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A caregiver educational program: A video program to promote aging services technologies awareness



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ABSTRACT

Research demonstrated that aging services technologies (ASTs) can reduce caregiver burden. However, ASTs are underutilized by caregivers due to poor awareness. This study evaluated the effectiveness of a video-based educational program to increase caregiver AST knowledge among 43 caregivers. Paired sample t-tests showed positive change in AST knowledge, stigma, and intention to engage in AST activities post-program. Caregivers endorsed highly positive AST views pre- and post-program without statistically significant change. Group by time repeated measures ANOVAs showed younger caregivers (<65 years old) had better knowledge and were more open to ASTs (improved attitude and stigma scores) than older caregivers (>65 years old). A significant interaction revealed caregivers of individuals who had fewer, but not more, domains of functional limitation reported a positive change in AST attitude post-program. The video program appeared to be beneficial to all caregivers, who provided vastly positive program feedback.

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Introduction

As the population ages, it is not uncommon for older adults to require assistance with daily activities. In fact, it was estimated that 34.2 million American adults cared for an individual age 50 or older in 2014, many provided unpaid care without help.¹ The management of chronic diseases often results in financial, physical, and emotional stress.^{1,26} Given the rapidly growing aging population, more emphasis has been placed on managing caregiver burden as caregiving can significantly affect a caregiver's work, health, and overall wellbeing. Community services like wellness programs, nutritional support (e.g., Meals on Wheels), psychoeducational programs (e.g., skill training, psychotherapy, etc.), and housing and financial assistance have consistently been highlighted as available resources to be discussed clinically with older adult patients and their caregivers.^{2,21} Despite evidence demonstrating that aging services technologies (ASTs), also known as assistive technologies, can support the independence of users and reduce caregiver burden, information about ASTs was not typically included in the resources or recommendations.¹⁷ Furthermore, data from the 2004 National Long-Term Care Survey and Informal Caregiver showed that only approximately half of the surveyed caregiver participants reported AST use ($N = 1908$;¹³).

According to the 2009 American Recovery and Reinvestment Act, ASTs are “health technology that meets the health-care needs of seniors, individuals with disabilities, and the caregivers of such seniors and individuals”. ASTs can assist caregivers by facilitating safety and increasing/maintaining the care-receivers' functional independence (see Table 1 for examples). In addition, ASTs, but not caregiver assistance, allow an older individual to be more independent.^{3,13} In a recent national study aimed at understanding current caregiving trends, a vast majority of the surveyed caregivers endorsed wanting to learn more about caregiving topics (>80%, $N = 1087$;¹). However, only one-third of the caregivers reported that they had discussed their caregiving needs with their medical providers.

Psychoeducation has been shown to be helpful in managing caregiving related challenges and reducing caregiver burden (e.g.,^{4,9}). In addition, research has demonstrated the efficacy of delivering psychoeducational programs and caregiver support groups using technological means (i.e., internet and phone; e.g.,^{11,12,25}). However, limited efforts have been made to increase caregivers' awareness of existing ASTs despite accumulating evidence demonstrating the efficacy of AST use in supporting caregivers.^{5,6,8} To our knowledge, there is currently no systemic video program available to provide information regarding ASTs that may be helpful for caregivers of older adults. Therefore, the goal of this study was to evaluate the effectiveness of a video-based educational program in a caregiver population. It was hypothesized that educational program participation would result in increased AST knowledge and improved AST perception as well as increased intention to use ASTs with their care-receiver. Caregiver and care-receiver

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Table 1
Examples of ASTs.

	ASTs
Safety	Grab bars Shower chairs Bed railings Rollators Floor and pressure alarm mats Automatic shut-off outlets
Independence	Medication reminders Magnifiers Scoop bowls Large grip utensils Sock pulls Electronic calendars

characteristics (e.g., caregiver gender, the amount of time caregivers spent with care-receivers, and care-receivers' functional level at study baseline) were also examined to identify potential factors that may be associated with better outcome following the educational program.

Methods

Participants

Study recruitment was completed through local agencies (e.g., support groups, hospitals, etc.) and word-of-mouth. Interested individuals were invited to either attend a local group meeting or participate online through the project website. Participants were 49 English-speaking caregivers of older adults. Thirty-five of the caregivers completed the study in person and 14 completed the study online. Most of the participants resided in Washington and Idaho State. Exclusion criteria included difficulties completing study materials due to sensorimotor (i.e., significant hearing or vision problems) and/or cognitive impairments that would preclude meaningfully participation in the study. Data from six participants were removed from the final analyses due to incomplete data ($N=43$, 33 in person, 10 online). One person had to leave the meeting before the videos were shown. Four of the remaining five individuals (all online) did not complete the post-program evaluation and one individual (in-person) completed only one of the four post-program questionnaires. Participant characteristics for the final sample are detailed in the Results section and Table 3.

Materials

Videos. Three videos from the Washington State University (WSU) AST video series were presented to the participants in a pseudorandomized order: medication management, daily living aids, and memory aids. The selection was based on the likelihood that the topics would be of interest and applicable to most caregivers of older adults. The complete video series also included five additional videos that discussed devices for fall prevention, mobility, vision, hearing, and communication. The scenario-based videos (8–12 min long) included testimonials by older adults, caregivers, and healthcare experts with no product endorsement. The overarching goal of the videos was to provide an overview of available ASTs and to educate viewers about ASTs that can be used to facilitate functional independence. The development of the videos was described in more detail elsewhere.²²

Questionnaires

Questionnaires measured AST-related factors included knowledge, attitude, stigma, self-efficacy, and intention to engage in AST activities. Unless specifically denoted below, questionnaire statement ratings were based on a 5-point Likert scale (i.e., 1 = Strongly disagree; 5 = Strongly agree). Demographics and background

information about both caregivers and their care-receivers (e.g., age, education, marital status, time spent with care-receiver) as well as program satisfaction were also collected.

Assistive technology questionnaire (ATQ²²). The ATQ, a 16-item questionnaire that was developed using Rausch model and a principal components analysis, includes subscales that assess AST knowledge, attitude, and stigma (loadings ranged from .60 to .82 with no cross-loading observed; $\alpha = .78$). The knowledge and stigma subdomains contained five statements, while the attitude subdomain comprised six statements. The wordings of the items were modified to be used with caregivers. Ratings for the stigma items were reverse scored such that a higher score represents better AST outcome.

AST self-efficacy. Based on prior research,¹⁹ five statements were generated to assess AST-related self-efficacy applicable to caregivers (e.g., I am confident in my ability to help my care-receiver to use ATs). A higher rating on this scale indicates better AST self-efficacy.

Intention to engage in AST-related activities. Thirteen statements were developed to assess the level of expressed intention to engage in AST-related activities by caregivers, an important outcome of the educational program (e.g., consult with a specialist, tell other caregivers about how to access AST information, recommend an AST to care-receiver). Participants were asked to indicate the frequency in which they engaged in AST activities in the past three months at baseline (i.e., 1 = Not at All; 5 = Very Frequently). They were then asked about their past intention to engage in AST-related activities for activities that were not engaged in at baseline. Following the video program, the participants were asked to indicate their future intention to engage in AST-related activities.

Tool identification task. Twelve multiple-choice questions were used as an objective measure of AST knowledge (also see²²). Each question consisted of a picture of an AST discussed in the video presentation and four response options. Participants were asked to identify the correct descriptor (e.g., automatic shutoff outlet) from three distractors (e.g., alert alarm, automatic timer, sensor plug). A total score was computed based on the number of correct responses such that a higher score denotes a higher level of AST knowledge.

Procedure

Participants attended either a local group presentation or completed an equivalent online protocol at their own convenience. Informed consent was obtained from all participants at the start of the study either by a research assistant or online. As part of the protocol, participants were asked to complete questionnaires before (T1) and after (T2) the video presentation. More specifically, AST related measures were administered at both T1 and T2, demographic and background information were collected at T2. At the end of the study, participants were provided access to the project educational materials, including the complete WSU AST video series. All project educational materials can be found on our project website: www.tech4aging.wsu.edu. The study was approved by the WSU Institutional Review Board.

Results

Analysis

In person and online participant ratings were first compared to determine whether this data could be collapsed together. Paired sample t-tests were used to compare pre- and post-program target outcome scores (i.e., AST knowledge, attitude, and stigma, self-efficacy, and tool identification scores). As another indicator of program

Table 2
T-Tests to compare pre-program (T1) scores between group and online caregivers.

	Group caregivers (N = 33)		Online caregivers (N = 10)		t	p
	M	SD	M	SD		
ATQ total score	3.88	0.42	3.85	0.59	0.21	0.84
ATQ knowledge	3.27	1.00	2.94	0.89	0.93	0.36
ATQ attitude	4.62	0.48	4.48	0.69	0.73	0.47
ATQ stigma	3.62	0.67	4.00	0.97	-1.55	0.13
Self-efficacy	3.86	0.74	3.80	0.68	0.23	0.82
Tool identification task	6.15	1.64	5.50	2.07	1.04	0.31

outcome, pre- and post-program levels of intention to engage in AST activities for activities not already being completed at the time of the educational program were compared. Exploratory ANOVAs were computed to evaluate the differential effects that caregiver characteristics may have on program outcomes. Caregiver (e.g., age, amount of time spent with care-receiver) and care-receiver (e.g., current level of AST use by care-receivers, care-receivers' functional status) characteristics that may affect program outcome were included and split into dichotomous groups. Given that a median split could not be applied to some of the variables, and to ensure that the comparisons had sufficient power, only characteristics that resulted in a minimum sample size per group of 16 (i.e., >40% of the available N) were analyzed. Almost all data was normally distributed; therefore, parametric tests were used except for when an item level analysis was conducted to evaluate intention to engage in AST-related activities. Unless otherwise stated, the significance level was set at 0.05. All analyses were completed using IBM SPSS 24.

In person vs online

T-test comparisons were computed to evaluate potential group differences between individuals who participated in person and online. As there were no significant differences in demographic, T1

questionnaire, or T1 performance measures, $t_s < 1.55$, between in person and online participants, the data were combined for the remainder of the analyses (see Table 2 for additional details).

Participant characteristics

Caregivers had an average age of 65 with at least an associate's degree (see Table 3). The majority of caregivers were Caucasian (95.2%) and female (81.4%). Many of them were married (69.8%), lived with (56.4%) and knew their care-receives very well (78%). According to the caregivers, they cared for individuals with a mean age of 78, who had obtained at least an associate's degree (see Table 4). Most care-receivers were reportedly Caucasian (95.2%) and lived in their own homes (75%). Over half of the care-receivers were female (65.9%), married (61%), and lived with their spouses (53.7%). Of the 32 caregivers who indicated that their care-receivers experienced everyday functional limitations, 37.5% of the care-receivers had neurologic conditions (e.g., Parkinson's, Dementia, Stroke, memory/cognition), 40.63% had medical/physical problems, 15.63% had both neurologic and medical conditions, and 12.5% had psychiatric disorders. For each video (i.e., medication management, daily living, and memory), approximately 70% of caregivers indicated that a video on that topic would be of value to them.

Program effectiveness

AST-related factors

Program effectiveness was evaluated by paired t-tests to compare pre- and post-program performances on the tool identification task as well as self-efficacy, ATQ knowledge, attitude, and stigma. Means, standard deviations, t-values, p-values, and effect sizes are included in Table 5. The results revealed that the ATQ total score, ATQ knowledge and stigma subdomain scores, self-efficacy, and the tool identification task score improved significantly post-program as compared to pre-program. The only non-statistically significant change was for the ATQ attitude score, which was likely reflective of a near ceiling effect as most caregivers reported a positive attitude towards ASTs pre-program. Effect sizes showed that the education program was most effective in increasing AST knowledge and improving performance on the tool identification. In addition, the educational program was moderately effective in reducing AST stigma and facilitating self-efficacy for AST use. The effect on AST attitude was minimal.

Intention to engage in AST activities

Expressed intention to engage in AST-related activities was assessed at baseline and post-program. Only pre- and post-program intentions were compared for activities that were not already being engaged in by caregivers so as to best evaluate the video-program outcome. Given the number of comparisons conducted, a Bonferroni correction was applied with the significance level set at 0.0038. As seen in Table 6, caregivers endorsed significantly higher levels of intention to engage in nine of the 13 AST-related activities post-program as compared to pre-program. These activities pertain to

Table 3
Caregiver characteristics.

	Caregiver participants	N
	Mean (Standard deviation) or % Frequency	
Caregiver age	64.64 (16.41); Range = 23-91	39
Caregiver education	22% high school graduate, diploma or GED; 17.1% associate degree; 46.3% bachelor's degree; 12.2% master's degree; 2.4% doctorate degree or equivalent	41
Caregiver gender	81.4% Female; 18.6% Male	43
Caregiver race	95.2% Caucasian; 4.7% Asian American	42
Caregiver marital status	4.7% widowed; 69.8% Married; 9.3% Divorced; 16.3% Single	43
Frequency of seeing care-receiver	56.4% live with care-receiver; 5.1% daily or almost daily; 17.9% 3-5 times/week; 7.7% 1-2times/week; 12.8% <1time/week	39
Level of familiarity with care-receiver's daily routine	78% very well; 12.2% pretty well; 7.3% fairly well; 2.4% not so well	41
Technology use	4.26 (10.88) i.e., often to always use technology in daily life	43

Table 4
Care-receiver characteristics according to their caregivers.

	Mean (Standard deviation) or % Frequency	N
Care-receiver age	78.41 (10.71)	39
Care-receiver education	35.7% high school graduate, diploma or GED; 14.3% associate degree; 19.0% bachelor's degree; 16.7% master's degree; 7.1% doctorate degree or equivalent; 7.1% do not know	42
Care-receiver gender	65.9% female; 34.1% male	41
Care-receiver race	95.2% Caucasian; 4.7% Asian American	42
Care-receiver marital status	24.4% widowed; 61% married; 9.8% divorced; 4.9% single	41
Care-receiver's housing situation	75% independently in own home; 7.5% independently in senior housing; 7.5% assisted living; 10% Other	40
Care-receiver living situation	26.8% alone; 53.7% with spouse; 19.5% with family	41
Care-receiver functional status	1.31 (0.68); Not at all – Somewhat Range: 0–2.75 (i.e., not at all to quite a bit)	43
Number of functional domains currently supported by ASTs among care-receivers	2.09 (1.82); Range: 0–7	43
Living environment adapted for disability/ATs	58.5% yes; 31.7% no; 9.8% do not know	41

gathering additional information about ASTs, starting to use ASTs, and sharing AST knowledge with care-receivers and other caregivers.

Program satisfaction

When asked to indicate their perceptions of the educational program, 95.2% of the caregivers ($N = 40$ of 42) found the information presented in the videos helpful, 100% of the caregivers ($N = 42$) learned additional information about ASTs, and 97.6% of the caregivers ($N = 40$ of 41) reported feeling more positive about AST use and its benefits after viewing the videos. In addition, all caregivers ($N = 43$) indicated that they would recommend this video series to others.

Exploratory analyses regarding group differences

Given that caregivers are often comprised of a heterogeneous group of individuals, group differences were explored to identify potential caregiver characteristics that may have influenced the educational program outcomes. For each characteristic in consideration, caregivers were split into binary groups using either raw scores, recategorization of responses, or an average score. The following factors were evaluated for potential group differences based on a minimum

Table 5

T-test comparisons of pre- and post-video ATQ, self-efficacy, and tool identification task scores.

	T1			T2		<i>t</i>	<i>p</i>	<i>d_{rm}</i>
	N	M	SD	M	SD			
ATQ total	43	3.88	0.46	4.29	0.41	-6.22	<0.001**	-0.95
ATQ knowledge	43	3.19	0.97	4.15	0.60	-7.15	<0.001**	-1.18
ATQ attitude	43	4.59	0.53	4.61	0.41	-0.40	0.69	-0.05
ATQ stigma	43	3.71	0.70	4.04	0.86	-2.59	0.013*	-0.40
Self efficacy	43	3.85	0.72	4.24	0.55	-3.60	0.001**	-0.56
Tool ID	42	6.00	1.77	9.88	1.58	-12.96	<0.001**	-2.00

Note. Tool ID = Tool identification task; T1 = Pre-program; T2 = Post-program.

* $p < .05$;

** $p \leq .001$.

sample size of 16 per group: age of caregiver, the amount of time caregiver spent with care-receiver, current AST use by care-receiver, and functional status (see Table 7 for more details). Outcome variables used in the repeated measures ANOVAs include ATQ total and subdomain scores, tool identification score, and self-efficacy score.

Effects of caregiver and care-receiver characteristics on AST outcomes

Group (e.g., younger caregivers vs. older caregivers) by time (pre- and post-program) repeated measures ANOVAs were conducted on the outcome variables (i.e., ATQ total, ATQ subdomain scores, tool identification task, and self-efficacy score) to identify potential differential effects of caregiver and care-receiver characteristics (i.e., see Table 7) on program outcomes. Main effects of time for all analyses were consistent with findings using the larger sample.

Main effects of age were found for the tool identification task and the ATQ total, stigma, and attitude scores. More specifically, younger caregivers [i.e., mean 8.53 (SE 0.30); $N = 17$] were significantly more accurate in identifying AST tools than older caregivers [mean 7.45 (SE 0.27); $N = 21$], $F(1, 36) = 7.12$, $p = 0.01$. Similarly, younger caregivers [mean 4.27 (SE 0.09)] scored higher on the ATQ (total score) than older caregivers [mean 3.93 (SE 0.08)], $F(1, 37) = 9.08$, $p = 0.005$. Follow-up repeated ANOVAs on the ATQ subscales showed that younger caregivers [mean 4.10 (SE 0.16); $N = 17$] endorsed a significantly lower level of stigma than older caregivers [mean 3.67 (SE 0.14); $N = 22$], $F(1, 37) = 4.13$, $p = 0.04$, and had a significantly more positive attitude about ASTs [younger caregivers: mean 4.82 (SE 0.10); $N = 17$; older caregivers: mean 4.46 (SE 0.08); $N = 22$], $F(1, 37) = 8.10$, $p = 0.007$. The groups did not differ on the knowledge subscale or the self-efficacy rating. There were also no significant interactions with age, indicating that both the younger and older caregivers benefitted similarly from the program.

Main effects of care-receivers' current AST use were also found for tool identification task and AST attitude such that caregivers with care-receivers who had more physical/cognitive domains supported by ASTs scored higher on the tool identification task [higher AST use: mean 8.50 (SE 0.26); lower AST use: mean 7.26 (SE 0.28); $F(1, 40) = 10.49$, $p = 0.002$] and reported more positive attitude towards ASTs [higher AST use:

Table 6

Wilcoxon signed rank test to evaluate pre- and post-program change in intention to engage in AST-related activities not completed at baseline.

	n	T1 Mdn (Range)	T2 Mdn (Range)	Z	P	r
1. Watch a video, read, or gather information about ATs	23	2 (1–4)	4 (1–5)	3.34	<0.001*	0.49
2. Talk with my care-receiver's doctor about ATs	21	1 (1–5)	3 (1–5)	2.65	0.008	0.41
3. Consult with an AT specialist or other providers knowledgeable about ATs	29	2 (1–5)	3 (1–5)	2.88	0.004	0.38
4. Talk with an AT user about their AT	22	3 (1–5)	3 (1–5)	2.49	0.013	0.38
5. View an AT at a store, online, or at a lending library	22	2 (1–5)	4 (1–5)	2.95	0.003*	0.44
6. Buy an AT	27	1 (1–5)	3 (1–5)	2.80	0.005	0.38
7. Start to use a new AT	29	1 (1–5)	3 (1–5)	3.56	<0.001*	0.47
8. Have my care-receiver learn more about ATs (e.g., watch videos, read, gather information)	33	1 (1–5)	4 (1–5)	4.45	<0.001*	0.55
9. Tell other caregivers about how to access AT information (e.g., videos, written materials, etc.)	34	1 (1–4)	4 (1–5)	4.72	<0.001*	0.57
10. Tell other care-receivers or other caregivers about an AT	28	1 (1–5)	4 (1–5)	4.25	<0.001*	0.57
11. Recommend an AT to my care-receiver or other caregivers	22	1 (1–5)	4 (1–5)	3.86	<0.001*	0.58
12. Show my care-receiver or other caregivers how to use an AT	25	1 (1–4)	3 (1–5)	4.06	<0.001*	0.57
13. Help my care-receiver to use a new AT	28	2 (1–5)	4 (2–5)	4.05	<0.001*	0.54

Note. T1 = Pre-video program; T2 = Post-video program.

* $p < .0038$.**Table 7**

Binary classification of caregiver and care-receiver characteristics.

Characteristic	Binary classification	
Age of caregiver	<65 years old (N = 17)	>65 years old (N = 21)
Time spent with care-receiver	Live with care-receiver (N = 22)	Daily visits or less (N = 16)
Current AST use by care-receiver	≤1 physical/cognitive domain supported by ASTs (N = 20)	≥2 physical/cognitive domains supported by ASTs (N = 23)
Functional status	<1.25 cognitive/physical domains of functional limitations (N = 20)	>1.25 cognitive/physical domains (N = 23)

mean 4.74 (SE 0.09); lower AST use status: mean 4.43 (SE 0.08); $F(1, 41) = 6.51, p = 0.02$. No other group differences or interactions were found. Although, no main effects of functional status was found, there was one interaction, $F(1,41) = 4.57, p = 0.04$, suggesting that AST attitude improved more from pre- to post-program for caregivers who cared for care-receivers who had fewer domains of functional limitations [T1: mean 4.47 (SE 0.12); T2: mean 4.63 (SE 0.09)], as compared to those who cared for individuals with more domains of functional limitations [T1: mean 4.69 (SE 0.11); T2: mean 4.60 (SE 0.09)]. There were no main effects or interactions based on the amount of time spent with care-receivers.

Discussion

Caregiving demands inevitably exert stress on caregivers and families physically, psychologically, and/or financially. A research survey showed that caregivers were interested in learning about resources that may further support caregiver needs.¹ Despite that ASTs have been shown to reduce caregiver burden, they are being underutilized by caregivers.^{17,23} Results from this study showed that the eight AST domains discussed in the WSU AST video series were relevant to caregivers' needs. Consistently, caregivers provided overwhelmingly positive program feedback. In addition, the program was effective in increasing AST knowledge and self-efficacy as well as reducing AST stigma, with the largest effect seen in changes in perceived and objective measure of knowledge. The video program also promoted caregiver intention to use ASTs. Exploratory analyses showed that the program generally benefited individuals equally despite various caregiver (e.g., age and time spent on caregiving activities) and care-receiver (e.g., care-receiver's current use of ASTs and functional limitation) characteristics. The one exception was the finding of a significantly greater improvement in AST attitude for caregivers of older adults who had fewer functional limitations such that at T2 caregivers caring for care-receivers with all levels of functional limitations had similarly positive attitudes. Although AST-related factors (i.e., knowledge, attitude, self-efficacy, and stigma) are not typically evaluated in the outcomes of AST use by caregiver (see⁷), these factors are important to consider as caregiver attitudes and perception towards ASTs can affect their care-receivers' AST adoption and use (e.g.,²²).

Several factors have been identified as barriers to caregiver support, including access to resources and services (e.g.,¹⁴). Anecdotally, it appears that caregivers may find it difficult to commit to engaging in additional community or self-care activities. Increasingly, studies have demonstrated the efficacy of online programs for caregivers (e.g.,¹⁵). Although further research is needed, our results suggested that the brief educational videos were beneficial to individuals who participated in the program online. As such, the online option may provide an alternative mean for caregivers to access the information at their convenience without the burden of scheduling additional daytime appointments.

Younger caregiver age contributed to better scores of objective knowledge (i.e., tool identification task accuracy) as well as AST-related attitude and stigma scores. Age-related differences in learning have been well-documented in research (e.g.,^{10,20}), which may explain some of the differences on an objective measure of knowledge between the younger (i.e., <65 years old) and older (i.e., >65 years old) caregivers. Similarly, while research provided evidence that older individuals generally remain open-minded regarding ASTs (e.g.,¹⁶), findings from our study suggest age-related differences in AST stigma and attitude. Still, direct comparison of study findings is difficult given the differences in study methodology (i.e., qualitative vs. quantitative design). However, the observed age differences in objective knowledge as well as self-report AST stigma and attitude may account for some of the variances in age differences in AST adoption reported in the literature (e.g.,¹⁸). Notably, caregivers, irrespective of age, endorsed similar levels of perceived gain in knowledge and benefitted similarly from the program.

Limitations and conclusion

Despite findings that support the efficacy of the educational program, the study is not without limitations. First, the study sample was comprised of primarily highly educated Caucasian individuals who cared for relatively functional individuals, which limits the generalizability of the study findings. In addition, the observed favorable outcomes may in part be attributable to the caregivers' already highly positive attitude towards ASTs (i.e., selection bias). Future studies

should evaluate the effectiveness of the video program among more diverse populations (e.g., those with more negative attitudes towards ASTs, other ethnic groups) with a delayed follow-up to further investigate outcomes of AST use by caregivers and the long-term effectiveness of the program. It may also be of interest to evaluate the potential differences between individuals who live in urban and rural areas as access to AST may differ. The effects of AST use on caregiver quality of life and overall well-being should also be further investigated.

In conclusion, this is one of the first studies to evaluate the effectiveness of a video-based educational program to promote AST awareness among caregivers. The study findings provide support for the use of the educational materials to promote AST knowledge and intention to use ASTs as well as reduce AST stigma among caregivers. Results also suggested that these materials can be useful to caregivers regardless of their age, experience, and involvement as well as care-receiver's functional level. Therefore, medical providers, aging agencies, and individuals who provide caregiver support are encouraged to utilize the educational materials developed for this project when working with caregivers of older adults. The educational materials are freely available on our project website: www.tech4aging.wsu.edu.

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Declarations of interest

None.

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