

Abstract

Objective: The current study was conducted to predict the dimensions of positive attitudes towards drugs in senior high school students based on individual and family characteristics. **Method:** All the senior high school students of Tehran constituted the statistical population of this study, among whom the number of 400 participants was selected via multi-stage cluster sampling method. These participants responded to Attitude to Drugs and Stimulants Scale, Scale of Secure-Insecure Levels of Family, Parenting Styles Scale, and Index of Brother and Sister Relations. This study was a correlational one wherein the obtained data were analyzed using multivariate linear regression and multiple linear regression. **Results:** The results show that age, family relationships, and parenting styles can predict the triple dimensional attitudes to drugs. In return, students' general attitude to drugs will be predictable from their age, father's education, family relationships, emotional atmosphere of families. **Conclusion:** Precise information about the individual and family characteristics that can predict positive attitudes to drugs is accessible when the three dimensions of attitudes to drugs are analyzed separately.

Keywords: positive attitude, drugs, adolescents, multivariate regression analysis, and multiple regression

On the Prediction of Positive Attitudes towards Drugs in Adolescent Students: Multivariate Regression and Multiple Regression Analyses

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Introduction

Drug use is one of the high-risk behaviors that is prevalent among high school students of Iran. For example, fifteen per cent of male and four percent of female high school students in Tehran take such drugs as cannabis and opium for fun (Alizadeh, 2005). In this regard, the research conducted in Karaj also shows that 57 percent of high school students have used soft substances and drugs, such as tobacco or hard substances and drugs, such as ecstasy, opium, crystal or crack at least once (Alaei Kharayem, Kadivar, Mohamadkhani, Sarrami, Alaei Kharayem, 2011). There are many reasons for students' tendency towards drug use, including the availability of drugs, the school environment, living in disadvantaged neighborhoods, media (Gunnarsson, 2012), economic status, family circumstances, one's relationship with others, and positive attitude to drugs (Shamsi Meymandi, Ziaeddini & Sharifi Yazdi, 2008). Attitudes underlie many behaviors, including risky behaviors in humans; therefore, it is possible to predict many future behaviors of people with the identification and measurement of attitudes (Hillsion & Murray-Webster, 2007).

Attitudes affect human judgment and perception about environmental stimuli like a pair of glasses. Attitudes are the overall assessment of a person toward a particular issue and this evaluation is founded upon three components, i.e. behavioral, affective, and cognitive ones. The affective component of attitudes refers to the feeling or emotions, the behavioral component refers to experiences or behaviors, and the cognitive component refers to the beliefs, thoughts, and characteristics that are related with attitudes (Maio & Haddock, 2010; Hillsion & Murray-Webster, 2007).

Positive attitude towards taking drugs refers to the individual's unrealistic assumptions about the risks and effects of drug use. Positive attitude to drugs is a multi-dimensional construct that has been composed of three dimensions, namely effects, consumption, and risks of drugs. The attitude towards the effects of drug use refers to the positive physiological, psychological, and social consequences of drug use. For example, the person who says: "drug use decreases anxiety and worry; indeed, s/he believes in the effects of drugs as a mentally sedative substance and s/he is likely to turn to drug use in future for achieving mental relaxation (Delawar, Alizadeh & Rezaei, 2004).

The dimension of attitude towards the risks of drug use refers to one's unrealistic assumptions about the risks of drug use; for example, a person who believes that the drugs are dangerous only if they are non-pure hold, in fact, an unrealistic imagination about the dangers of drug use. Thus, such a person has a positive attitude to drug use and s/he will be likely to consume drugs if people give him/her drugs and assure him/her that the substance is completely pure. The dimension of attitude toward the consumption of drugs refers to one's interest and willingness to the drug use where this interest has been created without taking into account the positive effects (physical, psychological, social) and

regardless of the risks awaiting him/her for. For example, someone who says taking drugs once is worth a try, s/he is interested in taking drugs regardless of the positive or negative consequences of drug use and also regardless of the risks towards which drug use directs him/her. The formation of positive attitudes to drugs in adolescents is influenced by several factors that can be divided in individual and familial categories. Individual characteristics, such as personality traits, including extraversion, neuroticism (Ganji, Rahnemay Namin & Sharifi, 2014), high sensation seeking (Hoseini, 2010), depression (Akbari & Amoupour, 2010), low self-esteem (Khushabi, Moradi & Habibi, 2011), and feeling of low self-efficacy (Bashirian, Heidarnia, Allahverdi Pour & Hajizadeh, 2012), low degree of interpersonal and intrapersonal emotional intelligence, difficulty in impulse control, and anger discharge (Khushabi et al. 2011), can lead to the formation of positive attitudes toward drugs in adolescents.

Family characteristics, such as parenting styles, parents' education, insecurity and turmoil in the home environment also promote the formation of positive attitudes to drug use. Lenient parenting styles or authoritarian position of parents (Ganji et al., 2014; Riahi, Aliverdina & Soleimani Beshli, 2009; Alizadeh, 2005), the large number of family members (Delawar, Alizadeh & Rezaei, 2009), apathy or lack of supervision over the work of children (Alhyas et al., 2015; Parsai, Voisine, Marsiglia, Kulis & Nieri, 2009), educational degrees of parents, or physical punishment, and the existence of insecurity and chaos in the home environment (Riahi et al., 2009) also play major roles in the formation of positive attitude to drugs in adolescents. If adolescents' emotional needs are not met in the family, they will probably try to meet such needs through membership in peer groups. Such adolescents coordinate their attitudes with their peers to preserve group membership. This attitudinal change take place gradually as a result of friendly conversations and becoming aware of the effects of drugs. Even if adolescents hold negative attitudes towards drugs before joining peer groups, they will most probably change their attitudes (Alhyas et al., 2015; Bahr, Hoffmann & Yang, 2005; Habibi, Besharat, Bahrami Ehsan, Rostami & Ferrer Raeder, 2012, Zahedi Asl & Lotfi, 2011; Riahi et al., 2009; Kharayem et al., 2010; Allahverdipour et al., 2005).

Taking models from family can also cause the formation of positive attitudes in young people; in other words, if the parents of young persons have a positive attitude to drugs and one or both of them use drugs, a positive attitude toward drugs is shaped in their child. As these children model their parents and emulate their attitudes, they will subconsciously take a positive attitude to drug use even if parents are not forced to create a certain attitude in children (Khushabi et al., 2011; Sharifi & Rezaei, 2009; Shamsi Meymandi et al., 2008; Ustuner, Aksoy & Ozer, 2009; Birhanu, Bisetegn & Woldeyohannes, 2014).

Parents' education is also another factor that is associated with positive attitudes toward drugs; however, strong evidence has not been achieved for this association (Jabbari Beyrami, Bakhshian, Vahidi, & Mohammadpour Asl,

2008). However, research shows that children's attitude towards drugs becomes more negative with the increase of mothers' education, (Riahi et al., 2009; Delawar et al., 2009) because mothers with higher education are able to establish proper interaction with their children and discuss the negative consequences of drugs with their children and give them a better understanding (Alizadeh, 2005).

Most researchers have considered attitudes to drugs as a one-dimensional construct (Bashirian et al., 2012; Khushabi et al., 2011; Zahedi Asl & Lotfi, 2011; Habibi et al., 2011; Akbari & Amoupour, 2010; Riahi et al., 2009; Allahverdi Pour et al., 2005). In other words, they have considered the total score of Inventory Attitude toward Drug as a criterion variable, and, then, have estimated the contribution of each of the predictor variables in the anticipation of attitude to drugs.

However, the results of some research have shown (Delawar et al., 2009; Alizadeh, 2005, Delawar et al., 2004) that attitude to drugs is a multi-dimensional psychological construct. However, few studies have been conducted on predictor variables of each of the dimensions of attitude to drug and, for this reason, some questions have been left unanswered in this regard. For example, it is not clear what percentage of the variance in adolescents' positive attitudes to drug use, effects, and risks is accounted for by family and individual characteristics and what variables can predict dimensions of drugs. Therefore, this research seeks to use multiple regression analysis and multivariate regression analysis and determine that which of the individual and family characteristics can explain and predict overall attitudes to drugs and its dimensions, including (a) attitudes to consumption, (b) attitudes to effects of drugs (c) attitudes to risks of drugs.

Method

Population, sample, and sampling method

The method used for this research is correlation and the statistical population of the current research consisted of all the senior high school students of Tehran who amounted to 432,751 students in the academic year 2010-11 according to the Department of Information and Public Relations of the Ministry of Education. Using Cochran formula, the required sample size of the study was estimated about 400 participants. Multi-stage cluster sampling method was used for the selection of participants. Accordingly, 10 high schools were selected from the list of high schools in districts of Tehran (5 male and 5 female high school). Then, the testers selected three classes via simple random sampling at the beginning of entering each school (one class from each grade) to administer the questionnaires to the students on a voluntary basis. Finally, out of 406 distributed questionnaires, 367 students, including 191 girls and 176 boys (190 first graders, 87 second graders, and 90 third graders) completed the questionnaire in full.

Instruments

Attitude to Drugs and Stimulants Scale: This scale was constructed by Delawar, Alizadeh & Rezaei via factor analysis in 2004 and consists of 40 items. It measures students' attitudes towards the effects (psychological, social, and physiological positive or negative consequences arising from drug use), the consumption (patients' interest and willingness to use drugs regardless of the probable risks and effects), and the risks of drugs (unrealistic perceptions about the dangers and risks of drug use).

The reliability of this has been reported to be acceptable and the Cronbach's alpha reliability coefficient and test-retest reliability of the total scale have been obtained equal to .88 and .83, respectively; and the reliability coefficients of the subscales have been obtained within the range of .81 to .91 (Delawar, Alizadeh & Rezaei, 2004).

Scale of Secure-Insecure Levels of Family: This scale was also constructed by Delawar, Alizadeh & Rezaei in 2004 and consists of 20 two-choice questions (yes/no questions). This scale measures family security and contains such items as "My family members make fun of each other". The reliability of the total scale was obtained equal to .87 via Guttman method and .67 via test-retest reliability, which represent the acceptable and satisfactory reliability of the scale. **Family Atmosphere Scale**, with 9 yes/no questions measures love, strict act, unity, and integration between family members. The coefficient reliability of the scale has been reported to be .89 by Guttman method.

Parenting Styles Scale and Index of Brother and Sister Relations were also constructed by Delawar, Alizadeh & Rezaei in 2004 and each of the scale contains 8 and 4 two-choice (yes/no) items, respectively. Their items are focused on parenting techniques and styles and brother-sister relationships. The reliability of these scales has been reported to be above .80 via Guttman coefficient method.

A list was prepared to evaluate the demographic characteristics of students, such as their residential location, school grade, age, level of education, parental education, family size, and family income per month.

Multivariate linear regression were used to determine the contribution of predictor variables in predicting criterion variables. Multivariate linear regression is the extended version of multiple linear regression by means of which it is possible to predict several different criterion variables (at least two variables) from several similar predictor variables. Although the criterion variables are different from each other, they are highly correlated with each other. Thus, the correlation between criterion variables is taken into account in this method when estimating the contribution of predictor variables in criterion variables (Stevens, 2009; Izenman, 2008). In this regard, individualistic predictor variables (i.e., GPA and age) and family predictor variables (including parental education, emotional climate of family, family income, secure and

insecure relationship in the family, relationship with siblings, parenting style) were simultaneously correlated with three criterion variables (A- attitudes to drug use, (b) attitudes to the effects of drug use, and (c) attitudes to the risks of drug use. For the conduct of multivariate regression analysis and multiple regression analysis, LISREL software version 8 was used (Jöreskog & Sörbom, 1993).

Results

The descriptive statistics of the variables are presented in the table below.

Table 1: Descriptive statistics of the variables under study

<i>Variable</i>	<i>Mean</i>	<i>SD</i>
Effects of drug use	45.64	13.84
Consumption of drugs	14.22	5.53
Risks of drug use	18.49	6.70
Overall attitude towards drugs	78.35	21.43
Age	15.99	.97
GPA	16.70	2.47
Fathers' education	4.66	1.37
Mothers' education	4.23	1.40
Family relations	3.43	3.80
Monthly income (in dollars)	300	75
Emotional atmosphere of family	1.66	1.85
Relationship with sister and brother	.85	1.12
Parenting styles	.94	1.18

The average age of the students who responded to the questionnaires was almost 16 years and their grade point average equaled 16.70. The available information indicates that the mean value of education for the parents of the students studied is equal to 4, which means that most of the parents had the education of the third grade of guidance school. It should be noted that, in this study, parents' education had been coded as follows: 1-illiterate, 2. literacy movement, 3. Fifth grade of elementary school, 4. third grade of guidance school, 5. diploma, 6. bachelor's degree, and 7. higher than bachelor's degree.

Before the conduct of regression analysis, the outliers were excluded. Then, the assumptions of multivariate regression analysis were evaluated via Kolmogorov-Smirnov test, Levene's test, and Pearson correlation coefficient test. The obtained results showed that the statistical distribution of criterion variables was normal and the assumption of the equality of variances was satisfied in all three variables. In addition, there was a high positive correlation between the criterion variables (i.e. dimensions of attitude to drugs) and all the correlations were significant at the level of .01. Accordingly, the correlation coefficients of attitude to consumption of drugs equaled .42 with the dimension of effects of drug use and equaled .60 with dimension of risks of drug use. In

addition, the correlation between dimension of effects of drug use and dimension of risks of drug use was obtained equal to .45.

After the evaluation of the assumptions, the data were analyzed using multiple regression analysis to determine to what extent each of the predictor variables can predict the overall attitude to drugs. The data are presented in the table 2.

Table 2: Summary of the regression model and coefficients of overall attitude to drug use

<i>Statistic</i>	<i>Age</i>	<i>GPA</i>	<i>Fathers' education</i>	<i>Mothers' education</i>	<i>Monthly income</i>	<i>Family relations</i>	<i>Emotional atmosphere of family</i>	<i>Relationship with sister and brother</i>	<i>Parenting styles</i>	<i>R²</i>
<i>Standardized regression coefficients (SE)</i>	.1 (.93)	-.01 (.38)	-.11 (.89)	.03 (.86)	-.19 (.48)	-.08 (.23)	.20 (.42)	.05 (.79)	.04 (.75)	.29
	*2.45	-.35	*-2.03	.62	-.48	*-2.1	* 4.79	1.42	-1.11	

*P<.01

As it is observed in the above table, age, fathers' education, family relations, and emotional atmosphere of family are among the predictor variables that could significantly predict overall attitude to drugs while the other predictor variables are not significant. In this regard, the overall positive attitude to drugs will increase .1 and .2 as a unit change in age and emotional atmosphere of family takes place, respectively. In contrast, the overall positive attitude to drugs will decrease -.11 and -.08 as a unit change takes place in fathers' education and family relations, respectively. These four variables explained 29% of the total variance of overall attitudes to drugs.

After multiple regression analysis, the collected data were analyzed using multivariate regression analysis to be revealed whether individualistic and family characteristics can predict the triple dimensional attitudes to drugs. The results are presented in the table below.

Table 3: Summary of multivariate regression coefficients and model of attitudes toward drugs

<i>Predictor variable</i>	<i>Standardized regression coefficients</i>			<i>Standard error</i>			<i>t</i>		
	<i>Attitudes to drug use</i>	<i>effect of drugs</i>	<i>risks of drug use</i>	<i>consumption of drugs</i>	<i>effect of drugs</i>	<i>risk of drug use</i>	<i>consumption of drugs</i>	<i>effect of drugs</i>	<i>risk of drug use</i>
Age	.035	.0092	.0006	.017	.045	.01	2.12*	.20	.41
GPA	.015	.15	.065	.10	.29	.09	.14	.52	.70
Fathers' education	.15	-.41	-.17	.14	.38	.12	1.08	-1.09	-1.44
Mothers' education	-.024	.18	.11	.10	.28	.09	-.24	.63	1.17
Family relations	-.011	.55	-.17	.19	.52	.17	-.05	1.05	-1
Monthly income (in dollars)	.51	.15	.53	.081	.22	.07	6.3*	5.20*	7.43*
Emotional atmosphere of family	.30	.28	.06	.20	.54	.18	1.52	.52	-.37
Relationship with sister and brother	-.11	.015	.14	.15	.41	.13	-.76	.036	1.08
Parenting styles	.079	.23	.26	.15	.40	.13	.54	.57	1.99*

As it is observed in the above table, only family relations and age significantly predict attitude to the consumption of drugs and other predictors are not significant. In this regard, the attitude to the consumption of drugs will increase .035 and .51 as a unit change in age and family relations takes place, respectively. These two variables could explain 20% of the variance of attitudes to drug use. In addition, the results of multivariate regression analysis on the prediction of attitudes to the effects of drug use show that only family relations could significantly predict the attitudes towards the effects of drug use; and other predictor variables are not significant. In this domain, the attitude to drug effects will increase .15 as a unit change takes place in family relations (based on standard deviation units). However, the other predictor variables could not predict attitudes towards drug effects. Moreover, the results of multivariate regression analysis show that only family relations and parenting styles could significantly predict attitudes towards risks of drug use and other predictor variables are not significant. Here, the attitude to risks of drug use will increase .53 and .26 as a unit change takes place in family relations and parenting styles (based on standard deviation units), respectively. These two variables could account for 25% of the total variance of attitudes towards risks of drug use.

Discussion and Conclusion

The present study aimed to predict attitudes to drugs based on individualistic and family characteristics. Before analysis of each of the dimensions, the scores

of each of the three dimensions were combined and a multiple regression analysis was run to determine to what extent each of the predictor variables can predict overall attitude to drugs. The obtained results showed that the emotional atmosphere of family, age, family relations, and fathers' education have the highest predictive power in students' attitudes to drugs. The standard error pertaining to the estimation of multiple regression showed that the variables of emotional atmosphere of family and family relations more accurately predicted students' attitudes to drugs than the variables of age and fathers' education. This finding is consistent with results of previous research (Jabbari Beyrami et al., 2008; Delawar et al., 2004). The results of the present study about the relationship between age and attitudes to stimulants, such as ecstasy and marijuana also indicated that it becomes more probable that students' attitudes to these drugs become positive with the increase of age (Zolfaghari & Hekmat, 2009). It seems that the increase of age will raise adolescent curiosity to learn and understand about the effects and consequences of drugs and stimulants more than ever and this curiosity provides the necessary conditions for the formation of positive attitudes to drugs.

In terms of parents' education and students' attitudes to drugs, the results of this research revealed that only fathers' education has an inverse relationship with students' attitudes. This means that the adolescents with more educated parents generally develop negative attitude towards drugs. This finding is different from the results of previous research (Riahi et al., 2009, Jabbari Beyrami et al., 2008; Alizadeh, 2005) since the results of these studies show that only mothers' education degree is correlated with children's attitudes to drugs. It seems that the reason for this difference can be attributed to the difference in the sample size used to examine the relationship between the variables. As a statistical principle, there is a higher probability that a non-significant relationship between the variables become significant by increasing the sample size.

Similar research done on the role of emotional atmosphere and family relations in children's attitudes to drugs (for example, Riahi et al., 2009; Sharifi & Rezaei, 2009; Alizadeh, 2005) support the finding obtained in this study. In the same direction with the mentioned studies, the results of the current study also showed that more positive attitudes to the consumption of drugs will be made if the emotional atmosphere of family is weakened. Moreover, if the family relations are more secure and healthy, more negative attitudes toward the consumption of drugs will be produced in children.

The construct of attitude to drugs is often considered as a one-dimensional construct (Bashirian et al., 2012; Khushabi et al., 2011; Zahedi Asl & Lotfi, 2011; Habibi et al., 2011; Akbari & Amoupour, 2010; Riahi et al., 2009; Allahverdi Pour et al., 2005). However, the results of some research have shown (Delawar et al., 2009; Alizadeh, 2005, Delawar et al., 2004) that attitude to drugs is a multi-dimensional psychological construct. For this reason, the more

accurate prediction necessitated to investigate the predictor variables of each of the dimensions of attitudes to drugs. The main objective of this research was to reveal what percentage of the variance in positive attitudes to the consumption, effects, and risks of drugs can be explained by individualistic and familial characteristics.

The results of multiple regression analysis showed that age and quality of family relationships can predict attitudes to the consumption of drugs. Similarly, attitude to drug effects can be predicted by the quality of family relationships. In addition, the attitude to the risks of drug use is predictable by the information about the quality of family relationships and parenting styles. In total, it was shown that family relations is the only common variable that plays a role in the prediction of triple dimensional attitudes to drugs.

The results of multiple regression analysis differ to some extent with those of multivariate regression analysis. Multivariate regression analysis showed that Grade Point Average, parental education, family income, emotional atmosphere of family, and relations with sister and brother do not have any significant role in the prediction of dimensions of attitudes to drugs. However, multivariate regression analysis showed that parents' education and emotional atmosphere of family can predict the overall attitude to drugs. This difference is due to the fact that the total score of attitude was considered as the criterion variable in multiple regression analysis and this increased the variability or variance of the criterion variable.

This study provided the conditions to identify the predictor variables of triple dimensional attitudes to drugs in addition to the overall attitude to drugs. This finding is the distinguishing feature of this study with the previous research in the field of predicting attitude to drugs. The results obtained from this study have provided evidence to conclude that it is possible to predict dimensions of attitude to drugs cannot be predicted with the same variables. If the multivariate regression were not used to analyze the data, this fact would remain hidden. Multivariate analysis is an efficient multivariate test that can be used for the prediction of dimensions of attitudes to drugs. However, it seems that multivariate regression analysis is not much known among researchers in the field of addiction studies.

During the study, some questions have been raised to the researchers that are suggested to those who are interested in the field of addiction studies. First, the coefficient of determination obtained in relation to the prediction of overall attitude to drugs and also prediction of triple dimensional attitudes to drugs showed that none of them were above .29. Therefore, it is also required to investigate and analyze the other variables that are effective in shaping attitudes to drugs and its dimensions. Only in this case, one can have a more accurate explanation of the predictor variables of attitudes toward drugs. Second, there is the question of to what extent the results obtained in this study are stable and reliable. To answer this question, one requires to assess the validation of the

obtained predictive equations in other provinces and other samples of high-school students.

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