Prevalence and Perception of Assistive Technology in the care of Patients with Dementia

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Introduction

Few quantitative data studies are available on the use of available modern assistive technology (AT) devices for aiding home-based dementia care by family caregivers. However, AT devices may be underutilized tools that can contribute to better outcomes for persons with dementia and their caregivers. This quantitative study focuses on the current use patterns of AT among community-living persons with dementia, the perceived usefulness of AT products rated by their informal family caregivers, and their willingness to pay for AT products. Other studies (Mao et al. 2014) looked at similar parameters in a different demographic with promising results and so using a quantitative approach to the perceived usefulness of ATs could be beneficial for home care coordinators to implement in the reduction of informal caregiver burden within the targeted urban population.

Methods

Baseline data from 59 informal caregivers of dementia patients who were taking part in a randomized controlled trial of a care coordination intervention (the MIND at Home study). Respondents completed a questionnaire on current use of 15 types of AT devices. Each device was also then rated on perceived usefulness (5-point scale: 1 - not-useful to 5 - extremely useful) and willingness to pay out-of- pocket for a percentage of product cost based on current market value.

Device Examples

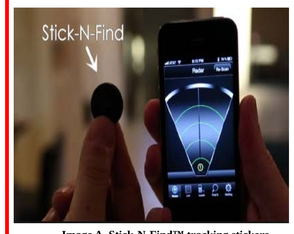

Image A. Stick-N-Find™ tracking stickers (D12)

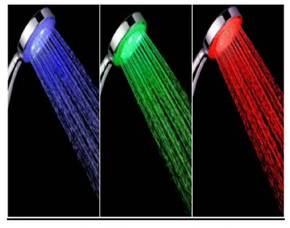

Image B. LED Temperature Regulating Shower Nozzle (D5)

Image C. GPS Location Wrist Band (D8)

Image D. Automatic Stove Shutoff Device (D1)

Figure 1. Selected Device Examples

Device Key	Device Description	Prevalence of Current Use
D1 A)	Automatic Stove Shut-Off Device	3.39%
D2 B)	Automatic Electrical Appliance Shut-Off Device (Microwave, Toasters, Etc.)	5.085%
D3 C)	Automatic Refrigerator Door Closer	3.39%
D4 D)	Scanner with Stickers that displays which foods are expired in the fridge	3.39%
D5 E)	Shower Nozzle that provides water at a constant temperature	13.56%
D6 F)	Hands Free Faucet On/Off Sensor	3.39%
D7 G)	Electronic Medication reminder and monitoring device (would warn caregiver of missed meds)	3.39%
D8 H)	GPS locating device, with alerts if outside a set area	0%
D9 I)	Remote viewing camera(s) (can be viewed anywhere using internet connection and computer)	6.8%
D10 J)	Door Guard (alarm that announces a door has opened, which door has opened, and logs the time the door opened)	27.12%
D11 K)	Tablet or Smartphone for communication, phone calls with video, or games or activities	18.65%
D12 L)	Bluetooth Tracking Stickers (can be located w/ smartphone or computer)	1.69%
D13 M)	Special locks for Cabinet doors	1.69%
D14 N)	Wristband to track activity, sleep, heartrate (e.g., fitbit, jawbone)	0%
D15 O)	Motion activated interior lights (e.g. use in bedroom)	8.47%

Table 1. Prevalence of Current Use by Assistive Technology Type

Device Key	Potential Use in Population (%)	Mean Likert Score	Standard Deviation
D1 A)	28.81	4	1.12
D2 B)	16.95	4.2	1.1
D3 C)	11.86	3.5	0.97
D4 D)	10.2	3.8	0.75
D5 E)	35.6	4.4	0.81
D6 F)	28.8	4.2	1.01
D7 G)	18.6	4	1
D8 H)	35.6	4.6	0.81
D9 I)	25.4	4.2	0.86
D10 J)	28.8	4.47	0.87
D11 K)	11.86	4.28	0.95
D12 L)	35.6	4.2	0.89
D13 M)	3.4	4	1.4
D14 N)	25.4	4.3	1.03
D15 O)	27.12	4.3	0.87

Table 2. Perceived Usefulness of Devices among Family Caregivers and Usefulness Likert Scores (range 1-5)

Results

A total of 59 valid caregiver questionnaires were analyzed on the 15 devices found in Figure 2. Overall, the prevalence of current use of all the devices was relatively low, ranging from 0% to 27% (mean 6.6%). However, more than three quarters (80%) (Figure 4) of the respondents found that at least one device had the potential to be useful in their care, and 53% having interest in 3 or more devices. The most current commonly used devices were door alarm (27%), and tablet or smartphone (18%). The three devices that scored the highest for perceived included: temperature regulating shower head (35.6%), GPS locating wrist bands (35.6%), and Bluetooth © tracking stickers (35.6%). For the shower nozzle (~$20) there was willingness to pay over the average market value of the device (average willingness $32.8). The GPS band (~$200) and Bluetooth stickers (~$70) had lower willingness to pay at $80 and $36, respectively.

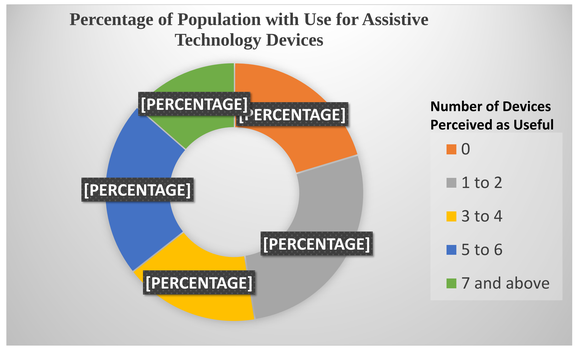

Figure 2. Number of AT devices Perceived as Useful by Family Caregivers

Summary and Conclusions

Results suggest that family caregivers may be open to using these types of technologies as tools to aid in the care for their loved ones with dementia, with over three quarters of the sample perceiving at least one of the devices as potentially useful. However, the current prevalence at the baseline visit was low. Future research should be done to understand whether targeted incorporation of AT into dementia management plans can improve outcomes and be economically viable.

ACKNOWLEDGMENTS

A thank you to the Geriatrics Division at The Johns Hopkins University, the MSTAR Summer Program, GA – Philadelphia College of Osteopathic Medicine, and to everyone at the MIND study for all of your support and guidance.
A special thank you to my mentor, Dr. Quincy Samus, who was kind enough to use some of her valuable time to help a fledgling student researcher.
Supported by MSTAR program and NIH R01AG046274 .

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Mao, Hui-Fen, et al. "Indicators of perceived useful dementia care assistive technology: Caregivers' perspectives." *Geriatrics & gerontology international*15.8 (2015): 1049-1057.

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