Comparison of Risky Behavior, Process Emotion Regulation Strategies, and Prospective & Retrospective Memory in School Students with and without Drug Use Tendency

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Abstract

Objective: The present aimed at comparing risky behaviors, process emotion regulation strategies, and prospective & retrospective memory between students with and without addiction tendency. **Method:** A causal-comparative research method was used for the conduct of this study. The statistical population of this study consisted of all high school male students of Tabriz in the academic year 2016-17. The study sample consisted of 60 students with addiction tendency and 60 students without addiction tendency who were selected among the whole group of students. For data collection purposes, high-risk behavior scale, Emotion Regulation Strategies Questionnaire, Prospective and Retrospective Memory Questionnaire, and Addiction Acknowledgment Scale were used. **Results:** The results of this study showed that there is a significant difference between the two groups in terms of retrospective memory, situation selection, sitiuation modification, attention deployment, behavioral modification, experiential modification, violence, smoking, and alcohol consumption. In fact, students with a tendency to addiction were revealed to have a higher degree of retrospective memory and risk behaviors and a lower degree of emotion regulation strategies. **Conclusion:** It can be argued that risky behaviors, emotion regulation strategies, and retrospective memory affect the severity of addiction in students.

Keywords: addiction, retrospective memory, prospective memory, process emotion regulation strategies, risky behaviors

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Introduction

Drug addiction is a recurring and chronic mental illness that is associated with severe motivational disorders and loss of behavioral domination (Dallas, David, & Julie, 2010). Addiction seriously reduces the health, security and economy of the nations of the world (Caetano, & Cunradi, 2002), and the increasing trend towards drug use is one of the major social problems. Drugs use and its unpleasant complications is one of the most serious mental disorders and is one of the most harmful social harms (Bahadori Khosroshahi and Khanjani, 2013). The fifth Diagnostic of Ststidtical Manual of Mental Disorder (5 Th Ed- Dsm-V) (2013) considers the important feature of substance abuse disorders as one of the cognitive, behavioral and physiological symptoms that people continue to use despite significant problems associated with abuse. On the other hand, drug addiction can be defined as the dense mass of negative results and has adverse drug, social, legal, sanitary, and economical effects of drug abuse (Wright, & Klee, 2001).

Addiction is associated with adaptive changes in the central nervous system that results in endurance, physical dependence, sensitivity, craving, and relapse in a drug abuser (Bessimi, Terchi, Enri and Ramberti, 2013). The adverse effects of this phenomenon are not only revealed on the person's mental and physical health, but also on the individual's family and society as a whole. This phenomenon in our country is associated with a high prevalence especially among adolescents and is considered as one of the major health problems (Safarzadeh and Sabahi, 2016).

Drugs use not only endangers the health of the individual, but also the health of the family and society, and causes mental and moral degradation of the individual. Also, the addiction cycle is a complex factor, on the one hand, a neuropsychological process, and on the other hand, is a psychological process that these neurophysiological and psychological create some changes of the neuropsychological outcomes. According to past surveys, several factors, including individual, family and social factors, are effective in the onset, continuation and return of addiction (Martin, Weinberg, & Bealer, 2007). Also, many studies confirm the effect of the addictive substances on the brain and, as a result, on cognitive abilities (Lundqvist, 2005).

In this regard, the defective and maladaptive styles of emotions and emotional behaviors are likely to be a significant predictor of risky behaviors. The individuals who lack the skills necessary to cope with their emotional experiences are more involved in risky behaviors while managing and controlling their negative emotions, and this increases the rate of drug use (Mohammadi, Tanha, and Rahmani, 2015). Risky behavior refers to behaviors that increase the likelihood of physical, psychological, and social harm to a person (Zadeh-Mohammadi and Ahmad-Abadi, 2008). Indeed, the tendency towards risky behaviors is used as a mechanism for suppressing negative emotions. The method to evaluate an individual's cognitive system in case of

coping up with negative event is of great importance (Garnefski, & Kraaij, 2006). Researchers believe that the maximum drugs use prevalence occur in the late adolescence and early adulthood periods. The risk of substance abuse is related to family history and behaviors such as violence and rape (Naemi and Faqihi, 2015).

Risky behavior is a maladaptive strategy in dealing with stressful and negative situations of life. It seems that when dealing with risky behavior, probably, the main event that stimulates the negative mood is not considered. When the risky behavior is stopped, an individual is prone to returning to the same negative state that he was trying to escape. Those who use risky behaviors, such as drug use, are prone to risky behaviors to reduce negative emotional states and vice versa. Particularly, risky behaviors become positive reinforcements that bring temporary relief from negative emotions and ultimately, this temporary relaxation may increase the likelihood of some behaviors, including drug use in the future (Mohammadi, Tanha and Rahmani, 2015).

In this regard, Copello, Velleman, & Templeton (2005) concluded in their study that the lack of skill in emotions regulation can involve people in problems that one of these problems is risky behaviors. In fact, emotional avoidance skills are associated with higher drugs use. Cooper, Shapiro, & Powers (1998) also found that the individuals who lack skills for dealing with their emotional experiences may be more likely to engage in risky behaviors in an effort to deal with their negative affect and may turn to using substances as a way to relieve their negative emotions.

One of the factors that play an important role in drug addiction in students is their memory. Some scholars have identified different characteristics for the memory of students with a tendency to drugs such as the absence of obvious signs (Javanmard and Ghareghozlou, 2015). They have discovered two types of signs or signs of memory: prospective signs, such as reminding drug purchases when a person crosses the pharmacy, and time-based signs or retrospective signs (person-centered) such as contact with a friend in the evening. Prospective memory, introduced by Smith, refers to a phenomenon by which the surrounding environment is effective on cognitive processes (Javanmard and Mohammadiqqaraghzlou, 2015). The signs of time or retrospective signs are less evident and less obvious than prospective ones, since they exhibit less external or apparent visualizations than environmental signs (González-Ramírez, & Mendoza-González, 2011).

In fact, it can be said that retrospective activities need self-start more than prospective activities, and this can be explained based on the cognitive load of individuals. Self-centralization in information processing requires a more cognitive capacity than the retrospective aspects (Javanmard and Mohammadiqergheghozlou, 2015).

Qanbari, Akbarzadeh, Akbarzadeh and Esmailzadeh (2015) in their research showed that there is a difference between quitters and healthy people in

prospective memory performance, but there is no significant difference in retrospective performance. Yan and colleagues (2013) in a study showed that heroin-dependent individuals have a lower performance in working memory assignments than control group. In this regard, Miller (1985) compared the use of morphine, chronic heroin and normal people in functional memory, spatial memory, planning and sequencing, and found that the function of the two groups in various fields was different from the normal people, although the type of disorder is different in the two types of drug used. Several studies have also shown that there are many evidences for cognitive abnormal performance after heavy and prolonged drug use and these effects include impaired perceptual-motor functions, especially memory and learning (Curran, Brignell & Fletcher, Middleton, & Henry, 2002).

In the study of the causation of drug addiction, various researchers and theorists have referred to emotional regulation deficiency, low tolerance to discomfort, emotional avoidance (Blum, 2005; quoted by Babaei, Hasani and Mohammad Khani, 2012). Emotional experiences, regardless of the positive or negative capacity, are considered as the main elements of the adaptation of living beings. All humans and animals, with varying degrees experience different emotional and mood status and use them for various activities of everyday life. Perhaps one of the fundamental differences of man with other species is his ability to manipulate, manage and control the severity, duration, manner of expression, time and place of expressing emotional experiences. The set of these abilities is referred as emotion regulation in the psychological books (Hassani and Kadivar, 2015). The low level of emotional regulation that results from the inability to deal effectively with excitement and its management is associated with the onset of drug use (Parker, Taylor, Eastabrook, Schell, & Wood, 2008). The ability to manage emotions makes it possible for an individual to use appropriate coping strategies in situations where the risk of using drugs is high (Trinidad and Johnson, 2002). Since emotional regulation plays a central role in normal development, its weakness is an important factor in the development of psychological disorders, especially drug use. Theorists believe that people who are not able to properly manage their emotions against everyday events show more diagnostic symptoms of psychiatric disorders, and drug use rates are higher in these individuals (Mennin, & Farach, 2007). Also, in the research of Sher& Grekin (2008) and Fox, Axelrod, Paliwal, Sleeper, & Sinha(2007), emotional regulation strategies are associated with alcohol-related disorders and drug use.

It seems that a part of the causes of the return to addiction or inability to withdraw can seem to be related to the lack of individual compliance with the doctor and the treatment process that occurs due to memory impairment. On the other hand, most studies have examined the effect of addiction on general memory performance (and not a specific memory type), but a few studies have been done on the effects of addiction on different types of memory, such as retrospective and prospective memory (Ghanbari et al, 2015). Also, the process

emotional regulation model includes a series of adapted strategies and a series of uncompromising strategies. The individuals with higher emotional problems mostly use uncompromised strategeis (Qa'daniyah-Jahrami, Hasani, Nouri and Fermaneh Shahreza, 2014). In general, the use of compromised cognitive coping strategies leads causes that individuals less suffer mental harms and the maintenance and improving the community's health requires that special attention is given to risky behaviors and effective factors in preventing addiction in schools, and this is especially true for young people who have a great share in society and they have specific physiological and psychological characteristics that make them vulnerable to high-risk behaviors and they are of great importance. Therefore, due to these theoretical basics and contradictory researches, the aim of the present study was to compare risky behaviors, process emotional regulation strategies, and prospective & retrospective memory in school students with and without drug use tendency.

Method

Statistical population, statistical sample and sampling method

A causal-comparative research method was used for the conduct of this study. The statistical population of this study consisted of all high school male students of Tabriz in the academic year 2016-17 and after the required coordination with the main office of education of province and getting permission regarding the conduct of study to identify the addiction susceptible students, the addiction tendency assessment scale was performed on 400 students and the students meeting the study criteria were identified. Then, of which, 60 students with addiction tendency with high score were selected randomly (cutting score above 50) and 60 students with low score were selected. The inclusion criteria were: male gender, having a high and low score in the addiction tendency score (50), the age range of 18 to 21 years, and exclusion criteria were psychiatric disorders, brain tumors, brain injuries and heart disease

Instrument

1- Prospective and Retrospective Memory Questionnaire: It is a pencil and paper test in which 16 questions are designed by Crawford, Henry, Ward, & Blake2006) and a five-point Likert scale is used for scoring. This test basically shows the degree of error in retrospective and prospective memory and the high score indicates the presence of weak memory components. The first eight questions relate to retrospective memory and the next eight questions are related to prospective memory. Crawford et al. (2006) reported the reliability of the test by internal consistency (Cronbach's alpha) on a retrospective/prospective scale of 0.88, 0.80, respectively (quoted by Zahednaghad, Poursharifi and Babapour, 2012). Also, in the present study, Cronbach's alpha coefficient for both retrospective and prospective memory has been 0.80 and 0.79, respectively

2-The Process Emotional Regulation Strategies Questionnaire: This questionnaire has 28 items, which was developed by Schutte, Manes, & Malouff (2009) in the Gullone, Moore, Moss, & Boyd model (2007). It has 7 scores for situation selection, situation modification, attention deployment, cognitive change, empirical modification, behavioral modification and biological modification. As qquestions 15, 11, 16 and 21 evaluate situation selection component, questions 8, 23, 9 and 19 situation modification component, questions 10, 7, 22 and 13 components attention deployment, questions 6, 14, 27 and 24 cognitive change, Questions 5, 12, 17 and 3 empirical modification, questions 4, 25, 26 and 28 behavioral modification component and questions 20, 2, 1, and 18 evaluate biological modification. The four sub-criteria for situation selection, situation modification, attention deployment and cognitive change are placed in emotional regulation strategies concentrating on outcome but the three subscales of empirical modification, behavioral modification and biological modification are dedicated to the strategies focusing on response.

For each of seven strategies, there are four items. Two items in each set focus on reduction of negative emotions and two items on increasing positive emotions. A 7-point Likert scale is also used in which 1 indicates strong disagreement and 7 total agreement (Hassani and Kadivar, 2013). Its reliability has been reported by Cronbach's alpha of 0.57-0.94. Also, the correlation between the scores of items and general scores of subscales has been reported (r = 0.44 to r = 0.72). The test-retest coefficients were obtained between 0.56 and 0.74. The internal relations between the subscales were reported significant (0.31 to 0.87) and the existence of specific patterns of correlation coefficients in the questionnaire, with positive, negative affect and symptoms of depression, is a sign of the criterion validity (Hassani And Kadivar, 2013).

3-Risky Behavior Questionnaire: This questionnaire examines the valid tools in adolescents' risk taking such as Gullone, Moore, Moss, & Boyd(2000) and the youth's risky behavior control system questionnaire of zade Mohammadi and Ahmad Abadi (2008) to evaluate the vulnerability to risky behaviors such as violence, smoking, substance abuse, alcohol use, sexual relationships and sexual tendency. The scoring system of this scale is Likert scale (5,4,3,2,1,0) or dual scale (1,0) as agree or disagree. So that in dual scoring, it is used for the rate of occurrence. In this questionnaire, items (1-4 and 6) evaluate dangerous driving, items (7-11) violence tendency items (12-16), smoking tendency (24-40) tendency to drugs, items (25-30), tendency to alcohol, items (31-34) tendency to sexual relationship and sexual behavior items and items (35-38) tend to be related to the opposite sex Nikkhoo (2007) reported the construct validity of this scale through exploratory factor analysis on a sample of 1204 as desirable and satisfactory. This scale is a multidimensional scale in which the first factor as drugs use subscale has the highest contribution (9.13%) in explaining the variance of this scale.

Cronbach's Alpha for the whole scale have been reported 0.94, dangerous driving 0.74, violence 0.78, smoking 0.93, drug abuse 0.90, alcohol use 0.90, sexual behavior and relationship 0.87 and friendship with the opposite sex 0.83 (Zadeh-Mohammadi and Ahmadabadi, 2008).

4- Addiction Acknowledgment Scale: This scale has 13 items and was developed by Weed, Butcher, McKenna, & Ben-Porath (1992) to measure respondents' willingness to accept alcohol-related or drug-related problems and drugs abuse tendency. Most of the questions refer directly to alcohol and other issues. The Responding procedure is done on a 5-point Likert scale from totally agree to totally disagree. Kord Mirza (1999) reported that Cronbach's alpha was 0.75. Also, Graham (2000) reported its reliability using the test -retest for men and women 0.89 and 0.84, respectively.

Results

The descriptive statistics of the research variables are presented in Table 1

Table 1: Descriptive Statistics of Studied Variables by Groups

Variables	With addiction tendency		Without addiction tendency	
	Mean	*SD*	*Mean*	*SD*
Retrospective memory	17/13	1/29	16/50	1/39
Prospective memory	17/08	1/21	17/23	1/21
Situation selection	17/48	1/33	18/30	1/40
Situation modification	17/01	1/25	18/21	1/53
Cognitive deployment	16/65	1/16	18/45	1/68
Cognitive change	17/01	1/23	17/21	1/58
Empirical modification	16/93	1/27	17/65	1/58
Behavioral modification	16/86	1/25	18/36	1/50
Biological modification	17/21	1/53	17/60	1/49
Dangerous driving	15/26	1/64	15/76	1/43
Violence	17/06	1/20	15/50	1/32
Smoking	15/31	1/38	12/31	1/85
Alcohol use	19/40	2/27	18/40	1/56
Sexual behavior	17/03	1/13	17/28	1/27
Tendency to opposite sex	17/15	1/29	16/58	1/98

Multivariate analysis of variance was used to examine the difference between groups. One of the assumptions of this analysis is the equality of variance-covariance matrices and the results of Box test show the satisfaction of this assumption (P>0.05, F=1.18 and M box=41.39). Another assumption of this analysis is the equality of error variances. The results of Leven's test to evaluate this assumption are shown in Table 2.

Table 2- The Results of Leven's Test to Evaluate the Equality of Error Variances in Study Variables

Variables	F statistics	Degree of freedom	Significance	Variables	F statistics	Degree of freedom	Significance
Retrospective memory	0/30	118	0/58	Empirical modification	2/41	118	0/12
Prospective memory	0/22	118	0/63	Behavioral modification	1/02	118	0/31
Situation selection	0/01	118	0/89	Biological modification	0/12	118	0/72
Situation modification	2/95	118	0/08	Dangerous driving	3/03	118	0/08
Cognitive deployment	5/96	118	0/06	Violence	0/99	118	0/32
Cognitive change	4/10	118	0/05	Smoking	4/41	118	0/04
Alcohol use	4/65	118	0/03	Sexual behavior	1/34	118	0/24
Tendency to opposite sex	3/24	118	0/06	–	–	–	–

As shown in Table 2, there is no error variance equality condition in cognitive change, smoking, and alcohol use variables. Therefore, the Pillai's effect index is used as a multi-variable index. The results of multivariate analysis of variance indicated that there was a linear difference between the two variables in the two groups (P < 0.001, F = 1.04, Pillai's effect=0.99). Univariate variance analysis was used to study patterns of difference as presented in Table 3.

Table 3: The Results of Univariate Variance Analysis for the Analysis of Difference Patterns of Variables in Two Groups

Variables	Sum of squares	Degree of freedom	Mean of squares	F statistics	Significance
Retrospective memory	225/96	1	225/96	6/63	0/01
Prospective memory	173/99	1	173/99	0/46	0/49
Situation selection	241/59	1	241/59	10/65	0/001
Situation modification	274/36	1	274/36	22/05	0/001
Cognitive deployment	343/70	1	343/70	46/53	0/001
Cognitive change	239/59	1	239/59	0/69	0/40
Empirical modification	258/79	1	258/79	7/47	0/007
Behavioral modification	294/36	1	294/36	35/10	0/001
Biological modification	274/99	1	274/99	1/92	0/16
Dangerous driving	287/96	1	287/96	3/15	0/07
Violence	262/36	1	262/36	46/03	0/001
Smoking	585/96	1	585/96	100/83	0/001
Alcohol use	478/80	1	478/80	7/88	0/006
Sexual behavior	173/99	1	173/99	1/28	0/25
Tendency to opposite sex	341/86	1	341/86	3/42	0/06

As shown in Table 3, there are significant differences between the groups in the variables of situation selection, situation modification, cognitive deployment, behavioral modification, violence, and smoking (P <0.001). Also, there was a significant difference between the groups in terms of retrospective memory, empirical modification and alcohol use (P <0.01). There was no significant difference between the groups in other variables (P> 0.05). According to descriptive statistics, students with a tendency to addiction have high retrospective memory errors and risky behaviors of violence, smoking, and alcohol use. Also, students with addiction tendency have lower emotional regulation process strategies.

Discussion and Conclusion
The present aimed at comparing risky behaviors, process emotion regulation strategies, and prospective & retrospective memory between students with and without addiction tendency. The results of this study showed that there is a difference between two groups of students with and without tendency to addiction in retrospective memory. But there was no difference in prospective memory. In fact, students with tendency to addiction have high retrospective memory error. This finding is consistent with the results of research by Ghanbari et al. (2015) and Miller (1985). An acceptable explanation for the existence of more memory errors can be that memory activity is performed in everyday life while doing other tasks simultaneously. In fact, odd-dimensional errors are more than peripheral errors. Therefore, an acceptable explanation for the existence of further errors in memory can be that memory activity is performed in everyday life while doing other tasks simultaneously. Also, when people complain of their weak memory, their complaints usually relate to everyday cognitive errors and the lack of recognition of familiar individuals, the obliteration of important events that happened in the past, the forgetting of the location of things at home, and so on. Such aspects of memory errors are the real world memory and relate to day-to-day memory and cognitive failures (Zare and Tarajeg, 2009). Therefore, the same errors in retrospective memory can play a greater role in students' tendency to addiction.

Memory and recall are effective factors on the pattern of patient compliance. The memory and perception of the patient indirectly influence the treatment satisfaction and also directly affect the compliance. On the other hand, people with better memory and less memory impairment have higher treatment compliance. It seems that a part of the reasons of turning to addiction or inability of withdrawal can be related to the lack of compliance by the physician and the treatment process associated with the destruction of memory (Ghanbari et al., 2015).

The other result of the study showed that there is a significant difference between two groups of students with and without addiction tendency in situation selection, situation modification, cognitive deployment, behavioral modification

and empirical modification, but in the cognitive and biological modification, there was no difference between two groups of students. In fact, students with a tendency to addiction have low process emotional regulation strategies. This finding is in line with the results of the research by Sher& Grekin (2008) and Fox et al. (2007), which showed that emotional regulation strategies are related to alcohol-related disorders and drug use. Also, in another study by Axlerroth et al. (2011) which examines the emotional regulation and the frequency of substance abuse in women with drug abuse and borderline personality disorder, found that improved emotional regulation not only improves mood but also reduces the frequency of drug abuse. Emotion regulation strategies help people to set up negative emotions. This regulation method has a direct relationship with the growth, progression, or development of mental disorders. Also, emotional regulation reduces negative emotions and increases the positive emotions and adaptive behavior of individuals (Gross & John, 2003).

Emotion regulation strategies help individuals to regulate arousal and negative emotions; the regulation method is associated with growth or mental disorders, including substance abuse. Some studies have shown that the ability of successful emotional regulation is associated with a number of physical, psychological and social outcomes. On the contrary, it is assumed that failure to regulate emotion is the underlying mechanism of many psychiatric disorders (Zare and Selgi, 2012). Emotion by coordinating biological, mental, and motivational processes makes the situation of the individual conditional on the environment and provides the person with special and efficient responses and ultimately causes his physical and social survival. On the other hand, emotions play an important role in creating and disconnecting interpersonal relationships, and this is done by adjusting the distance between individuals because emotions bring people together or makes them separated. (Eisenberg et al., 2010). Another result of the study showed that there is a significant difference between two groups of students with and without addiction tendency in violence, smoking and alcohol use. But, there was no difference in two groups in hazardous driving, sexual behaviors and tendency to the opposite sex. In fact, students with addiction tendency tend to have risky behaviors than non-addicted individuals. This finding is consistent with the results of the research by Kaplo et al. (2005) and Cooper et al. (1998). So lack of skill in emotions regulation can involve students in problems that one of these problems is risky behaviors. Actually, emotional avoidance skills are associated with higher drug use. Cooper et al. (1998) also concluded that the individuals who lack skills for dealing with their emotional experiences may be more likely to engage in risky behaviors in an effort to deal with their negative affect and may turn to using substances as a way to relieve their negative emotions. In explaining this finding, it can be said that individuals with risky behaviors have little familiarity with effective methods of coping with negative emotions (such as emotional reappraisal or distraction from it), and in different situations, especially in emergency cases in

which decision-making is done fast, they are not able to adjust and manage their emotions and reactions using their effective strategies. Especially when this group faces negative feelings and emotions, mostly use inefficient and non-diverse strategies (Walsh, DiLillo & Scalora, 2011).

Also, risky behaviors are a maladaptive strategy in dealing with stressful and negative situations of life. It seems that when dealing with risky behavior, probably, the main event that stimulates negative mood is not addressed. When risky behavior is stopped, a person is prone to returning to the same negative state that he was trying to escape. Individuals who use risky behaviors, in order to reduce their negative emotional states, are prone to being deprived of negative affect and tendency to risky behavior and vice versa. Particularly, risky behaviors become positive reinforcements that bring temporary relief from negative emotions, and ultimately, this temporary relaxation may increase the likelihood of such behaviors in the future (Mohammadi et al., 2015).

The restriction of sample to men, the uniqueness of the research for high school students in Tabriz, the lack of control of the type of drug and the amount of use are the limitations of this research, which should be cautious in generalizing the results. The results of this research can be used in prevention and pathology of students with tendency to addiction in schools and use long-term educational and therapeutic methods for improving memory and strategies for emotional regulation.

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