirmed through exploratory factor analysis (EFA). Known group validity is determined by the degree to which the instrument shows different scores between two groups of those who had an experience in drug use and those who did not have such an experience. In addition, reliability assessed via internal consistency and test-retest.

Findings: About 10 factor solution (containing 38 items) emerged as a result of EFA entitled adolescent's "beliefs on hookah and alcohol," "bonding to parents," "family rules on substance use," "drug resistance skills," "adolescent's beliefs on hard drugs," "situational perception on hookah and alcohol," "rules of school," "situational perception on hard drugs," "attachment to school," and "perceived opportunity at school." The first four emerged factors explained 46% of the total variance observed. Among these factors, adolescent's beliefs on hookah and alcohol explained a more than 25.3% of the total variance. Results indicated satisfactory internal consistency (Cronbach's alpha ranging from 0.71 to 0.85) and intra-class correlation coefficients (ICC) (ranging from 0.48 to 0.81).

Conclusion: The risk and protective factors of substance use questionnaire are the first instrument based on the SDM. The findings showed that this questionnaire is a valid and reliable instrument for assessing determinants of substance use which can be used by researchers and policymakers in preventive initiatives.

Keywords: Substance use, Questionnaire design, Social development model

1- Assistant Professor, Department of Health Education and Promotion, School of Health, Health Research Institute, Tehran University of Medical Sciences, Tehran, Iran
2- PhD Candidate, Community Based Participatory Research Center, Iranian Institute for Reduction of High-Risk Behaviors, Tehran University of Medical Sciences, Tehran, Iran
3- Professor, Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran
4- Professor, Research Center for Modeling in Health, Institute for Future Studies, Kerman University of Medical Sciences, Kerman, Iran
5- Professor, Department of Health Education and Promotion, School of Health, Health Research Institute, Tehran University of Medical Sciences, Tehran, Iran
6- Associate Professor, Mental Health Research Center, Iran University of Medical Sciences, Tehran, Iran
Correspondence to: Hassan Eftekhar-Ardabili MD, MPH, Email: eftkhara@sina.tums.ac.ir

Introduction

Drug use is a serious public health concern. Approximately, 5% of the population around the world are afflicted with some sort of illicit drug use.[1] Despite the relative decrease in substance use in developed countries, this problem is rapidly increasing in developing countries.[2] Currently, there are 1.2-3.3 million people in Iran who consume various types of substances.[2,3]

Drug use is usually started during adolescence, and it is commonly initiated with either smoking or consuming alcohol.[4,5] The results from one such study revealed that about 20% of the 8th grade students have tried at least one type of illicit drug, whereas this amount among 10th and 12th grades of students (16-18 years old) is 38 and 50%, respectively.[6] To date, only a few studies have been conducted on the prevalence of smoking, alcohol consumption, and other types of substance use among Iranian adolescents. A study showed that among high school students in Kerman, Iran [mean age ± standard deviation (SD): 17.9 ± 0.55], 37.7% experienced alcohol consumption, 34.6% smoked cigarettes, and 51.5% used hookah.[7]

Evidence shows that most of the adolescents who begin substance use in early adolescence will experience addiction and the problems associated with it later in life.[8,9] Substance use may lead to increased and/or intensified physical and psychosocial problems, and it has a variety of negative impacts on adolescents' health and welfare. Examples of such problems are increased risk of injury and death due to cases of interpersonal violence, accidental injuries, drowning, high-risk sexual behaviors, inability to use problem solving skills which in turn lead to wrong decisions (or even to suicide in some cases), criminal behaviors, social isolation, and psychosocial problems in subsequent stages of life.[10-12]

In addition to the above-mentioned problems, substance use among the students may lead to declined academic achievement, increased school absenteeism or drop out. All of these issues confront the society masquerading as a serious health, social, cultural, and economic problem.[10] Therefore, recognizing the age of onset for drug use seems quite crucial for policymakers to particularly aim their preventive programs toward this age group and as a result increase the effectiveness of their interventions.[5]

Preventing substance use among adolescents requires the understanding of its underlying causes. Several studies have attempted to determine the relationship between risk/protective factors and substance use among adolescents.[6,13] In general, individual and family factors, school conditions, peer groups, and community play important roles in alcohol, tobacco, and other types of drug use.[13-15]

In recent years, the emphasis on the identification of risk/protective factors, and the implementation of risk reduction/protective enhancement models have been among the most important achievements of the policymakers and theorists in the field of substance use prevention initiative. One of the most successful frameworks in determining the risk/protective factors during childhood and adolescence is social development model (SDM).[6,13,16] The risk and protective processes specified by the SDM serve as potential targets for the prevention or reduction of adolescent drug misuse. This model has shown promise in organizing predictors of risky behaviors. Lonczak et al.[17] demonstrated that SDM has the ability to predict adolescent alcohol misuse. It significantly mediated the effect of age-14 alcohol use on age-16 alcohol misuse.

Results of a study by Cleveland et al.[18] supported the SDM, which proposes that adolescent substance use is related to factors across several spheres of influence. It showed that the individual and peer risk factors were highly related to lifetime and recent use of cigarettes, alcohol, and marijuana. Among the protective factors, there was a strong association between substance use and community domain. Furthermore, family and community factors were more important among younger grades, whereas peer and school factors were more powerful among older adolescents.

Deng and Roosa[19] revealed that SDM is a valuable tool in studying the development of Chinese adolescent delinquent behaviors and mediation processes through which the family environment is related to these behaviors. Choi et al.[16] revealed that this model can be generalized to youth in different racial and ethnic groups. This model can also be utilized to predict later substance use[20] and violence.[21]

Conceptual framework: SDM, as a theory of human behavior, was developed by integrating social control, social learning, and differential association theories.[16] It assumes that social development (a process in which family, school, peers, and the community, acting as socialization units) influences either pro-social or anti-social behaviors in children. In fact, the behaviors formed in socialization process arise from four major constructs: "The perceived opportunities for involvement in conventional activities," "the degree of involvement and interaction," "the social skills necessary for the successful involvement," and "the perceived reinforcement provided by those with whom the individual interacts."[22,23]

The approach taken by SDM to prevent substance use is mainly aimed at strengthening the protective factors while simultaneously weakening the risk factors. SDM explains the underpinning mechanisms through which the risk/protective factors operate to increase or decrease the possibility of the drug use behavior.[22]

Based on a meta-analysis, only 5% of Iranian studies have been conducted on peer groups, and only 11% have chosen family as the focus of their attention.[15] Hence, developing an instrument based on SDM as a comprehensive model which considers the critical role of family, peer group, school, and community in adolescent's drug use seems necessary. It can help to develop preventive interventions and predict risk/protective factors. Another reason to carry out this study was the social roots of behavior. SDM instrument will uncover social mechanisms through which the risk/protective factors operate to affect the possibility of the drug use behavior. Different studies utilized the SDM to develop related tools for assessing risk and protective factors of drug abuse and assessing the effectiveness of preventive interventions.[17,18] Although, the authors could not find any similar studies on SDM and related tools in Middle Eastern countries or in Iranian context which has a high prevalence of drug use as mentioned above.

Therefore, this study conducted to develop a culturally appropriate instrument based on SDM to determine the protective factors influencing substance use among adolescents. The items in the instrument are based on the most frequent drugs consumed by adolescents which include alcohol, tobacco (cigarettes/hookah), opium, and marijuana.[24,25] This instrument can also be used to assess the effectiveness of preventive intervention programs on substance use or to design such programs.

Methods

Risk and protective factors of substance use questionnaire designed based on SDM and comprehensive review of the literature and the related available instruments to generate an item pool. The extracted statements on risk/protective factors for substance use were translated into Persian by two native translators (one expert in health promotion with experience in the area of substance use research and one professional translator). Then, to explore the effect of risk/protective factors on substance use, three focus groups were selected; two from 9th and 10th grade male high school students (n = 12) and the other from school counselors and specialists in substance use research (n = 6). The only inclusion criterion to participate in the interviews was to be a male student in the grade of 9 and 10 in high school.

The preliminary instrument was discussed in a consensus panel (made up of an expert in substance use research, two specialists in health education and promotion, one epidemiologist, and one psychologist) to achieve a refined questionnaire. Drugs were categorized into two distinct groups: "Hard" and "light" drugs. Hard drugs cause heavy addiction and include opium and hashish while light drugs include alcohol and tobacco.

The developed questionnaire consisted of three sections: Questions based on the constructs extracted from SDM which include 50 items and all used a 5-point Likert scale (strongly agree to strongly disagree); the participants' history in substance consumption and their current state of alcohol, tobacco (cigarette/hookah), hashish, and opium use which form 10 items with yes/no response options; and the socio-demographic characteristics of the respondents, such as age, number of household members, education of parents, and living with both parents. The questions related to substance use were asked in two forms; the first group inquired whether the participants had any experience of drug use while the second group was mainly concerned with whether the participants had consumed any substance during the last 30 days. Due to the

sensitive nature of the questions related to the consumption status and socio-demographic variables, the items in this category were placed at the final part of the questionnaire. Then the pilot study was conducted on 26 students. Completion of questionnaires led to the removal of 6 items of questionnaire specially those which were related to drug use in parents and siblings.

Validity

Face validity: Readability, wording, and cultural appropriateness of each item was examined in an informal focus group discussion by seven high school students with different socio-economic statuses (from various neighborhoods of the city) to make sure that the target group understood the items and the responses required by them as intended. The comments of the respondents on the content and meaning of each item led to a number of small changes in the questionnaire.

Content validity: Six specialists including three health education and promotion experts, one epidemiologist, one psychologist, and one substance use researcher reviewed the items of the questionnaire and commented on the 60% of questions. After three stages of correction, their intended amendments were implemented in the questionnaire and a 100% consensus was finally reached at the end of the session. To prevent the acquiescence response bias, both positive and negative questions were included in the questionnaire.

Construct validity: To ensure proper placement of questions in their sub-construct of the questionnaire, an exploratory factor analysis (EFA) was carried out to organize the items in their corresponding groups using principal axis factor fitting procedure and oblique rotation to interpret factor matrices. EFA was also carried out on the data collected from 235 high school students.

To measure the accuracy of the factor analysis and to determine the internal correlation of items, Kaiser-Meyer-Olkin (KMO) coefficient and the Bartlett's test were used. The KMO values between 0.5 and 0.7 were considered as mediocre, values between 0.7 and 0.9 were considered as satisfactory, and values above 0.9 were considered as superb.[25] To retain the factor, the eigenvalues < 1 and factor loadings (correlations between items and the factors) higher than 0.3 (Keiser's criterion) were considered as acceptable.[26] Furthermore, the factor pattern

matrix with principal axis factor and oblique rotation was calculated.

Known group validity: Known group validity was determined by the degree to which the instrument differentiated between the two groups of those who had an experience in drug use and those who did not have such an experience.

Reliability

The internal consistency of the questionnaire was determined by Cronbach coefficient alpha. The alpha values of 0.7 or more were considered as acceptable.[27]

Test-retest reliability

Test-retest reliability was determined using the intra-class correlation coefficient (ICC) considering 95% confidence intervals (CI). A sample of 20 respondents was interviewed 2 weeks after the first interview. The following gauge was used to measure the level of agreement: An ICC value of 0.40 or less presented poor reliability, 0.40-0.75 indicated fair to good reliability while value > 0.75 demonstrated excellent reliability (agreement beyond chance).[28]

The main study and participant

A cross-sectional study was carried out among 9th and 10th grade male students of high schools in Kerman, from January to February 2013. Multistage cluster sampling was employed to recruit 235 adolescents. The inclusion criteria were willingness and having written parental consent for participation. Data were collected through face to face interviews by the principal investigator of the study. The first, the purpose of the study was explained to the participants, and it was mentioned that their involvement in the project was completely voluntary. Then, the researchers assured the participants of confidentiality and anonymity. To ensure privacy and comfort, the interviews were held outside the classroom, either in the corridor or the prayer room (mosque) of the school without the attendance of school officials. The students completed the questionnaire independently, and the necessary guidance was provided for them by the principal investigator. The response time was generally between 20 and 30 minutes and for the most respondents it was up to 25 minutes. The response rate was 95%. The collected data were analyzed using SPSS software (version 16, SPSS Inc., Chicago, IL, USA). P < 0.050 was considered significant.

This study was approved by the Ethics Committee of Tehran University of Medical Sciences, Iran (Code No. 90194). A written consent was also obtained from the parents of students. Furthermore, in all the stages of the study, the Declaration of Helsinki was followed.

Results

Out of 235 students, 6 had not provided any response to more than 20% of the items on the questionnaire and thus were excluded from the study. The age of the respondents ranged from 14 to 18 years old (mean ± SD: 16.17 ± 0.98). About half of the respondents' parents had an elementary and secondary education (48.1% of mothers and 38.7% of fathers). More than 93% of the respondents reported that their parents were living together.

Validity

Construct validity: An EFA was carried out to ensure proper placement of the items in the questionnaire. All items had acceptable internal consistency indices. The KMO coefficient was 0.80, and the Bartlett's test result was also significant (P < 0.001). To calculate the score for each construct, items with a loading factor higher than 0.3 were selected.

Factor analysis was performed on 50 items through a five-point Likert-type scale. As a result, 11 factors emerged based on Eigen values higher than 1 and the interpretation of the results of scree plot. Using scree plot 10 factors were extracted and with eigenvalues > 1, 11 factors. In the expert panel, 11 factors were approved. Hence, the results of eigenvalues were close to expert panel.

In the initial factor analysis, 10 items were unloaded. These items were related to "the perceived amount of opportunities for involvement in conventional activities" (Items No.: 1, 43, 46) and were loaded in Factor 11, but since they resulted in a low Cronbach's alpha, an additional expert panel decided to exclude them. Through the next EFA, 10 factors and 38 items emerged based on eigenvalues higher than 1 and loading levels higher than 0.3 so that 66.1% of total variation was explained by the items. Table 1 contains the rotated factor loadings or factor pattern matrices which show how the items were weighted for each factor and the correlation between items and factors. The columns under the factor headings are the rotated factors that have been extracted.

These factors were named based on the underlying constructs of each item: Adolescent's beliefs on hookah and alcohol (factor 1), bonding to parents (factor 2), family rules on substance use (factor 3), drug resistance skills (factor 4), adolescent's beliefs on hard drugs (factor 5), situational perception on hookah and alcohol (factor 6), rules of school (factor 7), situational perceptions on hard drugs (factor 8), attachment to school (factor 9) and the perceived opportunity at school (factor 10) as shown in table 1. Moreover, there were four items related to peer-substance-use (Table 2) which were excluded from EFA because of the yes/no nature of their responses and their association with various substance types. These four items considered as a separate factor named F11. At this stage and ICC was calculated to determine the items' reliability.

Known-groups validity

Using independent sample t-test, the relationship between the factors of the instrument and substance use was determined (Table 2). The results showed that the most of the constructs (1, 2, 3, 4, 5, 6, 9 and 11) had a significant relationship with alcohol and tobacco use (P < 0.001).

In terms of internal consistency, Cronbach's alpha for the factors of the questionnaire showed an acceptable level (ranging from 0.71 to 0.85). Test-retest reliability showed that in all factors, the mean ICC was above 0.40 (ranging from 0.48 to 0.81) (Table 2).

Table 3 shows the matrix of correlation coefficients for all the constructs. Bivariate Pearson's correlation among pairs of factors and the total score of the substance use of questionnaire found to be in the low to the modest range. The lowest coefficient value (0.04) was attributed to "adolescent's beliefs on hookah and alcohol" factor and the "the situational perception on hard drugs" and the highest value (0.60) was found between the "drug resistance skills" factor and "adolescent's beliefs on hookah and alcohol."

The relationship between the mean score of the factors derived from the questionnaire and substance use history is shown in table 4. It demonstrates that the majority of the constructs have a significant relationship with hookah and alcohol use. Other significant relationships also exist among the constructs of the questionnaire and the history of consumption of hard drugs.

Out of all opium users, only 3 students (1.3%) reported consuming drugs in the past 30 days. Furthermore, 2 students (0.9%) had a history of

cannabis use that had not occurred in the past 30 days prior to the time of the study and so they were excluded from the study.

Table 1. Rotated factor matrix for reduced solution of 38 items in PSDMQ

KMO = 0.80 Total variance = 66.12%	Rotated component matrix[**]									
Items	1[*]	2	3	4	5	6	7	8	9	10
How much do you have the sense of closeness and friendship with those who use cigarette and hookah, and like to behave like them?	0.76									
How much do you have the sense of closeness and friendship with those who drink alcoholic drinks, and like to behave like them?	0.43									
How much do you have the sense of closeness and friendship with those who drink alcoholic drinks, and like to behave like them?	0.74									
How much time do you spend with friends who use drugs, cigarette, hookah, and alcohol?	0.49									
Can alcoholic drinks, opium, hashish, and other drugs be accessed easily in your neighborhood?	0.44									
Do smoking hookah and cigarette, and using alcoholic drinks with your friends strengthen your friendship?	0.73									
Do you like to drink alcoholic drinks?	0.73									
Do you like to smoke hookah?	0.70									
Drinking alcoholic drinks is good for entertainment and recreation.	0.57									
Smoking hookah is good for entertainment and recreation, and is not addictive.	0.60									
How much do you have friendly chats with your parents and enjoy their company?		0.70								
How much do you have the sense of closeness and friendship with your neighbors and relatives, and think that your usefulness is important to them?		0.65								
How is the intimate relationship among your family members?		0.75								
How much are you encouraged by your parents for the good deeds you do, and how much are you questioned and advised for the bad deeds you do?		0.65								
How much do your parents ask for your idea in family-related decision makings and how much do you cooperate with them?		0.52								
Are your parents strict if you use alcoholic drinks?			0.80							
How about smoking hookah or cigarettes? Are they strict?			0.79							
Are your parents strict if you use opium, hashish, and other drugs?			0.84							

Table 1. Rotated factor matrix for reduced solution of 38 items in PSDMQ (Continue)

KMO = 0.80 Total variance = 66.12%	Rotated component matrix[**]									
If my friends invite me to using alcoholic drinks, hookah, cigarette or other drugs, I say no without being shy.				0.79						
If I am in a place in which alcoholic drinks, hookah, cigarette or other drugs are used, I control myself and do not use anything.				0.73						
I am confident in my ability to resist the temptation to smoke hookah or other substances and I do not easily surrender.				0.65						
Do you like to smoke opium?					0.858					
Do you like to smoke hashish?					0.91					
Does smoking opium, hashish, or other drugs with your friends strengthen your friendship?					0.55					
Do you like to smoke cigarette?					0.50					
In your idea, how much of the people at your age smoke hookah?						0.78				
In your idea, how much of the people at your age drink alcoholic drink?						0.72				
Is your school strict about using cigarette and hookah by the students?							0.80			
Is your school strict about using alcohol, opium, hashish, and other drugs by the students?							0.78			
In your idea, how much of the people at your age smoke cigarette?								0.78		
In your idea, how much of the people at your age smoke opium, even if for fancy?								0.86		
In your idea, how much of the people at your age smoke hashish (bang), even if for fancy?								0.74		
How much do you think you like your class and school?									0.42	
How close are you with your teachers and think that you like them?									0.67	
How much do the authorities and teachers of your school ask for your idea in class and school-related decision makings and consult with you?									0.71	
Are there recreational facilities like playground and sport facilities in your school?										0.69
Are there extra-curriculum facilities like computer or extra-curriculum classes in your school?										0.71
How much do you go to places like English and Quran classes in your leisure time?										0.62
Rotation sums of squares	5.37	2.87	2.53	2.45	1.92	1.86	1.86	1.85	1.68	1.37
Initial Eigen values	9.13	2.70	2.18	2.08	1.45	1.42	1.35	1.25	1.15	1.07
Percent of variance explained	25.38	7.52	6.07	5.78	4.02	4.02	3.74	3.49	3.19	2.96

[*]Factor 1: Adolescent's beliefs on hookah and alcohol, Factor 2: Bonding to parents, Factor 3: Family monitoring, Factor 4: Drug resistance skills, Factor 5: Adolescent's beliefs on hard drugs, Factor 6: Situational perception on hookah and alcohol, Factor 7: School's rules, Factor 8: Situational perception on hard drugs, Factor 9: Attachment to school, Factor 10: Perceived opportunity at school, [**]In order to help in decreasing complexity of the table, the loadings above 4 were indicated in bold type
KMO: Kaiser–Meyer–Olkin; PSDMQ: Persian social development model questionnaire

http://ahj.kmu.ac.ir,   7 October

Table 2. Intra-class correlation and Cronbach's coefficient alpha of PSDMQ constructs

Constructs	Number of items	Mean ICC (range)	Cronbach alpha
Adolescent's beliefs on hookah and alcohol	10	0.61 (0.498-0.853)	0.72
Bonding to parents	5	0.52 (0.443-0.612)	0.75
Family monitoring	3	0.51 (0.412-0.631)	0.85
Drug resistance skills	3	0.48 (0.612-0.454)	0.81
Adolescent's beliefs on hard drug	3	0.80 (0.780-0.924)	0.70
Situational perception on hookah and alcohol	2	0.50 (0.491-0.518)	0.77
School's rules	2	0.68 (0.656-0.714)	0.87
Situational perception on hard drug	3	0.63 (0.546-0.714)	0.76
Attachment to school	3	0.65 (0.553-0.786)	0.71
Perceived opportunity at school	3	0.62 (0.516-0.714)	0.68
Peer substance use[*]	4	0.81 (0.784-0.921)	-

[*]This factor was not extracted from factor analysis
ICC: Intra-class correlation; PSDMQ: Persian social development model questionnaire

Table 3. PSDMQ factors correlation matrix

Factors	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11[***]	ATOD lifetime use
F1	1											+0.503[*]
F2	0.315[*]	1										+0.250[*]
F3	0.344[*]	0.236[*]	1									+0.211[*]
F4	0.600[*]	0.259[*]	0.249[*]	1								+0.470[*]
F5	0.459[*]	0.197[*]	0.154[**]	0.257[*]	1							-0.274[*]
F6	0.343[*]	0.181[*]	0.231[*]	0.227[*]	0.117	1						-0.182[*]
F7	0.148[**]	0.355[*]	0.357[*]	0.196[*]	0.074	0.081	1					-0.117
F8	0.045	0.151[**]	0.093	0.077	0.104	0.430[*]	0.088	1				-0.068
F9	0.421[*]	0.453[*]	0.258[*]	0.334[*]	0.096	0.187[*]	0.247[*]	0.141[*]	1			-0.281[*]
F10	0.139[**]	0.294[*]	0.129[**]	0.134[**]	0.068	0.187[*]	0.238[*]	0.105	0.286[*]	1		-0.118
F11	-0.475[*]	-0.267[*]	-0.175[*]	-0.407[*]	-0.158[*]	-0.391[*]	-0.147[**]	-0.137[**]	-0.269[*]	-0.133[**]	1	+0.449[*]

[*]P < 0.01, [**]P < 0.05, [***]Factor 11: Peer substance use (This factor was not extracted from factor analysis.)
ATOD: Alcohol, tobacco, and other drug; PSDMQ: Persian social development model questionnaire

Table 4. Relationship between the history of substance use and the mean scores of the factors (n = 235)

Factors	Substance history						
	Hookah (Hookah) H/L	Hookah (Hookah) (Past 30 days) H/R	Cigarette C/L	Cigarette (Past 30 days) C/R	Alcohol A/L	Alcohol (Past 30 days) A/R	Opium O/L
	P	P	P	P	P	P	P
F1	< 0.001	< 0.001	0.001	0.008	< 0.001	< 0.001	0.192
F2	0.002	0.004	0.001	0.312	0.038	0.028	0.038
F3	< 0.001	< 0.001	0.053	0.930	0.010	0.070	0.415
F4	< 0.001	< 0.001	0.001	< 0.001	< 0.001	0.003	< 0.001
F5	< 0.001	0.030	0.017	0.300	0.002	0.733	0.023
F6	0.001	0.002	0.120	0.700	0.002	< 0.001	0.524
F7	0.161	0.070	0.029	0.300	0.370	0.979	0.386
F8	0.664	0.623	0.080	0.150	0.996	0.994	0.524
F9	< 0.001	< 0.001	0.003	0.410	0.016	0.018	0.035
F10	0.185	0.024	0.428	0.800	0.206	0.214	0.179
F11	< 0.001	< 0.001	< 0.001	0.020	< 0.001	< 0.001	0.078

L: Life time use; R: Consuming in past 30 days; H: Hookah; C: Cigarette; O: Opium; A: Alcohol

Discussion

To design prevention interventions on substance use or to assess their effectiveness, a culturally-adapted, standardized instruments based on a firm theoretical framework was necessary. Considering the effectiveness of SDM in determining risk/protective factors in preventing

substance use,[23] the authors of the current study decided to develop and assess the psychometric properties of SDM based questionnaire to determine factors affecting substance use among adolescents. The results confirmed that the questionnaire has acceptable validity, reliability, and functionality. In terms of internal consistency, the factors found in the questionnaire had acceptable Cronbach's alpha values which were also in the acceptable ranges of high to very high (ranging from 0.71 to 0.85) based on de Vellis reference table.[29] In addition, the content and face validity of questionnaire ensured the clarity and simplicity of the instrument. Despite the rigor in designing the instrument, 19 out of 60 items of the preliminary questionnaire were excluded in the validation process.

The extracted factors from EFA can all be considered as determinants of substance use among adolescents. The first four factors found in the questionnaire (adolescent's beliefs on hookah and alcohol, bonding to parents, family rules on substance use, drug resistance skills) explain more than 46.0% of the total variance of the most important determinants. Among these factors, the first one explains more than 25.3% of the total variance by itself. It shows that one of the most important causes in consumption of alcohol and hookah is the prevalence of wrong beliefs about their effects; adolescents believe that hookah and alcohol yield fewer negative consequences and stigma than other drugs. This fact is also reflected in EFA so that items related to beliefs and situational perceptions of cigarette were loaded in factors related to opium and hashish. Results are consistent with the assumptions of SDM about the most important predictor of drug misuse which is drug-related beliefs.[23] Knishkowy and Amitai[30] have also mentioned that misperception among adolescents and their parents is a determinant factor in substance use. In the study of Choi et al.,[16] youth beliefs were directly and significantly associated with substance use across all race and ethnic groups.

The second and the third most important factors explaining substance use were bonding to parents and family rules on substance consumption. The crucial impact of weak family bonding and poor parental monitoring on the tendency of adolescent toward substance use is reported in other similar studies.[31-33] Choi et al.[16] revealed a significant relationship between bonding to family, family rules and tendency to substance use and crime. They showed that good parental monitoring increases youth involvement in pro-social behaviors and receiving reward which in turn increases bonding to parents as a protective factor against risky behaviors and substance use.

van der Vorst[34] revealed that substance abuse by parents, setting clear and strong rules in family and limiting availability of drugs were of important factors affecting on the tendency to substance use. Furthermore, appropriate parent-child relationship led to decrease and postpone tendency to alcohol consumption. It seems that despite the role of the peer groups in adolescent's drug tendency, families' role in providing protective and shaping healthy behaviors is much more prominent in Iranian society.

In the initial version of the questionnaire, items related to attachment and commitment to others and the activities derived from Catalano et al.[20] SDM instrument to measure the bonding construct. In our study, these items were loaded on the second factor. The aforementioned authors stated that the attachment and commitment are not simply change, but are slowly shape through daily accumulation of experience and perception of opportunities, participation, and reinforcement.

In this study, one of the strongest factors in the prediction of substance use was drug resistance skills. Similar studies have also demonstrated the strong positive relationship among poor life skills on resisting social influences and risky behaviors.[35] Because of the availability and prevalence of hookah and alcohol among adolescents,[7,36,37] competency in drug resistance strategies should be considered in any preventive efforts as an important protective factor.

For a better coverage of the role of social factors in adolescents' tendency toward substance use, the situational perception construct of Bandura's social cognitive theory was added to the instrument. Our analyses revealed a significant relationship between this construct and substance use. There are several incorrect perceptions and assumptions related to substance use as a commonplace matter and, therefore, the majority of people are indifferent toward being considered as substance users. Consequently, these beliefs and perceptions should be taken into

consideration in tackling the risk factors through preventive initiatives.[31,38]

The results show a significant relationship between adolescents' beliefs about hookah and alcohol use and peer drug use with substance use which is consistent with the findings of another study.[18] Here, it is worth mentioning that there was a high correlation between drug resistance skills (factor 4) and adolescents' beliefs on hookah and alcohol (factor 1) in our study. It shows that affecting adolescents' beliefs about these substances can strengthen their life skills. Furthermore, there is a significant relationship between hookah and alcohol use with most of the constructs. Our analyses revealed other marginally significant relationships between the factors of SDM and other less frequent substances consumed among adolescents. This issue requires to be studied in a larger sample population to be clarified.

The present study also supports the hypothesis that there is a strong relationship between peer substance use and adolescent's beliefs on hookah and alcohol. This finding is also consistent with Choi et al.'s study[16] that reports a significant relationship between peer norms and individual beliefs. Analysis of correlation between Persian social development model questionnaire (PSDMQ) constructs and the final behavioral outcomes of drug use shows that the factors affecting the prevalence of substance use are highly complex. Although none of these factors correlate with drug use, this relationship is significant for all cases. The factors extracted in this study, and the pattern of relationship among the SDM constructs and substance use are consistent with similar studies conducted based on SDM.[16,19,20]

Limitations

This study's design was cross-sectional and did not provide any causal claims on the direction of relationship. Therefore, a longitudinal study should be planned to determine a causal relationship. Because of the limitations of the self-report approach and the vast number of SDM constructs, we could not assess all the constructs that may have a relationship with substance use behavior. The items related to attachment and commitment were loaded on a single construct and as a result more studies are required to determine which items fit into the categories of commitment, attachment and reward constructs. In SDM, it is assumed that the bonding to the environment (family, school, etc.) acts against substance use and actually plays a protective role. Unfortunately, we could not distinguish between social and anti-social pathways; this limitations has also been mentioned in other works conducted on partial SDM.[16]

Another limitation is that we could not assess the situation of substance abuse in parents and siblings of adolescents for the omitting related items in the questionnaire development phase because of refusal to answer by participants.

Conclusion

The study questionnaire based on SDM can be considered as a comprehensive, valid, and reliable tool for assessing risk and protective factors of substance use among adolescents. The authors could not find any similar studies based on SDM in Iran or even in the Middle Eastern context. The results of this study are generalizable to the countries with similar context. The tool can help policymakers and researchers to prevent drug use. Other researchers are suggested to design a culturally adapted questionnaire based on all of the constructs of the SDM in the future studies.

Conflict of Interests

The Authors have no conflict of interest.

Acknowledgements

References

1. United Nations Office on Drugs and Crime. World Drug Report 2010 [Online]. [cited 2010]; Available from: URL: https://www.unodc.org/unodc/en/data-and-analysis/WDR-2010.html
2. Bakhshani NM, Dahmardei M, Shahraki-Sanavi F, Hosseinbor M, Ansari-Moghaddam AR. Substance abuse among high school students in Zahedan. Health Scope 2014; 3(1): e14805.
3. Moghanibashi-Mansourieh A, Deilamizade A. The state of data collection on addiction in Iran. Addiction 2014; 109(5): 854.
4. Farhadinasab A, Allahverdipour H, Bashirian S,

Mahjoub H. Lifetime pattern of substance abuse, parental support, religiosity, and locus of control in adolescent and young male users. Iranian Journal of Public Health 2008; 37(4): 88-95.

5. Geramian N, Akhavan S, Gharaat L, Tehrani AM, Farajzadegan Z. Determinants of drug abuse in high school students and their related knowledge and attitude. J Pak Med Assoc 2012; 62(3 Suppl 2): S62-S66.

6. Stone AL, Becker LG, Huber AM, Catalano RF. Review of risk and protective factors of substance use and problem use in emerging adulthood. Addict Behav 2012; 37(7): 747-75.

7. Ziaaddini H, Sharifi A, Nakhaee N, Ziaaddini A. The prevalence of at least one-time substance abuse among Kerman pre-university male students. Addict Health 2010; 2(3-4): 103-10.

8. Swendsen J, Burstein M, Case B, Conway KP, Dierker L, He J, et al. Use and abuse of alcohol and illicit drugs in US adolescents: results of the National Comorbidity Survey-Adolescent Supplement. Arch Gen Psychiatry 2012; 69(4): 390-8.

9. Behrendt S, Wittchen HU, Hofler M, Lieb R, Beesdo K. Transitions from first substance use to substance use disorders in adolescence: is early onset associated with a rapid escalation? Drug Alcohol Depend 2009; 99(1-3): 68-78.

10. Chen K, Sheth AJ, Elliott DK, Yeager A. Prevalence and correlates of past-year substance use, abuse, and dependence in a suburban community sample of high-school students. Addict Behav 2004; 29(2): 413-23.

11. French MT, Roebuck MC, Dennis ML, Diamond G, Godley SH, Tims F, et al. The economic cost of outpatient marijuana treatment for adolescents: findings from a multi-site field experiment. Addiction 2002; 97(Suppl 1): 84-97.

12. Tanski S, Garfunkel L, Duncan P, Weitzman M. Performing preventive services: a bright futures handbook. Washington, D.C: American Academy of Pediatrics; 2010.

13. Whitesell M, Bachand A, Peel J, Brown M. Familial, social, and individual factors contributing to risk for adolescent substance use. Journal of Addiction 2013; 2013: 9.

14. Ferreira M, Simões C, Matos MG, Ramiro L, Diniz JA. The role of social and emotional competence on risk behaviors in adolescence. The International Journal of Emotianal Education 2012; 4(1): 43-55.

15. Mohseni AR, Jazayeri AR, Babaei N. Factors affecting substance abuse in Iran: a meta-analysis of 49 psychosocial studies. Iranian Journal of Social Problems 2010; 1(1): 175-96. [In Persian].

16. Choi Y, Harachi TW, Gillmore MR, Catalano RF. Applicability of the social development model to urban ethnic minority youth: examining the relationship between external constraints, family socialization, and problem behaviors. J Res Adolesc 2005; 15(4): 505-34.

17. Lonczak HS, Huang B, Catalano RF, Hawkins JD, Hill KG, Abbott RD, et al. The social predictors of adolescent alcohol misuse: a test of the social development model. J Stud Alcohol 2001; 62(2): 179-89.

18. Cleveland M, Feinberg M, Bontempo D, Greenberg M. The role of risk and protective factors in substance use across adolescence. J Adolesc Health 2008; 43(2): 157-64.

19. Deng S, Roosa MW. Family influences on adolescent delinquent behaviors: applying the social development model to a Chinese sample. Am J Community Psychol 2007; 40(3-4): 333-44.

20. Catalano RF, Kosterman R, Hawkins JD, Newcomb MD, Abbott RD. Modeling the etiology of adolescent substance use: a test of the social development model. J Drug Issues 1996; 26(2): 429-55.

21. Huang B, White H, Kosterman R, Catalano RF, Hawkins JD. Developmental associations between alcohol and interpersonal aggression during adolescence. Journal of Research in Crime and Delinquency 2001; 38(1): 64-83.

22. Catalano RF, Oesterle S, Fleming CB, Hawkins JD. The importance of bonding to school for healthy development: findings from the social development research group. Journal of School Health 2004; 74(7): 252-61.

23. Hawkins JD, Weis JG. The social development model: An integrated approach to delinquency prevention. J Prim Prev 1985; 6(2): 73-97.

24. Ahmadi J, Ostovan M. Substance abuse among Iranian male students. International Journal of Drug Policy, 2002; 13(6): 511-2.

25. Hutcheson GD. The multivariate social scientist: introductory statistics using generalized linear models. London, UK: Sage Publications; 1999.

26. Lapointe MM. Adolescent smoking and health research. New York, NY: Nova Publishers; 2008.

27. Nunnally JC. Psychometric theory. New York, NY: McGraw-Hill; 1967.

28. Bartko JJ. The intraclass correlation coefficient as a measure of reliability. Psychol Rep 1966; 19(1): 3-11.

29. de Vellis RF. Scale development: theory and applications. London, UK: Sage Publications; 2012.

30. Knishkowy B, Amitai Y. Water-pipe (Narghile) smoking: an emerging health risk behavior. Pediatrics 2005; 116(1): e113-e119.

31. Griffin KW, Botvin GJ. Evidence-based interventions for preventing substance use disorders in adolescents. Child Adolesc Psychiatr Clin N Am

2010; 19(3): 505-26.

32. Khushabi K, Moradi S, Habibi M. Risk and protective factors of drug abuse in high school students. Iran J Psychiatry Clin Psychol 2011; 17(4): 313-23. [In Persian].

33. Mirzaei Alavijeh M, Nasirzadeh M, Eslami A, Sharifirad G, Hasanzadeh A. Influence of family function about youth dependence to synthetic drugs. Iranian Journal of Health Education and Health Promotion 2013; 1(2): 19-30. [In Persian].

34. van der Vorst H. The key to the cellar door: the role of the family in adolescents' alcohol use. UB Nijmegen; 2007.

35. Hecht ML, Graham JW, Elek E. The drug resistance strategies intervention: program effects on substance use. Health Commun 2006; 20(3): 267-76.

36. Karimy M, Niknami S, Heidarnia A, Hajizadeh I. Assessment of knowledge, health belief and patterns of cigarette smoking among adolescents. J Fasa Univ Med Sci 2011; 1(3): 142-8. [In Persian].

37. Nakhaee N, Ziaaddini H, Karimzadeh A. Epidemiologic study on drug abuse among first and second grade high school students in Kerman. Addict Health 2009; 1(1): 31-6.

38. Glanz K, Lewis F, Rimer B. Health behavior and health education: Theory, research, and practice. In: Glanz K, Rimer BK, Viswanath K, Editors. How individuals, environments, and health behavior interact: Social learning theory. Hoboken, NJ: John Wiley & Sons; 1990.

طراحی و روان‌سنجی پرسش‌نامه تعیین عوامل خطر و محافظت کننده مصرف مواد در ایران: کاربرد مدل توسعه اجتماعی

عابدین ایرانپور[۱]، انسیه جمشیدی[۲]، دکتر نوذر نخعی[۳]، دکتر علی‌اکبر حقدوست[۴]، دکتر داوود شجاعی‌زاده[۵]، دکتر مهرداد افتخار اردبیلی[۶]، دکتر حسن افتخار اردبیلی[۵]

مقاله پژوهشی

چکیده

مقدمه: مصرف مواد یکی از مشکلات رو به گسترش در دوره نوجوانی است. به دلیل عدم وجود یک پرسش‌نامه معتبر و پایا مبتنی بر مدل توسعه اجتماعی، این مطالعه با هدف ایجاد ابزاری جهت تعیین عوامل خطر و محافظت کننده از مصرف مواد مبتنی بر مدل توسعه اجتماعی در نوجوانی انجام شد.

روش‌ها: مطالعه حاضر بر روی ۲۳۵ نفر از دانش‌آموزان پسر سال‌های اول و دوم دبیرستان (سنین ۱۴ تا ۱۸ سال) که به روش نمونه‌گیری خوشه‌ای چند مرحله‌ای از مدارس دولتی شهر کرمان انتخاب شده بودند، انجام گرفت. گویه‌های پرسش‌نامه بر اساس مرور منابع مرتبط و بحث‌های گروهی با دانش‌آموزان انتخاب گردید. جهت تعیین خوانا و واضح بودن گویه‌ها، روایی صوری انجام شد. روایی محتوایی گویه‌های پرسش‌نامه نیز توسط خبرگان مورد بررسی و تأیید قرار گرفت. با استفاده از تحلیل عاملی اکتشافی و آزمون پرسش‌نامه در بین گروه‌های از پیش تعیین شده از طریق سنجش تفاوت در دو گروه دارای تجربه و فاقد تجربه مصرف مواد، روایی سازه‌ای انجام گردید. پایایی ابزار توسط روش آزمون-بازآزمون و Cronbach′s alpha محاسبه شد.

یافته‌ها: با استفاده از تحلیل عاملی اکتشافی، ۱۰ عامل مشتمل بر ۳۸ گویه از پرسش‌نامه استخراج گردید که شامل «باور نسبت به قلیان و الکل، پیوند به والدین، قوانین خانواده در مورد مصرف مواد، مهارت‌های مقاومت در برابر مصرف مواد، باور نوجوانان نسبت به مواد سنگین، درک موقعیتی نسبت به سیگار و الکل، قوانین مدرسه، درک موقعیتی نسبت به مواد سنگین، دلبستگی نسبت به مدرسه و فرصت‌های درک شده در مدرسه» بود. چهار عامل اول، ۴۶ درصد واریانس‌ها را تبیین نمود. از بین این عوامل، باور نوجوانان نسبت به قلیان و الکل بیش از ۲۵/۳ درصد از کل واریانس‌ها را تبیین کرد. ضریب همبستگی درونی سازه‌ها و ضریب همبستگی درون کلاسی (Intra-class correlation coefficient یا ICC) نیز در حد مطلوبی بود (ضریب Cronbach′s alpha بین ۰/۷۱-۰/۸۵ و ICC بین ۰/۴۸-۰/۸۱).

نتیجه‌گیری: پرسش‌نامه عوامل خطر و محافظت کننده از مصرف مواد، نخستین ابزار مبتنی بر مدل توسعه اجتماعی در ایران است. نتایج نشان داد که این پرسش‌نامه، ابزار معتبر و پایایی جهت ارزیابی تعیین کننده‌های مصرف مواد می‌باشد و می‌تواند توسط محققان و سیاست‌گذاران در مداخلات پیشگیری به کار رود.

واژگان کلیدی: مصرف مواد، طراحی پرسش‌نامه، مدل توسعه اجتماعی

۱- استادیار، گروه آموزش و ارتقای سلامت، دانشکده بهداشت، پژوهشکده تحقیقات بهداشتی، دانشگاه علوم پزشکی تهران، تهران، ایران

۲- دانشجوی دکتری، مرکز پژوهش‌های سلامت مبتنی بر مشارکت جامعه، پژوهشکده کاهش رفتارهای پرخطر، دانشگاه علوم پزشکی تهران، تهران، ایران

۳- استاد، مرکز تحقیقات علوم اعصاب، پژوهشکده نوروفارماکولوژی، دانشگاه علوم پزشکی کرمان، کرمان، ایران

۴- استاد، مرکز تحقیقات مدل‌سازی در سلامت، پژوهشکده آینده‌پژوهی در سلامت، دانشگاه علوم پزشکی کرمان، کرمان، ایران

۵- استاد، گروه آموزش بهداشت و ارتقای سلامت، دانشکده بهداشت، پژوهشکده تحقیقات بهداشتی، دانشگاه علوم پزشکی تهران، تهران، ایران

۶- دانشیار، مرکز تحقیقات بهداشت روان، دانشگاه علوم پزشکی ایران، تهران، ایران

نویسنده مسؤول: دکتر حسن افتخار اردبیلی   Email: eftkhara@sina.tums.ac.ir