Differences Between Expressive Suppression and Cognitive Reappraisal in Opioids and Stimulant Dependent Patients

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ABSTRACT
Background: Substance use and affective disorders frequently co-occur, but the role of affective dysregulation in addiction is often overlooked. There is evidence shows that substance-dependent individuals have more problems in regulating their emotions.

Objectives: This study compared two commonly used emotional regulation strategies, cognitive reappraisal and suppression, in opioids and methamphetamine dependents.

Materials and Methods: One hundred forty men with substance dependence (70 Opioids, 70 Methamphetamine) were selected by accessible sampling, and they responded to Emotion Regulation Questionnaire (Gross & John) and Clinical Drug Addiction Profile (CDAP) questionnaire. SPSS software was used to analyze the results, and descriptive statistics such as frequency tables and inferential statistics including independent t-test were used.

Results: Opioids and methamphetamine dependent patients differ in reappraisal strategy (P < 0.01). These groups differ not only in reappraisal strategy, but also in the suppression (P < 0.001).

Conclusion: Opioids and methamphetamine dependent individuals used different strategies for regulating their emotions. The key finding was that opioids dependents prefer suppression, and methamphetamine dependents usually use reappraisal for this purpose.

Keywords: Methamphetamine; Opioid; Cognitive

1. Background
Substance use disorders are prominent public health concerns. The number of substance abusers in Iran is estimated to be between 1.8 and 3.3 million (1), and it has the highest per capita number of opiate addicts in the world at a rate of 2.8% of Iranians over the age of 15 (2). Amphetamines are the second most commonly used illicit drug type after Cannabis worldwide (3). Methamphetamine use and dependency constitute serious problems not
only in Iran but also in a wide area in the world, close to 25 million people worldwide are estimated to use methamphetamine and amphetamine (4), and according to the National Survey of Drug Use and Health, lifetime use of methamphetamine by those 12 and older has ranged from 4.3% in 1999 to a peak of 5.3% in 2002 before falling to 4.9% in 2004 (5). The last report by the Iranian drug control headquarters showed that only 3.6% of substance abusers in Iran used methamphetamine (6). The result of just one study in Iran during 2009-2011, showed that methamphetamine use increased from 6% to about 20% (7). Non official reports estimate that methamphetamine is currently the second or third most widely used illicit substance in Iran (3). Clinical and epidemiological studies have shown a strong association between substance use and affective disorders. Evidences from recent studies show that individuals with affective disorders have high rates comorbidity with substance use disorders. Substance use disorders have also been linked to a range of deficits in the experience and expression of emotion in the absence of affective disorders (8, 9). Anecdotal and empirical evidence both suggest that negative affect and substance dependency are linked together. This association is conceptualized as which individuals who experience greater levels of negative affect are at a higher risk of using coping mechanisms like drugs, food or alcohol to escape from experiencing these emotions (10-14). Theorists and researchers have variously defined the concept of emotion regulation. Most influential definitions were provided by Gross (1998), "process by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (15). Thompson defined it as "the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals"(16). Individuals use different strategies to alter their emotion; these strategies affect not only their current emotional experience, but also cognitive and interpersonal processes. Emotion regulation is regarded as a crucial factor in well-being and adaptive behavior, and there are different strategies which individuals use for this purpose, but as Garefski (2002), argued some of these strategies are more adaptable than the others (17). Two well-studied regulation strategies are emotional reappraisal and suppression (15), to decrease or increase emotional response tendencies or affective states (18). Suppression reduces emotion-expressive behavior by inhibition during a state of emotional arousal (19). Reappraisal is the reinterpretation of emotionally valence stimuli in unemotional terms (20). It involves generating benign or positive interpretations or perspectives on a stressful situation as a way of reducing distress (21). Reappraisal may be particularly important for psychopathology.

2. Objectives

The aim of the present study was to examine the differences in emotion regulation between opioid and methamphetamine dependent patients.

3. Materials and Methods

The population of this research consists of patients with diagnosed substance dependence as the first axis I diagnosis according to DSM-IV criteria. 140 men (70 opioids, 70 methamphetamines) were selected by accessible sampling from an inpatient substance dependence treatment program of rebirth charity association in Tehran, Iran. The sample age ranged from 18 to 59 years old (Mean ± SD: 32.75 ± 8.35). Ninety one subjects (65%) had used just one type of substance, and 49 ones (35%), had used more than one type during their life. Inclusion criteria for the study were (a), used just one type of substance, opioids (crack, opium or heroin) or methamphetamine for at least 6 months, and (b), their last use was about 14 to 45 days of the date of our study. The exclusion criteria were (a), significant psychiatric disorder (2), and severe brain damage. Data collected between March and August 2012. Information is shown in (Table 1).

Table 1. Demographic Characteristics of Opioids and Methamphetamine Dependent Patients.

| Marital Status | Opioids, No. (%) | Methamphetamine, No. (%) |
|----------------|-----------------|--------------------------|
| Single         | 24 (34.3)       | 33 (47.1)                |
| Married        | 25 (35.7)       | 17 (24.3)                |
| Divorced       | 12 (17.1)       | 12 (17.1)                |
| Separated      | 5 (7.1)         | 7 (10)                   |
| Widowed        | 4 (5.7)         | 0                        |

| AGE             | Opioids, No. (%) | Methamphetamine, No. (%) |
|-----------------|-----------------|--------------------------|
| 18 - 26         | 14 (20)         | 18 (25.7)                |
| 27 - 35         | 35 (50)         | 35 (50)                  |
| 36 - 44         | 10 (14.3)       | 11 (15.2)                |
| 45 - 53         | 8 (11.4)        | 5 (7.1)                  |
| 54 - 62         | 3 (4.3)         | 1 (1.4)                  |
| Total           | 70              | 70                       |
Participants were invited to participate in the study after they had been at least 14 days substance free. They used just one of these categories, opioids or methamphetamine, for at least six months. Eligible participants had been told that they were under no obligation to participate in the study, although they encourage them to do it. At first, by a face to face interview, participants’ demographic information were recorded by means of clinical drug addiction profile (CDAP) by Mokri, Ekhtiari and Farhoudian (2011). This information included age, marital status, education level, family, and risk behaviors history. They described their previous treatments for substance use disorders. Consequently, their psychiatry histories were asked by detail; they were accomplished a five minute rest, afterwards they were asked to fill in the Emotion Regulation Questionnaire (ERQ) by Gross and John with a series of 10 statements. The ERQ assesses typical use of emotion suppression (4 items, e.g., I keep my emotions to myself), and reappraisal (6 items, e.g., When I want to feel less negative emotion, I change the way I am thinking about the situation) in the individual. They sat individually to complete the questionnaire. Then collected data was analyzed by SPSS-16 software. Inferential statistics, independent t-test, bivariate correlation, and Pearson correlation were used to analysis data.

3.1. The Emotion Regulation

Questionnaire (24), is designed to assess individual differences in the habitual use of emotion regulation styles: cognitive reappraisal and suppression. Cognitive reappraisal (When I want to feel more positive emotion, I change the way I am thinking about the situation), and suppression (I keep my emotions to myself). The questionnaire contains 10 items, of which four assess suppression, and the six assess the reappraisal strategy. Participants were asked to rate how they regulate their emotions using a scale from 1 to 7, higher score reflects which strategies individual use more to regulate their emotions. The mean rating across items was computed for each scale to form suppression and reappraisal variables. Gross and John (2003), reported a Cronbach’s alpha coefficient reliability value of 0.79 for reappraisal and 0.73 for suppression, and test-retest reliability across three months was 0.69 (24, 25). In the present study The Persian translation of the ERQ was used, which internal coherence estimated by the Cronbach’s alpha coefficient was 0.73 for reappraisal, and 0.54 for suppression.

3.2. Clinical Drug Addiction

Profile (CDAP) by Mokri, Ekhtiari and Farhoudian in collaboration with Ehterami, Farnam, Sefatian, Dolatshahi and Tavajjodi (2011), was used for collecting demographic information. The first part, basic demographic information, includes age, marital status, and education. The second part, drug abuse, profile includes information about the type of drugs used, and also the age, duration, and number of days in which the drug was used in the last month before their participating in the inpatient program. In the third part, treatment history, previous psychiatric treatment for substance use like methadone maintenance treatment, and Naltrexone treatment were asked. Risk behavior profiles include injection, sexual relationship, and criminal history. The fifth part, psychiatric and medical profiles include history of chronic diseases and psychological symptoms like depression, anxiety, and self-harm. The last part, family and social profiles, include occupation, family support and history of substance disorders in their parents.

3.4. Data Analysis

For descriptive statistics such as frequency tables and inferential statistics including t-test, bivariate correlation and Pearson correlation, SPSS 16, was used. T-test was used to compare the emotional regulation strategies between mono and poly substance dependents. Bivariate correlation was used to measure the association between emotion regulation strategies and total years of substance used. In this study results with P-value of less than 0.05 were considered significant.

4. Result

4.1. Group Comparisons

This study was performed on 140 men (70 Opioids, 70 Methamphetamine). For marital status, 57 subjects (40.7%) were single, 42 (30%) married, 24 (17.1%) divorced, 12 (8.6%) separated, and 4 (2.9%) widowed. The average level of education was approximately 11 years (Mean ± SD =11.3 ± 3.44). Education level of participants was as follows: 23 (16.4%), had maximum primary school diploma, 25 (17.9%) had guidance school up to high school diploma, 92 (65.7%) participants had high-school diploma or higher education. The opioids (opium %15.7, heroin 10.7, crack 23.6%) dependent group reported using opioids on a mean of 10.08 days last month (SD = 6.73). The methamphetamine dependent reported using methamphetamine on a mean of 9.95 days last month (SD = 5.75). As Table 2 shows, two groups have no significant differences in age, education, and the number of days drug used in the last month before participating in the inpatient program (P < 0.05).

Therefore it seems that opioids and methamphetamine dependent differ in reappraisal strategy. Methamphetamine group showed significantly higher scores on the reappraisal subscale. Therefore it seems that they usually
use this strategy to regulate their emotions. These groups were different not only in reappraisal strategy, but also in the suppression. As Table 3 shows, these groups differ in their habitual use of suppression. It seems that the opioids group uses this strategy to regulate their emotions more often.

To better characterize the difference between opioids and stimulate substance dependent of emotion regulation strategies, we again used t-test base on participations substance history. Descriptions and results of t-tests for these variables are shown in Table 4. No difference was observed on suppression and reappraisal strategies in these groups.

We used bivariate correlation to measure the association between the emotional regulation strategies and total years of substance used. In the second step we tried to find an association between emotion strategies and number of last month’s day substance (number of the days in which drug was used) before they participate in an inpatient program. The result is shown in (Table 5).
Table 5. Association (one-tailed Pearson’s r) of Schema Emotion Regulation Strategies with Methamphetamine and Opioids Use

|                          | Suppression Score | Reappraisal Score |
|--------------------------|-------------------|-------------------|
| **Methamphetamine**      |                   |                   |
| Total years of substance dependency | -0.04            | 0.17              |
| A number of the days methamphetamine used in the last month | 0.132            | -0.183            |
| **Opioids**               |                   |                   |
| Total years of substance dependency | -0.035           | -0.114            |
| A number of the days opioids used in the last month | 0.176            | -0.111            |

5. Discussion

The aim of the present study was to investigate emotion regulation strategies (reappraisal and Suppression) in Opioids and stimulant dependent patients. The result showed that opioids and methamphetamine dependent used different strategies for regulating their emotions. The key finding was that opioids dependents prefer suppression, and methamphetamine dependents usually use reappraisal for this purpose. Depression is prevalent in opiate-dependent patients. The lifetime prevalence rate for major depression was 20% to 50%, and current prevalence rate was in the range of 10% to 20% (26-29). The association between mood disorders and drug use has prompted the hypothesis that patients may often use drugs to blunt or self-medicate their uncomfortable and negative mood state (30, 31). Some researchers stated that the emotional symptoms in depression may be resulted from emotional dysregulation. Suppression is thought to be relevant with emotion regulation strategy in that disorder. Depressed patients not only reported increased suppression of negative affect, but also used suppression for their positive affects (32). Based on some evidences it seems that negative mood states can act as reliable triggers or conditioned stimuli for drug-related responses in opiate dependent patients. Evidence shows that negative induced moods can trigger alcohol desire in some persons (33). Another study showed that smokers with a history of depression have much more difficulty in stopping smoking than the control group (34). Guss reported that sad mood (Suppression of negative fleeing) was the only exception which does not change during naltrexone treatment. Interventions focusing on reducing depressed mood or anxiety symptoms have been shown to decrease relapse and the severity of alcohol use disorders (35). Moreover, in laboratory paradigms, the induction of negative affect was shown to predict increased urges to drink, and increased expectancies of relief after drinking (12, 36-38). Furthermore, interventions with a strong focus on emotion-regulation skills, such as dialectical behavioral therapy (39), have been shown to reduce substance use (including alcohol) in clients with borderline personality disorder (40, 41). So it seems that opioids dependent patients use drug to suppress their negative affects (35). On the other hand, Methamphetamine causes euphoria, increased energy, and alertness, and enhanced self-confidence. So it seems that methamphetamine dependents are looking for more positive affect. Reappraisal is defined as trying to view situations more positively, as the result showed that they prefer reappraisal to regulate their emotions. These findings are consistent with substantial evidence which suggest that dysregulation of affective processes underlies key aspects of substance use behavior, encompassing vulnerability, early experimentation, as well as the development, and maintenance of substance use disorder.

CBT-based treatments that incorporate mindfulness interventions have shown promise for treating both alcohol-use and drug-use disorders (42-44). These treatments are theorized to enhance the ability to tolerate negative affective states by facilitating a nonjudgmental attitude toward aversive experiences; while, also increasing habituation through formal and informal practices (37, 39). Such treatments include affect regulation training (38, 45) emotion focused therapy (46), and/or the emotion regulation, mindfulness, and distress tolerance modules of dialectical behavioral therapy (47). As opioids dependence prefers suppression to regulation their emotion, therefore therapies focused on emotions seems useful for this population, on the other hand, CBT based therapy would be beneficial for methamphetamine dependence. The result showed that opioids and methamphetamine dependent used different strategies for regulating their emotions. The key finding was that opioids dependents prefer suppression, and methamphetamine dependents usually use reappraisal for this purpose. The study may not be generalized to nonsubstance dependent populations nor people who are under Methadone or Buprenorphine treatment for their substance dependency. The study relies on self-reported emotional regulation estimates, and the nature of the study prevents conclusions about the causal impact of reappraisal/suppression differences in these groups. Future researches might explore how these...
groups differ with nonsubstance dependent populations, and people use different substance, too.

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Authors’ Contribution
All authors have equally collaborated in writing the article.

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References
1. Ahmadi J, Majdi B, Mahdavi S, Mohagheghzadeh M. Mood disorders in opioid-dependent patients. J Affect Disord. 2004;82(1):39-42.
2. Vick Karl. Opiates of the Iranian People. Despair Drives World’s Highest Addiction Rate. 2005.
3. United Nations Office on Drugs and Crime. World Drug Report. 2009.
4. United Nations Office of Drugs and Crime. World Drug Report. 2007.
5. Rockville M. Substance Abuse and Mental Health Services Administration. National survey on drug use and health (1994-2004). Office of Applied Studies; 2005.
6. Drug Control. Annual report and rapid situation assessment. Tehran: Islamic Republic of Iran, Drug Control Headquarters; 2008.
7. Lashkaripour K, Yusefi M, Ghasemi S, Zabih RT, editors. The comparison of demographic characteristics and variety of substances in Methadone maintenance clinic of Baharan Psychiatry Hospital in 2009-2010; 2012.
8. Cheetham A, Allen NB, Yuec M, Luhman DL. The role of affective dysregulation in drug addiction. Clin Psychol Rev. 2010;30(6):521-54.
9. Kring AM, Werner KH. Emotion regulation and psychopathology. 2004.
10. Kelly AB, Masterman PW, Young RM. Negative mood, implicit alcohol-related memory, and alcohol use in young adults: the moderating effect of alcohol expectancy. Addict Behav. 2011;36(1):234-51.
11. Adams ZW, Kaiser AJ, Lynam DR, Charnigo RJ, Milich R. Drinking motives as mediators of the impulsivity-substance use relation: pathways for negative urgency, lack of premeditation, and sensation seeking. Addict Behav. 2012;37(7):1484-95.
12. Cooney NL, Litt MD, Morse PA, Bauer LG, Gaupp L. Alcohol cue reactivity, negative-mood reactivity, and relapse in treated alcoholic men. J Abnorm Psychol. 1997;106(2):243-50.
13. McCollam JB, Burish TG, Maisto SA, Sobell MB. Alcohol's effects on physiological arousal and self-reported affect and sensations. J Abnorm Psychol. 1980;89(2):224 – 233.
14. Cooper ML. Motivations for alcohol use among adolescents: Development and validation of a four-factor model. J Psychol Assess. 1994;6:137-128.
15. Gross JB. Antecedent- and response-focused emotion regulation: divergent consequences for experience, expression, and physiology. J Pers Soc Psychol. 1998;74(1):224-37.
16. Thompson RA. Emotion regulation: a theme in search of definition. Monogr Soc Res Child Dev. 1994;59(2-3):25-52.
17. Garnefski Nadia, Van Den Kommer Tessa, Kraaij Vivian, Teerds Jan, Legerstee Jeroen, Onstein Evert. The relationship between cognitive emotion regulation strategies and emotional problems: comparison between a clinical and a non clinical sample. Eur J Pers. 2002;16(5):400-420.
18. Fridja NH. The laws of emotion. Am Psychol. 1988;43(5):349-58.
19. Gross JJ, Levenson RW. Emotional expression: physiology, self-report, and expressive behavior. J Pers Soc Psychol. 1993;64(6):970-986.
20. Speisman JC, Lazarus RS, Mordkoff A, Davison L. Experimental Reduction of Stress Based on Ego-Defense Theory. J Abnorm Psychol. 1964;68:387-90.
21. Gross James J. The emerging field of emotion regulation: An integrative review. J Rev Gen Psychol. 1998;2(3):271.
22. Werner Kelly, Gross James J. Emotion regulation and psychopathology. A conceptual framework. 2010.
23. Sher Kenneth J, Grekin Emily R. Alcohol and Affect Regulation. 2007.
24. Gross JJ, John OP. Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. J Pers Soc Psychol. 2008;95:348-362.
25. Gross JJ, Thompson RA. Emotional regulation: Conceptual foundations. 2007.
26. Quirk Stuart W. Emotion concepts in models of substance abuse. J Drug Alcohol Rev. 2001;20(2):195-104.
27. Ehring Thomas, Fischer Silke, Schnülle Jwegenija, Bösterling Andrea, Tuschen-Caffer Brunna. Characteristics of emotion regulation in recovered depressed versus never depressed individuals. J Pers Individ Diff. 2008;44(7):1574-584.
28. Nunes E, Quirtkin F, Brady R, Post-Roenig T. Antidepressant treatment in methadone maintenance patients. J Addict Dis. 1994;13(1):33-24.
29. Hasin DS, Nunes EV. Comorbidity of alcohol, drug, and psychiatric disorders: Epidemiology. 1988.
30. Khantzian EJ, Mack JE, Schatzberg AF. Heroin use as an attempt to cope: clinical observations. Am J Psychiatry. 1974;312(2):160-4.
31. Helgoe L. A comparison of diagnostic patterns in opiate and cocaine abuse patients. 1989.
32. Beblo T, Fernando S, Kloccke S, Griepenstroh J, Aschenbrenner S, Driessen M. Increased suppression of negative and positive emotions in major depression. J Affect Disord. 2012;144(2-3):474-9.
33. Litt MD, Cooney NL, Kadden RM, Gaupp L. Reactivity to alcohol cues and induced moods in alcoholics. J Addict Behav. 1990;15(2):317-46.
34. Glassman AH, Helzer JE, Covey LS, Cottler LB, Stewart Tipp, et al. Smoking, smoking cessation, and major depression. JAMA. 1990;264(12):1546-9.
35. Grüsser SM, Thalamann C N, Platzer W, Gölz J, Partecke G. A new approach to preventing relapse in opiate addicts: a psychometric evaluation. Biological psychology. 2006;73(1):23-29.
36. Birch CD, Stewart SH, Wall AM, McKee SA, Einstor SJ, Theakston JA. Mood-induced increases in alcohol expectancy strength in internally motivated drinkers. Psychol Addict Behav. 2004;18(3):231-8.
37. Sinha Rajita, Fox Helen C, Hong Kwangik A, Bergquist Keri, Bhagwagar Zubin, Siedlarz Kristen M. Enhanced negative emotion and alcohol craving, and altered physiological responses following stress and cue exposure in alcohol dependent individuals. J Neuropsychopharmacol. 2008;32(5):1998-2008.
38. Berking M, Ebert D, Filipek M, Cal Y, Dippel A. Evaluating the efficacy of affect regulation training as an adjunctive intervention in CBT for major depressive disorder. J Psychother. 2010;39(1).
39. Linehan Marsha. Cognitive-behavioral treatment of borderline personality disorder. The Guilford Press; 1993.
40. Linehan Marsha, Dimeff Linda A, Reynolds Sarah K, Contois Katherine Anne, Welch Stacy Shaw, Heagerty Patrick, et al. Dialectical behavior therapy versus comprehensive validation therapy plus 12-step for the treatment of opioid dependent women meeting criteria for borderline personality disorder. J Drug Alcohol Depend. 2002;67(1):11-26.
41. Harned MS, Chapman AL, Dexter-Mazza ET, Murray A, Contois KA, Linehan MM. Treating co-occurring Axis 1 disorders in re-
currently suicidal women with borderline personality disorder: a 2-year randomized trial of dialectical behavior therapy versus community treatment by experts. *J Consult Clin Psychol.* 2008;76(6):1068-75.

42. Hofmann Stefan G, Sawyer Alice T, Witt Ashley A, Oh Diana. The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *J Consult Clin Psychol.* 2010;78(2):269.

43. Witkiewitz Katie, Marlatt G Alan, Walker Denise. Mindfulness-based relapse prevention for alcohol and substance use disorders. *J Cognitive Psychother.* 2005;19(3):211-228.

44. Brown Kirk Warren, Ryan Richard M, Creswell J David. Mindfulness: Theoretical foundations and evidence for its salutary effects. *J Psychol Inquiry.* 2007;18(4):211-237.

45. Berking M, Ebert D, Filipek M, Cal Y, Dippel A. Evaluating the efficacy of affect regulation training as an adjunctive intervention in CBT for major depressive disorder. *J Psychol Psychothe.* 2010;39(1).

46. Greenberg LS. Emotion-focused therapy: Coaching clients to work through their feelings. 2002.

47. Linehan M. Skills training manual for treating borderline personality disorder. 1993.