DOI: http://dx.doi.org/10.22122/ijbmc.v11i1.640 Published by Vesnu Publications

International Journal of Body, Mind and Culture

The Effectiveness of Solution-Focused Brief Therapy on Emotional Regulation, Quality of Life, Pain Perception, and Hostile Attributions in Patients with Cardiovascular Diseases

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Quantitative Study

Abstract

Background: Today, with the increasing trend of urbanization and industrialization of societies, physical and mental diseases are increasing. The present study aimed to determine the effectiveness of Solution-Focused Brief Therapy (SFBT) on emotion regulation, quality of life (QOL), pain perception, and hostile documents in patients with cardiovascular diseases.

Methods: This research was a semi-experimental study with a pretest-posttest design, a control group, and a 2-month follow-up period. The statistical population comprised patients with cardiovascular disease at Tehran Heart Hospital, Iran, in 2023. The statistical sample, consisting of 30 individuals, was purposefully selected. Subsequently, 15 individuals were randomly assigned to the control group and another 15 to the experimental group. The intervention group underwent SFBT, comprising 8 sessions of 90 minutes each, conducted once a week. Data were collected and analyzed using the Affective Control Scale (ACS; Williams et al., 1997), the World Health Organization Quality of Life Questionnaire (WHOQOL-BREF), the McGill Pain Questionnaire (MPQ; Melzack, 1975), and the Hostile Documents Questionnaire (Arnetz et al., 2003). The variance was analyzed.

Results: The results showed that with controlling the pretest, there was a significant difference between the scores of the control and experimental groups in terms of emotion regulation ($P < 0.001$; $F = 40.716$), QOL ($P < 0.001$; $F = 110.980$), pain perception ($P < 0.001$; $F = 159.959$), and hostile documents ($P < 0.001$; $F = 168.955$).

Conclusion: These findings indicate that SFBT plays an important role in controlling heart patients' emotions and QOL, so these findings can be used to formulate preventive and even treatment programs for heart patients.

Keywords: Emotional regulation; Pain perception; Hostile documents; Solution-focused therapy; Quality of life

Citation: Ghanbari Z, Hassanzadeh M, Toubaei F, Gandhamkar I, Mirzajan Tabrizi A. **The Effectiveness of Solution-Focused Brief Therapy on Emotional Regulation, Quality of Life, Pain Perception, and Hostile Attributions in Patients with Cardiovascular Diseases.** Int J Body Mind Culture 2024; 11(1): 79-88.

Received: 03 Oct. 2023
Accepted: 02 Jan. 2024

Introduction

Today, changes in lifestyle and the cultural and social structure have led to increased cardiovascular diseases in society (Shataban, Mirmehdi, & Shataban, 2023). Cardiovascular disease, as a chronic condition, often begins with risk factors such as obesity, type 2 diabetes, and high blood pressure, which irreversibly damage the vascular structure and ultimately lead to adverse clinical outcomes such as arterial thrombosis and ischemic stroke. While genetics can be blamed for less than 20% of occurrences, dietary habits and nutrition have more profound and lasting effects. This disease is one of the most dangerous global health issues, causing a significant number of deaths each year and impacting 17.9 million people worldwide. The prevalence of cardiovascular disease is a considerable concern due to the difficulty in diagnosis (Kumar et al., 2022). Cardiovascular and cerebrovascular diseases are the leading cause of death and disability in Iran, with cardiac surgeries accounting for about 60% of all surgeries performed in the country (Pourqana, Amirinejad, Razavi Toosi, & Seyed Mohammad Taghi, 2021). Cardiovascular and cerebrovascular diseases affect various psychological aspects, including emotional regulation, quality of life (QOL), and pain perception.

One of the factors that play a crucial role in the lives of individuals with cardiovascular diseases is their ability to control emotions. Emotion regulation is the capacity to understand emotions and feelings, regulate emotional experiences, and express emotions. It is not merely the suppression of emotions, but rather the lack of a constant static state of arousal. Emotion regulation involves changing emotional experiences (Yuan et al., 2023). Emotion regulation consists of the four dimensions of anger, depressive mood, anxiety, and positive emotion. It is necessary for adapting to stressful life events (Raesi & Kashkoli, 2016).

The relationship between the QOL and the health of cardiac patients is significant. The concept of QOL encompasses potential abilities (functional status), access to resources and opportunities for using skills to pursue and engage in interests (objective QOL), and an overall sense of well-being (mental QOL) (Sella et al., 2023). Today, QOL has become one of the fundamental and essential issues in human societies, encompassing all dimensions of life, including health.

Chronic pain affects various aspects of an individual's life, including emotional, occupational, and physical functioning, imposing substantial costs on society and the healthcare system (Kelting et al., 2019). The perceptual experience of pain involves psychological processes such as attention, interpretation, coping strategies, and pain-related behaviors, starting from the moment sensory stimuli from the pain receptor system are transmitted to the central nervous system. These psychological processes are influenced by previous learning, cognitions, emotions, environmental factors, positive and negative outcomes, culture, and family, which lead to different pain processing and behaviors (Lopes & de Lima Osório, 2023).

Another influential factor on cardiovascular patients is hostile attribution bias. Researchers like Nisanci and Nisanci (2023) have defined negative attributions as significant reactions to betrayal in individuals who perceive betrayal. These attributions tend toward hostility toward others' behaviors (Zajenkowska et al., 2021), thus resulting in aggression and marital conflicts (Abreu-Afonso et al., 2022). Individuals with hostile attribution bias tend to think negatively about the causes of angry events in daily life. They engage in repetitive cognitive rumination, even after the event has ended, processing the causes of events in a hostile manner (Wang et al., 2019).

One of the suitable treatments for cardiovascular patients is Solution-Focused

Brief Therapy (SFBT). SFBT is one of the final therapies initiated at the Family Therapy Center in Milwaukee by Visconsi et al. They aimed to streamline the problem-solving stage in therapy sessions and enhance the solution-focused approach (Sperry & Sperry 2023). The goal of SFBT is mutual collaboration between clients and therapists in creating solutions, focusing on clients' goals, highlighting exceptions, miracle questions, coping questions, scaling questions, and identifying clients' strengths and resources as essential elements of this approach (Leslie, 2022).

Instead of focusing on deficiencies and weaknesses, SFBT prioritizes clients' strengths, resources, and capabilities (Ayar & Sabancioğullari, 2022). The effectiveness of SFBT on pain perception was examined, indicating that SFBT influences pain perception. Additionally, the results of studies by Ayar and Sabancioğullari (2022) and Stanely et al. (2019)) demonstrate the effectiveness of SFBT in reducing pain perception and increasing emotion regulation.

SFBT's effectiveness on some variables related to cardiovascular diseases has also been investigated. However, a search in the research literature did not lead us to a study regarding the efficacy of this therapeutic approach in controlling emotions and hostile attributions in these patients. Therefore, understanding the qualitative effectiveness of this approach holds significant implications for the application of therapeutic interventions in reducing psychosocial damages resulting from cardiovascular diseases and can be of considerable importance. Thus, the current research aimed to determine the effectiveness of SFBT on emotion regulation, QOL, pain perception, and hostile attribution bias in cardiovascular patients.

Methods

Study design and participants: The present study was conducted with a semi-experimental design, a pretest-posttest design, and a two-month follow-up. The statistical population of this research included patients referred to the specialized heart hospital in Tehran, Iran, from March to May 2022, diagnosed with heart failure by a cardiovascular specialist. The sample consisted of 30 individuals, randomly assigned to two groups of 15, the experimental and control groups. Subsequently, the experimental group received SFBT in 8 sessions of 90 minutes each, while the control group did not receive any intervention. After obtaining written and verbal consent from the participants, questionnaires were provided to them at the beginning of the research (pretest phase) and were completed.

The inclusion criteria for participation in the study included a diagnosis of cardiovascular disease by a cardiovascular specialist, willingness and informed consent to participate in the research, the ability to attend sessions, and cooperation in performing tasks. The criteria for exclusion from the study included the presence of other psychological or physical illnesses (such as cancer or gastrointestinal disorders) and severe and acute symptoms of heart disease that would make participation difficult or impossible. For the statistical analysis of the data at the inferential level, a multivariate analysis of covariance (MANCOVA) was used in SPSS software (version 26; IBM Corp., Armonk, NY, USA).

Instruments and variable

The Affective Control Scale: The Affective Control Scale (ACS) is a 42-item questionnaire developed by Williams et al. in 1997. It comprises the four dimensions of anger, depressed mood, anxiety, and positive emotion. Each question in each dimension is scored on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The test-retest reliability after four weeks for the anger dimension

is 0.73 and 0.72, for the depressed mood dimension is 0.76 and 0.91, for the anxiety dimension is 0.77 and 0.89, and for the positive emotion dimension is 0.66 and 0.84.

Convergent validity with the Positive and Negative Affect Schedule (PANAS) by Watson et al. (1988) shows an r = 0.36, and divergent validity with the negative emotion subscale of the PANAS is r = 0.58, as reported by Williams et al. (1997).

The reliability of the ACS was assessed in the study by Besharat et al. (2014), revealing Cronbach's alpha values of 0.53 for the anger dimension, 0.84 for the depressed mood dimension, 0.64 for the anxiety dimension, and 0.60 for the positive emotion dimension, indicating the scale's appropriateness. Tahmasebian et al. (2014) calculated the validity of this questionnaire in their research through correlational analysis, with results showing desirable validity for anger and emotion regulation (r = 0.765), depressed mood and emotion regulation (r = 0.751), anxiety and emotion regulation (r = 0.841), and positive emotion and emotion regulation (r = 0.844).

The World Health Organization Quality of Life Questionnaire: This World Health Organization Quality of Life Questionnaire (WHOQOL-BREF), developed by the World Health Organization (WHO), consists of 26 questions designed to measure the overall and general QOL of an individual. The questionnaire comprises four domains: physical health, psychological health, social relationships, and environment, along with an overall score. Each of the 26 questions is rated on a scale ranging from 1 to 5, with questions 3, 4, and 26 being reverse scored. The physical health subscale includes 7 questions, the psychological health subscale comprises 6 questions, and the social relationships and environment subscales consist of 3 and 8 questions, respectively. Additionally, 2 questions are related to overall QOL and general health.

Initially, a raw score is calculated for each subscale, and then, transformed into a standardized score ranging from 0 to 100. Scores between 0 and 30 indicate an unfavorable QOL, scores between 30 and 70 represent a moderate QOL, and scores from 70 to 100 indicate a high and desirable QOL. This questionnaire has been validated by the WHO Quality of Life Group in various countries, and its validity and reliability in Iran have been confirmed by Ghaffari et al. (2018).

McGill Pain Questionnaire: The McGill Pain Questionnaire (MPQ), developed by Melzack (1975), consists of 20 sets of phrases and aims to assess individuals' perception of pain from various dimensions, including the sensory perception of pain, emotional perception of pain, and evaluative perception of pain, covering diverse and varied types of pain. The cutoff point for this questionnaire is a score of 70. In the research by Dworkin (2009), the validity of this questionnaire has been confirmed. In Iran, the content validity of the MPQ was examined and approved in the study conducted by Moazzen et al. (2012). After translation and revision by language experts, 5 faculty members of Mashhad University of Medical Sciences, Iran, reviewed and validated the questionnaire. The reliability of the questionnaire was also calculated using Cronbach's alpha, resulting in alpha coefficients ranging from 0.83 to 0.87 for all dimensions.

Solution-Focused Brief Therapy

The solution-oriented SFBT sessions were taken from the book Key Concepts in Solution-Oriented Therapy by Deshazi (1985), quoted by Ekaqi et al. (2019). This approach consisted of 8 sessions, 90-minute sessions once a week. The content of the sessions is presented in table 1.

Analysis: MANCOVA was used in SPSS software to analyze statistical information at the inferential statistics level.

Table 1. Short-term psychotherapy sessions of Deschazer's circuit solution (1985)

Session	Description
First	On the group's initial meeting, the members were introduced and the rules were discussed. Then, a problem was transformed into a word and presented with attainable goals. Then, a discussion and debate on the solutions and assignments were presented for the next session.
Second	Last week's assignments were reviewed in the second session, and individual goals were set. Complaint solutions were discussed, and problem-solving circles were formulated. The participants were asked to write down the goals of participating in the counseling sessions for their homework and present them on the next session.
Third	The previous meeting presented a summary of the last meeting, and the group's current problems were discussed. A discussion about the future and the use of the technique of exceptions and miraculous questions was conducted. Next, the emphasis was on finding positive stories about the participants' problems. The assignment for the next week was for the participants to think about when they had fewer or no behavioral problems.
Fourth	On the fourth session, the conclusions from the previous session were presented, and the assigned assignments were reviewed. Explanations of master essential techniques and scaled questions were provided, and group members were asked to apply these techniques to their problems. to take
Fifth	On the fifth session, the previous week's assignments were reviewed, and then, pretend techniques, solution-oriented questions, Khalaf argument, and betting were discussed. For the task, the group members were asked to think about being different from the current behaviors and present their answers to the group on the next meeting.
Sixth	On the sixth session, the entire treatment program was reviewed, the group members' questions were answered, and the group members' reached treatment goals were discussed. For the task, the group members were asked to think about consolidating and consolidating changes for the next meeting and presenting them to the group.
Seventh	On the seventh session, the participants were helped to review sessions and what they changed. Counselors had to show these changes and encourage them to take action. In an assignment, the members were asked to report on their achievements and what they had learned from the group meetings by the next week. Applying it in thought life and bringing it to the discussions in written form.
Eighth	In this meeting, the group members, with the consultant's help, summarized the previous conferences and celebrated their success at the end. The success of each person in the group was reviewed, and the posttest was conducted.

Results

The mean age of the subjects in the control and experimental group was 28.33 ± 5.80 years and 28.73 ± 6.41 years, respectively.

As can be seen in table 2, the posttest and follow-up scores of the experimental group in the variables of emotion regulation, QOL, and perception in two hostile documents have improved in comparison to the pretest. However, the trend of the average scores of the control group has been almost constant, which somehow shows that the treatment is effective. Of course, to measure the significance of these differences, statistical tests should be used. For this purpose, the analysis of covariance (ANCOVA) was used after checking the assumption of normality, homogeneity of variances, and homogeneity of the covariance matrix.

Before running ANCOVA, its presuppositions were checked. Lune's test was used to check the homogeneity of variances. According to the table, the results of Lune's test showed the error of variances in the variables of emotion regulation ($P = 0.271$; $F = 0.260$), QOL ($P = 0.472$; $F = 0.531$), pain perception ($F = 0.324$; P, F=1.006) and hostile documents ($P = 0.231$; $F = 1.356$) are similar ($P < 0.05$), so the groups can be compared with each other. The results of the Box's M test to check the homogeneity of variance-covariance were not statistically significant, and this meant establishing the assumption of homogeneity of the covariance matrix ($P = 0.068$; $F = 1.961$; Box's M = 13.328).

Table 2. Descriptive statistics of SAPS, CAT, and DASS-21 questionnaires (Part I)

Variable	Intervention group		
	Pretest	Posttest	Follow-up
	Mean ± SD		
Emotion regulation	105.86 ± 29.83	126.86 ± 21.40	122.46 ± 19.26
Quality of life	70.33 ± 6.59	95.33 ± 5.30	89.35 ± 6.58
Pain perception	122.66 ± 10.58	93 ± 6.30	95.86 ± 4.72
Hostile documents	70.33 ± 6.95	52.33 ± 3.30	56.30 ± 5.13

Table 2. Descriptive statistics of SAPS, CAT, and DASS-21 questionnaires (Part II)

Variable	Control group		
	Pretest	Posttest	Follow-up
	Mean ± SD		
Emotion regulation	104.73 ± 31.33	104.2 ± 25.59	105.32 ± 32.54
Quality of life	70.1373 ± 7.03	69.46 ± 06.45	68.65 ± 8.76
Pain perception	123.5373 ± 10.91	122.53 ± 11.30	120.89 ± 13.76
Hostile documents	70.1373 ± 7.03	69.46 ± 6.45	70.93 ± 7.33

SD: Standard deviation

The results of Vickers' lambda showed that by controlling the effects of pretest scores, there is a significant difference between the two experimental and control groups in at least one of the variables ($P < 0.05$). Our general hypothesis was confirmed; the intervention was generally effective on dependent variables. The following results of ANCOVA are presented to check the dependent variables.

According to table 3, the results of ANCOVA showed that after controlling the effects of pretest scores, there was a significant difference between the scores of the two control and experimental groups in terms of emotion regulation ($P < 0.001$; $F = 40.716$), QOL ($P < 0.001$; $F = 110.980$), pain perception ($P < 0.001$; $F = 159.959$), and hostile documents ($P < 0.001$; $F = 168.955$). In other words, SFBT has been effective in controlling emotions, QOL, pain perception, and hostile documents in cardiovascular patients. In the continuation of examining the observed differences in the main effect of time (three stages of implementation), the Bonferroni post hoc test was used (Table 4).

Table 4 shows that the QOL scores have generally increased from the pretest to posttest and follow-up, indicating the effect of SFBT. In the QOL variable, the difference between the pretest and posttest stages ($P < 0.05$; $d = -7.91$) and the follow-up pretest ($P < 0.05$; $d = -5.74$) is significant. As can be seen in table 5, in general, the scores of emotional regulation, pain perception, and hostile documents have decreased from the pretest to the posttest and follow-up, respectively, which indicates the effect of psychotherapy.

Table 3. The result of the analysis of covariance for research variables

Variable	Source of variations	Sum of squares	df	Mean of squares	F	P	Eta
Emotion regulation	Pretest	12926.471	1	12926.471	131.225	0.001	0.191
	Group	4010.726	1	4010.726	40.716	0.001	0.528
	Error	2659.662	27	98.506			
Quality of life	Pretest	220.952	1	220.952	11.568	0.001	0.598
	Group	2119.770	1	2119.770	110/980	0.001	0.628
	Error	515.714	27	19.770			
Pain perception	Pretest	1219.813	1	1219.813	29.252	0.001	0.441
	Group	6670.402	1	6670.402	159.959	0.001	0.614
	Error	1125/921	27	41/701			
Hostile documents	Pretest	1229.813	1	1310.813	31.252	0.001	0.191
	Group	6680.400	1	6850.402	168.955	0.001	0.528
	Error	1124.921	27	38.701			

df: Degree of freedom

Table 4. Bonferroni's test to compare variables in three stages

Variable	Stage I	Stage J	P-value	Average difference (I-J)
Emotion regulation	Pretest	Posttest	0.001	-8.01
		Follow-up	0.001	-12.4
Quality of Life	Pretest	Posttest	0.001	-7.91
		Follow-up	0.001	-4.74
Pain perception	Pretest	Posttest	0.001	-6.90
		Follow-up	0.001	-4.70
Hostile documents	Pretest	Posttest	0.001	-3.60
		Follow-up	0.001	-10.70

As can be seen, in the emotion regulation variable, the difference between the pretest and posttest ($P > 0.05$; $d = -8.01$) and pretest and follow-up ($P < 0.05$; $d = -12.4$) is significant, and in the pain perception variable ($P > 0.05$; $d = -6.90$), the difference between the pretest and follow-up ($P > 0.05$; $d = -4.70$) is significant. Moreover, the difference between the pretest and posttest ($P > 0.05$; $d = -3.60$) and pretest and follow-up ($P < 0.05$; $d = -10.70$) in the variable of hostile documents is significant.

Discussion

The present study investigated the effectiveness of SFBT on emotion regulation, QOL, pain perception, and adversarial documents in patients with cardiovascular diseases. The results demonstrated that SFBT is effective in enhancing emotion regulation, improving QOL, altering pain perception, and mitigating adversarial documents. These findings are in line with the results of previous research by scholars such as Ayar and Sabancioğullari (2022), Stanely et al. (2019), Kesik et al. (2022), and Golbadi et al. (2021).

In interpreting the current research results, it can be stated that the effectiveness of SFBT on emotion regulation had a significantly positive impact, reshaping abnormal emotions by creating new meanings. Managing and controlling emotions makes individuals realistic, optimistic, and righteous, contributing to becoming valuable and efficient in societal progress. The more individuals experience conflicts, the more they liberate themselves from the suppression mechanism and feel greater vitality, creativity, self-discovery, and energy. The therapeutic intervention made individuals aware of their emotions, how emotions affect cognition and behavior, and the impact of emotions on decision-making. This awareness enabled participants to recognize the destructive effects of emotions on behavior and achieve positive emotion regulation by substituting balanced solutions for inappropriate ones (Stanely et al., 2019).

Moreover, SFBT significantly improved their QOL. Patients who have experienced adverse events in life, but focused on positive aspects report higher life satisfaction. Therefore, controlling and regulating emotions, meaning reducing depression and increasing positive mood and appropriate coping with the disease, can play an influential role in improving hope and mental health and, ultimately, the QOL in heart patients. Thus, positive emotions and feelings are essential to effective coping strategies, enhancing happiness, life satisfaction, and overall QOL for cardiac patients (Kesik et al., 2022).

The effectiveness of SFBT on pain perception and adversarial documents had a significant negative impact. By addressing patients' problems using techniques such as flooding, cognitive restructuring, cognitive distortions, mutual cognitive conversation, and improving relationships, this approach facilitates the resolution of negative cognitive patterns and introduces patients to valuable solutions. By reframing inappropriate solutions when faced with anger, anxiety, and confusion,

patients' capabilities in solution-oriented coping are enhanced (Ayar & Sabancioğullari, 2022). In essence, teaching specific interpersonal skills and social relationship patterns, along with providing basic concepts of communication and caring for patients with cardiovascular diseases, helps patients confront anxiety-provoking situations and reduces pain. This approach creates a pleasant and enjoyable experience accompanied by vitality and hope for life in cardiac patients (Gilbody et al., 2022).

Conclusion

The present study findings are in line with that of previous research, and demonstrated the effectiveness of SFBT on emotion regulation, QOL, pain perception, and adversarial documents in cardiovascular patients. However, it is essential to note some limitations of the current research, such as the purposive sampling method and a small sample size. Therefore, it is recommended that generalizability be enhanced in future studies by employing random sampling methods and larger sample sizes. It is suggested that future research investigates larger sample sizes in other regions of the country to improve the robustness of the findings.

Conflict of Interests

Authors have no conflict of interests.

Acknowledgements

We wish to thank all those who participated in this research.

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