

Abstract

Objective: This study aimed to identify the factors influencing drug abuse from the perspective of people who are involved in addiction treatment. **Method:** Due to the complex and ambiguous structure of the effective factors in youth addiction, fuzzy cognitive maps were used for data collection and analysis. The participants consisted of 16 physicians and psychologists working in Urmia medical and psychological treatment centers. **Results:** The results showed that the following variables had the highest effect on addiction from the perspective of specialists and experts: addiction of family members with the out degree of 1.54, unemployment with the out degree of 1.32, and deviant peers with the out degree of .88. In addition, these experts believe that addiction reduces one's ability to cope with life's problems and, thereby, inability to solve problems increases the person's sense of isolation. At the end, the whole process results in the severity of addiction. **Conclusion:** These results have practical implications. **Keywords:** drug abuse, youth, fuzzy cognitive maps

Effective Factors in Youth Drug Abuse in Iran: Analysis of Fuzzy Cognitive Maps based on Expert Opinion

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Introduction

Substance abuse has been one of the most serious human problems in recent years and one of the most complex human phenomena that leads to the incidence of repetitive occupational, social, and legal problems (Mansouri Jalilian, & Yazdanbakhsh, 2014). This disease can easily eliminate one's individual, familial, and social life by changing his/her minds, mood, personality, and behavior (Turner, Macdonald & Somerset, 2008), and seriously damages the health analysis, security, and economy of the nations in the world (Akbarzadeh, Akbarzadeh, & Javanmard, 2014; Hosseinifar, 2011).

Addiction is a biological, psychological, and social disease, and several factors are involved in the etiology of substance abuse and addiction that result in the onset of drug use and then addiction in interaction with each other (Darvishzadeh & Jillard Damavandi, 2010). Few phenomena can be found that threaten human societies like addiction. Despite the threats and complications of addiction, the number of victims of this deadly trap is increasing every day, and the observation of its horrific scenes has now not been seen as a serious warning to other people, especially young people to stop them from turning to this threat. Addiction victimizes individuals so quietly that victims do not remember the onset of addiction (Pourmusaea, Mousavi & Kafi, 2014).

Addiction may be considered to be a loophole for a defeated person to seek refuge in so that s/he can escape from the shortcomings, dysfunctions, and mental disorders. In the simple definition of addiction, it is a state in which a person becomes physically and psychologically dependent on a substance, there is a strong and compelled need for continued use of that substance, s/he is not able to abandon it with his/her will, and his/her tolerance against the consumption of that substance is gradually reduced (Narimani 2008, cited in Hashemi, Mohammadzadehghan, Ghasem Beklou, Irani, & Vakili, 2014). In general, addiction or maladaptive patterns of drug use lead to disorder or distress, which is of clinical significance. This model emphasizes the high frequency of maladaptive behaviors, the loss of control, inattention to other pleasures and tendencies in favor of substance. Addiction appears when a person takes on compulsive behaviors to obtain the intended substance and loses the controls of using that substance (Mohammadzadeh & Aghaee, 2014; Ganji, 2013).

As the most vulnerable group, young people are at risk of substance abuse more than other age groups. The extent of the effects of addiction is important in that its harsh consequences does not only inflict the addicted person, but also, usually, the family, friends, and colleagues will be exposed to its devastating effects (Siam, 2006). Considering the high costs of combating narcotic drugs, treatment, and caring of addicts as well as the disadvantages of treatment and detoxification methods, it seems that the prevention of drug abuse is more cost-effective and efficient. Therefore, the identification of correlated and effective

factors in the occurrence of this phenomenon can be an important step in addiction prevention (Rostami, 2006).

Analysis of the 30-year trends in the state of substance abuse in Iran from 1972 to 2002 shows that although the rate of drug use incidence in these years has undergone fluctuations, the overall trend in the past thirty years has risen. The highest increase has occurred in years 1973 to 1977 with a rate of 166%; then, its rate has gradually decreased by 1987, and then it has reached 59% in the period from 1988 to 2002. Over the past 20 years from 1978 to 1998, the average annual growing rate of drug abuse has been around 8% per annum, or it has increased twice every 12 years. The comparison of this rate with the population growth rate over the last 20 years, it was 2.63% on average. It is observed that the growth rate of malnutrition was estimated to be more than 3 times relative to the population growth rate. In addition, the growth rate of injectable drug use in the past 10 years has been 330 percent and this rate has been 33 percent per year on average (Rahimi Mo'aghar, Mohammad & Mohammad Rezaghi, 2002). Hence, the statistics about addiction in Iran signal a serious warning about its current situation in the country. This issue has imposed serious social, economic, political, cultural, and health damage on Iran; in this regard, it is possible to refer to such items as physical and contagious diseases like AIDS and hepatitis and even psychological illnesses, such as the increase in crimes related to addiction, theft, murder, self-burn, unemployment, domestic violence, child abuse, increased divorce rates, and academic drop-outs for students whose parents are addicted (Jamshidi, 2003).

Several studies have been conducted in Iran to identify the factors effective in or correlated with narcotic drug abuse. In this regard, one can refer to the studies carried out by Yaghoubi, Boulhari, Peirovi & Zafar, (2014); Taromian, Boulhari, Peirovi & Asgari (2011); Tavakoli & Dehkordian (2013); Asghari, Kordmirza & Ahmadi (2013); Effati Divsheli, Kafi Masouleh & Delazar, (2012); Seyfi Gandomani, Safarinia & Kalantari Meybodi (2012); and Poursayed Mousavi, Mousavi & Kafi (2012). In a meta-analysis on substance abuse during the past one and a half decades from 1981 to 2005, Mohseni Tabrizi, Jazayeri & Babaei (2010) reported the following variables as the major factors contributing to the development of substance abuse, respectively: life skills training and social resistance, peer and friends' groups, knowledge about the effects of drug use, the quality of relationships and family relationships, mood and personality factors, spatial and migratory movements, age, parental control, depression, behavioral personality variables, in-group interactions, academic performance, effects of film and caricature, family factors and status of economic activity, group therapy and father's addiction, family history of addiction, history of father addiction and sensitivity in interpersonal relationships, and awareness-raising through posters and caricatures.

All the studies conducted on identifying the factors affecting substance abuse have used student questionnaires and opinions. Due to the sensitivity of this

phenomenon and its criminal nature, there is a high probability that students give wrong and deviant responses. Therefore, the use of other methods of data collection and of other experts' opinion seems necessary. The professionals and individuals who are equipped with a lot of information about a phenomenon can be considered among the most important sources of knowledge about that phenomenon (Özesmi & Özesmi, 2004). In the field of substance abuse and addiction, the physicians and psychologists working in rehabilitation centers and drug addicts centers are among the richest sources of information in this area. These people gain a lot of information about the factors affecting the phenomenon of substance abuse due to daily involvement with the drug addicts who wish to quit addiction as well as due to the conduct of in-depth interviews with them. Therefore, the use of experts' comments is an important step in the identification of the factors influencing this ominous phenomenon. The review of research literature in Iran shows that no research has benefited from the views of these individuals so far and this research is the first attempt of this kind. On the other hand, studies have shown that many factors correlate with the incidence of addiction, and these factors also have interconnected and complex relationships with each other. Therefore, it is not possible to study these factors through correlational or interventional designs due to the high number of variables. In these cases, the use of fuzzy cognitive maps is the best method for the detection of the factors and the way these factors influence a phenomenon (Hossain, & Brooks, 2008). To date, no such a research has been conducted on the factors affecting substance abuse via this method. According to the above-mentioned points, the purpose of this study is to investigate the factors affecting drug abuse through fuzzy cognitive maps.

Method

Population, sample, and sampling method

The present study is an exploratory research that was conducted through fuzzy cognitive maps. Cognitive maps were first introduced by Axelrod. These maps are a representation of the causal relationships among several objects or problems, which include expert opinions about a subjective reality. Cognitive maps contain two main elements, namely causal concepts and relationships. The concepts are represented as variables and the causal relationships are represented as relations between variables. The causal relationships connect the variables together and can be positive or negative. The variables that bring changes are called causal variable causes, while the variables that are affected by changes are called dependent variables. Due to the qualitative nature of cognitive maps, and on the other hand, considering the quantification power of fuzzy logic, Kosko introduced fuzzy cognitive maps with fuzzy weights (Kosko, 1986). In these maps, the paths, in addition to having a positive or negative direction, took up numerical weights within the range of -1 to 1, which indicated the degree of the

effect of the variables on each other. Fuzzy cognitive maps eliminate the uncertainty problem in determining the overall effect.

Physicians and psychologists working in drug addiction treatment centers in Urmia constituted the participants of the present study. Fuzzy cognitive maps are based on the views of the experts who provide rich information about the discovery of causal mechanisms between variables. Due to the exploratory nature of this method and the long duration of data collection, it is not possible to use a large sample size. Moreover, since this method deals with exploration rather than generalization, there is no need for sampling (Özesmi & Özesmi, 2004). Özesmi & Özesmi (2004) suggest that sampling should continue until data saturation occurs. Saturation in the method of fuzzy cognitive mapping is obtained when the addition of new samples does not add new information to the cognitive maps. In this study, the data were saturated after the conduct of 16 interviews.

Instrument

For data collection, the respondents were asked to draw the circular shape of the main phenomenon, i.e. substance abuse on a piece of paper. Then, they were asked to draw the effective factors around it. In the following, they were asked to draw flashes of those factors towards substance abuse, determine whether the flashes were positive or negative by arrows, and decide upon the degree of the effect (low, medium, high, and very high). Eventually, they were requested to connect the factors that affected each other with a flash and also determine the magnitude of the effect. It has been recommended to use this approach when respondents have rich information about the phenomenon and do not need much guidance for responding (Özesmi & Özesmi, 2004). In this study, although the physicians and psychologists involved in the treatment of addiction were the participants and their information was possibly richer than the researchers, this method was used to collect data. It should be noted that the total number of factors introduced by experts equaled 26 ones.

After data collection, the maps designed by respondents were converted into matrices. After the completion of the matrices for all responders, this matrix was converted into fuzzy numbers based on the criteria determined by Hossain, & Brooks (2008). Thus, the zero score was assigned to None, 0.25 was assigned to Low, 0.50 was assigned to Moderate, 0.75 was assigned to High, and 1 was assigned to Very High. After converting the matrix completed by the experts to the fuzzy numbers matrix, these matrices were combined and a complete fuzzy matrix was obtained. The matrix then entered the FCM Mapper software (fcmmapper.com) to be analyzed. This matrix is presented in Table 1.

Table 1: Respondents' fuzzy numbers matrix

<i>Factors</i>	<i>Addiction</i>	<i>Hope for the future</i>	<i>Failure in life</i>	<i>Sense of curiosity</i>	<i>Feelings of isolation</i>	<i>Not meeting emotional needs</i>	<i>Deviant peers</i>	<i>Intolerance of life problems</i>	<i>Mental problems</i>
Hope for the future	-0.07								
Incurable disease		-0.71							
Feeling of fitting in with others	0.5								
Socioeconomic status	0.27		-0.05						
Failure in life	0.47								
Sense of curiosity	0.18								
Living in dormitory				0.52					
The availability of substances	0.75								
Feeling of maturity	0.27								
Defects in the rules	0.62								
Religious beliefs	-0.3								
Discrimination in society	0.25								
Genetic characteristics	-0.03								
Place of residence	0.3								
Earning pleasure	0.55								
Feelings of isolation	0.72								
Intolerance of life problems					0.63				
Mental problems	0.8								
Death of loved ones	0.31					0.27			
Deviant peers	0.88								
Lack of recreational facilities							0.53		
Parental divorce						0.11			
Inappropriate parent-child relationship						0.13			
Family members' addiction	0.66					0.89	0.69		
Unemployment	0.63						0.69		
Addiction								0.18	
Not meeting emotional needs									0.59

Results

It is very difficult to analyze complex cognitive maps, but the graph theory provides ways to analyze their structure. By testing the structure of the maps, we can determine how the system's specialists are. A very useful tool for comparing variables in a map or network is centrality (De nooy, Mrvar & Batagelj, 2005). The share of a variable in a cognitive map can be calculated by calculating its centrality, which shows how variable is connected to other variables. How is the compression strength of these communications? The centrality is the sum of the inner values, the number of directional arrows pointing towards a node or variable, and the outer level, the number of vertices or causal paths that exit a

node or variable. In addition, if the external variable is positive and the internal grade is zero, it is said to the transmitter, which indicates the effect of the variable. If the internal degree of the variable is positive and its external degree is zero, it is said to the recipient that the indicator is a variable effect. Ordinary variables also have a positive external and internal degree, which indicates the impact and variability of the variable (Özesmi and Özesmi, 2004). In this research, the density of the cognitive map of experts is 0.044, which indicates that 4.4% of all possible paths are available in the map. The total number of variables in the model is 27. 32 Connection between variables is established that 32 paths causing variables to affect each other. The total number of transmitter variables or variables that only affects other variables is 18. Also, the number of variables that affect both variables and other variables is 9. In Table 2, the results of the analysis of fuzzy cognitive maps for each individual variable have been reported.

Table 2: Graph indices for each of the variables for specialists

<i>Variable</i>	<i>Outer degree</i>	<i>Internal degree</i>	<i>Centrality</i>	<i>Variable Type</i>
Hope for the future	0.07	0.71	0.78	Normal
Incurable disease	0.71	0	0.71	Sender
Empathize with others	0.50	0	0.50	Sender
Socio-economic status	0.32	0	0.32	Sender
Failure in life	0.47	0.05	0.52	Normal
Sense of curiosity	0.18	0.52	0.70	Normal
Living in dormitory	0.52	0	0.52	Sender
Drug availability	0.75	0	0.75	Sender
Mature feelings	0.27	0	0.27	Sender
Defects in the rules	0.62	0	0.62	Sender
religious beliefs	0.30	0	0.30	Sender
Discrimination in society	0.25	0	0.25	Sender
Genetic features	0.03	0	0.03	Sender
Place of residence	0.30	0	0.30	Sender
Pleasure	0.55	0	0.55	Sender
Isolation feeling	0.72	0.63	1.35	Normal
Lack of emotional needs	0.59	0.70	1.29	Normal
Deviant peers	0.88	1.91	2.79	Normal
Intolerance to life problems	0.63	0.28	0.81	Normal
mental problems	0.80	0.59	1.39	Normal
Death of loved ones	0.58	0	0.58	Sender
Lack of recreational facilities	0.53	0	0.53	Sender
Parental divorce	0.11	0	0.11	Sender
Inappropriate parenting relationship with children	0.13	0	0.13	Sender
Addiction of family members	1.54	0	1.54	Sender
Unemployment	1.32	0	1.32	Sender
Addiction	0.18	8.56	8.74	Normal

According to Table 2, as experts' opinion, the addictive variable of family members with an external degree of 1.54 has the greatest effect on the cognitive map on other variables. The second most influential variable for the unemployed with an external degree is 1.32. The third most important influential variable of

deviant peers with an occipital level is 0.88. The least important variables are those with genetic features with an exogenous level of 0.03, a future hope with an exogenous level of 0.07, and a parent with an external degree of 0.11. The most important variable in the cognitive map accepts the most impact from other variables; the addiction is internal to 8.74. The second important variable influencing other variables is deviant peers with an internal degree of 1.91. The third most influential variable is the hope for the future with an internal level of 0.71. The most important impact factor of failure in life with an internal level of 0.05 is. According to Table 2, the highest number of centralities is related to the addictive variable. This number is 8.74 for the addiction variable, which indicates the great importance of this variable for specialists. The second most important variable for the deviant peers is centrality of 2.79. The third most important variable in the model is the family members' addiction with a centrality of 1.494. The most important variable of the cognitive map of the genetic features is with center of 0.03. In Figure 1, the fuzzy cognitive map of the experts is shown. Given this form, the squared square variables are factors that are outside the individual. The shape of the circle is also used to illustrate the factors that are within the individual. Addiction is also represented as a triangle. Given this form, there is a cycle in the cognitive map of specialists that exacerbates addiction. This cycle includes addiction, intolerance to life problems and isolation. According to experts, addiction reduces the ability of a person to cope with life problems; the inability to solve problems also increases the sense of isolation in the individual, which also exacerbates the addiction of the individual.

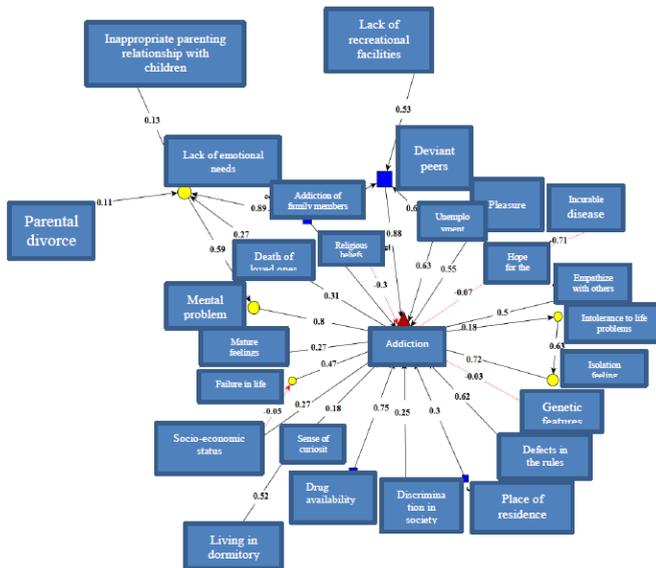


Figure 1: Fuzzy Cognitive Map of experts

Discussion and Conclusion

Addiction is one's captive dependence on a drug or narcotic substance that affects him/her physically and psychologically, exacerbates his/her personal and social behaviors, and attacks the human community as the most important social damage (Mehriar & Jazayeri, 1998). Accordingly, the present study was conducted to determine the factors affecting the occurrence of this phenomenon from the point of view of specialists and those involved in its treatment. Fuzzy cognitive maps were used to collect and analyze the data due to the complex and vague structure of the factors affecting youth addiction. Inspired by the findings of this research and considering cognitive mapping, one can say that the experts held the belief that the addictive variables of family members had the greatest impact, and genetic traits, hope for future, and parental divorce had the least effect in the cognitive mapping on addiction. The variables of unemployment, deviant peers, mental and psychological problems, and the availability of substances are in the subsequent stages of effectiveness in addiction in the cognitive maps from the experts' perspective.

This finding suggests that the reuse of drugs has become customary for most of the people who have been born and raised in addicted families and get far away from it for the fear of experiencing its use. Because there is no direct relation between father and child addiction in genetics, and the practice of drug use by the father becomes ordinary children, it seems that the social reactions of the addicted family members have become stable due to repetition. It becomes ordinary for other members of the family and the normalization of drug use will help with the facilitation of the consumption of drugs by other family members. Unemployment, as a social phenomenon, is also a prerequisite for deviations, especially addiction. Unemployed people spend most of their time in cafeterias and such places are the best and most suitable place for selling and consuming drugs. As a result, such places are considered among the beneficial factors for tendency towards addiction that come primarily from people's unemployment. In fact, one of the items that attracts attention during investigation is the existence of such public places for drug use. Deviant peers are another important factor influencing drug use in experts' views. According to Oetting, & Beauvais (1986), the only major variable in adolescents' substance abuse is the influence of peers that they have chosen for communication. In general, the use of drugs is directly related to peers. In this view, other factors indirectly affect the behavior of drug use. In fact, this theory was introduced in order to explain the relationship that was usually observed between substance use by the person and by his/her friends in a stable manner. The assumption is that drug use in adolescents is a group activity that occurs in the social context of a friend group. According to the friends group theory, small groups of friends and peers determine where, how, and when the drugs are consumed. In fact, these are the small groups that shape the attitude and beliefs of adolescents about drugs (Oetting, & Beauvais, 1986). The majority of adolescents are members of a

group of friends who participate in determining what the group should or should not consume and how a substance should be consumed. From the perspective of the external viewers, this seems to be conjugation to the group pressure, whereas this is perceived as a mutual agreement within the group.

One of the other main reasons for addiction is mental problems from the psychologists' point of view. To explain this finding, it can be said that young people take refuge in drugs in order to escape from the tensions, pressures, boredom, and restlessness of life. If the use of drugs is begun in order to escape the duties and responsibilities specific to adolescence, that is, the learning of coping with the stresses and the acquisition of perceptual, social, and professional skills; this, in itself, prevents the emergence of the necessary abilities in youth abusers for cope with problems in adulthood. Another reason that adolescents mention for turning to drug use is their attempt to escape the tensions and pressures of life and chaos and frustration. In some cases, the use of narcotics by adolescents suggests a sense of alienation with the outside world and, as a result, an internal tendency toward the personal world that is obtained through the use of substances (Stone, Becker, Huber, & Catalano, 2012).

The availability of drugs is another source of addiction from a specialist perspective. It should be said that people will have tendency to something that is easily accessible to people more quickly. In Iran, it has been proven that the permission of opium use even in special circumstances for a special group has contributed to youth addiction. Therefore, the Ministry of Health and Welfare Organization should also pay more attention to this social problem, because even the permission to consume for a special group of people has become a means for earning gains that both help with the devastation of people of society and the cessation of the social and economic development of the community. In the United States, it has been proven that the percentage of addicts was very high when the consumption of cigarette and cannabis was legal. As another example, in Nepal where the consumption of cannabis, marijuana, and heroin is free, there is the highest rate of young tourist attraction from western industrial societies. Even the girls that come to Nepal and have a high length of stay may sell their body for the purchase of drugs. On the other hand, as it gets easier to get access to drugs, and a person can afford it at a lower cost and risk, the rate of drug use will increase. About 75 to 98 percent of adolescent drug addicts have stated that they can easily obtain these drugs (Bahrami Ehsan, 2004).

The results of this study also showed that another major contributing factor to addiction is connection with deviant peers. Sutherland believed that deviations were generally learned in the form of early groups such as friends or family groups. These groups are much more influential than officials and authorities, such as teachers, priests, police or communications media, such as film and newspapers. For Sutherland, the process of learning criminal behavior involves techniques of criminality, motivations, tendencies, and the reasons for it. In this way, a young man learns how to successfully steal and how to bring reasons to

justify his robbery and excuse him (Mobaraki, 2004). Based on this perspective, socializing with close relatives, colleagues and especially addicted and deviant friends, imitating people around, socializing in unhealthy and diverse environments such as school and inappropriate educational environments are among the main causes of drug addiction (Krampour, 2000). Hence, training to young people on the best way to treat the groups of friends who are drug addicts is necessary. As it was shown in the present study addiction, and, consequently, a lack of parental support and supervision, leads to poor family ties, personality problems, and relationships with addicted peers. The theory of family interaction emphasizes the link between the child and parents as the most important protective factor and emphasizes parenting as the most important condition for the training of healthy children. Therefore, it is suggested that parents be informed of the adverse consequences of addiction through the media and other public media, as well as educational workshops and, accordingly, this catastrophic disaster should be prevented.

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