

Accepted Manuscript

Accepted Manuscript (Uncorrected Proof)

Title: The Role of Cognitive-Emotion Regulation, Resiliency and Sleep Disorder in Predicting Suicidal Ideation of Addicts under Treatment

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To appear in: *Avicenna Journal of Neuropsychophysiology Journal*

Received date: 2019/07/6

Revised date: 2019/07/20

Accepted date: 2019/07/25

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Please cite this article as:

Jahanchi, M. Abolghasemi, Sh. (In Press). The Role of Cognitive-Emotion Regulation, Resiliency and Sleep Disorder in Predicting Suicidal Ideation of Addicts under Treatment. *Avicenna Journal of Neuropsychophysiology*. Just Accepted publication Oct. 1, 2019. Doi: <http://dx.doi.org/10.32598/ajnpp.4.3.235>

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Abstract

Background: Suicide is the most common cause of death of drug abusers and drug abusers commit suicide ten times more than the usual population of the community. some of the variables that can be affective on suicidal ideation are cognitive emotion regulation, Resiliency and Sleep Disorder. The purpose of this study was to determining the role of cognitive-emotion regulation, resiliency and sleep disorder in predicting suicidal ideation in addicts under treatment.

Materials and Methods: The statistical population of the study included all addicts under treatment, who referred to addiction treatment centers of Rasht during the time interval from September to December 2018. A total of 180 individuals were selected employing the cluster sampling method. The instruments used in this research were: the Suicide ideation Scale by Beck et al. (1979), the Garnefsky and colleagues' cognitive emotion regulation questionnaire (2001), Conner-Davidson resilience scale (2003), and Pittsburgh sleep quality index (1989) Pearson correlation and multiple regression were used to analyze the collected data.

Results: The results showed that there is a relationship between cognitive-emotion regulation (positive, negative), resiliency, sleep disorder and suicidal ideation. According to the significance level, the linear relationship between positive emotion regulation and resilience with suicidal ideation at the level of 0.01 is negative and significant, and the linear relationship between the negative emotion cognitive-behavioral regulation of sleep disorders and suicidal ideation at the level of 0.01 is positive and significant. The variables of sleep disorder, resiliency, and emotion cognitive regulation (negative) are the best predictors of suicidal ideation and the variables of sleep disorder, resiliency, and emotion cognitive regulation (negative) at the level of 0.01 combined changes have been responsible for about % 20.7 of the variance of suicidal ideation.

Conclusion: It can be concluded that cognitive-emotion regulation, resiliency and sleep disorder can predict suicidal ideation of addicts under treatment.

Keywords: suicidal ideation, sleep wake disorders, emotions, cognition.

1. Introduction

Suicide is the most common cause of death of drug abusers. Drug abusers commit suicide ten times more than the usual population of the community. Most addicts sometimes refer for treatment when the problems associated with consumption reaches its topmost. For this reason, in this period, a person is highly susceptible to suicidal ideation (1). Other research results also indicate that subjects committing suicide have a history of drug abuse and drug dependence (2). Evidence suggests that one of the reasons for suicide increase is an increase in drug abuse (3). Regarding this fact, it is necessary to identify the factors influencing suicidal ideation in addicted people in the realm of prevention and reduction of suicide in addicts.

One of the variables that can be affective on suicidal ideation is cognitive emotion regulation. The emotion cognitive regulation represents a range of processes through which individuals can adjust the nature, fluctuation, and duration of emotions (4), which is appropriate for understanding emotion disorders. Individuals suffering from these disorders tend to experience their own negative emotions as uncontrollable and often lack the skills to manage and regulate these intense emotion experiences (5) which increase physiological arousal and reduce self-control (6). The way in which people deal with anger or regulate excitement may be considered relevant to their understanding of its relationship with suicidal behavior (6).

In general, individuals in confrontation with stressful experiences and situation employ a variety of cognitive strategies that help them adjust negative excitement and emotions in order to maintain their mental and emotion well-being (7). Research also shows that there is a strong relationship between cognitive regulation strategies and emotion problems (8). In investigating the relationship between strategies for cognitive regulation of emotion and emotion problems, researchers concluded that emotion problems had a significant positive correlation with maladaptive strategies of emotion cognitive regulation, and had a negative relationship with positive strategies of emotion cognitive regulation (9).

Another variable that seems to be effective in this case is the rate of individuals' resilience. Resilience is defined as the ability to overcome difficulties and conquer the difficult conditions of life. It includes situations that call for positive outcomes and succeed in coping with challenges or stressful situations (10). The best definition for resilience is to consider it as successful adaptation to bad conditions. The person's characteristics and position can determine resiliency processes if they lead to healthy outcomes after stressful conditions. In other words, resilience is the person's ability in establishing a biological-physical balance in difficult situation (11).

Another variable that has been studied in this study as an effective variable on suicidal ideation is the variable of sleep disorder. Several studies have confirmed the correlation between sleep disorder, and sleep quality with suicide (12). The present research is designed to predict suicidal ideation and prevent and reduce suicide, and seeks to answer the question: Do cognitive-emotion regulation, resiliency and sleep disorder have the power to predict the suicidal ideation of addicts under statement?

Suicide is one of the main causes of death in individuals afflicted with substance abuse and drug dependence disorders and is one of the main challenges in the treatment of these individuals. Studies on individuals committing suicide have shown that between 19% and 63% of them suffer from a type of substance-related disorder (13). Consumption of drugs increases the likelihood of committing suicide, and substance abuse and dependence are one of the major risk factors of suicidal attempts (14,15). The prevalence of suicidal ideation and suicidal behavior among addicts has been reported at %17 to %29 (16). The purpose of this study was to determine the role of cognitive-emotion regulation, resiliency and sleep disorder in predicting suicidal ideation in addicts under treatment.

2. Materials and Methods

The present research was a descriptive-correlational study. In order to collect data field method was employed and questionnaires were used to implement the data. The statistical population of all addicts who were under treating is referring to addiction treatment centers in Rasht between September and December of 2012. Regarding the lack of access to the exact number of the statistical population, the sample size was calculated based on the number of independent variables and for each variable 60, 180 persons. Considering the drop in the sample, 210 individuals were randomly selected as sample through random cluster sampling method. After collecting questionnaires, 30 questionnaires were excluded due to lack of completeness and 180 data were analyzed. Sample selection was as the following: First, 7 centers were selected randomly (Nedaye Slammat, Nasim Sahar, Forsat, Rahayesh, Moen, Nasr, Raha) and second, 30 individuals were randomly selected from each of these centers. It should be noted that the center's authorities helped in convincing the referents that the researcher was able to choose randomly. After referring to addiction treatment centers and random selection, the questionnaires were delivered to the clients who were selected. 60 minutes was spent for completion the questionnaires. Written consent have been obtained from participants. Some questionnaires needed to be instructed by researcher.

Beck Suicide Ideation Scale

This scale was designed in 1979 by Beck et al. The examiner has a questionnaire comprising 19 questions. Each question has three options, which are assigned scores of zero, one, and two, respectively; in total, scores will range from zero to 38 (depending on whether there is or not, and from different stages from thinking to suicide). This scale has high reliability, using Cronbach's alpha coefficient equal to 0.94 and by using a test-retest, the reliability of the test was .74 (17). Ekramzadeh et al (18), showed that simultaneous admissibility of suicide ideation criterion of Beck with GHQ is equal to .95. The calculated permanency for this test is 0.80, Alfa coefficient. The reliability of this scale in current research calculated .91 Chronbach Alpha.

Cognitive Emotion Regulation Questionnaire

This questionnaire was designed by Garnefski and his colleguses (2001), this questionnaire is a multi-dimensional self-report instrument with 36 two-item statements and has a special form for adults and children. This scale evaluates 9 types of cognitive strategies of self-denial,

acceptance, rumination, positive refocus, refocus on planning, positive reappraisal, perceptiveness, disaster, and blame for others. The questionnaire consists of 36 five-point scaled questions, (from *always* to *never*) that every four questions evaluates one factor and in total, assesses nine factors of self-blame, blaming others, dismay, rumination, concentration Re-evaluates planning, acceptance of conditions, positive re-focus, positive reappraisal, and the adoption of a perspective (19). Garnefski et al. have reported an optimal validity and reliability for this questionnaire. According to Garnefski et al. (19), Cronbach's alpha coefficient for the subscales of this questionnaire was reported in the range of .71 to .81. Abdi (20) showed that the subscales of the Persian version of the cognitive emotion regulation questionnaire had a good internal consistency (Cronbach's alpha was 0.76 to 0.92). The items scores and total scores of subscales were significantly correlated ($r=.46$ to $r=.75$) and the value of the correlation coefficient (0.51 to 0.77) indicated the validity of the scale. Validity and reliability of this questionnaire were 0.73 and 0.79 respectively.

Conner and Davidson's Resiliency Scale

This scale was developed by Connor and Davidson (2003) by reviewing the research resources of resiliency realm during 1979-1999. The questionnaire has 25 expressions that are scored on the Likert scale from 0 (completely false) to 4 (always true). Therefore, the maximum score of this questionnaire is 100 and the score of each subject is equal to the total score or the total values obtained from each of the questions. The rate of resiliency of each participant equals to the raw score (obtained score) divided by 100 and multiplied by 100. The more the score is nearer to 100, the higher the individual's resiliency; and the more his score is nearer to 0, the lower his resiliency will be (21). The calculation of the correlation of each score with the total score except for item 3 showed coefficients between 0.41 and 0.44. The items of the scale were then analyzed by factor analysis method. Before extracting factors based on the correlation matrix, the two KMO indexes were 5556.28, each of which showed the adequacy of the evidence for factor analysis and validity and reliability of this questionnaire were 0.78 and 0.82, respectively (22).

Pittsburgh Sleep Quality Index

One of the best tools that is designed and constructed regarding sleep quality measurement is Pittsburgh Sleep Quality Questionnaire (PSQI). The questionnaire was created in 1989 by Buysse and his colleagues at the Pittsburgh Psychiatric Institute. This questionnaire has 9 items in its original form, but since the 5th question contains 10 sub-items, therefore the entire questionnaire has 19 items which are scored in a 4-point Likert scale from 0 to 3. The questionnaire has 7 subscales as the following: Sleep mental quality, delay in sleeping, sleep duration, sleep efficiency, sleep disorders, using sleeping pills, daytime dysfunction. To score Pittsburgh Sleep Quality Questionnaire, first you must assign three kinds of scores to 19 items. Questions 1 and 3 are scored in one way questions 2 and 4 are scored in another way, and questions 5 to 9 are scored in another way. Boys et al. (1989) who developed and introduced the questionnaire for the first time reported an internal consistency of 0.83 for the questionnaire using Cronbach's alpha. In the Persian version the validity of the questionnaire was 0.86 and

the reliability was 0.89 (23). Also, in another study, the reliability of the questionnaire using Cronbach's alpha and Split-half methods was 0.46 and 0.52, respectively (24).

Data were analyzed using descriptive and inferential statistics. In this research, data analysis was used in the descriptive statistics domain included mean, standard deviation. To test the hypotheses of the research, Pearson correlation test and multiple regression (step by step) were used. Statistical analysis of this study was performed using SPSS.22 software.

3. Results

Table 1: The mean and standard deviation of the variables studied (n = 180)

Variable	Mean	Standard deviation
Positive emotion cognitive regulation	74.40	3.89
Negative emotion cognitive regulation	26.44	3.65
Resilience	74.50	4.23
Sleep disorder	17.79	3.96
Suicidal ideation	31.84	3.77

The significance level of Kolmogorov-Smirnov test for all variables under study is greater than 0.05. Therefore, the result of the test is not significant for any of the variables, and as a result the distribution of all variables is normal, so the parametric tests can be used to test the research hypotheses. To test the research hypotheses, the results of the correlation coefficient are considered, and each of them is presented.

Table 2: Correlation matrix of cognitive-emotion regulation (positive, negative), resiliency, sleep disorder, suicidal ideation

Variable	Positive cognitive-emotion regulation	Cognitive-negative emotion regulation	Resilience	Sleep disorder	Suicidal ideation
Positive cognitive-emotion regulation	1	-0.146*	0.458**	-0.162**	-0.265**
Negative cognitive-emotion regulation	-	1	-0.174**	-0.095	0.264**
Resilience	-	-	1	-0.231	-0.325**
Sleep disorder	-	-	-	1	0.357**
Suicidal ideation	-	-	-	-	1

P<0.01**

The data in the above table show the results of the Pearson correlation linear relationship between emotion cognitive regulation (positive, negative), resiliency, sleep disorder and suicidal ideation. Regarding the obtained significance level, the linear relationship between emotion cognitive regulation (positive) and resiliency with suicidal ideation is negative and

significant at the level of 0.01. Regarding the obtained significant level, the linear relationship between cognitive-emotion regulation (negative) and sleep disorders with suicidal ideation is positive and significant at the level of 0.01.

To determine the best predictor of suicidal ideation from among the variables of emotion cognitive, resiliency and sleep disorders, a regression model with stepwise method was used. It should be noted that the variables of sleep disorder, cognitive-emotion regulation are entered into the equation. The results are presented in Table 3.

Table 3: Summary of regression analysis of variables of sleep disorder, resiliency, cognitive-emotion regulation (negative)

Variables of the predictive model	R	R ²	ΔR ²	Standard error
Sleep disorder	0.357	0.127	0.122	3.53
Sleep disorder, resiliency,	0.436	0.190	0.181	3.41
Sleep disorder, resiliency, negative cognitive emotion regulation	0.470	0.221	0.207	3.36

Table 3 shows that the variable of sleep disorder could justify %12.2 of the variance of suicidal ideation ($\Delta R^2 = 0.122$). And, with the addition of the variable of resilience to the variable of sleep disorder in the second model resulted a %6 increase to the variance in of suicidal ideation (0.181) and variables of sleep disorder , resilience could justify %18.1 variance of the variables of suicidal ideation. And with the addition of a resilience variable to the sleep disorder variable in the third model resulted in a % 2 increase in the variance of suicidal ideation ($\Delta R^2 = 0.207$) and the variables of sleep disorder , resiliency, cognitive-emotion regulation (negative) justified about %20.7 of variance of the variable of suicidal ideation . Durbin-Watson statistic is an assumption that examines the independence of the errors, and when this statistic is between 1.5 and 2.5, it means that the errors are independent of each other. Since the value of this statistic is 1.757, errors are independent of each other. Therefore, it is possible to run a regression test.

Table 4: Analysis of variance analysis to investigate the significance of sleep regression, resiliency, and emotion-cognitive regulation (negative)

Statistical index	Sources of changes	Sum of squares	df	Mean of squares	F-test	Sig.
Regression	Variable of sleep disorder	324.121	1	324.121		
Remaining		2221.524	178	12.480	25.970	0.000
Total		2545.644	179			
Regression	Variables of sleep disorder and resiliency	482.972	2	241.486		
Remaining		2062.673	177	11.654	20.722	0.000
Total		2545.644	179			

Regression	Variables of sleep disorder and resiliency, negative emotion cognitive regulation	561.471	3	187.157	16.601	0.000
Remaining		1984.174	176	11.274		
Total		2545.644	179			

The results in Table 4 show that there is a correlation between the variables of sleep disorder, resiliency, emotion cognitive regulation (negative) and suicide. In addition, the variables of sleep disorder, resiliency, and emotion cognitive regulation (negative) has the predictive power of suicidal ideation.

Table 5: Regression analysis of (variables that are entered into the regression equation by using a step by step model) sleep disorder, resilience, and emotion cognitive regulation (negative)

	Indexes	regression	Standard error	Standard regression	T test regression line significance	Sig.
First model	Fixed ratio	25.800				
	Sleep disorder	0.340	0.067	0.357	5.096	0.000
Second model	Fixed ratio	32.540				
	Sleep disorder	0.283	0.066	0.298	4.281	0.000
	Resilience	-0.064	0.017	-0.257	-3.692	0.000
Third model	Fixed ratio	26.305				
	Sleep disorder	0.273	0.065	0.302	4.422	0.000
	Resilience	-0.056	0.017	-0.228	-0.3.292	0.001
	Negative motional cognitive regulation	0.185	0.070	0.179	2.639	0.009

4. Discussion

The aim of this research was to determine the role of cognitive-emotion regulation, resiliency and sleep disorder in predicting suicidal ideation in addicts under treatment. The results showed that there is a relationship between cognitive-emotion regulation (positive, negative), resiliency, sleep disorder and suicidal ideation that according to the obtained significance level, the relationship between cognitive-emotion regulation (positive), resiliency and suicidal ideation is negative. Regarding the obtained significance level, the linear relationship between cognitive-emotion (negative), sleep disorders and suicidal ideation is positive. In order to determine the best predictor of suicidal ideation from among predictive variables of cognitive-emotion regulation, resiliency and sleep disorder, a regression model with stepwise method was used that the variables of resiliency, sleep disorder, and negative emotion cognitive regression included in the equation. The variables of sleep disorder, resiliency, and emotion cognitive regulation (negative) in a hybrid variable have been able to predict about % 20.7 variance of suicidal ideation. In general, the research hypothesis that cognitive-emotion

regulation, resiliency and sleep disorder predicts suicidal ideation of addicts who are under treatment is confirmed. Sleep disorder and emotion cognitive regulation are the best predictors of suicidal ideation. The research results are consistent with the results of Richardson et al. (25), Cooley & Fite (30), and Walker (31).

Given this, factors in the individual and the environment can help individual to reduce these thoughts. One of these factors can be cognitive emotion regulation. Cognition and emotions are two important aspects of human life and in the manifestation of most of individuals' behaviors the interaction of these two constructs is obvious. Therefore, for a better understanding of suicidal behaviors and its behavioral correlations, the study of both cognitive and emotion constructs is essential. This feature is partially observed in the works of Schneiderman (28). In addition, contrary to uncompromising strategies of cognitive emotion regulation such as self-blaming and disaster, which constitute the core of emotion problems, compromised strategies such as re-evaluation and acceptance in the field of psychology are proposed as therapeutic techniques nowadays. Therefore, cognitive ability to manage emotions can enable individuals to use adaptive emotion strategies of suicidal ideation. Studies show that addicted individuals face more difficulties in emotion regulation than others (29), and since lack of excitement management can bring about feelings such as failure, hopelessness, low self-esteem, isolation, etc. that these factors can be the cause of suicidal ideation; therefore, it can be said that cognitive emotion regulation can predict suicide.

As the results show, another feature that can help people to reduce suicidal ideation is resilience. Resilience is a variable that keeps people save from being mental harms and a high level of resilience helps the individual to use positive feelings and emotions in order to end the undesirable experiences and passing to the desired state of affairs. Resilience provides the person an ability to make a more realistic and positive assessment of events and can more logically manage his emotions and choose more effective solutions to problems and difficulties of life, and use less of the harmful and inefficient practices such as ending his/her life.

Another result showed that sleep disorders are related to suicidal ideation and can predict suicide. Difficulty in sleeping is one of the important aspects of physical and psychological misconduct in drug abusers (30). In the acute phase of drug abusing, the delay in falling asleep increases and the total sleeping time decreases. At this stage, the number of slow waves come back to the normal levels, but the rate of sleep increases with rapid reactive or rebounded forms of eye movements. On the other hand, emotion memory and fixation of the inputs that somehow accompany with the individual's sense of prosperity are completely done in REM sleep, and the lack of using substance increases the REM sleep density and the fine emotion data have more chance of stabilization during sleep (31). Therefore, sleep disorder that disturbs the rhythm of sleep can cause cognitive disorders in the individual. Due to the inability of the addict to control thoughts and impulses, this disorder can lead to suicidal ideation in the helpless individual.

In explaining this finding, it can be said that emotion regulation is considered as the process by which their emotions are adjusted to respond to perceptible and non-existent environmental expectations (26). Emotion regulation has three important features: first, it is likely that people

will adjust their negative and positive emotions by both decreasing and increasing their emotions. (25). This emotion regulation usually has a social nature and, although individuals do not regulate their positive emotions, they report these emotions less than negative emotions. Secondly, the primary components of emotion regulation are alert and essentially happen deliberately and thoughtfully, but later times they happen without consciousness and awareness. Third, there is no default for this, whether the regulation of emotion is necessarily good or bad (30). In fact, the negative relation of positive strategies with suicide is for the reason that when one evaluates a negative event in his mind with these positive strategies, he/she looks at the event with a more positive attitude and considers its possible short and long-term positive aspects. As a result, they experience little depression and disappointment, and therefore are less susceptible to suicidal ideation. In general, when people with a full awareness and cognition of their thoughts use positive strategies, they substitute positive thoughts for suicidal ideation by correct emotion recognition.

The limitations of the present research included a decline in the number of 30 people that was due to the psychological and situational situation of the statistical sample. Using the self-report tool can affect the results. Research suggestions include: Considering measures to encourage more people to participate in research and use other data gathering methods in addition to questionnaires such as interviews and observations. Regarding the results that showed that there is a relationship between cognitive-emotion regulation with suicidal thoughts, and the cognitive-emotion regulation variable has the power of predicting variable of suicidal ideation, it is suggested that in order to prevent and reduce suicidal ideation, cognitive-emotion regulation should be considered as program together with other interventions for drug abuse patients. According to the results that the resilience variable inversely affects suicide ideation, and it predicts the criterion variable suicidal ideation, it is suggested that, in order to prevent and reduce suicidal ideation, individuals can be empowered with this regard by appropriate training. According to the results of the study, there was a relationship between sleep disorder and suicidal ideation; and the variable of sleep disorder has predictive power of predicting the variable of suicidal ideation, and the variable of sleep disorder has a direct impact on suicidal ideation, in the treatment of addiction there should be more attention to patient's problems.

Conclusion

It can be concluded that cognitive-emotion regulation, resiliency and sleep disorder can predict suicidal ideation of addicts under treatment.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles were considered in this article. The participants were informed about the purpose of the research and its implementation stages and signed the informed consent; They were also assured about the confidentiality of their information; Moreover, They were allowed to leave the study whenever they wish, and if desired, the results of the research would be available to them.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest

The authors declare that they have no conflict of interests.

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