

Abstract

Objective: This study was an attempt to determine the role of metacognition and negative emotions in predicting substance abuse behavior. **Method:** In a descriptive research method, 200 participants from Shahrud Addiction Treatment Clinics were selected through convenient sampling, amongst them 128 individuals were addicted and the 72 remaining ones were non-addicted. Then, the questionnaires pertaining to metacognition, anxiety, depression, and stress were distributed among participants. **Results:** The results of regression analysis showed that both variables were potentially capable of predicting the changes into the dependent variable, that is, substance abuse behavior. Two subscales of metacognition, namely uncontrollability & danger and cognitive confidence and also two subscales of negative emotions, namely depression and anxiety were revealed to be predictors of the changes into the dependent variable, that is, substance abuse behavior. **Conclusion:** Results showed that it is possible to reduce proneness probability by manipulating the variables and prevent the relapse of patients under treatment.

Keywords

Metacognition, Negative Emotions, Substance Abuse Behavior

The Role of Metacognition and Negative Emotions in Predicting of Substance Abuse Behavior

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Introduction

Psychotropic substance use and dependence is a serious threat to public health. United Nations Statistics Division has made estimation that 185 billion people throughout the world have experienced taking narcotic drugs at least once in their lives (World Health Organization, 2004; cited in Bar, Gerald, Farzan, George and Desakalin; translated by Mehrjerdi, 2009). This statistic is tantamount to 3.1 percent of the whole population of the world and 4.3 percent of the people aged 15 years old or above. However, two billion alcohol users and one billion smokers should be added to this number (World Health Organization, 2004; cited in Khodadadi an Ekhtiyari, 2009). However, National Institute on Drug Abuse (NIDA) has announced that drug abuse is followed by numerous physical problems and diseases such as human immunodeficiency virus, heart problems, respiratory problems, kidney and liver problems, brain dysfunctioning, cancer and prenatal injuries (Allen, 2009). As well, dependence on illegal substances has already caused the death of two million people throughout the world (0.4% of the world population) (World Health Organization, 2004, cited in Bar, et al translated by Mehrjerdi, 2009). Similarly, one of the prominent features of substance abuse disorder is its negative consequences as a result of acute medical conditions, legal problems and penalties, and loss of job, friends and social status (Petri, 1998; cited in Garcia, Perez, Lopez, and Garcia, 2007).

Given the abundance of problems arising from addiction, prevention of this problem is required and it entails identifying risk factors and protective factors against substance dependence (Rutter, 1993; cited in Kiani Dehkordi et al., 2005). In this framework, it should be mentioned that one of the most important predictor variables is substance abuse disorder that involves metacognitive beliefs about one's thoughts (Saed, Yaghubi, and Rosahn; 2010). In previous theories such as cognitive-behavioral theory, it was believed that the disorder or biases in thinking may cause substance abuse disorder, but this perspective suffers some limitations and does not regard any room for metacognitive beliefs (Saed et al., 2010). Flavell (1979) has defined metacognitive as awareness of how one learns, the knowledge of how to use the available information to achieve a goal, the ability to judge the cognitive processes involved in a particular task, the knowledge of what strategies are used for what purpose, and the self-assessment of one's progress during and after performance. By the same token, it should be mentioned that metacognition has a substantial influence on beliefs and thinking and forms the foundation of normal, abnormal, and conscious emotional experiences (Wells, translated by Mohammadkhani, 2009). Amongst them, several studies have investigated the role of anxiety, depression, and stress in substance abuse disorder and its relationship with metacognition (Spada, Nikcevic & Moneta, and Wells, 2007; Muneta, 2011). Although the relationship between negative emotions and substance use has been studied for

decades (Conger, Cappell, and Herman, 1972 cited in Garland, Carter, Ropes, and Howard, 2011), there is still little information available about how mediated metacognition increases the possibility of returning to substance use in quitting individuals through negative emotions (Garland, et al, 2011). Evidence obtained from epidemiological and clinical studies is indicative of a strong relationship between affective and substance use disorder. Individuals suffering from affective psychopathology, such as mood and anxiety disorders, have been found to demonstrate high rates of substance use disorder (Merikangas, Dierker, & Szamari, 1998 cited in Cheetman, Allen, Yucel, & Lubman, 2010). Similarly, affective psychopathology has been observed among substance users while it has been suggested that substance use disorders possibly play a causative role in the development of affective disorders (Schuckit, 2006; Volkow, 2004 cited in Cheetman et al, 2010). Clinical studies have shown that life stress is not only a risk factor resulting in addiction, but also is considered as a stimulant to addiction relapse (Brown, 1990 and 1995; Dewart, 2006; Mcnall, 1992; Ouimette, 2007 cited in Briand and Blendy, 2009). In fact, it should be noted that chronic stress is common among drug abusers (Moos, 1989; Tate, 2006 cited in Cole, Logan, and Walker, 2010) and is also associated with relapse of substance use (Brown, 1990, Tate, 2006 and 2008 cited in Cole et al., 2010).

As well, confronting with the socio-environmental stressors may succumb quitting people who are also vulnerable to relapse (Diassferre, 2009; cited in Garland, Carter, Ropes, and Howard, 2011). Clinical studies suggest that reducing stress is effective in addiction treatment. Therefore, the clarification of those factors that lie in the interaction between stress (in the present study, three categories of stress, anxiety, and depression) and substance abuse will be useful in the identification of appropriate treatment (Briand and Blendy, 2009). In this context, it should be noted that some studies have introduced metacognition as a mediator of the association between negative emotions (depression, anxiety, and stress) and substance abuse (Spada, Nikcevic & Moneta, and Wells, 2007; Montea, 2011; Saed, Yaghoubi, and Rosahn, 2010; Spada and Wells, 2008; Garland, Carter, Ropes, and Howard, 2011). This issue is derived from self-regulatory executive function theory (Wells and Matthews, 1994). It was the first theory that considered multiple metacognitive factors as the control element in information processing and affected the provocation and maintenance of psychological disorders (Spada et al., 2007). This theory suggests that psychological dysfunction is created by a) repeatable thoughts b) consideration established attention and c) maladaptive coping styles which jointly bring about an unknown Cognitive Attentional Syndrome (Wells, 2000 cited in Muneta, 2011). That metacognition contributes to the durability of maladaptive coping styles is a basic principle. For example, although smoking as a coping style seems to be adaptive on the surface; it is, in fact, maladaptive since it creates negative emotions and dependence in the long run (Spada et al., 2007).

Therefore, the present study is an attempt to address the role of cognitive variables and negative emotions in the prediction of substance abuse behavior.

Method

Correlational research designs are included among descriptive studies. All patients referring to Shahroud's quitting clinics under Methadone treatment from January 21, 2012 to July 20, 2012 constituted the study population. These patients were identified to be suffering from substance abuse disorder and treated with methadone. Using cluster random sampling, 9 clinics were randomly selected out of 21 quitting clinics in Shahroud; then, 128 male patients in the 18 to 50 age group who held the minimum education degree of third junior high school were selected as the participants. As well, a sample of 72 non-addicted individuals who had no background of substance abuse was included in the study.

Instrument

1. Depression, Anxiety, and stress Scale: Lovibond and Lovibond (2002) developed Depression, Anxiety and Stress Scale (DASS) to define and measure the constructs of anxiety and depression. Indeed, this scale is a total of three sub-scales of self-concept for measuring negative emotional states of depression, anxiety, and stress (Costello and Comrey, 1967 cited in Haji Alizadeh, Bahreinian, Naziri, and Modares Gharavi (2009). Reliability and validity of this scale have been evaluated in several studies. One of these studies is the investigation of normalization on an Iranian sample (Sahebi, Salari, and Asghari, 2005 cited in Haji Alizadeh et al., 2009). Here, the reliability of the scale was established using internal consistency; its validity was evaluated using factor analysis; also criterion validity was obtained using concurrent administration of Beck's Depression Inventory, Zung Self-Rating Anxiety Scale, and perceived stress; and internal consistency of the DASS sub-constructs was established using Cronbach's alpha (depression = 0.77, anxiety = 0.79 = 0, and stress = 0.78). Depression of DASS was correlated with Beck's Depression Inventory at the value of 0.70; anxiety of DASS was correlated with Zung Self-Rating Anxiety Scale at the value of 0.67; and the stress sub-scale of DASS was reported to be correlated with perceived stress at the value of 0.49 (Haji Alizadeh et al., 2009).

2. Metacognition Questionnaire (MCQ-30): This instrument has been designed to assess metacognitive beliefs and processes, some of which are central to the metacognitive model of psychological disorder. Metacognition questionnaire is a 30-item self-report scale which assesses metacognitive domains in five independent scales:

- a) Positive beliefs about worry (e.g., "Worrying helps me cope").
- b) Negative beliefs about worry concerning uncontrollability and danger (e.g., "When I start worrying I cannot stop").

- c) Low cognitive self-confidence (e.g., “I have a poor memory”).
- d) Need to control thoughts (e.g., “Not being able to control my thoughts is a sign of weakness”).
- e) Cognitive self-consciousness (e.g., “I pay close attention to the way my mind works”).

(Wells, 2000 cited in Mohammadkhani and Farjad, 2009). This scale has been designed based on self-regulatory executive function theory (Wells and Matthews, 1996) and emotional disorders and the metacognitive model of anxiety disorder (Wells, 1997). Questions are responded based on a four-value Likert scale from 1 = disagree to strongly agree = 4. Cronbach's alpha coefficients of its subscales are reported to be ranged from 0.72 to 0.92. Retest correlations within the interval of 22 to 118 days was as follows: total score = 0.75, positive beliefs = 0.79, uncontrollability / danger = 0.59, cognitive self-confidence = 0.69, need to control thoughts = 0.74 and cognitive self-consciousness = 0.87 (Wells, 2004 cited in Mohammadkhani and Farjad, 2009). In Iran, Shirinzadeh Dastgiri has reported its internal consistency 0.91 using Cronbach's alpha coefficient for the total scale and within the range of 0.59 to 0.83 for its sub-scales. Similarly, the test retest reliability of this test was obtained 0.73 for the entire scale and from 0.59 to 0.83 for its sub-scales within an interval of four weeks. As well, the correlation coefficient of the entire scale with trait anxiety was measured which was reported to be 0.43 for the establishment of validity of the scale while it lay in the range of 0.28 to 0.68 for its sub-scales. Last but not least, the correlation of the whole scale with its sub-scales was placed in the range of 0.58 to 0.87 (Mohammadkhani and Farjad, 2009).

Results

Logistic regression analysis was used to assess the discriminant power of metacognition sub-scales such as depression, anxiety, and stress, as follows:

Table 1: Regression model summary of substance abuse behavior based on predictors

<i>Log likelihood</i>	<i>Cox-Snell's Coefficient</i>	<i>Nigel-Kirk's coefficient</i>
158.69	0.28	0.38

As seen in the table above, both statistics pertaining to Pseudo R-Square are 0.28 and 0.38 and it indicates that predictors have explained from 28 to 38 percent of the variation of substance abuse. As well, Omnibus test result showed that the model goodness-of-fit was significant ($\chi^2=52.074$, $p< 0.001$). The following table shows the accurate discriminant power percentage of predictor variables for two addicted and non-addicted groups.

Table 2: Descriptive statistics of forecasting accuracy predictor variables for two groups

<i>Groups</i>	<i>Addicted</i>	<i>Non-addicted</i>	<i>Accurate Percentage</i>
Addicted	79	18	81.4
Non-addicted	22	39	63.9
Total	101	57	74.7

As seen in the above table, 79 subjects of the addicted group (81.4%) and 39 subjects of the non-addicted group (63.9%) have been correctly assigned to their groups so that predictors have managed to correctly assign 74.7% of the subjects to their right groups in total. The following table shows regression coefficients of the groups on the basis of metacognition variables, depression, anxiety, and stress.

Table 3: Regression coefficients of the groups on the basis of metacognition components, depression, anxiety, and stress

<i>Variables</i>	<i>B</i>	<i>SD</i>	<i>Wald Statistic</i>	<i>P</i>	<i>Exp(B)</i>
Positive beliefs about worry	-0.054	0.049	1.242	0.265	0.947
Uncontrollability and danger	-0.132	0.081	2.646	0.104	0.877
Cognitive self-confidence	-0.093	0.057	2.711	0.100	0.911
Need to control thoughts	0.052	0.073	0.510	0.475	1.053
Cognitive self-consciousness	0.025	0.066	0.138	0.711	1.025
Depression	-0.170	0.074	5.248	0.022	0.844
Anxiety	-0.137	0.069	3.997	0.046	0.872
Stress	0.185	0.078	5.687	0.017	1.204
Constant value	2.387	1.159	4.240	0.039	10.879

According to the above table, depression ($B = -0.170$, $P < 0.05$), anxiety ($B = -0.137$, $P < 0.05$), and stress ($B = 0.185$, $P < 0.05$) are the significant predictors. It should be mentioned that the negative coefficients in depression and anxiety imply that an increase in the scores of these two variables will be equal to the increased likelihood of being addicted.

Discussion and Conclusion

Along with specifying the role of metacognitive dimensions and negative emotions in predicting substance abuse behavior, it is noteworthy that the variables can predict the variations in the dependent variable, that is, substance abuse behavior. In terms of metacognition, two subscales, namely uncontrollability & danger and cognitive confidence were predictors of the variations in the dependent variable and their prediction was statistically significant. Similarly, two subscales of negative emotions, namely depression and anxiety were revealed to be predictors of the variations in the dependent

variable, that is, substance abuse behavior and also their prediction was reported to be statistically significant. These findings are consistent with results of studies conducted by different researchers. For example, Spada, Nikcevic, Moneta, and Wells (2007) found that three out of five dimensions of metacognition, i.e. positive beliefs about worry, uncontrollability and danger, and also cognitive confidence were significantly and positively correlated with smoking dependency. They also found that smoking dependency was also significantly and positively associated with anxiety and depression. Haji Alizadeh, Bahreinian, Naziri, and Modares Gharavi (2009) also concluded that there was a significant difference between the addicted and non-addicted groups in two out of five dimensions of metacognition, namely, uncontrollability & danger and cognitive confidence. Similarly, the mean score of substance users outweighed that of non-addicted group in all metacognitive dimensions. They reported the existence of a statistically significant difference in the subscale anxiety of emotions between addicted and non-addicted groups. Substance abusers received scores higher than non-addicted group in both depression and stress although the difference was not significant. Abolghasemi, Ahmadi, and Kiamarsi (2007) also concluded that metacognition was positively correlated with psychological consequences in addicted people. This study showed that metacognition is problematic in addicted people; accordingly, it can be inferred that self-regulatory behavior in them is also problematic which results in different psychological consequences such as anxiety, stress, depression, etc. As well, Moneta (2011) founded his study upon three following hypotheses: a) Metacognition is positively associated with alcohol dependency, b) Emotions mediate the relationship between metacognition and alcohol dependency, and c) Metacognition mediates the relationship between emotions and alcohol dependency. The first two hypotheses were not supported and the interaction of metacognition and emotions was shown as a significant positive predictor of alcohol dependency and the last hypothesis was supported. Saed, Yaghubi, and Roshan (2010) showed that the mean score of subcategories of metacognitive beliefs is higher in addicted group compared to normal subjects. This suggests that metacognitive beliefs are less efficient in addicts. This difference was particularly significant in uncontrollability/ danger and need to control thoughts. Jurdes (2003) showed that exposure to stress can increase the risk of substance abuse. People with stress (e.g., those suffering from post-traumatic stress disorder) take drugs to treat themselves. Indeed, they take drugs as a sedative to ease their stress and anxiety.

It is noteworthy that the two variables of metacognition and negative emotions, as independent variables, were collectively put together with the dependent variable, i.e. substance abuse in the regression equation where the variable, negative emotions, was significantly associated with substance abuse whereas metacognition was not. It can be interpreted that metacognition has a high overlap with negative emotions. Accordingly, since there is a negative

correlation between metacognition and emotions, the addition of emotions as a second variable in the regression equation is less effective. Overall it can be stated that:

1. The emotions of anxiety and sadness are the basic internal symptoms which suggest the outbreak of inconsistency in self-regulation and the threat of welfare.
2. These kinds of emotions naturally carry a limited period since sufferers use coping strategies for the reduction of threats and control of their own cognition.
3. Psychological disorders arise from the continuation of emotional responses.
4. Emotional responses will survive due to individuals' thinking styles and strategies.
5. The maladaptive style which is observed in disorders attention is called Cognitive Attentional Syndrome and entails anxiety, mental rumination, threat monitoring, etc. that are preventive to adaptive learning.
6. Cognitive Attentional Syndrome is the result of incorrect metacognitive beliefs that control and interpret thoughts and emotional states.
7. Cognitive Attentional Syndrome causes the intensification and elongation of emotional experience by means of several clearly established mechanisms.

Indeed, these principles briefly discuss that such emotions as anxiety, depression, stress, etc. are produced by the outbreak of inconsistency in self-regulation and the threat of welfare. Followed by dysfunctioning of metacognition which is referred to as Cognitive Attentional Syndrome; these negative emotions remain alive in individuals and get converted into disorders. Then, individuals turn to substance abuse behavior as a kind of self-treatment in order to moderate such emotions. In this case, metacognition mediates the relationship between emotions and substance abuse behavior.

References

- Abolghasemi, A., Ahmadi, M., Kiamarsi, A. (2007). The Relationship of Metacognition and Perfectionism with Psychological Consequences in the Addicts, *Journal of Research in Behavioural Sciences*, 5 (2), 73-79.
- Allen, T. .H. (2009). *Religiosity, Spirituality, and Substance Abuse*, Unpublished dissertation, University of Alabama.
- Briand, L. A, Blendy, J. A. (2009). Molecular and genetic substrates linking stress and addiction, *Journal of Brain Research*, 1314, 219 -234.
- Cheetman, A., Allen, N. B, Yucel, M., Lubman, D. I. (2010). The role of affective dysregulation in drug addiction, *The journal of Clinical Psychology Review*, 30,621-634.
- Cole, J., Logan, T. K., Walker, R. (2011). Social exclusion, personal control, self-regulation, and stress among substance abuse treatment clients, *Journal of Drug and Alcohol Dependence*, 113, 2-13.
- Flavell, J. (1979). Metacognition and cognitive monitoring, a new area of cognitive-developmental inquiry, *American psychologist*, 34, 906 -911.

- Garcia, A. V, Perez, C, R., Lopez, Garcia, M. P. (2007). Negative emotion-driven impulsivity predicts substance dependence problems, *Drug and alcohol dependence*, 2(86), 139-146.
- Garland, E, L., Carter, K., Ropes, K., Howard, M. O. (2011). Thought suppression, impaired regulation of urges, and Addiction-Stroop predict affect-modulated cue-reactivity among alcohol dependent adults, *Biological Psychology*, 89(1), 87-93.
- Haji Alizadeh, K., Bahreinian, S. A., Naziri, G., Modares Gharavi, M. (2009). The Role of Cognitive Variables, Metacognitive Dimensions and Emotions in Substance Abuse Behaviors, *Advances in Cognitive Science*, 11 (3), 1-12.
- Khodadadi, A., Ekhtiyari, H. (2009). Measures of cortical irritability, objective instrument for understanding the effects of abused substances in brain chemistry, *Quarterly Journal of Research on Addiction*, 3 (9), 23-31.
- Kiani, M. D., Rafiey, H., Samiei, M., Karimloo, M., Dolatshahi, B., Binazadeh, M. (2005). Resiliency against substance dependency in the male offspring of dependent and non- dependent fathers, *Hakim Research Journal*, 8 (2), 31-36.
- Moneta, G. B. (2011). Metacognition, emotion, and alcohol dependence in college students: A moderated mediation model, *Journal of Addictive Behavior*, 36,781-784.
- Mohammadkhani, S., Farjad, M. (2009). The Relationship of the Metacognitive Beliefs and Thought Control Strategies with Obsessive–Compulsive Symptoms in Nonclinical Population, *Journal of Clinical Psychology*, 1(3), 35-51.
- Saed, O., Yaghubi, H., Roshan, R. (2010). The role of Meta-cognitive belief on substance dependency. *Procedia Social and Behavioral Sciences*, 5, 1676-1680.
- Spada, M. M, Nikcevic, A.V, Moneta, G. B, Wells, A. (2007). Meta cognition as a mediator of the relationship between emotion and smoking dependence, *Journal of Addictive Behavior*, 32, 2120-2129.
- Spada, M. M., Mohiyeddini, C., Wells, A. (2008). Measuring meta cognitions associated with emotional distress: Factor structure and predictive validity of the meta cognitions questionnaire, *Journal of Personality and Individual Differences*, 45, 238-242.
- Wells, A. (2009). *Metacognitive therapy for anxiety and depression* translated by Mohammadkhani, S., Tehran: Varaye Danesh Publication.