

# Predictors of intent to use digital memory books among informal dementia caregivers

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## Abstract

**Background:** A memory book is a popular reminiscence approach for people with dementia (PwD) and caregivers. Recently, it has evolved into a digital format by incorporating music, videos, and other multimedia, referred to as a digital memory book (DMB). Like conventional memory books, DMBs have been found to improve the quality of life, cognition, communication, and mood among PwD and caregivers while reducing caregiver burden. Despite these benefits, the use of DMBs remains low, and there is limited research identifying factors that influence intent to use DMBs in this population.

**Research Aim:** Considering that family caregivers are most often the facilitators of DMBs for PwD, this study examined predictors of intent to use DMB among informal dementia caregivers.

**Methods:** Guided by the technology acceptance model, we analyzed data from 170 informal caregivers using linear regression analyses.

**Results:** Dementia type, primary caregiver status, and caregiver age, race and ethnicity, education, health, and relationship to the care recipient were significantly related to intent to use DMB, suggesting these characteristics may serve as possible predictors, to be confirmed in future longitudinal studies. We also found a significant interaction effect between dementia type (Alzheimer's disease vs. other dementias) and stage (mild vs. moderate to severe;  $b = 0.493$ ,  $SE = 0.217$ ,  $p = .025$ ). Differences in intent to use DMB between mild and moderate to severe stages were significantly greater among Alzheimer's caregivers compared to caregivers of other dementias ( $\Delta M = 0.45$  vs.  $0.05$ , respectively).

**Conclusion:** Considering these factors is crucial for developing DMB programs. Furthermore, understanding the type and stage of dementia during the design phase may help optimize desired features and outcomes for potential users, including PwD and caregivers.

Keywords: reminiscence therapy, memory book, dementia caregivers, technology use, technology acceptance model

## INTRODUCTION

Approximately 7.2 million Americans aged 65 or older are living with Alzheimer's disease (AD), and this population is projected to grow because the risk of dementia increases with advancing age (Alzheimer's Association, 2025). AD and related dementias require significant physical, emotional, and financial assistance from caregivers (National Alliance for Caregiving, 2015). Notably, an estimated more than 11.9 million family members and other unpaid caregivers dedicate about 19.2 billion hours of care to loved ones affected by AD (Alzheimer's Association, 2025). Dementia caregiving also involves significant time-intensive demands. Dementia caregivers provide 27 more hours of care per month on average (92 vs. 65 hours, respectively) than caregivers without dementia (Alzheimer's Association, 2025). The literature has shown that dementia

caregivers provide more care for behavioral and psychological problems and experience greater caregiving stress and burden and worse health and mental outcomes due to caregiving (e.g., quality of life, depressive symptoms) compared to their counterparts caring for someone without dementia (Karg et al., 2018; National Alliance for Caregiving, 2015; Sheehan et al., 2021).

Reminiscence therapy, originally derived from Butler's (1963) life review theory, highlights the benefits of sharing life stories and memories (Lazar et al., 2014). It is considered one of the most popular nonpharmacological, person-centered interventions in dementia care (Elfrink et al., 2018; Lazar et al., 2014; Sweeney et al., 2021; Woods et al., 2018). A memory book, a form of reminiscence therapy, is a tool that facilitates conversation using prompts such as photo-

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graphs, mementos, and anecdotes. Indeed, the memory book approach has been widely used and shown potential benefits for people with dementia (PwD), their family caregivers (Elfrink et al., 2018; Goodall et al., 2021; Woods et al., 2018), and healthcare professionals (e.g., dementia care specialists, registered nurses; Lazar et al., 2014; Subramaniam & Woods, 2016). For example, reminiscence therapy helps caregivers gain knowledge and information about PwD (e.g., family history, legacy, shared understanding), enhance communication with PwD (Dellkvist et al., 2024; Elfrink et al., 2018; Subramaniam & Woods, 2016; Sweeney et al., 2021), and support intergenerational interactions (Welsh et al., 2018).

In recent years, advancements in technology have transformed traditional memory books into digital memory books (DMB), which incorporate multimedia elements such as music, audio recordings, and videos. Extensive literature has shown that relative to conventional memory books, DMBs are equally if not more effective at enhancing cognition, sense of self, quality of life, and mood (i.e., reducing depression) among PwD (Subramaniam & Woods, 2016; Woods et al., 2018). They can also alleviate caregiving burden among caregivers (Subramaniam et al., 2023; Woods et al., 2018). Additionally, DMB has been found to encourage positive interactions and improve communication and relationship quality between PwD and caregivers (e.g., relatives, care staff members; Subramaniam & Woods, 2016; Welsh et al., 2018; Woods et al., 2018). Given that informal caregivers often serve as the primary facilitators or cocreators of DMB for PwD (Dellkvist et al., 2024; Sweeney et al., 2021), the present study explored factors that predict their intention to use DMB.

Despite the benefits of DMB, their use remains low. Prior studies identified multiple barriers to implementing technology-based memory books, including difficulties with access (e.g., initial set-up, logging in and out, accidental resets), varying levels of technology skills and device familiarity, and the need to adapt content as dementia progresses. These challenges have been reported by formal caregivers (e.g., health care professionals, staff members in long-term care settings), informal caregivers (e.g., family members), and PwD when using DMBs (Dellkvist et al., 2024; McAllister et al., 2020; Sweeney et al., 2021). Because memory books are most effective in dementia care when tailored via a person-centered approach (Sweeney et al., 2021), factors such as dementia type, severity, and individual preferences may critically influence the adoption and use of DMBs. Although the literature has highlighted the severity of cognitive impairment or disease

stage as a crucial factor regarding access to and use of technology in dementia care (Kaser et al., 2024), this aspect has received little research attention relative to DMBs. Understanding these obstacles is essential, particularly in light of the varied challenges faced by caregivers across dementia types and stages.

AD, the most common type of dementia, accounts for about 60% to 80% of cases (Alzheimer's Association, 2025). Mainstream literature on dementia caregivers has largely focused on AD caregivers, whereas caregivers for other types of dementia, such as vascular, Lewy body, and frontotemporal dementias, have been less studied (Cheng, 2017). Dementia caregivers can face unique challenges due to the varying neuropsychiatric symptoms associated with different types of dementia. For example, individuals with Lewy body dementia may experience visual hallucinations, whereas those with frontotemporal dementia may exhibit insensitive behaviors and a loss of empathy (Cheng, 2017). Based on the severity and stage of dementia, different approaches have been adopted for technology-based tools and dementia care services. For mild dementia, the focus has been more on supporting memory and independent living for PwD. In contrast, for moderate to severe stages, the emphasis often shifts to safety and therapeutic interventions (e.g., reminiscence tools) as the illness progresses (Lorenz et al., 2019). These differing challenges necessitate tailored caregiving support as caregivers adopt dementia care tools like DMBs. However, little is known about how different stages and severity of dementia influence caregivers' intent to use DMBs. Considering the varying types and severity of dementia underscores the importance of person-centered care and the preferences of PwD and their family caregivers, which are key to improving program quality and informing implementation strategies. Previous studies demonstrated that caregivers' demographic and caregiving-related characteristics influence their use of or intent to adopt digital technologies. Factors such as age, gender, race and ethnicity, education, and the caregiver's relationship to the care recipient have been consistently found to be influential (Alexander et al., 2022; Bastoni et al., 2021; Hvalič-Touzery et al., 2022; S. Lee et al., 2024; Parker et al., 2022; Wójcik et al., 2021; Wrede et al., 2023). Younger and more highly educated caregivers tend to show greater acceptance of and more frequent use of technology (S. Lee et al., 2024). In work closely aligned with the present study, Wójcik et al. (2021) identified sociodemographic predictors of smartphone and computer use among caregivers. They noted that although higher education increased acceptance and use, smart-

phone use did not differ across age groups, and computer use was lower among older caregivers, who often face persistent barriers (Wójcik et al., 2021). Regarding race and ethnicity, Black dementia caregivers often experience systemic challenges in accessing formal care, and technology-based support has been shown to reduce burden and enhance satisfaction in this group (Alexander et al., 2022; Parker et al., 2022). Caregivers' self-rated health has also been identified as a relevant contextual factor. Although Y. Lee et al.'s (2022) study examined predictors of respite service use rather than technology use, it is conceptually relevant because it highlighted that caregivers with poorer health have a greater need for supportive services, which might indirectly influence their motivation to use DMBs to alleviate their workload.

The type of dementia can influence caregiver burden and perceived needs. Clinical manifestations and disease progression vary across dementia types, such as AD and frontotemporal dementia (Parker et al., 2022). Accordingly, the type of dementia may affect caregivers' intended use of DMBs. Additionally, the caregiver's relationship to the care recipient can contribute to technology acceptance. Wrede et al. (2023) found that friend or neighbor caregivers were more likely to use contactless monitoring technologies than adult child caregivers, potentially due to differences in family living arrangements or privacy concerns. Their study also reported higher technology acceptance among male caregivers and those caring for a PwD who lives alone. Together, these studies provide a strong empirical foundation for the hypothesis that caregivers' demographic and caregiving-related characteristics influence their intent to use DMBs. At the same time, DMBs represent a distinct form of technology—different than others in purpose, functionality, and user experience—which may yield unique use patterns. This underscores the importance of examining how individual caregiver characteristics shape intention to use DMBs in dementia care contexts.

## Underpinning theory

The survey questions analyzed in this study were developed using the technology acceptance model (TAM; Davis, 1989) and its comprehensive third iteration, TAM3 (Venkatesh & Bala, 2008). TAM was selected because it is a parsimonious and well-established framework for examining initial technology acceptance in voluntary-use contexts, which aligns with this study's focus on dementia caregivers' early intention to use DMBs. Although more comprehensive models, such as the unified theory of acceptance and use of technology, incorporate

additional constructs and share conceptual overlap with our adapted TAM model, they were developed primarily for organizational and often mandatory-use settings and require more complex modeling. Given the exploratory and context-specific aims of the present study, TAM provided a theoretically appropriate and empirically tractable foundation. In particular, TAM3 posits that behavioral intention is primarily determined by perceived usefulness and perceived ease of use (Martín-García et al., 2022). These perceptions, in turn, are influenced by four categories of determinants: individual differences, system characteristics, social influence, and facilitating conditions (Venkatesh & Bala, 2008; Venkatesh & Davis, 2000).

TAM3 conceptualizes individual differences (e.g., age, gender) as influencing behavioral intention indirectly through perceived usefulness and perceived ease of use. Emerging evidence in healthcare technology adoption suggests that in complex health care delivery settings or high-burden caregiving contexts, these individual and contextual factors may exert significant direct effects on technology adoption intention (Dermody et al., 2023; Octavius & Antonio, 2021; Wójcik et al., 2021). In dementia caregiving, structural and clinical constraints often precede and shape perceptions of usefulness and ease of use, rather than the reverse (Lott et al., 2024; Wójcik et al., 2021). Therefore, this study focused on these two determinants in the broader TAM3 framework to examine their direct associations with intention to use DMBs. From the individual differences domain, we selected caregivers' age, gender, race and ethnicity, education, and health. These variables capture well-documented disparities in technology access, digital literacy, and self-efficacy among older adults and caregivers (Venkatesh & Bala, 2008; Wójcik et al., 2021). From a contextual perspective, variables such as dementia type and stage, primary caregiver status, and caregiving relationship were included because they function as de facto facilitating conditions in dementia care, shaping both the necessity for and feasibility of technology use. For example, the stage and type of dementia (e.g., AD vs. frontotemporal) can directly influence caregiving demands and usability requirements, which prior work has identified as key drivers of adoption in dementia-related technologies (Lott et al., 2024). Although this study did not explicitly model perceived usefulness and perceived ease of use as mediators, its analytic focus provides an essential empirical foundation for identifying which caregiver and care-context profiles are most likely to express initial intention to engage with DMBs. Future work can build on these findings

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by incorporating full TAM3 pathways to examine how these characteristics shape perceptions of usefulness and ease of use over time.

## Current study

Given that informal caregivers often serve as the primary facilitators or cocreators of DMBs for PwD (Dellkvist et al., 2024; Sweeney et al., 2021), this study focused on identifying predictors of their intention to use DMBs. Moreover, we explored how dementia type and stage may shape these intentions, recognizing the distinct challenges faced by informal caregivers at various points in the disease trajectory (Huang et al., 2022). For example, the perceived need for and willingness to use DMBs may differ between informal caregivers of PwD with mild AD versus those in moderate to severe stages. Similar distinctions may exist among caregivers of individuals with non-AD dementia. To address these gaps, we examined whether dementia type and stage interact to influence informal caregivers' intent to use DMBs. The study tested the following hypotheses:

Hypothesis 1: Informal dementia caregiver characteristics are significantly associated with intent to use DMBs.

Hypothesis 2: Dementia type (AD vs. other dementias) and dementia stage (mild vs. moderate to severe) interact to influence intent to use DMBs among informal dementia caregivers.

## METHOD

### Sample

Online survey data were collected in January 2022 from 600 dementia caregivers, including both formal (paid;  $n = 430$ ) and informal (unpaid;  $n = 170$ ) caregivers, through the Qualtrics cloud-based software platform for online surveys. For the current study, data from the 170 informal caregivers were used. Participant recruitment emails were distributed to dementia clinic networks, dementia care professionals (e.g., healthcare clinicians, direct care workers), and dementia care organizations in Ohio and Wisconsin. The Qualtrics survey link was provided to individuals who expressed interest and met the eligibility criteria: (a) age 18 or older and (b) providing care to a PwD. Although both formal and informal dementia caregivers were invited to participate, only data from informal caregivers were included in the present analysis to address the aim of this research. The study was approved by the institutional review board at the University of Wisconsin-Milwaukee (No. 20.279).

The survey included the study purpose, informed consent, demographic information for both the care recipient and caregiver (e.g., age,

race and ethnicity, gender, education, health). It also addressed types (e.g., AD) and stages (i.e., mild, moderate, severe) of dementia; caregiver status (e.g., primary caregiver); caregiving relationship (e.g., spouse, adult child); and questions about DMB features, including intent to use the study team's proposed DMB. A prototype of the proposed DMB was shared in the survey to help participants understand its features (Oh et al., 2024). *Figure 1* displays the proposed DMB prototype alongside a description of its key functions. It was presented on a dedicated page in the survey for participants to review. To ensure consistent reference, the prototype image remained visible throughout all survey pages. The proposed design would allow users to upload and organize photos, videos, and voice recordings; add personalized descriptions or hashtags; and replay content using customizable playback options. These features were informed by a preliminary study conducted by the authors, involving qualitative interviews with dementia caregivers to identify their needs regarding digital assistive technologies aimed at enhancing communication with their loved ones with dementia.

## Measures

*Dependent variable: Intent to use DMBs*

Intent to use is considered a key construct in the TAM that directly reflects a person's behavioral intention to adopt or use a technology. It was the dependent variable in this study. Items commonly measured in previous studies (e.g., plans, willingness) regarding intent to use technology based on the TAM (Martín-García et al., 2022) were used in this study. Four items were included: (a) "I would intend to use the mobile memory book in the future to have conversation with my loved one/client with dementia"; (b) "I would try to use the mobile memory book in my daily life to have conversations with my loved one/client with dementia"; (c) "I plan to frequently use the mobile memory book to have conversations with my loved one/client with dementia"; and (d) "Overall, I would be highly willing to use the mobile memory book to have conversations with my loved one/client with dementia." Responses were measured on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The average score across the four items was calculated, with higher scores indicating a higher intent to use DMB. Cronbach's alpha for these items was  $\alpha = .59$  in this sample.

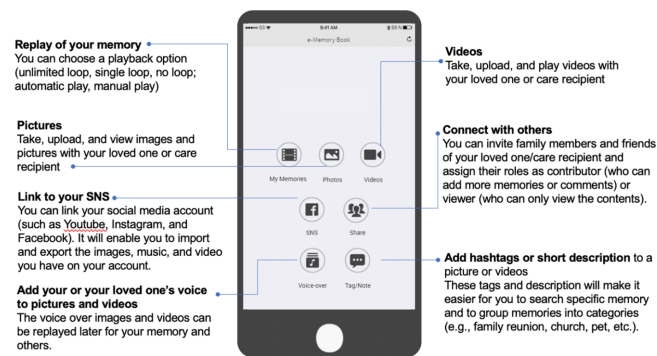
### *Independent variables*

Caregiver characteristics were examined as predictors in the analyses. These included age (years), gender (0 = male, 1 = female), race and ethnicity (0 = White, 1 = Black, 2 = Hispanic), education (0 = high school or less, 1 = college

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participant selected “I don’t know/unknown” for this variable.

Fifty-three (31.18%) participants cared for individuals with mild dementia and 117 (68.82%) cared for those with moderate to severe dementia. Approximately 44.4% of participants were primary caregivers for PwD. The average age among caregivers was 39.05 years ( $SD = 12.34$ ). More than half were female (55.29%), were White (50.59%), and had a college degree or higher (75.29%). Regarding their relationship to the care recipient, 23.53% of participants were spouses, 29.41% were adult children, 28.24% were grandchildren, and 18.82% were other family members, relatives, or friends. The mean score of caregiver self-rated health was 2.54 ( $SD = 0.63$ ).



Mobile Memory Book is a proposed application designed to help you communicate more effectively with your loved one or care recipient with dementia. As you may have experienced, people with dementia often have difficulty expressing their thoughts and feelings or understanding others. The Mobile Memory Book supports meaningful communication by helping individuals focus their attention, improve episodic memory, and enhance language skills. The app can be downloaded to your smart phone or other devices (e.g., tablet PC, laptop, TV). Within this Memory Book, you can collect and organize personal memories created by one or more family members or caregivers. A memory book can include a variety of themes—from celebrating special events to capturing moments or meaningful experiences from the person's life.

Figure 1. Screenshot of Digital Memory Book prototype and description used in the online survey

or more), and primary caregiver status (0 = not primary, 1 = primary). Other variables were relationship to the care recipient (0 = spouse, 1 = child, 2 = grandchild, 3 = other family member, relative, or friend), caregiver self-rated health (0 = poor to 4 = excellent), dementia type (0 = other dementia, such as vascular, Lewy body, or frontotemporal dementia, 1 = AD), and dementia stage (0 = mild, 1 = moderate to severe). Given the small sample size ( $N = 170$ ), dementia type and stage were organized into two categories despite potential heterogeneity (e.g., moderate vs. severe dementia). For example, moderate and severe stages were combined and compared with the mild stage, rather than analyzed as three groups.

## Data analysis

First, univariate analysis was conducted to understand the sample characteristics. Second, ordinary least squares regression analyses were conducted to examine the predictors associated with intent to use DMBs among dementia caregivers. Third, interaction terms between dementia stage and type were included in the model to address our research question. All analyses were performed in Stata version 17.

## RESULTS

### Sample characteristics

Table 1 presents the characteristics of the sample. Among these 170 informal caregivers, 110 (65.09%) were caring for loved ones with AD, whereas 59 (34.91%) were caring for those with other dementia type (e.g., vascular dementia, Lewy body dementia, frontotemporal dementia, Huntington's disease, Parkinson's disease). One

### Predictors of intent to use DMB

Table 2 shows the factors significantly associated with intent to use DMBs. As presented in Model 1, primary caregivers (vs. nonprimary caregivers;  $b = 0.263$ ,  $SE = 0.100$ ,  $p = .009$ ), caregivers with better self-rated health ( $b = 0.147$ ,  $SE = 0.072$ ,  $p = .042$ ), older caregivers (log transformed;  $b = 0.489$ ,  $SE = 0.202$ ,  $p = .016$ ), caregivers with higher education (i.e., college degree or more;  $b = 0.420$ ,  $SE = 0.112$ ,  $p < .001$ ), and child caregivers (vs. spouses;  $b = 0.344$ ,  $SE = 0.132$ ,  $p = .010$ ) showed higher intent to use DMBs in this sample. On the other hand, Black caregivers (vs. White;  $b = -0.288$ ,  $SE = 0.141$ ,  $p = .043$ ) and AD caregivers (vs. other dementias;  $b = -0.229$ ,  $SE = 0.105$ ,  $p = .030$ ) showed lower intent to use DMBs.

### Interaction effect of dementia type and stage on intent to use DMB

Model 2 in Table 2 included an interaction term to test the effect of dementia type (AD vs. other dementias) and stage (mild vs. moderate to severe) on intent to use DMBs. Results showed a significant interaction effect between dementia type and stage ( $b = 0.493$ ,  $SE = 0.217$ ,  $p = .025$ ). To interpret this interaction effect, the estimated means of DMB use intent (y-axis) by dementia type (x-axis) with mild versus moderate to severe dementia are depicted in Figure 2. Differences in intent to use DMB between mild and moderate to severe dementia were significantly greater among AD caregivers compared to other dementia caregivers ( $\Delta M = 0.45$  vs. 0.05, respectively). Specifically, the variation in intent to use DMB between mild and moderate to severe demen-

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Table 1. Characteristics of the Study Sample (N = 170)

	n (%) or M (SD)
Dementia type	
Alzheimer's disease	110 (65.09)
Other dementias	59 (34.91)
Dementia stage	
Mild	53 (31.18)
Moderate to severe	117 (68.82)
Caregiver status	
Primary	94 (44.38)
Not primary	75 (55.62)
Caregiver age (range: 21–72)	39.05 (12.34)
Caregiver education	
High school or less	42 (24.71)
College or more	128 (75.29)
Caregiver gender	
Male	76 (44.71)
Female	94 (55.29)
Caregiver race and ethnicity	
White	86 (50.59)
Black	26 (15.29)
Hispanic	58 (34.12)
Caregiver relationship to care recipient	
Spouse	40 (23.53)
Child	50 (29.41)
Grandchild	48 (28.24)
Other family, relative, or friend	32 (18.82)
Caregiver health (range: 1–4)	2.54 (0.63)

Note. Two participants (1.18%) had missing data on caregiver status and dementia type.

tia was notably more pronounced among AD caregivers than their non-AD counterparts.

## DISCUSSION

This study contributes to understanding factors that influence intent to use DMBs among informal dementia caregivers, who often serve as primary facilitators or cocreators of DMBs for PwD (Dellkvist et al., 2024; Sweeney et al., 2021). This area has received limited prior research attention. Our findings indicate that being a primary caregiver, having better health, having a higher education level, being older, and being an adult child caregiver (vs. a spouse caregiver) were significantly associated with higher intent to use DMBs among informal caregivers. Conversely, being an AD caregiver or Black were significantly associated with lower intent to use DMBs. Our findings suggest that individual and contextual factors related to the intent to use DMBs serve as direct predictors of behavioral intention in a complex and high-burden caregiving context. We also found a significant interaction effect between dementia type (AD vs. other dementias) and stage (mild vs. moderate to severe). Differences in intent to use DMB between mild and moderate to severe stages were significantly greater among AD caregivers compared to car-

egivers of individuals with other dementias. This implies that the severity of dementia may differently affect caregivers' perceptions and willingness to use DMBs based on dementia subtype (i.e., AD vs. non-AD).

Overall, these findings extend TAM and TAM3 by highlighting individual and contextual factors that directly influence intent to use DMBs among informal dementia caregivers. Future research can build on this work by incorporating full TAM3 pathways to examine how these characteristics shape perceived usefulness and ease of use over time. More broadly, the results underscore that technology adoption processes may differ depending on caregiver profiles and disease progression, pointing to future opportunities to refine and expand TAM for use in dementia caregiving contexts.

## Predictors of intent to use DMBs

In terms of caregiver status, the higher propensity toward technology use among primary caregivers compared to nonprimary caregivers can be tied to their greater engagement and responsibility in the overall caregiving journey. Primary caregivers generally have major interactions with PwD, often cohabitating with them and being involved in significant daily care duties. This involvement can entail ongoing caregiving challenges and lead to mental health outcomes such as anxiety and depression (Gorostiaga et al., 2022). Primary caregivers also experience higher level of caregiving burden than secondary caregivers (Gonçalves-Pereira et al., 2020). This burden is often due to facing behavioral and psychological symptoms of dementia (e.g., agitation, wandering, delusions; Chiao et al., 2015) and increased communication difficulties with PwD (Savundranayagam et al., 2005; Watson et al., 2012). These challenges may motivate them to seek digital tools that can reduce their burden and enhance communication and relationship quality with PwD. In contrast, secondary or tertiary caregivers may not necessarily feel the same level of caregiving demands (Barbosa et al., 2011) and urgency to adopt technology to manage dementia symptoms or relieve their caregiving stress.

Better caregiver health and higher education levels may be proxies for greater socioeconomic status, which can be a critical enabling factor for DMB use. These factors can indicate more time and resources that promote a higher intent to seek services that support their caregiving (e.g., respite services) and use DMBs. Beyond socioeconomic factors, caregiving role also appears to shape technology adoption. Compared to spouse caregivers, adult child caregivers may

Table 2. Predictors for Intent to Use Digital Memory Book among Dementia Caregivers

	Model 1 b (SE)	Model 2 b (SE)
Dementia type		
Alzheimer's disease (vs. other dementias)	-0.229 (0.105)*	-0.5830 (0.1872)**
Dementia stage		
Moderate to severe (vs. mild)	0.143 (0.118)	-0.048 (0.143)
Interaction		
Dementia type × dementia stage		0.493 (0.217)*
Caregiver status		
Primary (vs. not primary)	0.263 (0.100)**	0.274 (0.099)**
Caregiver health	0.147 (0.072)*	0.139 (0.071)
Caregiver age (log transformed)	0.489 (0.202)*	0.501 (0.199)*
Caregiver education		
College or more (vs. high school or less)	0.420 (0.112)***	0.395 (0.111)***
Caregiver gender		
Female (vs. male)	0.118 (0.096)	0.102 (0.095)
Caregiver race and ethnicity		
Black (vs. White)	-0.288 (0.141)*	-0.136 (0.154)
Hispanic (vs. White)	-0.047 (0.103)	-0.066 (0.102)
Caregiver relationship to care recipient		
Child (vs. spouse)	0.344 (0.132)*	0.303 (0.132)*
Grandchild (vs. spouse)	-0.136 (0.163)	-0.158 (0.161)
Other (vs. spouse)	-0.068 (0.133)	-0.091 (0.132)
Adjusted R <sup>2</sup>	0.3483	0.3653

Note. Missing data represented 1.18% of the sample. Listwise deletion was used.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

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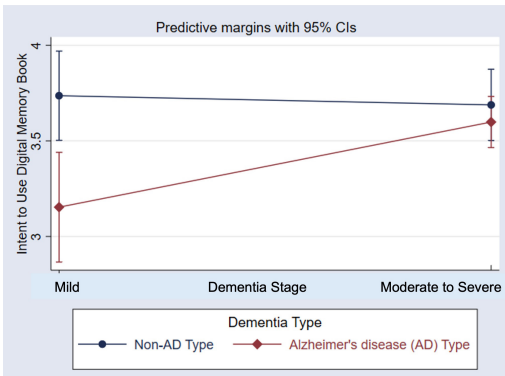


Figure 2. Intent to use Digital Memory Book by type and stage of dementia

be more tech-savvy and willing to use DMBs. Previous literature also indicated that these two groups (spouses vs. adult children) can differ significantly in their caregiving experiences, needs, burden, attitudes, understanding of the disease, and stage of life while caregiving (Chappell et al., 2014; Dang et al., 2022; Kristiansen et al., 2022). In our analysis, adult child caregivers demonstrated higher intent to use DMB even after controlling for caregiver age, suggesting that this association reflects differences in caregiving role or relationship context rather than chronological age per se.

Regarding age, it may seem counterintuitive that older caregivers reported higher intent to use DMBs. However, recent studies have shown that caregivers, including older caregivers, are increasingly using technology to handle caregiving tasks, indicating an increased level of interest in and adoption of technology among older caregivers (S. Lee et al., 2024). Additionally, older caregivers may be more willing and interested in using DMBs due to their familiarity and greater experience with traditional memory-keeping methods, such as photo albums and scrapbooks, which they consider vital links to their past relationships and history (Ankenbauer & Brewer, 2024). This implies that transitioning to a digital format might be a more natural progression for older generation caregivers compared to their younger counterparts.

## Interaction effect between type and stage of dementia

In this study, we found a significant interaction effect between dementia type (AD vs. other dementias) and stage (mild vs. moderate to severe) on intent to use DMBs. Specifically, differences in intent to use DMBs between mild and moderate to severe stages were significantly greater among AD caregivers compared to non-AD caregivers. This suggests that the progression

of dementia may differentially affect caregivers' perceptions and willingness to DMBs depending on the type of dementia. This indicates the potential value of tailoring the design and functions of DMBs according to the type and stage of dementia.

Our findings indicate that AD caregivers had lower intent to use DMBs during the mild stage of dementia. However, this intent significantly increased during moderate to severe stages of AD, whereas no notable difference occurred among caregivers of people with other dementia types. There are several possible explanations for this phenomenon. Caregivers of people with moderate to severe AD may have an increased need for memory aids and a higher level of caregiving burden than those caring for someone with mild AD (Huang et al., 2022; Lorenz et al., 2019). This might increase their motivation to adopt DMBs, which can have emotional and psychological benefits (Scerbe et al., 2023).

The features of DMBs can also support family caregivers both directly and indirectly. For instance, individuals with mild dementia may independently use the application to play music or browse a family photo album, which can reduce the need for constant supervision. As Lim et al. (2013) noted, technological tools such as tablet computers may offer caregivers valuable respite from the ongoing demands of supporting individuals with mild dementia. These findings suggest that future research could explore how assistive technologies like DMBs can be tailored to meet the needs of caregivers of individuals with moderate to severe AD. This process could include identifying adequate features, determining the appropriate timing for introducing these technologies, and selecting effective approaches for interacting with users.

Moreover, caregivers of people with moderate to severe AD may have more frequent interactions with healthcare professionals and caregiver support groups that encourage them to adopt helpful technologies (Aitken, 2015). These interactions can create a respite environment and increase their awareness and perceived value of DMB. These factors are especially important during later stages of AD, when maintaining connections with and communication about their loved one's past become increasingly meaningful.

## Limitations

This study had some limitations. First, the data were collected in only two states, which may limit the generalizability to other regions. Second, due to the small sample size, it was not feasible to categorize dementia types and stages into more detailed groups. Moderate to severe

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stages had to be combined and compared with the mild stage, instead of having three distinct groups. Similarly, heterogeneity might exist among caregivers for non-AD types (e.g., Lewy body or frontotemporal dementia). Combining moderate and severe stages of dementia and collapsing multiple dementia types into AD versus other dementias may have obscured important differences in caregiving experiences. Future studies with larger samples that examine differences among non-AD types could provide a better understanding of the needs of potential DMB users for each type of dementia.

Third, exploring other factors, such as previous experience with memory books or confidence using technology, could provide more insights. Conducting qualitative studies could yield a deeper understanding of intention to use DMBs, helping to delineate the needs and challenges faced by dementia caregivers. Fourth, regarding measurement reliability, the dependent variable, intent to use DMB, had a Cronbach's alpha of .59. This indicates relatively low internal consistency based on commonly accepted thresholds (e.g., .60 in Daud et al., 2018 and .70 in Raykov, 1997). Therefore, results involving this variable should be interpreted with caution. This may also reflect the unique contextual framing of our study, in which participants were asked about their willingness to use technology to facilitate communication with their loved one with dementia (e.g., "Overall, I would be highly willing to use the mobile memory book to have conversations with my loved one with dementia"), rather than general intent to adopt technology. Although this measure may provide preliminary insight into users' intentions, our future research will focus on strengthening this scale to improve its reliability.

Although older adults are becoming more competent with technology use, digital competence (e.g., using multimedia functions such as taking pictures, playing music on a tablet, or operating a DVD player) may still pose a significant barrier to using DMBs for both PwD and their caregivers (Critten & Kucirkova, 2019). Individuals with mild dementia may find DMBs enjoyable when used collabo-

ratively with caregivers, but ease of use remains essential. Designing DMBs with a highly intuitive, user-friendly interface tailored to the needs and abilities of care recipients and caregivers, therefore, will be crucial for successful implementation in dementia care. This challenge involves TAM3 constructs related to personality-based individual differences (e.g., computer self-efficacy, computer anxiety) and social influence factors (e.g., social norms), which were not included in the present analysis due to the scope of the survey and variables available in our dataset. These factors represent important topics for future research.

Last, although this study focused on caregivers' intention to use a DMB, it is crucial to assess practical considerations related to access, cost, device availability, or maintenance requirements. Using a DMB may require having a device, basic digital literacy, and in some cases, financial resources for hardware or software—all of which may pose barriers for some caregivers and influence real world adoption. Future research should examine affordability, technological access, and sustainability of use as potential facilitators or inhibitors of DMB adoption to inform implementation and dissemination efforts.

## CONCLUSION

This study has several important implications. Our findings provide preliminary evidence on predictors of intent to use DMBs among informal dementia caregivers. The study underscores the importance of understanding caregiver characteristics—such as primary caregiver status; relationship to the care recipient; and caregiver age, race and ethnicity, education, and health—and the needs of caregivers at different stages and severity of dementia. Addressing these needs and challenges during the design and development phase of DMBs is crucial for enhancing intention to use these tools among both PwD and caregivers. These preliminary findings highlight key factors that shape caregivers' intentions to use DMBs, underscoring the importance of tailoring DMB design and implementation to caregiver characteristics and dementia context.

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## Conflicts of interest

The authors declare no potential conflicts of interest with respect to the research, authorship, and publication of this article.

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## Ethical approval

This study was approved by the Institutional Review Board at the University of Wisconsin-Milwaukee (No. 20.279).

## Consent to participate

All participants provided electronic informed consent to participate in the study.

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