



Research Paper

Acceptance and Commitment Therapy on Psychological Distress, Alexithymia, and Spiritual Health in Cardiovascular Disease



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Running Title The Efficacy of ACT on Psychological Distress, Alexithymia, and Spiritual Health in CVD

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ABSTRACT

Background: Cardiovascular disease (CVD) can be aggravated due to stress, depression, anxiety, emotional and spiritual problems.

Objectives: The primary objective of this study was to assess the impact of acceptance and commitment therapy (ACT) on psychological distress, alexithymia, and spiritual health among women with CVD.

Materials & Methods: The current research adopted a randomized controlled clinical trial, employing a pre-test-post-test design along with a control group. The statistical population comprised women with CVD residing in the 6th district of Tehran during August and September 2021. The research sample comprised 30 women with CVD who were selected using purposive sampling and divided into experimental (n=15) and control groups (n=15). The experimental group received eight 90-minute sessions of ACT, but the control group did not receive any intervention. The data collection process included utilizing questionnaires to measure psychological distress, Toronto alexithymia, and spiritual health. The data collected were subsequently subjected to analysis using multivariate analysis of covariance SPSS software, version 24.

Results: The results showed that ACT compared to the control group significantly decreased anxiety (F=34.71, P=0.001, $\eta^2=0.63$), stress (F=30.14, P=0.001, $\eta^2=0.60$), depression (F=48.34, P=0.001, $\eta^2=0.71$), difficulty identifying feelings (F=28.80, P=0.001, $\eta^2=0.59$), difficulty describing feelings (F=44.30, P=0.001, $\eta^2=0.68$), externally oriented thinking (F=36.50, P=0.001, $\eta^2=0.68$), and increases existential health (F=37.69, P=0.001, $\eta^2=0.66$), and religious health (F=24.56, P=0.001, $\eta^2=0.55$) in women with CVD (P<0.01).

Conclusion: ACT offers promising prospects for improving the psychological, emotional, and spiritual health of women living with CVD. By promoting acceptance, emotional awareness, and committed action, ACT empowers women to cope effectively with psychological distress, address alexithymia, and nurture their spiritual well-being.

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Introduction

Cardiovascular disease (CVD) is a notable health concern for women, often underestimated and historically believed to be associated with male gender [1]. However, it's important to recognize that CVD affects women significantly, sometimes even more, and can exhibit distinct manifestations in females [2]. The prevalence of CVD varies by region and is influenced by factors like lifestyle choices, healthcare access, genetics, and socioeconomic status [3]. A study by Townsend et al. [4] highlighted a considerable occurrence of CVD in Europe, emerging as the primary cause of death for individuals under 70. In Iran, a review by Sarrafzadegan et al. [5] found that CVD was responsible for 46% of deaths and 23% of disease burden in the past four decades.

In CVD, anxiety, depression, and stress are among the psychological factors that may play a role in the occurrence or exacerbation of the disease. Psychological factors like anxiety, depression, and stress play a role in CVD, potentially triggering or exacerbating the condition [3]. Psychological distress encompasses negative emotions such as anxiety, depression, chronic stress, and mental suffering [6]. This distress can impact CVD development and progression, while CVD can reciprocally lead to psychological issues [7]. Unhealthy coping mechanisms, like overeating, smoking, sedentary behavior, and excessive alcohol consumption, can arise from psychological distress [8]. These behaviors contribute to CVD risk factors such as obesity, hypertension, and high cholesterol [9]. Research by Pimple et al. [10] revealed a strong link between psychological distress and CVD in women. Another study by Bouchard et al. [11] found that psychological distress and limited social support exacerbate CVD symptoms.

Emotions can have a significant impact on CVD, both in terms of its development and management. Suppressing and ignoring the emotions that exist in alexithymia can cause a late diagnosis of CVD. Alexithymia involves difficulties in recognizing, articulating, and managing one's emotions [12]. Individuals with alexithymia struggle to understand and express feelings, having limited emotional awareness [13]. Research suggests a link between alexithymia and CVD, implying its role in heart-related conditions [14]. Alexithymia may hinder recognizing physical CVD symptoms like chest pain [15]. Aluja et al.'s study [16] highlighted a strong correlation between alexithymia and CVD, leading to poor treatment adherence. Similarly, Wiernik et al. [17] found elevated alexithymia linked to lower quality of life and mental well-being, increasing susceptibility to CVD risk.

Having meaning in life can reduce the symptoms of illness and pain. The relationship between CVD and spiritual health is intricate and captivating. Spiritual health encompasses a sense of connection to something beyond oneself, finding purpose and meaning in life [18]. This multifaceted concept includes religious beliefs, practices, and a broader sense of spirituality apart from organized religion [19]. Spirituality and religion offer coping mechanisms to handle stress and challenges [20]. Religious activities like prayer or meditation can lower stress, a significant CVD risk factor, thereby promoting better heart health [21]. Brewer et al. [22] found that high spiritual levels correlate with healthier lifestyles, reduced fast-food and cigarette consumption, and fewer CVD instances. Similarly, von Flach et al. [23] discovered that spiritual health mitigates psychological issues and CVD risk. It's important to note that the impact of spiritual health on CVD can vary greatly from person to person. Not everyone is religious or spiritual, and individuals may have different belief systems. The key is that spiritual health, in whatever form it takes, can be a source of strength and support for individuals facing CVD. Healthcare providers should be sensitive to their patients' spiritual beliefs and consider the role of spirituality in their overall well-being and health management [19].

Pharmaceutical and medical treatments can be effective to some extent, but after some time having mental health and accepting the disease is of great importance. Recent research has started examining the role of acceptance and commitment therapy (ACT) for women with CVD [24], recognizing their unique challenges influenced by physical and psychosocial factors [25]. ACT is a psychotherapy approach that promotes psychological flexibility by helping individuals accept difficult emotions and thoughts and aligning actions with values and goals [26]. Utilizing mindfulness, acceptance strategies, and behavioral changes [27], ACT's emphasis on acceptance and mindfulness makes it suitable for addressing psychological factors in women with CVD [28]. ACT interventions have shown promise in reducing psychological distress among women with CVD, enabling them to better manage emotional burdens [29]. Rashidi et al. [30], Sheibani et al. [31], and Zhang et al. [32] collectively highlight ACT's efficacy in improving psychological and spiritual well-being among individuals with CVD.

The importance of mental health in women with CVD is multifaceted. It encompasses risk reduction, early intervention, treatment adherence, improved quality of life, and overall better cardiovascular outcomes. A holistic approach to women's cardiovascular care should include a focus on mental health, emphasizing the need

for screening, assessment, and intervention for mental health concerns alongside traditional medical management. This integrated approach can lead to more effective care and a higher quality of life for women living with CVD. Psychological treatments are an integral part of the comprehensive care provided to patients with CVD. They can help manage stress, anxiety, depression, and other emotional factors, facilitate behavior change, and improve overall well-being, all of which can contribute to better cardiovascular outcomes and a higher quality of life for these patients. Healthcare providers must consider the psychological aspects of CVD and integrate psychological interventions into the overall treatment plan for these patients. The present study was conducted with the aim of the effectiveness of ACT on psychological distress, alexithymia, and spiritual health of women with CVD.

Materials and Methods

The research design employed in this study was a randomized controlled clinical trial, utilizing a pre-test-post-test design supplemented with a control group. The statistical population under study consisted of women with CVD residing in the 6th district of Tehran during August and September the year 2021. After preparing a list of 30 patients (who had been diagnosed with CVD by a cardiologist), the researchers assigned 15 patients to the experimental and control groups by lottery. The determination of the sample size for this study was predicated upon earlier research and aligned with the parameters set forth by the G*Power software, version 3.1.9.7 (effect size=1.53, $1-\beta=0.97$, and $\alpha=0.05$) [33]. The inclusion criteria for participation in the study encompassed factors such as personal contentment, age range between 25 and 50 years (the disease is not due to old age), literacy for reading and writing, and the absence of psychiatric medication usage. Conversely, participants were excluded from the study if they failed to respond to questionnaire items, experienced an escalation in pain intensity, or missed more than two therapy sessions.

ACT

To select patients with CVD, two hospitals were referred. These individuals sought medical treatment for their condition at hospitals within the 6th district of Tehran (Gandhi and Mustafa Khomeini). Following the acquisition of consent from clinic authorities and patients, a total of 30 women diagnosed with CVD by their cardiologists were assigned to the intervention and control groups. The research questionnaires were completed by members of both groups in the form of a pre-test. Due

to the unfavorable conditions of the disease, it was tried to collect the pre-test scores in person and online (questionnaire link in [Google form](#)). ACT sessions by a therapist specializing in chronic diseases in the psychology clinic were then performed in eight 90-minute weekly group sessions for the experimental group, while the control group did not receive any intervention. To prevent the exchange of information between the members of the groups, they were asked not to discuss the content of the meetings with each other. For this reason, there was no dropout in the groups. ACT was designed based on the ACT programs proposed by Hayes et al. [34] and also taking into account the key characteristics in the design of ACT programs (Table 1). To comply with ethical principles, after collecting the post-test, treatment sessions were also held for the control group.

Measurement tools

Psychological distress scale (DASS-42)

The concise version of the DASS-42, grouped into three subscales: Depression, anxiety, and stress [35]. Each subscale has 14 questions, rated on a Likert scale of zero to three. Participants assess the extent of their experience of each condition over the past week, using a 4-point intensity/frequency scale. Scores for each subscale range from 0 to 42, where higher scores indicate greater psychological distress [34]. In the Iranian context, Cronbach's α coefficients for anxiety, depression, and stress are 0.85, 0.90, and 0.82, respectively [36]. In the present study, the content validity index (CVI) and content validity ratio index (CVR) were used to measure the content validity of the questionnaire. The CVI and CVR of the questionnaire were 0.83 and 0.87, respectively, which show the validity of the desired content of the DASS-42. Also, Cronbach's α coefficients for anxiety (0.86), depression (0.84), and stress (0.81) subscales showed reliable consistency.

Toronto alexithymia scale (TAS-20)

The 20-item alexithymia scale, developed by Bagby et al. [37] includes three subscales: Difficulty identifying feelings, difficulty describing feelings, and externally oriented thinking. Responses are assessed on a five-point Likert scale, ranging from 1 (completely disagree) to 5 (completely agree). Scores range from 20 to 100. Bagby et al. [37] established reliability with Cronbach's α of 0.81 and test re-test reliability of 0.77. In Iran, Cronbach's α ranged from 0.71 to 0.83, and test re-test reliability from 0.61 to 0.69 [38]. In the present study, the CVI and CVR were used to measure the content validity

Table 1. Overview of the sessions derived from the framework of ACT

Sessions	Target	Topic	Change Expected Behavior
1	Introduction to group guidelines and fundamental concepts of ACT.	Building rapport among group members and with the therapist, establishing group norms, objectives, and structure, introduction to therapeutic commitments, initial discussions on the principles of ACT.	Learn about ACT
2	Introduction to key therapeutic concepts in ACT, covering notions such as avoidance, cognitive fusion, and psychological acceptance.	Assessing clients' problems from the perspective of ACT, extracting experience, avoidance, mixing and values of the individual, making a list of advantages, disadvantages, and practices problem control.	Do not try to avoid negative emotions
3	Implement ACT techniques such as separation. Cognitive, psychological awareness, self-embodiment.	Specify inefficiency, and control negative events using metaphors, cognitive separation training, psychological awareness, and self-visualization.	Accepting negative behaviors and emotions
4	Teaching therapy techniques, emotional awareness, awareness wisely (metaphor of your victim).	Distinguishing between evaluations and personal experiences, adopting an observational stance towards thoughts without judgment, aiming for enhanced mental flexibility and cultivation of positive emotions.	Pay attention to current experiences and moment-by-moment
5	Instruction and application of therapeutic healing techniques, incorporating mindfulness practices and distress tolerance training.	Cultivate present-moment awareness and conceptualize self as an observing entity, instruct techniques for mindful awareness and building tolerance towards anxiety, emphasizing the acceptance of negative emotions.	Embracing negative emotions and thoughts without bias or judgment.
6	Instructing therapeutic strategies for identifying and embracing personal values with clarity-facilitating value clarification and delivering emotion regulation techniques.	Assisting clients in identifying life values and evaluating their significance, compiling a catalog of hindrances to value actualization, and cultivating positive emotions.	Strive for psychological flexibility
7	Teaching techniques of personal values and practice commitment and increasing interpersonal efficiency.	Offering concrete strategies to surmount obstacles, employing metaphors for enhanced understanding, and formulating plans to enact commitment towards values, ultimately cultivating a sense of life purpose and meaning.	Gain psychological flexibility
8	Revisiting and applying taught therapeutic techniques, with a focus on emotion regulation and cultivating meaning in everyday life situations.	Compilation of a progress report regarding value pursuit steps, encouraging clients to elaborate on session outcomes, and encouraging application of taught techniques in real-life scenarios to foster a sense of purpose and elicit positive emotions.	Mitigating negative emotions and thoughts while cultivating psychological flexibility.



of the questionnaire. The CVI and CVR of the questionnaire were 0.89 and 0.81, respectively, which show the validity of the desired content of the DASS-42. Also, Cronbach's α for subscales were 0.81, 0.86, and 0.84, indicating good internal consistency.

Spiritual health questionnaire (SHQ)

The SHQ was developed by Bufford et al. [39] and comprises 10 items with even numbers assessing existential health, and 10 items with odd numbers evaluating religious health. The combined spiritual health score, ranging from 20 to 120, results from both subsets' cumulative scores. Respondents' answers follow a six-point Likert scale. Bufford et al. [39] established the scale's

validity and reliability at 0.86 and 0.91, respectively, among students. In Iran, the questionnaire exhibited a Cronbach's α coefficient of 0.85 [40]. In the present study, the CVI and CVR were used to measure the content validity of the questionnaire. The CVI and CVR of the questionnaire were 0.84 and 0.83, respectively, which show the validity of the desired content of the DASS-42. Also, internal consistency was strong, with Cronbach's α coefficients of 0.89 for existential health and 0.84 for religious health.

Statistical analyses

To analyze the research data, descriptive statistics including Mean \pm SD and covariance analysis were used

based on their assumptions with the help of SPSS software, version 24. The significance level of these tests was considered 0.05. The Shapiro-Wilk test results were reported to check the normality of the distribution of variables in the two groups. According to the results, normal distribution was met for all variables. The study used multivariate analysis of covariance to assess the effectiveness of ACT on psychological distress, alexithymia, and spiritual health in women with CVD. The researchers tested various assumptions about the equality of variance, covariance matrix, and regression coefficients. The results indicated that these assumptions were valid.

Results

The Mean±SD of the age of the experimental and control groups were 49.12±5.27 and 48.74±4.86, respectively. As displayed in Table 2, highlights no statistically significant differences between the two groups in terms of demographic variables.

The Mean±SD of pre-test-post-test scores of psychological distress, alexithymia, and spiritual health in patients with CVD in the experimental and control groups are presented in Table 3. According to Table 3, there was a significant difference in the pre-test scores of the two experimental and control groups.

The results of the Levin test to examine the homogeneity of variance of dependent variables in groups showed that the variance of psychological distress ($F=2.615$, $P=0.117$), alexithymia ($F=1.50$, $P=0.231$), and spiritual health ($F=1.37$, $P=0.251$) were equal in the groups. The results of the Box test to evaluate the equality of the covariance matrix of dependent variables between the

experimental and control groups also showed that the covariance matrix of the dependent variables is equal (box $M=55.43$, $F=1.06$, $P=0.377$). Also, the results of the chi-square-Bartlett test to examine the sphericity or significance of the relationship between psychological distress, alexithymia, and spiritual health showed that the relationship between them is significant ($\chi^2=140.88$, $df=35$, $P<0.05$). The homogeneity of regression coefficients was examined through the interaction of dependent variables and independent variables (intervention method) in the pre-test and post-test. The interaction of these pre-tests and post-tests with the independent variable was not significant and indicated the homogeneity of the regression slope. Therefore, all assumptions of multivariate analysis of covariance were met. Table 4 shows the results of multivariate analysis of covariance for comparison between the two groups. The marginal post-test score adjusted for baseline covariate showed that there was a significant difference between the two groups in terms of anxiety ($F=34.71$), stress ($F=30.14$), depression ($F=48.34$), difficulty identifying feelings ($F=28.80$), difficulty describing feelings ($F=44.30$), externally oriented thinking ($F=36.50$), existential health ($F=37.69$), and religious health ($F=24.56$) at the level of 0.001. These findings indicate that there is a significant difference between the groups in these variables.

Discussion

The present study was conducted with the aim of the effectiveness of ACT on psychological distress, alexithymia, and spiritual health of women with CVD. The results of the present study showed that women with CVD had less anxiety, depression, and stress after receiving treatment based on ACT. These findings are in

Table 2. Demographic information of study participants in the experimental and control groups

Variables		No. (%)		P*
		Experimental	Control	
Duration of diseases (y)	1-3	7(46.6)	9(60.0)	0.085
	>4	8(53.4)	6(40.0)	
Marital states	Married	11(73.4)	10(66.6)	0.063
	Single	4(26.6)	5(33.4)	
Education	Diploma	6(40.0)	7(46.6)	0.059
	Bachelor's	4(26.6)	4(26.6)	
	Masters	5(33.4)	4(26.6)	

*Chi-square.

Table 3. Descriptive indices of study's variables in control and experimental groups

Variables	Group	Mean±SD		p [‡]
		Pre-test	Post-test	
Anxiety	Intervention	32.22±1.69	27.86±1.52	0.001
	Control	31.06±1.30	31.40±1.74	0.243
	p [‡]	0.384	0.001	
Stress	Intervention	28.53±1.95	24.60±1.52	0.001
	Control	28.73±2.62	28.33±2.09	0.145
	p [‡]	0.502	0.001	
Depression	Intervention	32.33±1.94	27.26±2.63	0.001
	Control	32.13±1.84	32.53±1.87	0.095
	p [‡]	0.163	0.001	
Difficulty identifying feelings	Intervention	27.46±1.38	24.60±1.49	0.001
	Control	27.60±1.22	27.40±1.83	0.307
	p [‡]	0.495	0.001	
Difficulty describing feelings	Intervention	28.13±1.37	24.13±1.98	0.001
	Control	28.01±1.28	28.26±2.51	0.086
	p [‡]	0.948	0.001	
Externally oriented thinking	Intervention	23.80±1.33	21.20±2.48	0.001
	Control	23.86±1.94	23.73±2.36	0.230
	p [‡]	0.642	0.001	
Existential health	Intervention	42.60±1.93	46.01±1.93	0.001
	Control	42.73±2.82	42.40±1.52	0.351
	p [‡]	0.593	0.001	
Religious health	Intervention	43.86±1.44	47.86±1.95	0.001
	Control	43.66±1.68	43.94±2.37	0.284
	p [‡]	0.417	0.001	

[‡]Within-group comparison; [‡]Between-group comparison.



line with the research of Dar et al. [8]; Osborne et al. [9]; Pimple et al. [10] and Bouchard et al. [11].

ACT can be beneficial in improving psychological well-being and reducing symptoms of anxiety, depression, and stress in various populations, including those with chronic health conditions [30]. In the case of women with CVD, ACT might have been used as an adjunct

to traditional medical treatment to address their mental health concerns. The stress and emotional burden associated with a CVD diagnosis can significantly impact a person's overall well-being [24]. By promoting acceptance, mindfulness, and value-driven actions, ACT equips women with the necessary tools to enhance their emotional well-being and overall quality of life. While medical interventions remain crucial, addressing the

Table 4. Comparison of post-test marginal mean scores between the two groups

Dependent Variables	Group	Marginal Mean	95% CI	F	P	η^2
Anxiety	Intervention	27.80	26.90-28.71	34.71	0.001	0.63
	Control	31.45	30.55-32.36			
Stress	Intervention	24.66	23.70-25.62	30.14	0.001	0.60
	Control	28.26	27.30-29.22			
Depression	Intervention	27.12	25.94-28.29	48.34	0.001	0.71
	Control	32.68	31.50-33.85			
Difficulty identifying feelings	Intervention	24.65	23.92-25.39	28.80	0.001	0.59
	Control	27.34	26.60-28.07			
Difficulty describing feelings	Intervention	24.10	23.18-25.02	44.30	0.001	0.68
	Control	28.29	27.37-29.21			
Externally oriented thinking	Intervention	21.22	20.61-21.82	36.50	0.001	0.65
	Control	23.71	23.10-24.31			
Existential health	Intervention	46.05	45.16-46.93	37.69	0.001	0.66
	Control	42.34	41.46-43.23			
Religious health	Intervention	47.75	46.65-48.85	24.56	0.001	0.55
	Control	44.03	42.94-45.14			

CI: Confidence interval; η^2 : Eta square.



psychological aspects of CVD is equally vital for providing comprehensive care to women facing this challenging health condition [31]. The results of Dar et al. [8] determined that people who have high levels of psychological distress are at risk of CVD. On the other hand, the findings of a review study by Osborne et al. [9] showed that stress, anxiety, and depression are among the aggravating factors in the onset and increase of CVD levels.

The findings of the present study showed that women with CVD had less difficulty identifying feelings, difficulty describing feelings, and externally oriented thinking after receiving ACT. These findings are in line with studies by Maqbool et al. [14]; Lazarević et al. [15]; Aluja et al. [16] and Wiernik et al. [17].

ACT can be a useful therapeutic approach for individuals struggling with alexithymia. By promoting acceptance of emotions and thoughts without judgment, individuals with alexithymia can begin to develop a greater understanding and awareness of their emotions [14]. Mindfulness practices in ACT can help individuals become more attuned to

their bodily sensations and emotional experiences, which can be beneficial for those with alexithymia, as they might find it challenging to identify emotions based solely on cognitive appraisal [26]. The values clarification and committed action aspects of ACT can help individuals with alexithymia align their behaviors with their deeper values, even if they struggle to connect with their emotions directly [30]. The study's findings underscore the significant impact of ACT in reducing alexithymia among women with CVD. By addressing this often-overlooked emotional factor, healthcare providers can contribute to improved patient outcomes, enhanced emotional well-being, and better quality of life for women living with cardiovascular conditions [25]. The results of Maqbool et al. [14] revealed that a significant number of patients with CVD have high levels of alexithymia, which causes them to not pursue treatment. On the other hand, the findings of Lazarević et al. [15] study indicated a significant positive correlation between alexithymia and CVD. In the meantime, people who had problems recognizing their emotions were indifferent to their illness and did not make efforts to increase their quality of life and mental health.

The results of the present study showed that women with CVD had higher existential and religious health after receiving ACT. These findings are in line with the research of Aryafard et al. [20]; Heshmati et al. [21]; Brewer et al. [22] and von Flach et al. [23].

The journey with CVD can evoke existential questions and prompt a search for meaning and purpose, making spiritual health vital for overall well-being. ACT's emphasis on values and committed action aligns with many spiritual principles, encouraging women to connect with their spiritual beliefs and integrate them into their lives [24]. As women identify and live in alignment with their spiritual values, they may experience greater spiritual growth and a deeper sense of purpose [31]. Spirituality is a deeply personal and transformative aspect of human existence, encompassing the search for meaning, purpose, and connection to something greater than oneself. Many individuals find solace, guidance, and a sense of fulfillment in their spiritual beliefs and practices [27]. In recent years, mental health professionals have recognized the significance of integrating spirituality into therapy to support individuals on their journey toward holistic well-being [29]. Both ACT and spirituality recognize the impermanent and uncertain nature of life. Through ACT's focus on values and mindfulness, individuals can develop resilience and cope with difficult emotions and challenging life circumstances. This can lead to a more profound acceptance of uncertainty, fostering a sense of surrender and trust in one's spiritual journey [28]. The results of a review study by Aryafard et al. [20] determined that the spiritual health of Iranian patients with CVD is average, which requires further improvement. On the other hand, the findings of Heshmati et al. [21] indicated a significant correlation between hope, optimism, and spiritual well-being. Patients with high levels of spirituality were less likely to have severe vascular disease.

The impossibility of controlling the social, educational, and economic status of the research participants was one of the limitations of the research. Therefore, it is suggested that in future research, efforts should be made to control these components. Also, due to the conditions of the COVID-19 epidemic, a small sample size was selected, and it is suggested that more patients be investigated in future studies. The impossibility of long-term follow-up of the impact of the program using a follow-up test was another limitation. Based on this, it is suggested that this issue be taken into consideration in future research so that it is possible to examine the long-term impact of ACT.

Conclusion

ACT offers promising prospects in improving the psychological, emotional, and spiritual health of women living with CVD. By promoting acceptance, emotional awareness, and committed action, ACT empowers women to cope effectively with psychological distress, address alexithymia, and nurture their spiritual well-being. As a holistic therapeutic approach, ACT acknowledges the interconnectedness of these dimensions, allowing women to find strength, purpose, and resilience as they navigate the challenges of living with CVD. As further research unfolds, the potential of ACT in enhancing the overall well-being of women with CVD remains an essential focus for clinicians and researchers alike.

Ethical Considerations

Compliance with ethical guidelines

The present study was approved by Ethics Committee of [Baqiyatallah University of Medical Sciences](#) (Code: IR.BMSU.BAQ.REC.1399.011).

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Authors' contributions

Conceptualization and supervision: Farzin Bagheri Sheykhangafshe and Vahid Savabi Niri; Methodology: Maryam Zolfagharnia, Zeynab Bourbour and Forough Esrfilian; Investigation: Farzin Bagheri Sheykhangafshe and Vahid Savabi Niri; Writing: All authors.

Conflict of interest

The authors declared no conflict of interest.

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