Effects of home visit empowerment program on burden and self-efficacy of caregivers of Iran-Iraq War veterans with diabetes: A Clinical trial study

Abstract

Aims: Diabetes is common among veterans, often cared for by family. Caregiving complexities can cause stress, highlighting the need to improve caregivers' self-efficacy. Home visits are essential for healthcare education. This study assessed the impact of home visits on caregiving stress and self-efficacy among caregivers of veterans with diabetes.

Methods: This 2024 clinical trial involved 60 caregivers of veterans with diabetes from Gorgan medical centers. Participants were randomized to intervention (four 40–60 minute home visit sessions with tailored diabetes care training) and control (routine training) groups (n=30 each). Data were collected using demographic questionnaires, the Sherer's Self-Efficacy Questionnaire, and the Novak and Guest Caregiving Stress Questionnaire.

Findings: No significant pre-intervention self-efficacy difference existed between groups (p=0.749). Post-intervention, a statistically significant difference in caregivers' self-efficacy was observed (p<0.001). Caregiving burden showed no significant difference between groups pre- (p=0.079) or post-intervention (p=0.220).

Conclusion: Improved self-efficacy suggests home visits are effective for enhancing caregiving skills. However, unchanged caregiving burden indicates home visits alone are insufficient to reduce stress. Integrating additional support (psychological, emotional, social, spiritual) into home visit programs is recommended.

Keywords: Home visits, care burden, self-efficacy, caregivers, veterans, diabetes

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Introduction

Veterans of the Iran-Iraq war experience numerous health challenges that extend to their families (1). The presence of a chronic illness in a family member significantly impacts family dynamics, relationships, and overall family structure, presenting challenges in adaptation and management (2). Research highlights the reciprocal influence between chronic patients and their families, where the health of one member affects the well-being of others. Family caregivers play an essential role in healthcare services, contributing significantly to the treatment and management of chronic diseases (3).

Over time, caregivers often experience exhaustion and fatigue due to the physical and mental toll of caregiving. In addition to attending to the veteran's needs, they must also manage other household responsibilities (4). The balance between the patient's demands and the caregiver's resources and capabilities often leads to caregiving burden, encompassing physical, emotional, social, and financial strains (5). Symptoms of caregiving burden include depression, anxiety, feelings of entrapment, and, in severe cases, helpless decision-making or even abandonment of care (6). Studies indicate that caregivers of veterans frequently experience moderate levels of caregiving burden (7). Several interventions have been proposed to alleviate caregiving burden, with medical and nursing teams playing a crucial role. These interventions generally focus on empowering caregivers through education, psychological support, and social assistance (8). In contrast to caregiving burden, self-efficacy refers to an individual's confidence in their ability to perform caregiving tasks effectively. High self-efficacy fosters motivation and belief in one's caregiving abilities, whereas a decline in self-efficacy can negatively impact both the caregiver and the veteran's health (9,10). Engaging caregivers in the treatment process through education can enhance their confidence, improve patient self-care, and enhance overall quality of life. While caregivers are not obligated to acquire caregiving knowledge, it is essential for the healthcare team to emphasize their critical role as the veteran's primary support system (11).

One effective approach to caregiver education is home visits, which tailor educational content to caregivers' specific needs and available resources (12,13). Home visits help deliver healthcare education to individuals with chronic conditions, particularly those living in remote areas with limited access to medical facilities (14). These programs empower both patients and caregivers, promoting greater independence (15). The growing recognition of home visits' importance has led

to specialized training programs for nurses in various communities (16). Proper education and a well-structured home care environment provide continuous support for caregivers and chronic patients while also being a cost-effective solution (13).
Beyond the direct consequences of war, veterans experience a higher prevalence of various disorders and diseases compared to the general population. Studies indicate that the prevalence of diabetes among war-injured soldiers in the United States is 25%, while research in Iran has reported a 7.5% prevalence of diabetes among neuropsychiatric veterans (17,18). Furthermore, diabetes control among individuals remains suboptimal due to poor adherence to treatment regimens, lifestyle modifications, and disease-related complications (19,20). Since more than 95% of diabetes care is managed within the home setting (21), caregivers face significant burdens.
Although numerous studies have examined caregiver burden and self-efficacy, there is a paucity of research specifically focusing on caregivers of Iran-Iraq war veterans with diabetes. Therefore, this study aimed to determine the effect of a home visit empowerment program on the burden and self-efficacy of caregivers of veterans with diabetes.

Methods

This study was designed as a single-blind randomized clinical trial to assess the effect of a home visit empowerment program on caregivers of veterans with diabetes. The population consisted of caregivers of veterans diagnosed with diabetes. The sample size was initially estimated at a minimum of 22 participants per group, based on a 95% confidence level, 80% test power, and 30% probability of attrition (22). However, to enhance generalizability, 32 participants per group (total: 64 participants) were recruited. Due to illness-related dropouts, 60 participants completed the study and were included in the final analysis.
Caregivers were eligible if they provided full-time care for a veteran with at least 50% disability and diabetes, were in good health at the time of the study, had at least a fifth-grade education, were not simultaneously caring for another patient, and had not experienced a stressful event in the past six months. Participants were excluded if they withdrew from the study, experienced the death of the caregiver or veteran, developed an acute illness or required hospitalization during the study, encountered a stressful event during the study, or missed two consecutive home visit sessions (4,23).
A list of veterans who met the inclusion criteria was first compiled. Eligible veterans were defined as those with a disability rating of 50% or higher and a confirmed diabetes diagnosis. Using this list, their caregivers were identified and numbered. Participants were randomly assigned to either the intervention group or the control group, with the first randomly selected caregiver placed in the intervention group and the next in the
control group. This alternation continued until all participants were assigned, ensuring equal distribution across groups.
Demographic data was collected using a veteran demographic questionnaire, which included details such as age, gender, economic status, duration of illness, and percentage of disability. Besides, caregiver demographic information was gathered, covering age, gender, duration of care, caregiver-to-veteran relationship, and education level.
To assess caregiver self-efficacy, the Sherer's Self-Efficacy Questionnaire was used. This 17-item scale is scored on a 5-point Likert scale, ranging from 1 (Strongly disagree) to 5 (Strongly agree). Items 1, 3, 8, 9, 13, and 15 are reverse-scored. The total possible score ranges from 17 to 85, with higher scores indicating greater self-efficacy. Sherer (1982) reported a Cronbach's alpha of 0.76 for the general self-efficacy scale. The validity and reliability of the Persian version of this questionnaire have been confirmed in multiple studies conducted in Iran (24,25).
To measure caregiving burden, the Novak and Guest (1989) Caregiving Burden Questionnaire was used. This 24-item questionnaire is scored on a 5-point Likert scale, ranging from 1 (Never) to 5 (Almost always), with a total score ranging from 24 to 120. Higher scores indicate a greater caregiving burden (26). The validity of this questionnaire was confirmed by Abbasi et al. (2013) using content and face validity, and its reliability was established with Cronbach's alpha ranging from 0.69 to 0.87 for subscales and 0.80 for the total questionnaire (11). The validity and reliability of the Persian version of the caregiving burden questionnaire have also been confirmed in various studies in Iran (26,27).
After obtaining written informed consent, the intervention was initiated. A diabetes education program was developed through relevant sources, under the guidance of diabetes experts and faculty members. After incorporating expert feedback, the program was validated. The intervention

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consisted of four face-to-face training sessions, each lasting 40 to 60 minutes, conducted in veterans' homes over a four-week period. Sessions were scheduled weekly, and prior coordination was ensured with caregivers (Table 1).

Table 1. Home visit empowerment Program Sessions and content list

1. First Session:
    - Assessment of caregivers' knowledge and caregiving skills
    - Identification of strengths and weaknesses in caregiving
    - Discussion of the veteran's condition and home environment
    - Recommendations to improve the caregiving setting
2. Second Session:
    - Developing a positive attitude towards diabetes
    - Explanation of disease-related information
    - Instruction on proper diabetes treatment regimens
3. Third Session:
    - Medication management and its role in treatment
    - Exercise and physical activity guidelines for veterans
4. Fourth Session:
    - Review and evaluation of the training content
    - Addressing learning deficiencies

The control group received only routine training through an educational pamphlet.

The intervention period lasted three months, during which caregivers in the intervention group received follow-up phone calls to address any training-related questions. Both groups were monitored for compliance with exclusion criteria (28).

At the end of the study, the educational content provided to the intervention group was also given to the control group in booklet form as an appreciation for their participation. Data were analyzed using SPSS version 22.

Results

Table 2 showed the frequency distribution of caregivers in intervention and control groups. The chi-square test showed no statistically significant difference between the two groups concerning caregivers' demographic characteristics. Besides, all caregivers in both the intervention and control groups had no secondary caregiver, were without financial support, had no acute illness or stressful event in the last six months ($p>0.05$). The independent t-test also did not show a significant difference in the average income ($p=0.460$) and caregiving duration ($p=0.294$) between intervention and control groups.

Table 2. Frequency Distribution of Demographic Characteristics of Caregivers of Veterans with Diabetes

Variable	**Intervention Group n (%)**	**Control Group n (%)**	**P**
Gender			>0.05
Male	0 (0)	0 (0)	
Female	30 (100)	30 (100)	
Marital Status			>0.05
Single	0 (0)	0 (0)	
Married	30 (100)	30 (100)	
Education Level			0.385
Below Diploma	22 (73.3)	20 (66.7)	
Diploma	4 (13.3)	8 (26.7)	
Bachelor's Degree	4 (13.3)	2 (6.7)	
Master's Degree and Above	0 (0)	0 (0)	
Occupation			>0.05

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Variable	Intervention Group n (%)	Control Group n (%)	P
Employee	1 (3.3)	2 (6.7)	
Self-employed	4 (13.3)	4 (13.3)	
Unemployed	25 (83.3)	24 (80)	
Laborer	0 (0)	0 (0)	
Financial Dependency			
Yes	26 (86.7)	24 (80)	0.488
No	4 (13.3)	6 (20)	
Age (years)	Mean (SD)	Mean (SD)	0.321
	51.13 (6.12)	52.53 (4.61)	

Table 3 showed that the frequency distribution of veterans' demographic characteristics was not different in both groups. Furthermore, all veterans in both groups had no acute illness or stressful events (p>0.05), and disability (p=0.956) in the last six months.

Table 3. Frequency Distribution of Demographic Characteristics of Veterans with Diabetes

Variable	Intervention Group n (%)	Control Group n (%)	P
Gender			
Male	30 (100)	30 (100)	>0.05
Female	0 (0)	0 (0)	
Marital Status			
Married	29 (96.7)	30 (100)	0.313
Single	1 (3.3)	0 (0)	
Education Level			
Diploma	0 (0)	26 (86.7)	0.112 (Fisher's Exact Test)
Associate Degree	30 (100)	2 (6.7)	
Bachelor's Degree	0 (0)	2 (6.7)	
Master's Degree and Above	0 (0)	0 (0)	
Occupation			
Self-employed	3 (10)	3 (10)	0.385
Laborer	1 (3.3)	0 (0)	
Pensioner	26 (86.7)	24 (80)	
Employee	0 (0)	3 (10)	
Age (years)	Mean (SD)	Mean (SD)	0.746
	60.30 (3.52)	59.97 (4.27)	

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Table 4 demonstrated no significant difference in the mean of self-efficacy before the intervention between two groups (p=0.749). However, after the intervention, a statistically significant difference was observed in caregivers' self-efficacy (p<0.001). Moreover, before (p=0.079) and after (0.220) the intervention, the average caregiving burden did not show a statistically significant difference between the two groups.

Table 4. Mean and Standard Deviation of before and after Self- efficacy and Care Burden in the Two Groups of Intervention and Control

Variable		Mean(SD)		CI 95% Difference	t score	P
		Intervention	Control			
Self-efficacy	**Before**	47.70(4.72)	47.20(7.07)	-3.60, 2.60	-0.322	0.749
	After	55.30(5.87)	47.70(4.95)	10.41, 4.79	5.41	<0.001
Care burden	**Before**	92.40(1.85)	89.20(9.46)	-6.78, 0.38	-1.81	0.079
	After	92.30(4.19)	89.87(8.56)	-5.68, 1.34	-1.24	0.220

Discussion

This study aimed to determine the effect of a home visit empowerment program on the burden and self-efficacy of caregivers of veterans with diabetes. The results indicate that the home visit empowerment program significantly improved the self-efficacy of veteran caregivers. This improvement can be attributed to the needs-based and ability-focused training provided, which allowed caregivers to receive personalized instruction and improve their caregiving skills. Similar results have been reported in previous studies. For instance, a study in Taiwan examined the effect of a home caregiver training program on self-efficacy in 48 participants and found that home-based training significantly improved caregivers' self-efficacy (29). Likewise, Hejazi (30) highlighted that self-efficacy is one of the most influential cognitive mechanisms and can be enhanced through education and attitude formation (30). Furthermore, Anggraini et al. (31) investigated the impact of diet management training on the self-efficacy and care performance of caregivers for diabetic patients. Their findings demonstrated that educational interventions improved both self-efficacy and management performance in home caregivers (31).

However, contrasting findings were reported in a study conducted in Thailand, where a family-centered educational program consisting of three sessions did not improve caregivers' ability to control the blood sugar levels of diabetic patients at home (32). The researcher attributes this discrepancy to differences in the study population, research environment, content, and implementation methods.

The study results revealed that caregiving burden did not change significantly in either the intervention or control group after the home visit empowerment program. While the researcher initially expected that educational training would help reduce burden, the findings did not support this hypothesis. This result differs from studies such as Othman et al. assessed the impact of a home-based training program on the caregiving behaviors of parents of children with diabetes. That study found that education on caregiving necessity and proper implementation improved patient symptoms and increased caregivers' sense of responsibility, ultimately reducing their care-related burden (33).

The researcher speculates that the complexity and high demands of diabetes care may have contributed to caregivers continuing to experience burden, despite receiving informational support through training. Caregivers may still feel overwhelmed by their responsibilities, which suggest that educational interventions alone may not be enough to alleviate burdens.

To effectively reduce caregiving stress, it may be necessary to incorporate non-educational interventions into the home visit programs. Psychosocial and spiritual support services could help caregivers manage their burdens, alongside practical caregiving education. In the study Home Visits, Necessary but Insufficient, Weiss et al. (34), argue that home visits alone do not fully meet the complex needs of families. Therefore, comprehensive, continuous, and family-centered programs are

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more effective. Furthermore, the success of such programs depends on the availability and quality of comprehensive support services, as well as caregivers' capacity to access and engage with these services (34). Similarly, Leung et al. (35) emphasize the importance of social support in caregiving. Their study suggests that increased self-efficacy, combined with strong family and social support, can significantly alleviate caregiving burden. This implies that caregivers who receive greater emotional and practical support from their families and communities experience lower caregiving stress (35).
The results of the study by Zupa et al. (36) align with the findings of this study, indicating that a simultaneous caregiving program for veterans with diabetes, which involved both the veteran and their caregivers, did not significantly affect the caregivers' caregiving burden (37). Furthermore, studies conducted by Louie et al. (37) and Van Den Heuvel et al. (38), with interventions lasting 1 month and 2 months, respectively, also reported an increase in caregivers' knowledge but did not have a significant impact on their psychological burden (37,38).
However, some studies have shown a positive effect of educational interventions on caregiving burden. For instance, in a study conducted in Turkey, nurse-led home visits reduced the caregiving pressure felt by home caregivers of asthma patients (39). This intervention was conducted over 5 sessions over a three-month period, with both patients and caregivers being educated, and educational evaluations performed between sessions. This approach differs from the intervention in the present study, suggesting that the duration and frequency of sessions may play a significant role in reducing caregiving burden. Besides, the study by Yang et al. (40) revealed that a mindfulness-based training program significantly reduced caregiving stress among caregivers. The researchers emphasized the importance of using strategies to prevent or relieve caregiving stress, urging healthcare providers to implement such interventions as a mandatory part of caregiving support (40).

Study Limitations

A potential limitation of this study is the receipt of additional information regarding interventions, which may have influenced the results and introduced confounding factors. Future studies should address this by controlling for such variables and considering their potential impact on the outcomes.

Conclusion

This study demonstrated that the home visit empowerment program was effective in improving caregivers' self-efficacy, which can enhance their caregiving capacity. However, as caregiving burden did not show significant improvement, it is likely that the educational intervention alone was insufficient to alleviate caregivers' caregiving burden. The study suggests the need to supplement educational programs with additional interventions, including psychological, emotional, social, and spiritual support, to reduce caregiving burden.

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