

Summary

- Physical activity plays an important role in healthy aging. Increased levels of physical activity contribute to better quality of life and improved health outcomes. However, residents in long-term care (LTC) settings often face challenges to participating in regular exercise or social activities. These challenges include lack of motivation and long periods of time spent sitting or lying down.
- This program introduced a new exercise technology, known as 2RaceWithMe (2RWM), to encourage increased physical activity by older adults in LTC and community settings. 2RWM combines hand and foot pedals, used together or separately, with a library of interactive travel videos. Pedalling is synchronized to the video so that users must keep pedalling in order to continue watching.
 - In addition to higher levels of physical activity, use of the 2RWM was also expected to result in increased mental stimulation and more social engagement for older adult users.
- The project was conducted across two different phases. Phase 1 included individuals residing in LTC, independent living, and semi-independent living units, while Phase 2 targeted more independently mobile older adults from assisted living and adult day programs. Participants' personal and health information was collected before and after each phase to assess exercise trends and compare health and social engagement outcomes.
 - Phase 1 included 32 older adult residents (ages 55 to 99 years; 21 females and 11 males; 10 Anglophones and 22 Francophones) at two LTC facilities (Faubourg du Mascaret [FdM] and York Care Centre [YCC]). Participants' 2RWM usage was tracked for six months.
 - Phase 2 included nine older adults (4 females and 5 males), all of whom were Anglophone, at one facility (YCC). The project tracked participants' use of the 2RWM for eight weeks.

HSPF Focus Area
Project Start & End Date
Organization/Agency
Location/Project Sites
Principal Investigator(s)

Increasing independence, quality of life, and promoting healthy lifestyles
 March 1, 2020 – March 31, 2024
 Centre for Innovation and Research in Aging (CIRA)
 Fredericton, Moncton
[Dr. Jalila Jbilou](#), [Justine L. Estey](#), and [Dr. Mark Chignell](#)

Indicator	Impact / Outcome / Result	Quote
General Health	<ul style="list-style-type: none"> 2RWM usage was measured by the average number of pedal revolutions per quarter. During Phase 1, usage at YCC initially increased, then dropped partway through the intervention before increasing to the end of the intervention period. Pedal revolutions at FdM decreased over time. Phase 2 results demonstrated a general increase in pedal revolutions over time. Variations in pedal revolutions during both project phases coincided with participant absences and illness outbreaks. 	<p><i>"I find it's great exercise for everyone."</i></p>
Prevention	<ul style="list-style-type: none"> Participants who were interviewed indicated that they enjoyed using the 2RWM. However, there were no statistically significant differences in participants' mobility, physical function, overall cognitive function, or overall quality of life following the intervention. Analysis of questionnaires administered before and after Phase 1 revealed that FdM participants' level of technology acceptance slightly decreased over time. FdM participants similarly demonstrated mildly increased scores for anxiety and depression indicators after the intervention. These changes may be attributed to factors including participant withdrawal, facility outbreaks, and reduced activity engagement. 	<p><i>"Good exercise ... feel it in my shoulders."</i></p>

Indicator	Impact / Outcome / Result
Prevention	<ul style="list-style-type: none"> Compared to before the intervention, Phase 1 participants at YCC likewise demonstrated slightly reduced cognitive performance scores, which may be attributed to changes in health status and decreased activity engagement.

Methods and Comparison

2RWM device data (number of pedal revolutions and length of use) was collected throughout the intervention to measure device usage. Questionnaires on personal and health information, physical and cognitive status, and social engagement were administered before and after the intervention to assess the device's impact. Participants were also interviewed on their experience and level of satisfaction with the 2RWM.

Conclusions and Lessons Learned

- Older adults indicated that they enjoyed using the 2RWM. However, participant absences, technical issues, facility outbreaks, and the level/availability of assistance from the project team impacted levels of device usage over the project duration. Additional research is needed to assess the full impact of the device on users' physical and mental health outcomes.
- Ongoing organizational support (from senior leadership, department leads, unit coordinators, activity directors, unit staff, volunteers, and students) and continued support from the 2RWM Customer Service Team is critical to integrate new technologies into regular practice within the LTC context.

Recommendations

- Conduct further research over a longer duration on the impacts of the 2RWM. This research should include the use of a control group and a range of device options for older adults.
- Share training materials and implementation guidance to help organizations determine if new technologies align with existing programs, policies, staffing capacity, and financial resources.

Next Steps

Since the end of the program, the 2RWM is still being used by residents at FdM. While the 2RWM is not consistently available for use at YCC, discussions are underway with site leadership to facilitate use of the device on three units across the facility.

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Improving Immunization Rates Among Seniors Using the CANImmunize Digital Application

Last updated: September 2024

Summary

- Although immunizations are important for reducing negative health outcomes related to pneumococcal disease, influenza, and herpes zoster (shingles), vaccination rates for older adults are well below the Public Health Agency of Canada's target rates (e.g., 80 percent target rate for pneumococcal immunizations in adults over 65 versus 42 percent actual rate).
- A lack of awareness about which vaccines are needed and when, as well as confusion around the role of healthcare providers in recommending vaccinations, contribute to low vaccination rates among older adults.
- While monitoring and tracking vaccinations through a digital reminder system has been shown to improve immunization rates for children, there has been less focus from researchers on tracking and increasing the immunization rates of older adults.
- This program implemented an existing Canadian digital immunization platform, known as CANImmunize, to help improve immunization rates for older adults in assisted, independent, and retirement living facilities.
 - The platform allowed older adults and their caregivers to access immunization records, view recommended vaccination schedules, and receive vaccination reminders on a secure website adapted for older adult use.
 - The platform also shared the immunization status of residents with care staff, who could prompt them to receive overdue vaccines.
- The primary goal of the project was to evaluate changes in older adults' pneumococcal immunization rates. The project also assessed changes in influenza, shingles, and COVID-19 immunization rates.
- The platform was implemented at three assisted/independent living facilities in Fredericton. Ten older adults (7 women and 3 men, aged 63 to 86 years) were recruited to participate. Data was also collected from a staff member at one of the assisted living facilities.

HSPF Focus Area

Using supportive technologies to foster healthy aging at home and in our communities

Project Start & End Date

May 1, 2020 – March 31, 2024

Organization/Agency

Centre for Innovation and Research in Aging (CIRA), CANImmunize, Bruyère Research Institute

Location

Fredericton

Principal Investigator(s)

[Justine Estey](#) and [Dr. Kumanan Wilson](#)

Indicator	Impact / Outcome / Result	Quote
Safety	<ul style="list-style-type: none"> • Surveys indicated that 4 of 10 participants had received a pneumococcal immunization before the program. There was no change in pneumococcal immunizations during the program. <ul style="list-style-type: none"> • During interviews, some participants noted that they were not aware that they should receive a pneumococcal immunization over the age of 65. • Most participants stayed up to date with their influenza and COVID-19 immunizations over the course of the study. One participant received a shingles vaccine during the study (from a baseline rate of 1 of 10 participants). <ul style="list-style-type: none"> • Several participants reported during interviews that they would receive the shingles vaccine if it was free. 	<p>While the majority of participants indicated that they preferred paper vaccine records over digital records, 5 of the 7 participants who completed the final survey would still recommend CANImmunize for other people to use. One participant explained: <i>"Trying to remember a piece of paper somewhere, and not being able to find if you had a shot done, but I can check my online CANImmunize account now."</i></p>

Indicator	Impact / Outcome / Result
Caregiver Burden	<p data-bbox="277 149 1513 212"><i>One assisted living facility staff member was interviewed. Although insightful, the single case limits generalizability of the outcomes. These results should be viewed with caution.</i></p> <ul style="list-style-type: none"> <li data-bbox="277 233 1513 289">• The staff member expressed concern about the additional time required to manage resident immunization records through a digital platform. <ul style="list-style-type: none"> <li data-bbox="375 296 1513 359">○ Since staffing constraints were common in the staff member's context, they felt that staff were unable to take on additional tasks. <li data-bbox="375 365 1513 428">○ The program did not reduce the participant's workload. Managing residents' immunization records was not a job responsibility before the program. <li data-bbox="375 434 1513 485">○ Immunizations were not a commonly requested care need in the staff member's personal experience and facility context.

Methods and Comparison

The project assessed CANImmunize data and surveyed older adult participants before and after the implementation of the digital platform to measure changes in immunization rates. Interviews were also conducted with older adult participants and one assisted living facility staff member to capture their perceptions and experiences with CANImmunize.

Conclusions and Lessons Learned

- Project outcomes provide insight into the immunization rates of older adults in a small sample, but generalizability of the findings is limited due to the project's small sample size.
- More research is still needed on the immunization rates of older adults.
- The COVID-19 pandemic significantly impacted the project.
 - Recruitment was impacted by COVID-19 fatigue and vaccine hesitance.
 - Much of the immunization data collected relates to COVID-19, rather than pneumococcal, immunization habits and experiences.
- Older adults' access to and relationship with technology impacted their engagement with the digital immunization platform, with some participants lacking regular access to internet-enabled technology and other participants wary of spam email communications (e.g., when they received digital reminders from the project team).
- Many of the older adults in the sample still desired paper immunization records instead of, or in addition to, digital records.

Recommendations

- Decision-makers at assisted living facilities should consider implementing policies for communal access to technology, such as shared computers for resident use.
- Experiment with different methods to engage older adults through technology (e.g., include the researcher's full name and credentials in email communications and send text messages in addition to email reminders).
- Include the option for users to print their digital records in future digital immunization platforms.

Next Steps

The program has not secured or applied for additional funding, as the web-based digital platform used in the study has been discontinued for public use. Participants were encouraged to use CANImmunize's free public mobile application after the study.

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Reconnecting with GENIE: Evaluating the Impact of a Telecommunications Portal on Social Isolation in Long-Term Care

Summary

- Maintaining social relationships improves mental health while helping combat feelings of social isolation. However, older adults living in long-term care (LTC) often face challenges connecting to family members, especially family who live far away.
 - Scheduling conflicts between family members, LTC residents, and LTC staff make it difficult to coordinate real-time in-person and virtual visits. Older adults in LTC may also experience barriers to navigating virtual communications platforms due to lack of familiarity with technology or challenges with hand and finger coordination.
- This pilot project introduced a standalone communications platform in LTC facilities to help address older adults' feelings of social isolation. The platform, known as GENIE, was specifically designed in collaboration with older adults to ensure ease of independent use. Because it is asynchronous (non-simultaneous), GENIE allows users to exchange messages, videos, and photos with family members and friends at convenient times for older adults and LTC staff.
- The goal of the evaluation was to assess the impact of GENIE on older adults' social isolation, loneliness, mood, emotional wellbeing, and sense of belonging.
 - Expected outcomes included improved mental and emotional health status and decreased rates of social isolation, loneliness, and depression in older adults living in LTC.
 - It was also anticipated that family members would experience lower levels of stress and worry about their loved ones, older adults and family members would report satisfaction with the platform, and LTC staff would report satisfaction with the platform and reduced burden at work.
- To assess GENIE's impact, the platform was implemented at 5 LTC homes in rural and urban locations across New Brunswick (intervention (TX) group). 5 additional facilities did not use GENIE (control (CTRL) group). At the end of the project, health outcomes were compared for GENIE users over time as well as between the TX and CTRL groups.
 - The TX group constituted GENIE users (i.e., sent >10 messages on GENIE over 3 months) and included 14 older adults (average age 88 years; 9 females and 5 males). The CTRL group included 14 non-GENIE users (average age 83 years; 9 females and 5 males). Data was also collected from 5 staff members and 15 family members at the intervention sites.

HSPF Focus Area	Increasing independence, quality of life, and promoting healthy lifestyles
Project Start & End Date	August 1, 2021 – March 31, 2024
Organization/Agency	Centre for Innovation and Research in Aging (CIRA)
Location	Fredericton, Moncton, Saint John
Principal Investigator(s)	Justine Estey

Indicator	Impact / Outcome / Result	Quote
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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.

Social Isolation	<ul style="list-style-type: none"> • After using GENIE for 3 months, there was no significant difference in older adults' perceived level of social connections or satisfaction with their social connections/networks. • Observational evidence that was collected from the project team and a small number of LTC staff suggests that GENIE had a positive impact on older adults' engagement with family members. 	<p>GENIE was "life-changing" for one older adult participant because it was the only way they could stay in touch with their family members; they expressed feeling a shift from being distanced and unable to engage in discussion to feeling engaged and active in their loved ones' lives.</p>
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Indicator	Impact / Outcome / Result
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Mental Health	<ul style="list-style-type: none">• After 3 months of GENIE use, there was no significant difference between GENIE users and non-GENIE users' mental health outcomes (i.e., feelings of loneliness and depression), as measured by survey responses to the UCLA Loneliness Scale and Geriatric Depression Scale.• However, after using GENIE, older adults' self-reported emotional wellbeing was significantly higher than the CTRL group (who did not have access to GENIE), as measured by responses to the RAND 36-Item Health Survey.
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Methods and Comparison

The impact of GENIE on older adults' mental and emotional health was assessed using surveys, observational data, and interviews. Outcome comparisons for GENIE users (TX group) were made before and after three months of GENIE use as well as between GENIE users (TX) and non-GENIE users (CTRL).

Conclusions and Lessons Learned

- Observational data suggests that GENIE had a positive impact on the mental and emotional health of the small sample of older adults who participated in the study. However, these findings should be interpreted cautiously due to the subjective nature of observational data. There was also a large amount of missing data and only a limited number of statistically significant results (which is perhaps due to the small sample size of the study). Altogether, these findings indicate that further research is needed to assess GENIE's impact on older adults.
- Due to physical and/or cognitive limitations, most older adults who participated in the study were unable to navigate GENIE on their own.
- Internet stability, family dynamics, family users' access to and comfort with smart technology, LTC staff members' workload, and older adults' cognitive status were key barriers that limited older adults' engagement with GENIE.
- GENIE may not be suitable for all older adults in LTC considering high rates of cognitive decline and LTC staffing shortages. Instead, GENIE may be better suited for more independent older adult populations.
- Some validated measurement scales may not be appropriate for all older adult populations, especially those living in LTC facilities. Research tools that require recollection may not be appropriate for participants who experience cognitive decline.

Recommendations

- Implement GENIE with more independent older adult populations.
- The project team has developed a "Best Practices Guide" based on lessons learned from the pilot project. This guide clearly outlines family member and LTC staff roles and responsibilities and should be used to guide any future implementations of GENIE.
- To ensure accurate and high-quality data, research tools and measurement scales should be adapted to the population being studied (e.g., using measurement scales that are appropriate for adults living in LTC and incorporating more comprehensive observational analysis).

Next Steps

- The 10 LTC sites that participated in the pilot project are interested in continuing to use GENIE with their residents.
- Reconnecting with GENIE has applied for, but not yet secured, scale-up funding to implement GENIE in communities with more independent older adults (e.g., adult day programs and independent living environments). One LTC site is interested in participating in the next phase of the project if funding is secured.

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C0061

Spread and Scale of a Polypharmacy App to Improve Health Outcomes of Older Adults Living in New Brunswick Nursing Homes

Last updated: July 2024

Summary

- Older adults are living longer and taking more medication as they age. Medication is intended to help people stay healthy, and residents of long-term care (LTC) facilities are often prescribed multiple medications at once. However, some medications may cause uncomfortable or dangerous side effects.
 - To ensure patients' medications are safe, doctors or pharmacist sometimes perform a prescription check-up. During a prescription check-up, the doctor/pharmacist reviews all the medications a patient is taking to identify any potentially inappropriate medications (PIMs), and if these PIMs can be reduced or discontinued. While prescription check-ups often lead to improved patient safety, they can be complicated and time-consuming.
- To help make the medication review process easier and quicker, this program introduced a digital application (app) called MedReviewRX. Using information from a patient's medical chart, combined with medication safety information from an electronic tool, MedReviewRX generates a report that summarizes any PIMs and provides suggestions for reducing or stopping unneeded or dangerous medications.
 - The goal of the program was to test an easier way to conduct prescription check-ups while reducing the number of PIMs patients are taking in LTC facilities.
- MedReviewRX was implemented in five LTC facilities across New Brunswick following a needs assessment to understand each facility's process and workflow. Patients at the sites were divided into three groups, with each group serving as its own control group. Outcomes were compared between the control and intervention groups to assess differences in medication deprescription rates.
- 725 older adults participated in the control phase, while 621 of the same older adults participated in the intervention phase. Of the 725 total older adults enrolled in the project, 478 participants identified as women and 247 participants identified as men. 629 participants indicated that their primary language was English and 92 participants noted that their primary language was French.
 - 7 LTC staff members (6 women and 1 man) and 11 prescribers (3 women and 8 men) were also surveyed and/or interviewed on usability and satisfaction with the app.
 - Data on family member/caregiver attitudes toward deprescribing was collected from 38 informal caregivers (26 women and 12 men).

HSPP Focus Area

Using supportive technologies to foster healthy aging at home and in our communities

Project Start & End Date

April 6, 2020 – March 31, 2024

Organization/Agency

Centre for Innovation and Research in Aging (CIRA), York Care Centre, Horizon Health Network, McGill University Health Centre

Location

Fredericton, Saint John, Moncton, Riverview, Quispamsis

Principal Investigator(s)

[Dr. Carole Goodine](#), [Dr. Emily Gibson McDonald](#), and [Justine Estey](#)

Indicator	Impact / Outcome / Result	Quote
<p><i>Full findings are described in project reporting but are not presented as part of this summary. Please contact the project principal investigators for more information.</i></p>		
Safety (Deprescribing PIMs)	<ul style="list-style-type: none"> • 36.4% of the intervention group had one or more PIMs stopped or reduced, compared to only 12.7% of the control group. This was a statistically significant improvement. 	<p><i>"So far, from what I've heard from the drug review team, they really enjoy the app and they want to keep this available after the project is done because they do find it helpful."</i></p>

Indicator	Impact / Outcome / Result
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**Safety
(Deprescribing
PIMs)**

- Compared to the control group, a higher level of deprescribing occurred for the intervention group across all classes of medication except for non-steroidal anti-inflammatories.
 - These included medication classes often associated with negative side effects, such as opioids (deprescribing for 34.4% of users in the intervention group versus 14.4% in the control group) and benzodiazepines (deprescribing for 18.9% of users in the intervention group versus 9.6% in the control group).
- All surveyed prescribers (n=6) indicated that they made changes to patients' medications because of the app.

All surveyed prescribers were also either "likely" or "very likely" to continue to seek out deprescribing opportunities in the future.

Methods and Comparison

- Older adult participants were split into three groups, with each group serving as its own control group. Control and intervention periods varied between groups: Group 1 had a 3-month control period and 9-month intervention period; Group 2 had a 6-month control period and 6-month intervention period; and Group 3 had a 9-month control period and 3-month intervention period. Deprescribing rates were compared using a statistical model.
- Prescriber feedback on app usability, acceptability, and satisfaction was collected through a survey.

Conclusions and Lessons Learned

- MedReviewRX is an effective tool for reducing the use of PIMs at LTC facilities, including medications that are often associated with negative side effects.
- Conducting a needs assessment at the beginning of the project was crucial to understanding each facility's work processes and ensuring a smooth roll-out of the app.
- Allocating time for troubleshooting, technology development, and incorporating user feedback helped promote the app's usability and user satisfaction.
- Some prescribers remain hesitant to use digital apps, preferring paper methods for medication management.

Recommendations

- Before finalizing a research study design, conduct a needs assessment to ensure that participating sites' unique processes and workflows are considered and incorporated.
- Allot sufficient time in the project design for technology updates based on user feedback.
- Educate healthcare providers on the benefits of electronic processes to reduce their hesitancy toward using a digital app.

Next Steps

This project has not yet secured scale-up funding. The project team is currently exploring options for sustainability of the app, including opportunities for commercialization.

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Supporting Seniors' Quality of Life in Long-Term Care – Early Integration of a Palliative Approach to Care

Last updated: August 2024

Summary

- New Brunswick has an aging population, with an increasing number of older adults living in long-term care (LTC). These older adults often have serious long-term health issues, and they will eventually require end-of-life or palliative care services.
- The goal of palliative care is to improve the quality of life of people with serious illnesses and their families by way of early identification, assessment, and treatment of physical, emotional, and spiritual issues to help relieve and prevent suffering.
- Despite the benefits of palliative care for LTC residents and their family members, there are challenges to integrating palliative care into LTC services, including cost, lack of accessibility, and the time commitment required from LTC staff for palliative education, training, and mentoring.
- To help address these challenges, this program introduced a 12-module online palliative care education program for LTC staff, focusing on different end-of-life care topics. The program design originally included in-person peer mentorship, but this was deemed unfeasible due to LTC staffing constraints.
 - The program aimed to improve the experience of LTC staff in applying a palliative approach to care while integrating the palliative approach into LTC homes' usual care processes. In turn, the program was expected to improve the care experience and outcomes of older adults and their families living with serious illnesses.
- The education program was deployed at one LTC home in New Brunswick over a 12-month period, with one new module posted each month. All 168 care staff at the facility, including Registered Nurses (RNs), Licensed Practical Nurses (LPNs), and Resident Attendants (RAs), had access to the program.
- 53 LTC staff (41 women and 12 men) were surveyed on their competence in palliative care before the deployment of the education program and 35 LTC staff (30 women and 5 men) were surveyed on their palliative care competence after the deployment of the program. The pre- and post-survey participants were not all unique, as it was not possible to maintain a paired (matched) sample. 7 additional staff members (6 women and 1 man) were interviewed on their perception of palliative care at the LTC facility before and after the deployment of the education program. Data was also collected from 22 family members of LTC residents.

HSPP Focus Area

Developing innovative care pathways

Project Start & End Date

February 7, 2020 – March 31, 2024

Organization/Agency

Centre for Innovation and Research in Aging (CIRA), Victoria Hospice

Location

Fredericton

Principal Investigator(s)

[Justine Estey](#)

Indicator	Impact / Outcome / Result	Quote
	<p><i>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.</i></p>	
Health Care System Barriers	<ul style="list-style-type: none"> • There were no statistically significant differences in palliative care competency scores before and after the deployment of the education program for RNs and LPNs. • However, following the deployment of the education program, RAs demonstrated a statistically significant ($p < .05$) improvement in the "Physical Needs - Other Symptoms" domain (i.e., symptoms other than pain) of the palliative care competency survey. 	<p><i>"[T]he whole idea of getting to know the resident and family, you're kind of initiating it right from the get go ... because the more you know about that resident, the better end of life care you're going to provide."</i></p>

Indicator	Impact / Outcome / Result
Health Care System Barriers	<ul style="list-style-type: none"> Results from post-program interviews (n=5) suggest that LTC staff members prefer a dedicated, quiet space for learning with access to a computer, as well as more opportunities for in-person training. These results should be interpreted with caution given small sample sizes.
Repeat Usage	<ul style="list-style-type: none"> The total number of LTC resident deaths in October 2020, before the deployment of the education program, was seven. The total number of resident deaths in October 2021, after the deployment of the education program, was four. All four of these residents passed away at the place of their choosing (York Care Centre). There were no distinct differences in the quality, quantity, or type of information in the progress notes on the individual resident charts for residents who passed away before and after the deployment of the program.

Methods and Comparison

LTC staff members completed the Palliative Care Nursing Self-Competence Scale survey before and after the deployment of the education program in order to measure their level of improvement in palliative care competence across ten different domains. Additional staff members were interviewed before and after the deployment of the program on their perception of palliative care at the LTC facility.

Conclusions and Lessons Learned

- Based on the project results, online education is a feasible way to promote a palliative approach to care in LTC facilities. However, further research involving a larger sample size, paired samples, and additional LTC facilities is required to fully assess the impact of the intervention.
- Some LTC staff prefer opportunities for in-person training instead of, or in addition to, online education.

Recommendations

- Conduct a needs assessment across LTC facilities to gain a better understanding of current palliative care practices, best practices, and the online and/or in-person tools that are currently in use.
- Incorporate opportunities for in-person learning into future palliative care education initiatives.
- When funding new programs, make sure to connect programs that are working on similar topics so that they can share lessons learned.

Next Steps

The project results will be shared with other LTC facilities across New Brunswick. However, due to the success of a similar research project, Palliative Approach to Care is not planning to sustain or scale the program.

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C0103

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

Last updated: August 2024

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.

HSPF 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
	<i>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.</i>	
General Health	<p>During interviews, both caregivers indicated that PassiveAware gave them <u>increased</u> insight into the schedule and behaviours of the care receivers, helping them manage care needs.</p> <p>While neither caregiver reported being able to predict a future medical issue while using the technology, both caregivers reported an <u>improvement</u> in care planning and decision making due to a better understanding of the care receivers' behavioural patterns.</p>	<p><i>“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.”</i></p>

Indicator	Impact / Outcome / Result	Quote
Caregiver Burden	<p>The level of caregiver burden, as measured by the Zarit Burden Interview, <u>decreased</u> for both caregivers by the end of the project.</p> <p>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.</p>	<p><i>"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."</i></p>

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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Home-Based and Residence-Based Virtual Reality Training to Increase Rehabilitative Exercise in Seniors

Summary

- Regular exercise can help seniors maintain their mobility and independence and decrease their risk of injury.
 - Despite the importance of exercising, seniors often experience challenges to completing regular exercise, including transportation, cost, weather conditions, low motivation, and fear for their safety.
- This project used virtual reality (VR) to help seniors safely, enjoyably, and effectively participate in an exercise program.
- The project team assessed whether using VR would improve strength, balance and gait, and general overall health. These improvements were expected to lead to fewer falls, emergency room (ER) visits, and hospital stays.
- Two separate groups of seniors were recruited – those living in their own home and those living in a long-term care residence.
- Of the 47 seniors who participated in the project, 24 were given 20-30 minutes of VR exercises 3-5 times per week for 8 weeks (intervention group) and 23 were instead instructed to complete their usual exercises for 8 weeks (control group). At the end of the project, outcomes relating to participants' health and physical function were compared between the two groups.
 - 31 long-term care residents (21 females – average age 85 years; 10 males – average age 79 years) were split between the intervention (16 participants) and control groups (15 participants).
 - 16 community-dwelling seniors (11 females – average age 72 years; 5 males – average age 76 years) were separated into intervention and control groups (8 participants each).

HSPF Focus Area	Increasing independence, quality of life, and promoting healthy lifestyles
Project Start & End Date	April 1, 2019 – March 31, 2023
Organization/Agency	Centre for Innovation and Research in Aging (CIRA), York Care Centre, Bruyère Research Institute
Location	Fredericton, Woodstock, Saint John, Stanley, Gagetown
Principal Investigator(s)	Lisa Sheehy and Justine Estey

Indicator	Impact / Outcome / Result
Falls	<p>Evidence suggests that community- and facility-based VR is a safe way for seniors who met the study's inclusion criteria to exercise.</p> <ul style="list-style-type: none"> • The community-dwelling sample experienced no falls, ER visits, hospitalizations, or long-term care admissions during the project period. • The facility-based sample experienced 4 falls (3 intervention, 1 control), 1 ER visit (control), 2 hospitalizations (control), and 1 death (control). • No falls occurred during VR exercise. • The data compare favourably to the average national senior falls rate (30% annually) and average provincial rate of senior ER visits (6% annually). <p>Due to the small sample size, these findings should be interpreted with caution. These samples may not accurately represent the entire population.</p>
General Health	<p>Although participants reported in interviews that they enjoyed the VR and that it helped them increase their exercise and mobility, there were no statistically significant improvements in the intervention groups' balance, mobility, gait, or quality of life.</p> <ul style="list-style-type: none"> • The facility- and community-dwelling intervention groups did an extra 22 or 23 sessions of exercise respectively, averaging 23 or 27 minutes per session over 8 weeks. <p>Most of the participants who were interviewed indicated that they wanted to continue using the VR after the project was completed.</p> <div style="float: right; border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p><i>"It was excellent to stay on track with consistent exercise."</i></p> </div>

Methods and Comparison

- The VR program's effectiveness and feasibility was measured using tests of physical function, questionnaires, participant interviews, VR system usage data, and an exercise logbook.
- To explore the program's impact on the healthcare system, the project tracked seniors' ER visits and hospital stays.

Conclusions and Lessons Learned

- VR exercise may be a safe way to increase the uptake of exercise for seniors who can sit or stand for at least 20 minutes, have no health conditions that preclude mild to moderate exercise, and have someone available to supervise their sessions. However, further research is needed to assess the specific impacts of VR exercise on seniors' balance, mobility, gait, and quality of life.
- Technology is often presented as a challenge for seniors to learn to navigate. However, seniors' ability to engage with technology should not be underestimated. Qualitative data indicated that seniors familiarized themselves with and enjoyed using the VR technology during the project.
- Healthcare staff found it challenging to supervise VR exercise in long-term care settings due to high existing workload demands and staff turnover (partly due to the COVID-19 pandemic). Adaptations in the project design (e.g., the addition of a volunteer base to supervise VR exercise sessions) helped address this barrier.
- The effects of the COVID-19 pandemic resulted in low sample sizes. This made it difficult to recruit seniors, conduct the study, and reliably assess project outcomes.

Recommendations

- Market the use of technology to seniors.
- Consider enlisting the help of family members and/or volunteers to supervise exercise interventions.
- Seniors living in their own homes and in long-term care residences should consider VR exercise as a safe way to increase their active minutes.

Next Steps

- Three long-term care facilities have expressed interest in continuing to use VR with their residents, dependent on funding for equipment and licensing.
- VR for Rehabilitation has not yet secured scale-up funding. The project is continuing to explore further funding opportunities.

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