The effectiveness of dialectical behavior therapy on adherence to treatment and self-caring behavior in patients with coronary heart disease

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Original Article

Abstract

BACKGROUND: The aim of this study was to investigate the effectiveness of dialectical behavior therapy (DBT) on adherence to treatment and self-caring behavior in patients with coronary heart disease (CHD).

METHODS: This was an experimental study based on control and experimental groups with pre-test and post-test. 32 male and female patients with CHD having at least high school diploma, referring to Isfahan cardiovascular research institute, Isfahan, Iran, were selected and placed randomly in two groups of control and experimental. Pre-test stage was done for both two groups by 8-item Morisky Medication Adherence Scale (MMAS-8) and Self-Care of Coronary Heart Disease Inventory (SC-CHDI). The experimental group was placed under the intervention of DBT for 8 sessions of 2 hours (once a week). Afterwards, the post-test was done for both groups.

RESULTS: It was shown by analyzing results from t-test that adherence to treatment and self-care behavior significantly increased in experimental group comparing to control group [(1.81 ± 0.75 vs. 5.19 ± 1.22, P < 0.001) and (72.50 ± 4.38 vs. 55.50 ± 7.42, P < 0.001), respectively]. Also results showed that self-caring and adherence to treatment significantly increased after being adjusted for baseline measurement (P < 0.001). The findings showed that DBT had effect on adherence to treatment and self-caring behavior of patients with CHD.

CONCLUSION: On the basis of results, it could be said that DBT intervention can have positive impact on adherence to treatment and self-caring behavior of patients with CHD.

Keywords: Coronary Disease, Dialectical Behavior Therapy, Treatment Adherence, Self-Care

Introduction

Today, cardiovascular diseases (CVDs) are the most common causes of death in most countries of the world such as Iran and are the most important causes of disability. Despite quick diagnostic and treatment progresses, one third of patients who suffer from a heart attack are still dying; also, two thirds of those who survive will never fully recover and return to normal life.[1]

Cardiovascular specialists have linked well-known physical factors such as high blood pressure, high level of bad cholesterol, diabetes, lack of physical activities, obesity, and heredity to vascular disease. However, evidence suggests that these factors predict a maximum of 50% of the disease and the above-mentioned physical factors cannot singly explain the incidence and persistence of coronary heart disease (CHD). Health psychologists have been attracted to the key role of non-biological factors in CHD by new medical-behavioral progresses and it has been a while that researches about this disease have been directed to psychological and mental-social factors.[2] One of the most important factors that can have a significant impact on mental illness is "adherence to treatment".

Studies have shown that at least 50% of patients do not follow their therapeutic recommendations and this leads to their re-hospitalization.[3]

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It has been especially considered to review effective factors on adherence to treatment in these patients due to the high prevalence of CHD.[4] According to this, 30%-70% of all patients do not completely follow treatment advises. Adherence is a multiple concept which consists of all behaviors conformed to recommendations of health experts and indicates the extent to which the patient responds to the acts or treatments which were advised by physician.[5]

Nowadays, CHD has become a social problem in Iran; therefore, self-care behaviors are important for people with chronic illnesses. And patients can affect their comfort, functional abilities, and disease progress by gaining self-care skills.[6] The key principle in self-care is participating in and accepting responsibility by patients who can control many complications of the disease by proper managing of self-care behaviors.[7]

Effective self-care is an important factor in promoting positive health outcomes and preventing repetitive hospitalization of patients with CHD.[8] It causes re-hospitalization and making patients worse the self-care non-observance; therefore, it has been more focused on accepting treatment and self-care during last year.[9]

According to the relationship between life quality and mental health and also high spread of psychological issues in patients with CHD, it seems urgent to effectively involve improving mental health conditions and life quality of patients. In this research, dialectical behavior therapy (DBT) is used to adhere to treatment and self-care and consequently reduce CHD. By considering the role of non-adherence to treatment and self-care behaviors in arising and sustaining heart disease, therapies which emphasize to improve conflicts and emotions for removing conflicts and gaining social supports could play an important role in treatment and prevention of recurrence of heart disease. One of the inventions in psychological treatments is DBT, which emphasizes on both gaining skills and adjusting emotions.

DBT is a cognitive-behavioral approach, which emphasizes on the psychosocial-social aspects of treatment. This approach mixed interventions related to cognitive-behavioral treatments which are based on principle of change with oriental philosophy of mind tests and techniques based on principle of acceptance; accordingly it suggests four interventional components in its treatment method: fundamental consciousness and distress tolerance as components of acceptance and emotional adjustment and interpersonal efficiency as change components.[10]

This method trains patient the required skills to deal with unsafe behaviors and change them.[11]

The main issue of this study comes from this point that in spite of beneficial effects of DBT that is a special type of cognitive-behavioral psychological treatment, the lack of such studies is so obvious in chronic diseases such as CHD by reviewing conducted researches in Iran. It is clear that DBT is an effective treatment in this field. Therefore, in this research, the main issue is to review effectiveness of DBT on adherence to treatment and self-care behavior of patients with CHD. According to what mentioned before, the question is whether DBT can affect the adherence to treatment and self-care behavior of patients with CHD?

Materials and Methods

This experimental study with control group was conducted in late 2017 on patients with CHD who referred to Isfahan Cardiovascular Research Center, Isfahan, Iran. The criteria for entry included the education level of at least high school diploma, age over 20 years, and the failure to receive any other educational program before and during the conduct of DBT; and the criteria for exclusion were: severe psychiatric illness simultaneously with CHD and other chronic diseases including diabetes. The sample size was selected based on the quasi-experimental researches, which is considered to be at least 15 in each quasi-experimental study.[12] So, after coordinating with the management and authorities of the Isfahan Cardiovascular Institute, 800 files of patients that referred to this center were submitted and evaluated, and by preliminary examination of the cases, about 80 people were eligible to participate in the research based on the criteria for inclusion and exclusion. Among them, 40 patients with CHD were selected through available sampling method and then randomly divided into two experimental and control groups (each included 20 people). Since some of the patients lived far from the hospital, number of participants in all groups was reduced to 16.

In the pre-test phase, for the two groups, the 8-item Morisky Medication Adherence Scale (MMAS-8)[13] and the Self-Care of Coronary Heart Disease Inventory (SC-CHDI)[14] were used. Then, DBT interventions (a brief description of DBT intervention in table 1) were performed for the experimental group for 8 sessions (2 months of a 2-hour session a week). In the post-test, again, the mentioned questionnaires were performed for both experimental and control groups and the data were analyzed.

Table 1. A brief description of dialectical behavior therapy (DBT) intervention sessions based on Marsha Linehan instructions[15-17]

Sessions	Brief description
Session 1 (mindfulness 1)	Familiarity with the concept of mindfulness and three mental states (reasonable mind, emotional mind, and wise mind)
Session 2 (mindfulness 2)	Teaching two types of skills to attain mindfulness; "What" skills (including viewing, description, and participation) and "How" skills (including non-judgmental stance, inclusive self-consciousness)
Session 3 (distress tolerance 1)	Learning distraction strategies with ACCEPTS skills (activities, contributing, comparisons, emotions, pushing away, thoughts, and sensation)
Session 4 (distress tolerance 2)	Learning self-soothing with five senses
Session 5 (emotion regulation 1)	Teaching a pattern of identifying emotions and tagging them, which leads to increased emotional control
Session 6 (emotion regulation 2)	Teaching positive emotional experiences by creating short-term positive emotional experiences
Session 7 (interpersonal effectiveness 1)	Opportunities for interpersonal effectiveness (the proportionality between your demands and the demands of others; the proportion of demands and musts)
Session 8 (interpersonal effectiveness 2)	The goals of interpersonal effectiveness (obtaining goals in a situation and confronting with resistance and conflict)

MMAS-8 was used to measure patient adherence to the drug regimen. The scale consists of eight questions, first seven items having a dichotomous answer (yes/no) that indicates adherent or non-adherent behavior. For item 8, a patient can choose an answer on a 5-point Likert scale, expressing how often happens that a patient does not take his medications. MMAS-8 scores can range from 0 to 8 points.[13] The scores of all the items in the questionnaire are added together to calculate the total score of the questionnaire. The overall score ranges from zero to eight. For a score of more than two, poorer drug adherence, score one and two, moderate adherence, and zero score, high adherence is considered.

Regarding validity and reliability of this questionnaire (MMAS-8), in the research of Kooshyar et al., the formal and content validity of the tool was confirmed by specialists, and also its internal reliability was reported by Cronbach's alpha of 0.68.[14]

SC-CHDI for CHD was developed by Vaughan et al.[18] The questionnaire consisted of 22 items and 3 sub-scales (self-care maintenance, management, and confidence). Self-care maintenance scale items were ranked on four grades from 1 (never) to 4 (always), self-care management scale items, on the grading of 5 from zero (never) to 4 (very sure/always), and items of self-confidence scale were ranked on four grades of 1 (not sure) to 4 (very sure). To compute the total score of the questionnaire, the scores of all the items were summed up. The questionnaire score was between 16 and 88, which means that the higher score obtained from the questionnaire indicates a more favorable level of self-care behavior, and vice versa.

Content validity of the SC-CHDI was verified by several cardiologists, neurologists, and clinical psychologists as well as their applied comments and suggestions. To examine the face validity of the questionnaire, a pilot study was carried out before sampling and a questionnaire was provided to 80 subjects with CHD who were eligible to participate in the study. The questionnaire was given to the same 80 people within 10 days to determine the reliability of the questionnaire. The correlation between the results of the two stages was 0.85. The internal consistency of the questionnaire was confirmed with Cronbach's alpha of 0.91.

To observe research ethics, DBT was also applied for the control group in 4-5 sessions after the post-test stage.

Data were analyzed using SPSS software (version 15, SPSS Inc., Chicago, IL, USA). For all analyses, statistical significance was assessed at a level of 0.05 (two-tailed). Discrete variables were presented as frequency (percentage), whereas continuous variables were expressed as mean ± standard deviation (SD).

To compare average age in experimental and control groups, we used independent t-test. Chi-square test was used for comparing sex, marital, employment, and economic status between two groups.

For comparison of means of adherence to treatment and self-care score in experimental and control groups, paired sample t-test and independent t-test were used for evaluating within and between

Table 2. Demographic data in the study groups

Demographic variables	Experimental (n = 16)	Control (n = 16)	P
Sex (male) [n (%)]	10 (62.5)	9 (56.3)	0.710[*]
Marital status (married) [n (%)]	12 (75.0)	11 (68.8)	0.690[*]
Employment status (employer) [n (%)]	12 (75.0)	11 (68.8)	0.690[*]
Economic situation (low & moderate) [n (%)]	12 (75.0)	11 (68.7)	0.700[*]
Age (year) (mean ± SD)	49.56 ± 11.52	49.06 ± 12.45	0.900[**]

[*] Obtained from chi-square test; [**] Obtained from independent samples t-test
SD: Standard deviation

groups effects, respectively. Analysis of covariance (ANCOVA) was used to compare means of dependent variables after intervention, when adjusted for the value of baseline measurement.

Results

The results of comparison of demographic variables are presented in table 2. According to the P-values reported in table, there was not a significant difference between variables in control and experimental groups.

According to table 3, there were not any significant differences between variables before intervention (P > 0.050). On the other hand, significant differences were seen after intervention in experimental group and not in control one. Results of ANCOVA test showed the significant differences between experimental and control groups after intervention (P < 0.001).

Therefore according to the results, DBT had an effect on the adherence to treatment and self-care behavior.

Discussion

By considering the results of this study, the intervention of DBT in patients with CHD in the post-test phase affected the adherence to treatment and self-care behavior of patients with CHD. Given this effect, it seems that intervention of DBT has significantly increased the utility of adhering to the treatment of CHD. Our results are in line with those of Shikany et al.,[19] Iakovleva,[20] Mosleh and Almalik,[21] Rosenzweig et al.,[22] and Merkes.[23]

It seems that the intervention of DBT has been able to lead to favorable follow-up in patients, although its main purpose is not adherence to treatment by patients. It can be concluded that the coronary heart problem in patients with this condition makes the patients feel that they have no control over their conditions. Moreover, the effect of CHD on their academic, family, occupational, and social performance made by illness, creates this feeling in the person that he/she is vulnerable and there is no longer hope to reach a relative or complete recovery. It is natural that such conditions in the patient cause distress and despair, followed by adverse treatment. By having information about DBT intervention and psychological comprehension, people identify stress and distress patterns of mental-physical therapy and search about coping with the challenges of life.

Therefore, in this intervention, patients are trained to practically learn about the tolerance and control of disturbances associated with the management of their daily life challenges and full conscious control of the excitement created by distress. And then they will appropriately behave through the training of interpersonal effectiveness skills. It seems that the intervention of DBT has led to adoption of adverse conditions by the patients with CHD and thereby has increased the amount of distress tolerance and control of excitement; consequently, they found desirable performance in terms of adherence.

Table 3. Mean and standard deviation (SD) of pre-test and post-test scores of variables

Variable	Group	Pre-test (mean ± SD)	Post-test (mean ± SD)	P[*]
Adherence to treatment	Experimental	5.19 ± 1.04	1.81 ± 0.75	< 0.001
	Control	5.00 ± 1.21	5.19 ± 1.22	0.670
		0.640	< 0.001[***]	< 0.001[**]
Self-care	Experimental	52.94 ± 7.93	72.50 ± 4.38	< 0.001
	Control	52.56 ± 8.60	55.50 ± 7.42	0.210
		0.900	< 0.001[***]	< 0.001[**]

[*]Obtained from paired sample t-test; [**]Obtained from analysis of covariance (ANCOVA) when baseline measurements were adjusted; [***]Obtained from independent t-test
SD: Standard deviation

Also, since DBT intervention is focused on mindfulness, problem solving, and coping strategies, individuals are encouraged to more comply with treatment regimens and attribute their recovery to their adhering not to environmental factors.

It seems that the patients' life style greatly and significantly benefited from adding techniques which are associated with physical activities even by mind-boggling techniques such as correct breathing (diaphragm) and body meditation. One of those benefits is more favorable and accurate adherence to their drug treatment.

In these techniques, alternating ventricular expansion and contraction and increased abdominal pressure cause blood flow increasing and better heart working as well as other internal organs. Thesetechniques causes adjustment of organic factors such as blood pressure in patients with CHD and reaching the appropriate level close to the normal one. As a result, it is necessary to significantly reduce the doze of certain medications, which largely reduces the risk and mortal-disabling effects of CHD.

It seems that based on the present study, should make people to attend and care of themselves by DBT exercises such as mind-boggling which emphasized on contemplating, being present in the moment, and not judging, as well as DBT exercises which made people be aware of themselves and respect and love themselves. It could also causes things like adherence to treatment and drug compliance.

Further, according to the pre-test of the experimental group, it seems that the intervention of DBT has increased the level of patients' self-caring. Our results are in line with those of Rosenzweig et al.,[22] Merkes,[23] Sherwood et al.,[24] and Lukkarinen and Hentinen.[25]

In explaining the above result, it could be said that more than ability to develop, implement, and maintain planned behavior, self-care also requires high flexibility; and this acceptability and flexibility certainly requires having a high acceptance. Most patients with CHD have low self-control and excitement due to their mental health problems. Adoption, through the experience of being in the moment, makes people be receiver and flexible towards the subject, instead of being silent and distant from it.

The high self-care, flexibility, and consequently awareness of different aspects of the condition of a disease helps people make a conscious decision and have a thoughtful awareness of themselves and their illness.

It seems that in this research, all of the DBT techniques have been able together to get favorable results in patients with CHD. However, it could be said that among DBT skills, mental skills such as the "wise mind" technique and the "what" and "how" techniques have been able to influence the self-care of patients; because they lead to vigilant living and self-consciousness, wise decision making, non-judgmental attitude, and efficient operation in patients. Patients in these techniques find out how they can pay attention to anything purposefully and focally (through observation, description, and participation) and how careful attention can reveal things that they have not seen in the past and can even change this experience.

It also seems that effective communication skills have also had a positive effect on patient's self-care among other DBT skills; because they help achieve goals in a situation and cope with internal and external resistances and conflicts in patients. Also they bring balance between the needs and the wants by their symmetry, followed by a rise in self-esteem and self-respect.

Through DBT skills, patients could see how their complex mental states and being controlled by their excitement can easily control them and reduce their self-care up to an undesirable level. They can also understand how they can achieve desirable self-esteem by controlling their excitements (rather than being controlled by excitements).

Following this study and taking into account the results of the analysis of collected data, DBT intervention can be used to improve mental health and address the psychological problems of patients with CHD; cardiovascular experts can help patients reduce their side effects by reducing their drug intake in collaboration with clinical psychologists. It should be noted that this research has been done in Isfahan Cardiovascular Research Center in 2017, so it is better to be cautious in generalizing its results to other similar clinics and research centers. Also the reaction of people against some DBT techniques differs not only in different communities but also between different groups of one society.

Conclusion

On the basis of results, it could be said that DBT intervention can have positive impact on adherence to treatment and self-caring behavior of patients with CHD.

Acknowledgments

Conflict of Interests

Authors have no conflict of interests.

References

1. Roger VL, Go AS, Lloyd-Jones DM, Benjamin EJ, Berry JD, Borden WB, et al. Executive summary: Heart disease and stroke statistics-2012 update: A report from the American Heart Association. Circulation 2012; 125(1): 188-97.

2. Sloan DM, Kring AM. Measuring changes in emotion during psychotherapy: Conceptual and methodological issues. Clin Psychol Sci Pract 2007; 14(4): 307-22.

3. Venner GH, Seelbinder JS. Team management of congestive heart failure across the continuum. J Cardiovasc Nurs 1996; 10(2): 71-84.

4. Barefoot JC, Brummett BH, Williams RB, Siegler IC, Helms MJ, Boyle SH, et al. Recovery expectations and long-term prognosis of patients with coronary heart disease. Arch Intern Med 2011; 171(10): 929-35.

5. Monirpour N, Bakhshi S, Raeisi Z, Sadeghian S, Nourbaha A. Relationship between disease perception, coping strategies, and social support with adherence to treatment among patients with cardiovascular diseases. Daneshvar Med 2013; 21(5): 1-10. [In Persian].

6. Toljamo M, Hentinen M. Adherence to self-care and social support. J Clin Nurs 2001; 10(5): 618-27.

7. Khodadadi A, Sayadi A, Smaeli H. Evolution of knowledge of the principles of self care in acute coronary syndrome patients admitted to Aliebn abitaleb Rafsanjan university hospital during 2009. Community Health Journal 2011; 5(1): 8-16. [In Persian].

8. Schreurs KM, Colland VT, Kuijer RG, de Ridder DT, van Elderen T. Development, content, and process evaluation of a short self-management intervention in patients with chronic diseases requiring self-care behaviours. Patient Educ Couns 2003; 51(2): 133-41.

9. Mast C. Personal and environmental factors affecting self-care behaviors of patients with heart failure [MSc Thesis]. Muncie, Indiana: Ball State University; 2008.

10. Gonzalez B, Lupon J, Herreros J, Urrutia A, Altimir S, Coll R, et al. Patient's education by nurse: What we really do achieve? Eur J Cardiovasc Nurs 2005; 4(2): 107-11.

11. Asmand P, Mami S, Valizadeh R. The effectiveness of dialectical behavior therapy and rational emotive behavior therapy in irrational believes treatment among young male prisoners who have antisocial personality disorder in Ilam Prison. Int J Health Syst Disaster Manage 2015; 3(2): 68-73.

12. Delavar A. Educational and psychological research. Tehran, Iran: Virayesh Publications; 2017. [In Persian].

13. Morisky DE, Ang A, Krousel-Wood M, Ward HJ. Predictive validity of a medication adherence measure in an outpatient setting. J Clin Hypertens (Greenwich) 2008; 10(5): 348-54.

14. Kooshyar H, Shoorvazi M, Dalir Z, Hosseini M. Health literacy and its relationship with medical adherence and health-related quality of life in diabetic community-residing elderly. J Mazandaran Univ Med Sci 2014; 23(1): 134-43. [In Persian].

15. Linehan M. Cognitive-behavioral treatment of borderline personality disorder. New York, NY: Guilford Press; 1993.

16. McKAY M, Wood JC, Brantley J. The dialectical behavior therapy skills workbook: Practical DBT exercises for Learning Mindfulness, Interpersonal Effectiveness, Emotion Regulation and Distress Tolerance. Oakland, CA: New Harbinger Publications; 2007.

17. Sheets MG. Out-of-Control: A dialectical behavior therapy (DBT)-cognitive-behavioral therapy (CBT) workbook for getting control of our emotions and emotion-driven behavior. Trans. Izadi S, Ghiyasi M. Tehran, Iran: Arjmand Publications; 2009. [In Persian].

18. Vaughan Dickson V, Lee CS, Yehle KS, Mola A, Faulkner KM, Riegel B. Psychometric testing of the self-care of coronary heart disease inventory (SC-CHDI). Res Nurs Health 2017; 40(1): 15-22.

19. Shikany JM, Safford MM, Bryan J, Newby PK, Richman JS, Durant RW, et al. Adherence to various dietary patterns and risk of recurrent coronary heart disease and mortality in the reasons for geographic and racial differences in stroke (REGARDS) Study. Circulation 2017; 135(suppl_1): A13.

20. Iakovleva MV. Adherence to treatment after coronary bypass surgery: Psychological aspects. Revista Iberoamericana de Psicologia y Salud 2016; 7(1): 9-14 [In Spainish].

21. Mosleh SM, Almalik MM. Illness perception and adherence to healthy behaviour in Jordanian coronary heart disease patients. Eur J Cardiovasc Nurs 2016; 15(4): 223-30.

22. Rosenzweig S, Greeson JM, Reibel DK, Green JS, Jasser SA, Beasley D. Mindfulness-based stress reduction for chronic pain conditions: Variation in

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treatment outcomes and role of home meditation practice. J Psychosom Res 2010; 68(1): 29-36.

23. Merkes M. Mindfulness-based stress reduction for people with chronic diseases. Aust J Prim Health 2010; 16(3): 200-10.

24. Sherwood A, Smith PJ, Hinderliter AL, Georgiades A, Blumenthal JA. Effects of exercise and stress management training on nighttime blood pressure dipping in patients with coronary heart disease: A randomized, controlled trial. Am Heart J 2017; 183: 85-90.

25. Lukkarinen H, Hentinen M. Self-care agency and factors related to this agency among patients with coronary heart disease. Int J Nurs Stud 1997; 34(4): 295-304.

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