DOI: http://dx.doi.org/10.22122/ijbmc.v10isp.475 Published by Vesnu Publications

International Journal of Body, Mind and Culture

The Effectiveness of Acceptance and Commitment Therapy on Psychological Flexibility of Patients with Myocardial Infarction

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Quantitative Study

Abstract

Background: Myocardial infarction (MI) is a condition characterized by the death of heart muscle cells due to a lack of oxygen, frequently resulting in death. Disease and health-related beliefs may play a function in the progression of MI. The current study aimed to examine the effectiveness of acceptance and commitment therapy on psychological flexibility of patients with MI.

Methods: The current research was semi-experimental research with a control group. The statistical population included all patients with MI referred to Nasiriyah Heart Center, Nasiriyah, Iraq, in 2021 and 2022 (n = 473). In the current study, 90 individuals were selected by simple random sampling and divided evenly between intervention and control groups. The Cognitive Flexibility Inventory (CFI) was utilized for data collecting. Utilizing SPSS software, the analysis of covariance (ANCOVA) method was performed. The statistical significance level was considered to be 0.05.

Results: Acceptance and commitment therapy was effective in psychological flexibility ($F = 116.17$, $P < 0.001$) in patients with MI. Besides, the results of a one-way ANCOVA indicated that the subscales, including avoidance ($F = 8.27$, $P < 0.001$), acceptance ($F = 13.86$, $P < 0.001$), and harnessing ($F = 6.14$, $P < 0.001$), improved significantly.

Conclusion: Acceptance and commitment therapy has increased the psychological flexibility of patients with MI and is effective non-pharmaceutical therapy for the psychological management of these patients.

Keywords: Myocardial infarction; Psychological adjustment; Acceptance and commitment therapy

Citation: Abdikarimova G, Alzubaidi MA, Alhili A, Kadhim AJ, Hamed NA, Faqri AMA, et al. **The Effectiveness of Acceptance and Commitment Therapy on Psychological Flexibility of Patients with Myocardial Infarction.** Int J Body Mind Culture 2023; 10(Special Issue).

Received: 25 Nov. 2022

Accepted: 06 Jan. 2023

Introduction

In most countries around the world, cardiovascular diseases (CVDs) are the leading cause of death; according to statistics, one-third of heart attacks result in death. Two-thirds of patients do not fully recover (Salah et al., 2022). These diseases have imposed enormous costs on societies. Myocardial infarction (MI) is a condition characterized by the death of heart muscle cells due to a lack of oxygen (Gustafsson et al., 2022). MI is often fatal as the acute stage of coronary heart disease. The global death rate due to MI has decreased recently, but it remains one of the most significant healthcare issues (Tang et al., 2022).

The beliefs associated with illness and health are likely to play a function in the development of CVD (Rashidi et al., 2021). Psychological factors, such as a person's beliefs about health and their ability to cope with the disease and its symptoms, play a more significant function in the performance of cardiovascular patients than physical factors, such as the number of blocked arteries (Faryabi, Rafieipour, Haji-Alizadeh, & Khodavardian, 2022). These factors are superior to others for predicting and determining an individual's performance status (Cao et al., 2022).

Psychological flexibility is closely related to mental health and is one factor that allows patients to adapt to the stresses and dangers of life (Dindo, Brandt, & Fiedorowicz, 2019). Psychological flexibility refers to a person's ability to experience internal and external stimuli. This trait varies in intensity among individuals and determines how they respond to novel experiences (Fiedorowicz et al., 2021). Psychological flexibility states that the ability to communicate with the current moment and to separate oneself from one's thoughts and experiences within the psyche is necessary for flexibility. In behavioral therapy, particularly the approach based on acceptance and commitment, psychological flexibility as an influential variable in health and adaptation to illness is a relatively new concept (Casey et al., 2018). This approach's central concept is psychological flexibility, and its pathological model is the model of psychological inflexibility, which increases the risk of health problems and psychological disorders (Guerrini Usubini et al., 2021). It should be noted that psychological flexibility is divided into three subscales: avoidance, acceptance, and harnessing.

Through cognitive dissonance-related interventions, acceptance and commitment therapy aims to help clients not rigidly submit to their thoughts and mental laws but rather develop more effective methods to interact with the directly experienced world (Spatola, Manzoni, et al., 2014). Exercises help a person deal with his illness more effectively. When an individual disregards his thoughts and acts by his values, he will have a novel experience (Kioskli, Scott, Winkley, Godfrey, & McCracken, 2020). This time, the individual will act despite these thoughts and feelings, realizing that he can do so and that his psychological flexibility has increased (Bergman & Keitel, 2020).

With the aid of exercises, clients in this treatment tend to accept without judgment. They become aware of understandings and interpretations, recognition of words, emotions, and bodily sensations, without evaluating their significance and whether they are true or false, healthy or unhealthy (Spatola, Cappella, et al., 2014). Breaking and mindfulness make this process possible. Self-monitoring creates a context in which the content of consciousness is not threatening, and therefore creates the context of acceptance (Jarvela-Reijonen et al., 2020). These interventions allow a person to experience the context of his qualitative areas directly. Acceptance and commitment influence psychological flexibility, so that the individual and the current

situation can utilize the situation's opportunities to move toward internal values despite undesirable psychological events (Paulos-Guarnieri et al., 2022). Due to this, the psychological damage is caused by psychological rigidity, and decreasing cognitive fusion and experiential avoidance can be a factor in increasing flexibility (Ahmadi Ghahnaviyeh, Bagherian, Feizi, Afshari, & Mostafavi, 2020).

People in this healing process allow their thoughts and feelings to enter and exit without attempting to rein them (Faghihi, Goli, Talighi, & Omidi, 2019). This strategy can help to become more tolerant of adverse events and emotions (Sauer & Maatouk, 2021). The person is taught to release the central processes of inhibiting thought, be free of disturbing thoughts, accept internal events rather than controlling them, specify their values, and deal with them during treatment (Pinna & Edwards, 2020).

Considering the risk to mental health in the modern era, cardiovascular patients must take appropriate measures to reduce mental disorders and improve mental health. Psychological flexibility is related to variables associated with mental health; therefore, this strategy effectively fosters psychological flexibility in patients. Consequently, the current study examines the application of acceptance and commitment treatment to the psychological flexibility of patients with MI. The novelty of the present research is that it examines the effect of the mentioned therapeutic intervention on psychological adaptability.

Methods

The current research was a semi-experimental research with a control group. The statistical population included all patients with MI referred to Nasiriyah Heart Center, Nasiriyah, Iraq, in 2021 and 2022 (n = 473). In the present study, 90 individuals were selected by simple random sampling and divided evenly between intervention and control groups (45 people in each group). The inclusion criteria included the ability to read and write, a maximum age of 70 years, consent to participate in the study, and an MI occurring at least eight months ago. The exclusion criteria were the use of neuropsychiatric medications, the absence of more than two sessions, and incomplete questionnaire completion. To comply with ethical considerations, the participants were assured that their information would remain confidential and that they could leave the study at any time and on their own accord. In the following section, the participants were thoroughly explained the research process and its objectives. Then their written consent for informed participation was obtained during the research meeting. The Ethics Committee of the College of Medicine at the University of Thi-Qar, Iraq, has approved the present study.

The Cognitive Flexibility Inventory (CFI) (Dennis & Vander Wal, 2010) is a 20-item self-report instrument used to measure cognitive flexibility, which is necessary for a person's ability to challenge and replace ineffective thoughts with more effective ones. It is scored on a 7-point Likert scale, with higher scores indicating greater psychological flexibility. This questionnaire is used in clinical and non-clinical evaluations to assess a subject's progress in developing flexible thought. Multiple studies demonstrated that this questionnaire's validity structure was adequate (Karekla, Karademas, & Gloster, 2019). This questionnaire's concurrent validity with the Beck Depression Inventory (BDI) (Beck et al., 1987) is 0.41, while its divergent validity with the Cognitive Flexibility Scale (CFS) (Martin & Rubin, 1995) is 0.76 (Roales-Nieto et al., 2016). In the present study, Cronbach's alpha method had a reliability of 0.87.

The intervention group received Hayes et al. (2012) protocol of acceptance and commitment therapy for eight 90-minute sessions. It is worth noting that after the

research was completed, the intervention was also presented to the people in the control group. Table 1 describes various sessions related to educational intervention.

To collect data, a demographic profile questionnaire was used first, followed by the CFI. The central tendency and dispersion indices were used to describe the variable distribution, and the analysis of covariance (ANCOVA) method was used in SPSS software (version 23, IBM Corporation, Armonk, NY, USA) to intervention the statistical assumptions at the inferential level. The statistical significance level was considered to be 0.05.

Results

The results of the demographic variables of the study participants are presented in table 2.

Table 1. Description of intervention sessions based on acceptance and commitment

Session	Description
1	In this session, participants were asked to describe the intended intervention, its history of assisting various groups, and its underlying premise that suffering is institutionalized in human life and is a natural part of life as a continuation of their goals and expectations. There were two categories of purposes: achieving better feelings and thoughts and living following their values.
2	Participants were asked to review the personal goals exercise from the previous week in this session. Then they were asked to complete a value assessment form, and the session continued with creative helplessness after explaining how these values guide the therapy sessions. During a group discussion, participants were asked to describe the unpleasant thoughts and emotions they experienced daily and their efforts to eliminate or reduce these adverse internal events. The effectiveness of these coping strategies and their classification as control methods were then discussed.
3	Various metaphors and experiential exercises were used to challenge the maintenance of an internal events control program. The distinction between the inner and outer worlds was illustrated with an example (after removing dysfunctional ways of control and avoidance and challenging the participants to find alternatives to desire), the process by which an individual chooses to experience an extensive range of internal events without attempting to change or resist them.
4	At the beginning of this session, it was explained that the human capacity for language was the primary cause of his pain and suffering and that this capacity led to cognitive fusion. When fusion occurs, a person cannot distinguish between the verbal world and the directly experienced world. The participants were then trained to view the problematic thought as merely a thought and not a reality through exercises designed to help them break away from these thoughts.
5	Beginning with a simple exercise focusing on bodily sensations, the session was devoted to teaching mindfulness and the observer's perspective (breathing) and followed by more advanced mindfulness exercises (white room meditation, mindful concentration, leaves in the water). The purpose of these exercises was to assist participants in observing their thoughts without reacting. With the aid of metaphor and group discussion, the concept of desire or acceptance was mentioned again after the session, and desire was introduced as an action rather than an emotional state.
6	The session began with a summary of the desire. In order to stop fighting and fully experience the emotions of the moment, the swamp metaphor was used to illustrate the distinction between fighting and suffering, which leads to further drowning. The remainder of the session discussed self-forgiveness and self-acceptance (self-compassion practice).
7	This session began with a review of the practice of elucidating values (what individuals seek in life and how they choose to spend their lives). Next, direct training and discussion regarding the various dimensions of value clarification (what they include and do not include and the distinction) were conducted. Then, the related components (goals, actions, and obstacles) were presented to assist the participants in identifying meaningful life directions.
8	The session emphasized committed action, particularly when participants face obstacles that prevent them from pursuing their values. A brief review of the previous meetings and assignments to take committed action following the values, as well as questions and answers regarding possible obstacles, committed action, and solutions for removing these obstacles, were conducted after the previous sessions.

Table 2. Demographic characteristics of participants

Variable		Intervention group [n (%)]	Control group [n (%)]	P-value
Gender	Men	27 (60.0)	29 (64.4)	0.34
	Women	18 (40.0)	16 (35.6)	
Age (year)	< 55	17 (37.8)	21 (46.7)	0.27
	> 55	28 (62.2)	24 (53.7)	
Education	Secondary	36 (80.0)	31 (68.9)	0.46
	College	9 (20.0)	14 (31.1)	
Job	Employed	19 (42.2)	22 (48.9)	0.62
	Unemployed	26 (57.8)	23 (51.1)	
Smoking	Yes	14 (31.1)	17 (37.8)	0.19
	No	31 (68.9)	28 (62.2)	

According to the results, 56 (62.2% of all participants) were men, whereas 34 (37.8%) were women. Most people were more than 55 years old (57.8%). In the intervention group, the mean age was 58.64 ± 8.16 years, while it was 56.38 ± 7.82 years in the control group. The majority of study participants, however, had secondary education (74.4%). Moreover, most individuals were unemployed (54.4%) and non-smokers (65.6%). In addition, the results of the independent t-test revealed no statistically significant differences between the two groups' demographic variables ($P > 0.05$).

Before the intervention, the intervention and control groups completed the CFI in the pre-test phase. After the intervention sessions in the intervention group concluded, the post-test phase was conducted with both groups. Table 3 presents the results regarding the mean and standard deviation (SD) of the psychological flexibility variable and its subscales separately for the two intervention and control groups.

Table 3 shows that the pre-test and post-test results of the control group have not changed ($P > 0.05$), whereas the post-test mean value has increased in the intervention group ($P < 0.001$). As a result, acceptance and commitment therapy has increased psychological flexibility and subscales.

Using the Kolmogorov-Smirnov test, the assumption that the distribution of grades was normally distributed was investigated. The assumption of normality of the distribution of variable scores will be met if the significance level of the result is greater than 0.05; otherwise, this assumption will not be met. Table 4 displays the outcomes of this assumption.

Levene's test demonstrated the homogeneity of psychological flexibility variances ($F = 1.67$, $P = 0.24$). The Box's M test results also demonstrated the homogeneity of the covariance variance matrix ($F = 1.92$, $P = 0.08$).

Table 3. Mean and standard deviation (SD) of the psychological flexibility and its subscales by groups in pre-test and post-test

Variable	Phase	Intervention group (mean ± SD)	Control group (mean ± SD)	P-value
Avoidance	Pre-test	10.41 ± 2.16	10.32 ± 2.08	0.380
	Post-test	11.53 ± 2.57	10.54 ± 2.33	< 0.001
Acceptance	Pre-test	12.09 ± 2.71	12.24 ± 2.86	0.230
	Post-test	13.71 ± 3.32	13.36 ± 2.97	< 0.001
Harnessing	Pre-test	9.79 ± 1.88	9.92 ± 1.96	0.670
	Post-test	11.03 ± 2.36	9.81 ± 1.93	< 0.001
Psychological flexibility	Pre-test	32.29 ± 4.54	32.48 ± 4.67	0.370
	Post-test	36.27 ± 5.72	32.71 ± 4.83	< 0.001

SD: Standard deviation

Table 4. Investigating the normality of the distribution of the variable in the pre-test and post-test

Variable	Phase	Intervention group		Control group	
		Z-value	P-value	Z-value	P-value
Avoidance	Pre-test	0.187	0.32	0.209	0.41
	Post-test	0.105	0.19	0.146	0.27
Acceptance	Pre-test	0.276	0.49	0.306	0.61
	Post-test	0.153	0.42	0.264	0.53
Harnessing	Pre-test	0.156	0.23	0.161	0.35
	Post-test	0.073	0.16	0.128	0.21
Psychological flexibility	Pre-test	0.219	0.38	0.237	0.47
	Post-test	0.113	0.21	0.195	0.34

Table 5 displays the results of the ANCOVA to determine the influence of acceptance and commitment therapy on the variable of psychological flexibility.

According to table 5, acceptance and commitment therapy increased psychological flexibility. A one-way ANCOVA was performed to examine the significant difference in the subscales between the two groups, and the results are shown in table 6.

According to table 6, presenting the independent variable (intervention) after the intervention resulted in a significant difference for the desired variables (psychological flexibility subscales) ($P < 0.001$). Therefore, when the intervening variable (pre-test) was controlled, the intervention significantly increased the mean values of the desired subscales in patients with MI.

Discussion

The current study aimed to examine the application of acceptance and commitment therapy on the psychological adaptability of patients with MI. The results demonstrated that the mentioned method enhanced the psychological flexibility and subscales of patients with MI. These findings are consistent with numerous studies conducted in this field (Contreras, Mioshi, & Kishita, 2020; Smith, Smith, & Dymond, 2020; Zhang, Leong Bin Abdullah, Shari, & Lu, 2022).

In explaining the results, the treatment was primarily based on acceptance and commitment, a behavioral therapy that employs cognitive fault acceptance skills and mindfulness to increase psychological flexibility. It entails developing the ability to select the most suitable option from various alternatives (Luoma, Hayes, & Walser, 2017). Acceptance and commitment therapy teaches individuals how to approach unwanted inner thoughts and feelings, as well as the physical states and communication patterns associated with these dynamics. In this way, individuals practice learning to consciously accept such thoughts and act in ways that continuously aim to facilitate adaptation to the disease. As individuals utilize these skills and strategies, they tend to adopt a more flexible approach to previously avoided situations.

Table 5. Analysis of covariance (ANCOVA) results for the effect of acceptance and commitment therapy on psychological flexibility

Source of variation	SS	df	MS	F	P-value
Pre-test	83.59	1	83.59	12.74	< 0.001
Dependent variable	762.37	1	762.37	116.17	< 0.001
Error	623.48	26	23.98		
Total	679.26	29			

SS: Sum of squares; df: Degree of freedom; MS: Mean square

Table 6. One-way analysis of covariance (ANCOVA) results for the effect of acceptance and commitment therapy on psychological flexibility subscales

Source of variation	Variable	SS	df	MS	F	P-value
Dependent variable	Avoidance	28.43	1	28.43	8.27	< 0.001
	Acceptance	49.37	1	49.37	13.86	< 0.001
	Harnessing	16.76	1	16.76	6.14	< 0.001

SS: Sum of squares; df: Degree of freedom; MS: Mean square

In addition, this method enables individuals to effectively manage their emotions by avoiding avoidance, altering their perspective on themselves and challenges, reevaluating their values and life goals, and committing to the goal, which is one of the method's primary components. These factors enhance the psychological adaptability of patients with MI by enhancing their social skills and interpersonal relationships (Habibovic, Piera-Jimenez, Wetzels, Widdershoven, & Soedamah-Muthu, 2022).

In treatment based on acceptance and commitment, behavioral commitment exercises, methods of breaking and accepting the individual's values and goals, and the need to specify values all contribute to a rise in psychological flexibility. In this approach, emphasizing people's desire for internal experiences was intended to help them experience their disturbing thoughts as just a thought and become aware of the dysfunctional nature of their current programs, so that instead of responding to it, they would implement what was essential to them in life and accordant with their values. Acceptance and commitment therapy aims to teach individuals to work towards their values and experience their thoughts and emotions rather than attempting to suppress them. In this therapeutic approach, metaphors and other techniques were also employed. Acceptance and commitment therapy is a situational intervention grounded in communication system theory that views the individual's suffering as the result of psychological rigidity fostered by cognitive fusion and experiential avoidance (Eifert, Forsyth, Arch, Espejo, Keller, & Langer, 2009). Instead of attempting to control, alter, or avoid negative experiences, an inflexible individual tends to maintain contact with them. To control or eliminate unpleasant experiences, individuals may engage in behaviors detrimental to their cognitive, emotional, and physical health. Furthermore, attempts to control unpleasant experiences may increase their intensity and frequency.

Another explanation is that, in therapy based on acceptance and commitment, the training of action based on values combined with the desire to act as meaningful personal goals prior to the removal of experiences prompted people to express their thoughts and emotions when confronted with problems (Foroozanfar & Ansari-Shahidi, 2020). By maintaining themselves, they reduced anxiety, irritability, fear, sense of danger, impatience, and restlessness caused by coping with physical issues. In addition, the technique of cognitive processes, which included exercises based on the exposure of linguistic metaphors and methods such as mental care, enabled individuals to overcome complex problems by preserving health and energy and enhancing performance, increasing their adaptability.

Acceptance and commitment therapy modifies the patients' attitude toward their pain and suffering, as well as their feelings and values; as a result, they will be more committed to their treatment and practice better self-care. Because MI is a common disease with psychological components, it can affect these patients' lifestyles and emotions. Moreover, self-care behaviors and following the treatment team's instructions are essential and undeniable for these patients. According to the results of the present study, acceptance and commitment therapy is introduced as one of the

effective non-pharmaceutical treatment methods for the psychological management of these patients and for increasing their psychological flexibility. Therefore, it must be considered an effective treatment alongside pharmaceuticals.

The current study also has limitations; because the participants are patients with MI, generalizing the results to other strata and groups should be done with caution. Other limitations include not conducting the follow-up phase and conducting the study in a treatment center. As a result, it is suggested that the desired intervention be carried out on other nations and cultures compared to the present study. According to the findings, it is suggested that counselors and psychologists, as well as doctors and nurses, hold specialized courses and retraining therapy based on acceptance and commitment. It is also suggested that in future studies, the effect of this method on other psychological aspects of patients with MI be investigated and that this psychological treatment be offered alongside medical treatment services in hospitals.

Conclusion

Psychological flexibility is emphasized as the foundation of mental health in acceptance and commitment therapy. The process of acceptance and commitment therapy helps patients accept responsibility for behavioral changes and change or push when necessary. In fact, this treatment strategy seeks to strike a balance between situationally appropriate methods. It focuses on change in areas where it is possible (such as overt behavior) and acceptance and mindfulness exercises where change is not possible (such as MI). In this regard, it assists the individual in adopting adaptive coping strategies. As a result, treatment based on acceptance and commitment, which has numerous benefits, particularly the training of acceptance and commitment to their implementation, enhances the psychological flexibility and its subscales of patients with MI.

Conflict of Interests

Authors have no conflict of interests.

Acknowledgments

None.

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