

3rd World Conference on Psychology, Counselling and Guidance (WCPCG-2012)

The relationship between stress and addiction

Afsaneh Hassanbeigi ^{a,b}, Jafar Askari ^{b*}, Dordaneh Hassanbeigi ^c, Zahra Pourmovahed ^d

^aMental Hospital, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

^bDepartment of Clinical Psychology, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

^cPlant Protection Center, Agriculture and Plant Protection Office, Shiraz, Iran

^dNursing College, Shahid Sadough University of Medical Sciences, Yazd, Iran

Abstract

Objectives: The purpose of the present study was to determine the relationship between stress and addiction. **Materials & Methods:** A total of 150 male opium addicts randomly selected from different addiction treatment centers in addition to 150 normal subjects as control group participated in the present study. The control group was matched with the addict group for age, education, marital and socioeconomic status. The instruments used included Paykel Scale of Stressful Life Events for assessing the rate of life stressors and Cope Inventory for assessing the methods of coping. The data were analyzed using Mann-Whitney Test. **Results:** The findings of the study showed that first, over a two-year period before beginning substance use, the occurrence rate of various psychosocial stressors in opium addict patients was statistically higher than normal subjects in the last two-year period ($P < .0001$). Second, in comparison to normal subjects, the opium addict patients made significantly less use of Problem-Focused Coping Methods including active coping, planning, suppression of competing activities, restraint coping and seeking of instrumental social support ($P < .01$), while they made significantly more use of Less Useful Coping Strategies including focus on and venting of emotions, behavioral disengagement and mental disengagement ($P < .0001$). In regarding to the use of Emotion-Focused Coping Methods including seeking of emotional social support, positive reinterpretation, acceptance, denial and turning to religion although, the drug addicts' scores were higher than those of normal subjects, it wasn't statistically significant. **Conclusion:** It seems that more stressful life events and more ineffective coping strategies in opium addicts may play a considerable role in their development of drug abuse or turning to relapse. Thus, to prevent the occurrence of severe stress and self treatment trough drug abuse, it's advisable to teach some skills such as stress prevention, alteration and toleration strategies to the at-risk groups.

© 2013 The Authors. Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Selection and peer-review under responsibility of Prof. Dr. Huseyin Uzunboylu & Dr. Mukaddes Demirok, Near East University, Cyprus

Keywords: stress; stressors; coping strategies; opium addicts

1. Introduction

Stress may affect health by producing changes in behavior and there is evidence that under high levels of stress, health-enhancing behavior declines and health-threatening behavior such as consumption of nicotine, alcohol, and other drugs may increases so people are more likely to engage in behaviors that increase the risk of illness and injury (Milgrom, & Burrow, 2001). Research on the mechanisms underlying drug disorders has shown that stress is one of

* Corresponding author. Tel.: +98-0351-8203410-7; fax: +98-0351-8202632.

E-mail address: askarifarr@yahoo.com

the strongest predictors of drug use and coping mechanisms is an important factor in mediating the effects of stress on substance use (Are'valo, Prado & Amaro, 2008). Stress refers to the problems or strains that people encounter throughout life, and coping refers to the behavioral or cognitive responses that people use to manage stress (Wagner, Myers & McNinch, 1999). Many studies have consistently demonstrated an association between stress and substance use (Constantinou et.al., 2010, Valentino & Aston-Jones, 2010). In a study to determine the rate of stressful life events in opium addict patients compared to normal subjects, results have shown that over a two-year period the occurrence rate of various life stressors such as illness and death of relatives, family problems, legal problems, occupational problems and other personal problems in opium addicts was statistically higher than normal subjects (Askari, Hassanbeigi & Fallahzadeh, 2010). Stress not only plays a key role in modulating the development and expression of addictive behavior, but also is a major cause of relapse following periods of abstinence (Ungless, Argilli & Bonci, 2010). In the study of Ames & Roitzsch (2000) patients who endorsed a greater overall number of daily stressors had a higher probability of experiencing cravings. The authors propose two possible hypotheses for this finding. First, individuals who experience a greater number of stressors may experience cravings because substance use has been associated with stressful minor life events since these individuals have used substances as a means of coping with these events in the past. This hypothesis is consistent with the tension reduction theory of substance abuse as proposed by Cappell and Greeley (1987). Second, an alternative hypothesis is that individuals who report experiencing a greater number of minor stressors may also experience cravings because they have a heightened attention to these stressful events, thereby influencing the number of cravings they experience. There are many reports that relapse to alcohol and drug use is more likely to occur in individuals exposed to high levels of life stress (Shaham, Erb & Stewart, 2000, Valentino, Lucki & Van Bockstaele, 2010, Weaver, Turner & O'Dell, 2000). In addition evidence from epidemiological and clinical studies has consistently shown a strong association between affect and substance use disorders. Affect is used to refer to the relatively brief feelings that are experienced in response to a particular stimulus or situation and play an important role in facilitating decision-making and generally guiding behaviors (Cheetham, Allen, Yücel & Lubman, 2010). In many studies negative affectivity due to stressful situations has been found to be a powerful predictor of substance use with regards to both initiation and frequency of use (Tarter, et. al., 1999, Cyders & Smith, 2008, Henderson, Galen & DeLuca, 1998, Randall & Cox, 2001).

Coping skills also play an important role in drug use (Kiluk, Nich, & Carroll, 2011, Valentino, Lucki & Van Bockstaele, 2010, Sinha, 2009). In the study of Annis, Sklar & Moser (1998), results showed that the patients who attempted any coping response were much more likely to abstain than those who did not, and those who executed two or more coping responses were more likely to abstain than those who used only one. Stress-coping skills are relevant for coping with general life stress, and the goal of stress-coping is to maintain physical and psychosocial well-being (Wagner, Myers & McNinch, 1999). The majority of research in the area has utilized Lazarus and colleagues' (Lazarus & Folkman, 1984; Monat & Lazarus, 1991) typology of stress coping that distinguishes between problem-focused coping strategies, which are directed at altering or removing a stressor, and emotion-focused coping strategies, which are directed at managing affective states associated with or resulting from the problem. problem-focused coping responses may be of greatest benefit in situations where a stressor is controllable and an individual has sufficient resources to devote toward the resolution of the problem, whereas emotion-focused coping strategies might be more effective when stressors are outside one's personal control and must be endured. Despite the situational specificity of the effectiveness of problem-focused and emotion-focused coping, a general finding in the substance use literature has been that individuals who routinely use problem-focused stress-coping strategies are less likely to develop and more likely to overcome substance use problems than the individuals who routinely use emotion-focused stress-coping strategies (Wills & Hirky, 1996). Likewise, individuals who rely more on approach coping, a form of problem-focused coping, and less on avoidance coping, a form of emotion-focused coping, are less likely to develop substance use problems and experience greater success in recovery attempts if they do develop such problems (Wagner, Myers & McNinch, 1999). An individual can either approach a problem and make active efforts to resolve it or avoid a problem and focus mainly on managing emotions associated with it. In the context of substance use, an individual can use drugs or alcohol as an avoidance strategy to try to reduce distress or depression or, alternatively, can rely on active/approach methods, such as problem solving and seeking social support, to cope with stress (Forys, McKellar & Moos (2007). Some other researchers divide coping strategies in to

the tree category: problem focused such as planful problem solving and seeking support, emotion focused such as self-blame and anger and avoidance such as denial of the problem (Staiger, Melville, Hides, Kambouropoulos & Lubman, 2009). Generally, the latter two styles have been considered maladaptive and the use of problem-focused strategies is associated with better adjustment to life stressors (Votta & Manion, 2003).

The purpose of present study is to determine whether before beginning substance use, the amount of the occurrence of stressful life events in the opium addict patients is greater than normal subjects or not, and to determine whether stress coping methods in opium addict patients are different from normal subjects or not.

2. Materials and Methods

2.1. Participants

A total of 150 male opium addicts randomly selected from different addiction treatment centers in Yazd (a city in Iran) in addition to 150 normal subjects as control group participated in the present study. The control group was selected from the addict's normal family members, friends and relatives. This group was matched with the addict group for age, education, marital and socioeconomic status. The patients have been addict for 1 to 15 years. The ages of the participants were between 20 to 50, 24 percent of them had a college degree and 63 percent were married.

2.2. Measures

2.2.1. Paykel Scale of Stressful Life Events

This instrument includes 61 life events (Paykel, Prusoff & Uhlenhuth, 1971). The questionnaire consists of stressors related to health, illness, work, education, finances, bereavement, legal matters, courtship engagement, family relations, change of residence, social relation and marriage. The addicts were required to determine the experienced stressors related to two years prior to their addiction. The control group subjects were asked to define their experienced stressors over the past two years.

2.2.2. Cope Inventory

Cope Inventory was developed to assess the different ways in which people respond to stress (Carver, Scheier & Weintraub, 1989). The instrument incorporates 13 conceptually distinct scales. Five scales measure conceptually distinct aspects of problem focused coping: 1- Active Coping (the process of taking active steps to try to remove or circumvent the stressor or to ameliorate its effects), 2- Planning (thinking about how to cope with a stressor), 3- Suppression of Competing Activities (putting other projects aside, trying to avoid becoming distracted by other events, even letting other things slide, if necessary, in order to deal with the stressor), 4- Restraint Coping (waiting until an appropriate opportunity to act presents itself, holding oneself back, and not acting prematurely), 5- Seeking of Instrumental Social Support (seeking advice, assistance, or information). Five scales measure aspects of what might be viewed as emotion focused coping: 6- Seeking of Emotional Social Support (the tendency to be reassured by obtaining emotional social support), 7- Positive Reinterpretation (managing distress emotions rather than at dealing with the stressor), 8- Acceptance (accepts the reality of a stressful situation), 9- Denial (minimizing distress and thereby facilitating coping), 10- Turning to Religion (turn to religion at the time of stress). Three scales measure coping responses that arguably are less useful: 11- Focus On and Venting of Emotions (the tendency to focus on whatever distress or upset one is experiencing and to ventilate those feelings), 12- Behavioral Disengagement (reducing one's effort to deal with the stressor), 13- Mental Disengagement (a wide variety of activities that serve to distract the person from thinking about the behavioral dimension or goal with which the stressor is interfering).

2.3. Analysis

The data were analyzed using Mann-Whitney Test.

3. Results

Regarding the first objective of the research the findings (Table 1) showed that over a two-year period before beginning substance use, the occurrence rate of various psychosocial stressors in opium addict patients was statistically higher than normal subjects in the last two-year period ($P < .0001$).

Table 1. Difference in the number of stressors experienced by the addict group over two years period prior to their addiction compared to stressors of normal subjects over the two past years

Groups Rate of stress	Addict(n=150) M(SD)	Normal (n=150) M(SD)	P Value
Number of life stressors	5.79 (3.36)	3.76 (3.18)	.0001

Regarding the second objective of the study, The findings showed that in comparison to normal subjects, the opium addict patients made significantly less use of problem-focused coping methods including active coping, planning, suppression of competing activities, restraint coping and seeking of instrumental social support ($P < .01$) while they made significantly more use of less useful coping strategies including focus on and venting of emotions, behavioral disengagement and mental disengagement ($P < .0001$). In regarding to the use of emotion- focused coping methods including seeking of emotional social support, positive reinterpretation, acceptance, denial and turning to religion, although the drug addicts' scores were higher than those of normal subjects, it wasn't statistically significant. (Table 2).

Table 2. Difference in the amount of various stress coping methods in the two groups of addict and normal

Groups Type of coping	Addict(n=150) M(SD)	Normal (n=150) M(SD)	P Value
Problem-Focused	11.34 (3.98)	12.48 (3.21)	.01
Emotion- Focused	12.22 (3.50)	11.62 (3.48)	NS
Less Useful	6.10 (2.64)	4.50 (2.28)	.0001

4. Discussion

The purpose of the present study was to determine whether the amount of experienced stressors and stress coping strategies of opium addict patients is different from normal subjects or not. On the basis of first objective of the study, findings showed that over a two-year period the occurrence rate of various psychosocial stressors in opium addicts was statistically higher than normal subjects ($P < .0001$). The literature on stress and substance abuse has established a link between stress and substance use and abuse (Are'valo, Prado & Amaro, 2008, Goeders, 2003). Some researches shown that stress increases an individual's vulnerability to substance misuse, both biologically (for example by chronic stress-mediated changes to the dopaminergic system) and psychologically, due to impaired

coping skills and increased sensitivity to negative affect (Constantinou et. al, 2010). In the laboratory, acute stress, evoked by personalized stress imagery scripts, produces negative affect, craving and stress response in addict patients (Sinha, 2009). What underlies the stress-induced increase in drug seeking and risk of relapse? Neurobiological data indicate that stress and negative affect impacts on catecholaminergic modulation of prefrontal circuits, which in turn impairs executive functions like inhibitory processes which underpin self and Impulse control (Constantinou et. al., 2010, Arnsten and Goldman-Rakic, 1998, Verdejo-Garcia et al., 2007). Stress may also impact on the salience of stimuli which are associated with an individual's habitual drug use. Conditioned responses to stimuli associated with drug use are known to play an important role in both the maintenance of addiction and precipitation of relapse (Constantinou et. al., 2010). An alternative hypothesis is that individuals who report experiencing a greater number of minor stressors may also experience cravings because they have a heightened attention to these stressful events, thereby influencing the number of cravings they experience (Ames & Roitzsch, 2000). However, a higher rate of stressful minor life events does not appear to solely account for the experience of cravings. Even after the total number of minor life events was entered into the model, individuals who perceived minor stressors as being more stressful had a greater probability of experiencing cravings. This finding suggests that an affective component may play a significant role in the experience of cravings. That is, a common affective component or cognitive bias may lead these individuals to perceive minor stressors as more stressful and may also influence the likelihood that they will experience cravings.

On the basis of second objective of the study, findings showed that in comparison to normal subjects, the opium addict patients made significantly less use of problem-focused coping methods including active coping, planning, suppression of competing activities, restraint coping and seeking of instrumental social support ($P < .01$), while they made significantly more use of less useful coping strategies including focus on and venting of emotions, behavioral disengagement and mental disengagement ($P < .0001$). In regarding to the use of emotion- focused coping methods including seeking of emotional social support, positive reinterpretation, acceptance, denial and turning to religion, although the drug addicts' scores were higher than those of normal subjects, it wasn't statistically significant. Indeed, our findings are consistent with results of previous researches on the relationship between stress and drug use (Kiluk, Nich, & Carroll, 2011, Valentino, Lucki & Van Bockstaele, 2010, Sinha, 2009, Wills & Hirsky, 1996, Wagner, Myers & McIninch, 1999). In general, problem-solving coping strategies such as implementing plans of action or gathering information reduce adverse psychological effects of life stressors (Penly, Tomaka, & Wiebe, 2002), in contrast, avoidance-oriented strategies, such as day-dreaming or venting, focus on managing emotions around problems are generally associated with negative outcomes, such as depression, substance abuse, and problem drinking (Cleveland & Harris, 2010). Commonly, more reliance on approach than on avoidance coping is predictive of better outcomes (Forys, McKellar & Moos, 2007). In this regard, in the study of Lemke & Moos (2003) approach coping at a 1-year follow-up predicted less substance use at a 5-year follow-up. Stress-coping models in addiction studies have shown the importance of effective coping responses as a mediator of the effects of stress (Are'valo, Prado & Amaro, 2008). For instance, studies have shown that positive coping skills enhancement increases the ability to manage craving and to remain abstinent despite severe stress (Rask et al., 2006). Marlatt and Gordon (1985) proposed that after a period of abstinence, being in a high-risk situation without an effective coping strategy would result in an individual having a low self-efficacy for their ability to cope with the high-risk situation (Hasking & Oei, 2007). The question becomes why certain people are able to cope successfully with stress while others are not; i.e., what is the process through which stress translates into distress for some individuals but not for others? (Koval & Pederson, 1999). It is not clear why some individuals may choose substance use rather than alternative coping strategies, such as prayer, talking to friends, or exercise. Wills and Shiffman (1985) suggest that people low in personal resources such as self-esteem, mastery, or social support may turn to substance use because it is the only means available to deal with stress. Social learning theory proposes that substance abusers need to learn adaptive skills to replace the maladaptive methods of coping with stress and seeking pleasure (Abrams and Niaura, 1987). For example, the communication skills training approach of Monti et al. (1990) teaches ways to improve one's lifestyle in general to make the social environment more conducive to abstinence, including modules such as conflict resolution, increasing positive communications with significant others, building new social networks, and assertiveness training. The model behind this approach is that a social network that provides more positive

interactions and where conflict is handled less stressfully will provide more support for abstinence (Rohsenowa, Martin & Monti, 2005). One of the most popular cognitive-behavioral theories of the addictive process is the stress-coping model in which substance use is viewed as a coping response to life stress that can function to reduce negative affect or increase positive affect (Wagner, Myers & McNinch, 1999). A considerable body of both anecdotal and empirical evidence suggests that negative affect and addiction are linked (Cheetham, Allen, Yücel & Lubman, 2010). Commonly, this relationship is conceptualised as a two-part model in which individuals who experience greater levels of negative affect are at a higher risk of using drugs or alcohol as a coping mechanism to improve mood or provide distraction from unpleasant feelings (Measelle, Stice, & Springer, 2006). In turn, once the individual develops physical dependence, their drug abuse is assumed to be primarily motivated by a desire to avoid negative affective states associated with withdrawal. This negative reinforcement model is perhaps the oldest and most widely studied model of addiction (Kassel et al., 2007). Activation of brain stress systems is hypothesized to be key to the negative emotional state produced by dependence that drives drug seeking through negative reinforcement mechanisms (Koob, 2008). Indeed, exposure to negative affect has been found to increase self-reported craving (Fox, Bergquist, Hong, & Sinha, 2007). Work examining the impact of negative affective states on attentional processes suggests that such states may increase attentional biases toward cues associated with drug-taking (Cheetham, Allen, Yücel & Lubman, 2010). Robinson and Berridge's (2008) incentive-sensitisation theory of addiction suggests that drug cues that consistently and reliably produce a drug reward become salient and 'grab the attention' of an addicted individual. Indeed, negative affect may increase the ability of substance-related cues to grab the attention, as under stress an organism is biased towards cues that signal an escape from negative affect (Constantinou et al., 2010). In support of this, stress was found to increase attentional bias to alcohol-related cues in heavy social drinkers who used alcohol as a coping mechanism (Field and Powell, 2007).

In summary, on the basis of the findings of present study, it seems that more stressful life events and more ineffective coping strategies in opium addict patients may play a considerable role in their development of drug abuse or turning to relapse. Thus, to prevent the occurrence of severe stress and self treatment through drug abuse, it's advisable to teach some skills such as stress prevention, alteration and toleration strategies to the at-risk groups.

References

- Abrams, D.B., Niaura, R.S., (1987). Social learning theory. In: Blane, H.T., Leonard, K.E. (Eds.), *Psychological Theories of Drinking and Alcoholism*. Guilford Press, New York, pp. 131–178.
- Ames, S. C., & Roitzsch, J. C. (2000) The impact of minor stressful life events and social support on cravings: a study of inpatients receiving treatment for substance dependence. *Addictive Behaviors*, 25, 4, 539–547.
- Arnsten, A.F., Goldman-Rakic, P.S., (1998). Noise stress impairs prefrontal cortical cognitive function in monkeys: evidence for a hyperdopaminergic mechanism. *Archives of General Psychiatry*, 55 (4), 362–368.
- Annis, H. M., Sklar, S. M., & Moser, A. E. (1998). Gender in relation to relapse crisis situations, coping, and outcome among treated alcoholics. *Addictive Behaviors*, 23, 1, 127–131.
- Are'valo, S., Prado, G., Amaro, H. (2008). Spirituality, sense of coherence, and coping responses in women receiving treatment for alcohol and drug addiction. *Evaluation and Program Planning*, 31, 113–123.
- Askari, J., Hassanbeigi, A., Fallahzadeh, H. (2011). The rate of various psychological stressors, perceived mental strain due to these stressors, and coping strategies in opium addicts compared to normal individuals. *Procedia – Social and Behavioral Sciences*, 30, 654–661.
- Cappell, H., & Greeley, J. (1987). Alcohol and tension reduction: An update on research and theory. In H. Blane & K. Leonard (Eds.), *Psychological theories of drinking and alcoholism* (pp. 15–54). New York: Guilford Press.
- Cheetham, A., Allen, N. B., Yücel, M., Lubman, D. I. (2010). The role of affective dysregulation in drug addiction. *Clinical Psychology Review*, 30, 621–634.
- Cleveland, H. H., Harris, K. S. (2010). The role of coping in moderating within-day associations between negative triggers and substance use cravings: A daily diary investigation. *Addictive Behaviors*, 35, 60–63.
- Constantinou, N., Morgan, C. J.A., Battistella, S., O'Ryan, D., Davis, P., Curran, H. V. (2010). Attentional bias, inhibitory control and acute stress in current and former opiate addicts. *Drug and Alcohol Dependence*, 109, 220–225.
- Cyders, M. A., & Smith, G. T. (2008). Emotion-based dispositions to rash action: Positive and negative urgency. *Psychological Bulletin*, 134(6), 807–828.
- Field, M., Powell, H., (2007). Stress increases attentional bias for alcohol cues in social drinkers who drink to cope. *Alcohol Alcohol*. 42, 560–566.

- Forys K., McKellar, J., Moos, R. (2007). Participation in specific treatment components predicts alcohol-specific and general coping skills, *Addictive Behaviors*, 32, 1669–1680.
- Fox, H. C., Bergquist, K. L., Hong, K. -I., & Sinha, R. (2007). Stress-induced and alcohol cue-induced craving in recently abstinent alcohol-dependent individuals. *Alcoholism, Clinical and Experimental Research*, 31(3), 395–403.
- Goeders, N. E. (2003). The impact of stress on addiction. *European Neuropsychopharmacology*, 13, 435–441.
- Hasking, P. A., Oei, T. P.S. (2007). Alcohol expectancies, self-efficacy and coping in an alcohol-dependent sample, *Addictive Behaviors*, 32, 99–113.
- Henderson, M. J., Galen, L. W., & DeLuca, J. W. (1998). Temperament style and substance abuse characteristics. *Substance Abuse*, 19(2), 61–70.
- Kassel, J. D., Veilleux, J. C., Wardle, M. C., Yates, M. C., Greenstein, J. E., Evatt, D. P., et al. (2007). Negative affect and addiction. In M. al Absi (Ed.), *Stress and addiction: Biological and psychological mechanisms*. London: Academic Press.
- Kiluk, B. D., Nich, C., Carroll, K. M. (2011). Relationship of cognitive function and the acquisition of coping skills in computer assisted treatment for substance use disorders. *Drug and Alcohol Dependence*, 114, 169–176.
- Koob, G. F. (2008). A Role for Brain Stress Systems in Addiction, *Neuron*, 59, 11–34.
- Koval, J. J., Pederson, L. L. (1999). Stress-coping and other psychosocial risk factors: a model for smoking in grade 6 students. *Addictive Behaviors*, 24, 2, 207–218.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer Publishing Company.
- Lemke, S., & Moos, R. H. (2003). Outcomes at 1 and 5 years for older patients with alcohol use disorders. *Journal of Substance Abuse Treatment*, 24, 43–50.
- Marlatt, G. A., & Gordon, J. R. (1985). Relapse prevention: Maintenance strategies in the treatment of addictive behaviors. NY: Guildford.
- Measelle, J. R., Stice, E., & Springer, D.W. (2006). A prospective test of the negative affect model of substance abuse: Moderating effects of social support. *Psychology of Addictive Behaviors*, 20(3), 225–233.
- Milgrom, J., & Burrow, G. D. (2001). *Psychology and psychiatry: integrating Medical practice*. (First ed.), chichester :John Wiley and Sons, (Chapter 2).
- Monat, A., & Lazarus, R. S. (1991). Introduction: Stress and coping—some current issues and controversies. In A. Monat & R. S. Lazarus (Eds.), *Stress and coping: An anthology* (pp. 1–16). New York: Columbia University Press.
- Randall, D. M., & Cox, W. M. (2001). Experimental mood inductions in persons at high and low risk for alcohol problems. *American Journal of Drug and Alcohol Abuse*, 27 (1), 183–187.
- Rask, M. B., Jorgensen, T., Jensen, J. P., Jorgensen, K. B., Madsen, M., Nielsen, B., et al. (2006). Influence of Pretreatment Coping Strategies on the Outcome of Outpatient Treatment of Danish Alcohol Abusers. *European Addiction Research*, 12, 83–90.
- Robinson, T.E., Berridge, K.C., (2008). The incentive sensitization theory of addiction: some current issues. *Philos. Trans. R. Soc. Lond. B Biol. Sci.* 363 (1507), 3137–3146.
- Rohsenowa, D. J., Martin, R. A., Monti, P. M. (2005). Urge-specific and lifestyle coping strategies of cocaine abusers: Relationships to treatment outcomes, *Drug and Alcohol Dependence*, 78, 211–219.
- Shaham, Y., Erb, S., Stewart, J. (2000). Stress-induced relapse to heroin and cocaine seeking in rats: a review, *Brain Research Reviews*, 33, 13–33.
- Sinha, R. (2009). Stress and Addiction: A Dynamic Interplay of Genes, Environment, and Drug Intake, *Biological Psychiatry*, 66, 100–101.
- Staiger, P.K., Melville, F., Hides, L., Kambouropoulos, N., Lubman, D. I. (2009). Can emotion-focused coping help explain the link between posttraumatic stress disorder severity and triggers for substance use in young adults? *Journal of Substance Abuse Treatment*, 36, 220–226.
- Tarter, R. E., Vanyukov, M., Giancola, P., Dawes, M., Blackson, T., Mezzich, A., et al. (1999). Etiology of early age onset substance use disorder: A maturational perspective. Development and Psychopathology. Special Issue, *Developmental Approaches to Substance Use and Abuse*, 11(4), 657–683.
- Ungless, M. A., Argilli, E., Bonci, A. (2010). Effects of stress and aversion on dopamine neurons: Implications for addiction, *Neuroscience and Biobehavioral Reviews*, 35, 151–156.
- Valentino, R., Aston-Jones, G. (2010). Special issue on neuropeptides in stress and addiction: Overview, *Brain Research*, 1314, 1 – 2.
- Valentino, R. J., Lucki, I., Van Bockstaele, E. (2010). Corticotropin-releasing factor in the dorsal raphe nucleus: Linking stress coping and addiction, *Brain Research*, 1314, 29–37.
- Verdejo-Garcia, A., Bechara, A., Recknor, E.C., Perez-Garcia, M., (2007). Negative emotion-driven impulsivity predicts substance dependence problems. *Drug Alcohol Dependence*. 91, 213–219.
- Votta, E., & Manion, I. G. (2003). Factors in the psychological adjustment of homeless adolescent males: The role of coping style. *Journal of the coping American Academy of Child and Adolescent Psychiatry*, 42, 778–785.
- Wagner, E. F., Myers, M. G., McIninch, J. L. (1999). Stress-coping and temptation-coping as predictors of adolescent substance use, *Addictive Behaviors*, 24, 6, 769–779.
- Weaver, G. D., Turner, N. H., O'Dell, K. J. (2000). Depressive symptoms, stress, and coping among women recovering from addiction, *Journal of Substance Abuse Treatment*, 18, 161–167.
- Wills, T. A., & Hirky, A. E. (1996). Coping and substance abuse: A theoretical model and review of the evidence. In M. Zeichner & N. S. Eudler (Eds.), *Handbook of coping: Theory research, and applications* (pp. 279–302). New York: Wiley.

Wills, T. A., & Shiffman, S. (1985). Coping and substance use: A conceptual framework. In S. Shiffman & T. A. Wills (Eds.), *Coping and substance abuse* (pp. 3–24). New York: Academic Press.