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Original Article

Caregiver Burden among Primary Caregivers of Community-Dwelling Older Adults: A Systematic Review

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ABSTRACT

Background: Caregivers are individuals responsible for assisting older, sick, or disabled persons. The majority of care services are provided by family members acting as primary caregivers. Providing care for older people entails considerable financial, physical, and psychosocial strain, which can reduce both the quality of life of caregivers and the quality of care provided. With the growing proportion of individuals aged 60 and above, along with advancements in medical and technological fields that extend life expectancy, concerns regarding elder care are increasing.

Methods: This systematic review examined the effects of interventions on caregiver burden among primary caregivers of community-dwelling older adults and identified key factors influencing caregiving challenges. A total of 354 peer-reviewed articles published between 2000 and 2023 were extracted from databases including Embase, PubMed, and Scopus. The agreement rate between the first and third authors during the article selection process was 93%. Article quality was assessed using the Physiotherapy Evidence Database (PEDro) Scale. Abstracts and full texts were reviewed by the second and fourth authors, with an inter-rater agreement of 89%.

Results: Thirteen articles met the inclusion criteria and were included in the final review. All were of medium to high methodological quality, each scoring five or above on the PEDro scale. The studies focused on interventions targeting older adults (n=4), caregivers (n=5), or both (n=4). Interventions aimed directly at caregivers were identified as the most effective in reducing caregiver burden. Findings were synthesized based on reported outcomes related to caregiver burden, stress, and depression.

Conclusion: The review concludes that direct interventions for caregivers are the most effective strategy for reducing caregiver burden. Designing and evaluating individualized intervention programs may further enhance their effectiveness and inform future caregiving support strategies.

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Introduction

Caregivers are individuals who provide support to sick or dependent persons by assisting them with practical tasks and activities of daily living (ADLs) [1]. Family members such as parents, siblings, and grandparents often serve as *primary caregivers*, assuming the majority of caregiving responsibilities [2]. In addition to primary caregivers, *informal secondary caregivers*—typically relatives, friends, or neighbors—also offer unpaid support, helping with daily care tasks for individuals who are ill or disabled [1].

In Europe, family caregivers are responsible for approximately 80% of long-term care, primarily related to the health and social support of elderly or disabled individuals. Around 17% of people in Europe and 18.2% in the United States provide long-term care for elderly or disabled relatives [2]. In the 28 countries of the European Union (EU-28), 47.9% of older adults have reported experiencing moderate to severe difficulties with personal care and household tasks. In family-oriented welfare states such as Spain and Italy, the provision of informal care has become a routine aspect of daily life for many families [3]. Similarly, in Iran, strong emotional bonds and cultural expectations contribute to a significant caregiving burden. Caring for elderly parents is considered a primary familial responsibility, and there is considerable resistance to placing older adults in nursing homes [4]. There are currently no official statistics available on the extent of caregiver burden among Iranian families [5].

Given the advancements in medicine and technology that have significantly extended human life expectancy, alongside the growing proportion of individuals aged 60 years and older, global concerns regarding elderly care are on the rise [6]. In 2015, approximately 8.5% of the world's population was classified as elderly. However, this proportion is increasing rapidly. Projections indicate that by 2030, older people will comprise 12% of the global population, rising to 16.7% by 2050. More specifically, an average annual increase of 27.1 million older adults is expected between 2015 and 2050 [7].

According to the 2013 census conducted by the Iranian Statistical Center, individuals aged over 60 years constituted 8.2% of the country's population. Projections indicate that this proportion is expected to exceed 10% by 2025 and reach between 21% and 25% by 2051 (Statistical Center of Iran, Population and Housing Census 2011) [7].

Providing care for older adults and managing the associated costs of care services have become pressing challenges for both families and governments [6]. While the majority of informal caregivers are motivated by strong emotional bonds, the caregiving role imposes considerable physical and psychosocial strain [8]. In a study conducted in Accra, Ghana, Kyei-Arthur and Codjoe (2020) explored the challenges and coping mechanisms of caregivers in low-income communities. Their findings revealed that prolonged caregiving led to declines in physical and mental health, reduced quality of life, weight and income loss, financial hardship, job insecurity, interpersonal conflicts, and diminished sexual desire among elderly caregivers [6]. Multiple factors contribute to the caregiving burden. According to Ruisoto et al. (2020), caregiver gender, duration of caregiving, personality traits such as neuroticism, and the cognitive status of the care recipient were significant predictors of caregiver burden [9].

Given the rapid increase in the elderly population, this systematic review aims to examine the effects of interventions on the burden experienced by primary caregivers of community-dwelling older adults, to inform the development of more effective treatment and support services.

Methods

Data Sources

This systematic review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to identify all relevant evidence related to caregiving for individuals with chronic or acute illnesses or disabilities [10, 11].

Ethical Considerations

The study was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences (IR.SBMU.RETECH.REC.1403.853).

To extract relevant articles, the following databases were searched: PubMed, Embase, and Scopus. Articles not published in English were excluded based on the predefined inclusion and exclusion criteria. Therefore, Iranian databases such as SID, Magiran, Iran Medex, MEDLIB, and IranDoc were not considered. Additionally, grey literature was excluded from this review.

The following search terms were used: *Informal Caregivers*, *Elderly*, *Caring*, *Frail*, *Caregiver*, *Informal Caring*, *Ageing*, *Caregiver Burden*, *Elder*, *Community-Dwelling*, *Caregivers*, *Community*, *Carers*, *Primary Caregiver*, *Spouse*, *Dwelling*, *Elderly*, *Older Adult*, *Aging*, *Older*, and *Elder*. Boolean operators "OR" and "AND" were applied to combine terms and narrow the search results. For example: *"Community-Dwelling AND Caregiver Burden."*

Eligibility Criteria

This study included articles that met the following criteria: 1) Focused on the issue of caregiving for the elderly population, 2) published in peer-reviewed English-language journals between 2000 and 2023.

To ensure the highest level of evidence, only studies classified as Level I according to the American Occupational Therapy Association (AOTA) levels of evidence [12]—including randomized controlled trials (RCTs), meta-analyses, and systematic reviews—were considered eligible.

The following types of publications were excluded: theses, and articles falling under other evidence levels such as non-randomized controlled trials, single-subject designs, narrative reviews, and case studies.

Study Selection

The entire search process was independently conducted by two researchers (the first and third authors) from May 14 to June 10, 2023. An initial total of 476 articles were identified. After the removal of duplicates, 354 articles remained. These articles were independently screened and evaluated by the two researchers based on the predefined eligibility criteria.

A total of 341 articles were excluded for the following reasons: 1) Inclusion of participants younger than 60 years old (n = 76), 2) Inclusion of participants other than community-dwelling older adults (n = 87), 3) ocus on general caregiver challenges rather than informal caregiving (n = 112), 4) ack of access to full text (n =14), 5) Publication before the year 2000 (n = 12), and 6) Publication in languages other than English (n = 27).

Following this screening process, 13 articles remained. The agreement rate between the two researchers was 93%. To enhance the reliability of the selection, the second author—who has prior experience in conducting review studies—reassessed the 13 included articles. Given that all articles met the inclusion criteria, with 100% agreement between the reviewers and the second author, these 13 articles were included in the final analysis. Both the abstract and full text of each article were thoroughly reviewed. See Figure 1.

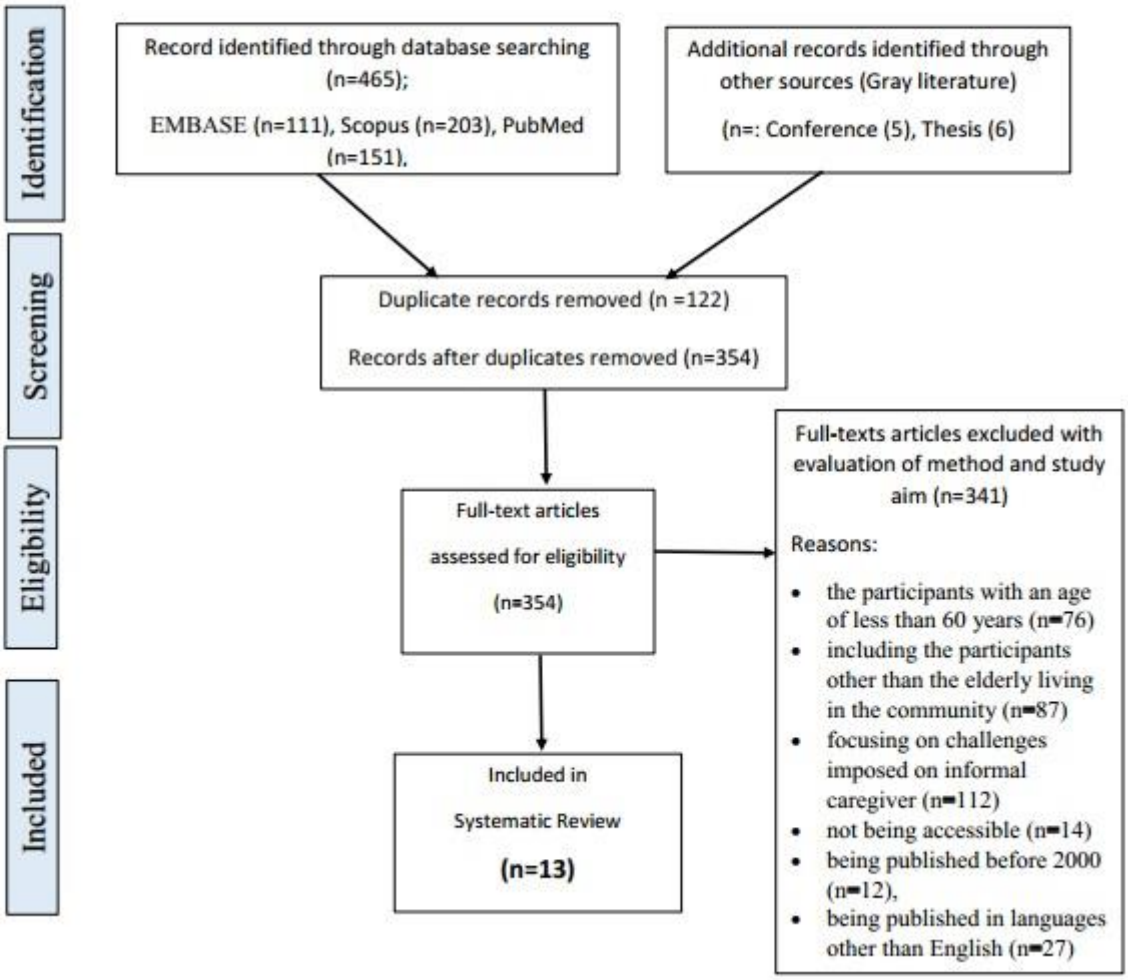

Figure 1: PRISMA Flow Diagram

Quality Assessment of Studies

The quality of the selected articles was independently assessed by two of the authors using the PEDro scale, which comprises 11 criteria. As shown in **Table 1**, each criterion was scored as either 0 (not satisfied) or 1 (satisfied), resulting in a total score ranging from 0 to 11 for each article. The interrater reliability of the PEDro scale is reported as satisfactory [10].

Results

Based on the PEDro scale, the methodological quality of all the included studies was determined to be moderate to high (scores ≥5). In the majority of the studies, primary caregivers were family members, with spouses being the most frequently reported. After a thorough analysis of the selected articles, they were categorized into three intervention groups: interventions targeting older adults, caregivers, and both the elderly and caregivers (see Table 2).

Table 1: Physiotherapy Evidence Database (PEDro) Results of Selected Studies

NO.	Article Author/Year	Q^*1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Total Score
1	Aggar et al. (2012)	1	1	1	1	1	1	1	1	0	1	1	10
2	Faes et al. (2010)	1	1	1	1	1	0	1	0	0	1	1	8
3	Boyacıoğlu & Kutlu (2016)	1	1	1	1	1	0	0	1	1	1	1	9
4	Knowles et al. (2010)	1	1	0	1	0	0	0	0	0	1	1	5
5	Kwok et al. (2012)	1	1	1	0	0	0	0	1	0	1	1	6
6	De Luca et al. (2021)	1	1	1	1	0	1	0	1	1	1	1	9
7	Jansen et al. (2011)	1	1	1	0	0	1	1	1	0	1	1	8
8	Yu (2016)	0	1	1	1	0	0	1	0	0	1	0	5
9	Cheung et al. (2020)	1	1	1	1	0	1	1	0	1	1	1	9
10	Garand et al. (2014)	1	1	1	1	0	0	1	1	1	1	0	8
11	Crist et al. (2015)	1	1	0	1	0	0	0	1	1	0	1	6
12	Phung et al. (2013)	1	1	1	1	0	0	1	1	1	1	1	9
13	Söylemez et al. (2016)	1	1	0	0	0	0	0	1	1	1	1	6

*Q= question

Table 2: Studies Analyzed in the Current Study

Author (year)	**Title**	**Type of Study**	**Randomization**	**Participants/ Diagnosis (N=/M: F/ age=To, IG (n)/M: F/ Mean age ±SD, CG (n)/M: F/ Mean age ±SD)**	**Intervention (Intervention of IG=…/ Intervention of CG=…)**	**Outcome Measure (Assessment)**	**Result**
1. Aggar et al. (2012)	Reactions to caregiving during an intervention targeting frailty in community living older people	single-center randomized controlled trial	+ (?)	(N=119 / 48:71) Age: 37 to 94 years old IG: (53) / 22:31/64.98± 14.65 CG: (66) / 26:40/ 68.05±12.94	IG: Frailty intervention CG: usual care	HADS, Caregiver Reaction Assessment (CRA)	**Improved health and higher levels of self-esteem** were observed in the caregivers receiving the intervention. The caregivers in both groups experienced **higher levels of Anxiety.**
2. Faes et al. (2010)	Multifactorial Fall Prevention for Pairs of Frail Community-Dwelling Older Fallers and their Informal Caregivers: A Dead End for Complex Interventions in the Frailest Fallers	A randomized, 2 parallel-group, single-blind, multicenter trial	+ (stratified/ minimization algorithm)	(N=36/ 14: 19) Age: ≤80 IG: (18)/9:9/ 67.3±13.1 CG: (15)/5:10/ 64.3±14.3	IG: geriatric physical and psychological programs. CG: usual care	FES-I, HADS, GDS, GARS, PMS, VAS	The rate of falls and fear of falling did not decrease in frail old adults, especially those suffering from mild cognitive impairment, despite using the **fall prevention program**. This intervention **boosted** not only the burden on **caregivers** but also **the burden of performing it at home**.
3. Boyacıoğlu & Kutlu (2016)	The Effectiveness of Psychoeducational Interventions in Reducing the Care Burden of Family Members Caring for the Elderly in Turkey: A Randomized Controlled Study	single-blinded	+(?)	(N=66/6:66) age: 18-75 IG: (33)/1:32/ 49.72 ± 10.75 CG: (33)/5:28/ 52.06 ± 8.23	IG: McGill Nursing Model (**Education, Demonstration)** CG: Routine care	ZBI, GSE , CERQ	Caregiver burden was remarkably lessened and caregivers' **positive coping methods** and **self-efficacy** were significantly enhanced by using the **theMcGill Model of Nursing-based** psychoeducational intervention program

Author (year)	Title	Type of Study	Randomization	Participants/ Diagnosis (N=/M: F/ age=To, IG (n)/M: F/ Mean age ±SD, CG (n)/M: F/ Mean age ±SD)	Intervention (Intervention of IG=…/ Intervention of CG=…)	Outcome Measure (Assessment)	Result
4. Knowles et al. (2010)	An initiative to provide emergency healthcare for older people in the community: the impact on carers	Cluster randomised controlled trial	+(?)	(N=401/ Female:561 ?	IG: minor acute health episode in addition to evaluating the impact on carers of the new Paramedic Practitioner in Older People's Support (PPOPS) service) CG: standard service of 999 ambulance response and transfer to the local emergency department	Questionnaire	Compared to the caregivers in the control group (the emergency department group), the caregivers in the intervention (the Paramedic Practitioner in Older People's Support) PPOPS), as community-based schemes) group provided a higher amount of care, probably due to the need for more input to support physical activities. The Paramedic Practitioner in the Older People's Support group was more willing to treat their patients at home and more satisfied with the intervention and staff attitude.
5. Kwok et al. (2012)	Case management to improve the quality of life of older people with early dementia and to reduce caregiver burden	?	+(?)	(N:102/43:59) Age: aged ≥65 years IG(59)/24:35/78.6±6.4 CG(43)/19:24/ 78.2±5.5	IG: case management (via home visits and telephone calls, a 3-month home-based cognitive stimulation activities, and a telephone hotline). CG: usual care	PWIID, ZBI, NPI, CSDD, GHQ	Both intervention and control groups utilized paid helpers and daycare services to the same extent during the intervention; however, the intervention group employed remarkably greater daycare services and paid helpers at the follow-ups. Both groups rarely utilized home help and respite care. Case management did not promote the quality of life in patients with early dementia, nor did it diminish the burden on caregivers. However, through this component, the caregivers were encouraged to seek aid, like day care services. The symptoms of depression decreased in the patients with dementia by using home visits and case management; nonetheless, the impact was not long-lasting.
6. De Luca et al. (2021)	A multidisciplinary Telehealth approach for community-dwelling older adults	?	+(Block Randomization)	N:60 Female:42/Male:18 age: 77.4 § 9.1 years IG:n:30/Female:20 Male:10/ Age: 76.7 § 8.3 CG:n:30/Female:22 Male:8 Age: 78.2 § 7.1	IG: multi-specialist telemedicine care CG: usual territory care	MMSE, BANSS, BPRS), GDS, CBI, MNA, SUS	Telemedicine positively impacted mood, nutritional status, ADL/IADL, behavior, and mood compared to the traditional approach. These improvements were boosted over time. The burden on the caregivers was reduced, and they considered the intervention to be an effective way of improving their condition.
7. Jansen et al. (2011)	Effectiveness of case management among older adults with early symptoms of dementia and their primary informal caregivers: A randomized clinical trial	?	+(?)	N:99 Female:69/Male:30 IG:54 Age: 63.6 (13.8) Female:36/Male:18 CG:45 Age: 61.6 (15.2) Female: 33/Male:12	IG: Case management CG: Usual care	SCQ, SF-36, CES-D, SPPIC, DQOL	The intervention and experimental groups did not exhibit any significant difference over time. The quality of case management was reported to be high by the informal caregivers. The fidelity of intervention was expected to be higher.

Author (year)	**Title**	**Type of Study**	**Randomization**	**Participants/ Diagnosis (N=/M: F/ age=To, IG (n)/M: F/ Mean age ±SD, CG (n)/M: F/ Mean age ±SD)**	**Intervention (Intervention of IG=…/ Intervention of CG=…)**	**Outcome Measure (Assessment)**	**Result**
8. Yu (2016)	Effects of a Health and Social Collaborative Case Management Model on Health Outcomes of Family Caregivers of Frail Older Adults: Preliminary Data from a Pilot Randomized Controlled Trial	Pilot Randomized Controlled Trial	+(?)	N:60 Female?/ Male? Age: 61.3 15.5 IG: n = 30 Female?/ Male? Age: 61.5 14.1 CG: n = 30 Age: 61.2 17.1 Female?/ Male?	IG: health and social collaborative case Management(HSC-CM,) CG: usual care,	HRQL , CBI, SF-36	In the intervention group, caregiver burden significantly decreased and improved medical outcomes, such as social role functioning, general well-being, and vitality.
9. Cheung et al. (2020)	Self-Administered Acupressure for Caregivers of Older Family Members: A Randomized Controlled Trial	randomized, assessor-blind, controlled trial	+ (block)	207/(?:?) 21 To older 103/?:?/59.03±11.73 104/?:?/58.97±13.75	IG=self-administered acupressure CG=nothing	CBI, PFS, PSQI, PHQ,	The intervention group experienced low stress. Fewer symptoms of depression and insomnia, and fewer secondary outcomes of fatigue were observed in this group. Physical health-related quality of life was improved. The co-occurring symptoms and stress of the elderly caregivers were reduced as a result of self-administered acupressure intervention.
10. Garand et al. (2014)	Effects of Problem Solving Therapy on Mental Health Outcomes in Family Caregivers of Persons with a New Diagnosis of Mild Cognitive Impairment or Early Dementia: A Randomized Controlled Trial	Two-group pretest–post-test, randomized design	+ (?)	73/16:57 27 to 84 36/8:28/66.4±8.0 37/8:29/63.4±13.7	IG= experimental intervention , based on the principles of PST (PST-MCI/ AD caregiving) CG= providing education about nutrition (NT).	CES-D, STAI, SPSI – Revised,	The family caregivers reported the utility of the problem-solving training intervention for the elderly who are newly diagnosed with cognitive problems. The depression symptoms of caregivers, particularly caregivers of older adults with early dementia, decreased more by using the problem-solving training intervention when compared with nutritional education. The anxiety levels of caregivers were reduced, which lowered negative problem orientation. Mental health improvements in new family caregivers were observed due to the enhancement of problem-solving skills acquired once a loved one was diagnosed with cognitive impairment (especially dementia).

Author (year)	Title	Type of Study	Randomization	Participants/ Diagnosis (N=/M: F/ age=To, IG (n)/M: F/ Mean age ±SD, CG (n)/M: F/ Mean age ±SD)	Intervention (Intervention of IG=…/ Intervention of CG=…)	Outcome Measure (Assessment)	Result
11. Crist et al. (2015)	The Impact of a Telenovela Intervention on Use of Home Health Care Services and Mexican American Elder and Caregiver Outcomes	two-group randomized control trial with repeated measures	+ (?)	Elders: 74/37:37 55 to 83 38/20:18/68.11±8.9 36/17:19/67.67±7.3 Caregivers: 74/11:63 18 To 80 38/4:34/50.47±14.4 36/7:29/53.86±12.6	IG: The intervention was two-part. The first part involved viewing a 12-minute telenovela. The second part was participation in a guided dialogue immediately following the telenovela viewing. CG= A telenovela “Health Screening for the Elderly”, each followed by a guided conversation with each session lasting approximately the same length. The attention control telenovela was also a DVD with the same format, quality, and length as the intervention to control for attention effects. The content of this control telenovela was a story about older people’s awareness of health screening needs, recommended and developed by the PI Advisory Council and ENCASA.	OARS, OMFAQ, ADL scale, CBS, PBS, CES-D, PSS,	Both groups raised their awareness of the home health care services (HHCS) and increased confidence in this intervention. HHCS was employed by the intervention group more, although the difference between the two groups was not significant. By using HHCS, the mutual relationship between the older adult and the caregiver was improved, and the caregiver's burden and depression were lessened.

Author (year)	Title	Type of Study	Randomization	Participants/ Diagnosis (N=/M: F/ age=To, IG (n)/M: F/ Mean age ±SD, CG (n)/M: F/ Mean age ±SD)	Intervention (Intervention of IG=…/ Intervention of CG=…)	Outcome Measure (Assessment)	Result
12. Phung et al. (2013)	A three-year follow-up on the efficacy of psychosocial interventions for patients with mild dementia and their caregivers: the multicentre, rater-blinded, randomised Danish Alzheimer Intervention Study (DAISY)	two-group randomized control trial with repeated measures		Elders: 330/151:179 50 To older 163/76:87/76.5±7.7 167/75:92/75.9±6.6 Elders: N=330/151:179 Age ? IG(163)/76:87/ 76.5 (7.7) CG(167)/75:92/ 75.9 (6.6) Caregiver: N=330/110:220/ Age? IG(163)/54:109/ 65.5 (12.7) CG(167)/56:111/ 66.5 (12.7)	IG A multifaceted and semi-tailored psychosocial intervention program was designed to provide counselling, information, and support to patients with mild dementia and their caregivers in the intervention group. CG= ?	MMSE, CDS, proxy-rated EuroQoL VAS, QoL-AD, NI-Q, ACSADLS, GDS, and self-rated EuroQoL VAS.	At the 12-month follow-up, Cornell depression (as a primary outcome) and proxy-rated QoL-AD (as a secondary outcome) were improved. Two years after that (at a 36-month follow-up), no improvements in primary and secondary outcomes were observed. No long-term impact of the intensive psychosocial intervention program on the primary and secondary outcomes of the older adults with very mild Alzheimer's disease and their caregivers were detected.
13. Söylemez et al. (2016)	Application of the progressively lowered stress threshold model with community-based caregivers: a randomized controlled trial	A randomized controlled trial with a repeated-measures	+ (?)	Elders: 70/29:41 ? To? 35/13:22/ 78.6 (5.67) 35/16:19/ 76.29 (5.76) Caregivers: 70/19:51 ? To? 35/9:26/ 61.2(13.14) 35/10:25/ 62.28(12.76)	IG= Progressively Lowered Stress Threshold (PLST)-based Intervention. CG= Routine care.	QOL–ADscale, NPI, CBI), BDI, WHOQOL-BREF.	The results for the control and intervention groups were similar. The caregivers in the intervention group remarkably developed the factors under investigation at the follow-up. Concerning the patient-related factors, there was no significant difference between the two groups. Although the use of the Progressively Lowered Stress Threshold (PLST) model effectively lowered the caregivers' depression and burden and enhanced their quality of life, it was as effective as routine care.

Intervention for Elders

In four of the reviewed articles, interventions were implemented directly on older adults, with the impact subsequently measured in their caregivers. The findings were mixed. One study reported that frailty-targeted interventions had no significant effect on caregivers' financial burden or levels of depression; instead, caregivers' stress levels increased over time during the intervention [13]. Another study evaluating case management for older adults with mild dementia found no meaningful improvement in caregivers' social or economic burden or stress levels [14].

In contrast, a study utilizing multidisciplinary telemedicine services reported a reduction in both caregiver burden and depression [15]. Additionally, one study compared two types of emergency healthcare services for older adults. While no statistically significant difference was observed between the groups, caregivers of patients receiving home-based PPOPS services reported higher satisfaction levels. However, more than half of the caregivers in both groups continued to report anxiety related to their caregiving responsibilities [16].

Intervention for Caregivers

In five studies, interventions were specifically directed at caregivers. The findings consistently indicated positive outcomes. A psychoeducational intervention based on the McGill Model of Nursing (MMN) was shown to effectively reduce both the social and economic burdens experienced by caregivers [17]. Similarly, the HSC-CM model significantly alleviated overall caregiver burden [18].

In another study, a self-administered acupressure intervention led to notable reductions in caregiver stress, depression, and burden within the intervention group [19]. Furthermore, when comparing nutritional education with problem-solving therapy (PST) for caregivers of older adults with mild cognitive impairment or early dementia, PST was found to be more effective in reducing depressive symptoms—particularly among primary caregivers of individuals with dementia. Additionally, problem-solving training was associated with decreased anxiety levels in caregivers [20].

However, one study developed a community-based training program aimed at equipping new caregivers with the skills to manage behavioral problems in individuals with mild Alzheimer's disease. This program utilized an intervention based on the Progressively Lowered Stress Threshold (PLST) model and was compared to routine care. The findings confirmed that the PLST-based intervention was effective in reducing caregiver burden and family members' depression, as well as enhancing their quality of life. Nevertheless, the PLST-based intervention was not found to be significantly more effective than routine care [21].

In four studies, interventions were simultaneously directed toward both older adults and their caregivers. In one study, a multifactorial fall prevention program was implemented at home as supplementary therapy, aiming to promote strategies for maintaining independence in older people. However, the results showed no significant difference between groups; caregivers in the intervention group reported stress, depression, and mental burden levels similar to those in the control group, both immediately after the intervention and over time [22]. Similarly, in another study involving elderly individuals with early-stage dementia, a case management intervention yielded no significant differences; caregivers in both the intervention and control groups reported comparable levels of burden and depression [23]. In the DAISY study, a psychosocial intervention targeting both elderly individuals with mild dementia and their caregivers was delivered over three years. The intervention was effective in preventing depressive symptoms in older people during the first year, but this effect was not sustained in the third year. Additionally, it did not impact caregivers' depressive symptoms at the three-year follow-up [24]. Another study employed a telenovela-based intervention in home healthcare services, which led to increased service utilization among the intervention group. This was associated with reduced caregiver-perceived mental burden and depression; however, it also resulted in heightened levels of perceived stress [25].

Discussion

Of the 13 articles included in this systematic review, four focused on interventions implemented directly for older adults, five examined interventions targeting caregivers, and four explored interventions designed for both older adults and their caregivers.

Intervention for Old Adults

Among the four articles examining the impact of directly providing intervention for older people on caregivers, Aggar et al. reported the effectiveness of the Frailty Intervention Trial on the health and self-esteem of caregivers and co-caregivers. This intervention can be considered a relatively constructive treatment for caregivers due to its 15-month follow-up, its multi-component and interdisciplinary nature, the stability of recovery, and the non-interference of the intervention in caregivers' daily life activities. These positive results may also be attributed to one component of the intervention—case management. However, the level of caregiver anxiety increased in both groups, leading to sleep disorders, low physical well-being, increased signs of sadness, higher mortality rates, greater risk of CVA, and more depression during bereavement. To address this issue, individuals at risk of or experiencing high levels of anxiety should be identified and provided with additional support. Interventions targeting frailty have the potential to impact caregivers' health and self-esteem positively. Further research examining the characteristics of frailty interventions that influence the experience of care is recommended [13].

Knowles et al. compared two types of care services—namely, PPOPS services at home and standard services. They found that those receiving the former intervention reported higher levels of satisfaction than those receiving the latter. The increased satisfaction in the experimental group can be attributed to the provision of services at home. Moreover, clinical assessments conducted in a familiar environment may make caregivers feel more confident in asking questions and seeking advice, which significantly affects their decision-making and the quality of subsequent care services. On the negative side, receiving services at home imposes some restrictions on the work and leisure time of other family members. However, more than half of the caregivers in both groups felt anxious about providing care. One possible reason for the increased anxiety is the advanced age of caregivers (over 60 years) in both groups. Therefore, due to the insufficient statistical power of the study, it is not possible to determine whether the findings are subject to type II error. It is also unclear whether the caregivers who participated were the primary caregivers of the patients [16].

Kwok et al. examined the case management model for older adults with mild dementia. They found that, although this intervention had no significant impact on the social and economic burden of caregivers, it encouraged them to seek financial aid and daily care services. The intervention reduced depression symptoms in older people, though the effects were not long-lasting. The cognitive impairment of dementia patients deteriorated over time, increasing care costs. These issues may explain the limited impact observed in this study. Moreover, no financial support was provided to these families during the study. The average indirect costs in the intervention group rose in the fourth month but did not increase in the twelfth month. The intervention group also showed improvement in behavioral symptoms. Despite having some therapeutic effects, the case management approach did not reduce caregiver burden or improve their well-being. Nevertheless, these findings are important for managing behavioral symptoms in people with mild to moderate dementia. Therefore, continuous community support for families dealing with dementia, particularly those with co-occurring depression, is essential. The small sample size in this study limits the generalizability of the findings; hence, further research in this area is needed to validate the results. Additionally, most daily care services for dementia patients were not provided through grants during the study, making them unaffordable [14].

De Luca et al. employed multidisciplinary telemedicine services for older adults and found that, compared to the traditional approach, telemedicine more effectively enhanced awareness of rehabilitation activities, internalization, self-regulation, mood, behavior, ADL/IADL (instrumental ADL), mental health, quality of life, and nutritional status in frail elderly patients living at home. Furthermore, it reduced the need for hospital-based medical services and hospitalizations, thereby lowering associated costs. These positive changes increased over time and ultimately led to a reduction in caregiver burden and depression [15].

Intervention for Caregivers

In Boyacıoğlu and Kutlu's study, the psychoeducational intervention was carried out for caregivers. The results revealed that this intervention was effective in lowering the level of social and economic burden. One possible explanation is that this intervention strengthens caregivers and promotes their adaptive strategies for dealing with their patients. Another reason may be the relatively short research duration (three- and six-month follow-ups) used in the study [17].

Using the HSC-CM model, Yu reported a significant decline in caregivers' perceived burden and notable improvements in their vitality, social role functioning, and general well-being. The effectiveness of this intervention can be attributed to the collaborative evaluation process, which provides more comprehensive and systematic assessments of personal care demands, the emphasis on developing caregivers' cognitive and psychomotor coping resources, and the integration of case management principles into caregiver support strategies. Nonetheless, this study did not adequately consider the statistical power of the tests used in data analysis. It failed to explore the possible impact of increased attention from professionals on the patients [18].

Cheung et al. conducted an eight-week intervention that included four training sessions to teach self-administered acupressure techniques and two follow-up sessions to support continued learning and daily practice. They demonstrated that caregivers in the intervention group experienced reduced stress levels after eight weeks. The intervention group also showed marked improvements in insomnia, as well as secondary outcomes including fatigue, health-related quality of life, and depression caused by caregiver burden, compared to the control group. The low cost and flexibility of the intervention may contribute to its effectiveness. By regulating the sympathetic nervous system, the secretion of stress hormones is reduced, leading to relaxation and stress relief. Additional attention received by participants during the training and follow-up sessions may have also contributed to these improvements. However, the follow-up was limited to four weeks post-intervention, which may be too short for a condition that requires long-term treatment. This highlights the need for further studies with extended follow-up periods [19].

Garand et al. compared problem-solving therapy (PST) with nutritional education and demonstrated that PST significantly reduced depressive symptoms in caregivers of elderly individuals with mild cognitive impairment. PST also alleviated caregivers' anxiety and improved negative problem orientation. The study concluded that enhancing coping strategies shortly after a loved one is diagnosed with cognitive impairment (particularly dementia) can lead to positive mental health outcomes among new caregivers [20].

Söylemez et al. designed a community-based training program incorporating the Progressively Lowered Stress Threshold (PLST) intervention to train novice caregivers in managing behavioral problems associated with mild Alzheimer's disease. They compared the program with routine care and found that the intervention effectively reduced caregiver burden and depression. These improvements may be partially attributed to strong family ties in Turkey, where the study was conducted, and the implementation of the intervention in the home setting. A plausible explanation for the change in caregivers' perceptions is that they were supported according to the PLST model's principles in a familiar environment. Although the intervention significantly reduced caregiver burden and depression, it did not prove to be more effective than routine care. Future research with longer intervention periods and follow-ups is needed to understand the long-term impacts of PLST-based interventions better. Since caregiver burden, depression, and quality of life are influenced by various factors—such as caregivers' perceptions of their physical, social, and psychological well-being and their satisfaction with daily life—and tend to worsen over time, gradual improvements in these variables suggest the clinical effectiveness of the intervention [21].

Intervention for Older Adults and Caregivers

In their study, Faes et al. utilized a multifactorial fall prevention program, delivered by assistant therapists at home, to teach strategies to older people and their caregivers for maintaining independence. They found that immediately after the completion of the intervention, no difference was observed. However, in the long-term evaluation, the elders experienced greater fear of falling, anxiety, and depression than those in the control group. The increased awareness among the patients receiving the intervention about the risks and consequences of falling may have augmented their fear of falling. Therefore, in both the short-term (immediately after the intervention) and long-term evaluations, the rate of falls in the intervention group exceeded that in the control group. On the positive side, as a result of this intervention, the older adults in the intervention group felt more in control compared with those in the control group. Although the older adults in the intervention group experienced greater fear of falling, the levels of stress, depression, and mental burden of the caregivers in both groups were approximately similar immediately after the intervention and over time. One possible explanation for the ineffectiveness of this intervention, especially for people with cognitive impairment, is that it was provided intensively. Moreover, the patients in this study were cognitively heterogeneous [22].

Jansen et al., in their study, did not confirm the effectiveness of applying case management to elders over time. The insignificant results obtained in this study may be attributed to the fact that the intervention lacked sufficient intensity and duration to bring about changes. Moreover, another possible reason can be ascribed to the poor fidelity of the intervention [23].

Using the telenovela intervention to raise awareness and confidence among Mexican-American older adults and family caregivers in home health care services (HHCS), Crist et al. showed that the intervention group utilized these services more than the control group. This reduced the mental burden, perceived burden, and depression levels of the caregivers. However, the perceived stress of the caregivers was elevated. Both older people and their caregivers exhibited a remarkable boost in awareness and confidence in HHCS. Consequently, older people and caregivers established a better mutual relationship, which decreased caregiver burden and depression. This intervention reduced the enormous costs of hospitalizations and effectively lessened significant health inequalities among older people and caregivers, which led to a reduction in caregiver mental burden. Performing the intervention at home implies its family-centered nature, which may enhance families' inclination to use it. In this study, the final sample size was not sufficient for data analysis. Also, the measures of awareness of HHCS and trust in HHCS may need to be revised [24].

Conducting the Danish Alzheimer Intervention Study (DAISY) with a 3-year follow-up, Phung et al. included a psychosocial intervention for older adults with mild dementia and their caregivers. The results indicated that in the first year, the intervention considerably prevented the incidence of depressive symptoms in older people. However, by the third year, it was no longer effective. Likewise, no significant changes in the caregivers' quality of life were identified. During the first year, clients performed their ADLs well and had very few behavioral disorders. At the 3-year follow-up, ADL performance had significantly deteriorated, and behavioral symptoms had emerged. To gain longer-term effects, it is suggested that early intervention be longitudinal, extensive, and flexible, be designed to track the status of the disease, and be constantly modified based on emerging needs [25].

Conclusion

Based on the findings of this review, the development and evaluation of individualized intervention programs are recommended. Such programs can enhance the design of future interventions and increase their effectiveness. Given that most caregivers were the patients' spouses, delivering interventions to these adults may present additional challenges. Therefore, caregiver characteristics should be carefully considered in the planning and implementation of any intervention.

Author Contributions

All authors contributed equally to this research.

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