

Usages of Computers and Smartphones to Develop Dementia Care Education Program for Asian American Family Caregivers

Jung-Ah Lee, PhD, RN¹, Hannah Nguyen, PhD, MSW², Joan Park, BS, RN¹, Linh Tran, BS, RN¹, Trang Nguyen, BS, RN¹, Yen Huynh, BS, RN¹

¹The Sue and Bill Gross School of Nursing, University of California Irvine, Irvine, CA, USA; ²Division of Human Development, College of Health, Human Services, and Nursing, California State University Dominguez Hills, Dominguez Hills, CA, USA

Objectives: Families of ethnic minority persons with dementia often seek help at later stages of the disease. Little is known about the effectiveness of various methods in supporting ethnic minority dementia patients' caregivers. The objective of the study was to identify smartphone and computer usage among family caregivers of dementia patients (i.e., Korean and Vietnamese Americans) to develop dementia-care education programs for them. **Methods:** Participants were asked various questions related to their computer or smartphone usage in conjunction with needs-assessment interviews. Flyers were distributed at two ethnic minority community centers in Southern California. Snowball recruitment was also utilized to reach out to the families of dementia patients dwelling in the community. **Results:** Thirty-five family caregivers, including 20 Vietnamese and 15 Korean individuals, participated in this survey. Thirty participants (30 of 35, 85.7%) were computer users. Among those, 76.7% (23 of 30) reported daily usage and 53% (16 of 30) claimed to use social media. A majority of the participants (31 of 35, 88.6%) reported that they owned smartphones. More than half of smartphone users (18 of 29, 62%) claimed to use social media applications. Many participants claimed that they could not attend in-class education due to caregiving and/or transportation issues. **Conclusions:** Most family caregivers of dementia patients use smartphones more often than computers, and more than half of those caregivers communicate with others through social media apps. A smartphone-app-based caregiver intervention may serve as a more effective approach compared to the conventional in-class method. Multiple modalities for the development of caregiver interventions should be considered.

Keywords: Dementia, Education, Family Caregiver, Smartphones, Minority Groups

Submitted: September 28, 2017

Revised: 1st, October 19, 2017; 2nd, October 21, 2017

Accepted: October 21, 2017

Corresponding Author

Jung-Ah Lee, PhD, RN

The Sue and Bill Gross School of Nursing, University of California Irvine, Irvine, CA, USA. Tel: +1-949-824-2855, E-mail: jungahl@uci.edu

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

© 2017 The Korean Society of Medical Informatics

I. Introduction

The widespread prevalence of Alzheimer's disease and other dementias accounts for one in three deaths among adults 65 years and older in the United States [1]. Asian American families of individuals with dementia often seek help in later stages of the disease, and some dementia sufferers remain undiagnosed [2]. Research has documented significant barriers to dementia care for underserved Asian Americans in California, including lack of health insurance, low income, limited English language ability, stigma surrounding

dementia, and low health literacy [2]. In fact, many Asian Americans continue to believe that dementia is a normal part of aging [3]. They avoid diagnosis and treatment for dementia until the late stage, and underutilize available public health services [3]. Orange County has a diverse population of older adults, including 66% Caucasian, 14% Hispanic, and 17.5% Asian [4]. In some areas (e.g., Westminster and Garden Grove), the Asian population constitutes 50%–60% of residents [5]. Orange County has the largest numbers of Vietnamese Americans living outside of Vietnam, and more than 30% of Korean Americans live in Southern California. These two ethnic minority groups have the highest rates of poverty (12% in Vietnamese Americans and 17% in Korean Americans) of all ethnic minorities ages 65 and over [5,6]. In Orange County, the Asian population is 62% foreign-born and the fastest growing ethnic population. Tragically, the death rate of Alzheimer's disease in Orange County increased 36% between 2006 and 2010 [6], which is higher than the California or national rates [7].

Internet- or phone-based interventions have been implemented to support dementia patients' caregivers [3,8]. However, little is known about the relevance and effectiveness of these interventions for ethnic minority caregivers. Asian Americans are the fastest-growing ethnic group in the United States, yet they remain an understudied group in relation to dementia care. More research is needed to highlight their unmet needs and to inform the development of educational interventions for this population.

The purpose of this study was to identify Vietnamese American and Korean American dementia patients' family caregivers' in usages of computers and smartphones as well as their caregiving needs in order to develop a dementia care education program for these groups.

II. Case Description

1. Methods

We conducted a brief survey on computer or smartphone use as part of a larger study to assess the needs of family dementia caregivers from ethnic minority communities, namely, Vietnamese and Korean Americans. Upon approval by the Institutional Review Board of the University of California Irvine (No. 2016-3344), flyers were distributed in two community centers, and a local non-profit Alzheimer's agency in Southern California. Snowball recruitment was also used to reach out to community-dwelling families impacted by dementia. To be included in this study, participants were required to be (1) informal dementia caregivers

(e.g., family members, relatives), and (2) aged 18 years or older, and Korean Americans or Vietnamese Americans. The survey questions developed by the research team included demographic-related questions, and 6 questions related to usages of computers and smartphones, including frequency of use (5-Likert scale, 1 = never, 5 = everyday) and items (e.g., Internet, social media applications) used in computers and smartphones. The English version of the questionnaire was translated into Korean and Vietnamese by bilingual research assistants.

Descriptive statistics (e.g., frequency, percentage, mean, standard deviation) were used to present the demographic information of the participants and their computer and smartphone usage.

2. Results

For a 6-month recruitment period, 20 Vietnamese and 15 Korean dementia caregivers participated in this study. Table

Table 1. Participant demographic information

	Korean American caregivers (n = 15)	Vietnamese American caregivers (n = 20)
Gender (female)	13 (86.7)	18 (90.0)
Age (yr)	66.3 ± 13.1	61.5 ± 11.4
≤60	4 (26.7)	9 (45.0)
61–70	5 (33.3)	6 (30.0)
≥71	6 (40.0)	5 (25.0)
Caregiver relationship with the patient		
Spouse	9 (60.0)	9 (45.0)
Adult child	6 (40.0)	10 (50.0)
Other relationship	0 (0)	1 (5.0)
Having a religion (yes)	14 (93.3)	19 (95.0)
Mean year of living in the United States	32.5 (17–46) ^a	27 (1–42) ^a
English proficiency ^b	2.8 ± 1.4	2.8 ± 1.1
High school completion or above	15 (100)	16 (80.0)
Currently employed	2 (13.3)	13 (65.0)

Values are presented as number (%) or mean ± standard deviation or mean (range).

^aOne participant in each group was excluded because they were born in the United States. ^bEnglish proficiency was measured on a 5-point Likert scale (5 = excellent, 1 = cannot speak English).

1 presents the characteristics of the participants. Their mean age was 63.9 years, ranging from 32 to 85 years. The sample comprised 18 spouse caregivers (51.4%), 16 adult-child caregivers (45.7%), and a sibling caregiver. Two pairs of family caregivers (spouse-child) were recruited. Participants reported that the majority (25 of 33, 75.8%) of their patient family members were suffering from moderate or severe stages of dementia.

Table 2 shows the usages of computers and smartphones in Vietnamese-American and Korean-American family caregivers. Thirty participants (30 of 35, 85.7%) were computer users. Among those, 76.7% (23 of 30) reported daily usage, and 53% (16 of 30) reported use of social media such as Facebook. Most of the participants (31 of 35, 88.6%) reported that they owned smartphones. Among those, 29 of 31 (94%) reported daily smartphone usage. More than half of the smartphone users (18 of 29, 62%) reported that they used social media applications (app), such as Kakao Talk for Korean caregivers or other apps (e.g., Instagram, Zalo,

Viber) for Vietnamese caregivers. Less than half of the participants (14 of 35, 40%) disclosed that they could not speak English or spoke very limited English. Most of the ethnic minority family caregiver participants revealed that they did not search for dementia-related information written in English and that they were not aware of local associations or resources related to Alzheimer's or dementia. Many participants expressed that they could not attend in-class education due to the time conflicts with caregiving and/or transportation issues.

III. Discussion

With an aging society and the global increase in immigration, immigrant families with persons with dementia suffer greatly due to limited knowledge of dementia-specific social and healthcare services. This may be rooted in culture, especially for Asian immigrants, who traditionally have Confucianism as their main ethical belief system; filial piety is expected of adult children (especially the eldest son) who are expected to take care of their parents [9]. This may lead to delays in Asian immigrant families seeking help when a family member shows signs of dementia; they are hesitant to rely on senior care facilities as it may seem that they are not fulfilling their filial duties to their parents with dementia [10]. In addition, Buddhist Asian immigrants often consider illness as punishment for misbehavior [9].

This study focused on identifying technology use among dementia family caregivers of ethnic minorities currently living in the United States. (i.e., Vietnamese and Korean). Ultimately, the study results may assist in developing culturally sensitive and person-centered dementia care education interventions for vulnerable ethnic minority populations affected by dementia. Our findings revealed that dementia caregivers more often use smartphones than computers. In particular, almost all Korean American participants reported that they used social media apps (i.e., Kakao Talk) for sending messages, pictures, or short video files while communicating with others through audio and video chats. Vietnamese American participants also reported that they use various social media apps to communicate with others. These results are in agreement with the general current trend in technology use; Asian Americans are the most frequent users of the Internet, broadband at home, and smartphones in comparison to other ethnic groups, such as Caucasians, African Americans, and Hispanics in the United States [11].

Prior studies on internet-based interventions for informal dementia caregivers resulted in increased confidence,

Table 2. Usage of computers or smartphones

	Korean American caregivers (n = 15)	Vietnamese American caregivers (n = 20)
Computer use (yes) ^a	13 (86.7)	17 (85.0)
Internet	12 (80.0)	16 (80.0)
Email	10 (66.7)	16 (80.0)
Social media	6 (40.0)	10 (50.0)
How often do you use computer?		
Everyday	9 (60.0)	14 (70.0)
Weekly	1 (6.7)	2 (10.0)
Monthly	2 (13.3)	0 (0)
Never	3 (20.0)	4 (10.0)
Smartphone use (yes) ^a	14 (93.3)	17 (85)
Call only	3 (20.0)	3 (15.0)
Internet	9 (60.0)	10 (50.0)
Social media app	12 (80.0)	6 (30.0)
How often do you use smartphone?		
Everyday	13 (86.7)	16 (80.0)
Weekly	1 (6.7)	1 (5.0)
Monthly	0 (0)	0 (0)
Never	1 (6.7)	3 (15.0)

Values are presented as number (%).

^aMultiple responses were applicable.

decreased depression, and enhanced self-efficacy as well as lower costs [12]. The findings were based on computer-based Internet programs [12]. Mobile technologies, including smartphones, tablets, and other wireless devices, serve as platforms of self-management interventions for chronic diseases (e.g., cancer, diabetes) [13,14]. Examples include features for remote symptom monitoring as well as the provision of programmed clinical advice through automated text messaging, web browsing, email, or video [14]. With the widespread use of smartphones among the Asian population, smartphone-based interventions could address the unmet needs of many dementia family caregivers who cannot leave home to take advantage of in-class education because they need to stay at home to care for their loved ones with dementia.

In addition to mobile-based approaches, multi-focal intervention methods (combinations of conventional methods and technology based methods) should be considered to support various dementia caregivers, including spouses, adult children, siblings, relatives, and/or friends/neighbors. Support for families affected by dementia can be found in the general community, such as the work of volunteers who possess a genuine calling to serve vulnerable dementia patients and their families. Partnerships with university students, religious groups, and local ethnic communities would enhance the impact of dementia care education, particularly in efforts to reduce caregiver stress and institutionalization of dementia patients [15].

This study had some limitations. The sample size was small, and data were collected in a specific regional area. However, little research has been conducted on this ethnic minority population of family dementia caregivers. We conducted this study as a preliminary work before we move on to develop culturally appropriate and people-favorable methods for dementia caregiver education and intervention for stress management in this specific population. Our approach can provide an example for other ethnic groups in dementia care research.

The findings from this study showed that most dementia family caregivers in the ethnic minority groups studied use smartphones more often than computers. Over half of those caregivers use social media apps to communicate with others. A smartphone app-based caregiver intervention could serve as a more effective approach in comparison to the conventional in-class method.

In conclusion, as Asian Americans are likely to be digitally adept, mobile-based dementia care education for Asian family caregivers may be an effective complement to traditional

educational methods, such as onsite education using paper-based handouts. Multiple modalities in the development of caregiver intervention should be considered.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

Acknowledgments

The project was supported by the National Center for Research Resources and the National Center for Advancing Translational Sciences, National Institutes of Health (Grant No. UL1 TR000153) and the Arthur N. Rupe Foundation.

References

1. Alzheimer's Association. 2017 Alzheimer's disease facts and figures [Internet]. Chicago (IL): Alzheimer's Association; 2017 [cited at 2017 Oct 15]. Available from: <http://www.alz.org/facts/>.
2. Jones RS, Chow TW, Gatz M. Asian Americans and Alzheimer's disease: assimilation, culture, and beliefs. *J Aging Stud* 2006;20(1):11-25.
3. Cooper C, Tandy AR, Balamurali TB, Livingston G. A systematic review and meta-analysis of ethnic differences in use of dementia treatment, care, and research. *Am J Geriatr Psychiatry* 2010;18(3):193-203.
4. US Census Bureau. Asian/Pacific American Heritage Month: May 2016 [Internet]. Washington (DC): US Census Bureau; 2016 [cited at 2016 May 15]. Available from: <https://www.census.gov/newsroom/facts-for-features/2016/cb16-ff07.html>.
5. The Orange County Register. OC has third highest Asian population in US [Internet]. Anaheim (CA): The Orange County Register; 2017 [cited at 2017 Oct 15]. Available from: <http://www.ocregister.com/articles/asian-300167-vietnamese-county.html>.
6. Orange County's Healthier Together [Internet]. Santa Ana (CA): Orange County's Healthier Together; 2017 [cited at 2017 Oct 15]. Available from: <http://www.ochealthiertogether.org/>.
7. Alzheimer's Association. 2015 Alzheimer's disease facts and figures [Internet]. Chicago (IL): Alzheimer's Association; 2015 [cited at 2017 Oct 15]. Available from: https://www.alz.org/facts/downloads/facts_figures_2015.pdf.

8. Czaja SJ, Loewenstein D, Schulz R, Nair SN, Perdomo D. A videophone psychosocial intervention for dementia caregivers. *Am J Geriatr Psychiatry* 2013;21(11):1071-81.
9. Asian-Americans: culturally connected and forging the future: the Asian-American Consumer 2015 report [Internet]. New York (NY): The Nielsen Company; 2015 [cited at 2017 Oct 15]. Available from: http://www.nielsencommunity.com/report_files/nielsen-asian-american-report-june-2015.pdf.
10. Pyke K. "The normal American family" as an interpretive structure of family life among grown children of Korean and Vietnamese immigrants. *J Marriage Fam* 2000;62(1):240-55.
11. Perrin A. English-speaking Asian Americans stand out for their technology use [Internet]. Washington (DC): Pew Research Center; 2016 [cited at 2017 Oct 15]. Available from: [http://www.pewresearch.org/fact-tank/2016/02/18/english-speaking-asian-americans-stand-out-for-](http://www.pewresearch.org/fact-tank/2016/02/18/english-speaking-asian-americans-stand-out-for-their-technology-use/)
12. Boots LM, de Vugt ME, van Knippenberg RJ, Kempen GI, Verhey FR. A systematic review of Internet-based supportive interventions for caregivers of patients with dementia. *Int J Geriatr Psychiatry* 2014;29(4):331-344.
13. Heo J, Chun M, Lee KY, Oh Y, Noh OK, Park RW. Effects of a smartphone application on breast self-examination: a feasibility study. *Healthc Inform Res* 2013; 19(4):250-60.
14. Kitsiou S, Pare G, Jaana M, Gerber B. Effectiveness of mHealth interventions for patients with diabetes: an overview of systematic reviews. *PLoS One* 2017;12(3): e0173160.
15. Dupuis SL, Gillies J, Carson J, Whyte C, Genoe R, Loiselle L, et al. Moving beyond patient and client approaches: mobilizing authentic partnerships in dementia care, support, and services. *Dementia* 2012;11(4):427-52.