Iran J Psychiatry 2026; 21: 3: 252-261

Original Article **https://doi.org/10.18502/ijps.v21i3.21861**

Effectiveness of Internet-Based Psychoeducation in Reducing Caregiver Burden in Dementia: A Clinical Trial

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Abstract

Objective: This study aimed to assess the impact of online psychoeducational training on reducing the psychological burden of caregivers of patients with moderate to severe dementia. Caring for such patients, especially by non-professional caregivers, poses significant mental and physical challenges. Internet-based interventions offer a practical and innovative solution to help alleviate this burden.
Method: This clinical trial was conducted in 2023 in Kashan, Iran, with 84 caregivers of patients with moderate to severe dementia. Participants were divided into two groups: an intervention group (n = 42) and a control group (n = 42). The intervention group received a 20-session online psychoeducational program over eight weeks, while the control group received routine care. Caregiver burden was measured using the Zarit Burden Interview (ZBI) before, immediately after, and three months after the intervention. Data analysis included independent t-tests and repeated measures ANOVA.
Results: Baseline characteristics of caregivers in both groups were homogeneous in most variables, except for education level, which differed significantly (P = 0.006). Repeated measures of the general linear model (GLM) analysis revealed a significant reduction in caregiver burden in the intervention group (P = 0.014). Within-group analysis showed that the burden significantly decreased immediately after the training. Although a slight increase was observed at the three-month follow-up, it remained lower than the baseline (P < 0.001).
Conclusion: Online psychoeducational training significantly reduces the psychological burden of dementia patient caregivers, with sustained effectiveness over a three-month follow-up. These findings support the integration of digital psychoeducation as a viable alternative or complement to traditional interventions, particularly in resource-limited or high-need settings.

Key words: *Caregiver Burden; Caregivers; Dementia; Health Education; Internet-Based Intervention; Telemedicine*

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Article Information:
Received Date: 2025/08/04, Revised Date: 2025/11/25, Accepted Date: 2025/12/17

Dementia is a progressive neurodegenerative disorder characterized by substantial cognitive decline, including impairments in thinking, memory, and reasoning that significantly interfere with both basic and instrumental activities of daily living. Instrumental activities, which include managing personal and household affairs, are critical indicators of an individual's capacity for independent living, while basic activities encompass fundamental self-care tasks such as bathing (1). Currently, approximately 55 million people worldwide live with dementia, with estimates projecting this figure to rise to 152 million by 2050 (2).

Most individuals with dementia receive care at home, predominantly provided by family caregivers (3). Non-family caregivers also contribute to the patient's care in their home or in long-term care institutional settings. Dementia caregiving is notably challenging due to the progressive cognitive decline, comorbid physical and psychiatric conditions, advanced age of patients, and high financial costs related to pharmacological and non-pharmacological care. Compared to many other medical conditions, dementia imposes greater economic and psychological burdens on both patients and their caregivers. Home-based caregiving demands continuous, often 24-hour supervision, assistance with daily activities, and management of chronic treatments, resulting in significant physical and psychological stress for caregivers (4). This persistent stress can lead to caregiver burnout, diminished well-being, and reduced quality of life (5).

Research consistently shows that most dementia caregivers are family members who typically lack formal training or education about the disease and caregiving strategies (6, 7). This knowledge gap exacerbates caregiver burden and contributes to psychological distress and burnout. Elevated caregiver burden is also linked to increased hospitalizations and extended patient stays in care facilities, escalating healthcare costs (8).

Caregiver burden encompasses physical, emotional, and financial stressors experienced by individuals providing dementia care. The relentless demands of caregiving may induce fatigue, irritability, anxiety, and depression. Caregivers frequently neglect their own health and social relationships, leading to compromised mental health and greater susceptibility to burnout (9, 10). Dementia affects not only patients but also their families profoundly, both emotionally and psychologically. The progressive loss of cognitive and functional abilities in loved ones requires caregivers to continually adapt to behavioral changes and symptom management, contributing to elevated stress and burden (11). Addressing the hidden burdens faced by dementia caregivers through supportive interventions is crucial. Support mechanisms include counseling, peer support groups, respite care, and educational programs (12). Among these, psychoeducation, a process of providing structured information about the disease and caregiving techniques, has gained prominence as an effective non-pharmacological intervention to reduce caregiver stress (13, 14).

Psychoeducational interventions are grounded in stress and coping theories and have effectively lowered caregiver burden, especially when delivered face-to-face (15). More recently, internet-based psychoeducation programs have become increasingly prevalent due to their flexibility, accessibility, and cost-effectiveness (16). The internet revolution has transformed caregiver support by providing accessible, evidence-based resources and fostering virtual communities that facilitate shared experiences and mutual support (17, 18). The COVID-19 pandemic further emphasized the value of online psychoeducation by disrupting traditional in-person programs and highlighting the benefits of flexible, asynchronous learning (4). These online programs have been shown to improve caregiver self-efficacy, the confidence to manage distressing situations, respond to behavioral changes, and maintain caregiving responsibilities—which is associated with better quality of life and reduced burnout (19, 20). Additionally, internet-based education alleviates financial and logistical barriers related to attending physical workshops or hiring professional caregivers. (21-23) Effective psychoeducation programs often include modules on stress management, relaxation techniques, mindfulness, and self-care strategies, enabling caregivers to reduce stress and enhance their overall well-being (24).

Psychoeducation is an evidence-based intervention designed to enhance caregivers' understanding of dementia, improve coping strategies, and promote adaptive behavioral and emotional responses. It typically combines informational content about the disease with skills training in stress management, communication, and problem-solving. Grounded in Lazarus and Folkman's stress and coping theory, psychoeducational programs aim to increase caregivers' self-efficacy and resilience, thereby reducing perceived burden and psychological distress. Multiple studies have demonstrated that structured psychoeducation, whether delivered face-to-face or through digital platforms, can significantly improve caregivers' knowledge, mental health, and quality of life. Integrating internet-based psychoeducation is particularly valuable in contexts where access to professional mental health services is limited, such as in Iran, thereby providing a cost-effective, scalable, and flexible model of support.

Given the growing prevalence of dementia and the scarcity of similar studies in Iran, this research aims to assess the impact of internet-based psychoeducation on the psychological burden experienced by caregivers of patients with moderate to severe dementia.

Materials and Methods

Study Design

This study was an interventional clinical trial with a three-month follow-up aimed at evaluating the effectiveness of internet-based psychoeducational training on the psychological burden experienced by caregivers of patients with moderate to severe dementia.

Study Population and Setting

The study involved caregivers of patients with moderate to severe dementia, confirmed by a psychiatrist using the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR) criteria, along with activities of daily living (ADL) and instrumental activities of daily living (IADL) assessments, who were referred to Kargarnejad psychiatric hospital in Kashan. Eligible caregivers were aged 18–65, had at least a primary education, could use the internet, provided a minimum of 4 hours of weekly care at home, and had no formal nursing training. Exclusion criteria included major psychiatric disorders in caregivers or patients, lack of access to digital tools, illiteracy, physical disability, or employment in institutional care settings.

Sampling Method and Sample Size

A convenience sampling method was used. The sample size was calculated based on parameters from a study by Baruah and Upasana on online education for caregivers of individuals with dementia in India. Accounting for an anticipated 50% dropout rate, 42 participants were allocated to each group. Subject assignment was conducted by the permuted block randomization method with four subjects in each block (AABB, BBAA, ABBA, BAAB, ABAB, BABA). Each four-subject group was assigned one of the six possible sequences, as mentioned above, using simple random sampling. After accounting for dropouts, 40 participants in the intervention group and 39 in the control group completed the study and were included in the analysis.

Intervention Procedure

A psychiatrist confirmed dementia severity using the DSM-5-TR criteria and ADL/IADL assessments. Caregivers were randomly assigned to either an intervention or a control group. Before enrollment, they received a face-to-face briefing on study details, confidentiality, and their rights, followed by the request to provide written informed consent.

Intervention group caregivers, equipped with smartphones or computers, received 20 psychoeducational video sessions over eight weeks via the Bale application and Aparat.com. Videos were shared three times a week and remained accessible throughout the study for both online and offline viewing. The control group received routine in-person education during visits and was waitlisted to access the online program after four months.

The 20-session educational program covered key topics, including the definition and symptoms of dementia, management of behavioral and communication issues, medication handling, caregiver self-care, and available support resources. The content was developed and delivered based on authoritative psychiatric references, including Kaplan & Sadock’s Comprehensive Textbook of Psychiatry (2017), issue 3 of the Synapse Mental Health Zine (2021), and findings from prior qualitative interviews with experts in geriatric mental health.

To assess content validity of the educational session evaluation tool, a questionnaire comprising five items (Assessment, Communication, Transparency, Simplicity, and Cultural appropriateness) was evaluated by eight experts (four psychiatrists, three clinical psychologists, and one geriatric nursing specialist) in the field of education and evaluation. The Content Validity Ratio (CVR) was calculated using Lawshe’s (1975) formula. With eight raters, the critical value for essentiality is 0.75. All items achieved CVR values at or above this threshold (range: 0.75–1.00), confirming their essentiality. The Content Validity Index (CVI) was computed as the proportion of experts assigning a score of 3 or 4 on a 0–4 Likert scale, yielding an average CVI of 0.85, with individual item CVIs ranging from 0.82 to 0.88, surpassing the acceptable threshold of 0.79. Additionally, the tool’s internal consistency was verified with a Cronbach’s alpha of 0.895, indicating high reliability. These results collectively demonstrate the tool’s strong content validity and reliability for evaluating educational sessions.

Content of Educational Sessions

A comprehensive 20-session program was designed to empower family and professional caregivers of people with dementia. It covers disease knowledge, practical daily care skills, behavioral and communication strategies, safety, medication management, and, crucially, extensive caregiver self-care and support network building to prevent burnout and sustain long-term caregiving (Table 1).

Table 1. Session-by-Session Educational Content and Learning Objectives for Intervention

Session	Contents	Goal
1	Familiarization with the definition of aging and dementia; what dementia is, symptoms, patients' emotions, DSM-5 definitions, prevention, reasons for hospitalization, diagnosis/treatment, and comorbid conditions	Enable caregivers to correctly understand dementia and normal aging, recognize early signs, reduce fear of the unknown, and know when/why medical help is needed
2	Types, stages, and symptoms of dementia; individual differences in progression; reducing caregiver stress from symptoms	Help caregivers identify the type/stage of dementia, anticipate changes, and lower their own anxiety by understanding that symptoms are part of the disease, not personal attacks
3–4	Strategies to maintain independence in ADL; importance of physical activity	Delay functional decline, preserve patient dignity and self-esteem, and reduce caregiver physical/emotional burden by maximizing remaining abilities
5	Home and environmental safety: identifying hazards, fall prevention, home modifications, urban design for the elderly	Prevent accidents and injuries, increase patient safety, and decrease caregiver constant vigilance and feelings of guilt/fear of "something happening"
6	Behavioral management techniques (distraction, validation, therapeutic fibbing, etc.); handling aggression and disturbances	Equip caregivers with practical, non-pharmacological tools to calmly manage challenging behaviors and significantly reduce daily stress and risk of injury
7–9	Medication management, timing, interactions, and preventing over-/underdosing	Avoid dangerous medication errors, reduce acute crises caused by wrong doing, and lower caregiver anxiety about "doing it wrong"
10	Effective communication strategies for language and cognitive impairments; handling repetitive questions, opposition, etc.	Improve daily interactions, decrease frustration and arguments for both parties, and restore a sense of connection despite communication barriers
11–12	Fundamental caregiving principles and behaviors when caring for dementia patients	Teach respectful, person-centered care that preserves patient dignity and helps caregivers feel competent and professional in their role
13	Recognizing hidden emotional burden, negative feelings, and risks to caregiver mental health	Increase caregiver self-awareness, normalize difficult emotions (guilt, anger, grief), and prevent burnout by early recognition of warning signs
14	Understanding delirium, its causes, urgency, and differentiation from dementia progression	Prevent misinterpretation of acute changes as "permanent worsening," ensure rapid medical intervention when needed, and reduce unnecessary panic
15	Identifying and using support resources: family help, support groups, day centers, legal/financial aid, nursing homes	Reduce isolation and overload by teaching caregivers they don't have to do everything alone and showing concrete ways to get practical and emotional help
16	Core principles of communication and interaction during dependency and disease fluctuations	Strengthen the emotional bond, minimize misunderstandings, and lower daily conflict and exhaustion caused by communication breakdowns
17–18	Self-care for caregivers: managing denial, anger, grief, loneliness, anxiety, depression, sleep, and spiritual aspects	Protect caregivers' own physical and mental health, prevent burnout and depression, and sustain long-term caregiving capacity
19	Review of all psychological education, preparation for the exam, and closing ceremony	Consolidate knowledge, boost caregiver confidence, and provide formal recognition of their effort and new competence
20	Final exam, program summary, certificate issuance, ongoing support guidance	Officially certify acquired skills, celebrate achievement, and connect caregivers to continuing resources for the future

Intervention Delivery and Fidelity Monitoring

To ensure treatment fidelity, the principal investigator served as the sole facilitator, conducting all 20 online sessions in accordance with a standardized protocol. Attendance was monitored through the online platform for each session; all intervention group participants (n = 39 attended every session as scheduled. Session logs, recorded and verified weekly by the facilitator, confirmed strict adherence to the planned sequence and session duration (60–90 minutes). Video materials were presented live during sessions under direct supervision, with participants required to stay actively engaged throughout. After each session, follow-up phone calls verified engagement and understanding, and addressed concerns. During these calls, the facilitator asked targeted questions to recall content and quickly discussed comprehension, resolving any technical or conceptual issues promptly. No sessions were canceled or rescheduled.

Data Collection

Data were collected using structured questionnaires and checklists. The Zarit Burden Interview (ZBI) was administered face-to-face before, immediately after, and three months after the intervention. It includes 22 items scored on a 5-point scale, with total scores from 0 to 88 (≤ 30: mild, 31–60: moderate, > 60: severe burden). The ZBI showed good reliability (Cronbach’s alpha = 0.88). Demographic and clinical data were also recorded, and confidentiality was maintained through the use of anonymization.

Outcomes

The primary outcome was caregiver burden measured by the ZBI, assessed before, immediately after, and three months post-intervention.

Statistical Analysis

Descriptive statistics were computed, including means, standard deviations, and frequencies. Chi-square tests and independent t-tests were used to assess baseline group equivalence. Intervention effects were analyzed using repeated measures using the general linear model (GLM), adjusting for potential covariates such as education level. Statistical significance was set at $P < 0.05$. Analyses were conducted using SPSS version 26.

Results

A total of 84 caregivers were randomly assigned to either an intervention group (n = 42) or a control group (n = 42). Following the intervention period, two participants in the intervention group and three in the control group were lost to follow-up. Therefore, data from 40 participants in the intervention group and 39 in the control group were included in the final analysis (Figure 1).

Baseline demographic and clinical characteristics were comparable between groups, except for education level, which showed a statistically significant difference (P = 0.001) (Table 2).

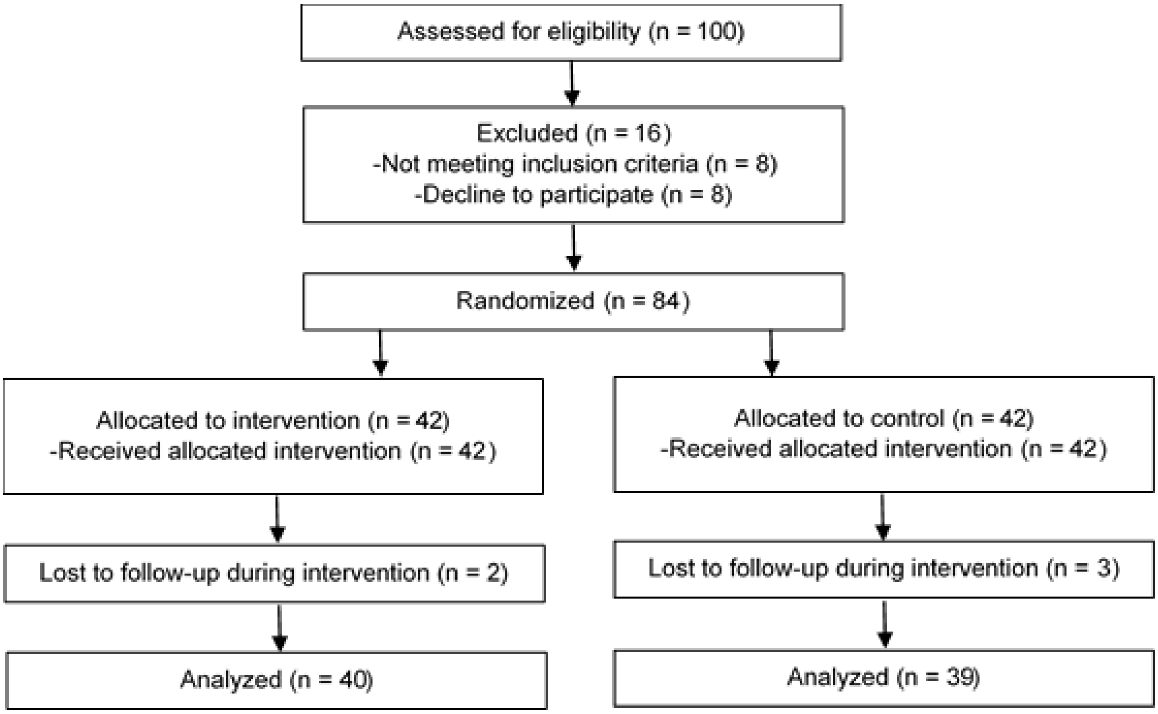


Figure 1. CONSORT Flow Diagram

Table 2. Baseline Characteristics of Caregivers in Intervention and Control Groups

Variable	Intervention Group	Control Group	P-value
Age (years)	53.85 ± 11.62	55.76 ± 11.88	0.470*
Duration of caregiving (months)	24.20 ± 14.03	30.76 ± 13.87	0.514**
Gender			0.539***

Variable	Intervention Group	Control Group	P-value
- Male	16 (55.2%)	13 (44.8%)	
- Female	24 (48.0%)	26 (52.0%)	
Education Level			0.001***
- Primary and Secondary	5 (20.8%)	19 (79.2%)	
- Diploma and Associate	33 (62.3%)	20 (37.7%)	
- Bachelor’s or Higher	3 (100%)	0 (0%)	
Occupation			1.000****
- Homemaker	29 (50%)	29 (50%)	
- Employed	11 (52.3%)	10 (47.6%)	
Disease Severity			0.502****
- Moderate	19 (46.3%)	22 (53.7%)	
- Severe	21 (55.3%)	17 (44.7%)	
Previous Psychoeducation	2 (100%)	0 (0%)	0.157***
Relationship to Patient			0.655***
- Spouse	4 (50%)	4 (50%)	
- Child	28 (49.1%)	29 (50.9%)	
- Sibling	1 (25%)	3 (75%)	
- Daughter/Son-in-law	1 (50%)	1 (50%)	
- Grandchild	5 (71.4%)	2 (28.6%)	
- Non-relative	1 (100%)	0 (0%)	
Previous caregiving experience for dementia	1 (100%)	0 (0%)	0.320***

*Independent t-test; **Mann-Whitney Test; ***Chi-square Test; ****Fisher's Exact Test

A repeated-measures analysis of the GLM was conducted to evaluate the effect of the educational intervention on caregiver burden. Caregiver burden scores were compared between the intervention and control groups at three time points: before, immediately after, and three months’ post-intervention, adjusting for education level as a covariate (Table 3).

Table 3. Mean Caregiver Burden Scores in Intervention and Control Groups before and after Training

Mental Health Component	Group	Before Training	Immediately After Training	3 Months After Training
Caregiver Burden	Intervention	68.87 ± 13.26	59.97 ± 15.36	65.72 ± 15.86
	Control	67.05 ± 11.31	69.79 ± 9.57	74.17 ± 9.36

Mauchly's test indicated a violation of the assumption of sphericity (W = 0.642, P < 0.001); therefore, degrees of freedom were corrected using the Greenhouse-Geisser estimate of sphericity ($\varepsilon = 0.736$). After controlling for education level, the repeated measures GLM revealed a significant main effect of time on caregiver burden (F (1.47, 108.99) = 3.64, P = 0.042, $\eta^2_p = 0.047$), indicating that, overall, burden changed significantly over time. The two groups differed significantly in their overall burden levels (F (1, 74) = 6.26, P = 0.014). More importantly, there was a highly significant Time × Group interaction (F (1.47, 108.99) = 43.06, P < 0.001, $\eta^2_p = 0.368$), reflecting different patterns of change over time: burden initially decreased in the intervention group after two months but subsequently increased, whereas it increased gradually in the control group. In contrast, the Time × Education Level interaction was not significant (F (1.47, 108.99) = 0.72, P = 0.451, $\eta^2_p = 0.010$), indicating that education level did not moderate the trajectory of caregiver burden over time. Similarly, interactions involving job and period of caring were non-significant (see Table 4).

To elucidate the significant Time × Group interaction (F (1.47, 108.99) = 43.06, P < 0.001, $\eta^2_p = 0.368$), Bonferroni-adjusted pairwise comparisons were performed separately within each group based on estimated marginal means (Table 5). In the intervention group, caregiver burden decreased significantly from baseline to immediately post-intervention (mean difference = 8.68, P < 0.001, 95% CI [5.32, 12.05]), but increased significantly again by the 3-month follow-up (mean difference = -5.85, P < 0.001, 95% CI [-9.02, -2.67]). Overall, burden at the 3-month follow-up did not differ significantly from baseline (mean difference =

2.84, P = 0.162). In the control group, no significant change occurred immediately post-intervention (P = 0.219), but burden increased significantly from immediately after the intervention to the 3-month follow-up (mean difference = -4.29, P = 0.006) and from baseline to the 3-month follow-up (mean difference = -6.81, P < 0.001, 95% CI [-10.51, -3.11]) in the intervention group.

Table 4. Effects of Time and Moderator Variables on Caregiver Burden in Repeated-Measures

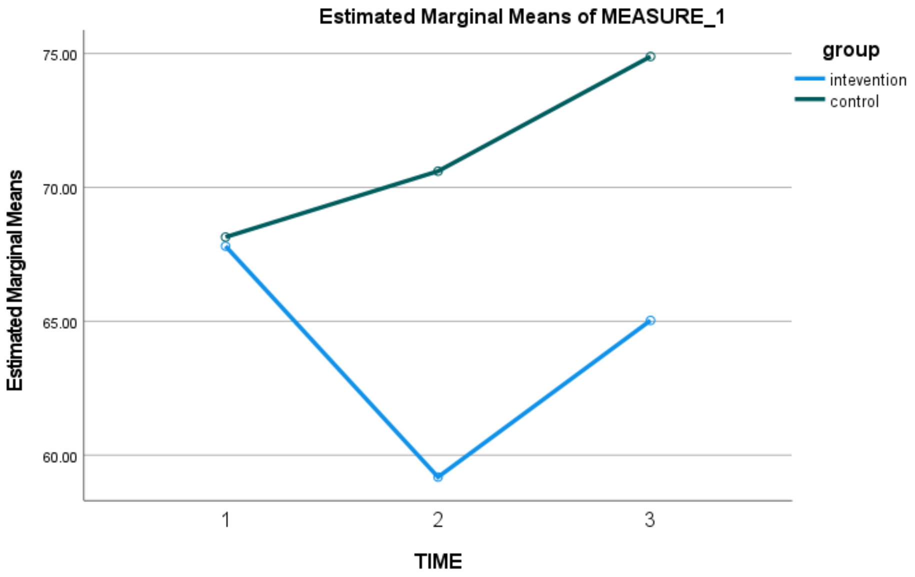
Source	F	df	P-value	Partial η²
Time	3.64	1.47	0.042	0.047
Time × Group	43.06	1.47	< 0.001	0.368
Time × Education Level	0.72	1.47	0.451	0.010
Time × Job	1.47	1.47	0.234	0.020
Time × Period of Caring	0.09	1.47	0.852	0.001

Table 5. Pairwise Comparisons of Caregiver Burden Scores Over Time

Group	Comparison	Mean Difference	Std. Error	95% Confidence Interval for Difference	P-value
Intervention	Baseline → Immediately after	8.684	1.428	5.32 to 12.05	< 0.001
Intervention	Immediately after → 3-month follow-up	-5.845	1.356	-9.02 to -2.67	< 0.001
Intervention	Baseline → 3-month follow-up	2.839	1.512	-0.79 to 6.47	0.162
Control	Baseline → Immediately after	-2.521	1.449	-5.95 to 0.91	0.219
Control	Immediately after → 3-month follow-up	-4.288	1.376	-7.51 to -1.07	0.006
Control	Baseline → 3-month follow-up	-6.809	1.534	-10.51 to -3.11	< 0.001

Note. Positive mean differences indicate a decrease in caregiver burden from the first to the second time point. Comparisons are based on estimated marginal means adjusted for education level, job, and history of education.

Figure 2 illustrates that caregiver burden scores decreased in the intervention group while increasing in the control group over time (P = 0.030).



Covariates appearing in the model are evaluated at the following values: education_level = 2.8861, job = 1.5316, month = 27.4430

Figure 2. Estimated Marginal Means for Caregiver Burden Scores Across Measurement Timepoints, Stratified by Study Group (Intervention Vs. Control)

Discussion

This study showed that the educational intervention effectively reduced caregivers’ psychological burden, with sustained improvements in emotional well-being during follow-up. The findings highlight the importance of structured support in enhancing coping skills and alleviating caregiving challenges. In contrast, the control group showed no significant changes, highlighting the benefits of targeted psychoeducational programs.

In this study, we introduced an innovative collection of educational sessions crafted to advance psychoeducation for improved disease management, uniquely delivered in Persian—a language in which such comprehensive content was previously unavailable. This novel approach addresses a critical gap in accessible, culturally relevant educational resources. By rigorously evaluating the quality and credibility of this collection, we ensured its alignment with high standards of content validity and reliability. This pioneering Persian-language framework represents a transformative step forward, offering a new pathway for delivering impactful psychoeducation to enhance disease management within Persian-speaking communities.

This outcome aligns with previous research emphasizing the positive impact of educational interventions on caregiver burden. For instance, Goto *et al.* (2024) reported significant reductions in stress among dementia caregivers in Japan following a web-based psychoeducational program, highlighting the promise of digital platforms as supportive tools (25). Similarly, Sharifan *et al.* (2021) observed improved caregiver outcomes through mobile application-based education, with demographic factors such as education level, gender, and familial relationships influencing stress levels (26). These findings suggest that adapting interventions to caregivers' characteristics further enhances their effectiveness.

Additional support for the present results is found in studies such as the one by Xie *et al.* (2024), which demonstrated that internet-based training reduced caregiver burden, improved caregiving competencies, and lessened behavioral symptoms in dementia patients (27). Likewise, Salehinejad *et al.* (2017) reported substantial improvements in caregiver psychological well-being following structured, web-based psychoeducation (28). These findings reinforce the feasibility and effectiveness of digital tools in caregiver education.

However, the literature is not entirely consistent. A meta-analysis by Yu *et al.* (2023) concluded that internet-based psychoeducation had limited effects on caregiver burden, anxiety, self-efficacy, and quality of life (29). This discrepancy may stem from methodological differences and strict inclusion criteria that exclude studies similar to the present one. In contrast, Cheng *et al*. (2020) confirmed the overall positive impact of psychoeducational interventions through a broader meta-analysis that covered diverse delivery formats, including face-to-face, telephone, videoconferencing, and self-guided programs (15).

Collectively, the evidence underscores the critical role of educational interventions—especially those delivered via digital platforms—in supporting informal dementia caregivers. Beyond reducing psychological distress, such programs enhance caregiving knowledge, increase perceived competence, and strengthen coping and problem-solving abilities. The emotional support and validation provided through structured education may also contribute to reduced stress and greater caregiving efficacy. Improved competencies could, in turn, lead to more effective management of dementia-related behavioral symptoms. Customizing these interventions to match caregivers' demographic and relational profiles may further boost their impact.

An interesting pattern emerged in the changes in caregiver burden over time. The intervention group experienced a significant reduction in burden immediately following the program; however, this was followed by a significant increase by the three-month follow-up. Importantly, burden scores at three months did not differ significantly from baseline levels, suggesting that the initial benefits of the intervention were not sustained long-term. This rebound may reflect the ongoing and escalating demands of dementia caregiving, which could outweigh the short-term gains from training as the disease progresses. In contrast, the control group showed a gradual and significant increase in burden over the same period, highlighting the cumulative toll of providing care without structured support.

Incorporating modern technologies, including mobile applications and web-based platforms, offers scalable and cost-effective alternatives to traditional face-to-face methods. This is particularly beneficial in situations where in-person support is limited, such as during global health crises like the COVID-19 pandemic. Despite some variability in findings across studies, the broader literature supports the value of internet-based psychoeducation in promoting caregivers' mental health and emotional resilience.

The findings of this study offer important implications for healthcare providers, policymakers, and researchers. Implementing accessible, evidence-based educational interventions tailored to caregivers' specific needs can enhance support systems, reduce caregiver distress, and ultimately improve care outcomes for individuals with dementia—contributing to broader public health goals.

Limitation

Nonetheless, this study has certain limitations. While the sample size was sufficient for statistical purposes, it may limit the generalizability of the findings. Additionally, the three-month follow-up period, although appropriate for designing and assessing short-term effects, does not provide insights into long-term sustainability. Future research should investigate the prolonged impact of psychoeducational programs and explore outcomes such as patient quality of life and caregiver self-efficacy. Furthermore, examining the moderating role of demographic and contextual variables could inform more targeted interventions.

Conclusion

This study reinforces the effectiveness of online psychoeducational interventions in alleviating the psychological burden experienced by caregivers of individuals with dementia. The enduring improvements observed following the intervention emphasize the utility of digital education as a sustainable support strategy. Given the limited accessibility of in-person services for many caregivers—particularly those with restricted mobility—online platforms offer a practical and scalable alternative. Moving forward, future research should examine the broader impact of such interventions on caregiver well-being, including dimensions such as anxiety, self-efficacy, and quality of life. Emphasis should also be placed on tailoring content to caregivers' individual needs and profiles to maximize the effectiveness of interventions. Embedding these personalized digital programs within healthcare systems may significantly strengthen caregiver support structures and enhance care outcomes for individuals with dementia.

Acknowledgment

The authors acknowledge that this research was conducted independently, without reliance on external funding or institutional sponsorship.

Funding

The study was conducted without financial support from any public, commercial, or charitable sources.

Conflict of Interest

None.

Author’s Contributions

ADL: Activities of Daily Living
IADL: Instrumental Activities of Daily Living
ZBI: Zarit Burden Interview
GLM: General Linear Model
DSM-5-TR: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision
SPSS: Statistical Package for the Social Sciences
ANOVA: Analysis of Variance

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