

Supporting Informal Caregivers with Personal and Environmental Emergency Response Systems: The HOME-Tech Study

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Background

- Caregiving can be rewarding and can strengthen the relationship between the caregiver and the care recipient
- Caregiving can present challenges
 - Caregivers may experience stress, emotional difficulties, difficulties with finances or physical health
 - Caregivers of home care clients with high needs are at a higher risk of burnout
 - Cap on the number of home care hours that are provided leaves family caregivers with the extra responsibility of providing care
- Other solutions are needed

What are personal and environmental sensors and alarms?

- First-generation
- Second-generation
- Third-generation



Sensors and Alarms as Supports for Caregivers

- These types of devices have been associated with positive effects on caregivers such as:
 - reduced anxiety, pressure, number of hours spent providing care
 - improved peace of mind and health-related quality of life
- Others have found that these devices were associated with decreased stress and strain, but found no effects on quality of life or burden

Purpose and Research Questions

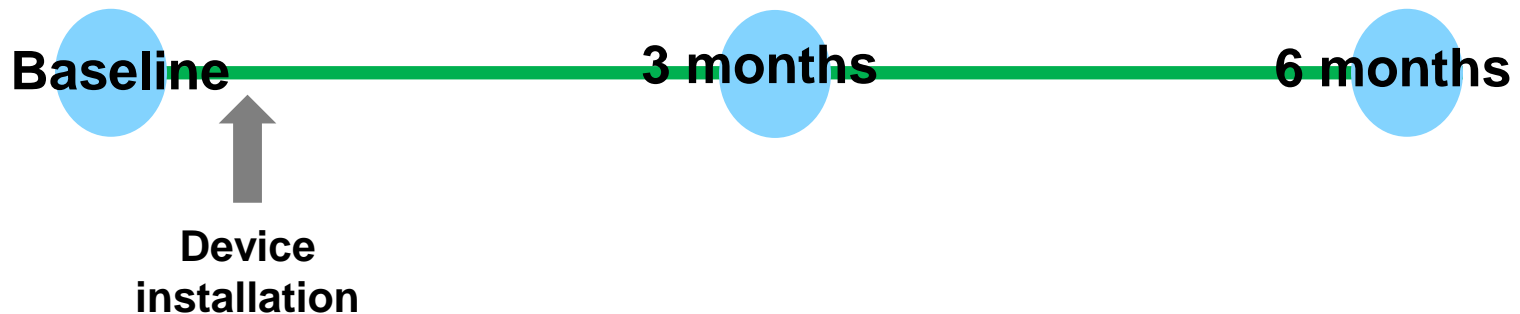
- **Purpose:** to determine whether these technologies could demonstrate positive outcomes on the health and well-being of unpaid care providers

Research questions:

- What are the views and attitudes of caregivers toward the use of the alarm and sensor devices in terms of satisfaction, acceptability, value, and usability?
- What is the impact of providing alarm and sensor technologies to community-dwelling older adults in terms of outcomes such as well-being, stress and anxiety of care providers, family, and loved ones?

Method

- Client and caregiver recruitment done through the Seniors LINCS (Living Independently with Community Supports) team in the Annapolis Valley District Health Authority (AVDHA)
- Mixed methods approach



- Data analysis: t-tests, repeated-measures ANOVAs, framework analysis

Participants

- n = 29; 25 females
- Mean age of 59.8 years (sd=13.1) and mean of 3 years spent caring for care recipient (sd=2.4)

Relationship to care recipient		
	Frequency	Percent
spouse	10	36%
daughter	9	32%
son	2	7%
sister in law	1	4%
friend	1	4%
daughter in law	2	7%
grandchild	1	4%
cousin	1	4%
sibling	1	4%

Care Recipients

	Age	Length in current home (years)	Gender		Housing status		Ethnicity	
Mean	78.8	11.7	Male	13 (36%)	Lives alone	19 (54%)	White	35 (97%)
Standard deviation	8.5	12.7	Female	23 (64%)	Lives with a partner or spouse	12 (34%)	Black	1 (3%)
					Lives with a son or daughter	3 (9%)		
					Lives with another family member	1 (3%)		

- Most common health conditions were heart disease (56%), arthritis or other joint problems (36%), and dementia (28%)
- 56% of care recipients received private or publically-funded home care

Devices Installed

	Number of devices at baseline
1	20 (64.5%)
2	6 (19.4%)
3	5 (16.1%)

Type of device	Frequency
Basic service only	19 (52.8%)
Bed sensor	5 (13.9%)
Stove sensor	5 (13.9%)
Medication Dispenser	5 (13.9%)
Flood sensor	1 (2.8%)
Motion detector	1 (2.8%)

Results: Effects on Well-being

- Caregivers had significantly lower stress levels at 3 months ($m=0.9$, $sd=0.5$) than at baseline ($m=1.2$, $sd=.7$), $t=2.4$, $p=.03$
- The majority of caregivers experienced increased peace of mind:

[baseline] “It’s just when I even just leave for the groceries into Middleton, it’s knowing that if he does fall that we have, that I have a safety net, when I go for my runs and my walk or whatever I have a safety net.”

[3 months] “I mean with [my husband]...at any time falling or not being able to breathe it’s definitely...you know [my husband] could be in there and if he presses it, they have all the information that if 911 comes...they have all that stuff there so yeah it is peace of mind. The more tools that we have in our little bucket [...] the better it is [...] for me and for him. He doesn’t feel like he’s all alone.”

[6 months] “Oh I love [the pendant]. I think that there should be a lot more PR to the public, the general public on the fact that more than anything this is a, it’s an insurance. It’s a safety measure for the caregiver and it’s a safety measure for the patient or the client. Yeah. And it certainly gives me a lot of relief when I’m you know, out in the yard or anywhere.” [Norma]

Results: Caregiver Challenges

- Stress experienced from multiple demands

“I guess the stress for me is knowing that I have to be up at certain times, I have to have meals ready at certain times, they have to meet certain criteria, and if I want to sleep in and not do that, I can’t you know and it sounds pretty selfish.” [Doris; baseline]

- Challenges meeting care receiver needs

“I have two brothers. One lives over here and one back there, but this one over here works 12 hour days and he’ll check on dad if we’re away, and then my brother and his wife back here and their daughter, they don’t come in very often, once in a while, but as far as doing stuff for dad, no, none of them go out and do errands or any of that.” [Sally; baseline]

Results: Caregiver Perceptions of Client-Device Fit

- Fit varied based on the client's ability to use a device

[baseline] “I: So thinking about the equipment that has been installed, what are you kind of hoping to get from that?”

Frank: Safety in circumstances that I can't imagine.”

[3 months]“...on a couple of occasions she has lost [the pendant] and I was almost on the verge of calling to say hey, I suppose I can get a replacement, but before I did that I discovered other people that had a similar experience and it's not at all uncommon and I just don't know whether or not she would remember in an emergency to push the button. Just don't know that.”

[6 months]“We're moving down beyond the stage where the [pendant] is of critical importance. The one that is most important, it was without a doubt, the fact that we have alarms on the door, ok. She does go out unexpectedly but immediately attention is called to it.”

Results: Caregiver Perceptions of Client-Device Fit Cont'd

- Fit also varied based on perceived need and timing
- “I think at first, she was thinking that, you know, she really wasn't going to need it but it was okay to go along with it because it wasn't going to, you know, it wasn't going to cost her anything. And then after we really talked about it, and then she started just being realistic about her situation. And I mean she did have...like a little slip and fall...and she was able to get up and everything. But she did wrench her back which has given her some issues for a fair while. So you know, she definitely, I think, in that situation... I said, well, you know, what if you hadn't been able to get up? Well, then you would have had your button. 'Yeah, that's true,' she said. You know, it's almost like she sees it but she doesn't sort of really want to accept it. And then, you know, if you talk about it then she will.”
[Robin; 6 months]

Implications and Conclusions

- Personal and environmental sensors and alarms have the potential to be effective tools for caregivers
- More education is needed on what this technology can do
- More research is needed on how this technology fits in with the various needs of older adults

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