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Modeling the Underlying Predicting Factors of Substance Abuse among Adolescents

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ABSTRACT
Regarding the willing and starting substance abuse among young people in Iran the aim of the study was to model the underlying factors in predicting the behavior of substance abuse among youth and students. In this analytical cross-sectional study, based on a random cluster sampling were recruited 733 pre university students, youth age ranged between 16 and 22 yr from Iran (Yazd). The data of demographic, community -school, family and individual-psychological related variables were acquired via a self-administered questionnaire. A series of multivariate logistic regressions were performed respectively for computing adjusted Odds Ratios utilizing SPSS 19 software. A number of 53 girls (20.7%) and 225 boys (50.2%) had experienced at least one of the substance. In addition adolescents' wrong attitude to drug abuse, disappointment, sensation seeking, family conflicts, parents' wrong attitude to drug abuse, milieu chaos, inappropriate psychological-social school environment were obtained as independent predictors of substance abuse. These results along with identifying the significance level of all the risky factors can be an appropriate instruction to prioritize solutions consistent with existing problems.
Keywords: substance abuse, risk factors, adolescences, Students, Iran

INTRODUCTION

Taking a realistic look at drug abuse, we can easily realize that opiate abuse history goes back to hundreds of years ago and it can be said that there is no single country around the world that is immune to drug abuse. This is one of the important social damages so much so it endangers not only public and individual heath but also causes individuals mental and moral decline [1]. The high prevalence of addictive drug abuse especially opioids in Iran and bordering with the world's largest drug producer are of the significant and known predicaments [2, 3]. According to the extensive research conducted in Iran and across the world, addictive drug abuse is increasingly growing among adolescents and young adults more than any other age ranges [4]. There are various factors involved in paving the way for drug abuse so that theoretical studies offer two set of factors, individual and social, as being the key causes of drug abuse [5]. Studies show that various factors such as age, sex, education, the presence of an addict in the family, parents' relationship together, parents' relationship with adolescents, parents' methods of control and supervision, peers and friends, and social-based reasons affect drug abuse among adolescents [6]. Numerous studies have pointed to various individuals, family and psychological factors such as mental health, religion practices, having warm family support, enjoying a good relationship with parents, enjoying educational progress, having a good relationship with family members, regular attendance to sport clubs, the presence of a positive model among the girls and affective control of the boys as a preventive factor, unpleasant emotional family environment, divorce are of the risky factors predicting drug abuse among adolescents [7, 8, 9, 10]. Addiction treatment and breaking its vicious cycle are

expensive and difficult. And it requires a comprehensive treatment system with different approaches of drug therapy, psychotherapy, rehabilitation. However, even the most effective treatments have got high relapse. In such cases, planning for prevention with the aim of delaying the onset of drug abuse would substitute the treatment itself. The essential requirement for any kind of planning for prevention is gaining awareness of the current conditions and situation of drug abuse among the youth as the prospect makers of the country [11].

Considering the importance of drug abuse prevention and the description of the current condition, the purpose of the present study is to determine the share of each of the risky or preventive factors of adolescents' drug abuse so that it can be used as guidance by health care managers in decision-making, planning and appropriate interventions on this noticeable predicament.

METHODOLOGY

This is a descriptive study carried out in a cross-sectional method. The population includes 733 pre-university boys and girls of Yazd in 2013. In order to determine the size of the sampling, mean comparing formula is used. And, based on mean values and total score diversion of risky obtained factors from Pilot study which was done on 100 students and given the confidence level of 95% (z= 1.96) and the accuracy of 3% (d=3%), appropriate size for sampling the population of 700 was gained. Cluster-random method was used for sampling in several levels. And, the completed questionnaire by students included two important parts: first, a checklist relating to demographic factors such as age, sex, living status of parents (together or apart from one another), education level, economic status of the family and knowledge of the experience abusing addictive drugs for more than one time: Cigarette, Alcohol, Opium burnt, Opium gum, Heroin, Crack, Norgesic or Temgesic(Buprenorphine), Cannabis, Bhang, Marijuana, Cocaine, Ecstasy, Glass(crystal), LSD, Phencyclidine (PCP), Snus (Nass), Pan (panperak), Glue, Lighter gas. Second is the standard of risky factors of abusing drugs among adolescents. This was a self-administered questionnaire and was completed by students. The questionnaire is based on the offered sample of United Nations Office for Drug Crimes (UNODC) which has been prepared to determine the factors affecting a wide variety of drug abuse among internal and external researches and it enjoys high psychometric properties and its reliability coefficient was reported to be 92% using analysis method [12, 13, 14, 15].

This questionnaire included 86 questions dealing with three important factors: community -school, family, individual- psychological ones. Community -school factors cover 21 questions dealing with three factors of school social -psychological environment, commitment to school, and milieu chaos. Family factors cover 17 questions dealing with family supervision, parents' attitude to drugs and family crackdowns. And, individual and psychological factors which cover 48 questions. Attitudes to drug abuse are dealt with from these aspects: disappointment, social skills, sensation seeking, impulsivity and anxiety sensitivity. These variables have been use in the tables based on the definitions below:

(X1...x12) twelve subscales which are based on the definitions below:

X1: adolescents' wrong attitude to drug abuse.

X2: disappointment

X3: impaired social skills

X4: sensation seeking

X5: impulsivity

X6: anxiety sensitivity

X7: family crackdown

X8: parents' wrong attitude to drug abuse

X9: family inadequate supervision

X10: milieu chaos

X11: an impaired sense of commitment to school

(X13...x15) threefold general scales based on the following definitions:

X13: individual –psychological factors

X14: family factors

X15: school-social factors

Information on drug abuse tendency was analyzed through the given responses to due questions on a multiple-choice Likert scale. Having collected the data, they are entered into SPSS. Then, using descriptive statistics methods, independent T test, chi-square test, correlation and logistic regression analysis were dealt with. Considering the importance of the issue and the necessity of taking students' satisfaction and trust to cooperate honestly in responding to the questions, first of all, nature and purpose of the questionnaire were clarified for students and anonymity was also emphasized. Moreover, the research was present during the administration of the questionnaire which lasted for an hour.

Table1. Demographic characteristics of the studied population					
Variables		Abundance	Percentage	Total	Percent
Sex	Female	256	36.4	100	704
	Mail	448	63.4		
Type of school	Government	453	64.3	100	704
	Non-profit	251	35.7		
Field of study	Mathematical	230	32.7	100	704
	Experimental	294	41.8		
	Human	180	25.6		
		Mea SD		(Min_Max)	
Age	GIRL	17.5±0.6		16-21	
	BOY	17.6±0.6		16-22	
	TOTAL	17.6±0.6		16_22	

RESULTS

The population included 204 pre-university students of Yazd with the mean age of 17.6±0.6 and 16 and 22 years as the min and max ages. Grade point average of last year's stand-out students was 16.6± 2.1 and the average family members for these students were 5. 592(84.1%) students had never retaken or failed a course. Among which 24 (3.4%) students were only child, 275(39.1%) first child and 314 (30.4%) were last-born children. In 656 (93.2%)students had parents living together, 23 students (3.3%) had one of their parents died, 664 students (94.3%) lived with their parents and 68 students (9.7%) were doing another job in addition to education (Table 1).

In general, drug abuse experience included 123 smokers (17.5%), 76 opium abusers (10.8%), 7 opium gum abuser (1%), 3 burned abusers (0.4%), heroin and crack abuser 0 (0.0%), cannabis, bang, marijuana, ecstasy, LSD, angel powder, NAS, pam flakes, glue, pam, lighter gas altogether covered 44 students (6.25%). In our study population, the prevalence of smoking, alcohol and drug abuse was more among boys than girls so much so that 53 girls (20.7%) and 225 boys (50.2%) had experienced at least one of the items above. In both sexes, the most common experience goes to smoking and alcohol comes second. The mean for total scores of risky factors shows at least one time abuse of addictive drugs among experienced people (188.8±14.1) and their value is 168.7±14.6 for inexperienced ones. This difference was statistically important (T test: P_ value <0.001) [figure1].
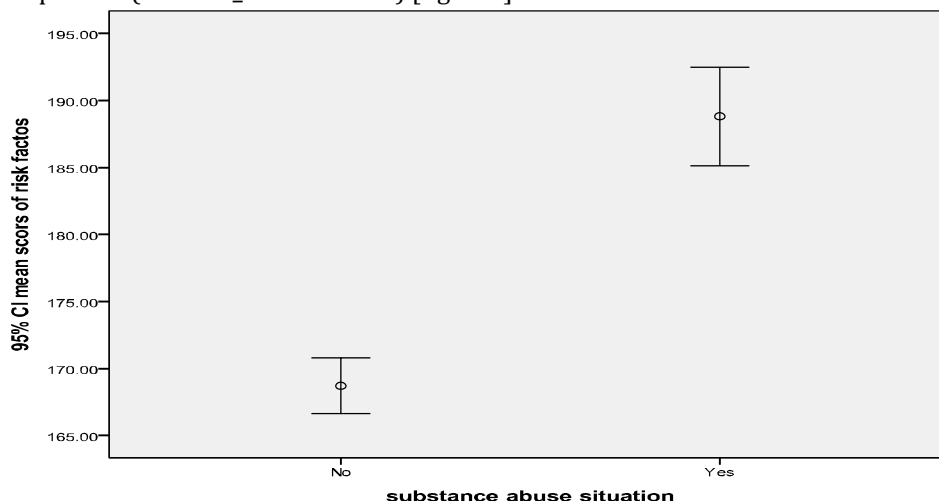

figure1. Average risk factor score of addictive substance abuse based on the level consumption

Analyzing the correlation between the desire for smoking and the value for each of the 12fold subscales of risky factors of drug abuse represented a significant correlation between tendency to smoking and psychological-social school environment, parents' attitude to drugs, family conflicts, impulsivity, sensitivity seeking, disappointment and adolescents' attitude to drug abuse. And, generally, there was a strong correlation between tendency to smoking and the value for each of the main scales of risky factors (Pearson Correlation r=0.23), family factors (Pearson Correlation: r=0.20) and school-social factors (Pearson Correlation: r=0.29). In all three cases, correlation value was statistically significant (P-value

<0.05). generally the correlation values (Pearson) between the desire for abusing any drug including alcohol, cigarette, and addictive drugs with each twelve-fold subscales' value and also with three general scales of drug abuse have been shown in tables 2 and three respectively.

VARIABLE	Tendency to use	Smoking	Alcohol	Opium	Cannabis	X tablet	Glass
X1	P-Value	0	0	0	0.25	0.02	0.004
	Correlation	0.25	0.28	0.17	0.04	0.08	0.10
X2	P-Value	0	0.003	0.052	0.131	0.052	0.47
	Correlation	o.16	0.11	0.073	0.057	0.073	-0.027
X3	P-Value	0.05	0.64	0.45	0.39	0.83	0.51
	Correlation	0.073	-0.17	0.028	-0.032	0.008	-0.025
X4	P-Value	0	0	0.01	0.96	0.01	0.01
	Correlation	0.258	0.291	0.091	-0.002	0.093	0.091
X5	P-Value	0	0.005	0.05	0.50	0.07	0.42
	Correlation	0.13	0.10	0.07	-0.02	0.06	0.03
X6	P-Value	0.2	0.054	0.39	0.535	0.03	0.42
	Correlation	-0.04	-0.07	0.03	-0.02	-0.08	0.03-
X7	P-Value	0.001	0.034	0.102	0.67	0.3	0.9
	Correlation	0.125	0.08	0.062	-0.016	0.39	-0.005
X8	P-Value	0	0	0.004	0.08	0.05	0.9
	Correlation	0.143	0.240	0.109	0.065	0.07	0.002
X9	P-Value	0.017	0.053	0.98	0.10	0.517	0.7
	Correlation	0.09	0.073	0.001	0.061	0.024	0.012-
X10	P-Value	0	0	0.009	0.602	0.06	0.01
	Correlation	0.264	0.226	0.099	-0.02	0.07	0.09
X11	P-Value	0	0	0.05	0.28	0.006	0.3
	Correlation	0.192	0.212	0.072	0.040	0.1	0.039
X12	P-Value	0	0	0.043	0.65	0.019	0.38
	Correlation	0.19	0.187	0.076	0.017	0.088	0.033

Table2. (Continue) Correlation between tendency drug use and subscales of risk factors

Within the results of logistic regression analysis with the aim of predicting smoking, after entering all variables of twelve-fold subscales (x1...x12) in the first model, variables like wrong attitude to drug abuse, disappointment, sensation seeking, family conflicts, parents' wrong attitude to drug abuse, milieu chaos and disorder in social-psychological school environment were determined as highly significant predictors of smoking. Details of β, P-value and each of the variable values have been listed in table 4.

The proposed formula for the contribution of each of the predictors of smoking in the first model is as following:

$$\frac{p}{1-p}=\log e[0.4X_1+0.6X_2+0.8X_4-0.4X_7+0.5X_8+0.6X_{10}+0.4X_{12}]$$

In the second model, having entered three variables of major scales of risky factors, variables of individual-psychological and community-school factors were determined as predictors of smoking (P-value<0.05) [table 4]. The proposed formula for predictors' quota in this model is as follows:

$$\frac{p}{1-p}=\log e[1.2X_{13}+1.23X_{14}]$$

In both 1 and 2 formulas, P is the proportion of smokers to the whole study population.

Table4. logistic regression result in contribution of risk factors and protective predictor of smoking (Model A&B)

VARIABLE	Upper	Lower	E(P)	Sig	B
MODEL 1(VARIABLE 12 ITEM)					
X1	2.43	1.004	1.56	0.048	0.44
X2	2.75	1.23	1.84	0.03	0.61
X4	3.52	1.51	2.30	0	0.83
X7	0.92	0.43	0.633	0.019	-0.45
X8	2.54	1.17	1.72	0.006	0.54
X10	2.66	1.28	1.85	0.001	0.61
X12	2.29	1.81	1.64	0.003	0.49
MODEL 2(VARIABLE 3 ITEM)					
INDIVIDUAL FACTOR	6.53	1.69	3.32	<0.001	1.20
SOCIAL FACTOR	5.52	2.11	3.42	<0.001	1.23

* Hosmer_Lemeshow:Chisqua (8)=11/4   P.Value=0.18 MODEL A
* Hosmer_Lemeshow:Chisqua (8)=7/55   P.Value=0.47 MODEL B

In the results of logistic regression analysis which is to predict smoking possibility, having entered all twelvefold subscale variables in the first model, there were highly significant predictors of smoking: wrong attitude to drug abuse, sensation seeking, parents' wrong attitude to drug abuse. Details of β, P-value and each of the variables' values have been listed in table 5.

$$\frac{p}{1-p}=\log e[0.8X_1+0.9X_4+1.13X_8]$$

In the second model, having entered three variables of major scales of risky factors, these were predictors of alcohol abuse: individual-psychological factors, community-school and family factors. P-value <0.05 (table 5). The proposed formula for predictors' quota in this model is as following:

$$\frac{p}{1-p}=\log e[0.9X_{13}+0.8X_{14}+0.7X_{15}]$$

Table5. Logistic regression result in contribution of risk factors and protective predictor of Alcohol(Model A&B)					
MODEL 1(VARIABLE 12 ITEM)					
VARIABLE	Uper	Lower	E(P)	Sig	B
X1	3.8	1.50	2.4	0.87	0.00
X4	4.45	1.60	2.6	0.98	0.00
X8	4.75	2.02	3.1	1.13	0.00
MODEL 2(VARIABLE 3 ITEM)					
INDIVIDUAL FACTOR	5.89	1.11	2.56	0.027	0.94
FAMILIAL FACTOR	4.94	1.17	2.40	0.01	0.87
SOCIAL FACTOR	3.6	1.12	2.02	0.01	0.70
MODEL A * Hosmer_Lemeshow:Chisqua (8)=13/28 P_Value=0.10 MODEL B * Hosmer_Lemeshow:Chisqua (8)=8/98 P_Value=0.344					

Where P is the proportion of alcoholic users to the whole study population

In the results of logistic regression analysis which is to predict all addictive drugs but for shisha, body-building and on-the-counter drugs, having entered all the variables for twelvefold subscales in the first model, these were highly significant predictors of all drug abuses but for shisha and body-building drugs: disappointment, sensation seeking, family contradicts, parents' wrong attitude to drug abuse, milieu disorder, disorder of psychological –social school environment. Details of β, P-value and each of the variables' value have been listed in table 4.

The proposed formula for predictors' quota of all addictive drugs is as follows:

$$\frac{p}{1-p}=\log e[0.59X_1+ 0.55X_2+0.93X_4 - 0.59 X_7 + 0.77 X_8 +0.77X_{10}+ 0.38 X_{12}]$$

In the second model, having entered three variables of major ones for risky factors, these were predictors for all addictive drug abuse but shisha, body-building enhancers and on-the –counter drugs: variables for individual-psychological factors, community-school and family factors. P-value < 0.05 (table 5), the proposed formula for predictors' quota in this model is as following:

$$\frac{p}{1-p}=\log e[1.1X_{13}+0.58X_{14}+1.11X_{15}]$$

Where P is the proportion of the abusers of all addictive drugs to the whole study population

Table6. Logistic regression result in contribution of risk factors and protective predictor of addictive material (Model A&B)					
MODEL 1(VARIABLE 12 ITEM)					
VARIABLE	Uper	Lower	E(P)	Sig	B
X1	2.79	1.18	1.18	0.007	0.59
X2	2.55	1.17	1.73	0.005	0.55
X4	3.76	1.71	2.50	0.00	0.93
X7	0.76	0.38	0.54	0.001	-0.59
X8	3.1	1.40	2.10	0.00	0.77
X10	3.04	1.53	1.47	0.00	0.77
X12	1.99	1.08	1.47	0.012	0.38
MODEL 2(VARIABLE 3 ITEM)					
INDIVIDUAL FACTOR	5.14	1.47	2.7	0.002	1.01
FAMILIAL FACTOR	3.13	1.03	1.8	0.037	0.58
SOCIAL FACTOR	4.78	1.92	3.03	0.00	1.11
MODEL B * Hosmer_Lemeshow:Chisqua (8)=5.74 P_Value=0.67 MODEL A * Hosmer_Lemeshow:Chisqua (8)=5.74 P_Value=0.68					

DISCUSSION

In the current study, there are generally three factors of community-school, individual-psychological, family respectively which have been regarded as the most significant predictors of experiencing at least one of the addictive drugs among adolescents. According to the present study's results, cigarette, alcohol, and opium are the most common addictive drugs among others. Based upon CDC report in 2010, the order of abusing addictive drugs among American adolescents is as follows: alcohol (13.6%), heroin and crack (10.1%) and marijuana 7.35.

Most of the studies carried out in Iran on the prevalence and the order of a variety of addictive drugs bear similar reports to this study's. For instance, in Mohammad Khani's study on secondary and high school students across 10 provinces (20), there are remarkably different results in some provinces due to specific conditions of climate, cultural and availability like Ziyaaldini's et.al. Study on Kerman's adolescents in which alcohol and opium abuse in boys respectively and opium and alcohol abuse in girls respectively enjoy the highest ranking of drug abuse.

Based on the results of this study, the prevalence of drug abuse experience was, totally, more among boys than girls, though prevalence of drug abuse among women has seen a dramatic rise in the recent years. Comparing drug abuse prevalence between males and females across different countries, various results have been found: in some countries there is not a significant difference between prevalence of males and females drug abuse. But in most of the studies carried out in Iran like the present one, the prevalence of experiencing drug abuse is higher among male adolescents than females (21, 19, 18, 17, and 16). Tough availability and cultural restrictions out there for girls can justify the earlier results.

In the present study, given the mean score of the whole risky factors of drug abuse, there is statistically significant difference between experienced and inexperienced adolescents. Analyzing the correlation between tendency to alcohol abuse and different scales of risky factors, the highest correlation value respectively related to community-school factors, family factors and individual-psychological factors.

In the results of logistic regression analysis to predict alcohol abuse, the highest prediction went to parents' and adolescents' wrong attitude to alcohol abuse.

It seems that parents' wrong attitude to alcohol abuse and alcoholic parents play a big part in adolescents' tendency to alcohol abuse. The importance of family factors and having faith in anomalous behavior of alcohol abuse has been touched upon in many similar studies. Based on the aforementioned results, one can probably say that the best seemingly prevention of alcohol abuse is to set up training courses with the hope of correcting students' and their parents' attitude to alcohol abuse.

In the results of logistic regression analysis to predict adolescents' smoking and addictive drug abuse, these were the most important predictors respectively: adolescents' wrong attitude to drug abuse, disappointment, sensation seeking, family conflicts, parents' wrong attitude to drug abuse, milieu chaos, inappropriate psychological-social school environment.

However, family conflict (strict and precise family supervisions) was counted as protective factor in the prediction of smoking and other drugs. The recent studies have suggested that there are three family protective factors- parents-children positive relationship, parents' sufficient and strict attention, parents' anti-drug abuse attitude- dramatically influence avoidance from drug abuse and other behavioral issues among adolescents.

According to the results drawn from above studies, these were the most important of subscale risky factors (predictors) and strict and precise family supervision factors (protective) in experiencing at least one of the addictive drugs among adolescents: adolescents' wrong attitude to drug abuse, disappointment, sensation seeking, parents' wrong attitude to drug abuse, milieu chaos, inappropriate psychological-social school environment. These results along with identifying the significance level of all the risky factors can be an appropriate instruction to prioritize solutions consistent with existing problems. It seems that the best educational factor to prevent alcohol abuse is to correct parents' and students' wrong attitude to alcohol (such as harmless entertaining abuse of alcohol, increasing the ability to cope with its side-effects, being safe to others in case of abuse). There are also other methods to be considered in intervention programs by health policy makers to prevent adolescents from drug abuse: training of coping skills, problem-solving skills, saying no skills in a group, individual consultations with the hope of dealing with psychological disorders and melancholy treatment, boosting students' interest in education and building a closer and intimate tie among students, parents and school, providing more interesting educational environment and dealing appropriately with juveniles.

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