Scientific Poster Session

11th Annual Summit of the Knowledge Network in Rural and Remote Dementia Care

Healthcare Delivery Across the Continuum for Rural and Remote Seniors with Dementia

October 23 & 24, 2018

Western Development Museum, Saskatoon, SK

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UNIVERSITY OF SASKATCHEWAN

Tuesday October 23rd, 2018
Scientific Poster Program
6:30 PM – 9:00 pm at the Western Development Museum (Butler Byers Hall)

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Dementia and Rural Aging: Stigma, Implications, and Next Steps

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INTRODUCTION

Background

- Age is the greatest risk factor for dementia, and the number of rural seniors aged 60+ is rising.
- Research suggests that there is prevalent stigma attached to poor cognitive health and dementia in seniors (Alzheimer's Disease International, 2012).
- Stigma refers to an attribute or characteristic which is socially discrediting and may lead to stereotyping, labeling, loss of status, discrimination, and exclusion (World Health Organization, 2018).
- Stigma related to dementia may manifest itself in various ways such as communication and language.
- Stigma linked to dementia may detrimentally impact relationships, interactions with health providers, attitudes about service utilization, and lead to social isolation, feelings of shame, and a decreased quality of life (Riley, Burgener, & Buckwalter, 2014).
- Rural seniors may face unique barriers to accessing information on cognitive health compounded by limited finances, public transportation, and geographic distance (Bacsu et al., 2017).
- In Canada, there is a paucity of research on the role of stigma in relation to dementia within a rural context.

PURPOSE

- To explore rural older adults' perceptions of cognitive health.

METHODOLOGY

- Lay theory (Furnham, 1988) and cultural schema theory (Quinn, 2005) were combined to study rural seniors' perceptions and understandings of cognitive health.
- Guided by ethnography and principles of community-based research, data were collected through two waves of semi-structured interviews with the same group of seniors in two rural communities in Saskatchewan, Canada.
  - 1st wave - 42 participants, February to May, 2014.
  - 2nd wave - 37 participants, July to August, 2014.
- Participant observation was conducted with 5 older adults to observe day-to-day activities related to memory and cognitive health.
- Guided by the theories, thematic analysis was performed to identify key patterns and relationships within the data.
- Although stigma was not the primary focus of the rural cognitive health study, it was identified as an emerging issue.

FINDINGS

Some key factors of stigma related to dementia in the rural communities included:

- **Derogatory language:** usage of negative words and phrases.
  - ➢ *"Bonkers", "basically a vegetable", and "senile"*
- **Inadequate information on cognitive health:** lack of information on cognitive health and dementia.
  - ➢ *"I guess the confusion is dementia, Alzheimer's? Where's the line drawn? Yeah, we joke about it as seniors..."*
- **Fear and anxiety:** strong sense of concern and anxiety in relation to developing dementia.
  - ➢ *"Dementia, I don't want to hear about that, because I'm getting there. You know?"*

DISCUSSION

- Key implications of stigma ranged from social isolation to limited opportunities for dialogue to discuss issues of cognitive health within the communities.
- Further research is necessary to explore the contributing factors, implications, and interventions to reduce stigma related to dementia in rural communities.
- Next steps include a study guided by Solutions Focused Theory (Macdonald, 2007) to examine rural seniors' perspectives on ways to support knowledge and awareness to reduce stigma of dementia.

References
Alzheimer's Disease International. (2012). *World Alzheimer report 2012: Overcoming the stigma of dementia.* Retrieved from, https://www.alz.org/document/world_report_2012.pdf.
Bacsu, J., Abonyi, S., Viger, M., Morgan, D., Johnson, S., & Jeffery, B. Examining rural older adults' perceptions of cognitive health. *Canadian Journal on Aging,* 36(3), 318-327.
Furnham, A. (1988). *Lay theories: Everyday understanding of problems in the social sciences.* Oxford, England: Pergamon Press.
Link, B., & Phelan, J. (2001). Conceptualizing stigma. *Annual Review of Sociology*, 27(1):363–385.
Macdonald, A. (2007). *Solution-Focused Therapy: Theory, Research & Practice*. London, UK: Sage Ltd.
Quinn, N. (2005). *Finding culture in talk: A collection of methods.* New York, NY: Palgrave Macmillan.
Riley, R., Burgener, S., & Buckwalter, K. (2014). Anxiety and stigma in dementia: A threat to aging in place. *Nursing Clinics of North America*, 49(2), 213-231.
World Health Organization. (2018). Ageing and lifecourse. Retrieved from, http://www.who.int/ageing/features/faq-stigma/en/.

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Dementia-related education and support service accessibility and use in rural areas: Barriers and promising solutions

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University of Saskatchewan, Centre for Health and Safety in Agriculture, Rural Dementia Action Research Team

Background

Support and education services can help people with dementia and caregivers live well in their communities, but service availability and accessibility may be affected by rurality. It is important to understand the scope of services available to and needed by rural populations, and any barriers to their accessibility and use. It is also important to examine possible solutions to barriers, so services can better meet support and education needs. Our team aimed to examine these issues via a scoping review, addressing the following questions in relation to people living with dementia and their caregivers in rural areas:

1) What are their education and support service ***needs***?

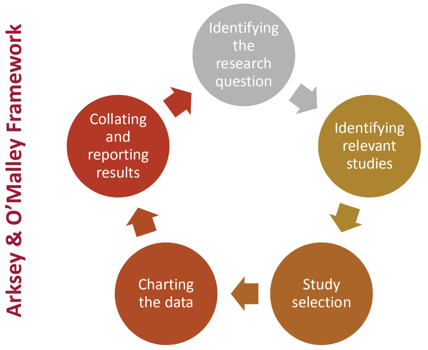
2) What ed. and support services are ***available*** and ***used***?

3) What ***barriers*** to accessibility and use are reported?

4) What potential ***solutions*** to barriers have been identified?

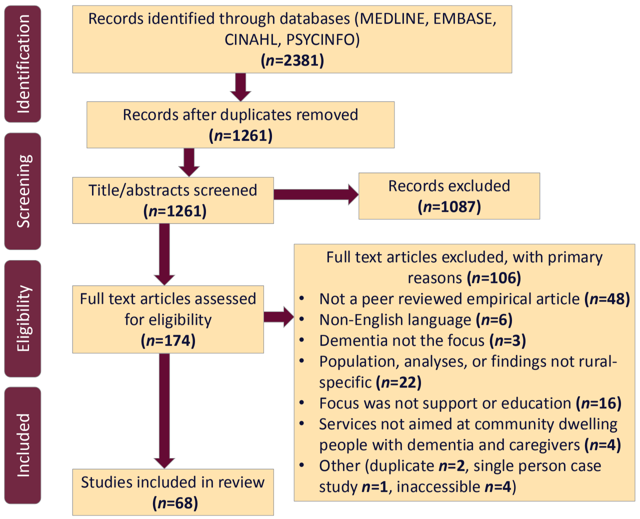
Methods

This work was guided by Arksey and O'Malley's (2005) five-step framework for scoping reviews, and additional recommendations from Levac and colleagues (2010).



Search terms related to four main concepts: **dementia**, **rurality**, **support**, and **education**. Team members acted as secondary independent reviewers during study screening, and met bi-weekly to discuss progress, challenges, and findings.

PRISMA diagram of the study selection process



Records identified through databases (MEDLINE, EMBASE, CINAHL, PSYCINFO)
(*n*=2381)

Records after duplicates removed
(*n*=1261)

Title/abstracts screened
(*n*=1261)

Records excluded
(*n*=1087)

Full text articles assessed for eligibility
(*n*=174)

Full text articles excluded, with primary reasons **(*n*=106)**
- Not a peer reviewed empirical article **(*n*=48)**
- Non-English language **(*n*=6)**
- Dementia not the focus **(*n*=3)**
- Population, analyses, or findings not rural-specific **(*n*=22)**
- Focus was not support or education **(*n*=16)**
- Services not aimed at community dwelling people with dementia and caregivers **(*n*=4)**
- Other (duplicate ***n*=2**, single person case study ***n*=1**, inaccessible ***n*=4**)

Studies included in review
(*n*=68)

Findings

Needs

Education about available resources was a major need. When needs were ranked, top needs included information on dementia, treatments, coping with responsive behaviours or symptoms, meaningful activities, resources, and caregiving and family dynamics. Needs differed by role (caregiver or recipient), sex, urban or rural residence, and dementia stage.

Availability

Limited and insufficient availability of education and support services was reported, especially day programming and respite care (in-home, evening, weekend, and emergency). Insufficient counseling and support services and early stage support were also reported. Choices in type, amount, and provider of services were limited even when services existed.

Use

Use of education and support services varied from 15% to 100% of rural participants. Home maintenance and services providing direct assistance (often in-home) to the person with dementia were used most frequently; support groups were used minimally. Gendered norms around caregiving, independence, and coping may affect use of services.

Barriers (themes)	Solutions
Knowledge of services *Poor visibility of services, low awareness of services, how to use them, and benefits of use*	- Use of a care manager, First Link, or program participation as a link - Education on services and benefits - Interagency collaboration, referral - Community education
Practicality and resources *Remoteness, travel and transportation, costs, need for respite, structure of service provision*	- Technological service provision - Help with transportation, respite - Free or reduced cost programs - In-home, outreach, local services - Fewer program sessions - Inter-agency accessibility solutions
Values and beliefs *Valuation of independence, reluctance to seek help, privacy concerns, beliefs around caregiving, denial of symptoms*	- Educating users on benefits of services use in their situation - Initial "foot in the door" program participation - Linking former to new caregivers
Negative judgements & stigma *Stigma around dementia and service use, fear of abilities or performance being judged negatively*	- Individual intervention - Services via telephone or home visits - Public education, and increased contact with people with dementia
Unacceptability of services *Perceptions of services/format as not suited to stage, inappropriate for needs, incompatible with personal background, characteristics, and interests, non-person-centered, inflexible, and impermanent*	- Person-centered services - Consideration of interests, characteristics, and backgrounds - Tailored presentation of information - Direct educational approach - Culturally safe services - Services tailored to subgroups - Program assessment and flexibility

Conclusions

While numerous barriers existed to education and support service use among rural populations, promising solutions and innovations within rural service provision were evident. Strategies to mitigate barriers should be considered in the implementation of rural dementia services. Few studies examined sex and gender; their incorporation into future research is required to understand how they intersect with rurality and service needs, use, and barriers.

References

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology, 8(1)*, 19-32. doi:10.1080/1364557032000119616

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: Advancing the methodology. *Implementation Science, 5:69*. doi:10.1186/1748-5908-5-69

The Impact of Leadership and Culture on Sustainability of a Dementia-Specific Training Program in Rural Long-Term Care Homes

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Introduction

An individual with dementia may experience changes in personality, reasoning, judgement, memory, and behaviours. Verbal and physical aggression and resistance to care are recognized as responsive behaviours – an expression of unmet need and means of communication (Talerico & Evans, 2000).

A dementia-specific training program can provide staff with the skills to safely minimize and de-escalate responsive behaviours (Morgan et al., 2005; Morgan et al., 2007).

The Conceptual Framework

The **Integrated Promoting Action on Research Implementation in Health Services (i-PARIHS)** was used to guide the current research, to gain an understanding of the factors that are related to the sustainability of evidence.

In the i-PARIHS framework:

Successful implementation of evidence-based practice is the result of the "**facilitation** of an **innovation** with the **recipients** in **their (inner and outer) context**" (Harvey & Kitson, 2015, pg. 40).

The Intervention

- The Gentle Persuasive Approaches (GPA) program is a dementia-specific 7.5 hour evidence-based education program designed for staff who care for older adults who display responsive behaviours.

- The goal of the GPA curriculum is to educate staff on how to use a person-centred, compassionate, gentle approach and respond respectfully, with confidence and skill, to responsive behaviours associated with dementia.

Research Purpose

The purpose of this research was to gain an understanding of the relationship between **leadership** (a characteristic of inner context) and **sustainability** of a dementia-specific training program for staff in rural LTC homes.

Methods

Design: An explanatory, holistic, multiple-case study design (seven cases)

<u>**Retrospective Study (5 cases)**</u>

Design: cross-sectional, retrospective qualitative research design

Site selection: Five homes were purposively sampled from rural LTC homes with similar number of residents and *where the GPA program had been fully installed* (Fixsen et al., 2005).

Participants: administrators, Directors of Care, Managers, nurses (RNs, RPNs, LPNs, Clinical Nurse Leaders) and nursing aides (NAs).

Data Collection:

- Semi-structured interviews (n=15)
- Focus groups (n=4)

<u>**Prospective Study (2 cases)**</u>

Design: prospective longitudinal, multi-site, comparative case study design *that followed events over a 15 month period.*

Site selection: Two homes were purposively sampled based on "comparison of difference" design logic (Fitzgerald & Dopson, 2009).

Data collection:

- Direct observations (24 hrs/home)
  - Shadowing (15 hrs/home) and brief discussions with staff
- Semi-structured interviews (n=15) with staff in all departments
- Document reviews (i.e., communication logs, incident reports, 12 resident charts, staff meeting minutes) beginning three months prior to GPA program installation phase.

Data Analysis

Retrospective Study: qualitative, inductive approach, using constant comparative method (Glaser & Straus, 1967; Charmaz, 2006).

Prospective Study:

i. **Within case analysis:** inductive, grounded approach, using the constant comparative method to analyze the three types of data.

ii. **Cross case analysis:** examined overall patterns for similarities and differences across the two homes.

Overall conclusions: an interpretive pattern-matching approach was used to compare the pattern of findings between the two studies.

Findings

There was *variability across the homes in terms of sustainability* of the program (continuum of low, medium, and high)

In the <u>low sustainability</u> homes (n=2)
- there was no sustainability of the GPA program
- did not move beyond the beginning of initial implementation phase as described by Fixsen et al. (2005)

In the <u>medium sustainability</u> homes (n=3)
- there was a higher degree of sustainability of the GPA than the low sustainability homes
- failed to move beyond the initial implementation stage (Fixsen et al., 2005)

In the <u>high sustainability</u> homes (n=2)
- high degree of sustainability compared to the low and medium sustainability homes
- achieved full operation (Fixsen et al., 2005) and were in the process of moving to innovating the GPA program

Sustainability of the GPA program strongly influenced by the *characteristics (skills, behaviours, attributes) of the formal leaders.*

- <u>Lower sustainability</u> homes had leaders with negative characteristics (e.g., lead with fear) that negatively impacted the sustainability of the GPA program.
- <u>Medium sustainability</u> homes had leaders who displayed more positive than negative leadership characteristics as compared to the low sustainability homes, but they were not as frequently used or as high in quality as the leaders in the high sustainability homes.
- <u>High sustainability</u> homes had leaders who displayed positive leadership characteristics that influenced the sustainability of the GPA program.

In the high sustainability homes, leadership was identified/observed by staff as strong.
- Leadership displayed higher quality skills (e.g., relationship building, problem solving, team building, communication) and practicing GPA was an expectation.

The *culture of care* that the formal leaders created through specific leadership characteristics influenced sustainability.

- The characteristics of the leaders created a continuum of cultures ranging from institutional (low and medium homes) to person-centred (high homes).
- The more institutional the culture of care of care, the lower the sustainability of the GPA program.
- The more person-centred the culture of care, the higher the sustainability of the GPA program.

Conclusions

Unlike other studies (Caspar et al., 2016; Rapaport et al., 2017), the GPA program achieved short-term sustainability in some of the LTC homes beyond six months.

This research supports previous researchers who found that the development of positive relationships and staff empowerment through an interactive approach (e.g., using feedback, positive communication, role-modelling, coaching) are related to the sustainability of programs, innovations, and person-centred care.

A key finding in this study was that the characteristics of formal leaders created a culture of care that could either be a barrier or a facilitator to sustainability of the GPA program. This finding is consistent with previous researchers who indicated that formal leaders create the culture in the LTC home which influences the ability of staff to perform person-centred care (Browie & Nancarrow, 2013; Orelland, Manthorpe & Moriarty, 2017).

Recommendations for Clinical Practice

- It is important to provide leaders with training that focuses on leadership styles and characteristics that empower staff so that they can be supported to practice person-centred care.

- In the i-PARIHS framework, leadership characteristics need to be taken into consideration when implementing evidence based-practices. In refining the framework so that it fits better with the chaotic and challenging implementation process in LTC homes, the i-PARIHS framework should **include leadership** in conjunction with **facilitation, innovation, context, and recipients.**

Acknowledgements

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GPA Gentle Persuasive Approaches

Palliative Care for People With Alzheimer's Disease or Other Dementia Living in Rural Areas: A Scoping Review In-Progress

Valerie Elliot, Debra Morgan, Julie Kosteniuk, Amanda Froehlich Chow, Melanie Bayly, Allen McLean, Megan E. O'Connell
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Background:

What is palliative care?

- **Specialized care for people facing life-limiting illnesses** like dementia[1]
- **Advanced disease stage services provided by health professionals for added comfort and relief** of patients and support and assistance of families[2]
- Services **can be in-hospital, at an outpatient clinic or at home**[3]

Why is palliative care for people with dementia important?

- It can play a **key role in improving and maintaining the best quality of life and death** for people with dementia and their families[1,2]
- **Needs are increasing:** aging population demands more palliative care services where people with dementia and other chronic conditions are living longer[4]; early planning should begin soon after dementia diagnosis[5]
- People with dementia often face **gaps in palliative care**[6] and living in **rural areas can create additional challenges** to accessing and utilizing care services[7]

Objectives:

- **Explore and summarize evidence** regarding palliative care specifically for people dementia living in rural areas
- **Map the evidence & identify gaps**
- **Help inform potential future research and efforts to improve the quality of life and death** for people with dementia living in rural areas

Methods:

Arksey & O'Malley[8] Framework:

I. Identification of the research question(s)
II. Identification of relevant studies
III. Study selection (in process)
IV. Charting data
V. Collating, summarizing, and reporting results

I. Research Questions:

1. What **palliative care services or interventions** have been identified?
2. What **advantages and disadvantages** of palliative care services or interventions have been identified for **people with dementia and their family caregivers**?
3. Does **degree of utilization** differ by individual characteristics? (e.g., sex, age, place of residence, socio-economic status)
4. What are the **barriers and facilitators to accessing and utilizing** palliative care services or interventions?
5. What **study recommendations** have been made regarding rural dementia-specific palliative care services and research?

II. Identification of Relevant Studies:

Search Strategy
(OR within columns; AND between columns)
(Terms mapped to subject heading specific to each database)
MEDLINE, EMBASE, PSYCINFO, CINAHL

Palliative (textword)	Dementia (keyword)	Rural (abstract or title)
palliative*	dement*	rural*
end of life*	alzheimer*	remote*
terminal*	lewy* bod*	isolate*
dying*	creutzfeldt	north*
death*	jcd	sparse population
late stage*	cjd	sparse populations
end stage*	pick* disease	
advanced stage*	huntington*	
hospice*	primary progressive aphasia	
advance care*		
advance directive*		
advance planning*		

III. Study selection:

Inclusion criteria	Exclusion criteria
Peer-reviewed, original research only	Letters to the editor, opinion letters, commentaries, dissertations, study protocols reviews, policy papers, reports, book chapters, and all other non-peer-reviewed documents and documents in non-peer-reviewed journals
English language only	Publications written in a language other than English
Relevant to the research question(s) • Palliative care services or interventions specific to AD or other dementia • Rural Settings (can include urban if rural-urban comparison is made)	Non-relevant to the research question(s) • Not specific to AD or other dementia • Not related to palliative care services or interventions • Non-rural settings (unless rural-urban comparison is made)

IV. Data Charting

- ➢**Study characteristics:** author, year, country, objective, population, design
- ➢**Individual characteristics (of persons with dementia and their family carers)**: sex, age, place of residence, socio-economic status
- ➢**Additional information and findings:** definitions of palliative care and rural, types of palliative care service or intervention, advantages/disadvantages, degrees of utilization, barriers/facilitators to access and utilization, main findings, study conclusions and recommendations

V. Collating, summarizing, & reporting:

- Collate by publication year, country, and type of palliative care service or intervention
- Thematic analysis of findings
- Address research questions, identify gaps
- Make recommendations for future research

References:

[1] Center to Advance Palliative Care (2018). Palliative Care. Dementia and Palliative Care. Available at: https://getpalliativecare.org/whatis/disease-types/dementia-palliative-care/
[2] Alzheimer's Society – United Against Dementia (2018). End-of-life care. Available at: https://www.alzheimers.org.uk/get-support/help-dementia-care/end-life-care
[3] Center to Advanced Palliative Care (2018). Alzheimer's Disease and Palliative Care. Available at: https://getpalliativecare.org/whatis/disease-types/alzheimers-disease-palliative-care/
[5] Alzheimer Society of Canada (2018). Importance of palliative care. Available at: http://alzheimer.ca/en/Home/Living-with-dementia/Caring-for-someone/End-of-life-care/Importance-palliative-care
[6] Canadian Institute for Health Information (2018). *Access to Palliative Care in Canada*. Available at: https://www.cihi.ca/sites/default/files/document/access-palliative-care-2018-en-web.pdf
[7] National Rural Health Alliance Inc. (October 2012). Fact Sheet 34-Palliative Care in Rural and Remote Areas. Available at: http://ruralhealth.org.au/sites/default/files/publications/fact-sheet-34
[8] Arksey, H & O'Malley, L (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology,* 8:1, 19-32.

Canadian Therapeutic Recreation Association
Association Canadienne de Loisir Thérapeutique

Mobile Recreation Therapy Services; Private Practice, In Rural Saskatchewan and Surrounding Area.

Donna BoserKelly, Recreation Therapist

Saskatchewan Association of Recreation Professionals

Developing Strengths and Resources in planning goals, dreams and aspirations, Therapeutic Recreation Practice: A Strengths Approach. (Anderson and L.Heyne, 2012 pg.66).

Recreation Therapy Designed Referral form used by Physicians.
Set up appointment, meet with client and family using the Leisure Diagnostic Battery assessment and the results will identify what the strengths are and or areas to work on in the various domains.
A Recreation Treatment plan is developed and designed with the clients interests, medical information and abilities.
Set goals and Dare to Dream.
Documentation of assessment summary, progress notes and plan updates.
Work closely with family, health professionals in the community along with volunteers, friends and organizations.
Visit one time per week for 8 weeks.
Reassess, results show any changes to be made or maintained.
The client is discharged or continues with the Mobile Recreation Therapy Services

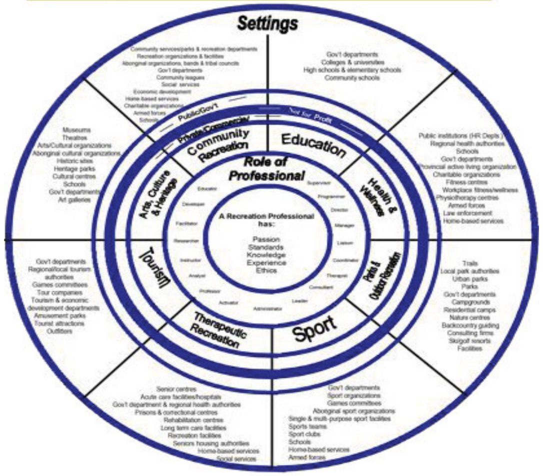
Recreation Therapists assess, plan, implement and evaluate and coordinate recreation based treatment plans for people of all ages and abilities.

The Mobile Recreation Therapy service is delivered on site and offered in clinical, residential and community settings.
An insurance is purchased yearly
Town Business Licence is purchased yearly
Organizations: CTRA and SARP membership renewal annually
Own vehicle
Equipment and supplies
<u>Quality Assurance checklist:</u>
Qualifications – Proof of Training
Ongoing education is offered with the organizations
Documentation, Physicians orders for Leisure modifications
Physical environment, calendar for each month
Program evaluation.
Activity Analysis form completed for all activities offered
Activity program review
Programs offered that meet the diversity of clients needs and abilities.
Advocate and recommendations on a continual basis (Martini, Weeks and Wirth 2011,p.303).

Leisure Ability Model:
Functional intervention – Improve functional ability
Leisure Education– Acquire Leisure Knowledge and skills
Recreation Participation – Engage in organized participation opportunities.(Stumbo, Peterson, 2000, p.15).

Codes of Ethics, Values and Standard of Practice, Recreation Therapists, as members of Saskatchewan Association of Recreation Professionals and Canadian Therapeutic Recreation Association.
We value professional leadership in the leisure service field.

Saskatchewan Association of Recreation Professionals
Model of the Recreation Profession in Saskatchewan



© S.A.R.P., 2004 Based on a model developed by the Alberta Recreation & Parks Association, with permission.

This is my friend and client Betty she has advanced dementia. She was referred by her Doctor. We work closely with her family and her friends in the community. Her assessment showed strength in music, sport and walking. An intervention and program began weekly. Her abilities have been improving her sessions have been documented and assessment results available using The Leisure Diagnostic Battery Assessment, Activity Type, Preference Inventory (permission by signing a waiver and also with family). Betty is becoming more social and she is now playing the piano, before she was sleeping a lot, now she enjoys the lifestyle she used to have which provides her with an improved quality of life.

Physical, Social, Emotional

Quality Of Life Domains

Spiritual and Cognitive

Therapeutic Program Design, (Peterson, Stumbo, 2000, p.79)

Understanding How Rural Primary Health Care Teams Collaborate To Deliver Dementia Care

Amanda Froehlich Chow,[1,2,3] & Debra Morgan,[1,2,3] Melanie Bayly,[1,2,3] Julie Kosteniuk , [1,2,3] Valerie Elliot[1,2,3] & Megan O'Connell[1,3,4]
University of Saskatchewan[1], Canadian Centre For Health and Safety in Agriculture[2], Rural Dementia Action Research Team RaDAR)[3], Department of Psychology[4]

Background

- Individuals living in rural areas have limited access to dementia-specific primary health care (PHC) services (Ogilvie & Eggleton, 2016). Moreover, little is known about the processes for interdisciplinary team-based dementia care, particularly in rural settings (Morgan et al., 2015).
- Rural Dementia Action Research (RaDAR) Team is implementing a 5-year study to identify and develop evidence-based best practices for delivering comprehensive, integrated PHC for dementia in rural settings.
- As part of this work a scoping review of literature was conducted to identify approaches to team-based PHC aimed at supporting those living with dementia in rural areas (Froehlich Chow, Morgan, Bayly, Kosteiniuk & Elliot, In review).
- Findings of this scoping review indicated that there was a large variation in the degree of collaboration and interaction among team members. Further, many teams were located in urban areas (outside of the rural community) and did not consist of local rural PHC professionals.
- Identified gaps in the literature included the lack of information about the processes that PHC teams *located in rural areas* engage in when diagnosing and managing the care of individuals living with dementia, and how teams work to develop solutions to barriers faced when implementing dementia care approaches in rural settings.

Purpose

- To understand how rural PHC teams are collaborating to deliver care to those living with dementia. Collaborative processes among PHC teams caring for older adults with chronic conditions will also be explored to determine if these processes can be applied to rural dementia care.

Guiding Research Questions

1) What specific strategies do rural PHC teams apply when working collaboratively?
2) What are the experiences of rural PHC team members when collaborating to deliver care?
3) Has the RaDAR project changed the way participating PHC teams collaborate to provide care to both those living with dementia and older adults with chronic conditions?
4) What are the key challenges that rural PHC teams face; and (if applicable) what solutions have teams developed to overcome these challenges?

Methods

- This study will be guided by a community-based research approach and employ a mixed methods design.
- *Participants* will include 4 rural PHC teams from southern Saskatchewan who are currently working with the RaDAR project.
- Data will be collected from the following sources:
  1) Information about PHC team members' experiences and strategies associated with collaborative care will be assessed via one-on-one interviews with PHC team members.
  2) Direct observation at PHC team meetings and document review methods will be employed to gather further information about participant experiences and better understand how PHC teams collaborate.
  3) Annual survey data collected by PHC Facilitators that include measures of interdisciplinary collaboration within PHC teams will also be reviewed for secondary analysis.
- Thematic analysis will be employed to identify types of strategies reported during one-on-one interviews.
- Analysis of direct observation and document review will assist in confirming or refuting themes identified in the interview data. Retrospective analysis of survey data will be used to rank participating PHC teams by degree of interdisciplinary collaboration.
- Data triangulation will support cross verification of the data gathered from each method (interviews, direct observation, document review and surveys); in turn increasing the credibility and validity of the results.

Work to Date

- Three of the four teams have been identified and enrolled with the RaDAR project.
- Semi-structured interview guide has been developed to facilitate interviews.
- Consultations are underway with PHC team facilitators to coordinate the data collection logistics and timeline.

Table 1. Description of Primary Health Care Teams enrolled in the study

Team 1	Team 2	Team 3
• PHC Team established in 2013 • Population: 1,140 plus surrounding area • 7 members • 3 family physicians • 1 nurse practitioner • 1 occupational therapist • 2 home care nurses	• PHC Team established in 2014 • Population: 10,870 plus surrounding area • 10 members • 4 family physicians • 1 nurse practitioner • 1 occupational therapist • 1 home care nurses • 3 social workers	• PHC Team Established in 2010 • Population approximately 2,000 across three communities • 8 members • 3 family physicians • 1 nurse practitioner • 2 home care nurses • 1 occupation therapist • 1 physical therapist

Impact

- The overall findings from this study will be used to inform the ongoing research of the RaDAR team which aims to implement a sustainable and scalable PHC dementia model for rural communities.
- Successful strategies and lessons learned will be shared and incorporated (where applicable) among PHC teams participating in the RaDAR project to enhance team-based collaborations.
- Incorporated strategies will then be evaluated for effectiveness as part of the RaDAR team's commitment to developing an inventory of evidence-based best practices for supporting the delivery of comprehensive, integrated rural PHC for dementia.

References

- Froehlich Chow, A., Morgan. M., Bayly, M., Kosteniuk, J. & Elliot, V. (2018). Collaborative Approaches to Team-Based Primary Health Care for Individuals with Dementia in Rural and Remote Settings: A Scoping Review. *Canadian Journal on Aging*. In Print.
- Morgan D, Kosteniuk J, Stewart N, O'Connell M, Kirk A, Crossley M, Dal Bello-Haas V, Forbes D, Innes A. (2015). Availability and primary health care orientation of dementia related services in rural Saskatchewan, Canada. Home Health Care Services Quarterly, 34(3): 137-158.
- Ogilvie, K. K., & Eggleton, A. (2016). *Dementia in Canada: A National Strategy for Dementia-friendly Communities*. Retrieved from http://www.alzheimer.ca/~/media/Files/national/Advocacy/SOCI_6thReport_DementiaInCanada-WEB_e.pdf

A Community Choir to Facilitate Psychosocial and Cognitive Health for Caregivers and Persons with Dementia

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Rationale

- Dementias in general, and Alzheimer's disease (AD) in particular, cause progressive neurodegeneration impacting psychosocial function and cognitive frailty[1,2].
- Nonpharmacological interventions have previously shown promise in slowing dementia-related decline[3].
- Community choirs may elucidate benefits for both caregivers (CG) and persons with dementia[4] (PwD): engaging body and mind, as well as lessening other burdens (e.g., stress, isolation)[5,6,7].
- This study examined the effect of community choir participation on psychosocial (e.g., depressive symptoms) & cognitive (e.g., memory) health of PwD & their caregivers.

Research Questions

1. Does community choir participation improve the cognitive function of PwD and their caregivers?
2. Does community choir participation reduce depressive signs and symptomology of PwD and their caregivers?

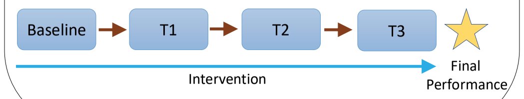
Participants

- Participants (initially n=28) included members from the first of three planned cohorts.
- 3 participants chose to withdraw prior to the baseline assessment resulting in a total of **n=25** at baseline.

Characteristic	Caregivers	Persons with Dementia
n	13	12
Age	67.62 (7.24)	78.67 (9.67)
Sex	4 male; 9 female	4 male; 8 female
Mean Education Level	Bachelor's Degree	Bachelor's Degree

Design

- In keeping with a philosophy of the CFN, our design encouraged participants to become involved in the research process (eg. assisting in participant recruitment).
- This investigation employed a longitudinal burst design, with data being collected at an initial baseline assessment and for 3 follow-up visits.
- Between assessments, all participants attended the community choir once per week, culminating in a final performance following the last assessment.
- Assessments included markers of social inclusion, health, affect, cognition, depression, quality of life, and neuropsychological function.



Baseline → T1 → T2 → T3

Intervention

Final Performance

Measures

1) Mini Mental State Examination (MMSE)

- 30 point questionnaire examining global cognition[8] through the following domains:
  - Orientation/Registration
  - Attention/Calculation
  - Recall
  - Language

A score ≤ 23 is indicative of cognitive impairment

2) Word Recall

- Measure of episodic memory based on Hultsch *et al.* 1998[9].
- 30 words belonging to discrete categories (insects, furniture, fabric, spices, family designations) were presented in a mixed list format.
- Participants were given 2 minutes to study the words & 5 minutes to recall them.

3) Patient Health Questionnaire 9 (PHQ-9)

- 9 question instrument for screening, diagnosing, & monitoring signs and symptoms of depression[10].
- DSM-IV criteria is combined with other major symptoms to facilitate deriving a summary score reflecting individual differences in depressive symptoms.

Statistical Procedure

- Multilevel modelling was employed to index changes in performance and function pursuant to choir participation.
- Models employed full information maximum likelihood to provide robustness in response to longitudinal attrition.
- Change in cognition and depressive symptoms was modeled as a function of time (weeks) since baseline assessment and cognitive status subgroup.

Results

Q1: Does choir participation improve cognition?

MMSE Model	B	SE	t	P value
Intercept	29.54	0.91	32.33	< 0.001*
Time	-0.07	0.27	-0.26	0.799
Status	-9.15	1.29	-7.08	< 0.001*
Time * Status	0.62	0.38	1.66	0.114

W. Rec. Model	B	SE	t	P value
Intercept	16.00	1.04	15.34	< 0.001*
Time	1.23	0.36	3.41	0.001*
Status	-13.24	1.50	-8.80	< 0.001*
Time * Status	-0.94	0.51	-1.84	0.072

Interpreting the Models

Intercept: Performance of the CG at baseline.

Time: Change in measure for CG per unit increase in time.

Status: Baseline difference b/w CG & PwD on measure.

Time*Status: Difference in slope b/w CG and PwD.

Q2: Does the choir lessen depressive signs & symptoms?

PHQ-9 Model	B	SE	t	P value
Intercept	4.82	1.07	4.50	< 0.001*
Time	-1.10	0.27	-4.01	< 0.001*
Status	-1.36	1.55	-0.88	0.388
Time * Status	0.57	0.39	1.43	0.156

Interpreting the Model

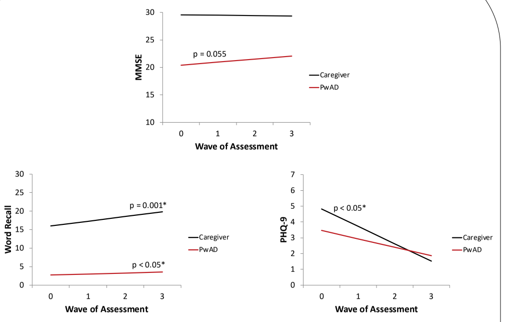
Intercept: Performance of the CG at baseline.

Time: Change in measure for CG per unit increase in time.

Status: Baseline difference b/w CG & PwD on measure.

Time*Status: Difference in slope b/w CG and PwD.

Change In Function Across Intervention



Slopes for change in performance over time were derived for all measures, with caregivers specified as the reference group (coded as 0). In two instances (Word Recall & PHQ-9), rate of change for the caregiver achieved significance. For persons with dementia, a significant gain in word recall & a trend toward significant gain in MMSE was observed.

Conclusions

- Preliminary findings for PwD indicated-significant episodic memory improvement with a similar trend observed for MMSE gains.
- Caregivers exhibited significant reduction in depressive symptoms on the PHQ-9; corresponding gains in episodic memory were seen for caregivers.
- Choirs are an inexpensive and socially-focused intervention that could have far-reaching implications, reducing healthcare costs and enhancing quality of life for PwD and their caregivers.

Limitations and Future Directions

- A primary limitation is the small sample size and its implications for the quantitative modeling; data will be pooled across the next two cohorts to address this issue.
- There is a ceiling effect for the MMSE, common for healthy populations of this age, limiting elucidation of caregiver benefit for this measure of global cognition.
- Beginning in September, an additional 2 community-dwelling cohorts as well as a residential care cohort will be undertaking the choir initiative.

More Information

Karl Grewal was supported by the CFN Summer Student Award. This project was supported by grants from the Alzheimer's Society of Canada & the Pacific Alzheimer's Research Foundation.

References

1. Wetzels R., Zuidema S., Jansen L., Verhey F., Koopmans R. *International psychogeriatrics / IPA.* 2010.; 2. Dugeon S. *Alz. Soc. of Canada.* 2010.; 3. Sampath P., Forbes D., Barton S., Blake C. *Perspectives.* 2015.; 4. Ruda K., J. R. *Neuropsychiatria i neuropsychologia.* 2013.; 5. Moran-Ellis J., Alexander V.D., Cronin A. *SAGE*, 2006.; 6. Elliott M, Gardner P. *Dementia (London).* 2016.; 7. Scott S.C.E., Kidd A.C. *Euro. Ger. Med.* (2016). 8. Folstein, M., Folstein, S.E., McHugh, P.R. *Journal of Psychiatric Research.* 1975.; 9. Hultsch D.F., Hertzog C., Dixon, R.A., Small BJ. *Cambridge Univ. Press.* 1998.; Kroenke K., Spitzer R.L., Williams J.B. *J. of Gen. Int. Med.* 2001.

Supporting a New Caregiving Community towards Improved Wellness

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Jillian Gushulak, RN, BSN

OBJECTIVES

Family carers are the backbone of the health care system, expected to provide care and support for an increasing number of older adults requiring palliative care to remain in their homes and communities. Carers often experience negative impact on their quality of life as well as emotional and physical exhaustion; therefore they require more support than they currently receive [1]. Given the growing role of technology in our everyday lives, the potential of internet-based tools to assist with caregiving is significant; however, further research is required to develop appropriate internet-based tools for caregiving needs [2]. The purpose of this research is to develop an accessible, feasible, innovative, and community-based technological application, or *app*, to create a community of carers, where they can find information, support, and explore options for respite.

METHODS

Mixed methods and Agile methodology are being used to develop and test an app with and for family carers [3]. The interdisciplinary research team consists of family carers, a community partner, and an app developer. Data collection consists of a multiple-baseline design for quantitative measures and qualitative data from focus groups. Agile requires continuous teamwork, incremental cycles of development, cooperative relationships, and an adaptive feedback cycle.

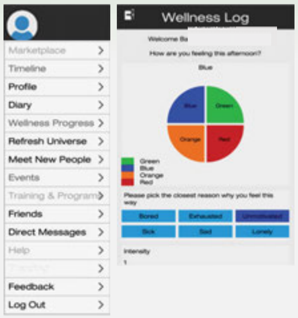
RESULTS

During Stage 1 of this research project, four focus groups were conducted with eight family caregivers to guide the app developer to form virtual caregiving communities, provide information and resources, and improve wellness. Quantitative data measuring each participant's social networks, levels of depression, social support, and satisfaction with life was obtained at the beginning of the study and tracked in and after subsequent focus groups. Currently, the quantitative data has showed no significant results due to the application only being released for the Stage 2 of the project. Qualitative data was collected through discussion questions and participant interactions, revealing the multiple roles caregivers take on and a diversity in their use of smartphone technology and the ways in which technology can be used to improve lives. See the charts below with data results.

CONCLUSION

These results provide evidence that these apps can improve the carer experience and improve social connectedness. Participants also showed that there are many ways that the application can be tailored to their experiences and aid in their caregiving experience. The app developer is now taking the data from the focus groups and using it in changing and developing the app.

Examples of the application

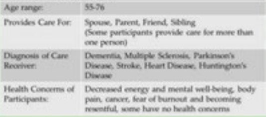


Welcome Ba

How are you feeling this afternoon?

Please pick the closest reason why you feel this way

Poster number: P095



Demographics of Participants	
Age range:	55-76
Provides Care For:	Spouse, Parent, Friend, Sibling (Some participants provide care for more than one person)
Diagnosis of Care Receiver:	Dementia, Multiple Sclerosis, Parkinson's Disease, Stroke, Heart Disease, Huntington's Disease
Health Concerns of Participants:	Decreased energy and mental well-being, body pain, cancer, fear of burnout and becoming resentful, some have no health concerns

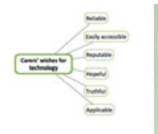
Participant demographics from the first focus groups

FUTURE STEPS

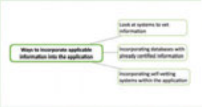
The application is being improved and tested through the Agile Methodology method. Four more focus groups are being conducted to collect more data on the application and to tailor the application towards the carer experience. The public application launch is scheduled for the spring of 2019.

Participants previous experience with technology varied

> *"I am very much of a dinosaur when it comes to phones."*
>
> *"I've had decades of being a caregiver. I have been what you might call a tech – a digital evangelist."*



The graphics to the left show the themes found in the transcripts where participants identified their uses and wishes for technology



The graphics to the right show the major themes that the focus group participants identified as being important in the app development

Participants use of technology in caregiving prior to the focus groups

> *"For me I haven't used technology a lot up to this point so I don't know if it is something I would delve into and I think the reason is that I get my information from the society [for the diagnosis my partner has] and from their publications so I don't feel like I need to go further than that….I think what would help for me is an online support group for people who have [the same diagnosis as my partner] and I haven't looked for one but I'm sure there must be something out there."*
>
> *"I'm one of those people that as soon as I got the diagnosis [for my partner] I went to google, the internet to check for everything for [their diagnosis]."*
>
> *"Yah, I've used technology to look up and Google stuff and also creative ways of getting funding."*

References

1. Canadian Institutes for Health Information [CIHI]. (2010). Supporting Informal Caregivers-The Heart of Home Care. Retrieved from https://secure.cihi.ca/free_products/Caregiver_Distress_AIB_2010_EN.pdf

2. Payne, A., Sheets, D., & Beach, C. (2016). *Technology to Support Community-Dwelling Older Adults with Dementia: A Survey of Home Care Clinicians.* 2016. Retrieved from: https://dspace.library.uvic.ca//handle/1828/7108

3. Abrahamsson, P., et al. (2017). *Agile software development methods: Review and analysis.* arXiv preprint Retrieved from: arXiv:1709.08439

Is the Canadian long-term care workforce ready for a palliative care mandate?

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Tamara Sussman, Ph.D.,Genevieve Thompson, Ph.D.,Lorraine Venturato, Ph.D.,& Abigail Wickson-Griffiths, Ph.D.

Introduction

- The average expected lifespan in many Canadian long-term care (LTC) homes is now less than two years post-admission.[1,2,3]
- Nearly one in five Canadian long-term care residents die in a given year.[4]
- The World Health Organization has recognized a global need to improve palliative care for older people living in LTC settings.[5]
- Available guidelines for palliative care in LTC emphasize managing residents' disease symptoms and physical needs, and addressing other important needs, such as quality of life, psychosocial/spiritual support, family support, and respect for personhood and dignity.[6,7]
- The main objective of this research is to describe the capacity of the LTC sector to embrace a palliative care mandate, with particular attention to some of the personal qualities that are necessary for this work.
- Given evidence that some personal qualities vary by occupational role, an additional goal is to describe strengths and weaknesses in readiness for palliative care across occupational groups.
- Among the personal qualities currently receiving greatest attention in palliative care research are employee wellbeing, self-efficacy, and person-centredness. These qualities were the focus of the study.

Methods

Design:

- This study is part of a larger mixed methods project exploring the implementation of a palliative program in four participating LTC homes using a participatory action approach.
- At the outset of this larger project, we conducted a baseline survey with LTC employees, and this paper reports on the results of that survey.

Setting & Participants:

- The survey was conducted in four separate LTC homes in the Canadian provinces of Alberta, Saskatchewan, Manitoba, and Ontario.
- The homes varied in size, housing 128, 50, 104, and 284 residents respectively. Three were privately owned by the same company. One was a non-profit entity.
- We recruited a convenience sample of employees from the homes. The only inclusion criterion was employment at a participating LTC facility. There were no exclusion criteria.
- To obtain sufficient group size for statistical analysis, we classified employees as either "professional staff" (e.g., physicians, nurses, social workers) or "non-professional" staff (e.g., nursing assistants, housekeepers, nutritional support staff).

Measures:

- **Biographical information:** age, gender identity, education level, occupation, employment details (e.g., full time), and years of experience in LTC and within the current LTC facility.
- **Employee Wellbeing:** The 30-item ProQOL[8] measures three aspects of professional quality of life or employee wellbeing: compassion satisfaction, burnout, and secondary traumatic stress i.e., (problems resulting from exposure to others' trauma).
- **Palliative Care Self-Efficacy:** The EOL-PC[9] survey is comprised of three subscales: patient and family centred communication (PFCC); cultural and ethical values (CEV); and effective care delivery (ECD)
- **Person-Centred Care:** The PDC[10] contains five subscales. Three were chosen for this study: Knowing the Person (PDC-Knowing), Comfort Care (PDC-Comfort), and Support for Relationships (PDC-Relationship).

Results

- A total of 228 questionnaires were returned. The overall response rate was 32%.
- Participant demographics: 33% were professional staff, and 66% non-professional; 84% were female, 9% were male, 6% did not specify gender identity, and 0.4% did not identify as either male or female; 50% were >=45 years old; the average years of work in LTC was 12 (SD 9.4); 11% were casual employees, 31% worked part-time, and 58% worked full-time.
- Table 1 shows means for each outcome variable against maximum scores, and, where available, accepted threshold or cut-off values. On average, staff in each occupational group scored well below accepted thresholds for burnout and secondary traumatic stress, and well above a threshold for low compassion satisfaction. Altogether, no one scored above threshold for burnout, only 1 scored below threshold for compassion satisfaction, and only 2 individuals scored above threshold for secondary traumatic stress.
- Table 2 shows *t*-test comparisons of the professional groups. Significant ($p < .05$) differences were observed for all self-efficacy subscales, compassion satisfaction and burnout, but not on any of the person-centred care subscales (see Table 2). In all cases, results favoured professional staff.
- There was no correlation between work experience or any of the outcome variables for either occupational group.
- *T*-tests comparing scale scores for women and all other gender identities did not reveal statistically significant differences ($p > .05$).
- Within the non-professional group, however, there was an effect of education (i.e., possessing a university degree) on one domain of person-centred care, comfort care, Welch's $t(72.38) = 3.56$, $p < .05$, and burnout was more likely among those with no university degree, Welch's $t(71.62) = 1.99$, $p = .05$.
- ANOVA was used to test for significant differences by age band (<35, 35-44, 45-54, 55+). There were no statistically significant differences ($p > .05$).

Table 1. *Sample size, mean, and standard deviations for self-efficacy, person-directed care, and quality of life scores for professional and non-professional staff.*

	Max	Cut	Professional			Non-Professional		
Personal quality			N	M	SD	N	M	SD
Efficacy - communication	48		76	37.58	9.14	98	28.38	11.38
Efficacy - values	32		75	23.44	5.88	108	19.69	7.48
Efficacy - delivery	32		73	18.63	6.29	106	15.33	7.52
PDC – Knowing the Person	35		74	22.05	6.55	125	22.91	6.16
PDC – Comfort Care	40		61	30.18	6.56	104	29.72	6.49
PDC – Foster Relationships	30		68	21.90	5.33	104	20.74	6.85
ProQOL - Satisfaction	50	22	75	43.24	4.85	144	41.56	5.49
ProQOL - Burnout	50	42	76	20.49	5.39	144	22.09	4.98
ProQOL - Trauma	50	42	75	21.47	5.77	136	22.18	5.68

Table 2. *Differences between professional and non-professional staff groups in palliative care self-efficacy, person-centred care, and professional quality of life.*

Scale	t	Sig.
Efficacy - communication	5.89	<.01
Efficacy - values	3.77	<.01
Efficacy - delivery	3.16	<.01
PDC – Knowing the Person	-.86	.39
PDC – Comfort Care	.42	.67
PDC – Foster Relationships	1.23	.24
ProQOL - Satisfaction	2.21	<.05
ProQOL - Burnout	-2.14	<.05
ProQOL - Trauma	-.84	.40

Discussion

Employee wellbeing

- These results give no indication that employee wellbeing is lacking in the Canadian LTC context. Scores below accepted thresholds were very rare in our sample, and average scores differed substantially from threshold values. This is encouraging, given other reports that seem to suggest a high potential for burnout among human service workers, including LTC staff.
- This might parallel the evolution of research in other palliative care contexts, initial concern about burnout was followed by evidence that burnout actually can be lower than in other professional settings (although this is not universally true).
- Despite the robust levels of LTC employee wellbeing suggested by the current results, other research suggests that it remains important to examine whether resources including social support, a realistic workload, and involvement in decision-making can further enhance outcomes or support palliative care.

Self-efficacy

- With regard to palliative care self-efficacy, professionals had a clear advantage over non-professionals, but both groups showed potential to grow.

Person-centred care

- Both groups evidenced room to improve attention to person-centred care, and there was no advantage for professional staff over non-professional staff.

Supporting a palliative approach to long-term care (SPA-LTC)

- Promising initiatives to support a palliative approach in long-term care are under development, but need further evaluation. These include job shadowing in hospice settings, attending interdisciplinary comfort care rounds to promote shared communication about palliative care in LTC, professional leadership, and capacity development.
- Our team is currently studying a SPA-LTC framework in four Canadian provinces. These results are from a survey administered during the baseline phase of our work. For more information, please contact Sharon Kaasalainen at McMaster University or Tamara Sussman at McGill University.

References

1. Abrahamson K, Suitor J, Pillemer K. (2009). Conflict between nursing home staff and residents' families: Does it increase burnout? *Journal of Aging and Health, 21*(6):895-912.
2. Ablett, J. R., & Jones, R. (2007). Resilience and well-being in palliative care staff. *Psycho-Oncology, 16*(8), 733–740. doi:10.1002/pon.1130
3. Anseel, F., Lievens, F., Schollaert, E., & Choragwicka, B. (2010). Response rates in organizational science, 1995–2008: A meta-analytic review and guidelines for survey researchers. *Journal of Business and Psychology, 25*(3), 335-349.
4. Canadian Institute for Health Information (2017). *Continuing Care Reporting System Quick Stats.* Ottawa, ON: CIHI. Retrieved December 5, 2017 from https://www.cihi.ca/en/quick-stats
5. World Health Organization (2011). *Palliative care for older people: better practices.* http://apps.who.int/iris/bitstream/10665/107290/1/e95052.pdf
6. Australian Government Department of Health. (2004). *Guidelines for a Palliative Approach in Residential Care (APRAC Guidelines).* Retrieved December 19, 2017 from http://www.health.gov.au/internet/main/publishing.nsf/Content/pcg-acs
7. van der Steen, J. T., Radbruch, L., Hertogh, C. M., de Boer, M. E., Hughes, J. C., Larkin, P., ... & Koopmans, R. T. (2014). White paper defining optimal palliative care in older people with dementia: a Delphi study and recommendations from the European Association for Palliative Care. *Palliative Medicine, 28*(3), 197-209.
8. Stamm BH. (2010). http://proqol.org. The Concise ProQOL Manual. Accessed May 1, 2017.
9. Lazenby, M., Ercolano, E., Schulman-Green, D., & McCorkle R. (2012). Validity of the end-of-life professional caregiver survey to assess for multidisciplinary educational needs. *Journal of Palliative Medicine, 15*(4),427-431.
10. White, D.L., Newton-Curtis, L., & Lyons, K.S. (2008). Development and initial testing of a measure of person-directed care. *The Gerontologist, 48(suppl 1),* 114-123.

Using Normalization Process Theory to evaluate the implementation of Montessori-based volunteer visits within a Canadian long-term care home

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Background

Montessori-based interventions (MBIs) involve participation in meaningful activities based on an individual's abilities and interests, and aim to promote engagement and success of participants.

MBIs have recently been used for individuals with dementia: reports document improved mood and engagement and clinical benefits such as decreased neuropsychiatric symptoms, better performance on cognitive tasks, and improved function.

Implementation of MBIs in long-term care facilities (LTCs) is challenging due to funding limitations and staffing constraints. Volunteer support is one way to overcome these barriers.

In a broader study, we found that residents experienced higher levels of pleasure and interest during volunteer visits (compared with periods during which no activities were planned). Volunteers were able to employ the MBI with very little support, and rated their own and their visiting partners' satisfaction as high.

Our study examines the experiences of supporting staff members as they helped integrate the volunteer-led MBI in to practice within an LTC special dementia unit.

Methods

Setting: Long-Term Care (LTC) special dementia care unit

Participants: 21 staff members working in the LTC who encountered the program

Analysis: Interviews with 21 staff members were analyzed following a 3 month pilot period of the MBI. We used a combination of inductive and deductive thematic analysis to analyze interviews. Specifically, we first used Normalization Process Theory (NPT) to examine the processes by which staff integrated this volunteer-led MBI into practice. To further explain these processes, we identified additional subthemes using an inductive approach. Results were audited to confirm trustworthiness. The auditor evaluated each theme's trustworthiness on a 5-point scale.

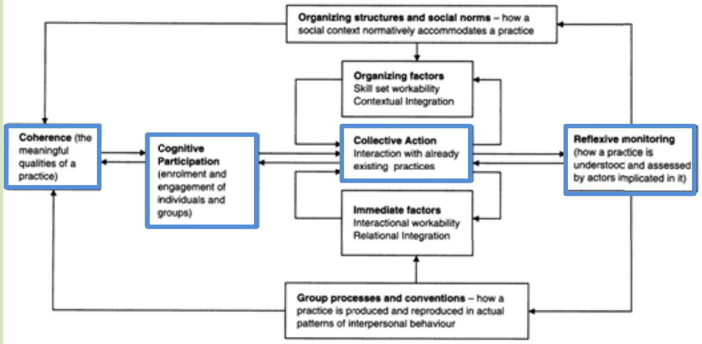

Image 1. Components of Normalization Process Theory (NPT), highlighting the 4 major categories and their sub-categories (May & Finch, 2009)

Results

Data fit well in to 4 major categories of the Normalization Process Theory:

1. Coherence
2. Cognitive participation
3. Collective action
4. Reflexive monitoring

An average audit rating of 4.5 supported trustworthiness of these findings.

Coherence (understanding of the MBI): overall, staff understood the MBI as a program of meaningful, individually tailored activities, delivered in the context of relationship, to enhance mood or enjoyment and reduce behavioural disturbance.

"The residents need somebody to be with them."

Cognitive participation (level of staff commitment): Since volunteers directly addressed a perceived gap in capacity for psychosocial care without demanding a great deal of support from staff members, the intervention was perceived as achievable on an ongoing basis, and was supported by staff members.

"These programs are vital. ... We need them very much and there should be funding for them."

Collective action (how staff integrated the MBI into their practice): Volunteer-based integration of the MBI complemented the work of the staff members and relieved some of their demands.

"They were very polite, they interacted well; if they ever had any questions, they were never intrusive."

Reflexive monitoring (outcomes as viewed by staff): According to staff members, the main outcomes of the MBI for residents were enjoyment, active participation in meaningful activities, and improved behaviour. Recreation therapy team members noted the program may not be as effective for residents experiencing greater dementia-related disability.

"It was nice. ... It helped the residents get involved and be more active."

Conclusions & Recommendations

- Structured one-on-one visits by volunteers have the potential to address gaps in psychosocial care.
- Staff are open to providing ongoing support to dementia care volunteers. Supporting roles for staff should be well described.
- To the extent that staff members are to be engaged in directly supporting an MBI, opportunities to learn about and practice the approach should be available.
- Dementia care volunteers might be exposed to risks, which should be anticipated, with plans in place to address incidents.
- The efficacy of MBIs for LTC residents with advanced symptoms of dementia should be further evaluated.

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References

1. May, C., & Finch, T. (2009). Implementing, embedding, and integrating practices: an outline of normalization process theory. Sociology, 43(3), 535-554.

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Outcomes of a volunteer-delivered Montessori-based intervention in a Canadian special dementia unit: A case series

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Background

Montessori-based interventions (MBIs) have recently been used for individuals with dementia. Several reports have documented improved mood and increased engagement during MBIs for persons with dementia, suggesting that MBIs provide a means to enhance psychosocial care in this environment.

Resources to support individualized programming are limited. Volunteer delivery might be a way to increase the feasibility of MBIs in long-term care environments.

This study is part of a larger investigation that examined the acceptability, feasibility, and outcomes associated with a Montessori-based approach to visiting from staff, volunteer, and resident perspectives.

The objective of the current study is to evaluate LTC residents' responses to a volunteer-led MBI.

Methods

Setting: Long-Term Care (LTC) special dementia care unit

Participants: 8 LTC residents with dementia diagnoses

Design: ABAB reversal design used to assess whether the MBI is associated with a change in the outcome variables of interest for a single individual

- A1: no-treatment baseline period
- B1: intervention period
- A2: no-treatment rest period
- B2: intervention period

Measures and Analysis:

- We used the Dementia Observation System to track the primary activity of residents from 1:00-8:00 p.m. five days per week during each A and B phase. We compared times that the resident was involved in the MBI (B phases) to approximately equivalent times during which no planned activity was taking place (A phases).
- We used the Apparent Affect Rating Scale (AARS) to assess the duration of several mood states at these times. Intervention effects were considered by graphing results (see Figures 1 to 6).

Results

Mood States	Findings
Pleasure	• Very little pleasure during baseline and reversal phases • Moderate-high levels of pleasure during MBI for most participants
Interest	• Variable levels of interest during baseline and reversal phases • All participants showed high levels of interest during the MBI
Contentment	• Variable levels of contentment during baseline and reversal phases • Most showed high levels during MBI with some variability
Anxiety	• 3 participants had no anxiety at any point • 3 participants had periods of anxiety that responded to the MBI • 1 participant had 2 episodes, 1 during baseline & 1 during the MBI
Sadness	• 7 participants were rarely sad during baseline and reversal • 1 participant showed intermittent sadness, greater at baseline • 1 participant had a single episode which occurred during the MBI
Anger	• Low baseline level of anger among all participants • 1 anger episode from 1 participant at baseline

Results

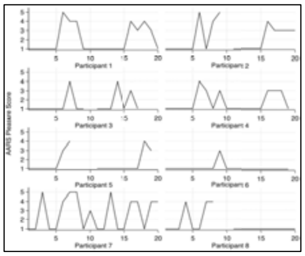

Figure 1. Pleasure.

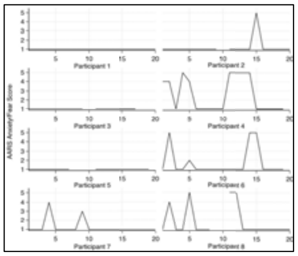

Figure 4. Anxiety/Fear.

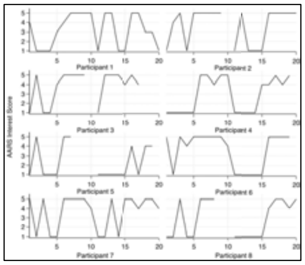

Figure 2. Interest

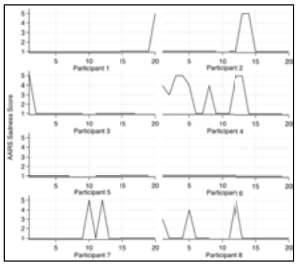

Figure 5. Sadness.

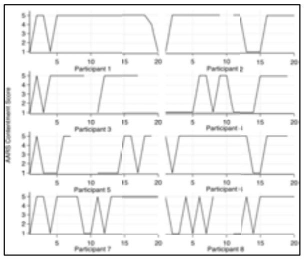

Figure 3. Contentment.

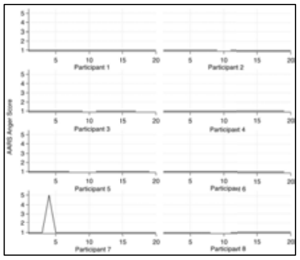

Figure 6. Anger.

Discussion

- Novice volunteers successfully delivered an MBI, adding to a growing base of evidence that it is possible to enhance psychosocial dementia care by encouraging volunteerism.
- We observed a clear positive effect of the intervention on positive mood states.
- Effects of the intervention on negative mood states were generally smaller or less likely to have been observed. This is best explained by the infrequency of low mood states (i.e., anxiety, sadness, and anger) at baseline.
- Additional research is needed to explore the strengths and weaknesses of volunteer-led MBIs as compared to other volunteer-led interventions.

Conclusions

- A volunteer-led MBI was associated with positive outcomes for LTC residents with dementia.
- Incorporating volunteer-led MBIs into long-term care environments has potential to improve the psychosocial wellbeing of LTC residents with dementia.
- These promising small-sample findings may justify the pursuit of more costly randomised clinical trials.

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Intervention Fidelity of a Volunteer-Led Montessori-Based Intervention within a Canadian Long-Term Care Home

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Background

Montessori-Based Interventions (MBIs) aim to support people with dementia by providing meaningful, individualized, and engaging activities. Previous research on the effects of MBIs on residents with dementia has found increased engagement and improvement in mood, cognition, and functioning. It also shows reduced behavioural symptoms associated with dementia such as agitation and aggression.

The objective of this study was to assess the fidelity (i.e. the degree to which an intervention is implemented as it is intended) of a volunteer-led MBI using the Conceptual Framework for Intervention Fidelity (CFIF; Carroll et al., 2007).

The findings we report here are associated with a more comprehensive study of volunteerism in LTC, including the acceptability, feasibility, and outcomes associated with a volunteer-led MBI.

Methods

Setting: Long-Term Care (LTC) special dementia care unit

Participants: 9 volunteers who were involved in the MBI

Measures:
- Interviews: 3 per volunteer, used to gain insight in to their experiences
- Visiting Quality Questionnaire (VQQ): designed to measure volunteer response and resident response to the MBI as judged by the volunteer

Analysis: The Conceptual Framework for Intervention Fidelity (CFIF) adapted from Carroll et al. (2007) was used to analyze interview, questionnaire, and observational data.

CFIF

The CFIF has five main elements: (1) *adherence* (the delivery of recommended content at the recommended dose), (2) *complexity*, (3) *facilitation strategies* (resources such as manuals and training, to promote adherence), (4) *delivery quality* (evidence that the intervention was delivered well or poorly), and (5) *participant responsiveness* (the extent to which participants were engaged in or satisfied with the intervention). Overall, *adherence* speaks most directly to intervention fidelity, and the other elements of the CFIF are potential influences on adherence (i.e., moderators).

Results

Adherence to intervention	Adherence Indicator	Findings
Content	Proportion of volunteers who used Montessori-based approach	All volunteers showed evidence of attempting to use MBI
Coverage	% visits attended by resident	78/80 (97.5%)
Frequency	(a) Volunteer attrition rate (b) % visits attended by volunteer	(a) 8/9 volunteers fulfilled their commitments (b) 66/80 (82.5%), most made up for missed visits

Moderators of Intervention Adherence	Fidelity Indicator	Findings
Delivery quality	Interview: description of the strengths and weaknesses in volunteer delivery • Use of Montessori activities • Modeling the activity first • Accommodating disability • Supervising the activity	• Most volunteers used Montessori activities during their visits, but some still relied on conversation, and this was not always appropriate to the resident's level of communication ability. • Volunteers often modeled the activities to residents prior to asking them to join in, which often prompted their interest and engagement in the activity. This also helped volunteers to assess the resident's ability to participate in the activity as modeled. • There was good evidence that volunteers were attentive to the needs, interests, and abilities of residents and adjusted the visits accordingly. • Volunteers strongly supervised residents during activities, and found this helped promote safety. They expressed an interest in having more support or training.
Facilitation strategies	Interview: facilitation strategies as perceived by volunteers: (a) facilitators (b) challenges (c) recommendations	• **Facilitators:** Volunteers found that initial training, having a diverse array of activities available, and being provided with resident interest and ability profiles facilitated their visits. • **Challenges:** Volunteers described some difficulties with visits including providing supports for residents with dementia, unavailability of their visiting partner, and variable resident engagement in activities (those with more severe dementia seemed to be less engaged) • **Recommendations:** Volunteers recommended increasing the range of available activities, providing more support for when the resident is not engaging, and receiving more training on responding to critical incidents.
Participant responsiveness	Interview: responses to the MBI as perceived by volunteers: (a) perceptions of residents' responses (b) their own responses to the visits (c) critical incidents	• **Resident responses:** VQQ results suggested that residents were, on average, moderately satisfied (avg. Score 5.46). Volunteers described residents' responses using the following terms: acceptance, engagement, changes in mood and behaviour, communication, and recognizing the volunteer. • **Volunteer responses:** VQQ results suggested that volunteers were very satisfied with the visits (avg. Score 6.12). Most volunteers described feeling comfortable, connected, and rewarded. A few volunteers described feeling drained, sad, or tired during their visits. • **Critical incidents:** Critical incidents occurred in 1% of 142 visits. Risk management discussions and actions were triggered by critical incidents.

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Exploring the Psychologically Traumatic Experiences of Rural Registered Nurses Who Live and Work in the Same Community

Sharleen Jahner, PhD(c), RN, Kelly Penz, PhD, RN, & Norma Stewart PhD, RN.

Introduction

Rural RNs work in diverse situations with limited support, carry enormous responsibility, and often make decisions and practice at levels beyond those expected in urban centres [2, 8, 12, 14]. Exposure to trauma events is inherent in their practice, and may place them at greater risk for negative psychological impact on their personal and professional wellbeing [7, 10, 11].

Purpose

To explore the social processes of how RNs deal with exposure to distressing traumatic events in the context of living and working in the same rural agricultural community.

Traumatic Event is defined as…

"an extreme event that may occur in any location or form in which a person is subjected to or witnesses; falls outside the range of normal experience; is life threatening or could result in serious injuries; exposes the person to shocking scenes of death or injuries and/or could lead a person to experience intense fear, helplessness, horror or other reactions of distress"

(Health Canada, 2007)

Rural nurses may be at higher risk and more vulnerable to psychological impact over time

- Isolated nature of their practice [8, 14].
- Overlapping relationships, blurred personal/professional boundaries [1, 2, 15, 16, 21].
- Close-ties to the communities they live and work [7, 9, 10, 21].
- Exposure to traumatic events with limited psychological support [7, 10, 11, 18].
- Dealing with higher rates of trauma and death [3, 4, 5, 6, 17, 19, 20].

Method

Constructivist Grounded Theory (Charmaz, 2006, 2014)

Target Sample: RN's who live and work in the same rural community

Sampling, Data Collection, Analyses

- **Data Collection Period:** Nov 2017 - May 2018
- **Setting:** 6 rural hospitals in west central Saskatchewan, range of 70-210 km from Saskatoon
- **Sample:** Rural Acute Care Hospital-based RNs
- **Purposive sampling:** 19 initial open-ended face-to-face interviews, semi-structured interview guide
- Data included **Reflective Journals** completed by 13 participants
- **Coding process:** Data transcribed verbatim, Initial line by line coding, then focused coding to identify emerging categories and properties to identify relationships
- **Theoretical** sampling: 16 follow-up interviews to fill in gaps identified in the developing categories
- **Memos:** sorted ideas, relationships, comparisons, categories and identified gaps
- **Reflexivity:** acknowledging familiarity with types of events and situations and participant responses from own experiences
- **Data Saturation:** determined with no new data or theoretical insights and patterns repeated

Preliminary Findings

Main Concern Identified:
Rural RNs are *'intertwined with traumatic events for life'*

Basic Social Process Identified:
'Staying Strong'

Developing sub-processes of *'Staying Strong'*:

External Subprocesses

- Reciprocal sharing of events, suffering, and distress with colleagues or peers
  - Re-living, dialoguing, and reflecting
  - Second-guessing oneself and questioning
  - Relying upon, validating feelings, and reassuring one another
- Seeking support from family and friends
  - Finding that place of emotional safety and security
  - Maintaining community connectedness

Internal Subprocesses

- Taking the time to process the event
- Searching for strength and peace
  - Relying on spirituality, faith and/or prayer
- Packing it down, enduring, and forging ahead
- Coming to terms/acceptance
  - Acknowledging inability to control the outcome
- Choosing a path of resilience and finding courage to move forward
- Trusting colleagues or peers
  - Creating sense of safety and security

Discussion

Findings will enhance understanding of the types of traumatic events experienced by rural nurses in the workplace, the potential psychological impact or these events, and the unique ways in which they cope with and deal with them over time.

Preliminary findings are being interpreted from an occupational health context and to better understand the risks that rural nurses face in their workplaces and communities.

References

1. Albion, M. J., Fogarty, G. J., & Anthony Machin, M. (2005). Benchmarking occupational stressors and strain levels for rural nurses and other health sector workers. Journal of Nursing Management, 13(5), 411-418.
2. Bushy, A. (2006). Nursing in rural and frontier areas: Issues, challenges and opportunities. Harvard Health Policy Review, 7(1), 17-27.
3. Burrows, S., Auger, N., Gamache, P., & Hamel, D. (2013). Leading causes of unintentional injury and suicide mortality in Canadian adults across the urban-rural continuum. Public Health Reports, 128(6), 443-453.
4. DesMeules, M., Pong, R., Lagace, C., Heng, D., Manuel, D., Pitblado, R., ... & Koren, I. (2006). How healthy are rural Canadians? An assessment of their health status and health determinants. Canadian Institute for Health Information. Retrieved from http://www.cwhn.ca/en/node/28300
5. Gomez, D., Berube, M., Xiong, W., Ahmed, N., Haas, B., Schuurman, N., & Nathens, A. B. (2010). Identifying targets for potential interventions to reduce rural trauma deaths: a population-based analysis. Journal of Trauma and Acute Care Surgery, 69(3), 633-639.
6. Gonzalez, R. P., Cummings, G., Mulekar, M., & Rodning, C. B. (2006). Increased mortality in rural vehicular trauma: Identifying contributing factors through data linkage. Journal of Trauma and Acute Care Surgery, 61(2), 404-409.
7. Hanvey, L. (2005). Rural nursing practice in Canada: A discussion paper. Canadian Nurses Association. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.693.776&rep=rep1&type=pdf.
8. Kulig, J. C., Kilpatrick, K., Moffitt, P., & Zimmer, L. (2016). Rural and remote nursing practice: An updated documentary analysis. Retrieved from http://www.unbc.ca/rural-nursing/en/new-rrn2-publication.
9. Lee, H. J., & McDonagh, M. (2010). Updating the rural nursing theory base. In C. A. Winters (Ed.), Rural nursing: Concepts, theory, and practice (pp. 19-39). New York, NY: Springer Publishing Company. LLC.
10. Lee, H. J., & Winters, C. A. (2010). Rural nursing: Concepts, theory and practice (3rd ed.). New York, NY: Springer Publishing Company.
11. Lenthall, S., Wakerman, J., Opie, T., Dollard, M., Dunn, S., Knight, S., ... & Watson, C. (2009). What stresses remote area nurses? Current knowledge and future action. Australian Journal of Rural Health, 17(4), 208-213.
12. LeSergent, C. M., & Haney, C. J. (2005). Rural hospital nurse's stressors and coping strategies: A survey. International Journal of Nursing Studies, 42(3), 315-324.Misener, R. M., 13. MacLeod, M. L., Banks, K., Morton, A. M., Vogt, C., & Bentham, D. (2008). There's Rural, and Then There's Rural": advice from nurses providing primary healthcare in northern remote communities. Nursing Leadership, 21(3), 54-63.
14. Molinari, D., & Bushy, A. (2011). The rural nurse: Transition to practice. (pp. 3-21). New York, NY. Springer Publishing Company Inc.
15. Nelson, W., Pomerantz, A., Howard, K., & Bushy, A. (2007). A proposed rural healthcare ethics agenda. Journal of Medical Ethics, 33(3), 136-139.
16. Opie, T., Lenthall, S., Dollard, M., Wakerman, J., MacLeod, M., Knight, S., ... & Rickard, G. (2010). Trends in workplace violence in the remote area nursing workforce. Australian Journal of Advanced Nursing, The, 27(4), 1-69.
17. Peek-Asa, C., Zwerling, C., & Stallones, L. (2004). Acute traumatic injuries in rural populations. American Journal of Public Health, 94(10), 1689-1693. Sabin-Farrell, R., & Turpin, G. (2003). Vicarious traumatization: implications for the mental health of health workers? Clinical Psychology Review, 23(3), 449-480.
18. Sabin-Farrell, R., & Turpin, G. (2003). Vicarious traumatization: implications for the mental health of health workers? Clinical Psychology Review, 23(3), 449-480.
19. Simons, R., Brasher, P., Taulu, T., Lakha, N., Molnar, N., Caron, N., ... & Hameed, M. (2010). A population-based analysis of injury-related deaths and access to trauma care in rural-remote Northwest British Columbia. Journal of Trauma and Acute Care Surgery, 69(1), 11-19.
20. Statistics Canada (2016). The 2001 Canadian Census-Tax-Mortality Cohort: A 10-Year Follow- up. Retrieved from http://www.statcan.gc.ca/pub/11-633-x/11-633-x2016003-eng.htm
21. Winters, C. (2013a). The Distinctive nature and Scope of Rural Nursing Practice: Philosophical Bases. In rural nursing, concepts, theory and practice (4th ed., p 241 - 258). New York, NY. Springer Publishing Company.

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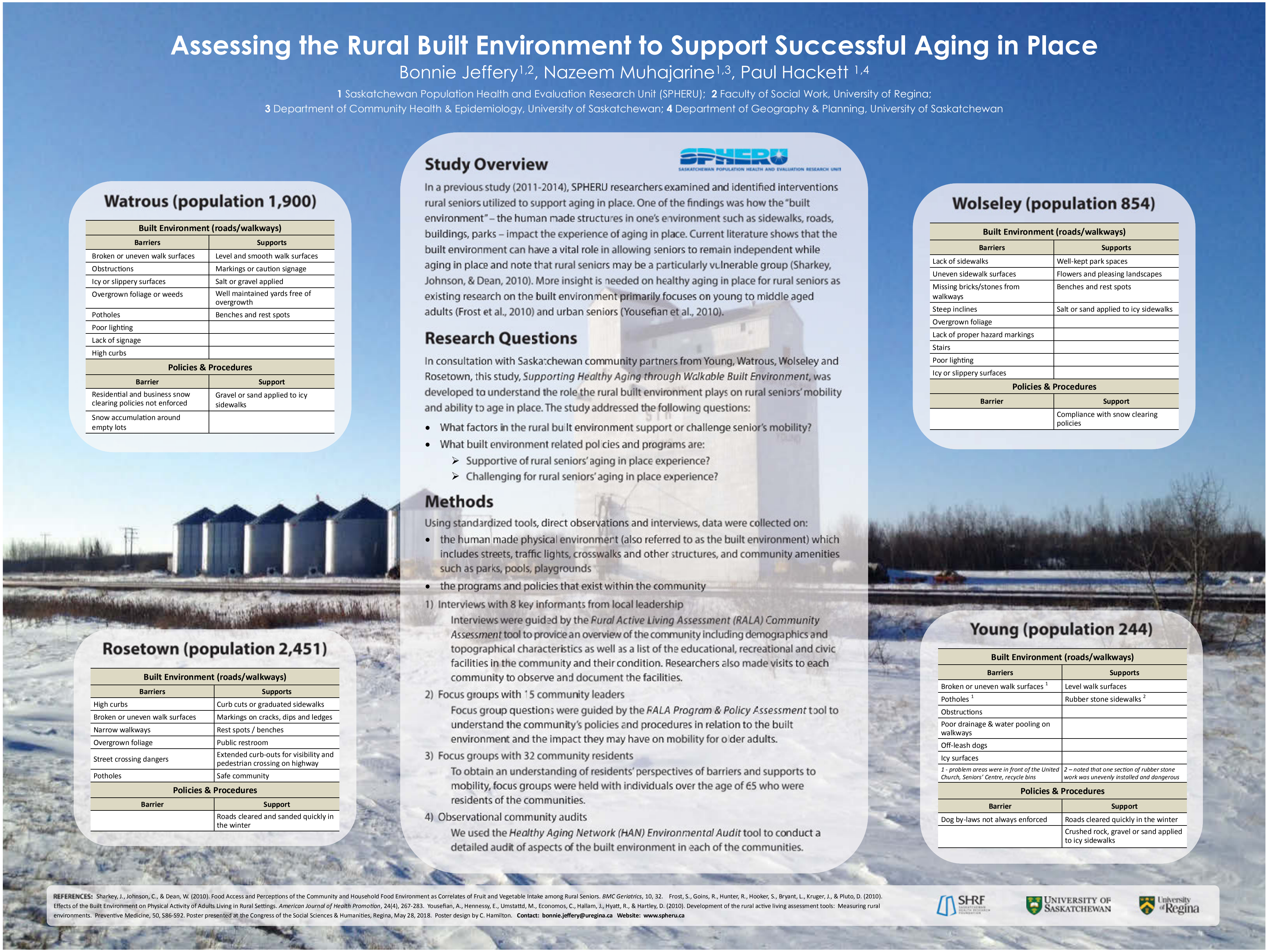

Assessing the Rural Built Environment to Support Successful Aging in Place

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3 Department of Community Health & Epidemiology, University of Saskatchewan; **4** Department of Geography & Planning, University of Saskatchewan

Watrous (population 1,900)

Built Environment (roads/walkways)	
Barriers	**Supports**
Broken or uneven walk surfaces	Level and smooth walk surfaces
Obstructions	Markings or caution signage
Icy or slippery surfaces	Salt or gravel applied
Overgrown foliage or weeds	Well maintained yards free of overgrowth
Potholes	Benches and rest spots
Poor lighting	
Lack of signage	
High curbs	
Policies & Procedures	
Barrier	**Support**
Residential and business snow clearing policies not enforced	Gravel or sand applied to icy sidewalks
Snow accumulation around empty lots	

Rosetown (population 2,451)

Built Environment (roads/walkways)	
Barriers	**Supports**
High curbs	Curb cuts or graduated sidewalks
Broken or uneven walk surfaces	Markings on cracks, dips and ledges
Narrow walkways	Rest spots / benches
Overgrown foliage	Public restroom
Street crossing dangers	Extended curb-outs for visibility and pedestrian crossing on highway
Potholes	Safe community
Policies & Procedures	
Barrier	**Support**
	Roads cleared and sanded quickly in the winter

Study Overview

SPHERU
SASKATCHEWAN POPULATION HEALTH AND EVALUATION RESEARCH UNIT

In a previous study (2011-2014), SPHERU researchers examined and identified interventions rural seniors utilized to support aging in place. One of the findings was how the "built environment" – the human made structures in one's environment such as sidewalks, roads, buildings, parks – impact the experience of aging in place. Current literature shows that the built environment can have a vital role in allowing seniors to remain independent while aging in place and note that rural seniors may be a particularly vulnerable group (Sharkey, Johnson, & Dean, 2010). More insight is needed on healthy aging in place for rural seniors as existing research on the built environment primarily focuses on young to middle aged adults (Frost et al., 2010) and urban seniors (Yousefian et al., 2010).

Research Questions

In consultation with Saskatchewan community partners from Young, Watrous, Wolseley and Rosetown, this study, *Supporting Healthy Aging through Walkable Built Environment*, was developed to understand the role the rural built environment plays on rural seniors' mobility and ability to age in place. The study addressed the following questions:

- What factors in the rural built environment support or challenge senior's mobility?
- What built environment related policies and programs are:
  - ➢ Supportive of rural seniors' aging in place experience?
  - ➢ Challenging for rural seniors' aging in place experience?

Methods

Using standardized tools, direct observations and interviews, data were collected on:

- the human made physical environment (also referred to as the built environment) which includes streets, traffic lights, crosswalks and other structures, and community amenities such as parks, pools, playgrounds
- the programs and policies that exist within the community

1) Interviews with 8 key informants from local leadership

   Interviews were guided by the *Rural Active Living Assessment (RALA) Community Assessment* tool to provide an overview of the community including demographics and topographical characteristics as well as a list of the educational, recreational and civic facilities in the community and their condition. Researchers also made visits to each community to observe and document the facilities.

2) Focus groups with 15 community leaders

   Focus group questions were guided by the *RALA Program & Policy Assessment* tool to understand the community's policies and procedures in relation to the built environment and the impact they may have on mobility for older adults.

3) Focus groups with 32 community residents

   To obtain an understanding of residents' perspectives of barriers and supports to mobility, focus groups were held with individuals over the age of 65 who were residents of the communities.

4) Observational community audits

   We used the *Healthy Aging Network (HAN) Environmental Audit* tool to conduct a detailed audit of aspects of the built environment in each of the communities.

Wolseley (population 854)

Built Environment (roads/walkways)	
Barriers	**Supports**
Lack of sidewalks	Well-kept park spaces
Uneven sidewalk surfaces	Flowers and pleasing landscapes
Missing bricks/stones from walkways	Benches and rest spots
Steep inclines	Salt or sand applied to icy sidewalks
Overgrown foliage	
Lack of proper hazard markings	
Stairs	
Poor lighting	
Icy or slippery surfaces	
Policies & Procedures	
Barrier	**Support**
	Compliance with snow clearing policies

Young (population 244)

Built Environment (roads/walkways)	
Barriers	**Supports**
Broken or uneven walk surfaces [1]	Level walk surfaces
Potholes [1]	Rubber stone sidewalks [2]
Obstructions	
Poor drainage & water pooling on walkways	
Off-leash dogs	
Icy surfaces	
1 - problem areas were in front of the United Church, Seniors' Centre, recycle bins	*2 – noted that one section of rubber stone work was unevenly installed and dangerous*
Policies & Procedures	
Barrier	**Support**
Dog by-laws not always enforced	Roads cleared quickly in the winter
	Crushed rock, gravel or sand applied to icy sidewalks

REFERENCES: Sharkey, J., Johnson, C., & Dean, W. (2010). Food Access and Perceptions of the Community and Household Food Environment as Correlates of Fruit and Vegetable Intake among Rural Seniors. *BMC Geriatrics*, 10, 32. Frost, S., Goins, R., Hunter, R., Hooker, S., Bryant, L., Kruger, J., & Pluto, D. (2010). Effects of the Built Environment on Physical Activity of Adults Living in Rural Settings. *American Journal of Health Promotion*, 24(4), 267-283. Yousefian, A., Hennessy, E., Umstattd, M., Economos, C., Hallam, J., Hyatt, R., & Hartley, D. (2010). Development of the rural active living assessment tools: Measuring rural environments. Preventive Medicine, 50, S86-S92.

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Addressing Social Isolation through Intervention, Evaluation and Exploration

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SASKATCHEWAN POPULATION HEALTH AND EVALUATION RESEARCH UNIT

An Aging Population

In September 2015, Statistics Canada released data highlighting that one in six Canadians is now over the age of 65 years and that the proportion of those aged 65 and older will increase to 20.1% of the population by 2024 (Statistics Canada, 2015). There are currently 5 million Canadian seniors aged 65 years and older, and this number is expected to double to 10.4 million in 2036, making seniors a quarter of the population (Human Resources and Skills Development Canada, 2013). In Saskatchewan, the number of those over the age of 65 years is projected to increase from 14.6% in 2011 to 23.3% in 2036 (HRSDC, 2013).

Many older adults desire to age in place. Doing so supports the ability of individuals to stay socially connected and engaged in community life. However, research suggests that there are significant numbers of older adults who are isolated and experience loneliness (Newall et al., 2009). This is particularly important, given evidence showing linkages between social isolation, health, and mental health (Cacioppo et al., 2002; National Seniors Council, 2014).

Social isolation refers to a situation in which a person is no longer able to participate in community, civic, or social life in the way in which they would choose. Social isolation can occur as a result of several factors including: physical and mental changes; life changes; lack of transportation; living alone; lack of access to services; distance from family.

Source: Saskatchewan Seniors Mechanism

Improving Rural Seniors' Mobility & Social Interaction through Exercise

Much of SPHERU's research on healthy aging has focused on interventions that support older adults to maintain independence and mobility, allowing them to 'age in place' in their communities. While remaining in one's community can help to maintain existing social connections, supports are needed to overcome barriers that can result in reduced social contact and participation.

In one study, funded by Saskatchewan Health Research Foundation (SHRF) we examined the impact of a peer-led community-based exercise program aimed at reducing falls and fostering social engagement. Volunteer participants aged 55 and older from three rural Saskatchewan communities – Young, Watrous & Wolseley – participated in a group and individual exercise program over a three-month period. Findings suggest positive impacts on both social interaction and mobility.

- ❖ A majority of participants in all three communities felt the social aspect of the program was important to them (93% in Young, SK; 90% in Watrous, SK and 67% in Wolseley, SK).
- ❖ Some program benefits expressed by participants included: a different opportunity to socialize; an opportunity to meet new people and/or get to know their neighbours better; having a reason to get out of the house; increased motivation to get in shape.
- ❖ Although some individual scores showed a decline, on average a majority of participants' mobility remained the same or increased in the program. Most notably, 85% of participants improved their time in the six-minute walk.
- ❖ The majority of participants in two communities (Wolseley 100%, Young 83%) and 28% in Watrous reported increased physical activity since the program ended.
- ❖ At the end of the study, approximately 50% of participants reported that they would continue with the program. As of October 2016 programs were still active in all communities.

Table 4: Change in mobility after participation in exercise program (N=47*)

Mobility Test	Declined		No Change		Improved	
TUG (timed up-and-go)	3	6%	17	36%	27	57%
Functional Reach Test	20	43%	0	0	26	57%
Sit-to-stand (once)	5	11%	28	61%	13	28%
Sit-to-stand (5 times)	15	33%	7	15%	24	52%
6 minute walk	7	15%	0	0	40	85%
IADL (instrumental activities of daily living)	5	11%	40	85%	2	4%
Life-space assessment	13	28%	9	19%	25	53%

Values indicate the change in score between T2 and T3 mobility tests.
**N=46 for the functional reach and sit-to-stand tests, as one participant was unable to complete those tests.*
Source: Improving Rural Seniors' Mobility and Social Interaction through Exercise: Community Report.

Reducing Isolation of Seniors Collective (RISC)

In June of 2016, SPHERU began a three-year evaluation of a collective impact project entitled Reducing Isolation of Seniors – Saskatchewan Impact Plan, funded through Employment and Social Development Canada's New Horizons for Seniors Program. Working as a collective, three provincial organizations have launched nine projects to specifically address social isolation for both rural and urban older adults in communities across South and Central Saskatchewan. The organizations and projects (in brackets) are:

- ❖ Saskatchewan Seniors Mechanism (Age Friendly Communities, Media and Ageism, Older Adult Abuse)
- ❖ Canadian Red Cross (Friendly Visiting Program)
- ❖ Alzheimer's Society of Saskatchewan (Dementia Friendly Communities, Dementia Helpline, ABC's of Dementia Warning Signs Campaign)

Data gathered from the evaluation will be used to inform discussion questions at a Policy-Community Summit planned for 2019, at which best practices for addressing social isolation will be presented and discussed among policy-makers, researchers, older adults, and those who deliver programs and supports to older adults.

Saskatchewan Seniors Impact Survey

To obtain a measure of the current level of social isolation a survey was conducted from May to October 2017 targeted at individuals 55 or older. 1,679 Saskatchewan responses were received, with approximately two-thirds of respondents being female and one-third male. Key indicators for the social isolation measure were: "feelings of support", "feelings of connectedness", and "feelings of value". Respondents were asked to rate their feelings on these indicators against a Likert-type scale. Additional questions explored barriers respondents faced when trying to participate in community activities.

- ❖ Findings indicate that 24% of respondents felt they lack support, 17% felt less connected to family and friends, and 17% did not feel valued by friends and family.
- ❖ Overall, almost one-quarter (24%) of respondents scored 'high' or 'medium' on a social isolation index comprised of respondents' scores from the "support", "connectedness", and "value" questions.

Table 12. **Respondent Levels of Isolation** (*n = 1,679*)

ISOLATION LEVEL	*N*	%
High	122	7.3
Medium	278	16.6
Low	1,279	76.2

Source: Saskatchewan Seniors Impact Survey: Initial Analysis

Exploring Emotional and Mental Healthcare Supports for Seniors in Rural Saskatchewan

In 2014/15 a pilot study was conducted in the Sunrise Health district (Yorkton and area). It focused specifically on emotional and mental health care supports for rural older adults and factors that contribute to or hinder their emotional wellbeing. Data was collected through interviews with rural adults between the ages of 65 and 91 (N=27), and focus groups held in four communities (N=40). Community Workshops were held in two communities to share findings from the study.

Participants identified four areas that impact directly upon reducing social isolation:

- ❖ independence
- ❖ access to services
- ❖ a range of services/supports for medical and social interaction
- ❖ the ability to age in place

Some participants expressed the impact social isolation has on their lives:

- ❖ *"Being alone - I think there is a shame on being depressed because people tend to stay away from you - they figure you are ready for a mental institution, they'll stay away."*
- ❖ *"It's not bad in the summer, but winter. When you get a lot of snow and everything, there is nothing to do and…Oh, you feel lonely alright but what can you do? It's when you are alone in the house you're kind of lonely. And you get depressed that's worse for you."*

REFERENCES: Cacioppo, J. T., Hawkley, L. C., Berntson, G. G., Ernst, J. M., Gibbs, A. C., Stickgold, R., and Hobson, J. A. (2002). Do lonely days invade the nights? *Psychological Science*, 13, 384-387. FSG. (2011). *Canadians in context: Aging population.* Retrieved from http://www4.hrsdc.gc.ca/3ndic.11.4.eng.pdf; National Seniors Council. (2014). Report on the social isolation of seniors. Retrieved from: http://www.seniorscouncil.gc.ca/eng/research_publications/social_isolation/page01.shtml, Catalogue #: Em12-6/2014E-PDF; Newall, N.E.G., Chipperfield, J.G., Clifton, R.A., Perry, R.P., Swift, A.U., & Ruthig, J.C. (2009). Casual beliefs, social participation, and loneliness among older adults: A longitudinal study. *Journal of Social and Personal Relationships, 26*, 273-290; Statistics Canada. (2015). Canada's population estimates: Age and sex, July 1, 2015. Retrieved from http://www.statcan.gc.ca/daily-quotidien/150029/dq150929b.eng.pdf; Jeffery, B., Johnson, S., Tran, C., Wilyman, K., & Hamilton, C. (2016). *Improving rural seniors' mobility and social interaction through exercise: Community Report*. Saskatchewan Population Health and Evaluation Research Unit (SPHERU): Universities of Regina and Saskatchewan; Nilson, C., Jeffery, B., & Caffet, S. (2017). *Saskatchewan Seniors Impact Survey: Initial Analysis.* Saskatchewan Population Health and Evaluation Research Unit (SPHERU): Universities of Regina and Saskatchewan. Poster presented at the Congress of the Social Sciences & Humanities, Regina, May 28, 2018. Poster design by C. Hamilton. **Contact: bonnie.jeffery@uregina.ca Website: www.spheru.ca**

Employment and Social Development Canada
Emploi et Développement social Canada

UNIVERSITY OF SASKATCHEWAN

Factor Analysis and Psychometric Properties of the Brief Symptom Inventory-18 Item in Rural Caregivers of Persons with Dementia

Kortzman, A., O'Connell, M. E., Kirk, A., & Morgan, D.

INTRODUCTION

- Number of persons with dementia to double in Canada by 2031(1)
- Caregivers crucial to dementia care
    - 2 billion+ caregiving hours annually by 2033(1)
- Measuring of caregiver distress is important
    - Feelings of depression and anxiety have high prevalence (2)
    - Antecedent to (or consequence of) burden
    - Psychological distress is predictor of increased healthcare use (3)
- Original Brief Symptom Inventory (53-item)(4)
    - Caregiver gender/age subsets have demonstrated distress(5)
    - Factor structure and psychometric properties have not been explored(5)
- Brief Symptom Inventory, 18-item (BSI-18)(6)
    - Short form version
    - Three-factor clinical model (depression, anxiety, and somatization) has been validated in various samples
    - Four-factor theoretical model (depression, panic, generalized anxiety, somatization)

OBJECTIVES

- Confirm BSI-18 factor structure in sample of rural caregivers
    - Has not been validated with this population
    - Less access to dementia support(7)
    - High levels of depression(8)
- Hypothesized support for three-factor model
    - Reflects findings on patient populations and individuals with European backgrounds
    - Four-factor model confirmatory factor analysis also completed
        - Model comparison
- Explore psychometric properties of BSI-18 in this population
- Explore differences by gender, by relationship, and interaction between the two
    - No a priori hypothesis

MATERIALS AND METHODS

- 194 caregivers of patients of Rural and Remote Memory Clinic
- R (version 3.5.0)(9) and Statistical Program for Social Sciences (version 24) used for analyses
- Brief Symptom Inventory, 18-item (GSI: Global Severity Index; 0 to 72; higher scores = higher distress)
- Zarit Burden Interview (ZBI; 0 to 60; higher scores = greater subjective feelings of burden)(10)
- 12-Item Short Form Survey (SF-12; compared to standardized normative mean of 50)(11)
    - Physical Health Component Summary (PCS); Mental Health Component Summary (MCS)
- Clinical Dementia Rating Scale(12) Sum of Boxes(13) (CDR-SOB; 0 to 18; higher scores = greater severity)

DESCRIPTIVES

Table 1.
Sample Descriptive Statistics with each Subset's Mean Measure Score and Standard Deviation

			BSI-18	SF-12		CDR-SOB	ZBI
	n	%	GSI *M* (*SD*)	PCS *M* (*SD*)	MCS *M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Total	194		5.75 (5.79)	49.89 (*10.54*)	51.61 (*8.67*)	6.58 (*3.43*)	13.66 (*8.27*)
Male	60	30.9	4.32 (*5.15*)	48.63 (*11.71*)	53.60 (*9.58*)	6.76 (*3.21*)	11.52 (*9.30*)
Female	134	69.1	6.39 (*5.96*)	50.45 (*9.97*)	50.72 (*8.11*)	6.51 (*3.52*)	14.63 (*7.61*)
Relationship							
Spouse	96	49.5	6.78 (*6.20*)	48.37 (*11.01*)	51.66 (*3.48*)	6.61 (*3.48*)	13.43 (*9.05*)
Adult Child	77	39.7	4.99 (*5.55*)	52.23 (*9.21*)	50.87 (*8.34*)	6.41 (*3.45*)	14.48 (*7.49*)
Other	21	10.8	3.81 (*3.53*)	48.34 (*11.85*)	54.32 (*7.89*)	6.58 (*3.43*)	11.76 (*7.13*)

- An analysis of variance revealed no differences by gender, relationship, or within interaction

CONFIRMATORY FACTOR ANALYSES

Table 2.
Confirmatory Factor Analysis Indices (N=194)

	Model	
Index (Acceptable Limit)	Three-Factor	Four-Factor
SRMR (< .10) [14]	.072	.067
RMSEA (< .08, CI = 90%)	.071 (.058,.084)	.067 (.054,.080)
CFI (> .90)	.842	.864
TLI/NNFI (> .90)	.817	.839
Model χ^2 (p > .05) [15]	261.81, p <.001	240.531, p < .001
Df	132	129
Relative χ^2 (χ^2/df < 3) [16]	1.983	1.865

Note. SRMR = Standardized Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; NNFI = Non-Normed Fit Index.

- SRMR, RMSEA, relative χ^2 are satisfactory
- CFI, TLI/NNFI, model χ^2 are unsatisfactory
- Item loadings appropriate and above .300
    - Exception: suicidal ideation (.250)
- Four-factor model marginally improved on three-factor model's indices and item loadings

EVIDENCE OF RELIABILITY AND VALIDITY

Table 3.
Internal Consistency, Convergent and Discriminant Validity of BSI-18 (N = 194)

		SF-12			
Scale/Factor	α (95% CI)	PCS	MCS	CDR-SOB	ZBI
GSI	.822 (.774, .850)	-.213**	-.638**	.210**	.406**
Depression	.758 (.702, .808)	-.052	-.657**	.255**	.425**
Somatization	.692 (.619, .754)	-.495**	-.177*	.043	.025
Anxiety^{+}	.682 (.607, .747)	.001	-.601**	.163*	.458*
Gen. Anxiety^{++}	.612 (.507, .698)	-.010	-.567**	.174*	.503**
Panic^{++}	.499 (.363, .610)	.020	-.450**	.089	.225**

Note. *p < .05; **p < .01; $^{+}$3-factor model; $^{++}$4-factor model

Note. BSI-18 = Brief Symptom Inventory, 18-item; GSI = BSI-18 Global Severity Index; SF-12 = 12-Item Short Form Survey; PCS = SF12 Physical Component Summary; MCS = SF12 Mental Health Component Summary; CDR-SOB = Clinical Dementia Rating Scale - Sum of Boxes; ZBI = Zarit Burden Interview

- Three-factor model approaching/exceeding internal consistency (α > .700)
- GSI shows weak-to moderate correlations
- Mental health factors moderately correlated to MCS; unrelated to PCS
- Somatization factor moderately correlated to PCS; weakly correlated to MCS

CONCLUSIONS

- Boundaries for good model fit not met
    - Three-factor clinical model partially supported
        - Most clinical utility
        - RMSEA, SRMR, relative χ^2 acceptable
        - Reliability and validity approaching acceptable limits
    - Four-factor model not supported
        - Low reliability on panic and general anxiety
        - Three-items per factor can result in inadequate psychometric properties(17)
- Caregiver sample may be inexperienced
    - Low GSI scores
    - Ambivalence to symptoms of negative affect(18)
    - Subjective feelings of role mastery(19)
    - Suicidal ideation item not loading
    - Weak GSI associations with ZBI and CDR-SOB
    - No GSI gender or relationship differences
- Limitations
    - Rural population; may not be generalizable
    - Proactive behaviours may moderate distress
- Future Direction
    - Attempt validation with more experienced sample

REFERENCES

1. Manuel, D. G., Garner, R., Fines, P., Bancej, C., Flanagan, W., Tu, K., . . . Bernier, J. (2016). Alzheimer's and other dementias in Canada, 2011 to 2031: A microsimulation Population Health Modeling (POHEM) study of projected prevalence, health burden, health services, and caregiving use. *Population Health Metrics, 14*(37), 10 pages.
2. Lou, Q., Liu, S., Huo, Y. R., Liu, M., Liu, S., Ji, Y. (2015). Comprehensive analysis of patient and caregiver predictors for caregiver burden, anxiety and depression in Alzheimer's disease. *Journal of Clinical Nursing, 24*(17-18), 2668-2678.
3. Zhu, C. W., Scarmeas, N., Ornstein, K., Albert, M., Brandt, J., Blacker, D., ... & Stern, Y. (2015). Health-care use and cost in dementia caregivers: Longitudinal results from the Predictors Caregiver Study. *Alzheimer's & Dementia, 11*(4), 444-454.
4. Derogatis, L. R., & Melisaratos, N. (1983). The Brief Symptom Inventory: An introductory report. *Psychological Medicine8, 13*(3), 595-605.
5. Anthony-Bergstone, C. R., Gatz, M., & Zarit, S. H. (1988). Symptoms of psychological distress among caregivers of dementia patients. *Psychology and Aging, 3*(3), 245-248.
6. Derogatis, L. R. (2001). *Brief Symptom Inventory (BSI) - 18. Administrations, scoring, and procedure manual (3rd ed.)*. Minneapolis, MN: NCS Pearsons, Inc.
7. Innes, A., Morgan, D., & Kostineuk, J. (2011). Dementia care in rural and remote settings: A systematic review of informal/family caregiving. *Maturitas, 68*(1), 34-46.
8. Butler, S. S., Turner, W., Kaye, L. W., Ruffin, L., & Downey, R. (2008). Depression and caregiver burden among rural elder caregivers. *Journal of Gerontological Social Work, 46*(1), 47-63.
9. R Core Team (2018). R: A language and environment for statistical computing (Version 3.5.0) [Software]. R foundation for Statistical Computing. Vienna, Austria.
10. Bedard, M., Molloy, D. W., Squire, L., Dubois, S., Lever, J. A., & O'Donnell, M. (2001). The Zarit Burden Interview: A new short version and screening version. *The Gerontologist, 41*(5), 652-657.
11. Ware, J., Kosinski, M., Keller, S. D. (1996). A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. *Medical care, 34*(3), 220-233.
12. Hughes, C. P., Berg, L., Danziger, W., Coben, L. A., & Martin, R. L. (1982). A new clinical scale for rating dementia. *The British Journal of Psychiatry, 140*(6), 566-572.
13. O'Bryant, S. E., Waring, S. C., Cullum, C. M., Hall, J., Lacritz, L., Massman, P. J. . . . Doody, R. (2008). Staging dementia using clinical dementia rating scale sum of boxes scores: A Texas Alzheimer's research consortium study. *Archives of Neurology, 65*, 1091-1095.
14. Schermelleh-Engel, Moosbrugger, & Muller (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research, 8*(2), 23-74.
15. Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods, 6*(1), 53-60.
16. Kline, R. B. (2005). *Principles and practice of structural equation modelling* (2nd ed.). New York: The Guilford Press.
17. Hinkin, T.R. & Schriesheim, C.A. (1989). Development and application of new scales to measure the French and Raven (1959) bases of social power. *Journal of Applied Psychology, 74*(4), 561-467.
18. Adams, K. B. (2006). The transition to caregiving: The experience of family members embarking on the dementia caregiving career. *Journal of Gerontological Social Work, 47*(3-4), 3-29.
19. Skaff, M. M., Pearlin, L. I., & Mullan, J. T. (1996). Transitions in the caregiving career: Effects of sense of mastery. *Psychology and Aging, 11*(2), 247-257.

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CIHR IRSC
Canadian Institutes of Health Research / Instituts de recherche en santé du Canada

CCNA Canadian Consortium on Neurodegeneration in Aging
CCNV Consortium canadien en neurodégénérescence associée au vieillissement

SHRF Saskatchewan Health Research Foundation

A scoping review of multiple transitions across care settings among individuals with dementia

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BACKGROUND

- Physical transitions across care settings have been linked to a number of poor outcomes in individuals with dementia and care partners.[1,2]
- Some transitions are unplanned and possibly avoidable with proper disease management.[3,4]
- Previous reviews have synthesized the evidence on services and interventions that reduce risk and improve transitions across community and institutional settings,[5] between home and hospital,[6] and from home to long-term care.[7] Caregiver needs during transition from home to long-term care[2] and interventions to support caregivers during this period[7] have also been the subject of recent reviews.

OBJECTIVE

- To identify patterns of multiple transitions experienced by individuals with dementia, including number of transitions and care settings involved, and the factors associated with multiple transitions.

METHODS

- This review was guided by the Arksey and O'Malley[8] five-stage scoping review methodology and additional steps for each stage as proposed by Levac et al.[9]

Research questions

1. What are the types of multiple transitions across care settings that have been studied?
2. Which care settings have been examined in terms of multiple transitions?
3. What factors are associated with multiple transitions?
4. How have multiple transitions been defined or described?
4. What are the timeframes in relation to multiple transitions that have been examined?
5. What other aspects of multiple transitions have been examined?

Search strategy

- MEDLINE, EMBASE, and CINAHL
- Peer-reviewed English articles published January 1, 2007 to May 3, 2017
- Terms related to dementia, care settings, and transitions

Study selection

Inclusion criteria

Study participants may reside in any setting at the start of the study

Study participants must be individuals with dementia (and caregivers) only, or individuals with dementia (and caregivers) and controls wherein those with dementia are analyzed as a separate group

Transitions between settings must be a study outcome, not a predictor

Care settings must not include emergency departments, physician offices, or any care setting that does not imply an overnight stay

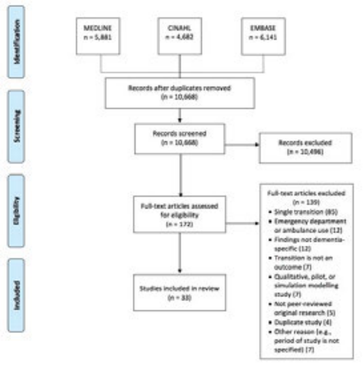
Must examine multiple transitions, defined as any one of the following:

- at least 2 moves between any 3 or more different settings (e.g., home-hospital-LTC; LTC-home-hospital; hospital-LTC-palliative care)
- including home, at least 3 moves between 2 settings (e.g., home-hospital-home-hospital; home-LTC-home-LTC;)
- excluding home, at least 2 moves between 2 care settings (e.g., LTC-hospital-LTC; hospital-LTC-hospital)

Exclusion criteria

Letters to the editor, opinion letters, commentaries, dissertations, reviews, study protocols, policy papers, reports, grey publications, and book chapters

Studies involving care settings that do not require an overnight stay (e.g., emergency department, physician office, home care)



PRISMA flow chart of study selection and inclusion

RESULTS

Study characteristics

- Majority of 33 articles were published in 2015 or later (*n* = 19), suggesting this is an emerging research topic
- Retrospective cohort study designs were used in more than half of the studies (*n* = 18) and four studies included an intervention
- All of the studies included a mixed-sex sample, with females accounting for at least 60% of the dementia sample in three-quarters of the studies (*n* = 25)
- Five studies included rural participants, with rural-urban comparisons in three studies

Multiple transition timeframes

- Timeframes ranged from less than 30 days to 10 years
  - ≤ 30 days (n=13)
  - 3 months to less than one year (n = 7)
  - ≥ 1 year (n = 23)
- 10 studies involved more than one period of time
- All studies of ≤ 30 days focused on rehospitalization
- Seven studies considered timeframes of ≥ 3 years

Multiple transition routes

- 26 distinct routes of two, three, or four+ transitions
- Most common two-transition route (n = 9) was *home-hospital-LTC*
  - Hospitalized patients with dementia were more likely than patients without dementia to be discharged to LTC (5.6-35.9% vs 3.5-8.6%)
  - Single transitions from hospital to LTC were associated with sex, age, marital status, and health characteristics such as comorbidity and functioning
  - Only one study focused on factors associated with a particular two-transition route as a whole
- Most common three-transition route (n = 11) was *x-hospital-x-hospital*
  - Patients with dementia had higher readmission rates than patients without dementia in 5 studies with controls (13.8-40% vs. 9.8-32%) and a lower rate in one study (17.3% vs. 24.4%)
  - Risk of rehospitalization increased in men with fewer cohabitants and in women with a longer hospital stay
  - Overall, rehospitalization risk increased with comorbid dementia and depression, more severe cognitive impairment, and greater medication use
- All of the four+ transition routes related to recurrent hospitalization

Starting location and number of other locations in the route	Two transitions	Three transitions	Four or more transitions
Home			
One		• home-hospital-home-hospital (Boltz et al., 2015; Cassel et al., 2016; Mondor et al., 2017; Ono et al., 2011; Sivanthanan & McGrail, 2016)	
Two	• home-hospital-LTC (Boltz et al., 2015; Bucher et al., 2016; Fogg et al, 2017; Harvey et al, 2015; Kedia et al, 2017; Mitchell et al., 2016; Mondor et al., 2017; Ono et al. 2011; Zekry et al., 2008) • home-hospital1-hospital2 (Ono et al., 2011) • home-hospital-hospice care (Kedia et al., 2017) • home-hospital-other (Bucher et al., 2016)	• home-hospital-x-hospital (Fong et al., 2012; Rudolph et al., 2010; Voisin et al., 2009)	• home-hospital-x-hospital-x-hospital (Voisin et al., 2009)
Long-term Care			
One		• LTC-hospital-LTC-hospital (Leung et al., 2013; Sivanthanan & McGrail, 2016)	• LTC-hospital-LTC-hospital-LTC-hospital (Aaltonen et al., 2014)
Two	• LTC-home-LTC (Callahan et al., 2012) • LTC-home-hospital (Callahan et al., 2012; Callahan et al., 2015) • LTC-hospital-LTC (Bucher et al., 2016; Callahan et al., 2012; Callahan et al, 2015) • LTC1-hospital-LTC2 (Aaltonen et al., 2014; Givens et al., 2013) • LTC-hospital-other (Bucher et al., 2016) • LTC-hospital-x (Sivanthanan & McGrail, 2016)		• LTC-hospital-LTC-hospital-x (Sivanthanan & McGrail, 2016)
Unspecified location			
One		• x-hospital-x-hospital (Daiello et al., 2014; Davydow et al., 2014; Draper et al., 2011; Gustafsson et al., 2017; Harvey et al., 2015; Hsiao et al., 2015; Kedia et al., 2017; Mitchell et al., 2017; Mitchell et al., 2016; Mitchell et al., 2015; Noel et al., 2017)	• x-hospital-x-hospital-x-hospital (Hsaio et al., 2015; Kedia et al., 2017; Teno et al., 2013) • x-hospital-x-hospital-x-hospital-x-hospital (Chang et al., 2015)
Two	• x-hospital-LTC (Bucher et al., 2016; Daiello et al., 2014; Draper et al., 2011; Kasteridis et al., 2016; Seematter-Bagnoud et al, 2012; Takacs et al., 2015) • x-hospital-hospice care (Oud et al., 2017) • x-hospital-home (Bucher et al, 2016) • x-hospital-other (Bucher et al., 2016)	• x-hospital-LTC-hospital (Callahan et al., 2012; Callahan et al., 2015) • x-hospital-home-hospital (Callahan et al., 2012; Callahan et al., 2015)	
Three or more		• x-hospital-LTC-home (Callahan et al., 2015)	

Note. 'x' locations were not specified; 'x' was counted as a single location in transitions that involved multiple unspecified locations; 14 studies reported more than one route (Aaltonen et al., 2014; Boltz et al., 2015; Callahan et al., 2012; Callahan et al., 2015; Daiello et al., 2014; Draper et al., 2011; Harvey et al., 2015; Hsaio et al., 2015; Kedia et al., 2017; Mitchell et al., 2016; Mondor et al., 2017; Ono et al, 2011; Sivanthanan et al., 2016; Voisin et al., 2009)

CONCLUSION

- The most common multiple physical transitions among individuals with dementia were a move from home into hospital and subsequently into long-term care, and readmission to hospital from unspecified settings
- The majority of the studies that included control patients showed that dementia increased the risk of single transition from hospital to long-term care and the risk of hospital readmission from unspecified settings
- Further studies are needed to understand multiple transitions:
  - that involve more routes than home-hospital-LTC, and rehospitalization
  - experienced over time periods longer than three years
  - in sub-populations of individuals with dementia (e.g., women, rural, ethnically diverse)

REFERENCES

1. Ray et al. (2015). Systematic review of planned care transitions for persons with dementia. *Neurodegenerative Disease Management, 5*(4), 317-331.
2. Afram, B., Verbeek, H., Bleijlevens, M., & Hamers, J. (2015). Needs of informal caregivers during transition from home towards institutional care in dementia: a systematic review of qualitative studies. *International Pyschogeriatrics, 27*(6), 891-902.
3. Phelan et al. (2012). Association of incident dementia with hospitalizations. *Journal of the American Medical Association, 307*(2), 165-172.
4. Pohontsch et al. (2017). (In-)formal caregivers' and general practitioners' views on hospitalizations of people with dementia – an exploratory qualitative interview study. *BMC Health Services Research, 17*, 530.
5. Hirschman, K., & Hodgson, N. (2018). Evidence-based interventions for transitions in care for individuals living with dementia. *The Gerontologist, 58*(S1), S129-S140.
6. Dawson et al. (2015). Evidence of what works to support and sustain care at home for people with dementia: a literature review with a systematic approach. *BMC Geriatrics, 15*, 59.
7. Muller et al. (2017). Interventions to support people with dementia and their caregivers during the transition from home care to nursing home care: a systematic review. *International Journal of Nursing Studies, 71*, 139-152.
8. Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, *8*(1), 19–32.
9. Levac et al. (2010). Scoping studies: Advancing the methodology. *Implementation Science*, *5*, 69.

University of Saskatchewan

Quality of Life Across Various Types of Dementia in Patients Presenting to a Rural and Remote Memory Clinic

Michelle Kushneriuk, Andrew Kirk, Chandima Karunanayake, Debra G. Morgan, Megan E. O'Connell

INTRODUCTION

- Dementia has become increasingly common as the population ages and is a major cause of disability throughout the world.
- The progressive nature of dementia leads to premature mortality, caregiver burden, increased healthcare utilization and cost, loss of independence, and reduced quality of life (QOL).[1]
- Health-related QOL is a multidimensional concept that considers all aspects of a patient's life, encompassing physical, mental, emotional, and social functioning, and is a valuable health measure in dementia.[2]
- With no present cure, dementia care is focused on promoting patient well-being and maintaining optimal QOL.[2]
- The University of Saskatchewan's Rural and Remote Memory Clinic (RRMC) was designed to improve access to diagnosis and treatment for rural patients with dementia.
- A database of information on several hundred patients assessed in the clinic has accumulated, including a record of patient and caregiver ratings of patient QOL.
- There has been little research assessing patient- and caregiver-rated patient QOL across various types of dementia, which could provide clinicians with information to help guide care and services to patients with specific types of dementia.

OBJECTIVES

- The purpose of this project was to further understand how dementia can affect one's QOL by comparing patient- and caregiver-rated patient QOL across different types of dementia in patients presenting to a RRMC.
- We hypothesized that QOL would differ depending on diagnosis and that patient vs. caregiver ratings may be more discordant in certain types of dementia.
- The ultimate goal was to acknowledge and provide information on the importance of QOL to better optimize patient care.

MATERIALS & METHODS

Data collection at the University of Saskatchewan's RRMC began in March 2004.

The 343 patients in this study were seen between 2004 and 2016 and were diagnosed at clinic day with mild cognitive impairment (MCI), frontotemporal dementia (FTD), Alzheimer's disease (AD), vascular dementia (VD), or Lewy Body dementia (DLB).

Patients and their caregivers completed client questionnaires at their initial visit.

Data collection for this study included patient QOL as rated by the patient (QOL-PT), patient QOL as rated by the caregiver (QOL-CG), initial MMSE score, age at clinic day, years of education, smoking status, caffeine consumption, alcohol consumption, and engagement in physical activity/exercise.

Statistical analysis was performed to assess patient demographics and the differences in QOL ratings across dementia subtypes. The groups were compared using one-way ANOVA, χ^2 tests, and t-tests.

RESULTS

Table 1: Patient characteristics based on dementia subtype

Patient Variables	Subtype (Mean ± SD)				
	MCI	FTD	AD	VD	DLB
QOL-PT	37.1 ± 5.4	37.2 ± 6.1	36.3 ± 5.6	33.7 ± 5.5	32.1 ± 5.9
QOL-CG	34.6 ± 7.1	30.9 ± 5.2	31.7 ± 5.9	33.5 ± 5.9	31.8 ± 5.2
Initial MMSE score	26.3 ± 2.7	22.7 ± 5.1	21.4 ± 4.0	24.6 ± 4.0	22.4 ± 6.6
Age at clinic day (years)	71.9 ± 10.5	66.9 ± 11.0	76.2 ± 7.7	71.7 ± 9.6	77.8 ± 6.3
Years of formal education	11.2 ± 3.0	11.6 ± 2.5	10.3 ± 2.9	10.6 ± 3.2	10.6 ± 2.4
Total years smoked	31.1 ± 16.5	32.4 ± 15.5	28.3 ± 18.1	36.8 ± 11.0	37.7 ± 27.6
Cups of caffeinated tea/coffee per day	3.0 ± 2.5	2.1 ± 1.3	3.3 ± 3.4	2.7 ± 2.0	2.8 ± 1.7
Drinks of alcohol per week	1.7 ± 3.9	1.7 ± 3.4	1.2 ± 2.5	1.6 ± 5.1	0.9 ± 1.6
Number of times engage in physical activity or exercise per week	3.4 ± 3.0	3.7 ± 3.8	3.3 ± 3.5	2.5 ± 2.9	2.4 ± 2.9

Table 2: Comparison of patient characteristics between each subtype. *Comparison is significant when p-value <0.05

Patient Variables	Comparisons (P-value)									
	MCI vs FTD	MCI vs AD	MCI vs VD	MCI vs DLB	FTD vs AD	FTD vs VD	FTD vs DLB	AD vs VD	AD vs DLB	VD vs DLB
QOL-PT	1.000	0.890	0.178	0.057	0.949	0.267	0.092	0.362	0.124	0.953
QOL-CG	0.020*	0.010*	0.948	0.449	0.934	0.535	0.984	0.748	1.000	0.926
Initial MMSE score	0.008*	0.000*	0.382	0.198	0.651	0.621	1.000	0.020*	0.969	0.789
Age at clinic day (years)	0.126	0.015*	1.000	0.029*	0.000*	0.385	0.000*	0.239	0.853	0.133
Years of formal education	0.982	0.219	0.917	0.937	0.195	0.772	0.814	0.997	0.998	1.000
Total years smoked	0.999	0.936	0.923	0.915	0.898	0.976	0.967	0.697	0.719	1.000
Cups of caffeinated tea/coffee per day	0.618	0.944	0.997	0.999	0.175	0.957	0.956	0.923	0.964	1.000
Drinks of alcohol per week	1.000	0.816	1.000	0.938	0.931	1.000	0.958	0.982	0.999	0.977
Number of times engage in physical activity or exercise per week	0.996	1.000	0.865	0.879	0.980	0.762	0.789	0.876	0.893	1.000

Table 3: Comparisons of patient (PT) and caregiver (CG) rated QOL within dementia subtypes.
***Comparison is significant when p-value < 0.05**

Diagnosis	QOL	Mean ± SD	P-value
MCI	PT	37.3 ± 5.0	0.035*
	CG	35.3 ± 7.3	
FTD	PT	37.2 ± 6.1	0.002*
	CG	31.7 ± 5.5	
AD	PT	37.0 ± 9.7	0.000*
	CG	32.1 ± 5.9	
VD	PT	33.7 ± 5.5	0.788
	CG	33.9 ± 6.2	
DLB	PT	32.1 ± 5.9	1.000
	CG	32.1 ± 4.3	

CONCLUSIONS

This study had three main findings:

(1) There are no significant differences in patient ratings of QOL across dementia subtypes;
(2) Caregivers rate patient QOL significantly higher in MCI compared to FTD and AD and;
(3) Patients rate their own QOL significantly higher than do their caregivers in MCI, FTD, and AD.

In order to improve the management of patients with dementia, it is essential for patient QOL to be taken into consideration. Management should focus on optimizing patient QOL and supporting patients, as well as their caregivers, through the challenges and reduced QOL that result from living with dementia.

REFERENCES

1. Fiest KM, Jetté N, Roberts JI, Maxwell CJ, Smith EE, Black SE, Blaikie L, Cohen A, Day L, Holroyd-Leduc J, Kirk A. The prevalence and incidence of dementia: a systematic review and meta-analysis. Can J of Neurol Sci. 2016;43(S1):S3-50.
2. Landeiro F, Walsh K, Ghinai I, Mughal S, Nye E, Wace H, Roberts N, Lecomte P, Wittenberg R, Wolstenholme J, Handels R. Measuring quality of life of people with predementia and dementia and their caregivers: a systematic review protocol. BMJ open. 2018;8(3):e019082.

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Using GIS to examine access to transportation for seniors in rural Saskatchewan

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Introduction

The number of seniors living in rural Saskatchewan, defined as those aged 65 years and older and living in areas with less than 1000 residents and/or where to access to key amenities is greater than 5 km, has increased by almost 50,000 residents between 2006 to 2011.[1] The rising number of seniors in Canada (and Saskatchewan) has increased the government's health expenditures dedicated to providing additional health services that better allow seniors to age in place.[2] This is in part due to seniors being more likely to develop functional impairments associated with age-related medical conditions (e.g., cognitive impairments, dementia, and Parkinson's disease) that can impact mobility and consequently, aging in place.[3]

Healthy aging is described as the process of optimizing opportunities for physical, social, and mental health.[4] Alternative transportation plays an essential role in promoting healthy aging by helping older adults (e.g., healthy older adults and those with cognitive impairment and/or dementia, physical disabilities) who can no longer drive to maintain their mobility and independence, as well as maintain access to health and community services that contribute to a better quality of life.[5]

In Saskatchewan, the Saskatchewan Transportation Company, a province-wide coach service that provided service to 254 rural communities, as well as the Greyhound Bus Service, were recently withdrawn.[6] As a result, rural residents of Saskatchewan are in need of alternative transportation, not only for accessing health care services, but also community and social services that are paramount for maintaining community engagement and connectiveness.

Objectives

The purpose of this research study is to describe current alternative forms of transportation including types of services and routes in Saskatchewan

Methodology

An environmental scan was conducted on 156 cities/towns/communities in Saskatchewan through a comprehensive search of websites (e.g., google, 211 service directory, town office, government webpages), social media (e.g. Facebook) and, organizations that offer any type of transportation services to all, followed by phone calls to the service providers. The collected data from different sources were compared to assure validity and reliability of data.

Data were collected on modes of transportation, route information, geographic boundary, and public or private type of service. Data from the environmental scan were then used to create a map using Geographic Information Systems (GIS) to determine whether there were any gaps in transportation services in Saskatchewan.

To describe Saskatchewan alternative transportation services, descriptive statistics (Mean±SD; range) or frequencies (%) were calculated. The 156 cities/towns/communities of Saskatchewan were divided into four groups based on the size of their population: rural areas with a population of less than 1,000; small population centers with a population of between 1,000 and 29,999; medium population centers with a population of between 30,000 and 99,999; and large population centers with a population of 100,000 and over.[7]

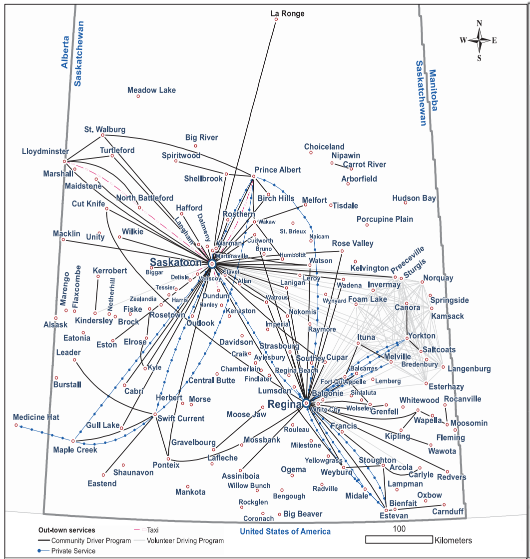

Figure 2. Alternative Transportation Routes and Types in Saskatchewan

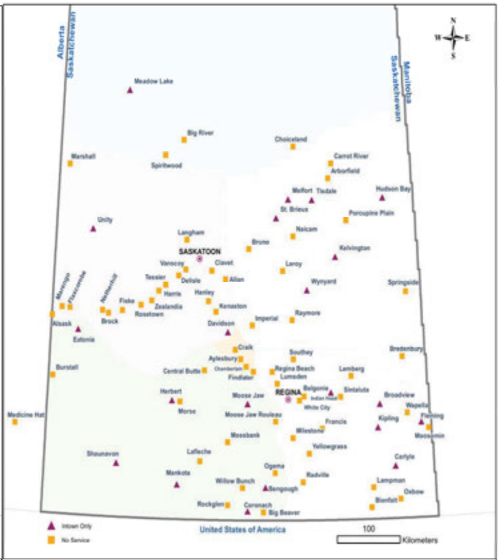

Figure 3. Rural and Small Populations with No Services

Table 1. Descriptive Statistics

	N	Population Size	Number of Services	Volunteer Driving Program (%)	Taxi Services (%)	Private Services (%)	Community Driver Program (%)	Community Driver Program Cost ($)	Community Driver Program Radius (km)
Rural	91	476.8±248.8 10-973	.53±.67 0-3	13.2	1.1	2	35.2	.69/km±.36 .36-2	172.8±106.4 20-440
Small PC	61	3,463.3±3,930.2 1,033-16,604	1.36±1.1 0-5	21.3	4.9	18.2	77	.76/km±.49 .40-2.88	176.6±107.6 8-380
Medium PC	2	34,908.0±1,439.7 33,890-35,926	4.0±2.8 2-6	0	100	50	0	N/A	N/A
Large PC	2	230,741.0±22,111.3 215,106-246,376	10.0±1.4 9-11	0	100	100	0	N/A	N/A

Results

The findings identified that large urban population centers (i.e. Saskatoon and Regina) have various types of transportation (e.g., different private services and taxi). The GIS maps indicated that many of the routes go back and forth between medium and large population centers with little access to rural regions of Saskatchewan. Rural regions and small population centers have limited transportation options despite accounting for almost 97.5% of the province's geography. Community vans and buses serve 35% of rural and 77% of small communities, offering individualized services. These vans/buses can travel 173 km on average in rural communities and 177 km in small towns. However, not all of them provide out-town services: in 11 communities they cannot be taken further than 67 km on average; and in 12 communities they can only run within the town. The individualized aspect of this service, in addition to this service being offered primarily during regular business hours, restrict the number of rural riders at a given time and does not allow them to use this service to attend medical appointments outside of its regular time schedules.

In some rural and small population centers like Cut Knife, Dalmeny, Kyle, Wilkie, Preeceville, Saltcoats, Eastend, Gull Lake, Maidstone, Ponteix, Carnduff, and Weyburn, clients must find their own driver. These drivers must have a Class 5 driver license (for driving vans and buses), submit a driving record to the Town Office, and attend an orientation class to properly operate the handi-van (community driver program) equipment such as motorized wheelchair lift.

Conclusions

There are significant challenges in connecting rural areas with large urban centers, considering both the types of alternative transportation available and the operations of the service. Rural residents also experience burdens of cost and time travelling longer distances to access health and social programs, primarily only available in urban population centers. The limited number of transportation services and their restricted schedules (do not operate on week-ends) leave many residents in rural areas and small towns of Saskatchewan isolated and underserved. Next steps involve talking with rural residents and other vested stakeholders about the feasibility of developing integrated transport systems connecting multiple residents in rural areas to larger centers in Saskatchewan. This is particularly important given rural residents are aging and are faced with age-related physical and cognitive declines.

References

1. Statistics Canada. *An aging population. Population and demography.* Statistics Canada; 2010. Retrieved from: http://www.statcan.gc.ca/pub/11-402-x/2010000/pdf/population-eng.pdf
2. Beard JR, Officer A, de Carvalho IA, Sadana R, Pot AM, Michel JP, Lloyd-Sherlock P, Epping-Jordan JE, Peeters GG, Mahanani WR, Thiyagarajan JA. The world report on ageing and health: a policy framework for healthy ageing. *The Lancet*. 2016;387(10033):2145–2154.
3. Marshall SC, Man-Son-Hing M. Multiple chronic medical conditions and associated driving risk: a systematic review. *Traffic Injury Prevention*. 2011;12(2):142–148.
4. Levasseur M, Dubois MF, Généreux M, Menec V, Raina P, Roy M, Gabaude C, Couturier Y, Pierre C. Capturing how age-friendly communities foster positive health, social participation and health equity: a study protocol of key components and processes that promote population health in aging Canadians. *BMC Public Health*. 2017;(17):502.
5. World Health Organization (WHO). *Global age-friendly cities: A guide.* 2007. Retrieved from http://www.who.int/ageing/publications/Global_age_friendly_cities_Guide_English.pdf
6. Saskatchewan Transportation Company; 2017. Retrieved from https://www.stcbus.com/
7. Statistics Canada. *Population Centre and Rural Area Classification 2016*. Retrieved from https://www.statcan.gc.ca/eng/subjects/standard/pcrac/2016/introduction

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Applications of computational simulation modeling methodologies in dementia research: A scoping review – stage 1

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Melanie Bayly[1,2,3], Amanda Froehlich Chow[1,2,3], Valerie Elliot[1,2,3], Nathaniel Osgood[1,3]
[1]University of Saskatchewan, [2]Canadian Centre For Health and Safety in Agriculture, [3]Rural Dementia in Action Research (RaDAR) Team 20

Background

- Computational science is a broad, multidisciplinary field blending advanced computing capabilities, powerful data analysis techniques, and discipline-specific knowledge for the study of complex problems that are difficult to investigate using conventional approaches.
- Computational science methods are complementary to the traditional approaches of theory generation and experimentation. This rapidly evolving field includes elements of mathematical modeling, simulation modeling (e.g. agent-based, system dynamics, discrete event), data science, complex adaptive systems theory, big data, and data analytics.
- The use of computational simulation modeling methodologies in human health research has increased dramatically over the past decade, and is recognized as increasingly important for the advancement of medical science.

Objective

A scoping review summarizing published research focusing on the use of computational modeling and simulation methodologies as they have been applied to questions in dementia research. Our data extraction will examine:

- What is the purpose of the model (e.g. predictive modeling to identify future trends and prevalence; implications for capacity planning and resource allocation; consequences for informal caregivers)?
- Which assumptions were made when constructing these models, and why?
- When was the study published, who was included in the population, and where geographically?
- What were the sources and quality of data, and what methods & methodology were used?
- What knowledge gaps exist that may indicate potential areas of future study?

Methods

- The RaDAR team and Principal Investigator will develop search strategies for this scoping review, with the assistance of a university librarian experienced in dementia research.
- Titles, abstracts, and full text articles will be screened independently by two reviewers, with data extraction carried out by one reviewer, then verified by a second reviewer.
- The review process will be informed by Levac, Colquhoun & O'Brien (2010), and the specific review stages are guided by the Arksey and O'Malley (2005) five-stage scoping review framework.

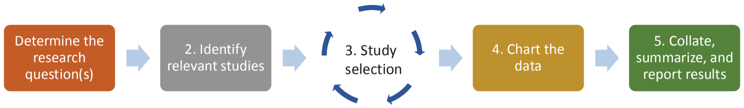
Determine the research question(s)
2. Identify relevant studies
3. Study selection
4. Chart the data
5. Collate, summarize, and report results

Figure 1. Arksey and O'Malley (2005) Scoping Review Framework

References

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology, 8(1)*, 19-32. doi:10.1080/1364557032000119616

Levac, D., Colquhoun, H., & O' Brien, K. K. (2010). Scoping studies: Advancing the methodology. *Implementation Science, 5*, 69. doi:10.1186/1748-5908-5-69

Figure 2: Model contributed by Dr. Geoff McDonnell, Adaptive Care Systems and UNSW, and Dr. Nathaniel Osgood, University of Saskatchewan. AnyLogic 7 Version by Wenyi An, University of Saskatchewan.

Figure 3: Adapted from a model originally designed by Dr. Nathaniel Osgood, University of Saskatchewan.

Figure 4: Adapted from a model originally designed by the AnyLogic Company.

System Dynamics

System dynamics is a highly abstract method of modeling. These simulation models are typically used for long-term, strategic decision-making.

System dynamics ignores the fine details of a system, such as the individual properties of people, products, or events, and produces a general representation of a complex system where the effects of change can be understood, tested and analyzed.

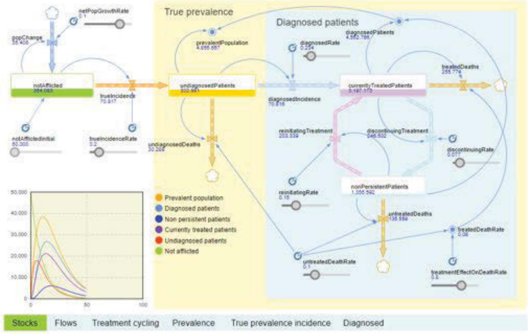

Figure 2: Generalizable model of chronic disease, and interactions with the healthcare system.

Agent-based Modeling

Agent based modeling focuses on the individual active components of a system. Active entities (agents) must be identified, and their behaviours defined. They may be people, hospitals, ambulances, staff, medications, or equipment – whatever is relevant to the system or question.

Networks, connections, and relationships between agents and their environment are established, and the global dynamics of the system then emerges from the interactions of the many individual behaviours.

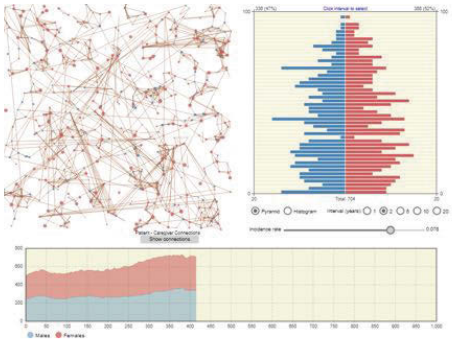

Figure 3: Generalizable model of disease incidence, and connections between patients and caregivers.

Discrete-event Modeling

Many healthcare processes can be described as a sequence of separate, discrete events. Discrete-event simulation (also called process, or resource allocation modeling), focuses on the processes in a system at a medium level of abstraction.

Discrete-event simulation is widely used in the manufacturing, logistics, pharmaceuticals, and healthcare fields. When the system under analysis can naturally be described as a sequence of operations, this technique should be used.

Figure 4: Generalizable model of a typical ED, with optimization through changes to the staff mix.

Alzheimer Society
SASKATCHEWAN
Learn More Live Well

U-First! is a training program that helps frontline staff to develop a common knowledge base, language, values and approach to caring for people with Alzheimer's disease and other dementias by:

- Understanding the person living with dementia and associated behaviour changes
- Working as a team to develop individualized support strategies

If you are caring for someone with dementia, the U-First! Program will help you:

- **U**nderstand that there can be many reasons why you might see behaviour changes when a person is living with dementia
- **F**lag the possible changes that you may see when you are supporting a person living with dementia
- **I**nteract in a new way with both skill and a common understanding of dementia
- **R**eflect and report on not only new behaviours you may see in the person you are supporting, but also share your strategies and your tips on working with a person who is living with dementia
- **S**upport the person with dementia, their family and friends in everyday activities
- **T**o know that you are part of an important Team caring for the person with dementia

Understanding Dementia:

Many of the clients or residents you work with will have been diagnosed with some form of dementia.

Dementia is a term used to describe a variety of brain disorders that include symptoms such as loss of memory, confusion and problems with speech and understanding, and changes in mood and behaviour.

One of the causes of dementia is Alzheimer's disease, which is a progressive, degenerative disease of the brain, which causes thinking and memory to become seriously impaired.

You may see changes in the person's ability to interact with the people around them and perform activities of daily living.

When we ask people who work with people who have dementia about the number one difficulty they face as a care provider, the answer is always a challenging behaviour, such as aggression, wandering, physical resistance or agitation. We call this behaviour "responsive," because it is not unpredictable, meaningless aggression or agitation.

We understand that:

- The person is responding to something negative, frustrating, or confusing in his or her environment
- The reasons or triggers for challenging behaviours may be external rather than within the individual
- Problems in the social or physical environment can be addressed and changed

U-First! Training will help you to work more effectively with people living with dementia, creating a healthy workplace for you.

U-First! provides a practical method for shared problem-solving and care planning, it also assists with the implementation of P.I.E.C.E.S. concepts.

Unique to U-First! is the innovative yet practical "job aide" (the U-First! wheel) which serves as a tool to promote on-the-job dialogue and communication between partners in care.

Note: U-First! is not P.I.E.C.E.S. training. However, participants learn basic P.I.E.C.E.S. concepts and how to apply these to observing changes and participating in care planning.

How do care providers benefit from U-First! Training?

- Increased awareness of the causes of behaviour in people with dementia
- Improved ability to handle situations that arise
- Increased teamwork with other staff
- Increased professionalism
- Increased ability to prevent aggression
- Reduced stress

**Source: Third Party Survey Data Evaluation December 2007 (Alzheimer Society of Ontario)*

U-First!™

Delivery of First Link:

In Person:

U-First! Training is delivered by a U-First! trainer as a one-day (6-hour) format. Class size is minimum 12 participants, maximum 24 participants. Cost $75. Currently piloting in Regina area.

Each learner receives

- 6 hours of training,
- U-First! workbook*,
- a U-First! wheel* and
- certificate of completion**

*The workbook and wheel are used not only as a resource while in the class but following it.

Online:

U-First! Online is offered over a 3-week period, in a blended learning format. Participants are responsible for completing specific activities each week and should be willing to commit approximately 3-5 hours per week for the course. $75

Week 1 complete 9 e-learning modules and 1 discussion forum

Week 2 complete 9 e-learning modules, 1 discussion forum, and a Case Study Assignment

Week 3 participate in 1 live webinar

**For a participant to be considered U-First! trained and receive a certificate of completion, they must be registered at the Alzheimer Society of Saskatchewan

Visit www.u-first.ca for more information and to register for a session.

Contact Joanne Michael, Director of Programs and Operations - jmichael@alzheimer.sk.ca

Development, implementation, and scaling up of a Rural Primary Health Care Model for Dementia

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Background

- 17% of Canada's population is rural (lives outside of a city of ≥10,000)[1]
- Older adults in Canada (≥65 years) account for 20% of the rural population vs.16% of the urban population[1]
- Only 2% of all specialists in Canada practice in rural communities[2]
- Repeated travel to urban physicians from rural areas is costly and difficult, time-consuming, and risky in poor weather. Private transportation is most often required, since public transportation can be very limited.
- Rural primary health care (PHC) providers must assume responsibility for dementia diagnosis and management
- However, evidence-based best practices for dementia care in rural PHC settings are unavailable

Aim

- To develop a sustainable and scalable model of rural primary health care for dementia that consists of integrated clinical support tools and education

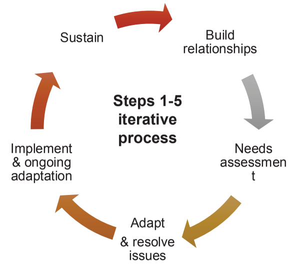
Methods

- Community-based Participatory Research
  - Co-development of model rather than implementation of externally developed model
  - PHC teams considered partners in research process; regular and frequent communication
  - Strengths and work processes of PHC teams incorporated to increase relevance, ownership, and sustainability

	PHC Team 1	PHC Team 2	PHC Team 3
Population	1,140 (1 community)	10,870 (1 community)	2,000 (3 communities)
Team members	7 (FP, NP, HC, OT)	10 (FP, NP, HC, OT, PT, SW)	8 (FP, NP, HC, OT, PT)
Year established	2013	2014	2010
Year enrolled	2014	2017	2018

FP = Family Physician, NP = Nurse Practitioner, HC = Home Care, OT = Occupational Therapist, PT = Physical Therapist

- 5-step development-adaptation process[3-6]



- Process evaluation of development-adaptation facilitators and barriers[7]

Results

Fig. 1 Rural Primary Health Care Model for Dementia
developed and adapted across 3 rural PHC teams

Team-based Care

Multidisciplinary Team
- Family Physician or Nurse Practitioner
- Home Care nurse
- Occupational Therapist
- Physical Therapist
- Social Workers
- Others such as office staff, PHC Facilitator

Care Management
- Team co-ordination built into EMR visit flow sheet
- Dementia case conferences implemented (between team & patient/family)

Education/support for Patient & Caregiver
- Alzheimer Society First Link Coordinator is included in case conferences
- A link to Alzheimer Society referral form added to EMR visit flow sheet

Specialist-to-provider support

Access to Dementia Specialists
- Referral – to SK Rural and Remote Memory Clinic
- Consultation – with RaDAR specialists, PC-DATA™ [8] developer
- Observation of team functioning in SK Rural & Remote Memory Clinic

Education Sessions
- PC-DATA™ info session
- PC-DATA™ education sessions
- Differential diagnosis
- Capacity and competency

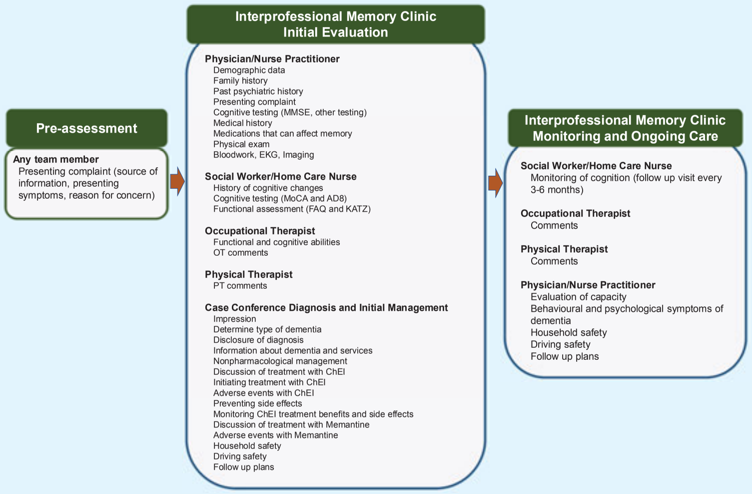
Decision support tools

Standard Tools & Guidelines
- 3 PC-DATA™ visit flow sheets adapted and added to regional EMR system
- Workbook
  - PC-DATA™ education manual
  - work standards for team processes
  - scripts for driving and communicating a diagnosis

Access to IT Resources
- All providers have access to work standards
- All providers have access to EMR visit flow sheets

Note. Model is informed by 7 elements of comprehensive and coordinated care for patients with dementia in primary care proposed by Aminzadeh et al.[9]

Fig. 2 Interprofessional Rural PHC Team Memory Clinics



Pre-assessment

Any team member
Presenting complaint (source of information, presenting symptoms, reason for concern)

Interprofessional Memory Clinic Initial Evaluation

Physician/Nurse Practitioner
Demographic data
Family history
Past psychiatric history
Presenting complaint
Cognitive testing (MMSE, other testing)
Medical history
Medications that can affect memory
Physical exam
Bloodwork, EKG, Imaging

Social Worker/Home Care Nurse
History of cognitive changes
Cognitive testing (MoCA and AD8)
Functional assessment (FAQ and KATZ)

Occupational Therapist
Functional and cognitive abilities
OT comments

Physical Therapist
PT comments

Case Conference Diagnosis and Initial Management
Impression
Determine type of dementia
Disclosure of diagnosis
Information about dementia and services
Nonpharmacological management
Discussion of treatment with ChEI
Initiating treatment with ChEI
Adverse events with ChEI
Preventing side effects
Monitoring ChEI treatment benefits and side effects
Discussion of treatment with Memantine
Adverse events with Memantine
Household safety
Driving safety
Follow up plans

Interprofessional Memory Clinic Monitoring and Ongoing Care

Social Worker/Home Care Nurse
Monitoring of cognition (follow up visit every 3-6 months)

Occupational Therapist
Comments

Physical Therapist
Comments

Physician/Nurse Practitioner
Evaluation of capacity
Behavioural and psychological symptoms of dementia
Household safety
Driving safety
Follow up plans

- **The Rural PHC Model for Dementia was developed with PHC Team 1 (Jan/16-Jan/17) Figure 1**

- **Team 1 trialed a *sequential interprofessional patient evaluation* (Feb/17-Nov/17)**
  - 4 appointments per patient
  - Patient and family seen by FP or NP in office, followed by separate home-based assessments by HC and OT, then case conference with full team including Alzheimer Society First Link Coordinator

  Advantages
  - Family satisfaction with case conference, opportunity to plan future care
  - Team satisfaction with discussing driving issues in team context rather than one-to-one
  - Team satisfaction with involvement in patient care earlier rather than in a crisis situation

  Disadvantages
  - Difficulty coordinating appointments with separate team members
  - Lengthy delays between appointments
  - Extra time and travel for all involved
  - EMR licenses needed to be activated for those team members who had only intermittent EMR access (OT, Home Care)

- **Team 1 trialed a *one-stop interprofessional memory clinic* (Dec/17-present)** Figure 2
  - 1 half-day appointment per patient; 2 patients/day
  - Team meets separately twice, separate assessments by each team member with patient and family, appointment ends with case conference where diagnosis is conveyed and initial management plan discussed

  Advantages
  - Patient receives assessments from multiple providers in one day (FP/NP, OT, HC)
  - Family feel supported, feel they have a voice, questions are answered, have a plan going forward
  - Team satisfaction with interprofessional learning and patient care

  Disadvantages
  - Long day of assessments for patients and care partners

- Model has been adapted for Teams 2 and 3 in different rural communities

Implications

- CCNA Phase 1: Developed a feasible and acceptable Rural PHC Model for Dementia for spreading to other rural teams in SK
- CCNA Phase II: Will implement and evaluate a novel model of remote healthcare where a highly-trained urban-based clinician delivers a suite of telehealth interventions for rural/remote Saskatchewan

References

1. Statistics Canada. 2017. *Population by broad age groups and sex, Canada, by Statistical Area Classification, 2016 Census.*
2. Canadian Institute for Health Information. 2017. *Supply, Distribution and Migration of Physicians in Canada, 2016: Data Tables*.
3. Cabassa et al. 2014: Using the collaborative intervention planning framework to adapt a health-care manager intervention to a new population & provider group to improve the health of people with serious mental illness. *Implementation Science* 9, 178.
4. Jansen et al. 2013. Adapting the SLIM diabetes prevention intervention to a Dutch real-life setting: joint decision making by science and practice. *BMC Public Health* 13, 457.
5. Lee et al. 2008. Using planned adaptation to implement evidence-based programs with new populations. *American Journal of Community Psychology* 41, 290–303.
6. McKleroy et al. 2006: Adapting evidence-based behavioural interventions for new settings and target populations. *AIDS Education and Prevention* 18, 59–73.
7. Damschroder et al. 2009: Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implementation Science* 4, 50.
8. Seitz, D. 2012: Primary Care-Dementia Assessment & Treatment Algorithm (PC-DATA). Retrieved 1 October 2017 from http://www.pc-data.ca/
9. Aminzadeh, F., Molnar, F., Dalziel, W. and Ayotte, D. 2012: A review of barriers & enablers to diagnosis and management of persons with dementia in primary care. *Canadian Geriatrics Journal* 15, 85-94.

Sub-equimolar concentrations of Aβ(1-38) protect against the Alzheimer-related, pathological Aβ(1-42)

Maa O. Quartey; Jennifer N.K. Nyarko; Ryan M. Heistad; Maria A.C. Bolanos; Jocelyn R. Barnes; Jason Maley; Josef Buttigieg; Matthew P. Parsons; Carlos E. de Carvalho; Darrell D. Mousseau

Introduction

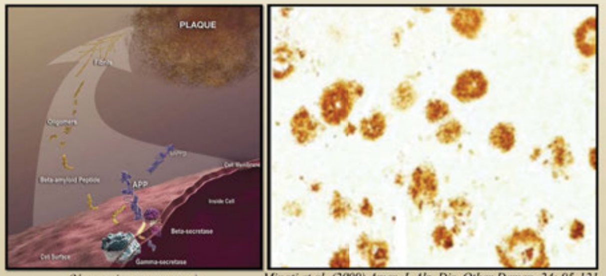
Background: The deposition of beta-amyloid (Aβ) peptides into senile plaques in brain parenchyma is a hallmark of Alzheimer's disease (AD) and contributes to neuronal death. Detectable Aβ from AD brain isolates consists mainly of the physiological Aβ(1-40) species, but also contains the more hydrophobic Aβ(1-42). Several other species of Aβ, exhibiting extensive N- and C- terminal heterogeneity, have been isolated, although their role(s) in AD are unclear. It also remains unclear what effects these Aβ species have on each other and how they affect the formation of the amyloid plaques that are a hallmark of AD. We investigated how the shorter and less abundant Aβ(1-38) affects the ability of the pathological Aβ(1-42) to form the structures that lead to the development of amyloid plaques and whether any interaction had a broader effect on cell and tissue phenotypes.

Methods: A cell-free Thioflavin-T (ThT) fluorescence assay, atomic force microscopy (AFM), circular dichroism (CD), dynamic light scattering (DLS), and surface plasmon resonance (SPR) were used to monitor interactions between synthetic Aβ(1-42) and Aβ(1-38) peptides. Electrophysiology measurements on dorsal root ganglia cells and rat hippocampal slices were used to study functional outcomes of any interaction between the two Aβ peptides. A paralysis assay using the *C. elegans* worm was used to study how particular Aβ species interacted in an *in vivo* model.

Results: Sub-equimolar concentrations of Aβ(1-38) inhibited the aggregation (DLS, AFM) of AD-relevant Aβ(1-42) as well as its ability to convert to a β-sheet-rich conformation (CD, ThT). The peptides interacted more when allowed to aggregate first (SPR). The loss of long-term potentiation (the communication between neurons that underlies memory) induced by Aβ(1-42) was rescued by Aβ(1-38). *C. elegans* worms reveal different phenotypes depending on whether they express Aβ(1-38) or Aβ(1-42).

Conclusion: Aβ(1-38) appears to mitigate the deleterious profile associated with the AD-related Aβ(1-42) peptide. This has significant implications for interpretation of Aβ function in preclinical as well as clinical contexts.

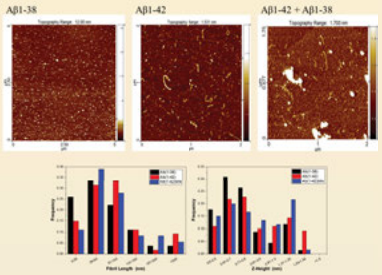
1. Amyloid plaque deposition in AD



(Neurosciencenews.com) Minati et al. (2009) Amer. J. Alz. Dis. Other Demen. 24: 95-121

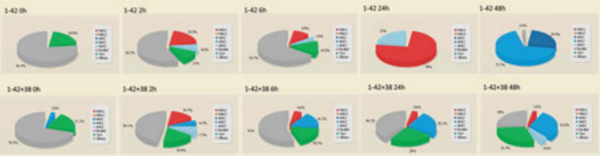
(*Left panel*) After liberation from the amyloid protein precursor (APP), the Aβ peptide (whose secondary structure consists predominantly of β–sheets) aggregates to form oligomers, then fibrils, which are ultimately deposited as extracellular plaque. (*Right panel*) Aβ–containing plaque deposits in an AD brain section.

2. AFM revealed different characteristics for fibrils formed by individual Aβ peptides on their own and in a mixture.



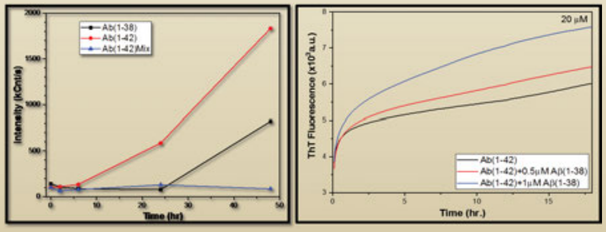
(*Top*) Atomic force micrographs showing fibrils formed by Aβ(1-38) and Aβ(1-42) individually or in a mixture. (*Bottom*) Histograms representing the range of heights and fibril lengths exhibited by the peptides individually or in a mixture.

3. The adoption of a β-sheet conformation by Aβ(1-42) is affected by Aβ(1-38).



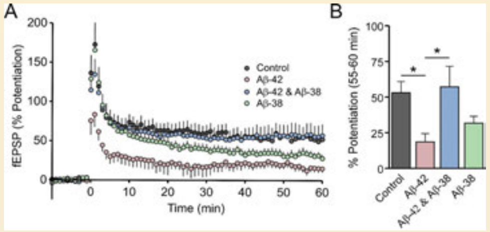
The tendency of the more hydrophobic, pathological Aβ(1-42) to adopt the β-sheet conformation found in amyloid plaques is reduced in the presence of sub-equimolar amounts of Aβ(1-38).

4. Aβ(1-38) affects both aggregation particle size and Thioflavin T binding of Aβ(1-42).



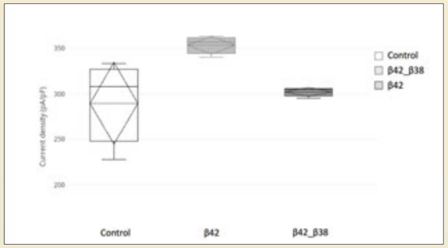
Aggregation of Aβ(1-42) peptides in solution as measured by dynamic light scattering (DLS) (*Left*) is reduced in the presence of Aβ (1-38). Thioflavin T (ThT) binding to Aβ(1-42) (*Right*) is also altered in the presence of Aβ (1-38).

5. Aβ(1-38) rescues Aβ (1-42)-induced reduction in long term potentiation (LTP).



Rat hippocampal slices bathed in a mixture of Aβ(1-38) and Aβ(1-42) exhibited a significantly higher percentage of potentiation than slices bathed in Aβ (1-42) alone.

6. DRG neurons treated with Aβ(1-38) following Aβ(1-42) exposure showed an improvement in current density



Dorsal root ganglion neurons treated with Aβ(1-38) following treatment with Aβ(1-42) exhibited a shift in current density towards that observed for control (untreated) neurons. Neurons treated with Aβ(1-42) alone exhibited a relatively higher current density.

General considerations:

- **Despite differing in length by only 2 amino acids, the shorter, less hydrophobic Aβ(1-38) peptide seems to suppress the ability of the pathological Aβ(1-42) to assume the toxic β-sheet conformation that contributes to fibril formation and plaque deposition. This occurs at sub-equimolar concentrations of Aβ(1-38).**
- **This is evident not only using physico-chemical assays, but also in in vivo models (cells; tissue).**
- **These findings suggest varying roles for the different Aβ peptide species, and provides support for the exciting possibility that not all Ab peptides are toxic, but rather than some, particularly the shorter one(s), could be neuroprotective under the right conditions (perhaps earlier on in disease progression. This might have significant impact on understanding how to slow the disease.**

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Digital Tools for Delivery of Dementia Education for Healthcare Providers of People Living with Dementia: A Systematic Review

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[1] Department of Psychology, University of Saskatchewan, [2] Department of Psychiatry, University of Toronto

INTRODUCTION

Digital/Remote Education [1]

- Encapsulates various forms of digital and remote media: internet, computer networks, virtual media, software, Telehealth, teleconference, telephone networks.
- Demonstrated to have similar effect on learning, compared to face-to-face delivery.

Benefits of remote medical education [2-5.]

- Remote/asynchronous delivery.
- Reduced barriers to professional development and continued education for rural healthcare providers.
- Increased knowledge on diagnosis, and care management.
- Increased diagnostic confidence.

RATIONALE/PROCESS

- This is a systematic review of digital tools for delivery of dementia education for healthcare providers, using Cochrane guidelines [6] and preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.[7]

- Databases were limited to the University of Saskatchewan, and included PsychINFO, MEDLINE, Cumulative Index of Nursing and Allied Health Literature (CINAHL), Sociological Abstract, AgeLine, Scopus, and Embase.
- Two reviewers carried out independent study searches, selection, extraction, risk of bias and evaluation of quality process. Conflicts were resolved verbally and via a third party reviewer.

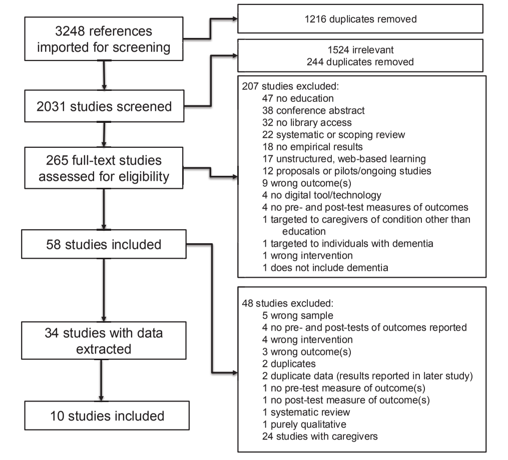
Inclusion criteria

- Peer-reviewed research, published in English.
- Interventions with at least one technology or digital tool to convey dementia education targeted to healthcare professionals.
- Interventions with an evaluation (pre – and –post).
- Interventions with structured, uniformly-delivered education.
- Case studies, pilots, randomized and non-randomized studies.

Exclusion criteria

- Ongoing, incomplete studies, and systematic reviews.
- Studies lacking an evaluative component .
- Studies where learning occurred without a digital tool.
- Where primary audience was not healthcare professionals.
- Interventions targeted to healthcare professionals caring for individuals with conditions other than dementia.

PRISMA DIAGRAM



3248 references imported for screening

2031 studies screened

265 full-text studies assessed for eligibility

58 studies included

34 studies with data extracted

10 studies included

1216 duplicates removed

1524 irrelevant
244 duplicates removed

207 studies excluded:
- 47 no education
- 38 conference abstract
- 32 no library access
- 22 systematic or scoping review
- 18 no empirical results
- 17 unstructured, web-based learning
- 12 proposals or pilots/ongoing studies
- 9 wrong outcome(s)
- 4 no digital tool/technology
- 4 no pre- and post-test measures of outcomes
- 1 targeted to caregivers of condition other than education
- 1 targeted to individuals with dementia
- 1 wrong intervention
- 1 does not include dementia

48 studies excluded:
- 5 wrong sample
- 4 no pre- and post-tests of outcomes reported
- 4 wrong intervention
- 3 wrong outcome(s)
- 2 duplicates
- 2 duplicate data (results reported in later study)
- 1 no pre-test measure of outcome(s)
- 1 no post-test measure of outcome(s)
- 1 systematic review
- 1 purely qualitative
- 24 studies with caregivers

RISK OF BIAS/QUALITY

- Risk of bias (ROB) assessment was performed by adopting and customizing data collection form for intervention review of the Cochrane Collaboration. ROB assessment was conducted by two reviewers. Overall risk of bias for studies was deemed low for selective reporting and unclear for other domains, due to impossibility of blinding, and study design (fewer RCTs).
- Critical Appraisal Skills Programme [8] (CASP) for RCTs and repeat measures intervention designs was carried out per outcome to assess study quality, and was completed by both reviewers. CASP for RCT studies was deemed at high quality. CASP for non RCTs was deemed medium to high quality by both reviewers due to frequent use of non-validated scales/measures.

RRMC Funding and in-kind support is generously provided by:

STUDIES/OUTCOMES

Study, year	Theoretical model	Design, sample size, attrition, female%
Chao, 2016	Adult Learning Theory	QEWPP, *n* = 105, *n* = 2, Female: 100%
Hobday, 2017	The CARES^{TM} Dementia-Friendly Hospital Program Learning Principles	WSPP, *n* = 25, *n* = NA, Female: 96%
Irvine, 2012	Social Cognitive Theory, Expanded Theory of Reasoned Action	WSPP, *n* = 57, *n* = 11, Female: 85.9%
Ruiz, 2006	No model	WSPP, *n* = 38, *n* = NA, Female: 89%
Banks, 2014	No model	PP, *n* = 113, *n* = NA, Female: NA
Pleasant, 2017	CARES^{TM} Dementia Basics Program Principles	PP, *n* = 51, *n* = 11, Female: 88%
Luconi, 2008	Cognitive Constructivism Theory, Socio-Constructivism, Four-Stage Theory of Physician's Learning, Clinical Reasoning Model	CS, *n* = 8, *n* = NA, Female: 38%
Broughton, 2011	No model	RCT, *n* = 34 (training group), *n* = 15 (control group), *n* = 3, Female: 86.5%
Downs, 2006	No model	RCT, *n* = 9 (practice-based workshop), *n* = 8 (electronic tutorial), *n* = 8 (decision-based software), *n* = 10 (control), *n* = 1, Female: 79.4%
Rosen, 2002	No model	RCT, *n* = 103 (Lecture site, attrition = 15%), *n* = 70 (Computer-based training, attrition = 26%), *n* = 106 (control, attrition = 26%), Female: NA

Note: RCT = randomized controlled trial, QEWPP = quasi-experimental with pre- and post- measures, WSPP = within subjects with pre- and post- measures, PP = pre- and post- measures, CS = controlled case study, NA = not available, CL = classroom learning, SD = self-directed, OLM = online learning modules, Dx = diagnosis, AD = Alzheimer's Disease, CKS-C = Communication Knowledge Scale – Chinese version, CSAS-C = Skills and Attitudes Scale- Chinese version, PREAS = Patient's Receptive and Expressive Ability Scale, CCS = Communication Competency Scale, CPS = Communication Performance Scale, DKS = Dementia Knowledge Scale, SCIDC = Sense of Competence in Dementia Care- Staff Scale, PRQ-I = Participant Reaction Questionnaire, PAC = Positive Aspects of Care giving.

- ***Learning:*** self-directed and self-paced, in professional and home environments, online modules: audio-narration, graphics, video scenarios, expert opinion, narrated text, blended-forms of learning with an applied component and a teaching component, DVDs with expert commentary, case analyses, online forum/discussion board, online quizzes.

- ***Duration:*** 40 minutes to 120 minutes. # of online modules: 4 -12, duration of intervention: 2 days- 5 months.

- ***Healthcare professionals:*** family physicians, registered nurses, nursing assistants, licensed practical nurses, occupational therapists, dieticians, physiotherapists, speech and language pathologists, and allied hospital and care home workers.

- ***Outcomes:*** knowledge on dementia, detection rates and concordance with guidelines (for physicians), skills-related to care and diagnosis, attitudes on dementia, ability to communicate with patients, self efficacy, care-competence, positive aspects of care-giving, and knowledge of support strategies.

1 Cobbett, S., Redmond, S., LeBlanc, A., MacNaughton-Doucet, L. J., Edgecombe, N., & Helpard, H. (2016). On-line dementia education: cultivating nursing students' comprehension, application and critical thinking skills. *Perspectives, 39*, 9-14.
2 Jones, C., & Moyle, W. (2016). Sexuality & dementia: an eLearning resource to improve knowledge and attitudes of aged-care staff. *Educational Gerontology, 42*, 563-571.doi: 10.1080/03601277.2016.1205373
3 Kosteniuk, J. G., Morgan, D. G., O'Connell, M. E., Kirk, A., Crossley, M., Teare, G. T., Stewart, N. J., Dal Bello-Haas, V., McBain, L., Mou, H., Forbes, D., Innes, A., & Quail, J. M. (2016). Simultaneous temporal trends in dementia incidence and prevalence, 2005–2013: a population-based retrospective cohort study in Saskatchewan, Canada. *International Psychogeriatrics, 28*, 1643-1658. doi: 10.1017/S1041610216000818
4 Irvine, A. B., Beaty, J. A., Seeley, J. R., Bourgeois, M. (2012). Use of a dementia training designed for nurse aides to train other staff. *The Journal of Applied Gerontology, 32*, 936-951. doi: 10.1177/0733464812446021
5 Degryse J., De Lepeleire, J., Southgare, L., Vernooij-Dassen, M., Gay, B., & Heyrman, J. (2009). An evaluation of a computer base education program for the diagnosis and management of dementia in primary care. An international study of the transcultural adaptations necessary for European dissemination. *Medical Teacher, 31*, 397-402. doi: 10.1080/01421590802331438
6 Higgins JPT, Green S (editors). *Cochrane Handbook for Systematic Reviews of Interventions* Version 5.1.0 [updated March 2011]. The Cochrane Collaboration, 2011. Available from www.handbook.cochrane.org.
7 Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. (2009). Reprint-Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *American Physical Therapy Association, 89*, 873-880. doi: 10.7326/0003-4819-151-4-200908180-00135
8 Critical Appraisal Skills Programme (2018). CASP (Systematic Review) Checklist. [online] Available at: https://casp-uk.net/casp-tools-checklists/ Accessed: October 1, 2018

Alternative scoring algorithm for a computer-based cognitive screening tool

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Introduction

Purpose

Develop a scoring algorithm for a computer-based cognitive screening tool which may be used in a rural primary care setting to improve the diagnosis of dementia.

Rationale

- 564,000 Canadians live with dementia, placing a significant burden on informal caregivers, and costing Canadians $10.4 billion annually.[1]
- Timely diagnosis improves patient quality of life[2],
- Information about a patient's objective cognitive functioning is central to diagnosis[5] but many primary care providers (PCP) lack training in cognitive testing
- Computer Assessment of Mild Cognitive Impairment (CAMCI) is a reliable and valid automated cognitive assessment instrument[9] which is easily administered and influences PCPs' care decisions.[10]
- While previous versions of CAMCI included an interpretive report with a global risk of cognitive impairment[9], current version reports over 30 individual test scores with no interpretation.
- Interpretation requires specialized knowledge[11] therefore a scoring algorithm is needed to summarize the test scores in a single, global estimate of cognitive impairment usable by PCPs

[1]Alzheimer's Society of Canada. (2016). *Dementia numbers in Canada.* Retrieved October 10, 2016, from http://www.alzheimer.ca/en/About-dementia/What-is-dementia/Dementia-numbers
[2]Alzheimer's Disease International. World Alzheimer Report 2011. London.
[3]Gaugler J et al. (2005). Early community-based service utilization & its effects on institutionalization in dementia caregiving. *Gerontologist, 45*, 177-85.
[4]McCloskey R et al. (2014). Alternate level of care patients in hospitals. *Journal of Canadian Geriatrics,17*, 88-94.
[5]McKhann, G. M., Knopman, D. S., Chertkow, H., Hyman, B. T., Jack, C. R., Kawas, C. H., . . . others. (2011). The diagnosis of dementia due to Alzheimer's disease: Recommendations from the National Institute on Aging-Alzheimer's Association workgroups on diagnostic guidelines for Alzheimer's disease. Alzheimer's & Dementia, 7(3), 263-269.
[6]Aminzadeh, F., Molnar, F. J., Dalziel, W. B., & Ayotte, D. (2012). A review of barriers and enablers to diagnosis and management of persons with dementia in primary care. Canadian Geriatrics Journal, 15(3), 85.
[7]Bradford, A., Kunik, M. E., Schulz, P., Williams, S. P., & Singh, H. (2009). Missed and delayed diagnosis of dementia in primary care: prevalence and contributing factors. Alzheimer Disease and Associated Disorders, 23(4), 306-314.
[8]Forbes, D., Morgan, D. & Janzen, B. (2006). Rural and urban Canadians with dementia: Use of health care services. *Canadian Journal on Aging, 25*(3), 321-330.
[9]Tierney, M. C. et al. (2016). Feasibility and Validity of the Self-administered Computerized Assessment of Mild Cognitive Impairment With Older Primary Care Patients. *Alzheimer's Disease and Associated Disorders, 0*(0), 1-9.
[10]Tierney, M. C. et al. (2016). The Effects of Computerized Cognitive Testing of Older Patients on Primary Care Physicians' Approaches to Care. *Alzheimer's Disease and Associated Disorders, 0*(0), 1-7.
[11]*Crawford, J. R., Garthwaite, P. H., & Gault, C. B. (2007). Estimating the percentage of the population with abnormally low scores (or abnormally large score differences) on standardized neuropsychological test batteries: A generic method with applications. Neuropsychology, 21(4), 419–430.*
[12]*Saxton, J., Morrow, L., Eschman, A., Archer, G., Luther, J., & Zuccolotto, A. (2009). Computer assessment of mild cognitive impairment. Postgraduate medicine, 121(2), 177-185.*
[13]*Harrell, F. E. (2015). Regression modeling strategies: with applications to linear models, logistic regression, and survival analysis (Second edition). New York: Springer.*

Methods

- Analysis of secondary dataset obtained from CAMCI developers, Psychological Software Tools, Inc.
- Attempted to replicate classification accuracy reported by test developers using decision tree method as reported by Saxton and colleagues (2009)
- Compared with accuracy of logistic regression model developed according to Harrell (2015)
- Divided dataset into training and testing subsets and compared accuracy of methods in each subset

Table 1. Demographic and clinical characteristics of participants in CAMCI dataset

Variable	Full Sample	Replication Sample	Cross- Validation Sample
n	887	524	363
Sex , M/F	291/596	183/341	108/255
Age	72.7(7.1)	73.3(6.5)	71.9(7.7)
Education, y	13.4(2.7)	13.5(2.7)	13.2(2.7)
Adjudicated Classification, normal/impaired	559/328	296/228	263/100
Mini-Mental State Examination	28.1(1.7)	28.1(1.7)	28(1.7)

Data are means (SD) or counts

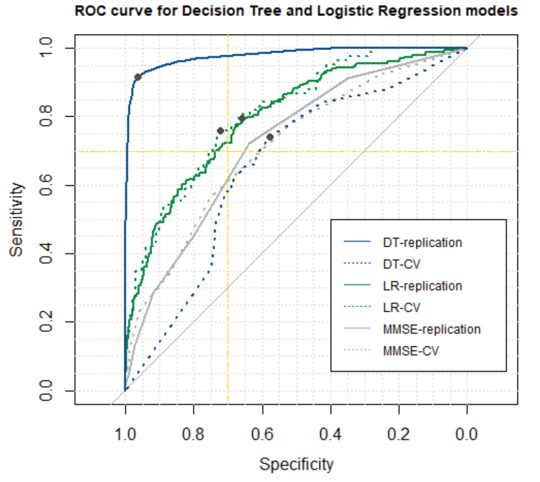
ROC curve for Decision Tree and Logistic Regression models

Figure 1. DT = rpart decision tree; *replication* = model trained and tested on *replication* dataset; *CV* = model trained on *replication* dataset and tested on *cross-validation* dataset; *LR* = principal component logistic regression model; MMSE = Mini Mental State Examination raw score; Black circles indicate optimal threshold to maximize *sensitivity + specificity*; Golden reference lines placed at 0.7 sensitivity and 0.7 specificity for ease of interpretation.

RRMC Funding and in-kind support is generously provided by:

Results

- Replicated the accuracy of the test developer's study only by overfitting decision tree model in a training dataset (AUC=0.98, sensitivity = 0.92, specificity = 0.96)
- Decision tree accuracy decreased in a cross-validation dataset (AUC=0.66, sensitivity = 0.74, specificity = 0.58)
- Logistic regression model using the principal components of the CAMCI raw scores discriminated well in both training (AUC=0.80, sensitivity = 0.79, specificity = 0.66) and cross-validation datasets (AUC=0.81, sensitivity = 0.76, specificity = 0.72)
- The logistic regression model was more accurate than the replicated decision tree model, and produced accuracy estimates consistent with other independent studies.
- No evidence of sex differences in either model

Discussion

- Decision tree model reported by test developers works poorly on new data
- Healthcare decision makers should reference independent accuracy studies of the CAMCI
- Logistic regression model that uses the principal components of the raw CAMCI scores performs adequately on both the training data and on new data
- Recommended to use logistic regression model to generate interpretive report for PCPs

These research programs work best when we work together. We would love to hear your thoughts!

Alzheimer Society
SASKATCHEWAN
Learn More Live Well

ABC's of Dementia – More Than Memory

The Alzheimer Society of Saskatchewan's ABC's of Dementia Campaign is a significant public health awareness initiative addressing one of the most critical health care challenges facing the province - the rising rate of dementia and the lack of awareness about the warning signs.

While remaining true to the evidence-based information, our ABC's of Dementia campaign simplifies the warning signs of dementia.

Every 24 hours 10 more people in Saskatchewan develop dementia.

Our ABCDementia.ca site urges individuals to seek an early diagnosis as it is key to empowering people to live well with dementia. The site has a *Getting a Diagnosis Toolkit* that helps individuals prepare for a conversation with their doctor or health care provider.

This campaign has the potential to positively impact thousands of individuals and families across the province.

ABCDementia.ca

The ABC's of Dementia

There are 10 evidence-based changes that have been identified as warning signs for dementia. It's about more than memory loss. The warning signs involve a change in an individual's abilities, behaviours or how they communicate. Different dementias have different warning signs.

Abilities

The loss of ability to perform basic tasks or a sudden struggle to complete an action that was once routine is a significant warning sign.

Occasionally a person may be preoccupied or distracted and miss a step, or misplace an item. However, if the order of a task suddenly becomes confusing, or if functional ability is compromised, it may be an indication of dementia.

The warning signs:
- Changes in day-to-day abilities
- Difficulty performing familiar tasks
- Disorientation of time and space
- Misplacing things

Behaviours

Preferences and interests can shift with age, but major changes in core personality traits are cause to talk to a doctor.

Sudden and unexplainable decreases in initiative or interest can impact relationships and may increase a risk of isolation. Other times problems with judgment or decision making may lead to a dangerous situation if not properly addressed.

The warning signs:
- Impaired judgement
- Changes in mood and behaviour
- Changes in personality
- Loss of initiative

Communication

Unusual changes in vocabulary and language are important signs to discuss with a doctor. Some forms of dementia may affect the area of the brain in charge of language before memory is even involved.

These changes may affect both written and spoken language and may become apparent when incorrect words are substituted in place of others, common words are difficult to understand, or sentences seem hard to follow.

The warning signs:
- Problems with language
- Problems with abstract thinking

What we know is that people who connect with the Alzheimer Society have a far better experience with the disease than those who don't.

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