# Technological Innovations in Dementia Care: The Role of Social Work Advocacy

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## AUTHOR'S NOTE

At the time of this paper's writing, the U.S. federal government was undergoing a presidential transition. As a result, significant changes have been made to federal government websites, including the removal or modification of policies, webpages, and datasets. These limitations in information availability, along with policy shifts under the new administration, may affect some of the resources, government programs, and funding opportunities discussed in this paper. Future research will be needed to evaluate the long-term impact of these changes on equitable access to dementia care technologies, public access to essential data for caregivers and healthcare professionals, and the role of social work advocacy in supporting affected communities.

## ABSTRACT

According to the World Health Organization (2023), dementia affects over 55 million people across the globe, projected to increase to 139 million individuals by the year 2050. The caregiver burden, which compounds over the years of illness, includes emotional, physical, and financial challenges. These challenges disproportionately impact low-income and minority communities (Mickens et al., 2020). This research paper explores the role of technology in alleviating these challenges by improving the quality of life of both persons with dementia (PWDs) and their caregivers. Current technological tools, including healthcare monitoring tools, location-tracking devices, and reminiscence therapy platforms, are analyzed for their strengths in addressing the cognitive and safety needs of PWDs. I also address limitations such as financial barriers, digital literacy gaps, and accessibility challenges among older adult populations. The study emphasizes the significant role of social workers in advocating for equitable, person-centered care through policy and community-level interventions. Recommendations for social workers are provided, including promoting digital literacy programs, subsidizing assistive technology costs, and prioritizing user-centered designs to ensure equitable access to dementia care technologies.

# INNOVATIONS IN DEMENTIA CARE: THE ROLE OF TECHNOLOGY AND SOCIAL WORK ADVOCACY

Dementia, a progressive neurodegenerative condition, leads to a wide array of cognitive impairments, including memory loss, difficulty with language, and a reduced ability to perform daily activities (Rahman & Howard, 2018). Globally, over 55 million people live with dementia, and this number is projected to reach 139 million by the year 2050 (World Health Organization [WHO], 2025). This significant increase emphasizes the urgent need to address the numerous challenges associated with dementia care. These concerns include ensuring the safety of persons with dementia (PWDs), alleviating the caregiving burden on their caregivers, and improving the quality of life for both groups.

## UNDERSTANDING DEMENTIA

Dementia is an umbrella term for over 100 distinct conditions, with Alzheimer's disease being the most prevalent and well-known (Mace & Rabins, 2017). PWDs experience a range of cognitive and noncognitive symptoms over time. Cognitive issues, particularly in short-term memory and learning, are often early and generally well-known signs of the condition. Noncognitive symptoms include neuropsychiatric conditions such as physical aggression and restlessness, wandering behaviors, decreased sexual drive, and inappropriate social behaviors like cursing or hoarding (Biernacki, 2007).

Symptoms of dementia often begin on a mild level, such as forgetfulness or difficulty using precise diction; they eventually progress to more severe impairments. In the early stages of the condition, PWDs may maintain some independence in daily life but begin to struggle with more complex tasks. As the condition advances, they often require assistance with basic activities such as dressing and eating. In its late stages, dementia leads to complete dependence on caregivers for all aspects of daily living (Rahman & Howard, 2018). Given that these symptoms shift over time, PWDs often unwillingly experience emotional, cognitive, and social disruptions that decrease their quality of life.

## CAREGIVER BURDEN AND TRENDS

The progressive and severe nature of dementia makes caregiving for PWDs particularly demanding. According to the Centers for Disease Control and Prevention (CDC; 2024), 80% of people with dementia are cared for at home, with 16 million caregivers providing care to their family members and friends. One in three caregivers is 65 or older (CDC, 2024) and thus experiences the unique social, financial, and physical vulnerabilities that impact the older adult population.

Caregivers help manage activities of daily living (ADLs) for those affected by dementia, which include essential tasks like bathing, eating, and toileting, as well as more complex tasks like managing medications, finances, and transportation. A survey of 11.5 million families and other caregivers of individuals with dementia reported that these caregivers provide approximately 31 hours of unpaid help per week (Alzheimer's Association, 2024). As a result, caregivers for PWDs experience a range of challenges that may lead to burnout, defined as a state of physical, emotional, and mental exhaustion caused by the stressors and demands of caregiving (Maslach & Leiter, 2016). As they witness the gradual decline of their loved ones, caregivers often experience emotional challenges including grief, guilt, and depression (Mace & Rabins, 2017). Physically, the caregiving role frequently leads to fatigue and health deterioration due to chronic stress and disruptions in regular sleep patterns (Mace & Rabins, 2017). Financial challenges include significant costs of medical care and the potential loss of income due to caregiving responsibilities. These challenges make dementia one of the most costly conditions to manage (Alzheimer's Association, 2019).

For marginalized communities, these challenges are further compounded by systemic inequities, including limited access to healthcare, technological tools, and caregiver support services. Research shows that racial and ethnic minority caregivers are more likely to experience higher caregiving burdens due to disparities in healthcare access and socioeconomic barriers (Mickens et al., 2020). African Americans are twice as likely as white Americans to develop dementia, and Hispanic Americans are 1.5 times more likely (Alzheimer's Association, 2019). Yet these groups often experience significantly lower access to diagnostic services, treatment options, and caregiver support programs (Gaugler et al., 2020). Additionally, caregivers in low-income households are particularly vulnerable to financial stress. They also face additional barriers to accessing paid care services (Andrén & Elmståhl, 2007), thus increasing susceptibility to caregiver burnout.

## THE PRESENT STUDY

In the context of these systemic and daily challenges faced by caregivers and individuals with dementia, technology significantly enhances dementia care. Technological advancements provide increasing benefits for older individuals with dementia, as well as for their caregivers (Allen, 2020). Various technological tools, such as assistive devices and telehealth platforms (Saragih et al., 2022), are being integrated into dementia care in increasing numbers, using innovation to address the needs and demands of dementia care.

However, equitable access to such technology remains a challenge. Caregivers' willingness and ability to use these tools may be influenced by economic barriers, digital literacy, and the additional cognitive load required to learn new systems. Older caregivers in particular may struggle with adopting unfamiliar digital platforms, while underserved populations may have less access to essential assistive technologies (Leff et al., 2025). When implemented with an ethical and inclusive approach that prioritizes accessibility, affordability, and cultural sensitivity, technology can help manage the safety and cognitive symptoms of PWDs while simultaneously alleviating caregiver burdens. Thus, technology can play a significant role in increasing the quality of life of both individuals with dementia and their caregivers.

The present study first delves into the strengths of various innovative tools currently being used in dementia care, such as healthcare technologies and location-tracking devices to address the wandering behaviors of PWDs. Next, the limitations of these technologies are discussed, followed by actionable strategies for social workers on policy and community-level interventions to promote inclusive, accessible solutions for integrating technology into dementia care.

## TECHNOLOGICAL INNOVATIONS IN DEMENTIA CARE

### HEALTHCARE TECHNOLOGIES FOR DEMENTIA CARE

Healthcare technologies for dementia care have numerous applications in both homes and care facilities, and have been shown to play a significant role in relieving stressors for both care recipients and caregivers (Allen, 2020). From a medical standpoint, video monitoring technology supports the treatment of patients by providing useful content for care plan discussions with healthcare professionals and more immediate feedback for caregivers of individuals with dementia. Additional healthcare technologies include the following, which collectively ensure the quality of treatments, general safety, and daily care for individuals with dementia (Allen, 2020):

- Exit sensors to manage wandering behaviors
- Flood, carbon monoxide, and extreme temperature detectors to maintain environmental safety
- Bed occupancy sensors
- Medication reminders

Further technological innovations in clinical treatments for dementia have been identified in recent years, including those that address the complex socioemotional challenges associated with dementia. One such advance is the integration of technology into reminiscence therapy, a therapeutic approach used in dementia care that encourages individuals with dementia to recall and share memories from their past (Woods et al., 2018). This approach has been demonstrated to improve emotional mood, social interactions, and cognitive functioning among PWDs (Woods et al., 2018). Based on this evidence-based approach, researchers Huldtgren, Vormann, and Geiger (2015a, 2015b) have explored methods of using a specially designed computerized mapping program to facilitate reminiscence therapy for people with dementia. Tools like interactive mapping software assist in memory recall and strengthen bonds between PWDs and their caregivers, contributing to a therapeutic environment and positive social connections. These e-health platforms incorporate multimedia elements such as photos, audio, and videos to provide personalized experiences for patients (Huldtgren et al., 2015a, 2015b), further enhancing the intervention's effectiveness.

By enhancing reminiscence therapy with technology, these innovations provide significant emotional and psychological relief for both PWDs and their caregivers. For PWDs, reliving positive past experiences can improve mood, reduce anxiety, and strengthen cognitive function (Woods et al., 2018). For caregivers, these tools offer an opportunity to engage with their loved ones in a structured and meaningful way, reducing the stress and emotional burden often associated with dementia care.

These innovations play an important role in engaging PWDs emotionally and cognitively, important aspects in maintaining cognitive health and mitigating the symptoms of dementia. Meanwhile, caregivers also benefit from such technologies, as they help alleviate the physical and emotional burdens associated with caregiving. For instance, telehealth services and remote monitoring systems allow caregivers to oversee the health and safety of PWDs while maintaining their own personal and professional commitments. Smart medication dispensers ensure that PWDs adhere to prescribed treatments without requiring constant reminders from caregivers, thus reducing stress and improving time management (Patel et al., 2022). By allowing caregivers to maintain a sense of balance between personal and caregiving responsibilities, these tools support their mental health and ongoing resilience despite the strain of providing care to PWDs (Mace & Rabins, 2017).

## TECHNOLOGIES TO MANAGE WANDERING BEHAVIORS

Among the safety concerns surrounding PWDs is the prevalence of wandering behaviors. Research by Algase et al. (2007) defines wandering as “a syndrome of dementia-related locomotion behaviour having a frequent, repetitive, temporally-disordered and/or spatially-disoriented nature that is manifested in lapping, random, and/or pacing patterns, some of which are associated with eloping” (p. 723). These behaviors have been observed to stem from a range of variables, such as immersion in unfamiliar environments, mood-related agitation caused by brain damage, or disorientation in general. Research shows that wandering behavior substantially increases the risk of injury and/or fatalities, caused by, for example, being struck by vehicles or succumbing to environmental hazards (Byard & Langlois, 2019). As a result, PWDs exhibiting wandering behaviors may find themselves in at-risk environments or become lost, leading to the potential for physical harm or even death.

Approximately 60% of individuals with dementia will experience wandering during the course of the disease (Alzheimer’s Association, 2022). This leads to additional challenges for a significant proportion of PWDs and their caregivers, who may experience fearfulness and anxiety as a result. To address these concerns, several low-tech strategies are often implemented, such as PWDs carrying reminders to remain calm and call home or wearing medical bracelets that provide critical health information and emergency contact numbers (Mace & Rabins, 2017). As technology has advanced, however, innovative products have been designed to both prevent and respond to wandering behaviors among PWDs.

In particular, wearable devices equipped with location tracking features, such as GPS-enabled bracelets, watches, or even shoe inserts, allow caregivers to manage the location of PWDs in real time. For example, GPS SmartSole is a water-resistant device discreetly embedded in the sole of a shoe. This technological tool was developed for individuals with dementia, autism, or traumatic brain injury who are prone to wandering. The product is recharged daily, offering real-time location updates and helping protect the safety of PWDs (Nunes, 2021).

Another innovative tool to address the risks of wandering behaviors is AngelSense, a location tracker designed to securely attach to clothing. This device offers all-day monitoring of arrivals, departures, and travel speeds, along with automatic alerts when the individual enters unfamiliar geographic areas. Additional features include a two-way voice function and a first-responder emergency alert, which enhances the safety of persons with dementia (AngelSense, n.d.).

In addition to these wearable, location-based devices, video monitoring systems have become increasingly popular. These systems allow caregivers to observe individuals remotely and intervene promptly during emergencies. Features such as motion detection and automated alerts help maintain a balance between ensuring safety and promoting independence for PWDs (Allen, 2020).

## LIMITATIONS IN TECHNOLOGICAL TOOLS

However, these technological tools are not without limitations. For example, a significant barrier to technology adoption among older adults is the pervasive gap in financial resources and digital literacy, defined as competence in one’s technical understanding of technology (Vercruyssen, et al., 2023). This problem is exacerbated by insufficient access to training and resources. Many older adults, particularly those from low-income and minority populations (McCreadie & Tinker, 2005), lack the digital skills or financial resources to navigate these technological tools, which limits their ability to benefit from digital innovations. This issue is particularly concerning because one-third of caregivers are older adults themselves, leaving both caregivers and those they support at a disadvantage in accessing these digital resources (Costa & Moniz, 2024).

Additionally, these technologies present challenges in meeting the diverse needs of users, such as older adults and caregivers, who are more susceptible to physical, sensory, or cognitive limitations. These issues arise in part from the lack of accessible design of these products, including poor usability, such as lacking help and search options and limited instructions, and not tailoring features to individual impairments and disabilities (Hassan et al., 2022). Consequently, the digital tools intended to enhance support for individuals with disabilities and their caregivers are often underused (Hassan et al., 2022).

Moreover, current literature reveals a gap in examining the effectiveness of interventions, including technological tools, among communities of color. While existing academic research clearly establishes that ethnic minority caregivers of individuals with dementia experience disproportionately higher levels of caregiver burden, it also highlights significant limitations in understanding how these technological tools benefit marginalized populations, such as PWDs and caregivers of color (Kindratt et al., 2023; Liu et al., 2022). Further research is needed to analyze their unique barriers and needs related to technology utilization; only a few studies have explored how these tools can be adapted to better serve PWDs and their caregivers. Without such attention, disparities in access to and adoption of technological tools and interventions will likely persist.

Finally, implementing technological tools for PWDs and their caregivers poses ethical concerns. From data privacy and informed consent for location-tracking technologies, to obstacles in the equitable distribution of resources, these concerns call for action that is grounded in the social justice–oriented principles of social work. Social workers play a pivotal role in confronting these barriers for these vulnerable populations by promoting equitable access to caregiving technologies from program- and policy-level standpoints.

## IMPLICATIONS FOR SOCIAL WORK PRACTICE

Several existing macro-level initiatives provide an excellent framework for social workers to address gaps in digital literacy and financial resources that lead to barriers in accessing technology for dementia care. For example, California's Access to Technology program provided $48 million to communities and organizations to spearhead digital literacy initiatives, including digital literacy education programs and funding for technological devices, for adults with disabilities and older adults (California Department of Aging, n.d.). In addition, the Federal Communications Commission (2021) offers the Lifeline Program, geared toward national broadband expansion. This program advocates for affordable internet access for underserved populations and communities, making it a solid example of promoting access to telehealth and digital tools. These programs could improve the personal autonomy and quality of life among PWDs and their caregivers. Social workers can play pivotal roles in bridging gaps among tech developers, policymakers, and caregiver and PWD communities.

These programs are key examples of promoting the accessibility and affordability of assistive technologies for dementia care. Subsidizing assistive technology promotes equitable access, improving the quality of life for low-income families. By referencing the advantages of these initiatives in community-level and policy-level advocacy, social workers may play a significant role in advocating for equitable digital knowledge, education, and resources in their communities. A key entry point for policy change involves integrating assistive technology funding into existing healthcare programs, such as Medicaid and home- and community-based services, to provide financial support for families in need (KFF, 2022). Public-private partnerships between technology developers, healthcare institutions, and policymakers can facilitate the large-scale distribution of these tools, ensuring cost-effective and inclusive access.

Older adults and their caregivers who encounter physical and cognitive limitations need user-friendly technology design. When navigating these issues, social workers should turn to the model of person-centered care (National Association of Social Workers, 2021), which prioritizes the dignity and autonomy of individuals, ensuring that care plans are personalized and that the individual's voice remains central to decisionmaking. Technological tools like the MindMate app (2018) are designed to offer interactive memory exercises and medication reminders for individuals with dementia and Alzheimer's disease. They are also individually tailored with input from users and patients, aligning with the principles of person-centered care that emphasize the voices of populations served.

As technology plays an increasingly pivotal role in dementia care, future social work research and product development efforts must prioritize collaboration between social workers, product designers and engineers, and healthcare providers to create solutions that are not only effective in dementia care, but also equitable for marginalized populations. Many older adults, particularly those with cognitive impairments, face challenges in interacting with complex technology. Research should focus on creating intuitive, user-friendly interfaces that can accommodate the varying cognitive abilities of individuals with dementia (McCreadie & Tinker, 2005), such as designs that incorporate large fonts, clear visuals, and voice-activated systems to promote independence while minimizing confusion. Additionally, social workers may advocate for ongoing usability testing with target populations to ensure that the technology remains accessible, effective, and engaging for those with dementia, as well as their caregivers, and to ensure a person-centered care model in product development. Through approaches like cross-disciplinary partnerships, social workers can help ensure that technological tools not only address the clinical aspects of dementia care but also uplift the voices and self-reported needs of individuals with dementia and their caregivers.

To address the lack of existing research on ethnic minority engagement with technological interventions, future social work research should prioritize inclusivity in both study design and implementation. Considering that users vary across sociodemographic factors such as race, ethnicity, and socioeconomic status, as well as their unique behavioral and cognitive manifestations of dementia (Vollmer Dahlke & Ory, 2020), research must account for these complexities when evaluating the effectiveness of technological tools. A more comprehensive approach would involve engaging not only primary users, including individuals with dementia and their caregivers, but also secondary stakeholders, such as formal and informal caregivers and family members who play a significant role in the adoption and use of these technologies (Vollmer Dahlke & Ory, 2020).

## CONCLUSION

Social workers can advocate for policies and programs that ensure equitable access to these resources, working alongside community organizations and multidisciplinary professionals. The role of social workers in promoting inclusivity in both the design and distribution of dementia care technologies can contribute to a more just and supportive healthcare system for all individuals affected by dementia. By providing digital education to caregivers and PWDs in the form of digital literacy education programs and classes and enhancing the reach of technological solutions, these efforts can ensure more equitable care for individuals with dementia and other disabilities, benefiting both families and society as a whole.

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