

The Effect of Cognitive-Behavioral Therapy (CBT) on Anxiety Reduction in Critical Care Unit (CCU) Patients During Hospitalization

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Abstract: Patients admitted to Critical Care Units (CCU) face multiple stressors, and these stressors cause anxiety in patients. Anxiety increases heart function in heart patients. High levels of anxiety in cardiac patients increase in association with hospital complications. The purpose of this study was to determine the effect of Cognitive-Behavioral Therapy (CBT) on reducing the anxiety of patients in CCU during their hospitalization. The study design was quasi-experimental (pre-test and post-test). This study was performed on patients in CCU of Shahid Mostafa Khomeini hospital in 2019; for this purpose, 30 patients in CCU were randomly divided into intervention (n=15) and control (n=15) groups. Before the intervention, the demographic variables questionnaire and DASS-21 anxiety questionnaire were completed by both groups. Then, the intervention group received CBT for eight sessions according to the average number of hospital days (eight days) by the therapist (researcher). The control group did not receive any intervention. After the intervention, the demographic variables questionnaire and DASS-21 questionnaire were completed by the intervention and control groups again. Data analysis was done by SPSS-21 software and descriptive tests, ANOVA, and independent and pairwise t-test. There was no significant difference between the two groups in the mean score of anxiety before treatment, but the mean score of anxiety significantly decreased after treatment in the intervention group (9.63 ± 2.773) compared to the control group (13.23 ± 2.115 ; $p < 0.001$). CBT can reduce the level of anxiety in patients admitted to CCU, and this method can be used as a simple and low-cost complementary non-pharmacological practice in these patients.

Keywords: Cognitive-Behavioral Therapy (CBT), Anxiety, Critical Care Unit (CCU).

INTRODUCTION

Hospitalization in the intensive care unit puts great stress on the patient physically and mentally [1]. Unfamiliar environment, the impact of the disease on lifestyle and role-playing, chest pain, and fear of disease prognosis are among the causes of anxiety in the intensive care unit [2]. The stressful and anxious conditions of current societies have made cardiovascular disease one of the leading causes of premature death [3]. This disease accounts for 40% of deaths in Iran [4].

Stressful and anxious conditions in current societies have made cardiovascular diseases the leading cause of premature death [4,5]. Various factors such as illness and anxious environments can affect people's physical and mental health and cause physical and

psychological changes in people. The setting of Critical Care Units (CCUs), depending on their specific conditions and characteristics, can be considered a serious anxiety factor [6]. In cardiovascular patients, psychiatric disorders exacerbate and prolong disease, interfere with treatment, and ultimately delay recovery [7,8].

Depression and anxiety are high in CCU (critical care unit) patients. Studies show that cardiac patients who experience high anxiety levels are five times more likely to develop ischemia, re-infarction, and Ventricular Fibrillation (VF) than patients with low anxiety [9]. Anxiety plays an important role in treating coronary artery diseases (CAD) and has various physical-psychological effects [10]. Patients in the CCU face a series of physical and psychological stresses and experience a range of fears and anxieties [11,12]. Currently, sedative medications are used to reduce anxiety in CCU patients, which have side effects, delaying patients' recovery, increasing length of stay, and cost of treatment [13].

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Consultation is one of the common ways to reduce the anxiety of patients. Inpatient counseling can reduce the physical and psychological consequences of heart disease. Psychotherapy and supportive practices can positively reduce mortality, activity tolerance, and diet adherence [14-16]. One approach is cognitive-behavioral therapy (CBT), which has been proven useful in some studies [17]. This treatment is a combination of two cognitive and behavioral approaches. This helps the patients to change their negative and irrational thoughts and dysfunctional behavior and replace their positive thoughts. Regular, organized tasks are used to do this. In their study, Higgins *et al.* showed that the intervention group under the rehabilitation program experienced a better condition in terms of mental health and faster return to work [18,19].

Due to the fact that most of the studies were performed outside the hospital and on certain aspects of mental health (depression, social dysfunction), and so far no CBT has been performed in the hospital environment to reduce patient anxiety in the intensive care unit, the hypothesis examined was that cognitive-behavioral intervention has a different effect in reducing anxiety in patients with myocardial infarction before and after intervention in both groups based on demographic variables.

Most studies done so far have pointed to the role of cognitive-behavioral therapy after discharge from the hospital, while this study examines the effect of cognitive-behavioral therapy in reducing the anxiety of patients with heart diseases during hospitalization in the intensive care unit.

This study tends to reduce the anxiety of patients in the CCU during hospitalization.

MATERIALS AND METHODS

This was a quasi-experimental (pre-test and post-test) study to investigate the effect of CBT on reducing the anxiety of patients (human) in CCU hospitalized in Shahid Mostafa Khomeini hospital (Ilam) in 2019.

After receiving a written letter from the Research Assistant of Ilam University of Medical Sciences among patients admitted to the Critical Care Unit, the researcher selected the qualified participants. After introducing himself and providing them with sufficient information about the study's objectives and obtaining informed consent, and assuring confidentiality of their personal information and responses, participants were

randomly divided into intervention (n=15) and control (n=15) groups. Inclusion criteria included age group 30-70 years, time and place awareness, verbal communication ability, lack of hearing loss, and hemodynamic stability. Exclusion criteria included the absence of the patient in three sessions of cognitive-behavioral therapy-patient psychotic disorders.

This study was approved by the Ethics Committee of Ilam University of Medical Sciences (ethical code IR.MEDILAM.REC.1398.131). After obtaining written informed consent for each individual at the beginning of the study, the two groups completed the demographic checklist and DASS-21 anxiety questionnaire. DASS-21 questionnaire has 21 questions in three subscales (stress, anxiety, and depression). To measure anxiety, the subscale anxiety with 7 questions was used. The lowest score for each question was zero, and the highest score was 3 (0-3 normal, 4-5 mild, 6-7 moderate, 8-9 severe, and >9 very severe). The sum of scores varied from zero to 21. This questionnaire was first introduced by Lovibond in 1995, and its validity and reliability were confirmed. Lovibond reported a Cronbach's alpha value of 73% for anxiety in the DASS-21 test [20]. By random distribution for the intervention group, depending on the average number of hospital days (8 days), eight sessions of Cognitive-Behavioral Therapy were conducted daily by the researcher (familiar with cognitive-behavioral therapy), and the participants underwent CBT training. Before the main phase of the study, a pilot study was performed on two people under the supervision of a therapist. The content included several objectives:

- Patient awareness of anxiety symptoms and anxious issues
- Familiarity with cognitive-behavioral training logic
- Relaxation techniques
- Effective communication practices
- Stopping thoughts to deal with negative thoughts
- Helping subjects identify their negative spontaneous behaviors and thoughts.

The first sessions were for the introduction and building trust between the therapist and the patient, and the rules and goals of the work were set. During the second and third sessions, people's needs and problems were discussed, and their questions were answered. These sessions aimed to increase

information and awareness of patients with Myocardial Infarction(MI) and express their feelings and concerns. From the fourth session onwards, patients identified their negative thoughts and cognitive errors and were instructed by the therapist to identify ways to overcome negative thoughts and use them to overcome their cognitive thoughts and errors.

After the Cognitive-Behavioral Therapy sessions, the questionnaire was completed by the intervention and control groups again. Statistical data was inserted in the software and analyzed by descriptive tests, ANOVA, t-test, and pairwise t-test.

RESULTS

The mean age of participants was 55.63 ± 5.78 years, ranging from 32 to 68 years. There was no significant difference in demographic characteristics between the intervention and control groups (Table 1). The hypothesis was rejected.

In examining the effect of Cognitive-Behavioral Therapy on the anxiety of patients with Myocardial Infarction(MI), t-test results showed no difference between two groups before the treatment, while after treatment between the two groups, the mean score of anxiety after treatment significantly decreased in the intervention group (9.63 ± 2.773) compared to the control group (13.23 ± 2.115) (Table 2). The mean pre-intervention anxiety score was 13.67 and decreased to 9.73 after treatment (Table 3).

According to Table 1, a comparison of the intervention and control groups showed no statistically significant difference was found in demographic variables. The frequency and percentage of patients in the intervention and control groups are based on gender, occupation, education, insurance, income, smoking, residence, and children's number.

According to Table 2, comparing the pre- and post-intervention scores of both groups, there was a significant difference between the means of pre-

Table 1: Demographic Characteristics between the Intervention and Control Groups

Variable		Intervention group		Control group		Result
		N	%	N	%	
Gender	Male	10	60.0	9	46.7	P<0.483
	Female	5	40.0	6	53.3	
Occupation	Employed	9	52.3	8	39.9	P<0.411
	Unemployed	6	47.7	7	61.1	
Smoking	Yes	7	51.3	8	53.3	P<1.000
	No	8	48.7	7	46.7	
Residence	Urban	8	60.0	8	52.3	P<0.708
	Rural	6	40.0	7	47.7	
Education	Diploma and lower	6	40.0	8	46.7	P<0.905
	Associate's degree	5	33.3	4	26.7	
	Bachelor's degree	4	26.7	3	26.7	
Income	<200000 T	7	51.3	8	60.0	P<0.803
	200000-4000000 T	6	33.2	5	32.3	
	>4000000 T	1	13.3	2	7.7	
Children	<2	2	13.3	3	20.0	P<0.808
	2-4	5	33.3	4	26.7	
	>4	8	53.3	8	53.3	
Insurance	Social security	5	26.7	2	20.0	P<0.620
	Medical services	5	32.3	3	20.0	
	Rural	3	27.7	7	46.7	
	Armed Forces	2	13.3	3	13.3	

Table 2: Pre- and Post-Intervention Scores in Two Groups in Terms of Anxiety

T	P	Intervention group		Control group		DASS-21 subscales	
		SD	M	SD	M		
-0.831	0.356	4.174	13.23	2.687	14.53	Before	Anxiety symptoms
-4.512	<0.001	2.701	9.73	2.115	13.41	After	
4.698	<0.001	2.251	3.85	0.853	0.87	Before	Anxiety difference

Table 3: Intervention Group in Terms of Anxiety in Pairs

T	P	SD	M		
6.479	<0.001	4.186	13.23	Before	Anxiety
		2.789	9.73	After	

intervention and post-intervention scores in the intervention group ($p < 0.001$), indicating the effectiveness of treatment in the intervention group. However, this difference in the mean of pre-intervention and post-intervention scores of the control group, which did not actually receive any intervention, was not observed. In other words, the difference in mean of the scores of the two groups was related to the effect of interventions.

Table 3 shows a significant difference in the sum of means of the scores in the intervention group in terms of anxiety in pairs, indicating the effect of CBT on the intervention group.

Table 1 shows the frequency and percentage of intervention and control patients by gender, occupation, education, insurance, income, smoking, residence, and the number of children.

According to Table 2, comparison of pre- and post-intervention scores of two groups showed no significant difference between means of pre- and post-intervention scores of the intervention group ($P < 0.001$), indicating the effectiveness of CBT in the intervention group, while this difference was not found in means of pre-intervention and post-intervention scores of the control group, which in fact received no intervention. In other words, the difference in means of scores of the two groups was related to the effect of interventions.

Table 3 shows pairwise comparison (mean \pm standard deviation) of pre- and post-intervention scores in terms of anxiety (overall, there is a significant difference in mean of scores of the

intervention group in terms of anxiety), indicating the effect of CBT on the intervention group.

DISCUSSION

The present study showed that a significant proportion of patients in the intervention and control groups had anxiety before the CBT. However, this proportion decreased in the intervention group after the psychological intervention while the decrease in the control group was not significant; the results indicated a significant effect of interventions on reducing anxiety in the hospitalized patients after the intervention. In the control group, without intervention, the anxiety level increased, which may be due to reaction to the disease.

Cognitive-behavioral therapy has the highest effect on anxiety. However, other studies have highlighted the role of factors such as age, gender, occupation, etc., in the development of anxiety in cardiac patients [9]. Still, there was no significant difference in the present study (Hypothesis was rejected). In the present study, the frequency of pre-intervention severe anxiety was 48%, which was higher compared to other studies. After the intervention, this significantly decreased, which is consistent with Sabri [21]. The present study had the highest effect on anxiety initially. In his study, Ranjbar reported that the effect of cognitive-behavioral therapy was effective on the depression of patients referring to a consulting clinic during eight sessions; cognitive behavioral therapy leads to the belief in clients that they can counteract and modify negative thoughts [22]. Through a clinical trial on patients with myocardial

infarction, Sebrechts *et al.* reported that patient education in follow-up programs had been shown to reduce fatigue symptoms and improve mental health in the intervention group, which is consistent with the present study [23].

Another study that found that CBT had a positive effect in improving the mental health of patients is Borji *et al.*, who reported that CBT improved the mental health of caregivers [24]. Dorsey *et al.* also reported a reduction in PTSD in children [25]. Garland *et al.* also reported that insomnia improved in patients with cancer, which is consistent with this study regarding the positive effect of CBT on patients' health [26]. Atlantis *et al.* [27] reported that psychological interventions performed over 24 weeks would improve the long-term mental health of myocardial infarction patients, while in the present study, cognitive-behavioral therapy was performed for eight weeks (because patients were not willing to participate in the long-term treatment plan), its therapeutic effects will certainly be short-term. In their study, the treatment outcome would be long-term, which is not consistent with the present study. In a clinical trial study of patients with myocardial infarction, Sebrechts *et al.* reported that educating patients in follow-up programs reduced fatigue symptoms and improved the mental health of the intervention group, which is consistent with the results of the present study [23].

In the present study, there was a positive correlation between the possibility of depression and severity of symptoms with the presence and severity of anxiety symptoms. In this case, the more severe the degree of depression, the greater the anxiety. This finding was confirmed by Kawachi *et al.* [28]. After discharge from the hospital, patients gradually forget the trained treatment recommendations, so it is necessary to follow up on this training at home. According to the findings, mental health showed a significant increase in most areas. Izawa *et al.* also found that implementing a cardiac rehabilitation program for three to 12 months could cause a statistically significant difference in the social dimension of mental health of the intervention group, which is consistent with the results of the above study [29].

The findings of the present study indicate that education, control, and follow-up play an important role in reducing cardiovascular risk factors, which is consistent with Mats *et al.*, who showed a significant effect of the cognitive-behavioral intervention [30].

Implementation of a rehabilitation program is essential as patients gradually forget the trained medical recommendations after discharge. Therefore, follow-up training is required at home. According to the findings, mental health increased significantly in most areas.

One of the advantages of the above study is that it can be implemented by almost trained nurses who are not specialized, and it can be used in health care centers. Given that this study was a short-term intervention, its efficacy is short for 3-6 months. On the other hand, considering the fact that in this study, samples were selected randomly and the sample size was small, it proposes limitations in the generalization of results. Therefore, it is suggested that if cognitive therapy of these patients is longer with a larger sample size, its therapeutic effects will be better.

CONCLUSION

The findings of the present study showed the effect of CBT on reducing the anxiety of patients in CCU during their hospitalization. The effects of treatment can be observed by focusing on challenging irrational beliefs, muscle relaxation, coping skills training, insight, cognition, and attitude change during the intervention. Because anxiety is an undesirable feeling that patients experience as well as the source of emotion in their thinking, researchers tend to guide and encourage patients to change their thoughts and emotions and eventually adhere to treatment recommendations.

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COMPETING INTERESTS

None declared.

REFERENCES

- [1] Ingram P, Sinclair L, Edwards T. The safe removal of central venous catheters. *Nursing Standard* (through 2013) 2006; 20(49): 42-60. <https://doi.org/10.7748/ns2006.08.20.49.42.c4483>
- [2] Freedland KE, Carney RM, Rich MW, Caracciolo A, Krotenberg JA, Smith LJ, Sperry J. Depression in elderly patients with congestive heart failure. *Journal of Geriatric Psychiatry* 1991; 24(1): 59-71. <https://dx.doi.org/10.11909%2Fj.issn.1671-5411.2018.06.01>
- [3] Jariani M, Saki M, Momeni N, Ebrahimzade F, Seydian A. The effect of progressive muscle relaxation techniques on anxiety in patients with myocardial infarction. *Yafteh* 2011; 13(3): 22-30.

- [4] Christensen AV, Dixon JK, Juel K, Ekholm O, Rasmussen TB, Borregaard B, Mols RE, Thrysøe L, Thorup CB, Berg SK. Psychometric properties of the Danish Hospital Anxiety and Depression Scale in patients with cardiac disease: results from the DenHeart survey. *Health and Quality of Life Outcomes* 2020; 18(1): 1-3. <https://doi.org/10.1186/s12955-019-1264-0>
- [5] Sigdel S, Ozaki A, Basnet M, Kobashi Y, Pradhan B, Higuchi A, Uprety A. Anxiety evaluation in Nepalese adult patients awaiting cardiac surgery: A prospective observational study. *Medicine* 2020; 99(9): e19302. <https://dx.doi.org/10.1097%2FMD.00000000000019302>
- [6] Nasiri M, Rahimiyan BE, Jahanshahi ME, Hajjyan KA, Nikfar JA. Stressors associated with hospitalization in the stressful cardiac care unit. *Iranian Journal of Critical Care Nursing* 2011; 4(3): 141-8.
- [7] Soleimani MA, Bahrami N, Zarabadi-Pour S, Motalebi SA, Parker A, Chan Y. Predictors of death anxiety among patients with heart disease. *Death Studies* 2020; 44(3): 160-7. <https://doi.org/10.1080/07481187.2018.1527416>
- [8] Pervichko EI, Babaev YA, Podstreshnaya AK, Zinchenko Y. Motivational Conflicts and the Psychological Structure of Perfectionism in Patients with Anxiety Disorders and Patients with Essential Hypertension. *Behavioral Sciences* 2020; 10(1): 25. <https://doi.org/10.3390/bs10010025>
- [9] Salehi S, Safavi M, Vafaie M. Level of anxiety and its correlation with some individual characteristics in patients with myocardial infarction in hospitals related to Islamic Azad University, Tehran Medical Branch (2005-2006). *Medical Science Journal of Islamic Azad University-Tehran Medical Branch* 2008; 18(2): 121-5.
- [10] Moradian ST. Comparison of hospital anxiety and depression among patients with coronary artery disease based on the proposed treatment. *Iranian Journal of Critical Care Nursing* 2011; 4(2): 97-102.
- [11] Heenan A, Greenman PS, Tassé V, Zachariades F, Tulloch H. Traumatic Stress, Attachment Style, and Health Outcomes in Cardiac Rehabilitation Patients. *Frontiers in Psychology* 2020; 11: 75. <https://dx.doi.org/10.3389%2Ffpsyg.2020.00075>
- [12] Bekendam MT, Mommersteeg PM, Kop WJ, Widdershoven JW, Vermeltfoort I. Anxiety and hemodynamic reactivity during cardiac stress testing: The role of gender and age in myocardial ischemia. *Journal of Nuclear Cardiology* 2020; 1-12. <https://doi.org/10.1007/s12350-020-02079-3>
- [13] Maleki M, Ghaderi M, Ashktorab T, Jabbari Nooghabi H, Zadehmohammadi A. Effect of light music on physiological parameters of patients with traumatic brain injuries at intensive care units. *The Horizon of Medical Sciences* 2012; 18(1): 66-74.
- [14] Andrews LA, Hayes AM, Abel A, Kuyken W. Psychology C. Sudden gains and patterns of symptom change in cognitive-behavioral therapy for treatment-resistant depression. *Journal of Consulting and Clinical Psychology* 2020; 88(2): 106. <https://doi.org/10.1037/ccp0000467>
- [15] DeRubeis RJ, Zajecka J, Shelton RC, Amsterdam JD, Fawcett J, Xu C. Prevention of recurrence after recovery from a major depressive episode with antidepressant medication alone or in combination with cognitive behavioral therapy: phase 2 of a 2-phase randomized clinical trial. *JAMA Psychiatry* 2020; 77(3): 237-45. <https://doi.org/10.1001/jamapsychiatry.2019.3900>
- [16] Mostoufi A, Chamkouri N, Kordrostami S, Alghasibahaahmadi E, Mojaddami A. 3-Hydroxypyrimidine-2, 4-dione derivatives as HIV Reverse Transcriptase-Associated RNase H Inhibitors: QSAR analysis and molecular docking studies. *Iranian journal of pharmaceutical research: IJPR* 2020; 19(1): 84-97. <https://dx.doi.org/10.22037%2FIjpr.2020.1101004>
- [17] Neufeld CB, Palma PC, Caetano KA, Brust-Renck PG, Curtiss J, Hofmann S. A randomized clinical trial of group and individual Cognitive-Behavioral Therapy approaches for Social Anxiety Disorder. *International Journal of Clinical and Health Psychology* 2020; 20(1): 29-37. <https://doi.org/10.1016/j.ijchp.2019.11.004>
- [18] Luyster FS, Ritterband LM, Sereika SM, Buysse DJ, Wenzel SE, Strollo P. Internet-based cognitive-behavioral therapy for insomnia in adults with asthma: a pilot study. *Behavioral Sleep Medicine* 2020; 18(1): 10-22. <https://doi.org/10.1080/15402002.2018.1518229>
- [19] Hossieni O, Maashi SA, Chamkouri N, Sabati Z, Nourbakhsh P, Sajedinejad M, Gholamiyan A. A Selective Membrane Electrode for Iodide Ion based on New Ionophore and its Application to Pharmaceutical Samples. *Indian Journal of Forensic Medicine & Toxicology*. 2020;14(2), 1394-1399.
- [20] Lovibond PF, Lovibond S. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy* 1995; 33(3): 335-43. [https://doi.org/10.1016/0005-7967\(94\)00075-u](https://doi.org/10.1016/0005-7967(94)00075-u)
- [21] Shaikhow SK, Hussin AA. Acute Myocardial Infarction And Depression. *Duhok Medical Journal* 2008; 2(1): 5-16.
- [22] Shojaaaddin F, Kazemi M, Alipour A, Oraki M. The effect of cognitive behavioral therapy on depression and anxiety in patients with myocardial infarction. *Evidence Based Care* 2013; 2(4): 47-55. <https://dx.doi.org/10.22038/ebcj.2013.463>
- [23] Sebrechts EH, Falger PR, Appels A, Kester AD, Bär F. Psychological effects of a short behavior modification program in patients with acute myocardial infarction or coronary artery bypass grafting. A randomized controlled trial. *Journal of Psychosomatic Research* 2005; 58(5): 417-24. <https://doi.org/10.1016/j.jpsychores.2004.02.021>
- [24] Borji M, Nourmohammadi H, Ottaghi M, Salimi AH, Tarjoman A. Positive effects of cognitive behavioral therapy on depression, anxiety, and stress of family caregivers of patients with prostate cancer: A randomized clinical trial. *Asian Pacific Journal of Cancer Prevention* 2017; 18(12): 3207. <https://doi.org/10.22034/apjcp.2017.18.12.3207>
- [25] Dorsey S, Lucid L, Martin P, King KM, O'Donnell K, Murray LK. Effectiveness of task-shifted trauma-focused cognitive behavioral therapy for children who experienced parental death and posttraumatic stress in Kenya and Tanzania: a randomized clinical trial. *JAMA Psychiatry* 2020. <https://doi.org/10.1001/jamapsychiatry.2019.4475>
- [26] Garland SN, Xie SX, DuHamel K, Bao T, Li Q, Barg FK. Acupuncture versus cognitive behavioral therapy for insomnia in cancer survivors: a randomized clinical trial. *Journal of the National Cancer Institute*. 2019; 111(12): 1323-31. <https://doi.org/10.1093/jnci/djz050>
- [27] Atlantis E, Chow CM, Kirby A, Singh MF. An effective exercise-based intervention for improving mental health and quality of life measures: a randomized controlled trial. *Preventive Medicine* 2004; 39(2): 424-34. <https://doi.org/10.1016/j.ypped.2004.02.007>
- [28] Kawachi I, Sparrow D, Vokonas PS, Weiss ST. Symptoms of anxiety and risk of coronary heart disease. The Normative Aging Study. *Circulation* 1994; 90(5): 2225-9. <https://doi.org/10.1161/01.cir.90.5.2225>
- [29] Izawa K, Hirano Y, Yamada S, Oka K, Omiya K, Iijima S. Improvement in physiological outcomes and health-related quality of life following cardiac rehabilitation in patients with

-
- acute myocardial infarction. *Circulation Journal* 2004; 68(4): 315-20.
<https://doi.org/10.1253/circj.68.315>
- [30] Gulliksson M, Burell G, Vessby B, Lundin L, Toss H, Svärdsudd K. Randomized controlled trial of cognitive behavioral therapy vs. standard treatment to prevent recurrent cardiovascular events in patients with coronary heart disease: Secondary Prevention in Uppsala Primary Health Care project (SUPRIM). *Archives of Internal Medicine* 2011; 171(2): 134-40.
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