C0103

Proactive Care for Persons with Dementia: Using In-Home Passive Sensors to Reduce Caregiver Stress and Promote Aging in Place

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Summary

- New Brunswick's population is aging rapidly, with more older adults expected to be living with Alzheimer's Disease and related dementias (ADRD) in the coming years.
- ADRD can endure and worsen for up to 20 years, often necessitating hands-on care in the home. Due to the limited capacity of the formal healthcare system, this care is often provided by informal caregivers – usually family members and friends of the person living with ADRD.
    - Informal caregivers may experience high levels of stress and burden as they attempt to manage their own lives while ensuring the safety and wellbeing of the person living with ADRD.
    - Issues with timing and availability mean that there are times when caregivers are unable to check in on their loved one living with ADRD. Moreover, check-ins by informal caregivers offer only a limited snapshot of the condition and needs of the person living with ADRD.
- Behavioural monitoring devices (e.g., wearables, cameras, or listening devices) can facilitate safe aging in place for people living with ADRD while lessening the stress and burden felt by their informal caregivers. However, many of the monitoring devices that are currently available for use only provide alerts in the event of an emergency. People living with ADRD may also find these devices to be intrusive and an invasion of their privacy.
- To address these issues, this program introduced a passive monitoring system in the homes of older adults living with ADRD. Known as PassiveAware, the technology consists of "tags" placed on objects around the home to monitor behavioural patterns. The technology can detect behaviours that might signal disease progression.
    - Informal caregivers were able to receive PassiveAware notifications and alerts.
    - The project aimed to alleviate caregiver stress and burden and facilitate safe aging in place for people living with ADRD.
- Two "dyads", each consisting of one person living with ADRD (care receiver – two women over age 65) and one informal caregiver (two women), were recruited to participate in the study. The PassiveAware technology was installed in the care receivers' homes over a period of six months.

HSPP Focus Area	Using supportive technologies to foster healthy aging at home and in our communities
Project Start & End Date	July 1, 2021 – March 31, 2024
Organization/Agency	Centre for Innovation and Research in Aging (CIRA)
Location	Fredericton
Principal Investigator(s)	Justine Estey

Indicator	Impact / Outcome / Result	Quote
Full findings are described in project reporting but are not presented as part of this summary. Please contact the project principal investigator for more information.		
General Health	During interviews, both caregivers indicated that PassiveAware gave them increased insight into the **schedule and behaviours** of the care receivers, helping them manage care needs. While neither caregiver reported being able to predict a **future medical issue** while using the technology, both caregivers reported an improvement in **care planning** and **decision making** due to a better understanding of the care receivers' behavioural patterns.	*"If my mother was still in her own home I absolutely would [continue using the technology] … I felt that it benefited my life a great deal."*

Indicator	Impact / Outcome / Result	Quote
Caregiver Burden	The level of **caregiver burden**, as measured by the Zarit Burden Interview, decreased for both caregivers by the end of the project. One caregiver's burden score increased mid-study before decreasing by the end of the study to a lower level than the pre-study score. Based on interview data, the mid-study increase in caregiver burden may have been the result of the care receiver's worsening condition, which contributed to the caregiver's overall level of stress.	*"I feel overall more stressed because Mom is doing poorly, I feel less stress than I would without [the technology] … I feel less stressed than I otherwise would."*

Methods and Comparison

Caregivers were surveyed and interviewed before, during, and after use of the PassiveAware technology to measure changes in their levels of stress, burden, and wellbeing as well as their perception of the caregiving experience, care planning and decision-making process, and positive aspects of caregiving. Data on care receiver hospitalizations and transitions to long-term care was also collected.

Conclusions and Lessons Learned

- Passive monitoring technology may be an effective tool in decreasing informal caregivers' levels of stress and burden while facilitating the longer-term care planning process. However, given the project's low sample size, further research involving both an intervention and control group is needed to measure the intervention's impact on both caregivers and care receivers.
- Recruiting caregiver participants can be challenging due to their high levels of fatigue and stress.
- Caregivers and older adults might be reluctant to participate in a research project involving technology if they do not think they need it, do not understand its value, or are uncomfortable using it.

Recommendations

- Implement a larger-scale research study with the use of an intervention and control group.
- To facilitate increased recruitment with a more diverse group of participants, partner with community organizations who have existing relationships with caregivers and older adults.
- During the recruitment phase, emphasize the passive (non-intrusive) nature of the technology to potential participants; if possible, allow the participants to look at and/or try out the technology before they consent to the project.

Next Steps

- Proactive Care for Persons with Dementia has secured funding through the Centre for Aging + Brain Health Innovation (CABHI) to extend the program until September 2024 with additional participants from across New Brunswick, Nova Scotia, and Ontario.
- The program is also exploring opportunities for commercialization of the PassiveAware technology.

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