Review

Implementation of Telemedicine for Patients With Dementia and Their Caregivers: Scoping Review

Mengfei Ye[1*], MD; Zheng Liu[2*], PhD; Weigen Xie[1*], MD; Mengna Shou[3], MD; Shengpang Wang[1], MD; Xuebing Lin[1], MD; Yan Xu[1], MD; Miner Yao[1], MD; Jialu Chen[1], MD; Yunli Shou[1], MD; Jingzhu Wu[1], MD; Lili Guan[1], MSc

[1]Department of Psychiatry, Shaoxing Seventh People's Hospital, Affiliated Mental Health Center of Shaoxing University, Shaoxing, China

[2]Department of Pharmacology, School of Medicine, Shaoxing University, Shaoxing, China

[3]Department of Women's Health, Shaoxing Maternity and Child Health Care Hospital, Shaoxing, China

[*]these authors contributed equally

Corresponding Author:
Lili Guan, MSc
Department of Psychiatry, Shaoxing Seventh People's Hospital, Affiliated Mental Health Center of Shaoxing University
Shengli West Road, Yuecheng District
Shaoxing, 312000
China
Phone: 86 13957501678
Email: lilyg1678@qq.com

Abstract

Background: As dementia advances, symptoms and associated concerns lead to significant distress for both the patients and their caregivers. Telemedicine has the capacity to alleviate care-related issues for patients with dementia and their family caregivers.

Objective: This study aims to synthesize the implementation strategies for providing telemedicine to assist patients with dementia and their caregivers in home and community settings and to examine its effectiveness and implementation barriers.

Methods: In accordance with the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) guidelines, a systematic search was conducted across 6 databases, including MEDLINE, Embase, PsycINFO, CINAHL, Web of Science, and ProQuest. The eligibility criteria for peer-reviewed English publications from January 2000 up to January 2025 encompassed research studies related to telemedicine services for individuals diagnosed with dementia and caregivers.

Results: This study included 54 articles, comprising 14,446 participants from 10 countries. In total, 4 major themes emerged from the articles: the design of telemedicine services, effectiveness of telemedicine, external environmental factors, and barriers in telemedicine implementation. Cognitive training was addressed in 28 studies. Within the domain of work and leisure, 24 solutions were identified. Most reviewed studies indicated favorable experiences with telemedicine services and highlighted perceived personal and social benefits among patients with dementia, as well as identified barriers to accessing and using such services.

Conclusions: Future studies should encompass the enhancement of digital accessibility for individuals with restricted resources and limited technological proficiency, the use of randomized controlled trial methodologies to ascertain the comparative efficacy of various service delivery modes, and the augmentation of sample diversity.

(J Med Internet Res 2025;27:e65667) doi: 10.2196/65667

KEYWORDS

telemedicine; dementia; mobile phone; implementation; telehealth; scoping review; family caregiver; systematic search; mental health; mental illness; mental disorder

Introduction

Dementia is a complex neurodegenerative condition characterized by progressive deterioration and a diverse array of subtypes and clinical manifestations. According to a recent report, there will be an estimated 152.8 million cases of dementia worldwide by the year 2050, posing a significant burden on health systems that are already facing challenges in meeting the needs of the elderly population [1]. As dementia

progresses, the care needs become more complex. In order to effectively fulfill their responsibilities, caregivers require support to mitigate heightened levels of stress, anxiety, burnout, and depression that often result from the demands of caregiving [2].

In light of the COVID-19 pandemic, nations proactively implemented preventive strategies, including the prohibition of large gatherings, the suspension of entry for travelers from specific regions, and the limitation of face-to-face medical services [3]. The pandemic had a serious impact on older individuals with dementia and their families [4]. A study conducted from March to December 2020 revealed a 25.7% increase in the mortality rate among individuals living with dementia compared to the corresponding period in the previous year, representing nearly twice the rate observed in the elderly population without dementia [5]. However, historical evidence suggests that the occurrence of new pandemics or other disasters is inevitable [6].

Health care interventions for patients with dementia are increasingly incorporating technology to address the escalating costs of health and social care, as technology-based interventions require fewer staff and can reach a larger number of individuals at a comparable cost. The acceleration of this transition can be attributed to the impact of the COVID-19 pandemic, prompting numerous services to shift to a digital format [7]. Telemedicine is defined as the use of internet-connected devices such as computers, tablets, or smartphones to facilitate communication between health care providers and patients [8]. This form of health care delivery can be classified as either synchronous, involving real-time interactions, or asynchronous, involving delayed communication through various mediums such as data, images, messages, or prerecorded videos [9]. Numerous services were already accessible via Telemedicine for purposes such as clinical consultation, diagnosis, evaluation, and psychotherapy [10]. Telemedicine has the potential to aid health care providers in efficiently diagnosing individuals with dementia and their caregivers, especially those living in rural areas [11]. However, the field of telemedicine research faces various challenges, such as people with dementia struggling to focus and communicate with health care providers digitally.

We described and synthesized the implementation strategies used for the provision of Telemedicine to assist patients with dementia and caregivers in home and community settings. The secondary aim was to identify the effectiveness and barriers to the implementation of telemedicine.

Methods

This scoping review was carried out in accordance with the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) guidelines [12].

Selection Criteria

We conducted a comprehensive search of articles from January 2000 to January 2025 across 6 databases, including MEDLINE, Embase, PsycINFO, CINAHL, Web of Science, and ProQuest. The literature search was limited to studies published from 2000 onward, as telemedicine for patients with dementia gained significant attention with technological advancements and increasing recognition of its role in health care access [13]. Before 2000, research in this area was still emerging, and telemedicine interventions were less commonly studied or implemented. This time frame ensures the inclusion of the most relevant and impactful studies in this evolving field. Preprint servers were excluded from the search strategy due to their absence of peer review and quality control mechanisms. The search strategy was formulated across 3 core domains, namely, dementia, caregivers, and telemedicine (Tables S1 and S2 in the Multimedia Appendix). We conducted an initial limited search on PubMed to identify pertinent keywords and MeSH (Medical Subject Headings) terms within the 3 domains. Subsequently, we used various combinations of these terms to search across multiple databases. To conduct a thorough search, we examined the reference lists of all articles that were included in the study to uncover additional relevant studies.

Eligibility Criteria

We exclusively reviewed English publications in peer-reviewed journals without restricting the types of publications, thereby encompassing original research articles, reports, and reviews for screening. The studies included in this analysis must pertain to telemedicine services for dementia or cognitive impairment, as well as family caregivers who assist individuals with dementia or cognitive impairment, or both populations. The participants were not limited to individuals with dementia or caregivers; perspectives were also sought from telemedicine service providers and other pertinent stakeholders.

Selection of Studies

Two authors (MY and FH) independently evaluated all articles that emerged from the search strategy. Initially, the titles and abstracts were reviewed to assess relevance. For entries deemed potentially relevant, the full texts were thoroughly examined by both reviewers to confirm their pertinence to the research question. Any discrepancies in article selection were resolved through consensus meetings between the 2 reviewers.

All relevant articles were thoroughly reviewed and coded to identify recurring patterns or concepts. These codes were grouped into categories based on similarities. Through several rounds of discussion and refinement, the authors identified 4 major themes: design of telemedicine services, effectiveness of telemedicine, external environmental factors, and barriers in telemedicine implementation. The final themes were reached through consensus among the authors to ensure accuracy and consistency.

Data Extraction and Data Analysis

Two authors (MY and XL) independently gathered data from the articles that were included. In accordance with the CONSORT-EHEALTH (Consolidated Standards of Reporting Trials of Electronic and Mobile Health Applications and Online Telehealth) guidelines [14], the data extracted from the selected articles encompassed various categories, including article attributes (such as authorship, publication date, and country of origin), patients with dementia (including diagnosis and age), caregiver demographics (including age, gender, and educational background), study parameters (such as theoretical

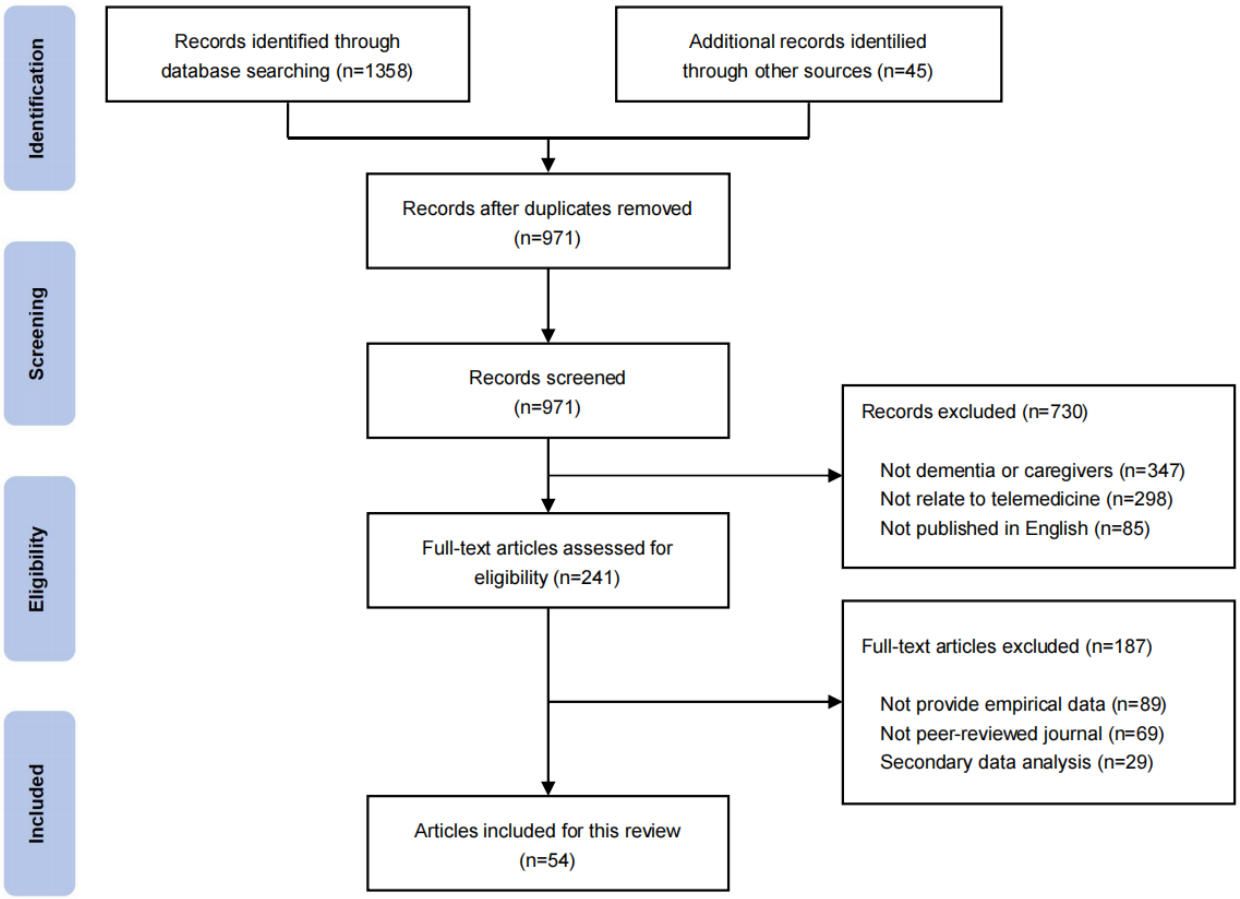
underpinnings, research methodology, objectives, participant selection criteria, and findings), and specifics related to the implementation of interventions (such as technological platforms used, dissemination strategies, modes of usage, and developmental phase). Following the extraction of information from all included articles, descriptive quantitative analysis was used to summarize the frequency and distribution of native apps across platforms, study design, caregiver participant-selection criteria, and investigated outcomes. We conducted a comprehensive review of the included studies, focusing on specific aspects such as interventions and intervention outcomes. All relevant articles were thoroughly reviewed and coded to identify recurring patterns or concepts. These codes were grouped into categories based on similarities. Through several rounds of discussion and refinement, the authors identified major themes. The final themes were reached through consensus among the authors to ensure accuracy and consistency. For patients, caregivers, and telemedicine platforms, we summarized the key factors in telemedicine for patients with dementia.

Results

Selection and Inclusion of Studies

A total of 1403 records were initially identified, with 1358 originating from the database search and 45 from other sources. After removing 432 duplicate records, a title and abstract screening process was conducted on the remaining 971 records. A total of 241 full-text articles were evaluated, and 730 articles were excluded from the study due to not having dementia or caregivers (n=347), not being related to telemedicine (n=298), and not being published in English (n=85). The final 54 articles were included in this study, while 187 articles were excluded due to not providing empirical data (n=89), not being peer-reviewed journals (n=69), secondary data analyses (n=29; see Figure 1 for details and Multimedia Appendix 1 for the PRISMA-ScR checklist).

Figure 1. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram of the literature search.



Study Characteristics

Tables 1 and 2 provide an overview of the included articles. These 54 studies were conducted across 5 different regions: 3 from Asia, 5 from Oceania, 24 from Europe, 20 from North America, 1 from South America, and 1 multinational study. In total, 27 articles were randomized controlled trials, 7 articles were single group intervention, and 9 articles reported qualitative research results. According to the study objective, 25 articles focused exclusively on dementia, and 9 articles focused exclusively on caregivers. Additional details regarding themes and related terms, search strategies for some of the databases searched, and the characteristics of the included studies are outlined in Multimedia Appendix 2.

Table 1. Information of the studies that were included.

Studies (author, year)	Country	Type of research[a]	Sample	Participants	Objects	Delivery method	Duration[b] (months)
Lima et al, 2022 [15]	Brazil	SGI[c]	89	Mixed	Dementia	Mobile phone	8
Roach et al, 2021 [16]	Canada	Descriptive	20	Mixed	Mixed	Mobile phone	1
Lai et al, 2020 [17]	China	RCT[d]	60	Mixed	Mixed	Mixed	1
Arighi et al, 2021 [18]	Italy	RCT	108	Mixed	Mixed	Mixed	3
Capozzo et al, 2020 [19]	Italy	SGI	33	Mixed	Mixed	Mobile phone	1
Goodman-Casanova et al, 2020 [20]	Spain	RCT	93	Mixed	Mixed	Mobile phone	1
Marinello et al, 2021 [21]	Italy	Case study	10	Other dementia	Dementia	Mobile phone	3
Cheung and Peri, 2021 [22]	United Kingdom	Case study	10	Mixed	Dementia	Mixed	3
Cooper et al, 2021 [23]	United Kingdom	SGI	12	Mixed	Dementia	Mixed	2.5
Peri et al, 2023 [24]	New Zealand	Cross-sectional	38	Mixed	Mixed	Computer	3
Di Lorito et al, 2021 [25]	United Kingdom	Qualitative	10	Mixed	Mixed	Mobile phone	3
Giebel et al, 2021 [26]	United Kingdom	RCT	50	Mixed	Mixed	Mobile phone	1
Tuijt et al, 2021 [27]	United Kingdom	Qualitative	61	Mixed	Mixed	Mixed	3
Kalicki et al, 2021 [28]	United States	Cross-sectional	873	Mixed	Mixed	Mixed	2
Macchi et al, 2021 [29]	United States	Qualitative	198	AD[e]	Dementia	Mobile phone	4.5
Gately et al, 2022 [30]	United States	Cross-sectional	15	Other dementia	Dementia	Mixed	2
Masoud et al, 2021 [31]	United States	SGI	17	AD	Mixed	Computer	1
Weiss et al, 2021 [32]	United States	Descriptive	85	Other dementia	Caregivers	Mobile phone	2.5
Neal et al, 2023 [33]	Netherlands	RCT	150	Mixed	Mixed	Computer	30
Lott et al, 2006 [34]	United States	SGI	90	Alzheimer	Dementia	Mobile phone	2
Ganguli et al, 2023 [35]	United States	SGI	4691	Mixed	Dementia	Mixed	3.5
Gillespie et al, 2019 [36]	United States	RCT	731	Other dementia	Dementia	Mobile phone	5
Xie et al, 2018 [37]	United States	Cross-sectional	50	Other dementia	Mixed	Mixed	0.75
LaMonica et al, 2017 [38]	Australia	Descriptive	221	Other dementia	Dementia	Mixed	20
Cristancho-Lacroix et al, 2015 [39]	France	RCT	49	Alzheimer	Caregivers	Computer	6
Laver et al, 2020 [40]	Australia	RCT	104	Other dementia	Dementia	Mixed	4
Williams et al, 2019 [41]	United States	RCT	107	Other dementia	Dementia	Mobile phone	3
Howard et al, 2021 [42]	United Kingdom	Cross-sectional	495	Mixed	Dementia	Mixed	38
Wesselman et al, 2020 [43]	Netherlands	RCT	137	Mixed	Dementia	Mixed	1
Peterson et al, 2023 [44]	United States	Cross-sectional	27	Mixed	Mixed	Mixed	3
Iyer et al, 2023 [45]	United States	Qualitative	30	Mixed	Caregivers	Mobile phone	9
Lindauer et al, 2017 [46]	United States	RCT	28	Alzheimer	Mixed	Mixed	3
Mahoney et al, 2003 [47]	United States	RCT	100	Alzheimer	Caregivers	Mixed	12
Smith et al, 2023 [48]	United States	RCT	3838	Alzheimer	Dementia	Mixed	24
Emedoli et al, 2023 [49]	Italy	Cross-sectional	225	Mixed	Dementia	Computer	8
Carotenuto et al, 2018 [50]	Italy	RCT	28	Alzheimer	Dementia	Mixed	24
O'Connor et al, 2014 [51]	Australia	RCT	415	Alzheimer	Dementia	Mixed	4
Stara et al, 2021 [52]	Italy	Descriptive	20	Mixed	Mixed	Mixed	1
Mendez et al, 2021 [53]	United States	Cross-sectional	117	Mixed	Caregivers	Mixed	14
Lancaster et al, 2020 [54]	United Kingdom	Qualitative	35	Mixed	Dementia	Mobile phone	12

Studies (author, year)	Country	Type of research[a]	Sample	Participants	Objects	Delivery method	Duration[b] (months)
Potts et al, 2020 [55]	United Kingdom	RCT	56	Alzheimer	Mixed	Mixed	3
Banbury et al, 2019 [56]	Australia	RCT	69	Alzheimer	Dementia	Mixed	1.5
Williams et al, 2021 [57]	United Kingdom	RCT	71	Alzheimer	Mixed	Mixed	3
Pot et al, 2015 [58]	Netherlands	RCT	149	Alzheimer	Dementia	Computer	6
Pagán-Ortiz et al, 2014 [59]	United States	RCT	23	Alzheimer	Dementia	Mixed	12
Levinson et al, 2020 [60]	Canada	Cross-sectional	12	Alzheimer	Dementia	Mixed	5
Dam et al, 2019 [61]	Netherlands	RCT	96	Alzheimer	Caregivers	Mixed	4
Boots et al, 2017 [62]	Netherlands	RCT	72	Alzheimer	Mixed	Mixed	2
Baruah et al, 2020 [63]	India	RCT	23	Alzheimer	Caregivers	Computer	6
Mitchell et al, 2020 [64]	United States	RCT	30	Mixed	Mixed	Mixed	24
Núñez-Naveira et al, 2016 [65]	Spain	RCT	77	Alzheimer	Dementia	Mixed	3
Boessen et al, 2017 [66]	Netherlands	SGI	32	Alzheimer	Caregivers	Mixed	2.5
Park et al, 2020 [67]	Korea	RCT	26	Alzheimer	Dementia	Mobile phone	1
Gaugler et al, 2024 [68]	United States	RCT	240	Mixed	Caregivers	Mixed	12

[a]Descriptive refers to studies that describe characteristics or phenomena without exploring causal relationships or underlying mechanisms. Qualitative refers to studies that collect data through methods such as interviews or focus groups to explore participants' experiences, perspectives, or behaviors. Cross-sectional refers to studies that collect data at a single point in time, typically using surveys, to assess relationships or prevalence of variables.

[b]Data collection duration (months).

[c]SGI: single group intervention.

[d]RCT: randomized controlled trial.

[e]AD: Alzheimer disease.

Table 2. Characteristics of included studies.

	Studies (N=54)	Sample size (N=14,446)
Regions, n (%)		
Asia	3 (5.56)	109 (0.75)
Oceania	5 (9.26)	847 (5.86)
Europe	24 (44.44)	2079 (14.39)
North America	20 (37.04)	11,295 (78.19)
South America	1 (1.85)	89 (0.62)
Multinational	1 (1.85)	27 (0.19)
Participants, n (%)		
Alzheimer	21 (38.89)	5469 (37.86)
Other dementia	8 (14.81)	1323 (9.16)
Mixed	25 (46.30)	7654 (52.98)
Research design, n (%)		
RCT[a]	27 (50.00)	6930 (47.97)
SGI[b]	7 (12.96)	4964 (34.36)
Case study	2 (3.70)	20 (0.14)
Cross-sectional	9 (16.67)	1852 (12.82)
Qualitative	5 (9.26)	334 (2.31)
Descriptive	4 (7.41)	346 (2.40)
Delivery method		
Mobile phone only	15 (27.78)	1607 (11.12)
Computer only	7 (12.96)	651 (4.51)
Mixed	32 (59.26)	12,188 (84.37)
Objects		
Dementia only	25 (46.30)	11,807 (81.73)
Caregivers only	9 (16.67)	772 (5.34)
Mixed	20 (37.04)	1867 (12.92)
Duration (months)		
<3	18 (33.33)	1754 (12.14)
3-12	26 (48.15)	7656 (53.00)
>12	10 (18.52)	5037 (34.87)

[a]RCT: randomized controlled trial.

[b]SGI: single group intervention.

Characteristics of the Study Design

Numerous researchers have worked to enhance telemedicine services by focusing on improving access and user-friendliness for individuals with dementia and their caregivers. Several reviewed studies established eligibility criteria to ensure that participants had access to the internet and were engaged with the service, with the goal of minimizing attrition rates. However, these criteria may unintentionally decrease the diversity and representation of the study sample by excluding individuals who may encounter significant barriers in using telemedicine technology. For instance, 2 articles excluded older adults lacking electronic devices or caregivers and those with physical disabilities, citing challenges in internet connectivity [15,17]. The complete list of included articles is provided in Table S3 in the Multimedia Appendix.

Characteristics of Telemedicine Services

Various technological platforms, such as the web, telephone, mobile app, and remote wearable device, were used to administer interventions. The duration of telemedicine interventions varied, with some providing continuous access to websites, while others involved brief sessions, such as 6-minute telephone calls. Psychoeducation, psychotherapy, and social support were the most common types of interventions, even though the content varied. The psychotherapy interventions

incorporated components of cognitive behavioral therapy aimed at assisting caregivers in regulating their emotions and behaviors, such as cognitive restructuring, relaxation techniques, and the use of telephone counseling. In total, 2 studies used the nation's predominant instant messaging application (ie, WhatsApp) for medical consultations [15,54]. Some programs developed user guides to assist older individuals with hearing impairments in navigating speakerphones. The assessment of outcomes varied among studies, with depression, anxiety, burden, and self-efficacy being the most frequently evaluated variables. Moreover, it was reported that interventions involving telephone, internet, and psychotherapy as well as social support had the larger effect sizes [28,55].

Outcomes of People Living With Dementia

The term "dementia" broadly includes individuals with Alzheimer disease, vascular dementia, and early-onset dementia; nonetheless, 45.3% (24 out of 53) of the studies failed to specify the specific type of dementia. There was a significant correlation between characteristics and telemedicine service access among patients with dementia. A total of 3 studies used purposeful sampling techniques to enhance the diversity of participant representation, including individuals from racial and ethnic minority groups, individuals residing in rural areas, and families with varying income levels [25,33,35]. Elderly individuals with limited educational attainment displayed a decreased propensity to embrace telemedicine services.

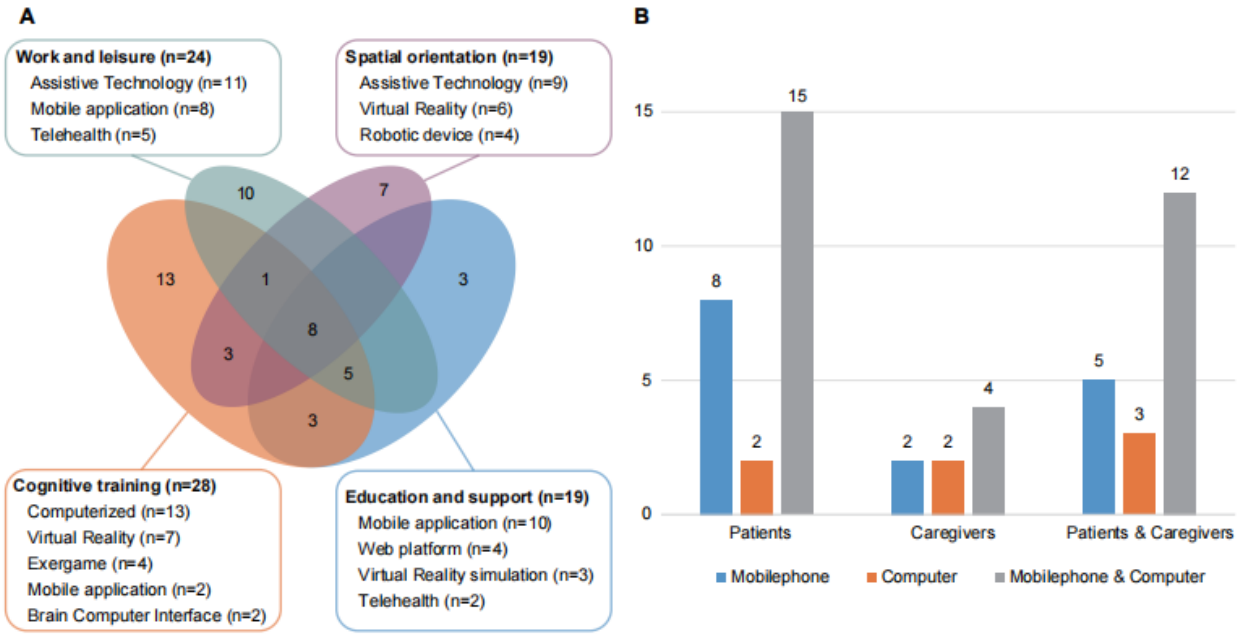
Outcomes of Caregivers

In total, 8 studies were developed to target caregivers, designed to improve their caregiving abilities, including the evaluation and management of symptoms, as well as offering professional consultation and psychological support. Various caregiver-focused interventions included eHealth, support group interventions, and care coordination. Nevertheless, the specific details regarding the execution of these interventions were still ambiguous. Formal caregivers typically possess greater expertise in providing care for individuals with dementia, as they have received specialized training and have accumulated prior experience in this area [69]. In addition, technology-based interventions may not be universally suitable for all caregivers due to various factors, such as age.

Telemedicine Solutions and Mobile Device Platforms

As shown in Figure 2A, the solutions could be categorized by application domain. Our sample included applications from all domains, but we found considerable overlap between the domains. Cognitive training was addressed in 28 studies. Within the domain of work and leisure, 24 solutions were identified. In addition to solutions for personal organization, these solutions also addressed the training and support for activities of daily living (eg, cooking, medication management, and household chores). There was another solution in this field that delivered education and support through telemedicine (n=19). The majority of mobility and navigation were focused on supporting spatial orientation and autonomous navigation (n=20). It was found that mobile phones were the most commonly examined mobile platforms, but preferences varied according to patients and caregivers (Figure 2A). Mobile devices are being investigated as convenient, cost-effective methods for screening and monitoring cognitive impairment due to the high rate of smartphone ownership. Several studies have developed ambulatory wearable sensors that use mobile phone to monitor voice, activity, and location.

Figure 2. Telemedicine solutions and mobile device platforms. (A) Categorization of the telemedicine interventions by application domain. (B) Mobile device platforms used by patients and caregivers.



Effectiveness of Telemedicine

Overall, individuals with dementia and their caregivers reported satisfaction with telemedicine services and expressed willingness to continue using them. Panerai et al [59] conducted a study in Italy examining the effects of a telephone-based cognitive intervention on individuals living with dementia. The results indicated that the intervention group (n=14) demonstrated superior outcomes compared to the control group (n=13) after 1 month of training, including reductions in behavioral and psychiatric symptoms and improvements in cognitive performance. Capozzo et al [19] conducted a study in which they assessed the self-efficacy of caregivers and observed a notable enhancement following telemedicine. Additionally, several caregivers reported improved relationships with individuals living with dementia, highlighting the potential of telemedicine to foster emotional connections. In contrast, Goodman-Casanova et al [20] modified a television-based intervention for dementia by integrating COVID-19–related modules and health resources; however, their study found no statistically significant differences in outcomes, suggesting limited efficacy of this specific approach. There was no statistically significant difference observed in the outcomes of individuals living with dementia.

Barriers in Accessing and Using Telemedicine Services

The challenges associated with implementing telemedicine for individuals with dementia and their caregivers can be categorized into 3 main domains: individual factors, accessibility-related factors, and environmental factors. Due to diminished cognitive abilities, individuals affected by dementia often encounter difficulties in concentrating and effectively communicating with health care professionals through digital platforms. Studies reported that individuals with advanced cognitive impairment, along with additional disabilities such as visual and auditory impairments, exhibit lower rates of engagement with telemedicine services compared to those in the early stages of dementia. In addition, the prevalence of the digital divide and inequality is significant among older adults. One study revealed that domestic broadband network coverage in households where individuals with dementia live alone was just 34%, which significantly limits their ability to access telemedicine services, particularly in underserved regions [18]. Several interventions and treatments, such as clinical tests necessitating specialized equipment and physical training and rehabilitation requiring close physical supervision by therapists, were not feasible to administer via telemedicine.

Discussion

Overview

Recent reimbursement policies have expanded access to telemedicine, making it an increasingly prominent method of remote care provision [70]. This study examined the feasibility, acceptability, and efficacy of telemedicine interventions for individuals with dementia and their caregivers. Overall, the results suggest that telemedicine programs hold promise in addressing the medical, psychological, and social needs and preferences of individuals in dementia-caregiver dyads.

Telemedicine for Participants

This convenience is particularly beneficial for patients with dementia and their caregivers, who often face significant logistical challenges in accessing specialized health care. Participants in rural areas, who often face logistical barriers to accessing specialized care, perceive telemedicine to be as effective as in-person visits due to reduced commuting times [71]. This convenience is especially advantageous for patients with dementia and caregivers, facilitating timely access to health care. And it facilitates the involvement of family members who may be unable to physically attend a visit in person, allowing for greater support and collaboration in managing the patient's condition [72]. Telemedicine interventions, such as remote monitoring, digital consultations, and tele-education, have been shown to enhance medication adherence, reduce hospitalizations, and improve the overall quality of life for patients with dementia [20,35,42]. However, telemedicine implementation faces challenges when patients lack confidence or perceive a disconnect between the intervention’s goals and the organization’s mission [73].

Telemedicine for Caregivers

According to a review, telemedicine is effective in addressing psychological concerns of caregivers of dementia [74]. However, the implementation of telemedicine is hindered by personal attributes of caregivers, such as deficiencies in their personal capacity (eg, financial and physical capacity, digital literacy), as well as staff members' lack of social and cultural awareness [75]. Therefore, the knowledge and capacity of caregivers are improved by using a cascade training model, hiring external training agencies, and requiring licensed and certified intervention caregivers to ensure program quality [76]. Caregivers must promptly address patient inquiries, adhere to telemedicine schedules, and conduct root-cause analyses to resolve recurring issues [77].

Intervention Characteristics for Implementation

In the delivery method, video calls are determined to be more effective than phone calls, as a higher level of accuracy in their assessments is based on participants’ facial expressions and body language [48]. While telemedicine commonly uses video-based communication, instances of technical challenges or residents who may struggle with video interaction may require a transition to audio-based communication [78]. Although audio-based visits may present challenges for cognitive evaluations, there are telephone-based measures available that could provide valuable information to the specialist regarding the patient's condition [79]. It is imperative that providers receive supplementary similarly for all modalities of telemedicine. In order to compare interventions effectively, rigorous and standardized methods are required [80].

Outer Environmental Setting

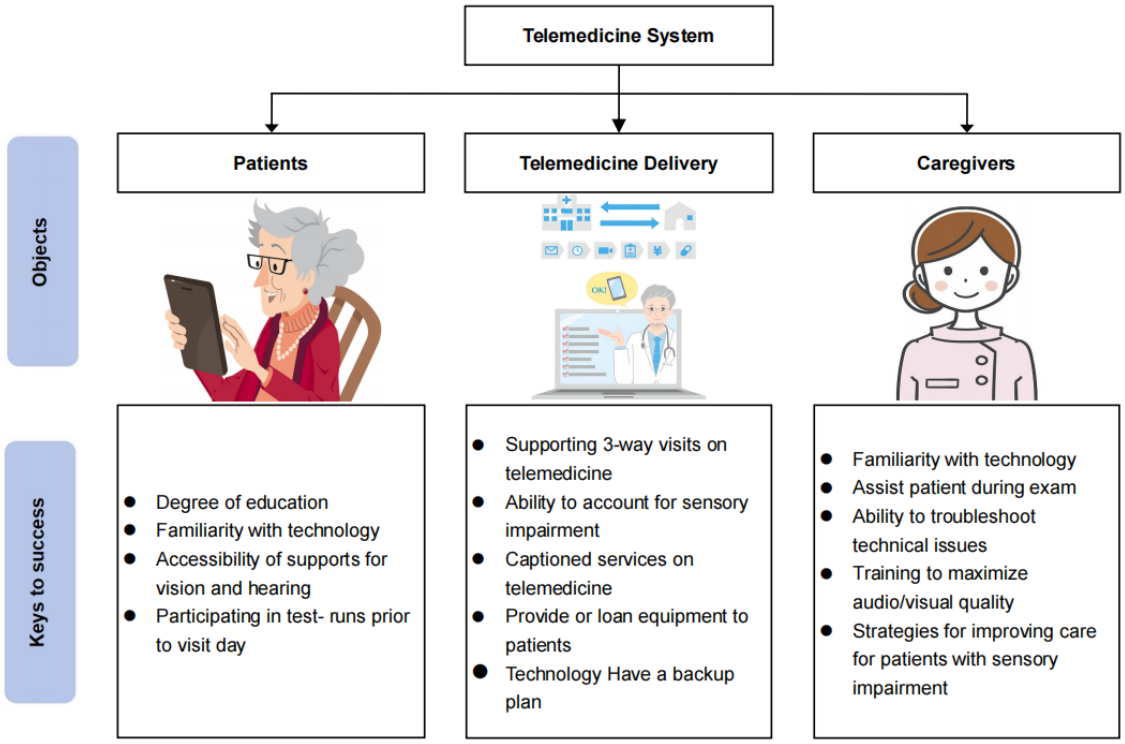
External factors, such as insurance coverage, policy regulations, and broadband accessibility, significantly influence telemedicine implementation. However, these aspects were underexplored, with most studies focusing on barriers like reimbursement policies and digital infrastructure gaps [81]. For example, support from external sources assists in circumventing additional

implementation costs. Telemedicine methods are more likely to be covered by insurers for health care encounters of patients with dementia [42]. To enhance the effectiveness of telemedicine, future studies should examine its integration with local health systems, addressing specific needs of patients, caregivers, and communities. Practical steps, such as training local staff and tailoring interventions to cultural contexts, can further improve outcomes [82].

Factors to Consider for Successful Implementation of Telemedicine

In order to successfully implement telemedicine systems for patients with dementia, it is necessary to take into account both their needs and the way they interact with telemedicine (Figure 3). Adapting technology that accounts for sensory impairments is one possible way to accommodate the needs of patients with dementia [83]. Considering the high prevalence of hearing loss among up to 90% of older adults with Alzheimer disease and related dementias, as well as the substantial impact of vision impairment affecting over 30% of individuals with Alzheimer disease and related dementias, the modification of telemedicine technologies to accommodate sensory changes holds promise for enhancing the efficacy of telemedicine services for this population [40]. Additionally, it may be advantageous for caregivers to receive specialized training in effectively communicating with patients with dementia who experience cognitive and sensory impairments [84]. Interdisciplinary care team members can use this information to contact patients ahead of time about specific barriers to care. Depending on the patient's specific needs, a patient-specific plan might require training care partners in telemedicine, equipment, or captioning services, as depicted in Figure 3.

Figure 3. Factors to consider for successful implementation of telemedicine for patients with dementia.



Why Is Telemedicine Effective?

First, telemedicine can make people with dementia feel more comfortable, reduce their anxiety about unfamiliar environments, and enhance the effectiveness of interventions or treatments [44]. Second, videoconferencing platforms provide therapists with the ability to use visual and auditory stimuli to engage individuals with dementia, thereby enhancing communication [23]. Third, caregivers have reported that telemedicine services help to reduce the burden of travel time and financial expenses associated with visiting clinics or treatment centers [85].

Barriers in Telemedicine Services

The field of telemedicine research encounters numerous obstacles, including the provision of access to telemedicine services for individuals who have limited experience with remote or internet-based platforms, as well as the verification of the efficacy and effectiveness of these services [86]. Patients with dementia may face barriers in accessing and using technology due to the digital divide. For instance, the rate of smartphone ownership among individuals aged 65 years and older is 61%, the figure is notably lower than the 90% ownership rate observed among individuals aged 18-35 years [87]. Besides, some participants raised concerns regarding safety and privacy when using telemedicine services [88]. However, existing studies have not documented the implementation of adequate cybersecurity measures to safeguard personal health information. Finally, most of the studies are in the pilot phase of development, which raises questions about their effectiveness [89].

Work in the Future

Based on the results of this review, there are numerous potential avenues for further research. First, additional research is required

to create implementation frameworks for telemedicine that effectively guide the implementation processes and overcome barriers in community-based implementation of non-pharmacological evidence-based interventions [90]. Second, the optimization and enhancement of telemedicine programs is essential for ongoing improvement. For instance, the use of a wearable device to track a patient's heart rate and blood pressure in the context of a telemedicine consultation can improve the evaluation of the individual's health status, thereby contributing to enhanced patient care [91]. Third, telemedicine services should explore the incorporation of emotional support modules, including emotional health screening, psychological counseling, and referrals to mental health services. In order to bridge the digital divide in the future, more investment and technical guidance will be needed [92].

Finally, future research should focus on implementing more robust data encryption techniques in telemedicine platforms, particularly during data transmission and storage. Research could explore the effectiveness of various combinations, such as passwords, message verification codes, and biometric authentication, in enhancing system security [93]. In addition, educating patients and caregivers on cybersecurity practices is essential. For example, educational initiatives on identifying phishing attacks, using strong passwords, and configuring secure settings would be valuable [94]. Furthermore, developing industry standards and compliance guidelines would provide a framework for data security in telemedicine, ensuring that patient health information remains protected in line with global privacy regulations [95].

Limitations

Our study also has limitations that warrant discussion. First, the implementation of telemedicine relies on the familiarity of patients and caregivers with technology. Many patients and caregivers may lack the technical skills to use devices such as smartphones and computers, which could prevent some individuals from effectively participating in telemedicine services, thereby limiting the generalizability of the study findings. Second, most studies focus on the short-term effects of interventions, with a lack of evaluation of the long-term impact of telemedicine. Dementia is a chronic progressive disease, and short-term outcomes may not fully reflect the actual role of telemedicine in long-term care. Finally, the telemedicine interventions included in studies are highly diverse, with no standardized protocols or evaluation criteria. This variability makes direct comparisons between studies difficult, affecting the reliability and generalizability of research conclusions.

Conclusions

The study reviewed indicates that telemedicine services show promise in addressing the difficulties encountered by individuals with dementia and their caregivers, including enhancing mental well-being, preserving quality of life, and averting functional deterioration. Collaborative efforts at multiple levels are necessary to address the digital divide in order to enhance their access to telemedicine programs and improve readiness for potential future emergencies. Future research should consider a dyadic perspective to enhance comprehension of the requirements of individuals with dementia and their caregivers, thereby improving the design and efficacy of telemedicine programs.

Acknowledgments

This work was funded by the Shaoxing Science and Technology Project (2022A14001), the Zhejiang Medical Health Science and Technology Project (2024KY484, 2025KY1696, and 2022KY1310), and the Shaoxing Medical Health Science and Technology Project (2023SKY073 and 2024SKY067).

Data Availability

All data generated or analyzed during this study are included in this published article and its supplementary information files.

Authors' Contributions

MY and WX wrote the protocol, managed the literature searches, analyzed the data, and wrote the manuscript draft; LG and ZL designed the study, wrote the protocol, and revised the manuscript; MS, YS, SW, and XL managed the literature searches and analyses; and YX and MY modified the manuscript. All authors contributed to and approved the final manuscript.

Conflicts of Interest

None declared.

Multimedia Appendix 1

PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) checklist.
[DOCX File , 67 KB-Multimedia Appendix 1]

Multimedia Appendix 2

Additional information.
[DOCX File , 95 KB-Multimedia Appendix 2]

References

1. GBD 2019 Dementia Forecasting Collaborators. Estimation of the global prevalence of dementia in 2019 and forecasted prevalence in 2050: an analysis for the global burden of disease study 2019. Lancet Public Health. 2022;7(2):e105-e125. [FREE Full text] [doi: 10.1016/S2468-2667(21)00249-8] [Medline: 34998485]
2. Leniz J, Higginson IJ, Stewart R, Sleeman KE. Understanding which people with dementia are at risk of inappropriate care and avoidable transitions to hospital near the end-of-life: a retrospective cohort study. Age Ageing. 2019;48(5):672-679. [doi: 10.1093/ageing/afz052] [Medline: 31135024]
3. Carpinelli Mazzi M, Iavarone A, Musella C, De Luca M, de Vita D, Branciforte S, et al. Time of isolation, education and gender influence the psychological outcome during COVID-19 lockdown in caregivers of patients with dementia. Eur Geriatr Med. 2020;11(6):1095-1098. [FREE Full text] [doi: 10.1007/s41999-020-00413-z] [Medline: 33052535]
4. Veronese N, Barbagallo M. Specific approaches to patients affected by dementia and COVID-19 in nursing homes: the role of the geriatrician. Ageing Res Rev. 2021;69:101373. [FREE Full text] [doi: 10.1016/j.arr.2021.101373] [Medline: 34051375]
5. Gilstrap L, Zhou W, Alsan M, Nanda A, Skinner JS. Trends in mortality rates among medicare enrollees with Alzheimer disease and related dementias before and during the early phase of the COVID-19 pandemic. JAMA Neurol. 2022;79(4):342-348. [FREE Full text] [doi: 10.1001/jamaneurol.2022.0010] [Medline: 35226041]
6. Jones DS. History in a crisis - lessons for COVID-19. N Engl J Med. 2020;382(18):1681-1683. [doi: 10.1056/NEJMp2004361] [Medline: 32163699]
7. Borges-Machado F, Barros D, Ribeiro Ó, Carvalho J. The effects of COVID-19 home confinement in dementia care: physical and cognitive decline, severe neuropsychiatric symptoms and increased caregiving burden. Am J Alzheimers Dis Other Demen. 2020;35:1533317520976720. [FREE Full text] [doi: 10.1177/1533317520976720] [Medline: 33295781]
8. Kim E, Baskys A, Law AV, Roosan MR, Li Y, Roosan D. Scoping review: the empowerment of Alzheimer's disease caregivers with mHealth applications. NPJ Digit Med. 2021;4(1):131. [FREE Full text] [doi: 10.1038/s41746-021-00506-4] [Medline: 34493819]
9. Galea MD. Telemedicine in rehabilitation. Phys Med Rehabil Clin N Am. 2019;30(2):473-483. [doi: 10.1016/j.pmr.2018.12.002] [Medline: 30954160]
10. Kitsiou S, Paré G, Jaana M, Gerber B. Effectiveness of mHealth interventions for patients with diabetes: an overview of systematic reviews. PLoS One. 2017;12(3):e0173160. [FREE Full text] [doi: 10.1371/journal.pone.0173160] [Medline: 28249025]
11. Dang S, Gomez-Orozco CA, van Zuilen MH, Levis S. Providing dementia consultations to veterans using clinical video telehealth: results from a clinical demonstration project. Telemed J E Health. 2018;24(3):203-209. [doi: 10.1089/tmj.2017.0089] [Medline: 28686082]
12. Arya S, Kaji AH, Boermeester MA. PRISMA reporting guidelines for meta-analyses and systematic reviews. JAMA Surg. 2021;156(8):789-790. [doi: 10.1001/jamasurg.2021.0546] [Medline: 33825806]
13. Nkodo JA, Gana W, Debacq C, Aidoud A, Poupin P, Camus V, et al. The role of telemedicine in the management of the behavioral and psychological symptoms of dementia: a systematic review. Am J Geriatr Psychiatry. 2022;30(10):1135-1150. [doi: 10.1016/j.jagp.2022.01.013] [Medline: 35241355]
14. Eysenbach G, CONSORT-EHEALTH Group. CONSORT-EHEALTH: improving and standardizing evaluation reports of web-based and mobile health interventions. J Med Internet Res. 2011;13(4):e126. [FREE Full text] [doi: 10.2196/jmir.1923] [Medline: 22209829]
15. Lima DP, Queiroz IB, Carneiro AHS, Pereira DAA, Castro CS, Viana-Júnior AB, et al. Feasibility indicators of telemedicine for patients with dementia in a public hospital in Northeast Brazil during the COVID-19 pandemic. PLoS One. 2022;17(5):e0268647. [FREE Full text] [doi: 10.1371/journal.pone.0268647] [Medline: 35604914]
16. Roach P, Zwiers A, Cox E, Fischer K, Charlton A, Josephson CB, et al. Understanding the impact of the COVID-19 pandemic on well-being and virtual care for people living with dementia and care partners living in the community. Dementia (London). 2021;20(6):2007-2023. [FREE Full text] [doi: 10.1177/1471301220977639] [Medline: 33381996]
17. Lai FH, Yan EW, Yu KK, Tsui W, Chan DT, Yee BK. The protective impact of telemedicine on persons with dementia and their caregivers during the COVID-19 pandemic. Am J Geriatr Psychiatry. 2020;28(11):1175-1184. [FREE Full text] [doi: 10.1016/j.jagp.2020.07.019] [Medline: 32873496]
18. Arighi A, Fumagalli GG, Carandini T, Pietroboni AM, De Riz MA, Galimberti D, et al. Facing the digital divide into a dementia clinic during COVID-19 pandemic: caregiver age matters. Neurol Sci. 2021;42(4):1247-1251. [FREE Full text] [doi: 10.1007/s10072-020-05009-w] [Medline: 33459891]
19. Capozzo R, Zoccolella S, Frisullo ME, Barone R, Dell'Abate MT, Barulli MR, et al. Telemedicine for delivery of care in frontotemporal lobar degeneration during COVID-19 pandemic: results from Southern Italy. J Alzheimers Dis. 2020;76(2):481-489. [doi: 10.3233/JAD-200589] [Medline: 32651328]
20. Goodman-Casanova JM, Dura-Perez E, Guzman-Parra J, Cuesta-Vargas A, Mayoral-Cleries F. Telehealth home support during COVID-19 confinement for community-dwelling older adults with mild cognitive impairment or mild dementia: survey study. J Med Internet Res. 2020;22(5):e19434. [FREE Full text] [doi: 10.2196/19434] [Medline: 32401215]

21. Marinello R, Brunetti E, Luppi C, Bianca D, Tibaldi V, Isaia G, et al. Telemedicine-assisted care of an older patient with COVID-19 and dementia: bridging the gap between hospital and home. Aging Clin Exp Res. 2021;33(6):1753-1756. [FREE Full text] [doi: 10.1007/s40520-021-01875-2] [Medline: 34003476]
22. Cheung G, Peri K. Challenges to dementia care during COVID-19: Innovations in remote delivery of group cognitive stimulation therapy. Aging Ment Health. 2021;25(6):977-979. [doi: 10.1080/13607863.2020.1789945] [Medline: 32631103]
23. Cooper C, Mansour H, Carter C, Rapaport P, Morgan-Trimmer S, Marchant NL, et al. Social connectedness and dementia prevention: pilot of the APPLE-tree video-call intervention during the Covid-19 pandemic. Dementia (London). 2021;20(8):2779-2801. [FREE Full text] [doi: 10.1177/14713012211014382] [Medline: 33913362]
24. Peri K, Balmer D, Cheung G. The experiences of carers in supporting a person living with dementia to participate in virtual cognitive stimulation therapy during the COVID-19 pandemic. Aging Ment Health. 2023;27(2):372-379. [doi: 10.1080/13607863.2022.2053834] [Medline: 35403508]
25. Di Lorito C, Duff C, Rogers C, Tuxworth J, Bell J, Fothergill R, et al. Tele-rehabilitation for people with dementia during the COVID-19 pandemic: a case-study from England. Int J Environ Res Public Health. 2021;18(4):1717. [FREE Full text] [doi: 10.3390/ijerph18041717] [Medline: 33578949]
26. Giebel C, Cannon J, Hanna K, Butchard S, Eley R, Gaughan A, et al. Impact of COVID-19 related social support service closures on people with dementia and unpaid carers: a qualitative study. Aging Ment Health. 2021;25(7):1281-1288. [doi: 10.1080/13607863.2020.1822292] [Medline: 32954794]
27. Tuijt R, Rait G, Frost R, Wilcock J, Manthorpe J, Walters K. Remote primary care consultations for people living with dementia during the COVID-19 pandemic: experiences of people living with dementia and their carers. Br J Gen Pract. 2021;71(709):e574-e582. [FREE Full text] [doi: 10.3399/BJGP.2020.1094] [Medline: 33630749]
28. Kalicki AV, Moody KA, Franzosa E, Gliatto PM, Ornstein KA. Barriers to telehealth access among homebound older adults. J Am Geriatr Soc. 2021;69(9):2404-2411. [FREE Full text] [doi: 10.1111/jgs.17163] [Medline: 33848360]
29. Macchi ZA, Ayele R, Dini M, Lamira J, Katz M, Pantilat SZ, et al. Lessons from the COVID-19 pandemic for improving outpatient neuropalliative care: a qualitative study of patient and caregiver perspectives. Palliat Med. 2021;35(7):1258-1266. [FREE Full text] [doi: 10.1177/02692163211017383] [Medline: 34006157]
30. Gately ME, Muccini S, Eggleston BA, McLaren JE. Program evaluation of my life, my story: virtual storytelling in the COVID-19 age. Clin Gerontol. 2022;45(1):195-203. [doi: 10.1080/07317115.2021.1931610] [Medline: 34219605]
31. Masoud SS, Meyer KN, Martin Sweet L, Prado PJ, White CL. "We Don't Feel so Alone": a qualitative study of virtual memory cafés to support social connectedness among individuals living with dementia and care partners during COVID-19. Front Public Health. 2021;9:660144. [FREE Full text] [doi: 10.3389/fpubh.2021.660144] [Medline: 34055724]
32. Weiss EF, Malik R, Santos T, Ceide M, Cohen J, Verghese J, et al. Telehealth for the cognitively impaired older adult and their caregivers: lessons from a coordinated approach. Neurodegener Dis Manag. 2021;11(1):83-89. [FREE Full text] [doi: 10.2217/nmt-2020-0041] [Medline: 33172352]
33. Neal DP, Ettema TP, Zwan MD, Dijkstra K, Finnema E, Graff M, et al. FindMyApps compared with usual tablet use to promote social health of community-dwelling people with mild dementia and their informal caregivers: a randomised controlled trial. EClinicalMedicine. 2023;63:102169. [FREE Full text] [doi: 10.1016/j.eclinm.2023.102169] [Medline: 37680943]
34. Lott IT, Doran E, Walsh DM, Hill MA. Telemedicine, dementia and Down syndrome: implications for Alzheimer disease. Alzheimers Dement. 2006;2(3):179-184. [doi: 10.1016/j.jalz.2006.04.001] [Medline: 19595881]
35. Ganguli I, Orav EJ, Hailu R, Lii J, Rosenthal MB, Ritchie CS, et al. Patient characteristics associated with being offered or choosing telephone vs video virtual visits among medicare beneficiaries. JAMA Netw Open. 2023;6(3):e235242. [FREE Full text] [doi: 10.1001/jamanetworkopen.2023.5242] [Medline: 36988958]
36. Gillespie SM, Wasserman EB, Wood NE, Wang H, Dozier A, Nelson D, et al. High-intensity telemedicine reduces emergency department use by older adults with dementia in senior living communities. J Am Med Dir Assoc. 2019;20(8):942-946. [FREE Full text] [doi: 10.1016/j.jamda.2019.03.024] [Medline: 31315813]
37. Xie B, Champion JD, Kwak J, Fleischmann KR. Mobile health, information preferences, and surrogate decision-making preferences of family caregivers of people with dementia in rural hispanic communities: cross-sectional questionnaire study. J Med Internet Res. 2018;20(12):e11682. [FREE Full text] [doi: 10.2196/11682] [Medline: 30530450]
38. LaMonica HM, English A, Hickie IB, Ip J, Ireland C, West S, et al. Examining internet and eHealth practices and preferences: survey study of Australian older adults with subjective memory complaints, mild cognitive impairment, or dementia. J Med Internet Res. 2017;19(10):e358. [FREE Full text] [doi: 10.2196/jmir.7981] [Medline: 29070481]
39. Cristancho-Lacroix V, Wrobel J, Cantegreil-Kallen I, Dub T, Rouquette A, Rigaud A. A web-based psychoeducational program for informal caregivers of patients with Alzheimer's disease: a pilot randomized controlled trial. J Med Internet Res. 2015;17(5):e117. [FREE Full text] [doi: 10.2196/jmir.3717] [Medline: 25967983]
40. Laver K, Liu E, Clemson L, Davies O, Gray L, Gitlin LN, et al. Does telehealth delivery of a dyadic dementia care program provide a noninferior alternative to face-to-face delivery of the same program? A randomized, controlled trial. Am J Geriatr Psychiatry. 2020;28(6):673-682. [FREE Full text] [doi: 10.1016/j.jagp.2020.02.009] [Medline: 32234275]

41. Williams KN, Perkhounkova Y, Shaw CA, Hein M, Vidoni ED, Coleman CK. Supporting family caregivers with technology for dementia home care: a randomized controlled trial. Innov Aging. 2019;3(3):igz037. [FREE Full text] [doi: 10.1093/geroni/igz037] [Medline: 31660443]
42. Howard R, Gathercole R, Bradley R, Harper E, Davis L, Pank L, et al. The effectiveness and cost-effectiveness of assistive technology and telecare for independent living in dementia: a randomised controlled trial. Age Ageing. 2021;50(3):882-890. [FREE Full text] [doi: 10.1093/ageing/afaa284] [Medline: 33492349]
43. Wesselman LMP, Schild AK, Hooghiemstra AM, Meiberth D, Drijver AJ, Leeuwenstijn-Koopman MV, et al. Targeting lifestyle behavior to improve brain health: user-experiences of an online program for individuals with subjective cognitive decline. J Prev Alzheimers Dis. 2020;7(3):184-194. [doi: 10.14283/jpad.2020.9] [Medline: 32463072]
44. Peterson C, Birkeland R, Louwagie K, Ingvalson S, Mitchell L, Scott T, et al. Refining a driving retirement program for persons with dementia and their care partners: A mixed methods evaluation of carFreeMe™-dementia. J Gerontol B Psychol Sci Soc Sci. 2023;78(3):506-519. [FREE Full text] [doi: 10.1093/geronb/gbac151] [Medline: 36149829]
45. Iyer SS, Ngo V, Humber MB, Chen P, Pallaki M, Dolinar T, et al. Caregiver experience of tele-dementia care for older veterans. J Gen Intern Med. 2023;38(13):2960-2969. [FREE Full text] [doi: 10.1007/s11606-023-08188-2] [Medline: 37131102]
46. Lindauer A, Seelye A, Lyons B, Dodge HH, Mattek N, Mincks K, et al. Dementia care comes home: patient and caregiver assessment via telemedicine. Gerontologist. 2017;57(5):e85-e93. [FREE Full text] [doi: 10.1093/geront/gnw206] [Medline: 28158415]
47. Mahoney DF, Tarlow BJ, Jones RN. Effects of an automated telephone support system on caregiver burden and anxiety: findings from the REACH for TLC intervention study. Gerontologist. 2003;43(4):556-567. [doi: 10.1093/geront/43.4.556] [Medline: 12937334]
48. Smith V, Younes K, Poston KL, Mormino EC, Young CB. Reliability of remote national Alzheimer's coordinating center uniform data set data. Alzheimers Dement (Amst). 2023;15(4):e12498. [FREE Full text] [doi: 10.1002/dad2.12498] [Medline: 38034852]
49. Emedoli D, Houdayer E, Della Rosa PA, Zito A, Brugliera L, Cimino P, et al. Continuity of care for patients with dementia during COVID-19 pandemic: flexibility and integration between in-person and remote visits. Front Public Health. 2023;11:1301949. [FREE Full text] [doi: 10.3389/fpubh.2023.1301949] [Medline: 38259745]
50. Carotenuto A, Rea R, Traini E, Ricci G, Fasanaro AM, Amenta F. Cognitive assessment of patients with Alzheimer's disease by telemedicine: pilot study. JMIR Ment Health. 2018;5(2):e31. [FREE Full text] [doi: 10.2196/mental.8097] [Medline: 29752254]
51. O'Connor E, Farrow M, Hatherly C. Randomized comparison of mobile and web-tools to provide dementia risk reduction education: use, engagement and participant satisfaction. JMIR Ment Health. 2014;1(1):e4. [FREE Full text] [doi: 10.2196/mental.3654] [Medline: 26543904]
52. Stara V, Vera B, Bolliger D, Rossi L, Felici E, Di Rosa M, et al. Usability and acceptance of the embodied conversational agent anne by people with dementia and their caregivers: exploratory study in home environment settings. JMIR Mhealth Uhealth. 2021;9(6):e25891. [FREE Full text] [doi: 10.2196/25891] [Medline: 34170256]
53. Mendez KJW, Budhathoki C, Labrique AB, Sadak T, Tanner EK, Han HR. Factors associated with intention to adopt mHealth apps among dementia caregivers with a chronic condition: cross-sectional, correlational study. JMIR Mhealth Uhealth. 2021;9(8):e27926. [FREE Full text] [doi: 10.2196/27926] [Medline: 34463637]
54. Lancaster C, Koychev I, Blane J, Chinner A, Wolters L, Hinds C. Evaluating the feasibility of frequent cognitive assessment using the mezurio smartphone app: observational and interview study in adults with elevated dementia risk. JMIR Mhealth Uhealth. 2020;8(4):e16142. [FREE Full text] [doi: 10.2196/16142] [Medline: 32238339]
55. Potts C, Bond R, Ryan A, Mulvenna M, McCauley C, Laird E, et al. Ecological momentary assessment within a digital health intervention for reminiscence in persons with dementia and caregivers: user engagement study. JMIR Mhealth Uhealth. 2020;8(7):e17120. [doi: 10.2196/17120] [Medline: 32420890]
56. Banbury A, Parkinson L, Gordon S, Wood D. Implementing a peer-support programme by group videoconferencing for isolated carers of people with dementia. J Telemed Telecare. 2019;25(9):572-577. [doi: 10.1177/1357633X19873793] [Medline: 31631761]
57. Williams KN, Shaw CA, Perkhounkova Y, Hein M, Coleman CK. Satisfaction, utilization, and feasibility of a telehealth intervention for in-home dementia care support: a mixed methods study. Dementia (London). 2021;20(5):1565-1585. [FREE Full text] [doi: 10.1177/1471301220957905] [Medline: 32902313]
58. Pot AM, Blom MM, Willemse BM. Acceptability of a guided self-help Internet intervention for family caregivers: mastery over dementia. Int Psychogeriatr. 2015;27(8):1343-1354. [FREE Full text] [doi: 10.1017/S1041610215000034] [Medline: 25648589]
59. Pagán-Ortiz ME, Cortés DE, Rudloff N, Weitzman P, Levkoff S. Use of an online community to provide support to caregivers of people with dementia. J Gerontol Soc Work. 2014;57(6-7):694-709. [FREE Full text] [doi: 10.1080/01634372.2014.901998] [Medline: 24689359]

60. Levinson AJ, Ayers S, Butler L, Papaioannou A, Marr S, Sztramko R. Barriers and facilitators to implementing web-based dementia caregiver education from the clinician's perspective: qualitative study. JMIR Aging. 2020;3(2):e21264. [FREE Full text] [doi: 10.2196/21264] [Medline: 33006563]
61. Dam AEH, Christie HL, Smeets CM, van Boxtel MP, Verhey FR, de Vugt ME. Process evaluation of a social support platform 'Inlife' for caregivers of people with dementia. Internet Interv. 2019;15:18-27. [FREE Full text] [doi: 10.1016/j.invent.2018.09.002] [Medline: 30510911]
62. Boots LM, de Vugt ME, Smeets CM, Kempen GI, Verhey FR. Implementation of the blended care self-management program for caregivers of people with early-stage dementia (Partner in Balance): process evaluation of a randomized controlled trial. J Med Internet Res. 2017;19(12):e423. [FREE Full text] [doi: 10.2196/jmir.7666] [Medline: 29258980]
63. Baruah U, Shivakumar P, Loganathan S, Pot AM, Mehta KM, Gallagher-Thompson D, et al. Perspectives on components of an online training and support program for dementia family caregivers in India: a focus group study. Clin Gerontol. 2020;43(5):518-532. [doi: 10.1080/07317115.2020.1725703] [Medline: 32081097]
64. Mitchell LL, Peterson CM, Rud SR, Jutkowitz E, Sarkinen A, Trost S, et al. "It's Like a Cyber-Security Blanket": the utility of remote activity monitoring in family dementia care. J Appl Gerontol. 2020;39(1):86-98. [FREE Full text] [doi: 10.1177/0733464818760238] [Medline: 29504488]
65. Núñez-Naveira L, Alonso-Búa B, de Labra C, Gregersen R, Maibom K, Mojs E, et al. UnderstAID, an ICT platform to help informal caregivers of people with dementia: a pilot randomized controlled study. Biomed Res Int. 2016;2016:5726465. [FREE Full text] [doi: 10.1155/2016/5726465] [Medline: 28116300]
66. Boessen ABCG, Verwey R, Duymelinck S, van Rossum E. An online platform to support the network of caregivers of people with dementia. J Aging Res. 2017;2017:3076859. [FREE Full text] [doi: 10.1155/2017/3076859] [Medline: 28894609]
67. Park E, Park H, Kim EK. The effect of a comprehensive mobile application program (CMAP) for family caregivers of home-dwelling patients with dementia: a preliminary research. Jpn J Nurs Sci. 2020;17(4):e12343. [doi: 10.1111/jjns.12343] [Medline: 32363664]
68. Gaugler JE, Birkeland RW, Albers EA, Peterson CM, Louwagie K, Baker Z, et al. Efficacy of the residential care transition module: a telehealth intervention for dementia family caregivers of relatives living in residential long-term care settings. Psychol Aging. 2024;39(5):565-577. [doi: 10.1037/pag0000820] [Medline: 38753405]
69. Mole L, Kent B, Hickson M, Abbott R. 'It's what you do that makes a difference' an interpretative phenomenological analysis of health care professionals and home care workers experiences of nutritional care for people living with dementia at home. BMC Geriatr. 2019;19(1):250. [FREE Full text] [doi: 10.1186/s12877-019-1270-4] [Medline: 31500576]
70. Merrell RC, Doarn CR. Whither telemedicine? Telemed J E Health. 2019;25(6):433-434. [doi: 10.1089/tmj.2019.29025.crd] [Medline: 31166156]
71. Tipre M, Scarinci IC, Pandya VN, Kim YI, Bae S, Peral S, et al. Attitudes toward telemedicine among urban and rural residents. J Telemed Telecare. 2024;30(4):722-730. [doi: 10.1177/1357633X221094215] [Medline: 35578537]
72. Merrell RC, Doarn CR. Geriatric telemedicine. Telemed J E Health. 2015;21(10):767-768. [doi: 10.1089/tmj.2015.29003.mer] [Medline: 26431256]
73. Barrado-Martín Y, Heward M, Polman R, Nyman SR. People living with dementia and their family carers' adherence to home-based Tai Chi practice. Dementia (London). 2021;20(5):1586-1603. [FREE Full text] [doi: 10.1177/1471301220957758] [Medline: 32924589]
74. Gately ME, Trudeau SA, Moo LR. In-home video telehealth for dementia management: implications for rehabilitation. Curr Geriatr Rep. 2019;8(3):239-249. [FREE Full text] [doi: 10.1007/s13670-019-00297-3] [Medline: 32015957]
75. Burgess J, Wenborn J, Di Bona L, Orrell M, Poland F. Taking part in the community occupational therapy in dementia UK intervention from the perspective of people with dementia, family carers and occupational therapists: a qualitative study. Dementia (London). 2021;20(6):2057-2076. [doi: 10.1177/1471301220981240] [Medline: 33371738]
76. Lockwood MM, Wallwork RS, Lima K, Dua AB, Seo P, Bolster MB. Telemedicine in adult rheumatology: in practice and in training. Arthritis Care Res (Hoboken). 2022;74(8):1227-1233. [doi: 10.1002/acr.24569] [Medline: 33555127]
77. Dryden EM, Kennedy MA, Conti J, Boudreau JH, Anwar CP, Nearing K, et al. Perceived benefits of geriatric specialty telemedicine among rural patients and caregivers. Health Serv Res. 2023;58 Suppl 1(Suppl 1):26-35. [FREE Full text] [doi: 10.1111/1475-6773.14055] [Medline: 36054487]
78. Lin L, Cai M, Su F, Wu T, Yuan K, Li Y, et al. Real-world experience with Deutetrabenazine management in patients with Huntington's disease using video-based telemedicine. Neurol Sci. 2024;45(5):2047-2055. [doi: 10.1007/s10072-023-07179-9] [Medline: 37973627]
79. Rome D, Sales A, Cornelius T, Malhotra S, Singer J, Ye S, et al. Impact of telemedicine modality on quality metrics in diverse settings: implementation science-informed retrospective cohort study. J Med Internet Res. 2023;25:e47670. [FREE Full text] [doi: 10.2196/47670] [Medline: 37494087]
80. Kahn JM, Hill NS, Lilly CM, Angus DC, Jacobi J, Rubenfeld GD, et al. The research agenda in ICU telemedicine: a statement from the critical care societies collaborative. Chest. 2011;140(1):230-238. [FREE Full text] [doi: 10.1378/chest.11-0610] [Medline: 21729894]

81. Chen W, Flanagan A, Nippak PM, Nicin M, Sinha SK. Understanding the experience of geriatric care professionals in using telemedicine to care for older patients in response to the COVID-19 pandemic: mixed methods study. JMIR Aging. 2022;5(3):e34952. [FREE Full text] [doi: 10.2196/34952] [Medline: 35830331]
82. Chaiyachati KH, Snider CK, Mitra N, Huffenberger AM, McGinley S, Bristow R, et al. Economics of a health system's direct-to-consumer telemedicine for its employees. Am J Manag Care. 2023;29(6):284-290. [FREE Full text] [doi: 10.37765/ajmc.2023.89369] [Medline: 37341975]
83. Ghiselli S, Sorrentino F, Lazzerini F, Rabito C, Murri A, Scimemi P. Telemedicine for hearing-impaired patients in Italy. Acta Otorhinolaryngol Ital. 2024;44(5):342-345. [FREE Full text] [doi: 10.14639/0392-100X-N3116] [Medline: 39526771]
84. Barrera-Caballero S, Romero-Moreno R, Del Sequeros Pedroso-Chaparro M, Olmos R, Vara-García C, Gallego-Alberto L, et al. Stress, cognitive fusion and comorbid depressive and anxiety symptomatology in dementia caregivers. Psychol Aging. 2021;36(5):667-676. [doi: 10.1037/pag0000624] [Medline: 34351188]
85. Agachi E, Mierau JO, van Ittersum K, Bijmolt TH. The impact of a lifestyle behaviour change program on healthcare costs: quasi-experimental real-world evidence from an open-access mobile health app in the Netherlands. Prev Med. 2024;189:108174. [FREE Full text] [doi: 10.1016/j.ypmed.2024.108174] [Medline: 39532214]
86. Barbosa W, Zhou K, Waddell E, Myers T, Dorsey ER. Improving access to care: telemedicine across medical domains. Annu Rev Public Health. 2021;42:463-481. [FREE Full text] [doi: 10.1146/annurev-publhealth-090519-093711] [Medline: 33798406]
87. Langford AT, Solid CA, Scott E, Lad M, Maayan E, Williams SK, et al. Mobile phone ownership, health apps, and tablet use in US adults with a self-reported history of hypertension: cross-sectional study. JMIR Mhealth Uhealth. 2019;7(1):e12228. [FREE Full text] [doi: 10.2196/12228] [Medline: 31344667]
88. Haleem A, Javaid M, Singh RP, Suman R. Telemedicine for healthcare: capabilities, features, barriers, and applications. Sens Int. 2021;2:100117. [FREE Full text] [doi: 10.1016/j.sintl.2021.100117] [Medline: 34806053]
89. Puchades R, Said-Criado I. Telemedicine in clinical practice: barriers and risks. Med Clín (English Ed). 2024;162(3):123-125. [doi: 10.1016/j.medcle.2023.10.007]
90. Hartasanchez SA, Heen AF, Kunneman M, García-Bautista A, Hargraves IG, Prokop LJ, et al. Remote shared decision making through telemedicine: a systematic review of the literature. Patient Educ Couns. 2022;105(2):356-365. [doi: 10.1016/j.pec.2021.06.012] [Medline: 34147314]
91. Vaghasiya JV, Mayorga-Martinez CC, Pumera M. Telemedicine platform for health assessment remotely by an integrated nanoarchitectonics FePS/rGO and TiC-based wearable device. Npj Flex Electron. 2022;6(1):73. [FREE Full text] [doi: 10.1038/s41528-022-00208-1] [Medline: 35990769]
92. Meiksin R, Lewandowska M, Scott RH, Palmer M, McCarthy O, Salaria N, et al. SACHA Study Team. Patient and health professional attitudes towards the use of telemedicine for abortion care in Britain: findings from the SACHA study. Digit Health. 2024;10:20552076241288717. [FREE Full text] [doi: 10.1177/20552076241288717] [Medline: 39502487]
93. Tangari G, Ikram M, Sentana I, Ijaz K, Kaafar M, Berkovsky S. Analyzing security issues of android mobile health and medical applications. J Am Med Inform Assoc. 2021;28(10):2074-2084. [FREE Full text] [doi: 10.1093/jamia/ocab131] [Medline: 34338763]
94. Cui F, Ma Q, He X, Zhai Y, Zhao J, Chen B, et al. Implementation and application of telemedicine in China: cross-sectional study. JMIR Mhealth Uhealth. 2020;8(10):e18426. [FREE Full text] [doi: 10.2196/18426] [Medline: 33095175]
95. Singh J, Badr MS, Diebert W, Epstein L, Hwang D, Karres V, et al. American academy of sleep medicine (AASM) position paper for the use of telemedicine for the diagnosis and treatment of sleep disorders. J Clin Sleep Med. 2015;11(10):1187-1198. [FREE Full text] [doi: 10.5664/jcsm.5098] [Medline: 26414983]

Abbreviations

CONSORT-EHEALTH: Consolidated Standards of Reporting Trials of Electronic and Mobile Health Applications and Online Telehealth
MeSH: Medical Subject Headings
PRISMA-ScR: Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews

Edited by T de Azevedo Cardoso; submitted 21.08.24; peer-reviewed by R Chen, KW Tay; comments to author 23.01.25; revised version received 07.02.25; accepted 11.03.25; published 05.05.25

Please cite as:
Ye M, Liu Z, Xie W, Shou M, Wang S, Lin X, Xu Y, Yao M, Chen J, Shou Y, Wu J, Guan L
Implementation of Telemedicine for Patients With Dementia and Their Caregivers: Scoping Review
J Med Internet Res 2025;27:e65667
URL: https://www.jmir.org/2025/1/e65667
doi: 10.2196/65667
PMID: