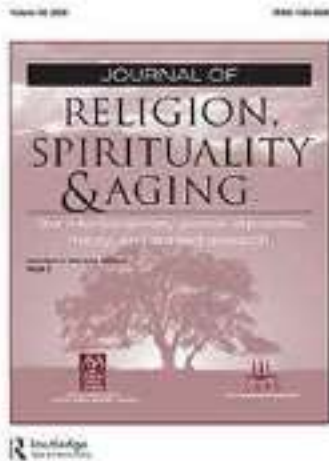




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To cite this article: Kosar Pourhasan, Sahar Dabaghi, Malihe Nasiri & Parvaneh Vasli (05 Aug 2026): Effect of a spiritually integrated empowerment program on care burden and quality of life among family caregivers of stroke survivors, Journal of Religion, Spirituality & Aging, DOI: 10.1080/15528030.2026.2714810

To link to this article: <https://doi.org/10.1080/15528030.2026.2714810>



Published online: 05 Aug 2026.



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Effect of a spiritually integrated empowerment program on care burden and quality of life among family caregivers of stroke survivors

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ABSTRACT

The aim of this quasi-experimental study was to assess the impact of a spiritually integrated empowerment program (SIEP) on care burden and health-related quality of life (HRQoL) in for family caregivers of stroke survivors. The study was conducted on 96 family caregivers of stroke survivors, divided into the SIEP group (SIEPG; $n = 48$) and the control group (CG; $n = 48$). The intervention was SIEP and data were therefore collected in three phases. The linear mixed model results showed that the mean care burden score in the SIEPG was significantly -20.312 points lower than that in the CG ($p < .001$, 95% CI = -25.332 to -15.292) and the mean HRQoL score was 19.979 points higher than that in the CG ($p < .001$, 95% CI = 11.6 to 16.357). Healthcare planners and providers can use the study results and implement the SIEP to promote the health of the family caregivers of stroke survivors.

KEYWORDS

Care burden; family caregiver; quality of life; spirituality; stroke

Introduction

Stroke is a serious health condition that has been documented as the second leading cause of mortality or disability (Mou et al., 2021). In light of this, approximately 15 million cases of stroke are reported each year worldwide, with nearly five million cases resulting in death and 10 million cases surviving (Suksatan et al., 2022). Following initial hospitalization, approximately 80% of stroke survivors return home. However, they depend to a significant extent on family care to meet their own needs physically and emotionally (McCarthy et al., 2020).

Permanent disabilities, multiple language and communication problems, urinary incontinence, and changes in behavior after stroke have been identified as underlying reasons for providing such survivors with long-term rehabilitation and family support (Bekele et al., 2023).

In numerous countries, including Iran, family caregivers are frequently engaged in the care of stroke survivors within their own homes (Mirhosseini et al., 2024). These caregivers play a pivotal role in facilitating functional

recovery in survivors and in preventing certain complications (Bekele et al., 2023). Family caregivers, also known as informal caregivers, represent those who frequently provide unpaid care to their family members who are suffering from chronic illnesses, disabilities, or other long-term healthcare needs (Li et al., 2024).

The care of a sick family member requires time and physical and emotional effort, which can result in a care burden experienced by family caregivers. This can lead to anxiety or depression. The concept of care burden can be illustrated by the pressure experienced by someone who provides care for a sick, disabled, or older family member (Pont et al., 2020).

Care burden can be defined as the strain experienced by an individual who provides care for a family member who is chronically ill, disabled, or elderly (Homayouni et al., 2022). Care burden is further considered as a multidimensional reaction to the physical, mental, emotional, social, and financial stressors connected with the caregiving experience. Additionally, it is classified into two distinct categories: subjective and objective. The latter category encompasses the burden experienced by family caregivers following the provision of physical assistance, whereas the former encompasses the psychological, social, and emotional consequences of objective care burden on these individuals (Pont et al., 2020).

Caring for a family member with a chronic illness can have negative impacts on the health status of the family caregivers as well as their quality of life (QoL). This is defined as an individual's understanding of the existing situations in different contexts, with reference to cultural aspects and value systems they live in, along with their goals, expectations, standards, and concerns (Okonkwo et al., 2022).

While QoL encompasses a comprehensive, multidimensional assessment of intrapersonal and environmental systems, health-related QoL (HRQoL) places significant emphasis on the impact of physical and mental health on an individual's daily activities (Fagerström et al., 2020). Consequently, HRQoL is a multifaceted concept that encompasses various dimensions of health, including physical, mental, emotional, and social functioning (Zafari Nobari et al., 2021).

As evidenced in the related literature, the family caregivers of stroke survivors often feel that they do not receive sufficient support to manage the care burden. This urgency thus calls for the implementation of more evidence-based programs to minimize care burden among such caregivers and subsequently improve their well-being and QoL (Elsheikh et al., 2022).

Empowerment programs can effectively assist family caregivers in becoming more active in terms of their motivation, psychology, knowledge, and attitudes toward sick family members, thereby promoting their health (Rahgoi et al., 2019). Empowerment is primarily based on knowledge and skills to enhance QoL, as it enables individuals to select the most

appropriate strategies to control the main resources to achieve the desired outcomes (Belim et al., 2024). In this context, a spiritually integrated empowerment program (SIEP) assists individuals in adopting a series of strategies, including establishing positive relationships with themselves, families, and friends, taking care of themselves, practicing religion, positive thinking, and active listening, as well as increasing self-confidence (Nasution et al., 2020). Spirituality is therefore regarded as a crucial resource for coping with challenging circumstances, including stressful events, problems, injuries, and deprivations, and for fostering a more resilient approach to managing numerous problems (Salamizadeh et al., 2017).

However, religious and spiritual experiences may play a complex role in the way people cope with things. For example, people who are experiencing spiritual difficulties may engage in both religious and secular coping strategies. In some cases, they may also disengage from religious coping, depending on the nature of their struggle (Abu-Raiya et al., 2016; Wilt et al., 2024).

Literature review

A number of studies have been conducted to investigate the impact of spirituality-related interventions on care burden and QoL, as well as the relationship between spirituality and health-related variables. A study investigating the impact of a family-based training program incorporating spirituality as a dimension on care burden in the family caregivers of patients undergoing hemodialysis demonstrated that the program could reduce care burden (Sotoudeh et al., 2019). In a study conducted by Milbury et al. (2019), it was demonstrated that a program of dyadic yoga could have a beneficial effect on the mental QoL of family caregivers of glioma patients.

In a systematic review conducted by Ambrosca et al. (2024), revealed that spirituality plays a pivotal role in enhancing the QoL and mitigating anxiety and depression among stroke survivors and family caregivers. Furthermore, the findings of another systematic review suggest that a dyadic psychoeducational intervention may be an effective approach to enhancing functional independence in stroke survivors and reducing the burden on their family caregivers over the short term (Mou et al., 2021). The findings of the study conducted by Mirhosseini et al. (2024) demonstrated a robust and statistically significant correlation between the burden of caregiving and spiritual well-being in this population.

A cross-sectional study conducted in Iran revealed that spiritual well-being was inversely associated with caregiver burden and served as a predictor of this phenomenon (Rafati et al., 2020). In their study, Torabi Chafjiri et al. (2017) demonstrated that there was a significant positive relationship between spiritual attitude and the care burden of family caregivers of older stroke survivors.

Despite the extensive research conducted in this field, no study has yet examined the impact of spirituality on the family caregivers of stroke survivors. Given the necessity of identifying strategies to alleviate care burden in the family caregivers of stroke survivors and promote their QoL, the present study aimed to assess the impact of a SIEP on care burden and HRQoL among these individuals. In this context, the research hypotheses are as follows:

H_1 : The SIEP has an effect on care burden in family caregivers of stroke survivors.

H_2 : The SIEP has an effect on HRQoL in family caregivers of stroke survivors.

Methods

Study design and setting

This quasi-experimental study was conducted in the neurology wards of two hospitals, affiliated to Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Participants and recruitment

The present study was conducted on 96 family caregivers of stroke survivors in accordance with the following formula, as proposed by Deyhoul et al. (2020), taking account of the type-I error of 0.05, the type-II error of 0.10, and the test power of 0.8, including 10% sample attrition, estimated as 48 family caregivers of stroke survivors in each group, viz., the spirituality-based empowerment program group (SIEPG) and the control group (CG).

Participants were allocated to intervention and control conditions based on hospital of recruitment to minimize contamination between groups. One hospital was assigned to the SIEPG and the other to the CG. Although allocating participants to hospitals may introduce potential institutional confounding factors, both hospitals are university-affiliated centers that provide similar neurological and stroke care services. Furthermore, the baseline characteristics of the participants were comparable between the groups.

Eligible family caregivers were selected using convenience sampling within each hospital. Although individual randomization was not feasible due to the risk of contamination within clinical settings, baseline characteristics were assessed to ensure comparability between groups.

A total of 120 family caregivers of stroke survivors were assessed for eligibility and subsequently enrolled in the study. Six individuals were excluded from the study on the grounds that they did not meet the inclusion

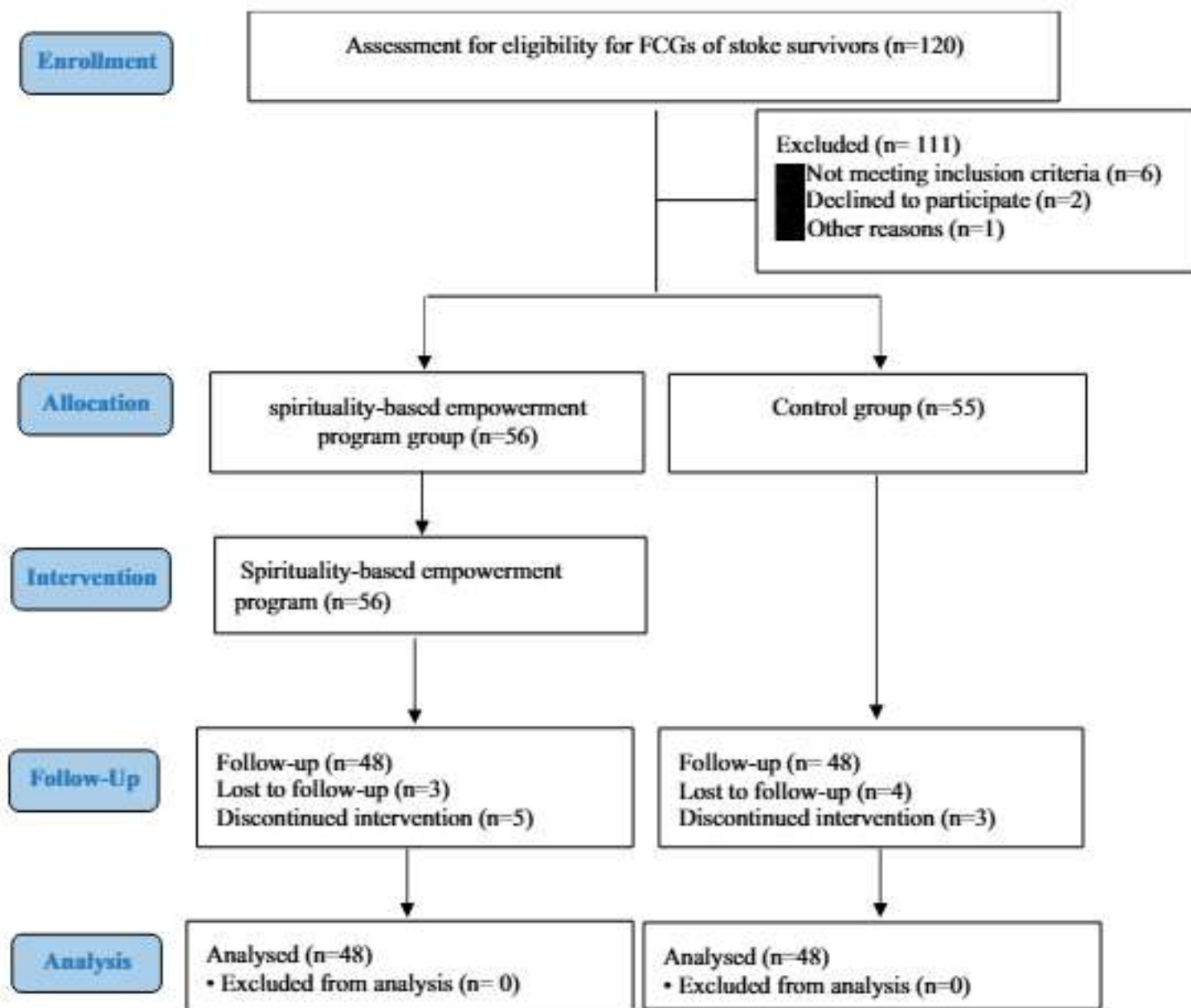


Figure 1. CONSORT flow chart of the study.

criteria. In addition, two cases were excluded from participation in the study, and one individual whose patients had died prior to entering the study. Consequently, 101 family caregivers of stroke survivors were included in the SIEPG (56 individuals) and the CG (55 individuals). Four family caregivers of stroke survivors were removed from the SIEPG due to the death of their patients occurring during the implementation of the SIEP. Additionally, three further cases were excluded at the follow-up stage for the same reason. In the CG, three family caregivers of stroke survivors were removed during the implementation of the SIEP, and four individuals in the follow-ups because of their patient's death. Consequently, 48 participants remained in the SIEPG and CG until the conclusion of the study (Figure 1).

Inclusion criteria were family caregivers of stroke survivors as primary caregivers, at least 18 years of age, with listening, speaking, reading, and writing skills, no history of working as a healthcare professional, ownership of a smartphone, and self-reported nonuse of antidepressants or antipsychotics. In contrast, exclusion criteria were patient death, caring for patients with other illnesses, not attending at least half of the program sessions, and submitting incomplete data collection instruments.

Outcome measurements

The data were collected by the first researcher and the study results included the changes in care burden and HRQoL of family caregivers of stroke survivors measured at three stages, i.e., baseline (before the SIEP), follow-up 1 (immediately after the SIEP), and follow-up 2 (three months after the SIEP). Accordingly, at baseline and follow-up 1, the data collection tools were completed by the family caregivers during the hospitalization of the stroke survivors in the neurological wards. Participants were enrolled during their acute hospitalization following stroke onset. Therefore, the baseline assessment was conducted after admission to hospital and before the intervention began. At follow-up 1, the given tools were also provided to the participants to complete the follow-up 2 data and send it to the first researcher via the Iranian messaging app Bale, WhatsApp, or Telegram.

Measures

Demographic information questionnaire

The Demographic Information Questionnaire included two items about the age and sex of the stroke survivors and nine items about the demographic characteristics of the family caregivers, including age, sex, educational level, marital status, income adequacy, underlying medical conditions, relationship to stroke survivors, and having a supporter in the family.

12-item short form health survey (SF-12)

The SF-12 was used in this study to measure HRQoL. This questionnaire consisted of 12 statements and eight dimensions under two subscales, namely physical and mental. Its minimum and maximum scores were also 12 and 48, respectively; therefore, the higher the score obtained, the higher the HRQoL (Zafari Nobari et al., 2021). The validity and reliability of this tool have been previously investigated and confirmed (Montazeri et al., 2009). In order to determine the test-retest reliability, the SF-12 was completed twice with an interval of two weeks by 10 family caregivers of stroke survivors who were later excluded from the study, and then the intraclass correlation coefficient was calculated, the value of which was 0.86. In addition, the Cronbach's alpha coefficient was found to be 0.88 after the instrument was completed and endorsed by 20 family caregivers of stroke survivors, confirming its reliability.

Zarit burden interview

The 22-statement Zarit Burden Interview, developed by Zarit et al. (1980) to measure care burden of the family caregivers of older adults with dementia in the United States, was used to measure caregiver burden in this study. Responses to the statements were rated on a five-point Likert-type scale

from never (score 0) to always (score 4). Total scores also ranged from 0 to 88, such that an increase in scores indicated an upward trend in care burden (Yu et al., 2020). This tool was previously validated in the Persian language for a sample of family caregivers of stroke survivors by Hekmatpou et al. (2019). In this study, the intraclass correlation coefficient and Cronbach's alpha coefficient were further obtained as 0.85 and 0.87, respectively, confirming the reliability of the tool.

Intervention: SIEP

The content of the SIEP was developed with reference to Barkhordari-Sharifabad and Mousavi (2022), who investigated the impact of a spiritual skills development program on the QoL of family caregivers of patients undergoing hemodialysis, and then modified based on the latest evidence. The content validity of this program was further reviewed and confirmed by two faculty members of the School of Nursing affiliated with Shahid Beheshti University of Medical Sciences, Tehran, Iran, a neurologist, a religious specialist, and a meditation coach.

Spirituality was included because caregiving for stroke survivors is a prolonged and emotionally demanding process. Spiritual coping has been shown to reduce caregiver burden and improve quality of life by enhancing resilience, emotional regulation and perceived meaning in adverse situations (Young et al., 2024).

The SIEP was designed to empower the family caregivers of stroke survivors with a strong focus on spirituality and then strengthen the care of stroke survivors to increase their independence in terms of performing activities of daily living, achieving self-care, and finding physical and mental health.

In addition to educating participants about stroke care and self-care strategies, the program incorporated culturally relevant spiritual concepts as supportive coping resources within a broader framework of empowerment. Spirituality was addressed in this program as a means to help caregivers find meaning in their caregiving experience, enhance hope, strengthen positive thinking and improve their psychological adaptation to their caregiving responsibilities. Spiritual discussions were presented in a cultural and Islamic context with which participants were familiar, focusing primarily on positive spiritual coping strategies such as hope, self-awareness, compassion and trust in God. These spiritual components were fully integrated with the educational and self-care content, rather than being delivered as a stand-alone intervention.

To ensure clarity regarding the spiritual component, it was presented as structured content in sessions 3 and 4. These sessions focused on specific domains, including meaning-making, hope, self-awareness and trust in God. While spirituality itself was not assessed as an independent outcome variable,

its various elements were incorporated into the intervention as structured therapeutic content, functioning as a contextual mechanism that supports coping and adaptation.

The SIEP was designed to enhance caregivers' knowledge and caregiving skills, and to strengthen their spiritual and psychological coping resources. Through education, self-awareness, positive thinking, fostering hope and problem-solving skills, as well as encouraging trust-based coping strategies, the program aimed to help caregivers adapt to the demands of caregiving, reduce their perceived care burden and improve their health-related quality of life.

Spiritual components were fully integrated with the educational and self-care content and were not delivered as a stand-alone intervention. The titles of the educational content of the program were: 1) definition of stroke disease, symptoms and risk factors, complications and treatment; 2) how to properly care for the patient by focusing on providing solutions to increase the stroke survivor's ability to perform daily living activities (personal hygiene, bathing, eating, toileting and cleaning, climbing stairs, dressing, stool control, urine control, walking and mobility and movement); 3) improving the physical activity and nutrition of stroke survivors; and 4) spirituality and spiritual skills for family caregivers, include the need for spirituality and its function in life and health from an Islamic perspective (purification of the self and then manifesting this positive inner change in daily life through belief in God, His prophets, the Qur'an as a heavenly book, ritual worship and ethical behavior), spiritual self-awareness from an Islamic perspective (introspection to respond to God and achieve spiritual excellence by understanding thoughts, feelings and behavior), human strengths and weaknesses, achieving positive thinking and boosting self-confidence, self-love, hope and problem-solving.

Once the participants were enrolled in the SIEPG, the necessary arrangements were made regarding the time and place of the SIEP sessions. The intervention was initiated on the first day of stroke survivors' hospitalization in the neurology ward. The four face-to-face sessions took place on days 1, 4, 8 and 12 of their stay. Following discharge, three telephone follow-up sessions were conducted at two-weekly intervals. The program was then delivered for four weeks, with one 30-minute session per week (Table 1).

The first four sessions were conducted individually and face-to-face using some educational media, such as Microsoft PowerPoint, which included the content of the booklet. The materials that were taught face-to-face when the stroke survivors were admitted to the hospitals were also reviewed by telephone calls once every three weeks for three sessions, and some questions raised by the participants were answered. Notably, the implementation of the program was done by the first researcher after receiving a certificate in courses related to spirituality, self-awareness, and spiritual health to properly fulfill it.

Table 1. SIEP for FCGs of stroke survivors.

Sessions	Place and Time	Objectives	Content	Exercises / Spiritual Activities
1	1st day of hospitalization in the neurology ward	family caregivers' acquaintance with the researcher as their instructor, increasing their awareness of stroke, and empowering	Introducing the researcher, outlining the study objectives, and providing generalities about stroke • definition of stroke disease, symptoms and risk factors, complications and treatment • Care for the patient by focusing on providing solutions to increase the stroke survivor's ability to perform daily living activities (personal hygiene, bathing, eating, toileting and cleaning, climbing stairs, dressing, stool control, urine control, walking and mobility and movement) A review of previous session Physical activity and mobility of the stroke survivors Healthy eating for the patient	• Short discussion to introduce caregiver role and encourage questions
2	4th day of hospitalization in the neurology ward	Raising family caregivers' awareness of stroke, improving their HRQoL, boosting lifestyles, and empowering	A review of previous session Physical activity and mobility of the stroke survivors Healthy eating for the patient	• Talking about daily care problems (e.g., bathing, feeding, moving patient) • Choosing one problem and finding a simple solution together with the trainer • Practicing how to perform one caregiving task step-by-step • Talking about "why caring for my patient is important for me" • Saying or thinking about 2–3 good meanings of caregiving (e.g., responsibility, helping family, reward from God) • Thinking of a difficult situation and replacing it with a more hopeful thought • Simple guided reflection: "What gives me hope when I feel tired?"
3	8th day of hospitalization in the neurology ward	Increasing family caregivers' awareness of stroke, improving their HRQoL, and reducing care burden based on spirituality	A review of previous sessions Spirituality and spiritual skills • The spirituality approach and its function in life from an Islamic perspective • Spiritual self-awareness from the Islamic perspective • Human strengths and weaknesses Reaching positive thinking and boosting self-confidence	• Thinking of a difficult situation and replacing it with a more hopeful thought • Simple guided reflection: "What gives me hope when I feel tired?"

(Continued)

Table 1. (Continued).

Sessions	Place and Time	Objectives	Content	Exercises / Spiritual Activities
4	12th day of hospitalization in the neurology ward	Alleviating care burden and improving HRQoL based on SIEP	A review of previous sessions Spiritual skills • Self-love • Hope Problem solving	• Saying one positive sentence about oneself as a caregiver (e.g., "I am doing my best") • Choosing one daily problem and saying how it can be solved step by step • Short guided practice of calm breathing + silent prayer or personal spiritual reflection • Thinking about personal strengths (e.g., patience, love, responsibility) • Talking about how caregiving is going in daily life • Explaining one problem faced during the week and how it was handled • Reminding and repeating simple coping ideas (hope, patience, trust, positive thinking) • Encouraging continuation of simple daily coping behaviors
5–7	Home	Telephone follow-up (every two weeks)	A review of previous sessions Examining the practice of the taught content in daily life	

Note: SIEP, spiritual integrated empowerment program; HRQoL, health-related quality of life.

Data analysis

The study data were analyzed using the SPSS Statistics (ver. 21) software. Accordingly, the Chi-square test and the independent-samples t-test were employed to compare the demographic characteristics of the SIEPG and the CG. The normality of the data was further checked with reference to the Kolmogorov-Smirnov test results. Furthermore, an intergroup comparison of care burden and HRQoL at different stages of the study was conducted using the independent-samples t-test and analysis of covariance. The intragroup comparison was performed via the repeated measures analysis of variance. Additionally, a linear mixed model was employed to identify the absolute changes in care burden and HRQoL. It is noteworthy that a significance level of less than 0.05 was applied in all tests.

Results

Baseline information of participants

The study results demonstrated that the mean $\pm$ standard deviation of the age of the stroke survivors in the SIEPG was 64.35 ± 11.08 , while that of the CG was 61.91 ± 11.61 . Additionally, the mean $\pm$ standard deviation of the age of the family caregivers of such survivors in the SIEPG and the CG was 46.88 ± 14.58 and 47.81 ± 12.23 , respectively. Table 2 presents a comprehensive overview of the demographic characteristics of the study participants. With regard to the demographic characteristics of the stroke survivors and their family caregivers, no significant difference was identified between the SIEPG and the CG (Table 2).

Care burden changes in SIEPG and CG

As demonstrated in Table 3, there was no statistically significant difference in the independent-samples t-test and ANCOVA results for the total mean scores and the care burden dimensions in the intergroup comparison between the SIEPG and the CG at the baseline, and no significant difference was detected in the follow-ups 1 and 2 ($p < .001$). In the intragroup comparison, the results of the repeated measures ANOVA demonstrated a significant decrease in the mean scores of care burden and its dimensions in the family caregivers of stroke survivors in the SIEPG from the baseline to the follow-up 2. In contrast, there was a significant increase in the CG ($p < .001$).

HRQoL changes in SIEPG and CG

The results of the independent-samples t-test and ANCOVA, as presented in Table 4, indicate that there was no significant difference between the total

mean scores and the physical and mental dimensions of HRQoL in the SIEPG and the CG at the baseline. However, there was a significant difference between both groups in the course of the follow-ups 1 and 2 ($p < .001$). The results of the repeated measures ANOVA indicated that the total mean scores and the physical and mental dimensions of HRQoL among the Family caregivers in the SIEPG significantly increased from the baseline to the follow-up 2. In contrast, there was a significant drop in the CG ($p < .001$).

Absolute changes in care burden and HRQoL

Table 5 illustrates the outcomes of the linear mixed model for the absolute changes in care burden and HRQoL, controlling for the demographic characteristics of the study participants. The results of the first part of the study indicated that the mean score for care burden in the SIEPG was significantly lower than that in the CG, with a difference of -20.312 units ($p < .001$, 95% CI = -25.332 to -15.292). This was observed following the implementation of the SIEP. Furthermore, the care burden mean score in the follow-up 1, when compared to the baseline value, was 8.208 ($p < .001$, 95% CI = -13.228 to -3.1). Furthermore, the mean score in the follow-up 2 was 14.5 units ($p < .001$, 95% CI = -19.520 to -9.479), indicating a significant reduction. These results indicated that the SIEP could significantly alleviate care burden in the Family caregivers of stroke survivors.

The results in the second part (Table 5) demonstrated that the HRQoL mean score in the SIEPG was significantly higher than that in the CG by 19.979 units ($p < .001$, 95% CI = 11.6 to 16.357) after the SIEPG completion. Moreover, the HRQoL mean score increased by 5.687 ($p < .001$, 95% CI = 3.309 to 8.065) in the follow-up 1. The mean score increased by 9.375 units ($p < .001$, 95% CI = 6.996 to 11.753) in the follow-up 2, which appeared to be statistically significant. These results indicated that the SIEP had a significant impact on the HRQoL of the Family caregivers of stroke survivors.

Discussion

The study findings indicated that the SBEP was efficacious in reducing care burden in the family caregivers of stroke survivors and enhancing their HRQoL, thereby confirming both study hypotheses.

With regard to the initial research hypothesis, the study findings indicated that the SIEP could potentially minimize care burden of the family caregivers of stroke survivors. Previous studies had yielded comparable results. For instance, Mosher et al. (2019) had found that a telephone-based acceptance and commitment therapy program had moderated distress in the family caregivers of patients living with lung cancer. The intervention applied in

Table 2. Demographic information of the FCGs of stroke survivors in SIEPG and CG.

Group Variables		SIEPG (n = 48)		CG (n = 48)		p-value ^a
		n	%	n	%	
Patients with stroke	<i>Gender</i>					
	Female	26	54.16	21	41.66	0.307
FCGs	Male	22	45.84	28	58.34	
	<i>Gender</i>					
	Female	36	75	40	83.3	0.315
	Male	12	25	8	16.7	
	<i>Education level</i>					
	Illiterate and Primary school	3	6.2	3	6.2	0.232
	Middle school	7	14.6	4	8.3	
	High school and diploma	19	39.6	20	41.7	
	Academic	19	39.6	21	43.8	
	<i>Occupation</i>					
	Unemployed	2	4.7	2	4.7	0.757
	Self-employed	13	27	12	25	
	Employee	3	6.3	5	10.14	
	Retired	9	18.7	5	10.14	
	Homemaker	21	43.8	24	50	
	<i>Marital status</i>					
	Married	34	70.8	40	83.3	0.423
	Single	12	25	7	14.6	
	Widow	1	2.1	0	0	
	Divorced	1	2.1	1	2.1	
	<i>Income adequacy</i>					
	Yes	22	45.8	31	64.6	0.165
	No	26	54.2	17	35.4	
	<i>Underlying medical conditions</i>					
	Hypertension	25	52	24	50	0.452
	Diabetes	14	29.2	8	16.7	
	Hypercholesterolemia	4	8.4	7	14.6	
	Myocardial infarction	3	6.3	6	12.5	
	CVA	2	4.1	3	6.2	
	<i>relationship to stroke survivors</i>					
	Spouse	11	23	9	18.7	0.742
	Child	25	52.1	26	54.2	
	Brother/sister	5	10.4	8	16.7	
	Others	7	14.5	5	10.4	
	<i>Having a supporter in the family</i>					
	Yes	38	79.1	41	85.4	0.423
	No	10	20.9	7	14.6	

Note: ^aChi-square test.

FCGs, family caregivers; SIEPG, spirituality integrated empowerment program group; CG, control group.

this study included supportive listening and guidance for patients and family caregivers to access resources for gaining practical health information and psychosocial support, with a particular focus on individual values and beliefs as well as mindfulness. This approach was, to a certain degree, in agreement with the program employed in the present study and could lead to relatively similar achievements.

In a separate study, a web-based meaning-centered psychotherapy was also found to facilitate the formation of a sense of meaning and to reduce care burden in the family caregivers of cancer patients (Applebaum et al., 2018). The intervention was based on three key elements: education, contemplation, and a series of practices designed to address questions based on a booklet containing the Meaning-Centered Psychotherapy content. This content was

Table 3. Comparison of changes in the mean of CB in the SIEPG and CG.

Group CB (total and subscales)		SIEPG (n = 48)	CG (n = 48)	SIEPG vs. CG
Total	Baseline	59.68 ± 15.32	51.83 ± 15.84	0.139 ^a
	Follow-up 1	51.22 ± 10.04	63.64 ± 12.24	<0.001 ^b
	Follow-up 2	44.93 ± 8.93	65.25 ± 10.71	<0.001 ^b
	Follow-ups vs. Baseline ^c	p < .001	p < .001	
Negative affect	Baseline	16.66 ± 5.81	14.29 ± 5.77	2.008 ^a
	Follow-up 1	12.87 ± 3.54	17.29 ± 4.64	<0.001 ^b
	Follow-up 2	10.45 ± 3.03	17.31 ± 4.32	<0.001 ^b
	Follow-ups vs. Baseline ^c	p < .001	p < .001	
Personal strain	Baseline	12.43 ± 5.16	10.29 ± 4.35	2.202 ^a
	Follow-up 1	10.54 ± 3.41	13.81 ± 3.63	<0.001 ^b
	Follow-up 2	9.12 ± 2.81	14.02 ± 3.28	<0.001 ^b
	Follow-ups vs. Baseline ^c	p < .001	p < .001	
Patient's dependence	Baseline	9.5 ± 2.45	8.14 ± 3.05	2.39 ^a
	Follow-up 1	9.33 ± 2.33	10.10 ± 2.31	<0.001 ^b
	Follow-up 2	8.54 ± 1.82	11.16 ± 1.99	<0.001 ^b
	Follow-ups vs. Baseline ^c	p < .001	p < .001	
Uncertainly	Baseline	9.93 ± 2.61	9.18 ± 3.16	1.266 ^a
	Follow-up 1	8.41 ± 2.07	10.7 ± 2.36	<0.001 ^b
	Follow-up 2	7.2 ± 1.86	10.85 ± 1.95	<0.001 ^b
	Follow-ups vs. Baseline ^c	p < .001	p < .001	
Guilty	Baseline	10.89 ± 3.15	9.91 ± 3.07	1.54 ^a
	Follow-up 1	10.06 ± 1.99	11.58 ± 2.68	<0.001 ^b
	Follow-up 2	9.6 ± 1.72	12.04 ± 2.01	<0.001 ^b
	Follow-ups vs. Baseline ^c	p < .001	p < .001	

Note: ^ap-values for comparing scores between the intervention and control groups, at baseline (derived from independent t-test) and at follow-ups; ^b p-values for comparing scores between the intervention and control groups, at baseline (derived from independent t-test) and at follow-ups (derived from repeated measures ANCOVA); ^c p-value for comparing differences between follow-ups and baseline (derived from repeated measures ANOVA).

CB, care burden; SIEPG, spirituality integrated empowerment program group; CG, control group.

Table 4. Comparison of changes in the mean HRQoL in the in the SIEPG and CG.

Group dimensions of HRQoL		SIEPG (n = 48)	CG (n = 48)	SIEPG vs. CG
Total	Baseline	28.25 ± 7.58	29.47 ± 7.71	t = -0.787
	Follow-up 1	33.93 ± 4.65	25.18 ± 6.08	p < .001
	Follow-up 2	37.62 ± 3.69	23.64 ± 4.65	p < .001 ^b
	Follow-ups vs. Baseline ^c	p < .001	p < .001	
Physical health	Baseline	13.08 ± 3.2	13.41 ± 3.61	t = -0.48 ^a
	Follow-up 1	15.19 ± 2.29	12.33 ± 73.85	p < .001 ^b
	Follow-up 2	16.67 ± 1.87	11.29 ± 2.85	p < .001 ^b
	Follow-ups vs. Baseline ^c	p < .001	p < .001	
Mental health	Baseline	15.17 ± 5.15	16.06 ± 4.82	t = -0.884 ^a
	Follow-up 1	18.72 ± 2.74	12.85 ± 3.45	p < .001 ^b
	Follow-up 2	20.93 ± 2.27	12.35 ± 2.31	p < .001 ^b
	Follow-ups vs. Baseline ^c	p < .001	p < .001	

Note: ^ap-values for comparing scores between the intervention and control groups, at baseline (derived from independent t-test) and at follow-ups; ^b p-values for comparing scores between the intervention and control groups, at baseline (derived from independent t-test) and at follow-ups (derived from repeated measures ANCOVA); ^c p-value for comparing differences between follow-ups and baseline (derived from repeated measures ANOVA).

HRQoL, health related quality of life; SIEPG, spirituality integrated empowerment program group; CG, control group.

consistent with the SIEP in some respects, as it aimed to enhance spirituality and a sense of meaning. In a separate study, Sotoudeh et al. (2019) implemented a family-based training program comprising various components, including self-care skills, communication, and spirituality, for the family caregivers

Table 5. Mixed model with SIEP in FCGs of stroke survivors.

Dependent	Independent	B	SE	t	p-value	95%CI ^b	
						Lower Bound	Upper Bound
CB	Intercept	44.937	1.803	24.919	<0.000	41.387	48.487
	SIEPG	-20.312	2.55	-7.965	<0.000	-25.332	-15.292
	CG (ref)	0 ^a	—	—	—	—	—
	Follow-up 1	-8.208	2.55	-3.219	<0.000	-13.228	-3.188
	Follow-up 2	-14.5	2.55	-5.686	<0.000	-19.520	-9.479
	Baseline (ref)	0 ^a	—	—	—	—	—
HRQoL	Intercept	37.625	0.854	44.041	<0.000	35.943	39.306
	SIEPG	19.979	1.208	11.570	<0.000	11.6	16.357
	CG (ref)	0 ^a	—	—	—	—	—
	Follow-up 1	5.687	12.208	4.707	<0.000	3.309	8.065
	Follow-up 2	9.375	1.208	7.760	<0.000	6.996	11.753
	Baseline (ref)	0 ^a	—	—	—	—	—

Note: SIEP, spirituality integrated empowerment program; FCGs, family caregivers; CB, care burden; HRQoL, health related quality of life; SIEPG, spirituality integrated empowerment program group; CG, control group.

^aThis parameter is set to zero because it is redundant.

^b95% confidence intervals; ref: references category.

of patients undergoing hemodialysis. The program was found to result in a reduction in care burden. The intervention in question bore resemblance to the one currently under investigation, with a particular focus on selected dimensions, including self-care and spirituality.

In Yazdanmanesh et al. (2023), the positive effect of an empowerment program for the family caregivers of older adults with Alzheimer's disease was evaluated. This program involved a combination of self-care and meaning-making skills, and its impact on care burden in family caregivers was investigated. A clinical trial conducted by Terracciano et al. (2020) found that a training program focusing on self-care, emotion control, and emotional distress for family caregivers had a negative impact on care burden in caregivers of individuals with dementia. In a further cross-sectional study, the results indicated that spirituality may be associated with emotional distress in the family caregivers of patients receiving exclusive palliative care (Vigna et al., 2020).

Confirmation of the first research hypothesis, alongside consistency with previous studies, suggests that the SIEP may effectively reduce caregiver burden and improve HRQoL among family caregivers of stroke survivors. These results support the use of a multi-component empowerment approach with this group.

Although the findings suggest that the spiritually integrated components may have contributed to reducing caregiver burden and improving HRQoL, the present study design did not allow the independent effect of the spiritual component to be separated from the educational and empowerment components of the intervention. Therefore, the observed outcomes may reflect the combined effect of caregiver education, self-care training, supportive interactions, and spiritual coping strategies.

In addition, the study results validated the second hypothesis and showed that the SIEP could promote HRQoL in the family caregivers of stroke survivors. The changes in HRQoL of these family caregivers as a result of the interventions and training programs have been further investigated in previous research. For example, Khosravi et al. (2022) had investigated the effects of a spirituality-based program on stress, anxiety and depression in family caregivers of patients with mental disorders. As one of the two parts of HRQoL was mental health, and the SIEP had a positive effect on total HRQoL scores and mental health in the present study, it was in line with the above work. In both studies, the results showed that the given program developed on the basis of spirituality could improve the mental health of the family caregivers. Similarly, in their clinical trial, Terracciano et al. (2020) had concluded that a training program with content on self-care, emotion control and emotional distress for family caregivers with dementia could improve their mental health.

Milbury et al. (2019) had found that a dyadic yoga program as a supportive care strategy could reduce fatigue and depression in family caregivers of glioma patients and promote their mental QoL. Similarly, the results of a cross-sectional study by Alquwez and Alshahrani (2021) in Saudi Arabia had shown that spiritual coping strategies, especially religious ones, by the family caregivers of stroke survivors had a positive impact on their QoL and led to improvements in physical and mental health.

In conclusion, the present study suggested that the SIEP may improve HRQoL among family caregivers of stroke survivors. The observed benefits are likely related to the combined effects of caregiver education, self-care training, supportive interactions, and spiritually integrated coping strategies embedded within the program.

This study was important for a number of reasons. First, it was conducted in a traditional Islamic context where family members play a leading role in the care of stroke survivors at home. Second, the study reflected on a vulnerable group under care burden due to the long-term care of stroke survivors with lower than average HRQoL. The third point was to investigate the impact of a multidimensional intervention program based on spirituality and two important health-related variables, namely care burden and HRQoL, which was feasible and inexpensive to implement.

Limitations

Notably, there were some limitations to this study. First, the accuracy of the participants' responses to the data collection instruments was questionable due to the possible restlessness of some stroke survivors, as well as some individual, family and social factors affecting their care burden and HRQoL.

The second limitation was the inability to randomize participants into the groups of interest, which may have affected the generalizability of the study. The third limitation was the self-report nature of the data collection instruments. Another limitation was the multidimensional nature of the intervention, which made it impossible to isolate the specific contribution of the spiritual component to the study outcomes. Additionally, the religiosity of caregivers and the potential influence of caregiver type (e.g. spouse, child or other relative) on study outcomes were not evaluated.

Conclusion

The study results showed that the SIEP was effective in alleviating care burden and improving HRQoL in family caregivers of stroke survivors. Therefore, it was suggested that health care professionals should implement this program as a low-cost and feasible strategy to improve physical, mental and spiritual health in the family caregivers of stroke survivors referred or admitted to health care facilities. It was also recommended that health care managers use the SIEP and its multifaceted content as one of the indicators to evaluate staff performance for accreditation purposes. Accordingly, further studies on the impact of this program on the care burden and HRQoL of family caregivers with other chronic diseases, such as cancer or hemodialysis, should be conducted.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Ethics approval

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of University of Shahid Beheshti University of Medical Sciences (Date 01/08/2023, No IR.SBMU.PHARMACY.REC.1402.072).

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