The Impact of Dialectic Behavior Therapy on the Reduction of Impulsivity in Women with Comorbidity of Borderline Personality Disorder and Substance Abuse

Alireza Aghayousefi, Morteza Tarkhan, Tahereh Ghorbani

Alireza Aghayousefi
Associate Professor
Psychology Department
Payam Noor University of Tehran, Tehran, Iran

Morteza Tarkhan
Associate Professor
Psychology Department
Payam Noor University of Tehran, Tehran, Iran

Tahereh Ghorbani
Lecturer, Department of Psychology
Payam Noor University and Ph.D Student in Psychology
Tehran
Iran
E-mail: ghorbani_190@yahoo.com

Research on Addiction Quarterly Journal of Drug Abuse
Presidency of the I. R. of Iran
Drug Control Headquarters
Department for Research and Education

Vol. 9, No. 34, Summer 2015
http://www.etiadpajohi.ir/

Abstract

Objective: This study aimed to examine the effect of dialectic behavior therapy on the reduction of impulsivity in women with comorbidity of borderline personality disorders and substance abuse. **Method:** An experimental single system research design using multiple baselines was employed for this study. Based on the structured diagnostic interview and entry criteria, four participants among female patients with borderline personality disorders and substance abuse were selected via purposive sampling method. All four subjects received twelve dialectic behavior therapy sessions. Then, Impulsivity Bart Scale (IBS) was used to measure impulsivity. **Results**: Dialectic behavior therapy led to the significant reduction of impulsivity scores in women with borderline personality disorders and substance abuse. Graphs pertaining to the effectiveness and effect size indicate a significant decrease in participants' impulsivity. **Conclusion:** Dialectic behavior therapy interventions can contribute to the decrease of impulsivity and bring about desired practical implications in the treatment and prevention of substance abuse.

Keywords: Dialectic Behavior Therapy, Substance Abuse, Impulsivity

Introduction

Impulsivity is referred to as a set of behaviors, hurry, incontinence, impatience, and lack of attention to the consequences of an action. Heinz, Bui, Thomas & Blonigen (2015) introduced four personality dimensions in relation to different aspects of impulsive behaviors: 1) Lack of planning: the tendency to engage in urgent actions rather than to act with careful thought and planning. 2) Urgency: the difficulty in resisting strong impulses and a tendency to act out of indiscretion when experiencing positive or negative emotions. 3) Sensation-seeking: the tendency to search for adventure and excitement 4) Lack of stability: the difficulty in maintaining attention on task performance and failure in tolerance of boredom. Research shows that executive functions and the ability to control impulses are significantly weak in impulsive individuals due to damage to the prefrontal lobe. For this reason, such people are widely in trouble in purposeful behaviors and self-regulation (Bickel, Jarmolowicz, Mueller, Gatchalian & McClure, 2012). On the other hand, it seems that different aspects of impulsivity are associated with different aspects of risk behaviors (Coskunpinar, Dir & Cyders, 2013 Dick et al., 2010) and poor treatment outcomes in substance abusers (Loree, Lundahl & Ledgerwood, 2014; Stevens et al., 2014; Streeter et al., 2008). For example, lack of planning rather than urgency is associated with alcohol drinking in non-clinical samples of university students (Anestis, Selby & Joiner, 2007; Lynam & Miller, 2004). In addition, negative emotions are related to severe problems and involvement in a variety of risky behaviors such as alcohol consumption, gambling, and abnormal overeating (Coskunpinar et al., 2013). Finally, negative emotional impulses (rather than lack of planning) is a strong predictor of mental health, social, and family problems and high dose of drug and alcohol consumption in substance abusers (Verdejo-García, Bechara, Recknor & Pérez-García, 2007). Moreover, impulsivity is an important feature of some mental disorders including substance abuse and borderline personality disorder (Dawe & Loxton, 2004). Many studies have investigated the relationship of impulsivity with stimulants and cocaine abuse (Moeller & Dougherty, 2002; Butler & Montgomery, 2004). Evidence suggests that impulsivity is both a cause and a consequence of substance abuse disorders (Crews & Boettiger, 2009; De Wit, 2009). Similarly, secondary problems arising from impulsivity, including poor pregnancy, decision-making, and planning can be a major obstacle in the way of treating substance abusers, especially in the initiation, follow-up, and continuity of treatment. In clinical samples, impulsivity is correlated with the factors contributing to relapse, such as temptation for drug use and intensity of drug use. This is a potential mediating factor in the responsiveness and effectiveness of treatment methods (Loree et al., 2014). Accordingly, impulsivity is a very important research area for the conduct of experimental studies and clinical research on those seeking treatment for substance abuse disorders (Stevens et al., 2014). In this regard, recent research

on non-clinical samples has shown that the possibility of substance abuse and related problems declines when one's impulsivity is reduced over a period of time (King, Fleming, Monahan & Catalano, 2011; Littlefield et al., 2009).

Borderline personality disorder is characterized by pervasive problems in regulating emotions and impulsive behaviors. Suicidal self-harm behaviors and impulsive behaviors are indicative of these features which can be due to these people's problems in emotion regulation. Impulsive or self-harm behaviors are observed in 70 to 80% of people with borderline personality disorder. However, it is noteworthy that not all people with severe personality disorder show self-harm behavior in response to sever negative emotions (Brown, Comtois & Linehan, 2002; Kleindienst et al., 2008). People participating in substance abuse treatment programs experience a decline in impulsivity (Blonigen, Timkco, Moos & Moos, 2009). Impulsivity moderates the relationship between treatment process and reduction of alcohol-related problems (especially among young people) (Blonigen, Timko & Moos, 2013). Therefore, potential mechanisms of change in successful treatment of substance abuse disorders may reduce the level of impulsivity (Blonigen et al., 2013). Despite this, little research has examined the role of impulsivity and its impact on access to treatment of substance abuse disorders or comorbidity of substance abuse and borderline personality disorders. Since different aspects of impulsivity affect the treatment process of substance abuse, it is necessary that clinicians pay attention to the effects of these important factors. Therefore, the current study is aimed at examining the impact of dialectical behavior therapy on reducing impulsivity in women with comorbidity of borderline personality disorder and substance abuse.

Method

Population, sample, and sampling method

An experimental single system research design using multiple baselines was employed for the conduct of this study. Based on the structured diagnostic interview and entry criteria, four participants among female patients with borderline personality disorders and methamphetamine abuse (from the population who had referred to one of the rehab centers of Najafabad city) were selected via purposive sampling method. The criteria for the inclusion of participants were: in the age group of 28 to 35 years, minimum high school education, history of maximum one year crystal consumption, and not suffering any physical ailments. In the selection of participants, organized diagnostic interviews were also used in addition to the Psychiatrist's diagnosis.

The first participant was a 34-year-old married woman who had been addicted to heroin since she was 20. She had started using crystal for three months. She received borderline personality disorder diagnosis in addition to drug addiction disorder diagnosis. It is also noteworthy that she had experienced addiction abstinence 7 times where the longest time was a 6-week abstinence attempt. The

second participant was a 29-year-old married woman who had become dependent on heroin use and used crystal for six months. She received both borderline personality disorder diagnosis and drug addiction disorder diagnosis. In addition she had the history of 10 attempts at addiction withdrawal where the lengthiest one had taken two weeks. The third participant was a 31-year-old married woman who had become dependent on heroin use at the age of 16 and used crystal for one year. She suffered borderline personality disorder and drug addiction disorder at the same time and had attempted to stop addiction six times where the lengthiest attempt had taken 4 months. The fourth participant was a 28-year-old married woman who had become dependent on heroin use and used crystal for one year. She suffered both borderline personality disorder and drug addiction disorder and had attempted to stop addiction 14 times where the lengthiest attempt had taken 6 months.

Instrument

Barrat Impulsivity Scale: This scale measures three factors, namely cognitive impulsivity, motor impulsivity, and non-planning (Barratt, Stanford, Kent & Felthous, 1997). Reliability of the questionnaire was measured via test-retest and Cronbach's alpha methods which were equal to .77 and .81, respectively. Overall, the results of this study provided sufficient empirical support for the use of this scale in clinical and research situation in Iran (cited in Javid, Muhammadi & Rahimi, 2012). Naderi & Haghshenas (2009) conducted a study and explored the validation of this scale in Iran. They used Zuckerman's Sensation Seeking Scale to evaluate the convergent validity of the scale and reported the existence of a significant relationship between the scores of the two scales. In the same way, the half reliability and internal consistency of the scale were reported equal to .60 and .42, respectively.

This scale is scored based on a 4-point Likert scale from rarely to almost always. The items numbered 1, 7, 8, 9, 10, 12, 13, 15, 20, 29, and 30 are reversely scored. It should be mentioned that the items numbered 7, 10, 12, 13, 14, 15, 18, 27, 29, and 30 are related to non-planning sub-scale; items numbered 2, 3, 4, 8, 16, 17, 19, 21, 22, 23, and 25 are related to motor impulsivity subscale; and items numbered 5, 6, 9, 11, 20, 24, 26, and 28 belong to cognitive impulsivity subscale.

Procedure

Participants attended twelve 60-minute sessions of dialectical behavior therapy with the content mentioned in the table below and some tasks and assignments were given to them in each training session.

Table 1: Content of dialectical behavior therapy sessions

Session	*Content*
First session	Why should these skills be learnt? Start of self-awareness stages
Second and third sessions	Training of self-recognition skills, training of self-recognition skills (emotional self-awareness)
Fourth session	Naming of emotions, identification of myths (discussing the interpretations that the person may have about emotions)
Fifth session	Attention to the rational, emotional and logical mind about the interpretation about and response to emotions, observation and description of them (self-observation)
Sixth session	The role of positive self-talk and problem-solving skills in controlling emotions
Seventh session	Training of harm reduction skills (planning on sleep, exercise, proper nutrition, decrease of drug use, and filling of leisure time)
Eighth session	Training of the skill for staying away from emotional mind
Ninth session	Domination of one's world: training how to plan to increase positive experiences, providing a list of enjoyable activities
Tenth session	Emotional awareness and act in an appropriate manner against negative emotions (anger, fear, depression, stress and guilty feeling)
Eleventh session	Use of problem-solving skills and opposite practice against negative emotions
Twelfth session	Review of sessions and the given assignments

After the completion of therapy sessions, the follow-up was conducted three times, i.e. one, three and six months after treatment.

Results

In this study, visual analysis, trending index, stability, percentage of non-overlapping data, and percentage of overlapping data were used for data analysis (Farahani, Abedi, Aghamohammadi & Kazemi, 2011). The raw scores were repeatedly measured during the baseline sessions intervention and follow-up and these scores are presented in Table 2.

Table 2: Differentiation scores at baseline, intervention and follow-up states for the four participants

	Baseline			***Intervention***					***Follow-up***		
Participant	***Session 1***	***Session 2***	***Session 3***	***Session 1***	***Session 2***	***Session 3***	***Session 4***	***Session 5***	***Session 6***	***Follow-up***	***Follow-up***	***Follow-up***
1	81	82	82	76	69	63	67	63	69	62	59	57
2	79	79	77	71	61	64	50	43	39	41	38	38
3	68	66	68	60	58	51	47	39	33	38	36	35
4	74	74	75	63	60	60	48	44	39	38	34	36

The graph pertaining to the baseline, intervention, and follow-up states is presented below.

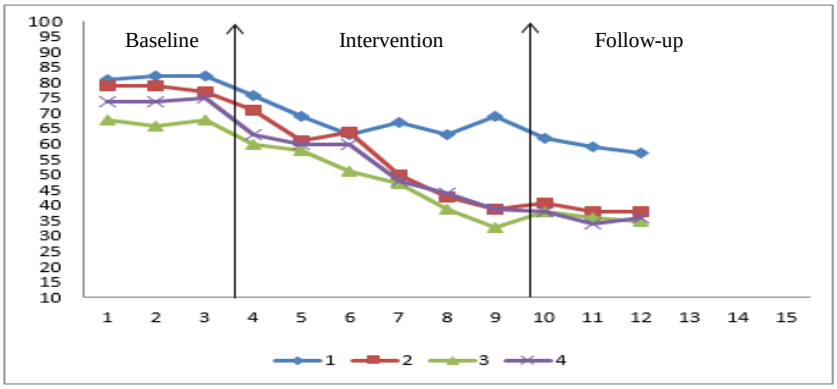

Figure 1: Impulsivity scores in baseline, intervention, and follow-up states for four participants

For visual analysis of data charts, the chart specific to each participant was first drawn. Then, the median line was drawn parallel with the x-axis using the median of baseline and intervention data. Next, a stability envelope was covered on the median line. Stability envelope refers to a state in which two parallel lines, one below and one above the median line should be drawn. The distance and range between the two lines show the drop-out or variability of the data series. According to the 20-80% standard, the data are believed to hold stability (Farahani et al., 2011). Then, split-middle method was used to evaluate the data trend and the stability envelope of the trending line was drawn on the basis of 20-80% standard.

After drawing the median line and the trending line and their stability envelopes, indexes of descriptive statistics such as mean, indexes of within-condition and between-condition visual analysis such as level change, trending, and percentage of non-overlapping data (representing percentage of non-overlapping of baseline and intervention lines) were calculated. The experimental control in single-subject research depends on level change from one position to another one and percentage of non-overlapping data. This means that slight changes in the values of the dependent variable during the intervention lying in the baseline after the path of variable data hold lower experimental control than the slight changes in the intervention in which there is stability in the path of baseline data. Moreover, as the percentage of non-overlapping data between two adjacent positions is higher (or lower percentage of overlapping data), it is possible to regard the intervention effective with higher certainty (Farahani et al., 2011). Table 3 shows the results of within- and between-condition visual analysis of participant No. 1 as per the visual analysis form (Farahani et al., 2011).

Table 3: The variables of within- and between-condition visual analysis for participant No. 1

Within-condition			***Between-condition***	
Sequence of situations	A	B	Comparison of situations	B/A
Length of situations	3	6	Trend changes	
Level			Direction change	Descending to ascending
Median	82	68	Goal-dependent effect	Negative
Mean	81.6	67.8	Stability change	Stability to instability
Range	81-82	63-76	Level change	
Variation range of stability envelope 20% from the median of each situation	Stable	Stable	Relative change	63 to 82
Level change			Absolute change	76 to 82
Relative change	81-82	63-69	Median change	68 to 82
Absolute change	81-82	69-76	Mean change	67.8 to 81.6
Trending			Data coverage	
Direction	Ascending	Descending	PND	100%
Stability	Stable	Stable	POD	0%
Multiple paths	No	No		

Based on visual analysis of the data pertaining to participant No. 1, the median line and stability envelope were obtained as follows.

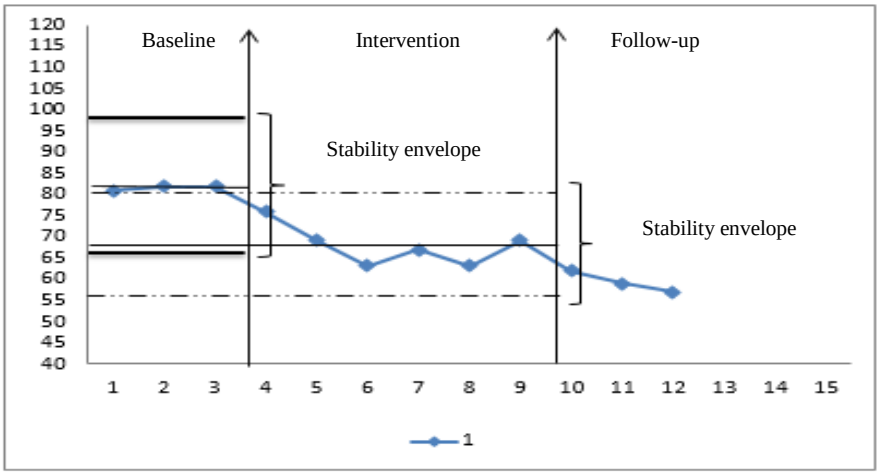

Figure 2: Median line and stability envelope for participant No. 1 in the baseline and intervention situations

Median line and stability envelope for participant No. 1 in the follow-up situation has been presented as follows.

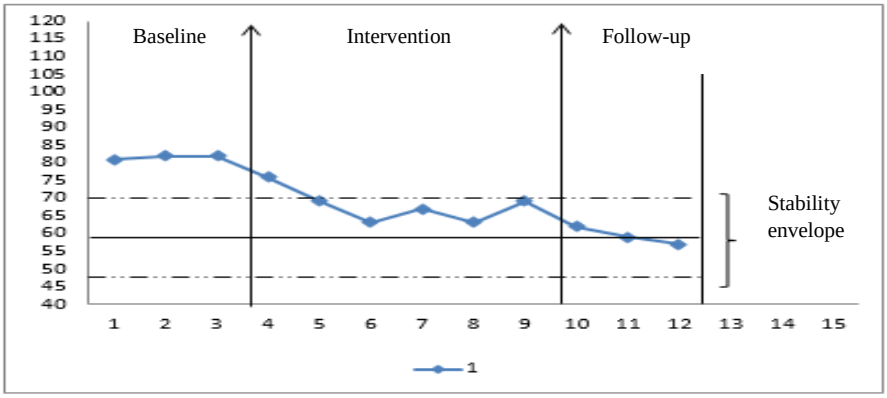

Figure 3: Median line and stability envelope for participant No. 1 in follow-up situation

The within- and between-condition visual analysis for participant No. 2 is presented in the following table.

Table 4: The variables of within- and between-condition visual analysis for participant No. 2

Within-condition			***Between-condition***	
Sequence of situations	A	B	Comparison of situations	B/A
Length of situations	3	6	Trend changes	
Level			Direction change	Descending to ascending
Median	79	55.5	Goal-dependent effect	Negative
Mean	78.3	54.6	Stability change	Stability to stability
Range	77-79	39-71	Level change	
Variation range of stability envelope				
20% from the median of each situation	Stable	Unstable	Relative change	43 to 79
Level change			Absolute change	71 to 77
Relative change	77-79	43-66	Median change	55.5 to 79
Absolute change	77-79	39-71	Mean change	54.6 to 78.3
Trending			Data coverage	
Direction	Ascending	Descending	PND	100%
Stability	Stable	Stable	POD	0%
Multiple paths	No	No		

Median line and stability envelope for participant No. 2 in the follow-up situation has been presented as follows.

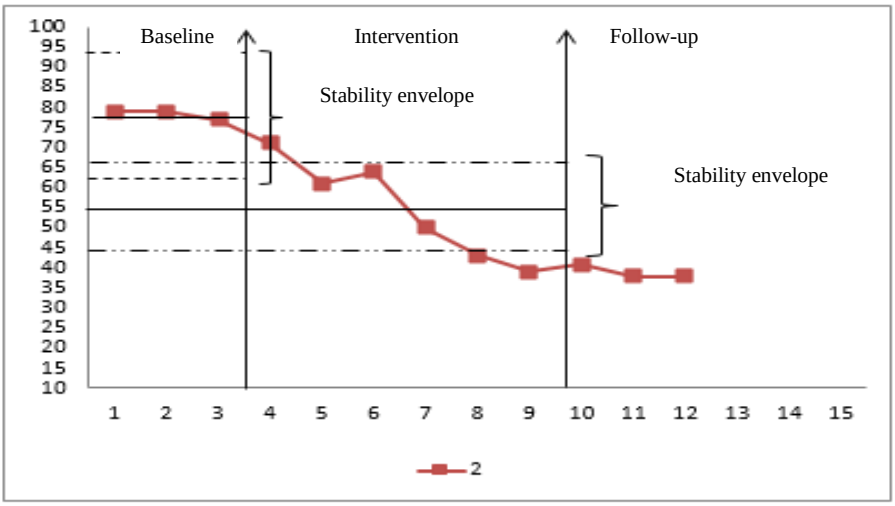

Figure 4: Median line and stability envelope for participant No. 2 in the baseline and intervention situations

Median line and stability envelope for participant No. 2 in the baseline and intervention situations has been presented as follows.

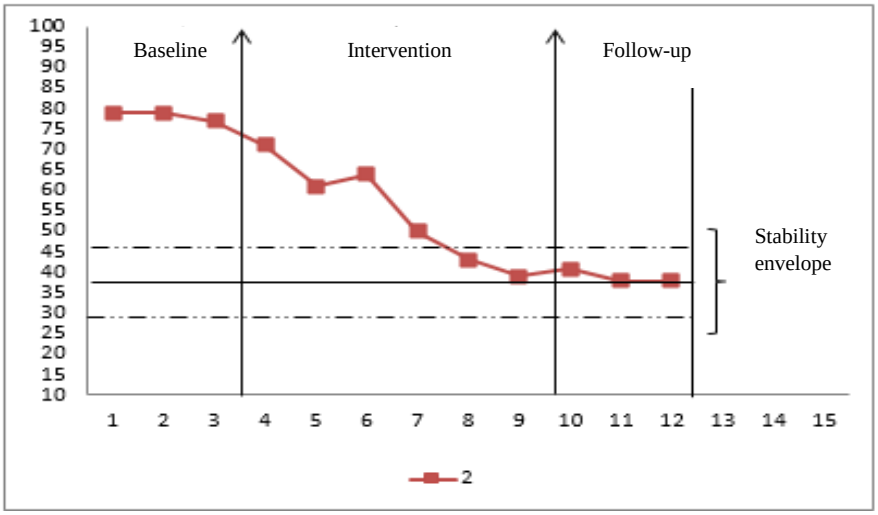

Figure 5: Median line and stability envelope for participant No. 2 in follow-up situation

The within- and between-condition visual analysis for participant No. 3 is presented in the following table.

Table 5: The variables of within- and between-condition visual analysis for participant No. 3

Within-condition			***Between-condition***	
Sequence of situations	A	B	Comparison of situations	B/A
Length of situations	3	6	Trend changes	
Level			Direction change	Descending to zero slope
Median	68	49	Goal-dependent effect	Negative
Mean	67.3	48	Stability change	Stability to stability
Range	66-68	33-60	Level change	
Variation range of stability envelope 20% from the median of each situation	Stable	Stable	Relative change	39 to 68
Level change			Absolute change	60 to 68
Relative change	66-68	39-58	Median change	49 to 68
Absolute change	68-68	33-60	Mean change	48 to 67.3
Trending			Data coverage	
Direction	Zero	Descending	PND	100%
Stability	Stable	Stable	POD	0%
Multiple paths	No	No		

Median line and stability envelope for participant No. 3 in the baseline and intervention situations has been presented as follows.

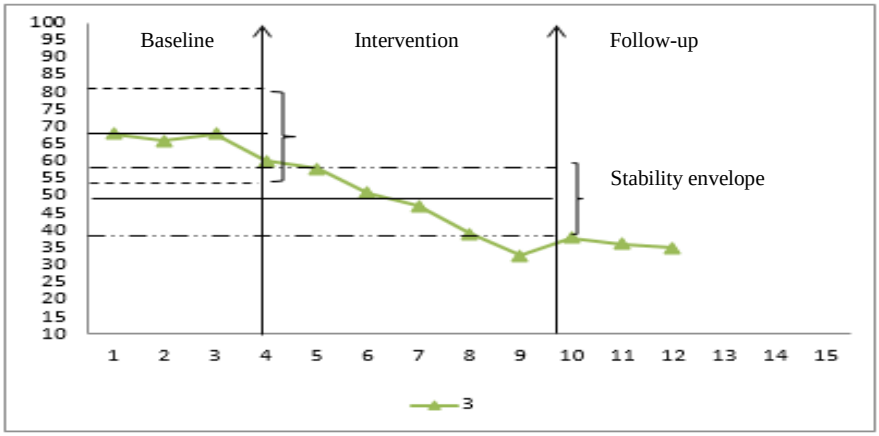

Figure 6: Median line and stability envelope for participant No. 3 in the baseline and intervention situations

Median line and stability envelope for participant No. 3 in the follow-up situation has been presented as follows.

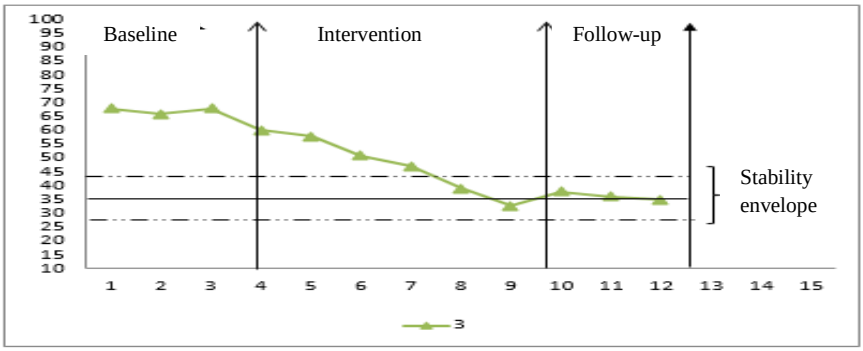

Figure 7: Median line and stability envelope for participant No. 3 in follow-up situation

The within- and between-condition visual analysis for participant No. 4 is presented in the following table.

Table 6: The variables of within- and between-condition visual analysis for participant No. 4

Within-condition			***Between-condition***	
Sequence of situations	A	B	Comparison of situations	B/A
Length of situations	3	6	Trend changes	
Level			Direction change	Descending to ascending
Median	74	54	Goal-dependent effect	Negative
Mean	74.6	52.3	Stability change	Stability to stability
Range	74-75	39-63	Level change	
Variation range of stability envelope 20% from the median of each situation	Stable	Stable	Relative change	44 to 75
Level change			Absolute change	63 to 75
Relative change	74-75	46-60	Median change	54 to 75
Absolute change	74-75	39-63	Mean change	52.3 to 74.6
Trending			Data coverage	
Direction	Ascending	Descending	PND	100%
Stability	Stable	Stable	POD	0%
Multiple paths	No	No		

Median line and stability envelope for participant No. 4 in the baseline and intervention situations has been presented as follows.

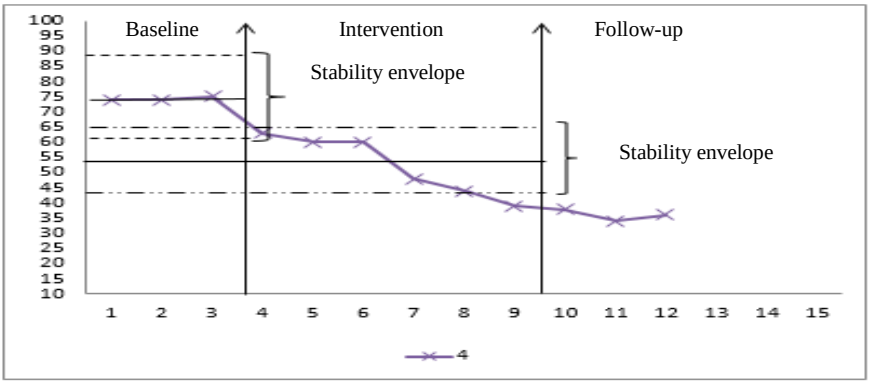

Figure 8: Median line and stability envelope for participant No. 4 in the baseline and intervention situations

Median line and stability envelope for participant No. 4 in the follow-up situation has been presented as follows.

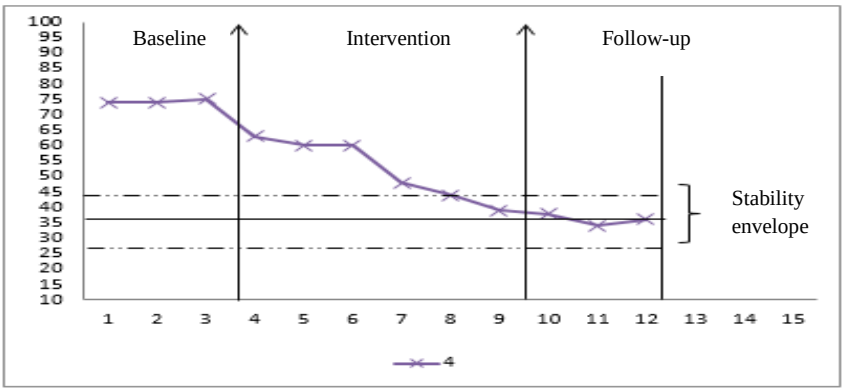

Figure 9: Median line and stability envelope for participant No. 4 in follow-up situation

Discussion and Conclusion

This study examined the impact of dialectical behavior therapy on reducing impulsivity in women with comorbidity of borderline personality disorder and substance abuse. The obtained results pertaining to all the four participants showed a descending trend both after the intervention and in the follow-up stage in terms of the research goals. The first participant showed a stable and an ascending trend within three points of the baseline. With the initiation of the training, some change was made in the level and trend of the scores (as per level

change and trending change indexes) and the score trending changed from an ascending order to a descending one. This was indicative of the effectiveness of the training. Reduction in baseline scores from 81.6 to 67.8 reflects an improvement in the performance of the subjects. In addition, PND index shows that the intervention was effective with 100% confidence. In terms of participant No. 2, some changes have occurred to the scores after the start of the intervention and mean scores in the baseline has reached 54.6 from 78.3. The percentage of overlapping data was zero. This means that the NPD index of the treatment has been effective with 100% confidence. For participant No. 3, there was also a stable trend in the baseline. Here, the level of scores has changed with the continuity of the intervention. The mean score has changed from 67.3 in the baseline to 48 in the intervention situation which is an acceptable change. Moreover, it can be claimed that the intervention has been effective according to the PND index with 100% confidence. For participant No. 4, the baseline scores indicate that some change has occurred to the scores after the start of the intervention. Generally, the mean score has shifted from 74.6 in the baseline situation to 52.3 in the intervention situation. The percentage of overlapping data was also zero. This means that PND index has been effective with 100% confidence. The findings of the current study suggest that dialectical behavior therapy reduces impulsivity in patients with comorbidity of borderline personality disorders and substance abuse. This finding is consistent with that of the study done by Fleischhaker, at al. (2011), Perepletchikova, at al. (2011), and Saffarinia, Nikoogoftar & Damavandian (2004). These researchers showed that dialectical behavior therapy is effective in reducing self-harm and dialectical behaviors of people with borderline personality disorder. Moreover, these results are in line with the findings of the study undertaken by Littlefield, et al. (2009) in that dialectical behavior therapy is effective in reducing self-harm behaviors and impulsivity in drug abusers. Suymoto (1998, cited in Saffarinia, et al. 2004) believed that one should know why a particular behavior is oozed by one person in a specific time under a certain outcome if s/he wants to perceive the origins of self-harm behavior. This refers to the functional role of self-harm behaviors whose important aspect is the interpersonal functioning that can act as automatic negative reinforcement and automatic positive reinforcement (Lloyd-Richardson, et al., 2007; cited in Saffarinia et al., 2004). They believe that self-harm behaviors may act in the form of automatic negative reinforcement with the aim of halting or removing adverse emotional and cognitive states (freedom from failure, reduction of emotional pain, anger expression towards others, and stress reduction) and/or automatic positive reinforcement, which refers to the use of self-harm behavior to create some internal modes. The social functions of self-harm behaviors are regulated by one's external environment. Social positive reinforcement refers to the point that the use of self-harm behaviors is to attract attention and/or to access some specific social resources. Similarly, automatic negative reinforcement refers to the use of self-harm behaviors media to escape

from some personal duties or tasks. School avoidance, isolation, and hatred towards parents' conflicts represent the performance of social automatic negative reinforcement of self-harm behavior (Lloyd-Richardson, et al., 2007; cited in Saffarinia et al., 2004).

According to the results of this study, one can assert that dialectical behavior therapy skills such as mindfulness skills and emotion regulation reduce self-harm behaviors and impulsivity among the women with the comorbidity of substance abuse and borderline personality disorders. As a result, the teaching of these skills can help to take a step towards reducing these behaviors and substance abuse since research has shown that there is a bi-directional relationship between substance abuse and impulsivity (Fillmore & Weafer, 2013; King, Patock-Peckham, Dager, Thimm & Gates, 2014). These studies have shown that certain personality traits such as impulsivity affect the decrease of drug use and risky behaviors among substance abusers and people with borderline personality. Therefore, the treatment process of these patients can be improved.

Reference

Anestis, M. D., Selby, E. A., & Joiner, T. E. (2007). The role of urgency in maladaptive behaviors. *Behaviour Research and Therapy, 45*(12), 3018-3029.

Barratt, E., Stanford, M.S., Kent, T. A., & Felthous, A. (1997). Neuropsychological and cognitive psychophysiological substrates of impulsive aggression, *Society of Biological Psychiatry, 41*, 1045-1061.

Bickel, W. K., Jarmolowicz, D. P., Mueller, E. T., Gatchalian, K. M., & McClure, S. M. (2012). Are executive function and impulsivity antipodes? A conceptual reconstruction with special reference to addiction. *Psychopharmacology*, *221*(3), 361-387.

Blonigen, D. M., Timko, C., & Moos, R. H. (2013). Alcoholics anonymous and reduced impulsivity: A novel mechanism of change. *Substance Abuse*, 34, 4–12.

Blonigen, D.M., Timko, C., Moos, B. S., & Moo, R.H. (2009). http://refhub.elsevier.com/S0306-4603 (14)00374-8/rf0015 Anonymous, and 16-year changes in impulsivity and legal problems among me and women with alcohol use disorders. *Journal of Studies on Alcohol and Drugs*, 32, 701-712.

Brown, M. Z., Comtois, K.A., & Linehan, M. M. (2002).Reasons for suicide attempts and non-suicidal self-injury in women with borderline personality disorder. *Journal of Abnormal Psychology*, 111(1), 198–202.

Butler, G. K. L., Montgomery, A.M.J. (2004). Impulsivity, risk taking and recreational 'ecstasy' (MDMA) use. *Drug and Alcohol Dependence*, 76, 55–62.

Coskunpinar, A., Dir, A. L., & Cyders, M. A. (2013). Multidimensionality in impulsivity and alcohol Use: A meta-analysis using the UPPS of impulsivity. *Alcoholism: Clinical and Experimental Research, 37(9),* 1441-1450.

Crews, F. T., & Boettiger, C. A. (2009). Impulsivity, frontal lobes and risk for addiction. *Pharmacology, Biochemistry, and Behavior*, *93*(3), 37-247.

Dawe, S., & Loxton, N.J. (2004). The role of impulsivity in the development of substance use and eating disorders. *Neuroscience and Biobehavioral Reviews* 28, 343–351.

De Wit, H. (2009). Impulsivity as a determinant and consequence of drug use: A review of underlying processes. *Addiction Biology, 14*(1), 22-31.

Dick, D. M., Smith, G., Olausson, P., Mitchell, S. H., Leeman, R. F., O'Malley, S. S., & Sher, K. (2010). Understanding the construct of impulsivity and its relationship to alcohol use disorders. *Addiction Biology*, *15*(2), 217-226.

Farahani, H., Abedi, A., Aghamohammadi, S. & Kazemi, Z. (2011). *Methodology of single case designs in behavioral science and medicine (practical approach)*. Tehran: Danzheh Publication.

Fillmore, M.T., &Weafer, J. (2013*). Behavioral inhibition and addition*. In J. MacKillop, & H. DeWit (Eds.), The Wiley-Blackwell handbook of addiction psychopharmacology (pp. 135–164). United Kingdom: Wiley, Blackwell.

Fleischhaker, C. H., Bohme, R., Sixt, B., Bruck, C. H., Schneider, C., Schulz, E. (2011). Dialectical Behavioral Therapy for adolescents (DBT-A): a clinical Trial for Patients with suicidal and self-injurious Behavior and Borderline Symptoms with aone-year Follow-up .*Child and Adolescent Psychiatry and Mental Health, 5,3*. http://www.capmh.com/content/5/1/3

Heinz, A. J., Bui, L., Thomas, K. M., & Blonigen, D. M. (2015). Distinct Facets of Impulsivity Exhibit Differential Associations with Sub- stance Use Disorder Treatment Processes: A Cross-Sectional and Prospective Investigation among Military Veterans. *Journal of Substance Abuse Treatment*, 22,1-37.

Javid, M., Muhammadi, N. & Rahimi, Ch. (2012). Psychometric properties of the Persian version of Barratt Impulsiveness Scale (eleventh edition). *Psychological Methods and Models*, 2 (8), 23-34.

King, K. M., Fleming, C. P., Monahan, K., & Catalano, R. (2011). Changes in self-control and attention problems during middle school predict alcohol and marijuana use during high school. *Psychology of Addictive Behaviors*, 25, 69–79.

King, K.M., Patock-Peckham, J.A., Dager, A.D., Thimm, K., & Gates, J.R. (2014). On the mismeasurement of impulsivity: Trait, behavioral, and neural models in alcohol research among adolescents and young adults. *Current Addiction Reports*, 1, 19–32.

Kleindienst, N., Bohus, M., Ludäscher, P., Limberger, M. F., Kuenkele ,K., Ebner-Priemer, U. W. ,Schmahl, C. (2008). Motives for non-suicidal self-injury among women with borderline personality disorder. *Journal of Nervous and Mental Disease*, 196(3), 230–236.

Littlefield, A. K., Stevens, A. K., Cunningham, S., Jones, R. E., King , K. M., Littlefield, A. K., Sher, K. J., &Wood, P.K .(2009). Is "maturing out" of problematic alcohol involvement related to personality change? *Journal of Abnormal Psychology*, 62,118-360.

Loree, A. M., Lundahl, L. H., & Ledgerwood, D. M. (2014). Impulsivity as a predictor of treatment outcome in substance use disorders: Review and synthesis. *Drug and Alcohol Review*, 35, 21-29.

Lynam, D. R., & Miller, J. D. (2004). Personality pathways to impulsive behavior and their relations to deviance: Results from three samples. *Journal of Quantitative Criminology, 20(4),* 319-341.

Moeller, G. F., Dougherty, D. M., 2002. Impulsivity and substance abuse: what is the connection? *Addictive Disorders and Their Treatment*, 1, 3–10.

Naderi, F. & Haghshenas, F. (2009). *Validation of Barratt Impulsiveness Scale and the relationship of impulsivity and loneliness with the use of mobile phones in Ahvaz University Students*, MA thesis, General Psychology, Islamic Azad University of Ahvaz.

Perepletchikova, F., Axelrod, S. R., Kaufman, J., Rounsaville, B. J., Douglas- Palumberi, H., Miller, A, L. (2011). Adapting Dialectical Behaviour Therapy for Children: Towards a New Research Agenda for Paediatric Suicidal and Non- Suicidal Self-Injurious Behaviours. *Child Adolesc Ment Health***.** 16(2), 116–121

Saffarinia, M., Nikoogoftar, M. & Damavandian, A. (2004). The effectiveness of dialectical behavior therapy in reducing self-harm behaviors in delinquent teenagers resident in the correctional center of Tehran. *Journal of Clinical Psychology*, 4 (15), 141-158.

Stevens, L., Verdejo-García, A., Goudriaan, A. E., Roeyers, H., Dom, G., & Vanderplasschen, W. (2014). Impulsivity as a vulnerability factor for poor addiction treatment outcomes: A review of neurocognitive findings among individuals with substance use disorders. *Journal of Substance Abuse Treatment*, *47(1)*, 58-72.

Streeter, C. C., Terhune, D. B., Whitfield, T. H., Gruber, S., Sarid-Segal, O., Silveri, M. M., & Yurgelun-Todd, D. A. (2008). Performance on the Stroop predicts treatment compliance in cocaine-dependent individuals. *Neuro psychopharmacology, 33(4)*, 827-836.

Timko, C., Finney, J. W., Moos, B. S., & Moos, R.H. (2011). Alcoholics Anonymous attendance, decreases in impulsivity and drinking and psycho social out- comesover16 years: Moderated-mediation from a developmental perspective. Addiction, 106, 2167–2177.

Verdejo-García, A., Bechara, A., Recknor, E. C., & Pérez-García, M. (2007). Negative emotion- driven impulsivity predicts substance dependence problems. *Drug and Alcohol Dependence*, *91*(2-3), 213-219.