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Comparison of the Effectiveness of Spiritual Therapy and Mindfulness-Based Cognitive Therapy on Social Anxiety in Older Adults with Cardiovascular Disease

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A B S T R A C T

Purpose: The present study aimed to compare the effectiveness of spiritual therapy and mindfulness-based cognitive therapy on social anxiety in older adults with cardiovascular disease.

Methods and Materials: This study employed a quasi-experimental design with a pretest–posttest–follow-up structure including two experimental groups and one control group. The statistical population consisted of older adults aged 65 years and above with cardiovascular disease who were referred to Imam Jafar Sadiq Super-Specialty Hospital in 2021. Using multistage sampling, 45 participants were selected and randomly assigned to spiritual therapy, mindfulness-based cognitive therapy (MBCT), and control groups (15 participants in each group). Data were collected using the Social Anxiety Questionnaire developed by Jerabek (1996). The spiritual therapy intervention was based on the protocol by Boalhari et al. (2012), and the MBCT intervention followed Segal et al. (2009), each delivered in eight 90-minute group sessions. Data were analyzed using repeated-measures multivariate analysis of variance (MANOVA) in SPSS version 27.

Findings: The results indicated that the main effect of group on social anxiety components was significant ($p < .05$), demonstrating differences among the three groups. The within-group effect across time (pretest, posttest, and follow-up) was also significant ($p < .05$), indicating changes in social anxiety over time. Bonferroni post hoc tests revealed significant differences between pretest and posttest, and between pretest and follow-up in the experimental groups ($p < .05$), while no significant difference was found between posttest and follow-up ($p > .05$), indicating stability of treatment effects. The interaction effect of time and group was significant ($p < .05$), showing differential changes across groups over time. However, no significant difference was found between the spiritual therapy and MBCT groups in overall effectiveness ($p > .05$).

Conclusion: Both spiritual therapy and mindfulness-based cognitive therapy are effective interventions for reducing social anxiety in older adults with cardiovascular disease, and their effects are maintained over time; however, neither approach demonstrates superiority over the other.

Keywords: *Spiritual therapy, mindfulness-based cognitive therapy, social anxiety, older adults, cardiovascular disease.*

1. Introduction

Cardiovascular disease is one of the most serious health challenges in late adulthood, because it is not only associated with mortality and physical disability but also with substantial psychological burden. Older adults with cardiovascular disease often experience reduced functional capacity, dependence on medical care, fear of recurrence or worsening symptoms, and limitations in social participation. Recent evidence has emphasized the continuing vulnerability of older populations to cardiovascular mortality and disease-related complications, showing that cardiovascular risk in late life is shaped by biological, environmental, and psychosocial factors (Yao et al., 2025; Zeng & Yin, 2025). In older adults, chronic cardiovascular conditions may also interact with emotional problems, especially anxiety and depressive symptoms, because illness-related uncertainty, reduced autonomy, and repeated medical follow-up can intensify psychological distress. Studies on older and middle-aged patients with cardiovascular-related conditions have shown that depressive and anxiety symptoms are closely linked with non-fatal cardiovascular disease and health vulnerability, indicating that psychological status should be considered an important component of cardiovascular care (Chang et al., 2025; Shu et al., 2025). Therefore, psychological interventions for older adults with cardiovascular disease should address not only physical symptoms but also emotional regulation, self-perception, social functioning, and existential concerns.

Social anxiety is one of the psychological problems that can significantly reduce the quality of life of older adults with chronic illness. Although social anxiety is often studied among adolescents and young adults, its manifestations in older adults can be clinically important, particularly when physical illness increases dependency, self-consciousness, fear of being judged, and avoidance of interpersonal situations. In older adults with cardiovascular disease, social anxiety may be intensified by fear of visible physical symptoms, concerns about health-related limitations, and worry about negative evaluation by others. Evidence from aging and chronic disease research indicates that older patients often face combined burdens of physical impairment, emotional distress, sleep disturbance, malnutrition, and reduced quality of life, all of which can weaken social engagement and psychological well-being (Alatas & Arslan, 2023). Moreover, social anxiety is associated with intolerance of uncertainty, negative self-focused attention, and avoidance patterns that restrict interpersonal participation and reduce emotional resilience (Felsman et al., 2023). These processes are especially problematic in late adulthood, when social support and interpersonal connectedness are protective resources against loneliness, illness-related distress, and reduced quality of life.

Mindfulness-based cognitive therapy has emerged as an important psychological intervention for reducing anxiety, depression, emotional reactivity, and maladaptive cognitive patterns. MBCT integrates mindfulness practices with cognitive therapy principles and aims to help individuals develop nonjudgmental awareness of thoughts, emotions, bodily sensations, and behavioral impulses. Rather than attempting to suppress distressing thoughts, MBCT trains participants to observe them as transient mental events, thereby reducing cognitive fusion, rumination, avoidance, and automatic emotional reactions. Meta-analytic and clinical evidence has supported the effectiveness of MBCT and related mindfulness-based interventions for depression, anxiety, suicidal ideation, and cognitive-emotional outcomes across different clinical and nonclinical populations (Kraines et al., 2022; Tseng et al., 2023; Zhang et al., 2022). In chronic conditions, adherence to MBCT may be influenced by illness burden, motivation, perceived relevance of practices, and accessibility of training; nevertheless, evidence suggests that mindfulness-based approaches can be adapted to populations with persistent health problems (Marks et al., 2023). For older adults with cardiovascular disease, MBCT may be particularly useful because it targets anxious bodily monitoring, catastrophic interpretations of symptoms, and avoidance of distressing internal experiences.

The relevance of MBCT to social anxiety is supported by studies showing its effects on self-esteem, self-concept, emotion regulation, and anxiety reduction. In individuals with social anxiety disorder, MBCT has been reported to improve self-esteem and self-concept while reducing social anxiety symptoms, suggesting that mindfulness practices can change the way individuals relate to socially threatening thoughts and emotions (Raee et al., 2022). Similarly, research on women exposed to domestic violence showed that mindfulness-based cognitive therapy improved social anxiety, resilience, and emotion regulation, indicating that MBCT can reduce anxiety even in populations exposed to chronic psychological stress (Taherifard & Mikaeili, 2019). Recent systematic evidence also shows that mindfulness-based interventions can be effective in reducing social

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anxiety and may offer outcomes comparable to cognitive-behavioral approaches in some populations (Dones et al., 2024). Furthermore, MBCT has shown promising effects for social anxiety symptoms in people living with alopecia areata, a condition in which visible symptoms may increase fear of evaluation and social avoidance, a mechanism that is conceptually relevant to older adults who experience visible or perceived health-related vulnerability (Heapy et al., 2023).

Beyond social anxiety, MBCT has been applied to a broad range of psychological and behavioral conditions, strengthening its theoretical and clinical basis. Research has shown that different forms of meditation training, including focused attention, open monitoring, and MBCT, can influence emotional reactivity and regulation at both subjective and neural levels (Brown et al., 2022). MBCT has also been examined for stress and anxiety reduction among college students, with evidence suggesting that mindfulness practices may reduce distress through improved awareness, attention regulation, and adaptive coping (Ellison et al., 2024). In addition, MBCT has been extended to areas such as academic grit, internet gaming disorder, and neurological symptom management, indicating its flexible application across different forms of dysregulation and maladaptive engagement with thoughts, impulses, and symptoms (Kim et al., 2025; Rusadi et al., 2023; Wong & Wingrove, 2025). Evidence also supports mindfulness-based interventions in neurological and medical populations, such as poststroke patients with depression, further highlighting their relevance for individuals whose psychological symptoms occur in the context of physical illness (Tao et al., 2022). These findings suggest that MBCT may be a suitable intervention for older adults with cardiovascular disease who experience anxiety-related avoidance and reduced social functioning.

Spiritual therapy is another intervention with strong relevance for older adults and patients with chronic illness. Spirituality can provide meaning, hope, connection, acceptance, and a framework for coping with suffering, uncertainty, and fear of death. In late adulthood, spiritual beliefs and practices may become especially salient because individuals often face losses, illness, dependency, and existential concerns. Religious and spirituality-based therapies have been increasingly examined in mental health care, and meta-analytic evidence indicates that such interventions can be beneficial compared with standard treatment in psychological outcomes (Bouwhuis-Van Keulen et al., 2024). Spiritual group therapy has also been shown to improve quality of life and empowerment in women with breast cancer, suggesting that spiritual interventions can strengthen coping resources and psychological adjustment in medical populations (Momennasab et al., 2024). In patients with diabetes, spiritual therapy has been compared with hope therapy and has shown benefits for quality of life and biological indicators, supporting its relevance for chronic disease management (Peyravi, 2022). For older adults with cardiovascular disease, spiritual therapy may help reduce social anxiety by increasing trust, meaning, emotional calmness, self-acceptance, and perceived support.

Previous Iranian studies have also shown that spiritual therapy and mindfulness-based interventions can reduce psychological symptoms in clinical and older adult populations. A comparative study on patients with irritable bowel syndrome reported the effectiveness of both mindfulness-based cognitive therapy and spiritual therapy on somatic symptoms, anxiety, and depression, indicating that both approaches can influence psychological and bodily distress in psychosomatic conditions (Asadollahi, 2013). Another study comparing mindfulness-based therapy and spiritual therapy among older women showed that both interventions were effective in reducing irrational beliefs and anxiety, which is directly relevant to older adults who experience anxiety-related cognitions and emotional vulnerability (Barghi Irani & Dehghan Saber, 2020). These findings are important because they suggest that both interventions may be culturally and clinically acceptable in Iranian samples and may address different dimensions of psychological distress. While MBCT primarily targets cognitive-emotional processes through awareness and decentering, spiritual therapy may operate through meaning-making, spiritual connection, hope, and existential reassurance.

Despite the growing body of research on MBCT and spiritual therapy, comparative evidence regarding their effectiveness for social anxiety in older adults with cardiovascular disease remains limited. Many studies have examined mindfulness-based interventions in depression, stress, social anxiety, chronic illness, or general mental health outcomes (Ellison et al., 2024; Maloney et al., 2024; Raee et al., 2022), while spiritual therapy has often been studied in relation to quality of life, empowerment, anxiety, and coping in chronic disease populations (Bouwhuis-Van Keulen et al., 2024; Momennasab et al., 2024; Peyravi, 2022). However, older adults with cardiovascular disease represent a distinct population in which biological vulnerability, fear of symptoms, reduced social

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participation, and existential concerns may simultaneously contribute to social anxiety. Therefore, comparing these two interventions can clarify whether approaches based on mindfulness and cognitive decentering differ from approaches based on spiritual meaning and connection in reducing the components of social anxiety. Such comparison is clinically valuable because it may help psychologists, counselors, and health-care professionals select culturally appropriate and psychologically effective interventions for older cardiac patients.

Accordingly, the present study aimed to compare the effectiveness of spiritual therapy and mindfulness-based cognitive therapy on social anxiety in older adults with cardiovascular disease.

2. Methods and Materials

2.1. Study Design and Participants

The present study employed a quasi-experimental design with a pretest–posttest–follow-up structure including a control group. The statistical population consisted of all older adults aged 65 years and above with cardiovascular diseases in Aligudarz County who were referred to Imam Jafar Sadiq Super-Specialty Hospital in 2021. Their diagnosis was confirmed by a specialist physician based on diagnostic tests, and all participants had medical records at the hospital. The sampling method was multistage (convenience sampling in the first stage and purposive sampling in the second stage). Cohen's table was used to determine the sample size. Considering an effect size of 0.70 based on prior studies, statistical power of 0.91, and a significance level of 0.05, the minimum sample size for each group was 12 participants; thus, a total of 36 participants was required to test the hypothesis with a power of 0.91. To account for potential attrition during the study, the sample size was increased to 45 older adults with cardiovascular disease. Accordingly, 45 participants were randomly assigned (using random allocation based on group matching using initial data) to two intervention groups and one control group based on the inclusion and exclusion criteria. Ethical considerations included obtaining informed consent, ensuring confidentiality of participants' information, and providing the control group with access to interventions free of charge. Inclusion criteria consisted of a medical diagnosis of cardiovascular disease by a specialist, absence of psychotic spectrum disorders, no substance use or withdrawal medication during the study and psychotherapy sessions, voluntary participation, age of 65 years or older, and basic literacy skills. Exclusion criteria included the presence of psychological disorders, physical illnesses such as cancer, seizures or neurological disorders, substance abuse, intellectual disability, and psychotic spectrum disorders.

After obtaining the necessary permissions and referring to the hospital, 45 older adults with cardiovascular diseases were selected using a multistage sampling method (convenience sampling followed by purposive sampling) and were randomly assigned to two intervention groups and one control group based on the inclusion and exclusion criteria. All participants in both intervention and control groups completed the research questionnaire as a pretest prior to the implementation of the interventions. During the study, participants were provided with instructions regarding the purpose of the research, the necessity of answering all questionnaire items, and assurance of confidentiality. All questionnaires in the pretest, posttest, and follow-up stages were coded, and a unique code was assigned to each participant. Participants were informed of their right to withdraw from the study at any stage. An 8-session treatment protocol was developed for the implementation of interventions (spiritual therapy and mindfulness-based cognitive therapy). To ensure cooperation and trust among participants, session rules and duration were clearly explained, and session schedules were arranged with participants' agreement prior to implementation. After completion of the intervention, all participants in both intervention groups and the control group completed the posttest questionnaire. To assess the durability of treatment effects, all groups were reassessed two months later during the follow-up phase. The interventions were delivered by the researcher, who had completed formal training in these therapeutic approaches, at a clinical setting. The control group did not receive any intervention during this period. After the study, members of the control group were offered the opportunity to participate in the interventions free of charge or benefit from related educational resources and workshops, either free or at discounted rates. Additionally, participants who requested feedback were provided with a simplified interpretation of their questionnaire results. Ethical principles were strictly observed, including informing participants about the study objectives, voluntary participation, confidentiality, anonymity, and the right to withdraw at any stage. Ethical approval and an ethics committee code were also obtained.

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2.2. *Measures*

The Social Anxiety Questionnaire developed by Jerabek (1996) was used to assess social anxiety. This instrument consists of 25 items rated on a 5-point Likert scale ranging from “almost always” to “almost never.” The scoring is direct (not reverse-scored), such that “almost always” receives a score of 5 and “almost never” receives a score of 1. Higher scores on this scale indicate lower levels of social anxiety. This questionnaire was administered in Iran by Sam Deliri (2002) on a sample of 477 students, and its validity and reliability were reported as satisfactory. Construct validity was established using factor analysis, which extracted five factors: fear of strangers, fear of evaluation by others, fear of public speaking, fear of social isolation, and fear of exhibiting anxiety symptoms. These five factors explained 47.23% of the total variance (Sam Deliri, 2002). In the present study, reliability was assessed using Cronbach’s alpha, yielding a coefficient of 0.87.

2.3. *Interventions*

The spiritual therapy intervention was developed based on the spiritual skills protocol of Boalhari et al. (2012) and was implemented as an eight-session group treatment program, with each session lasting 90 minutes. The first session focused on introducing participants, familiarizing them with the therapeutic process, establishing a supportive and friendly relationship with older adults with cardiovascular disease, and explaining well-being, spirituality, spiritual therapy, and its benefits. The second session addressed knowledge and belief in God, the role of divine presence in everyday life, the characteristics of a spiritual person, and the distinction between religion and spirituality. The third and fourth sessions reviewed previous content and assignments and introduced different forms of self-awareness, including physical, psychological, social, and spiritual self-awareness, accompanied by examples, discussion of spiritual experiences, and practical exercises. The fifth session focused on remembrance of God, its forms, and its effects on mental health, tranquility, anxiety reduction, self-confidence, willpower, spiritual growth, and the replacement of negative behaviors with positive ones through prayer and spiritual exercises. The sixth session included meditation as an experiential mindfulness practice, review of assignments, awareness of current behaviors and emotions, internal and external control, and the interpretation of anxious behaviors and psychological well-being as internal and external choices. The seventh session emphasized the expansion of spiritual experiences, appropriate goal setting, continuous relationship with God in daily life, compassion, kindness, helping others, and the role of kindness in improving interpersonal relationships and the treatment process. The eighth session focused on finding meaning in life, reviewing assignments, discussing the concept of life meaning and inner peace, modeling comprehensive spiritual behaviors, improving interpersonal relationships, resolving personal and social worries through religious practices, strengthening inner connection, expressing positive psychological emotions, and reflecting on new experiences derived from spiritual functioning.

The mindfulness-based cognitive therapy (MBCT) intervention was developed based on Kelly’s (2009) MBCT protocol and was implemented as an eight-session group treatment program, with each session lasting 90 minutes. The first session included participant introduction, establishment of a therapeutic relationship and trust, completion of questionnaires, explanation of the treatment rationale and procedure, a brief overview of the eight-session program, discussion of participants’ experiences during exercises, and assignment of homework focused on present-moment awareness and the raisin-eating exercise. The second session involved reviewing homework, practicing the body scan, seated meditation, discussion of meditation experiences, distinguishing thoughts from emotions, and assigning mindfulness of a pleasant event and seated meditation as homework. The third session included seeing and hearing exercises, seated meditation, discussion of homework, mindful movement practices, the three-minute breathing space, discussion of participants’ experiences, and distribution of session materials. The fourth session focused on homework review, meditation with attention to breathing and walking, stress responses and reactions to difficult situations, mindful walking practice, seated meditation, mindful physical movement, and the three-minute breathing exercise during an unpleasant event. The fifth session included discussion of meditation homework, seated meditation, recording unpleasant events, mindful body movements, and homework involving the three-minute breathing space during an unpleasant event and mindfulness of a new daily activity at home. The sixth session involved reviewing seated meditation and the three-minute breathing space, discussing pleasant events, practicing the creation of thoughts from detached perspectives, accepting feelings as feelings, and choosing personally preferred combinations of meditation practices along with daily mindfulness exercises. The seventh session

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included a half-day retreat lasting five hours, homework review, four-dimensional mountain meditation, self-care exercises, training in nonjudgmental acceptance, and continued meditation and breathing-space homework. The eighth session focused on reviewing homework, body scan practice, seated meditation, administration of tests, the three-minute breathing space, discussion of strategies for coping with problems and obstacles to meditation, review of the entire program, presentation of strategies for continuing mindfulness practices after the intervention, and administration of the posttest.

2.4. Data Analysis

Descriptive statistics, including percentages, frequencies, tables, figures, and charts, were used to describe demographic characteristics. Means, standard deviations, skewness, and kurtosis were used to describe the study variables. Descriptive analyses were conducted using SPSS version 27. In the inferential statistics section, multivariate analysis of variance with repeated measures was employed using SPSS version 27 to address the research questions.

3. Findings and Results

The descriptive results of the Social Anxiety Scale are presented in Table 1 by pretest, posttest, and follow-up stages in the experimental and control groups. As can be observed, the mean scores in the spiritual therapy and mindfulness-based cognitive therapy groups changed at the posttest stage compared with the pretest stage. Based on the results presented in this table, it can be stated that spiritual therapy and mindfulness-based cognitive therapy reduced the components of social anxiety in older adults with cardiovascular disease.

Table 1

Descriptive indices of social anxiety by measurement stage across groups

Group	Variable	Index	Pretest	Posttest	Follow-up
Spiritual therapy	Fear of strangers	Mean	32.27	22.67	22.87
Spiritual therapy	Fear of strangers	Standard deviation	6.52	6.09	6.39
Spiritual therapy	Fear of strangers	Skewness	0.57	0.58	0.10
Spiritual therapy	Fear of strangers	Kurtosis	-1.41	-0.47	-1.03
Mindfulness-based cognitive therapy	Fear of strangers	Mean	32.27	25.60	26.20
Mindfulness-based cognitive therapy	Fear of strangers	Standard deviation	6.33	5.37	4.84
Mindfulness-based cognitive therapy	Fear of strangers	Skewness	-0.65	1.09	0.77
Mindfulness-based cognitive therapy	Fear of strangers	Kurtosis	0.29	-0.71	-0.23
Control	Fear of strangers	Mean	32.00	31.60	29.67
Control	Fear of strangers	Standard deviation	5.44	5.93	6.50
Control	Fear of strangers	Skewness	-0.08	0.08	-0.31
Control	Fear of strangers	Kurtosis	-0.21	0.43	1.42
Spiritual therapy	Fear of evaluation by others	Mean	14.53	9.27	9.80
Spiritual therapy	Fear of evaluation by others	Standard deviation	3.09	4.20	3.61
Spiritual therapy	Fear of evaluation by others	Skewness	1.24	0.69	-0.57
Spiritual therapy	Fear of evaluation by others	Kurtosis	0.77	-0.26	-0.90
Mindfulness-based cognitive therapy	Fear of evaluation by others	Mean	14.27	11.20	12.00
Mindfulness-based cognitive therapy	Fear of evaluation by others	Standard deviation	3.39	4.06	3.98
Mindfulness-based cognitive therapy	Fear of evaluation by others	Skewness	1.32	0.02	-0.02
Mindfulness-based cognitive therapy	Fear of evaluation by others	Kurtosis	0.14	0.30	-0.56
Control	Fear of evaluation by others	Mean	14.47	14.20	14.80
Control	Fear of evaluation by others	Standard deviation	3.27	3.49	3.90
Control	Fear of evaluation by others	Skewness	1.33	1.17	0.45
Control	Fear of evaluation by others	Kurtosis	0.20	0.04	-1.42
Spiritual therapy	Fear of public speaking	Mean	16.60	11.00	11.80
Spiritual therapy	Fear of public speaking	Standard deviation	4.15	5.45	4.77
Spiritual therapy	Fear of public speaking	Skewness	1.30	0.68	-0.51
Spiritual therapy	Fear of public speaking	Kurtosis	1.28	-0.31	-0.89
Mindfulness-based cognitive therapy	Fear of public speaking	Mean	16.20	13.67	14.60
Mindfulness-based cognitive therapy	Fear of public speaking	Standard deviation	4.46	5.43	5.46
Mindfulness-based cognitive therapy	Fear of public speaking	Skewness	1.25	0.19	0.05
Mindfulness-based cognitive therapy	Fear of public speaking	Kurtosis	0.07	0.25	-0.65
Control	Fear of public speaking	Mean	16.60	16.20	17.00

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Control	Fear of public speaking	Standard deviation	4.22	4.52	5.07
Control	Fear of public speaking	Skewness	1.25	1.13	0.46
Control	Fear of public speaking	Kurtosis	0.18	-0.01	-1.46
Spiritual therapy	Fear of social isolation	Mean	16.47	11.00	11.13
Spiritual therapy	Fear of social isolation	Standard deviation	5.15	4.96	5.04
Spiritual therapy	Fear of social isolation	Skewness	0.60	0.52	0.01
Spiritual therapy	Fear of social isolation	Kurtosis	-1.42	-0.44	-1.02
Mindfulness-based cognitive therapy	Fear of social isolation	Mean	16.60	13.67	13.93
Mindfulness-based cognitive therapy	Fear of social isolation	Standard deviation	4.85	4.05	3.77
Mindfulness-based cognitive therapy	Fear of social isolation	Skewness	-0.77	1.15	0.84
Mindfulness-based cognitive therapy	Fear of social isolation	Kurtosis	0.43	-0.55	0.03
Control	Fear of social isolation	Mean	16.47	16.07	14.60
Control	Fear of social isolation	Standard deviation	4.10	4.59	5.08
Control	Fear of social isolation	Skewness	-0.16	0.05	-0.32
Control	Fear of social isolation	Kurtosis	-0.39	0.44	1.50
Spiritual therapy	Fear of exhibiting anxiety symptoms	Mean	16.33	9.13	9.67
Spiritual therapy	Fear of exhibiting anxiety symptoms	Standard deviation	5.38	5.58	5.79
Spiritual therapy	Fear of exhibiting anxiety symptoms	Skewness	1.07	0.88	0.90
Spiritual therapy	Fear of exhibiting anxiety symptoms	Kurtosis	0.13	-0.77	-0.04
Mindfulness-based cognitive therapy	Fear of exhibiting anxiety symptoms	Mean	16.47	12.73	11.93
Mindfulness-based cognitive therapy	Fear of exhibiting anxiety symptoms	Standard deviation	5.98	5.80	5.39
Mindfulness-based cognitive therapy	Fear of exhibiting anxiety symptoms	Skewness	-0.02	0.72	0.23
Mindfulness-based cognitive therapy	Fear of exhibiting anxiety symptoms	Kurtosis	-1.48	-0.30	-0.25
Control	Fear of exhibiting anxiety symptoms	Mean	16.20	16.73	16.20
Control	Fear of exhibiting anxiety symptoms	Standard deviation	5.28	5.50	5.12
Control	Fear of exhibiting anxiety symptoms	Skewness	-0.12	-0.36	-0.02
Control	Fear of exhibiting anxiety symptoms	Kurtosis	-0.51	-0.35	-0.38

Regarding the normality of data distribution, the results showed that, since the significance level of the social anxiety variable in all three stages of pretest, posttest, and follow-up was greater than .05, the data distribution was normal and this assumption was confirmed. Regarding homogeneity of variances, the results showed that, since the significance level of the social anxiety variable across the three groups and the three stages of pretest, posttest, and follow-up was greater than .05, the assumption of homogeneity of variances was confirmed. Regarding homogeneity of the variance–covariance matrix, the results showed that, since the within-group significance level of the social anxiety variable for each group across the three stages of pretest, posttest, and follow-up was greater than .05, the assumption of homogeneity of the variance–covariance matrix was confirmed. Regarding sphericity of within-group variances, the results showed that the significance level for all three dependent variables was less than .05; therefore, the assumption of sphericity of within-group variances was not met. Accordingly, the Greenhouse–Geisser criterion was used in testing the hypotheses to obtain a more accurate approximation (Houman, 2001), and the results of within-group analysis of variance were calculated considering the violation of the sphericity assumption. Therefore, based on the above assessment of all assumptions of repeated-measures multivariate analysis of variance, the results of the multivariate analysis of variance can be considered reliable. The software outputs for this test are presented below.

The results of the univariate between-group main effect showed that the calculated F value for the between-group factor was significant at the .05 level ($p < .05$). Therefore, there was a significant difference among the three groups of spiritual therapy, mindfulness-based cognitive therapy, and control in the overall mean scores of social anxiety components. Regarding the univariate within-group main effect, the results showed that the calculated F value for the effect of stages (pretest, posttest, and follow-up) was significant at the .05 level for the components of social anxiety ($p < .05$). Therefore, there was a significant difference among the pretest, posttest, and follow-up mean scores of the social anxiety components over time. The Bonferroni post hoc test was calculated to examine differences between means in the time factor. The results showed significant differences in the social anxiety components between pretest and posttest, and between pretest and follow-up, in the experimental groups ($p < .05$). However, there was no significant difference between posttest and follow-up in the experimental groups; that is, the social anxiety components did not show a significant change at follow-up compared with posttest in the experimental groups ($p > .05$). In addition, the results of the univariate interaction effect showed that, regarding the

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interaction between stages and group, the calculated F value for the effect of stages (pretest, posttest, and follow-up) among the three groups of spiritual therapy, mindfulness-based cognitive therapy, and control was significant at the .05 level for the components of social anxiety ($p < .05$). Therefore, there was a significant difference among the pretest, posttest, and follow-up mean scores of the social anxiety components across the three groups. Accordingly, the Bonferroni post hoc test was calculated to examine differences between means across the three groups over the three time stages (pretest, posttest, and follow-up). The results showed no difference in the social anxiety components at the pretest stage ($p > .05$). Therapeutic interventions, namely spiritual therapy and mindfulness-based cognitive therapy compared with the control group, affected the components of social anxiety at the posttest and follow-up stages ($p < .05$).

The results of the univariate between-group main effect are presented in Table 2. According to Table 2, the calculated F value for the between-group factor was not significant at the .05 level for the components of social anxiety ($p > .05$). Therefore, there was no significant difference between the spiritual therapy and mindfulness-based cognitive therapy groups in the overall mean scores of social anxiety components.

Table 2

Between-group univariate analysis of variance for social anxiety components

Variable	Factor	SS	df	MS	F	Sig.	Effect size
Fear of strangers	Between-group	0.04	1.00	0.04	0.01	0.96	0.01
Fear of evaluation by others	Between-group	12.10	1.00	12.10	1.47	0.24	0.05
Fear of public speaking	Between-group	4.44	1.00	4.44	0.31	0.58	0.01
Fear of social isolation	Between-group	0.71	1.00	0.71	0.17	0.68	0.01
Fear of exhibiting anxiety symptoms	Between-group	0.00	1.00	0.00	0.01	1.00	0.01

Furthermore, the results of the univariate within-group main effect are presented in Table 3. The results of Table 3 show that, regarding the within-group factor, the calculated F value for the effect of stages (pretest, posttest, and follow-up) was significant at the .05 level for the components of social anxiety ($p < .05$). Therefore, there was a significant difference among the pretest, posttest, and follow-up mean scores of the social anxiety components across the time stages.

Table 3

Within-group univariate analysis of variance for social anxiety components using the Greenhouse–Geisser criterion

Variable	Factor	SS	df	MS	F	Sig.	Effect size
Fear of strangers	Time	192.09	1.95	98.43	19.79	0.001	192.09
Fear of evaluation by others	Time	755.36	1.51	499.57	70.09	0.001	755.36
Fear of public speaking	Time	221.07	1.18	187.15	19.86	0.001	221.07
Fear of social isolation	Time	109.42	1.54	71.20	37.38	0.001	109.42
Fear of exhibiting anxiety symptoms	Time	125.60	1.73	72.72	36.03	0.001	125.60

In addition, the results of the univariate interaction effect are presented in Table 3. According to Table 3, regarding the interaction between stages and group, the calculated F value for the effect of stages (pretest, posttest, and follow-up) between the three groups of spiritual therapy, mindfulness-based cognitive therapy, and control was not significant at the .05 level for the components of social anxiety ($p > .05$). Therefore, considering the nonsignificance of the between-group and interaction effects, it can be stated that there was no significant difference between the spiritual therapy and mindfulness-based cognitive therapy groups in the pretest, posttest, and follow-up mean scores of social anxiety components.

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Table 4

Interactive univariate analysis of variance for social anxiety components

Variable	Factor	SS	df	MS	F	Sig.	Effect size
Fear of strangers	Time × Group interaction	2.76	1.95	1.41	0.28	0.75	0.01
Fear of evaluation by others	Time × Group interaction	8.87	1.51	5.86	0.82	0.42	0.03
Fear of public speaking	Time × Group interaction	3.29	1.18	2.78	0.30	0.63	0.01
Fear of social isolation	Time × Group interaction	0.62	1.54	0.41	0.21	0.75	0.01
Fear of exhibiting anxiety symptoms	Time × Group interaction	0.80	1.73	0.46	0.23	0.76	0.01

4. Discussion and Conclusion

The findings of the present study demonstrated that both spiritual therapy and mindfulness-based cognitive therapy (MBCT) were effective in reducing the components of social anxiety among older adults with cardiovascular disease at posttest and that these effects were maintained at follow-up. The results further indicated that there was no significant difference between the two intervention groups in terms of overall effectiveness, suggesting that both therapeutic approaches were comparably beneficial in addressing social anxiety symptoms. Additionally, the within-group analyses revealed significant changes across time, confirming that the interventions contributed to meaningful reductions in social anxiety from pretest to posttest and follow-up. However, the lack of significant differences between the two experimental groups suggests that, despite their distinct theoretical foundations, both approaches may operate through partially overlapping mechanisms in reducing anxiety-related processes.

The effectiveness of mindfulness-based cognitive therapy in reducing social anxiety observed in the present study is consistent with a growing body of empirical research. MBCT has been shown to reduce maladaptive cognitive patterns such as rumination, negative self-referential thinking, and catastrophic interpretations, which are central features of social anxiety. By fostering present-moment awareness and nonjudgmental acceptance, MBCT enables individuals to disengage from automatic cognitive biases and emotional reactivity. This is supported by evidence demonstrating that MBCT improves emotional regulation and reduces anxiety and stress symptoms across different populations (Ellison et al., 2024). Moreover, MBCT has been found to significantly improve self-esteem and self-concept in individuals with social anxiety disorder, thereby reducing fear of negative evaluation and social avoidance (Raee et al., 2022). The present findings also align with research showing that mindfulness-based interventions can effectively reduce social anxiety symptoms and may yield outcomes comparable to traditional cognitive-behavioral approaches (Dones et al., 2024). Additionally, the observed persistence of treatment effects at follow-up is in line with studies indicating that mindfulness practices promote long-term changes in cognitive processing and emotional regulation (Maloney et al., 2024).

From a neurocognitive perspective, mindfulness-based interventions influence attentional control, emotional processing, and self-regulation systems. Evidence suggests that different forms of meditation training, including MBCT, can modulate emotional reactivity and enhance regulatory capacities at both subjective and neural levels (Brown et al., 2022). These mechanisms are particularly relevant for older adults with cardiovascular disease, who may experience heightened sensitivity to bodily sensations and interpret them as threatening. By cultivating a decentered perspective toward internal experiences, MBCT reduces hypervigilance to physiological symptoms and decreases anxiety associated with perceived health risks. Furthermore, MBCT has demonstrated effectiveness across a wide range of clinical conditions, including depression, suicidal ideation, and chronic illness-related distress, highlighting its versatility as a therapeutic approach (Kraines et al., 2022; Tseng et al., 2023; Zhang et al., 2022). Therefore, the current findings extend previous evidence by confirming that MBCT is also effective in reducing social anxiety among older adults with cardiovascular conditions.

The results of the present study also confirmed the effectiveness of spiritual therapy in reducing social anxiety, which is consistent with prior research emphasizing the psychological benefits of spirituality-based interventions. Spiritual therapy can enhance individuals' sense of meaning, hope, and connectedness, which are crucial for coping with chronic illness and age-related challenges. In the context of cardiovascular disease, where uncertainty and fear of physical deterioration are prevalent, spiritual beliefs may provide emotional stability and reduce anxiety. Previous studies have shown that spiritual group therapy can improve quality of life and empowerment among patients with

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chronic conditions such as breast cancer, indicating its effectiveness in promoting psychological well-being (Momennasab et al., 2024). Similarly, research on patients with diabetes has demonstrated that spiritual therapy can improve quality of life and reduce psychological distress, suggesting that its benefits extend across different chronic disease populations (Peyravi, 2022). These findings support the current results by highlighting the role of spirituality in enhancing psychological resilience and reducing anxiety.

The mechanisms underlying the effectiveness of spiritual therapy may involve multiple psychological and existential processes. Spiritual interventions often encourage individuals to reinterpret stressful experiences within a broader framework of meaning, which can reduce perceived threat and increase acceptance. Additionally, practices such as prayer, meditation, and reflection may induce relaxation responses and decrease physiological arousal associated with anxiety. Meta-analytic evidence has also indicated that religious and spirituality-based therapies can be effective in mental health care, further supporting their role as complementary interventions for anxiety and stress (Bouwhuis-Van Keulen et al., 2024). For older adults, spirituality may also fulfill developmental needs related to life review, meaning-making, and preparation for later life stages, thereby reducing existential anxiety and enhancing emotional well-being.

The absence of a significant difference between spiritual therapy and MBCT in the present study suggests that both interventions may target common underlying mechanisms of social anxiety, albeit through different pathways. Both approaches promote acceptance, reduce avoidance, and encourage adaptive coping strategies. While MBCT focuses on cognitive processes and attentional regulation, spiritual therapy emphasizes meaning, connection, and transcendence. Despite these differences, both approaches may ultimately lead to similar outcomes by reducing emotional reactivity and enhancing psychological flexibility. This finding is consistent with previous comparative research showing that both mindfulness-based and spiritual interventions can effectively reduce anxiety and irrational beliefs in older populations (Barghi Irani & Dehghan Saber, 2020). Furthermore, studies comparing different mindfulness-based interventions have shown that various therapeutic approaches can produce comparable effects on emotional regulation and well-being, suggesting that multiple pathways may lead to similar psychological outcomes (Kraines et al., 2022).

Another important finding of the present study was the stability of treatment effects over time. The lack of significant differences between posttest and follow-up indicates that the benefits of both interventions were maintained after the completion of the treatment program. This suggests that participants were able to internalize and continue applying the skills learned during the intervention. In the case of MBCT, this may involve ongoing mindfulness practice and increased awareness of cognitive and emotional processes. In the case of spiritual therapy, this may involve continued engagement with spiritual practices and beliefs. The durability of treatment effects is an important consideration in clinical practice, as it indicates that these interventions can produce lasting changes in psychological functioning. This finding is consistent with previous research demonstrating the long-term effectiveness of mindfulness-based interventions in promoting well-being and reducing mental health symptoms (Maloney et al., 2024).

The present findings also highlight the importance of addressing psychological factors in the treatment of older adults with cardiovascular disease. Research has shown that psychological distress, including anxiety and depression, is closely linked to physical health outcomes in this population (Chang et al., 2025; Shu et al., 2025). Therefore, interventions that reduce social anxiety may not only improve psychological well-being but also contribute to better overall health outcomes. Given the increasing prevalence of cardiovascular disease among older adults and the associated psychological burden (Yao et al., 2025; Zeng & Yin, 2025), integrating psychological interventions such as MBCT and spiritual therapy into standard care may be beneficial.

Despite the valuable findings of this study, several limitations should be acknowledged. First, the sample size was relatively small, which may limit the generalizability of the results. Second, the use of convenience and purposive sampling methods may introduce selection bias, as participants who volunteer for psychological interventions may differ from the general population. Third, the reliance on self-report measures may be associated with response biases, such as social desirability or inaccurate self-assessment. Fourth, the follow-up period was relatively short, and longer-term studies are needed to assess the sustainability of treatment effects over extended periods. Finally, the study did not examine potential mediators or moderators of treatment outcomes, such as individual

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differences in spirituality, cognitive style, or baseline anxiety levels.

Future research should address these limitations by employing larger and more diverse samples to enhance the generalizability of findings. Longitudinal studies with extended follow-up periods are needed to examine the long-term effects of spiritual therapy and MBCT on social anxiety and related outcomes. Additionally, future studies should investigate the mechanisms underlying the effectiveness of these interventions, including cognitive, emotional, and physiological processes. Comparative studies involving other therapeutic approaches, such as cognitive-behavioral therapy or acceptance and commitment therapy, may also provide valuable insights into the relative effectiveness of different interventions. Furthermore, research should explore the role of cultural and contextual factors in shaping the effectiveness of spiritual and mindfulness-based interventions.

In terms of practical implications, the findings of this study suggest that both spiritual therapy and mindfulness-based cognitive therapy can be effectively used to reduce social anxiety in older adults with cardiovascular disease. Health-care providers and mental health professionals should consider incorporating these interventions into treatment programs for this population. Training clinicians in the delivery of MBCT and spiritual therapy may enhance the availability and accessibility of these approaches. Additionally, integrating psychological interventions into routine cardiovascular care may improve both psychological and physical health outcomes. Providing patients with opportunities to engage in group-based interventions may also enhance social support and reduce feelings of isolation.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the study and participated in the research with informed consent.

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