Mount Saint Vincent University

Department of Family Studies and Gerontology

Assessing Therapeutic Recreation Attendance and Potentially Inappropriate Antipsychotic Use in Long-Term Care

by

J. Rowen McKenzie

A Thesis

submitted in partial fulfillment

of the requirements for the degree of

Master of Arts in Family Studies and Gerontology

June, 2020

Halifax, Nova Scotia

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Dedication

This research is dedicated to all persons living in long-term who have allowed me to care for and support them as a Registered Nurse. You have each inspired this research, whose underpinnings are best reflected in an excerpt from Ontario's (2007, p. 5) *Long-Term Care Homes Act, 2007*:

> A long-term care home is primarily the home of its residents and is to be operated so that it is a place where they may live with dignity and in security, safety and comfort and have their physical, psychological, social, spiritual and cultural needs adequately met.

Acknowledgements

I would firstly like to acknowledge the members of my thesis committee for the significant roles they each had in this work. Thank you to my supervisor, Dr. Janice Keefe, for your guidance and support throughout this process and for motivating me to finish. Your insight, experience and knowledge of long-term care and the field of gerontology has been fundamental to the success of this study. An immeasurable thank you to Dr. Zachary Zimmer for his time, patience and understanding throughout the analysis process. Your proficiency with statistical analysis and SPSS has been critical to the outcomes produced in this study. Thank you to Dr. Susan Bowles for your time, insight, attention to detail and commitment. Your clinical background and body of knowledge has brought rigour and depth to this study. I would like to recognize how challenging the last few months have been in light of the Coronavirus (COVID-19) outbreak and express my appreciation for how accommodating and understanding you have all been.

I would also like to acknowledge all the family and friends who helped me achieve my Master of Arts. Thank you to my parents Louise and Phil for supporting me in my decision to attend graduate school and move to Nova Scotia. Thank-you mom for your countless hours of proof reading through both of my degrees. Thank you to my sister Tonya and to my friends Cass and Josh for being there when I needed to talk, regardless of the distance between us. I would like to recognize my Halifax family: Swasti, Brett and Madison. Thank you for being a part of my life and for allowing me to be a part of yours. Thank you to you all. Being away from home has been challenging at times and I do not know what I would have done without all of your love and support.

Abstract

Responsive behaviours are commonly expressed by persons living with dementia (PLWD) in long-term care (LTC) as a way of communicating an unmet need. One commonly reported unmet need amongst PLWD is the need for daytime activity. PLWD in LTC spend much of their time by themselves. Minimal opportunities for engagement or daytime activity in LTC may lead to the expression of responsive behaviours. Pharmacological and non-pharmacological interventions are often employed by health care professionals in LTC to mitigate or halt the expression of these behaviours. Despite their known risk of harm and evidence which supports the use of non-pharmacological interventions, antipsychotics continue to be administered to PLWD in LTC.

The purpose of this research was to determine whether there was a correlation between therapeutic recreation (TR) attendance and potentially inappropriate antipsychotic (PIA) use in LTC homes in Alberta (AB) and Ontario (ON). It was hypothesized that there would be a negative correlation between TR attendance and PIA use in LTC. This study utilized secondary, aggregate (e.g., institutional level), unidentified data collected with the Resident Assessment Instrument -Minimum Data Set 2.0 (RAI-MDS 2.0) and obtained from the Canadian Institute for Health Information. This data set, titled *Continuing Care Reporting System, 2018-2019*, reflected RAI-MDS 2.0 assessments from the last fiscal year. Seven nested linear regression models were generated with the Statistical Package for Social Sciences to assess for a correlation between PIA use, TR attendance and other variables of interest. Analyses for significant interaction effects were also undertaken.

A total of 303 LTC homes were included in this analysis (AB = 131, ON = 172). Within the total sample, the mean proportion of PIA use in a 7-day period was .19; rates of use were similar in AB and ON. The proportion of TR attendance within the total sample was low at .27. On average, TR was attended for 34.98 minutes or 0.73 days in a 7-day period. The mean proportion of TR attendance was significantly lower in ON (.13) than AB (.46). Responsive behaviours were commonly observe in LTC homes in both provinces. The proportion of dementia within the total sample was .50. Findings of the main linear regression model (N = 267) indicated that TR attendance (β = .145, p = .069), home size (medium vs. small [β = -.352, p = .002], large vs. small [β = -.460, p = .001]), and proportion of depression (β = -.208, p = .011) were significant predictors of PIA use in LTC. Several significant interaction effects were observed, including mean Aggressive Behaviour Scale scores and proportion of dementia.

Results of this study support further inquiry into PIA use and the provision of social and leisure activities in LTC homes. Three suggestions are made for improving quality of life in LTC: (a) ensure the effective use of allied health professionals; (b) allocate funding for regular social and leisure activities; and (c) improve staffing ratios in smaller homes. These suggestions as well as recommendations for future research and policy implications are discussed.

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List of Abbreviations

AB	Alberta
ABS	Aggressive Behavior Scale
CIHI	Canadian Institute for Health Information
CPS	Cognitive Performance Scale
ISE	Index of Social Engagement
LOP	Log Odds of the Proportion
NIQ	Neighbor Income Quintile
ON	Ontario
OT	Occupational Therapist/occupational therapy
PIA	Potentially inappropriate antipsychotic(s)
PLWD	Persons living with dementia
RAI-MDS 2.0	Resident Assessment Instrument – Minimum Data Set 2.0
TR	Therapeutic recreation

Chapter I: Introduction

Dementia is a progressive, neurocognitive disorder wherein individuals experience a decline in their cognitive functioning that is the *beyond* the conventional aging process (American Psychiatric Association, 2013; World Health Organization, 2019). As their disease progresses, persons living with dementia's (PLWD) also experience a decline in social, domestic and occupational functioning (Gale, Acar & Daffner, 2018), resulting in functional dependence (Cunningham, McGuinness, Herron & Passmore, 2015). Although many Canadian seniors wish to age in place and remain in their homes, those who can no longer live independently or safely in their community may transition into long-term care (LTC; Federal/Provincial/Territorial Ministers Responsible for Seniors Forum, 2012). Between 2017-2018, over 1,360 Canadian, residential-based continuing care facilities (e.g., LTC homes) provided care and support to more than 112, 256 PLWD (Canadian Institute for Health Information [CIHI], 2018c).[1] Dementia was the most common disease diagnosis within those facilities (62% of persons).[2]

While many PLWD transition into LTC due to increasing care needs and concerns for their safety, this shift may also be influenced by the presence of responsive behaviours. Although the terms "challenging behaviours" (Smalbrugge, Zwijsen, Koopmans & Gerritsen, 2017), "behavioural and psychological symptoms of dementia (PBSD)" (Rappaport et al., 2018; Thompson Coon et al., 2014), "neuropsychiatric

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[1] Statistic reflects full coverage of LTC homes with subsidized/publicly funded beds in British Columbia (BC), Yukon (YT), Alberta (AB), Saskatchewan (SK), Ontario (ON) and Newfoundland and Labrador (NL); partial coverage for Manitoba (Winnipeg Regional Health Authority [WRHA]; MB) and Nova Scotia (NS; CIHI, 2018c).

[2] Statistic will not total to 100%; persons may have had multiple diagnoses (CIHI, 2018c).

symptoms (NPS)" (Kuronen, Kauthianen, Karppi, Hartikainen & Koponen, 2016) and "problem behaviours" (Cohen-Mansfield, Dakheel-Ali, Marx, Thein & Regier, 2015) are used interchangeably in literature addressing responsive behaviours, they are not person-centered and label both the PLWD and their behaviours negatively (Ontario, 2011). According to the Alzheimer Society of Ontario (ASO, 2017b, para. 1), PLWD prefer the term "responsive behaviours" as it describes how their gestures, actions or words are a response to, and expression of, something important in their physical, social or personal environment. Responsive behaviours may be exhibited "at any stage of the disease" process (Alzheimer Society of British Columbia, 2017, para. 3). They occur due to changes in the structure and function of the persons brain, which affects their behaviour, mood, memory, orientation and judgement (ASO, 2017b). Common responsive behaviours reported by the ASO (2013; 2017a) include: agitation, restlessness, wandering or pacing, repetitive questioning, whining or complaining, cursing, screaming, verbal aggression, paranoia and/or hallucinations.

Responsive behaviours can impact the well-being and quality of life of all persons living in LTC (ASO, 2013). Professional carers (e.g., registered nurses, licensed practical nurses and personal care workers) too are impacted by responsive behaviours as they may be subjected to the risk for injury, insults and threats associated with these behaviours (Duxbury, Pulsford, Hadi & Sykes, 2013). According to Smalbrugge et al. (2017, p. 57), a "behaviour is considered challenging, when this meaningful reaction leads to distress or direct harm for the person with dementia or for persons living with or caring for him or her". While not all PLWD in LTC exhibit responsive behaviours, they are commonly

occurring phenomena. A report published by CIHI (2018a) indicated that between 2015-2016, responsive behaviours were exhibited by 50% of PLWD in Canadian LTC homes.

When implemented effectively, non-pharmacological interventions may prevent or mitigate the expression of responsive behaviours. Therapeutic recreation (TR) is a program provided in many settings including LTC homes which gives persons the opportunity to meaningfully participate in leisure/recreation activities (Therapeutic Recreation Ontario [TRO], 2017). Providing PLWD with opportunities for engagement may enhance "the level of their daily functioning… and [prevent] the manifestation of loneliness, boredom, and the problem behaviours associated with dementia" (Cohen-Mansfield, Dakheel-Ali & Marx, 2009, p. 300). Despite their known risk of harm and evidence which supports the use of non-pharmacological interventions, antipsychotics are commonly administered to PLWD in LTC to manage responsive behaviours. Antipsychotics are a chemical restraint. They impact the quality of life and well-being of PLWD and are associated with a high risk of adverse effects (Fick et al., 2019). When PLWD are prescribed an antipsychotic *without* a diagnosis of psychosis, it is deemed "potentially inappropriate" (CIHI, 2020b, para. 1).

Research Questions

This thesis addresses the issue of PIA use and TR attendance in LTC homes in Alberta (AB) and Ontario (ON). Secondary, aggregate data collected with the Resident Assessment Instrument-Minimum Data Set 2.0 (RAI-MDS 2.0) and obtained from CIHI was utilized to answer the following research questions:

1. Do LTC homes with higher rates of TR attendance have lower rates of PIA use?

2. Do LTC homes with a higher prevalence of aggressive behaviours have higher rates of PIA use and lower rates of TR attendance?
3. Do LTC homes with a higher proportion of dementia have higher rates of PIA use and lower rates of TR attendance?

Given TR provides engagement activities that could function as opportunities for redirection, it was theorised that there would be a negative correlation between TR attendance and PIA use in LTC. Relatedly, it was also hypothesized that the correlation between these two variables would be moderated by: (a) aggressive behaviours (e.g., that aggressive behaviours would be positively correlated with PIA use and negatively correlated to TR attendance); and (b) proportion of dementia (e.g., that the proportion of dementia would be positively correlated with PIA use and negatively correlated to TR attendance).

Long-Term Care: Alberta and Ontario

Although CIHI collects RAI-MDS 2.0 data from LTC homes in many Canadian provinces, their coverage is only partial, with many provinces being underrepresented (CIHI, 2019b). In 2018-2019, CIHI (2019b) held RAI-MDS 2.0 data for all subsidized/ publicly funded beds in continuing care facilities in British Columbia, Yukon, AB, Saskatchewan, ON and Newfoundland and Labrador and partial coverage of facilities in Manitoba (Winnipeg Regional Health Authority) and Nova Scotia. This study used data from AB and ON for a number of reasons. Firstly, in 2017-2018, AB had the lowest rate of PIA use amongst Canadian LTC homes (CIHI, 2018c).[3] In 2016, *The Alberta Guideline on the Appropriate Use of Antipsychotic (AUA) Medication* was implemented

[3] Statistic reflects full coverage of LTC homes with subsidized/publicly funded beds in BC, YT, AB, SK, ON and NL; partial coverage for MB (WRHA) and NS (CIHI, 2018c).

by Alberta Health Services (AHS; 2016b). It is possible this guideline may have influenced the lower rate of PIA use within this province. Secondly, in 2017-2018, ON had the lowest rate of TR attendance amongst Canadian LTC homes (CIHI, 2018c).[4] Due to its substantial population, ON has a higher number of LTC homes as compared to other provinces and it was queried why their rates of TR attendance were so low. The following sections present information on legislation and regulations within AB and ON. These documents will be referred to throughout Chapter III.

Alberta. LTC homes in AB are regulated by the *Nursing Homes Act* which was last amended in 2012 (Province of Alberta, 1985a). The Act sets forth regulations regarding the operation of LTC homes within AB (Province of Alberta, 1985a). LTC homes in AB are further governed by the *Nursing Homes Operation Regulation*, which was last amended in 2017 (Province of Alberta, 1985b). This document sets forth regulations for LTC homes regarding medical care, drugs and medicine, pharmaceutical services and life enrichment services.

Ontario. LTC homes in ON are governed by the *Long-Term Care Homes Act, 2007* (LTCHA), which was last amended in 2019 (Ontario, 2007, 2011). The purpose of the LTCHA is to "help ensure that [persons] of [LTC] homes receive safe, consistent, high-quality, resident-centered care" (Ontario, 2011, p. 1). The LTCHA sets forth information on the rights of persons living in LTC (Ontario, 2007). LTC homes in ON are also governed by the *Ontario Regulation 79/10,* last amended in 2018, which further sets forth the rights of persons living in LTC homes (Ontario, 2010).

[4] Statistic reflects full coverage of LTC homes with subsidized/publicly funded beds in BC, YT, AB, SK, ON and NL; partial coverage for MB (WRHA) and NS (CIHI, 2018c).

Motivating the Research

PIA use amongst PLWD in LTC is a timely issue which needs to be addressed. Within the coming years, the prevalence of dementia in Canada is expected to rise exponentially, influenced greatly by the aging baby boomer generation. Between 2002 and 2013, the number of seniors living with dementia in Canada increased by more than 83% (CIHI, 2018a). The Alzheimer Society of Canada (ASC; 2019) estimates that within the next 15 years, 937,000 Canadians could be living with dementia. As the number of PLWD in Canada increases, so too will the number of persons living in LTC. According to CIHI (2018a), rates of PIA use are disproportionately higher for PLWD as compared to those without. In 2015-2016, the percentage of PLWD in Canadian LTC homes who were "given antipsychotics (without a diagnosis of psychosis) was more than double that for [persons] without dementia (27% versus 11%"; CIHI, 2018a, para. 16).

The purpose of this research project was to determine whether there was a correlation between TR attendance and PIA use in LTC. Specifically, whether LTC homes with a higher proportion of PLWD and TR attendance administered fewer PIAs. The outcomes of this analysis are intended to be used to inform policy regarding antipsychotic use amongst PLWD in LTC, staffing models, program development and to improve the quality of life of all those living in LTC homes.

Chapter II: Theoretical Models

As the disease progresses, PLWD experience a decline in their ability to communicate with others, impacting their capacity to convey their needs and thoughts (Smalbrugge et al., 2017). These needs may be physiological (Schölzel-Dorenbos, Meeuwsen & Olde Rikkert, 2010) or psychosocial (Reynolds et al., 2000). PLWD may also experience an imbalance "between lifelong habits and personality", affecting the ways in which they are able to engage with their environment (Cohen-Mansfield et al., 2015, p. 59). Due to changes in their ability to effectively communicate with others or express their needs, PLWD may exhibit responsive behaviours as a means of conveying these needs. While various models attempt to explain these behaviours, a theory of unmet needs, specifically those for activity and opportunities for engagement, was the focus of this study. According to Cohen-Mansfield (2013), an unmet need of boredom in LTC may propagate the expression of responsive behaviours. The following sections present the Unmet Needs Model (Cohen-Mansfield et al., 2015), the Hierarchy Model of Needs in Dementia (Schölzel-Dorenbos et al., 2010) and a conceptual representation of this thesis research.

The Unmet Needs Model

Developed by Cohen-Mansfield et al. (2015, p. 2), the Unmet Needs Model (presented in Figure 1) attempts to explain the meaning behind responsive behaviours, postulating that as their disease progresses, PLWD experience both "increasing difficulty in communicating [their] needs, and a decreased ability to provide for [themselves]". According to the authors, these needs may be related to mental or physical discomfort (e.g., pain, hunger, thirst, acute/chronic health issue, etc.), uncomfortable environmental

conditions (e.g., temperature, noise, stimulation, etc.), the need to socialize with others, or an insufficient provision of stimulation.

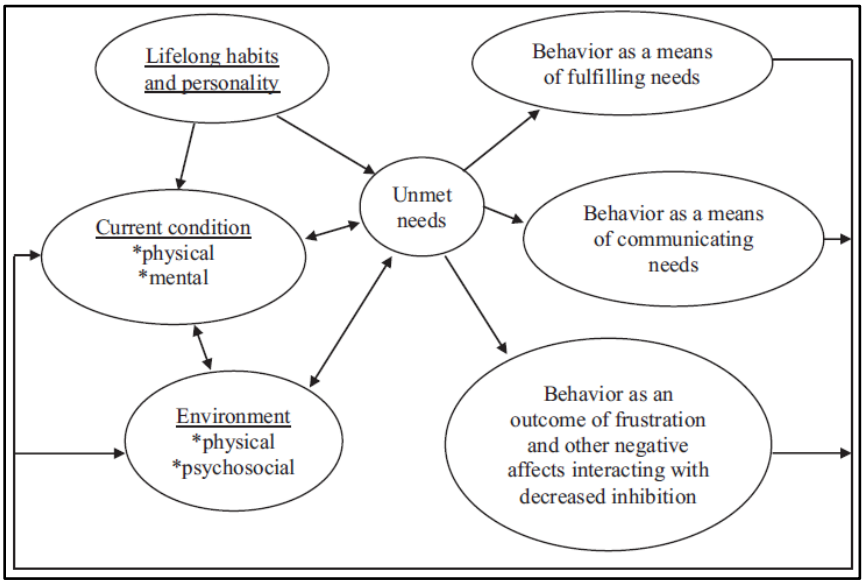

Figure 1. The Unmet Needs Model © (Cohen-Mansfield et al., 2015).[5] This model asserts that PLWD experience unmet needs due to a deterioration in their ability to provide for themselves or communicate, and that these unmet needs can result in the expression of problem (e.g., responsive) behaviours.

According to Cohen-Mansfield et al.'s (2015, p. 2) model, responsive behaviours arise from an imbalance between a person's personality and lifelong habits, current mental and physical status, "and less than optimal environmental conditions". The authors state that unmet needs typically arise due to dementia-related impairments affecting individuals' ability to communicate and engage with their environment to accommodate their needs. In turn, neither the person's caregivers nor the environment provides for these needs, or if they do, they are provided in a manner that does not take

[5] From "Which unmet needs contribute to behavior problems in persons with advanced dementia?", by J. Cohen-Mansfield, M. Dakheel-Ali, M. S. Marx, K. Thein and N.G. Regier, 2015, *Psychiatry Research, 228,* p. 60. Copyright 2015 by Jiska Cohen-Mansfield. Reprinted with permission.

into consideration the person's habits, disabilities or preferences (Cohen-Mansfield et al., 2015). As a result of these unmet needs, PLWD may exhibit responsive behaviors, such as repetitious vocalizations to communicate physical discomfort, or pacing to alleviate boredom (Cohen-Mansfield et al., 2015).

The Hierarchy Model of Needs in Dementia

The Hierarchy Model of Needs in Dementia (HMND), developed by Schölzel-Dorenbos et al. (2010), is grounded on Maslow's (1943) hierarchy of needs and theory of motivation. Maslow (1943) argued that human behaviour is motivated by wants and unsatisfied need and that when an individual has an unmet need, they are motivated to fill it. It is integral that physiological needs are met to ensure an individual's survival and well-being. Until that need is met, physiological needs may be all a person can focus on (Maslow, 1943).

The HMND was developed to assess the relationship between "health-related quality of life" and unmet needs amongst PLWD (Schölzel-Dorenbos et al., 2010, p. 113).[6] It consists of two triangles side-by-side, the one on the left pointing up and the one on the right pointing down. The triangle on the left represents the HMND which, similarly to Maslow's model, denotes five basic needs for PLWD (Schölzel-Dorenbos et al., 2010). These five levels, arranged from the bottom of the model to the top, include: "biological and physiological needs" (e.g., mental/physical health and basic life needs); safety needs (e.g., financial situation and security); "belongingness and love needs" (e.g., social contact, attachment, affect and enjoyable activities); esteem needs (e.g., self-image, privacy and self-esteem); and self-actualization (Schölzel-Dorenbos et al., 2010, p. 117).

[6] An image of HMND was not included in this thesis as the author was unable to obtain permission to reprint.

The triangle on the right represents the "consequences of [those] unmet needs in dementia" and consists of five levels which align with those of the HMND (Schölzel-Dorenbos et al., 2010, p. 117). These levels, arranged from the top of the model to the bottom include: "unmet goals of patients or caregiver", behavioural symptoms (e.g., responsive behaviours), "increased caregiver burden", "decreased health-related quality of life]" and institutionalization (Schölzel-Dorenbos et al., 2010, p. 117). According to this model, responsive behaviours result as a consequence of the persons' unmet needs.

Dementia and Engagement in Long-Term Care Model

Dementia and Engagement in Long-Term Care Model (Figure 2) was designed by the author to represent the logic behind this research and the underlying hypotheses. It takes into consideration the two previous models, the findings of the accompanying literature review and the author's experiences working as a Registered Nurse in LTC.

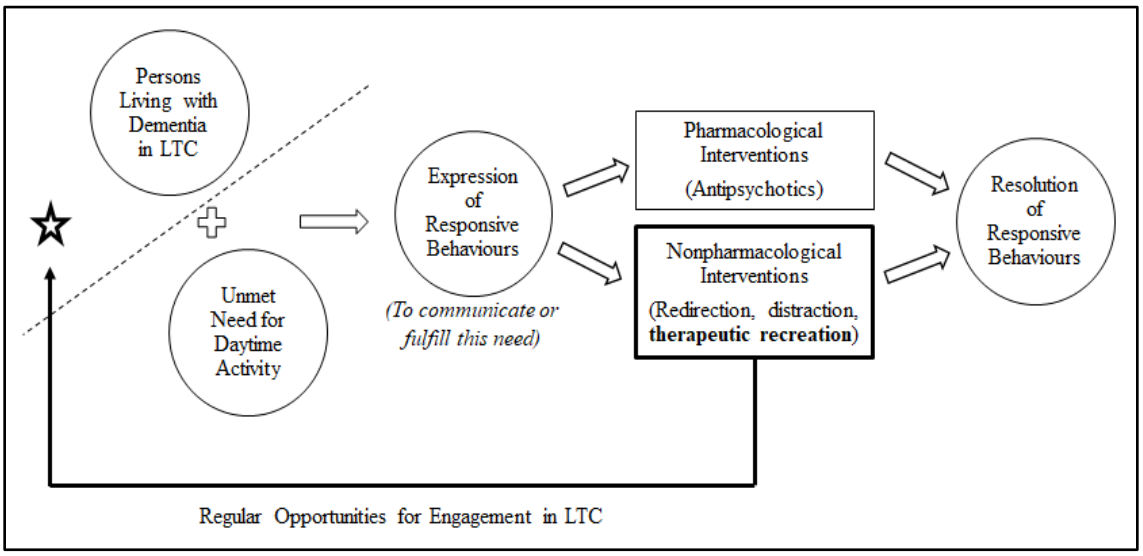

Figure 2. The Dementia and Engagement in Long-Term Care Model asserts that regular opportunities for engagement for PLWD within LTC could lead to a reduction in the expression of responsive behaviours and the need for pharmacological interventions.

This model postulates that when PLWD in LTC experience an unmet need for daytime activity, they may exhibit responsive behaviours as a means of communicating or fulfilling this need. When responsive behaviours are noted, healthcare professionals may employ pharmacological interventions (e.g., antipsychotics) or non-pharmacological interventions (e.g., redirection, distraction or TR) as a way of resolving the behaviour. The Dementia and Engagement in Long-Term Care model postulates that LTC homes which provided regular opportunities for engagement, such as TR, would have a noted decline in the frequency and severity of responsive behaviours expressed by PLWD and the need for/administration of antipsychotics to manage these behaviours.

Chapter III: Literature Review

This chapter reviews interventions for responsive behaviours, the unmet needs of PLWD and opportunities for engagement within LTC. Information is also presented on the Canadian Institute for Health Information, the RAI-MDS 2.0 and potential confounders for this research. Novanet Discovery, Academic Search Premier, Ageline, CINAHL Plus, PsychArticles, PsychINFO, SocINDEX and Eric were initially searched to identify relevant journal articles, books or book chapters published between 2009 to 2019. However, journal articles outside this time frame were included if they made a significant contribution to their field of research. Google and Google Scholar were utilized for searches related to grey literature and specific resources (e.g., data sets, provincial acts, legislation or practice guidelines). Bibliographies of identified sources were also searched. Key words used in the search were: dementia, long-term care (LTC), unmet needs, systematic review, responsive behaviours, engagement, recreational therapy, TR, antipsychotics, legislation, Alberta, Ontario, Canadian Institute for Health Information (CIHI) and RAI-MDS 2.0. Articles sourced during in the authors' 2018-2019 academic year at Mount Saint Vincent University (MSVU) were included if relevant.

Interventions for Responsive Behaviours in Long-Term Care

As discussed in Chapter I, responsive behaviours are commonly exhibited by PLWD in LTC. When present, these behaviours can impact the well-being and quality of life for all persons living in LTC and the health care professionals who support them (ASO, 2013; Duxbury et al., 2013). When these behaviours are exhibited by persons in LTC, pharmacological and/or non-pharmacological interventions may be employed to

prevent, mitigate or halt their expression. The following sections will provide insight into these two interventions and the ways in which they are implemented within LTC.

Non-pharmacological interventions. Non-pharmacological interventions should be implemented as the primary approach to managing responsive behaviours in LTC (Fick et al., 2019). Non-pharmacological interventions that were discussed in the literature included redirection, purposeful social engagement and increased physical activity (Simmons et al., 2018) and some sensory activities such as touch therapy, music therapy and massage (Cohen-Mansfield, Jensen, Resnick & Norris, 2011). Non-pharmacological interventions for responsive behaviours "work best when they are targeted, tailored, individualized and modified to take into account the behavioural symptom and its etiology" (Cohen-Mansfield et al., 2011, p. 42). Providing persons in LTC with person-centered care may also be effective for managing responsive behaviours (ASC, 2017b; Cohen-Mansfield et al., 2011). According to the ASC (2017b), antipsychotic use amongst PLWD can be reduced or eliminated when a person-centered approach to care is implemented. The ASC (2017b) encourages health professionals to practice person-centered care, taking time to develop an understanding of each persons' unique and specific preferences, needs and values. The ASC (2017b, p. 1) states that by providing person-centered care, health care professionals may be "better able to recognize [the individuals'] behaviours, remove triggers that may be at the root of the behaviour, and provide more personalized care". In addition to person cantered care, the provision of one-on-one care by familiar and regular caregivers may also be effective in reducing responsive behaviours (Simmons et al., 2018).

In a study undertaken to assess clinicians' (e.g., physicians, psychologists and nurse practitioners) attitudes/knowledge concerning the use of non-pharmacological interventions for responsive behaviours, 92% to 97% of clinicians agreed that "non-pharmacological interventions should be used before pharmacological ones" when managing of these behaviours (Cohen-Mansfield et al., 2011, p. 38). Nearly all clinicians in this study (95% to 100%) agreed that non-pharmacological interventions should be implemented more frequently than they were, and 36% to 67% of clinicians agreed that "for many agitated behaviours, there are no pharmacological treatments" (p. 38).

Barriers to implementation. Although non-pharmacological interventions have the potential to prevent, mitigate or halt the expression of responsive behaviours, health care professionals working in LTC may face barriers to effectively implementing them. Staffing shortages/insufficient staffing were commonly noted barriers within the literature (Cohen-Mansfield et al., 2011; Cornegé-Blokland, Kleijer, Hertogh & van Marum, 2012; Kirkham et al., 2017; Simmons et al., 2018). Due to staffing shortages and time constraints, non-pharmacological interventions may be deemed too labour intensive or challenging to implement (Cohen-Mansfield et al., 2012). Physicians in one study (Cornegé-Blokland et al., 2010) felt that a lack of time and understaffing were important barriers to the success of non-pharmacological interventions. Psychologists and nurse practitioners in another study stated their use of non-pharmacological interventions was limited due to insufficient professional staff (Cohen-Mansfield et al., 2011). Numerous clinicians in this study agreed that many responsive behaviors result from staff members not paying enough attention to the persons' requests. A study conducted by Cornegé-Blokland et al. (2010) found that an absence of appropriately qualified staff, emergencies

and already escalated situations were further barriers to implementing non-pharmacological interventions. Interestingly, this study also noted that non-pharmacological interventions are often ineffective when PLWD are already in an emotional crisis.

Alberta. Non-pharmacological interventions for responsive behaviours are addressed in Section 5 of AHS's (2016b) *Appropriate Use of Antipsychotic Medication* Guideline. This section in the Guideline stipulates that non-pharmacological interventions should be utilized whenever possible in LTC to mitigate or halt responsive behaviours (AHS, 2016b). The Guideline also stipulates that health care professionals should monitor the effect these interventions may have on a persons' responsive behaviour and continue to implement them if they appear to be effective at achieving the desired outcome (e.g., the minimization or cessation of responsive behaviours; AHS, 2016b). Health care professionals are encouraged to document non-pharmacological interventions which achieved a desired outcome within the person's health record/care plan (AHS, 2016b). The Guideline encourages health care professionals to access the *AUA Toolkit* (available online) for further resources on managing these behaviours (AHS, 2016b).

Ontario. Non-pharmacological interventions for responsive behaviours are addressed under Section 53 of Ontario's (2010) *Regulation 79/10*. This section of the Regulation stipulates that licensees of LTC homes should ensure that written strategies are developed for persons with responsive behaviors (Ontario, 2010). According to the Regulation, these strategies are intended to be used by staff as a means of preventing, lessening or responding to the behaviours (Ontario, 2010). The Regulation also stipulates that action should be taken in response to the person's needs (e.g., assessments,

interventions and reassessments), and that their response to an intervention should be documented (Ontario, 2010). Ontario also has an initiative titled *Behavioural Supports Ontario (BSO)*, which addresses responsive behaviors in LTC through the use of "mobile interdisciplinary behavioural support outreach teams that provide support to professional care providers" (BSO, 2019, para. 4).

Pharmacological interventions. While it is recognized that non-pharmacological interventions should be implemented first when addressing responsive behaviours (Fick et al., 2019), their implementation may not always be effective or feasible (Simmons et al., 2018). As a result, nursing staff may turn to pharmacological interventions, such as the administration of antipsychotics, to manage these behaviours (Simmons et al., 2018). The administration of an antipsychotic to a person living in LTC *without* a diagnosis of psychosis is considered "potentially inappropriate" (CIHI, 2020b, para. 1). Rates of PIA use in LTC are captured with the RAI-MDS 2.0. This measure excludes persons living with a diagnosis of delusions or hallucinations, Huntington's disease or schizophrenia, or those "receiving end-of-life care", as these are conditions wherein the use of antipsychotics may be appropriate (CIHI, 2020b, para. 4). Furthermore, behaviors other than delusions or hallucinations are unlikely to respond to antipsychotic agents (Schneider, Dagerman & Insel, 2006).

Prevalence. Rates of antipsychotic use by persons living with and without dementia in LTC were discussed in various resources included in this review. In 2016, CIHI (2016) published a reported titled *Use of Antipsychotics Among Seniors Living in Long-Term Care Facilities, 2014*, which utilized data from the National Prescription Drug Utilization Information System Database and the Continuing Care Reporting

System (e.g., RAI-MDS 2.0 data). This report noted that 39% of persons living in Canadian LTC homes in 2014 received at least one antipsychotic medication, and approximately one-quarter of those persons received an antipsychotic regularly. Although these measures include both persons living with and without dementia in Canadian LTC homes, this report (CIHI, 2016, p. 5) found that "[persons] with severe cognitive impairment and those exhibiting highly aggressive behaviour were more likely to have used an antipsychotic". The findings of this report are higher than a measurement obtained by Feng et al. (2009), who six years earlier used RAI 2.0 data to assess the prevalence of antipsychotic use in LTC. Findings of their study showed that the rate of antipsychotic use amongst persons living in Canadian LTC homes to be 26.4%.

Similarities were noted in the literature regarding the rates of antipsychotic use amongst PLWD in LTC. Results of a systematic review assessing antipsychotic use showed that 37.5% of PLWD in LTC were prescribed these medications (Kirkham et al., 2017). Similar findings were reflected in a Canadian retrospective cross-sectional study, which showed the incidence of antipsychotic use amongst PLWD in LTC to be 37.2% (Rios et al., 2017). A report published by CIHI (2018a) indicated that in 2015-2016, the unadjusted rate of PIA use amongst PLWD in LTC homes was disproportionately higher (27%) as compared to those living without dementia (11%). An additional report published by CIHI (2016) indicated that the rate at which seniors in LTC homes were administered antipsychotics in 2014 increased with cognitive impairment and the expression of aggressive behaviours. According to this additional report, rates of

antipsychotic use increased from 20.2% amongst those exhibiting no aggression, to 51.3% amongst those exhibiting severe aggressive behaviours.[7]

Although studies show that PLWD are prescribed antipsychotics, rates of PIA use in Canadian LTC homes are declining (as depicted in Figure 3). Since 2014, national rates of PIA use have decreased by nearly seven percent, from 27.2% to 20.7% (CIHI, 2020b).[8] Rates of PIA use in AB and ON are currently below the national average, at 17.2% and 19.0% respectively (CIHI, 2020b).[9] In 2018-2019, AB had the lowest rate of PIA use in LTC, while NL had the highest (28.2%; CIHI, 2020b).[9]

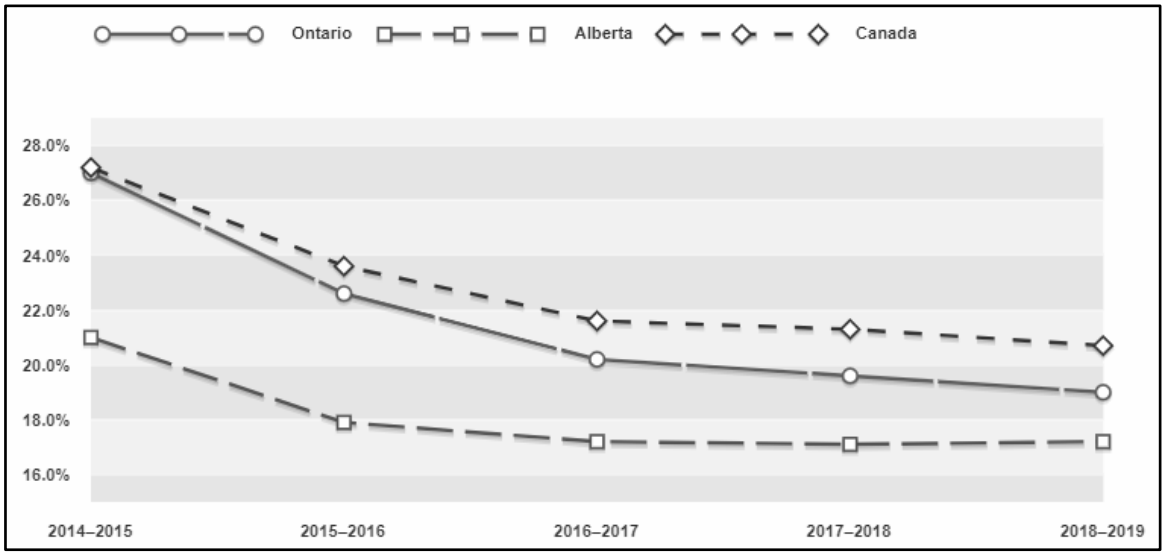

Figure 3. Potentially Inappropriate Use of Antipsychotics in Long-Term Care © (Percentage; CIHI, 2020b).[10] This figure indicates that PIA use in long-term care homes (ON, AB and Canada) has been declining since 2014.

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[7] Findings reflect BC, YT, AB, ON; partial coverage of MB, SK, NL, MB and NS (CIHI, 2016).
[8] Findings reflect selected Canadian provinces: BC, YT, AB, ON; partial coverage of MB, SK, NL, MB and NS (CIHI, 2018a).
[9] Statistic reflects roughly 60% of LTC homes: all LTC homes in BC, YT, AB, SK, ON, NL; some in MB, New Brunswick (NB) and NS (CIHI, 2020b).
[10] From "Potentially Inappropriate Use of Antipsychotics in Long-Term Care", by Canadian Institute for Health Information, 2020, https://yourhealthsystem.cihi.ca/hsp/inbrief?lang=en#!/indicators/008/ potentially-inappropriate-use- of-antipsychotics-in-long-term-care/;mapC1;mapLevel2;/ Copyright 2020 by Canadian Institute for Health Information. Reprinted with permission.

Alberta. Antipsychotic use amongst PLWD in LTC in AB is influenced by *The Alberta Guideline on the Appropriate Use of Antipsychotic (AUA) Medication* (AHS, 2016b). Established in 2016, the AUA Guideline "guide[s] the appropriate use of antipsychotic medications in the management of residents/patients with dementia in Long Term Care…settings" (AHS, 2016b, p. 1). The Guideline (AHS, 2016b) also sets forth recommendations for health care professionals regarding the ways in which they should respond to responsive behaviours within LTC. AHS (2016b) requires all volunteers, students, employees and those acting on its behalf working within LTC to comply with the AUA guideline. To better support health care professionals working in LTC, AHS (2020) has developed the *AUA Toolkit*, which consist of tools and resources that are available online.

One document found in the *AUA Toolkit* titled *Clinical Indicators for Prescribing Antipsychotic Medication* (AHS, 2016a) provides health care professionals with information on antipsychotic use amongst PLWD and detailed steps they are to adhere to when prescribing these medications. AHS (2016a) recognizes that while antipsychotics may not be appropriate for the management of all responsive behaviours, there are times where their administration would be suitable. According to AHS (2016a), antipsychotic use amongst PLWD may be appropriate when they are administered to alleviate symptoms associated with: (a) a "confirmed mental health diagnosis" (p. 1); (b) severe delusions, hallucinations or psychosis; or (c) the expression of "behaviour that places the [person] or others at risk of injury" (p. 2).

Ontario. In ON, the Centre for Effective Practice (CEP, 2016) developed a tool to support health care professionals in managing the responsive behaviours expressed by

PLWD in LTC. Funding for this tool was provided by the Government of Ontario (CEP, 2016). Titled *Use of Antipsychotics in Behavioural and Psychological Symptoms of Dementia (BPSD) Discussion Guide*, "this tool [was] designed to help providers understand, assess, and manage residents in LTC homes with…responsive behaviours" (CEP, 2016, p. 1). It provides health care professionals in LTC with information regarding: (a) how to assess for responsive behaviours; (b) when/how to implement non-pharmacological interventions for responsive behaviours; (c) when pharmacological trials should be considered/how they should be implemented; and (d) antipsychotic therapy (CEP, 2016).

Bjerre et al. (2016) also developed an algorithm to support clinicians with deprescribing antipsychotic medications used PLWD in LTC with support from the Government of Ontario (Ontario Pharmacy Evidence Network, n.d.). This algorithm sets forth guidelines regarding when it is appropriate to prescribe an antipsychotic (e.g., a diagnosis of schizophrenia, bipolar disorder, acute delirium, etc.) and when it is recommended to deprescribe (e.g., the treatment of behavioral and psychological symptoms of dementia [BPSD] or insomnia; Bjerre et al., 2016). Clinicians are also provided with a list of the most commonly prescribed antipsychotics as well as their form and various strengths (Bjerre et al., 2016). Recommendations are also made regarding how to safely taper doses and initiate non-pharmacological interventions for BPSD (Bjerre et al., 2016).

Adverse effects. Antipsychotics are a chemical restraint whose mechanism of action can affect the quality of life of PLWD in LTC. Many antipsychotics have a sedative side effect, leaving persons feeling lethargic or drowsy, impacting their ability to

interact or engage with their surrounding environment. Others, such as risperidone, may cause a drop in one's blood pressure, putting them at an increased risk for falls or serious injury. According to the ASC (2017b), older PLWD are at an increased risk of experiencing adverse effects associated with antipsychotic use due to the changes that occur within their physiology as they age. As a result, older PLWD have lower thresholds regarding the onset of adverse effects associated with antipsychotic use and are at risk of experiencing poorer outcomes (Chiabrando, Bianchi, Poluzzi, Montanaro & Scanavacca, 2010). In one study, elderly care physicians supporting PLWD exhibiting responsive behaviours identified the following as the most commonly expected side effects of antipsychotic use: increased fall risk (60%), sedation (54%), parkinsonism (51%), dysphagia (28%), cognitive decline (23%), pneumonia (14%), stroke (3%) and "increased risk of death (10%; Cornegé-Blokland et al., 2010, p. 80.e3). Other commonly noted adverse effects associated with antipsychotic use include extrapyramidal side effects (e.g., akathisia, rigidity or decreased motor activity,) and tremors (Chiabrando et al., 2010). Antipsychotic use also can lead to further cognitive impairment (Schneider et al., 2006).

While antipsychotic use amongst PLWD in LTC is not uncommon, various documents cite its practice as inappropriate. In 2005, Health Canada (2005) published a summary of 13 placebo-controlled studies that examined the effects and outcomes of olanzapine, quetiapine and risperidone (atypical antipsychotics) on PLWD exhibiting responsive behaviours. These studies demonstrated a mean 1.6 increase in mortality amongst PLWD treated with atypical antipsychotics as compared to untreated persons. Common noted causes of death included cardiac events and infections, and Health

Canada (2005, para. 4) requested “that all manufacturers of atypical antipsychotic drugs include a warning of this risk in their Product”. Health Canada (2005, para. 3) approved risperidone’s use for the "short-term symptomatic management of inappropriate behavior due to aggression and/or psychosis in patients with severe dementia". Health Canada (2005) concluded that all atypical antipsychotics, other than risperidone, were not approved for use in treating responsive behaviours. In 2015, Health Canada (2015, para. 3) updated the indication for risperidone, limiting its use to persons with “severe dementia of the Alzheimer type”.

Health Canada’s stance on the use of antipsychotics by PLWD in LTC is reflected in other resources. In their position statement on antipsychotic use by PLWD, the ASC (2017b, p. 2) states that “antipsychotics [should] only be used as a last resort to treat [BPSD], especially in older adults”. This recommendation is further supported by the American Geriatrics Society Beers Criteria®. Updated in 2019, this document provides insight into PIAs whose use should be avoided in older adults, as well as those living with certain syndromes or diseases (Fick et al., 2019). According to Fick et al. (2019, p. 2238), the as-needed and chronic use of antipsychotics by PLWD exhibiting responsive behaviours should be avoided unless non-pharmacological interventions have been unsuccessful *and* the person is “threatening substantial harm to self or others”. The authors strongly recommend that use of these medications by PLWD be avoided.

Barriers to discontinuation. Though using antipsychotics to manage responsive behaviours in LTC can be viewed as inappropriate, health care professionals may face barriers to their discontinuation. Barriers noted in the literature included: ineffective non-pharmacological interventions and/or limited staff resources; worsening or recurring

symptoms; family resistance; and concern for environmental and staff safety (Simmons et al., 2018). Other noted barriers included: the potential for increased workload; an increase in time devoted for observation of the person as their medications are discontinued; the potential to impact the person's quality of life; a "recurrence of the initial behavioural problems"; and a "risk of harm to the [person]" (Azermai, Vander Stichele, Van Bortel & Elseviers, 2014, p. 350). While there are risks associated with administering antipsychotics to PLWD, at times their use may be unavoidable. This barrier was noted by a physician in a study conducted by Cornegé-Blokland et al. (2012) who commented that when responsive behaviours are severely impacting the PLWD, there may be no other option to pursue except antipsychotics.

The Unmet Needs of Persons Living with Dementia

If the etiology of responsive behaviours can be understood as a means of expressing unmet needs, insight must be gained into the incidence and types of unmet needs amongst these individuals. Studies have shown that PLWD in LTC have numerous unmet needs. As mentioned in Chapter II, these needs may be physiological, such as the need for food, drink or shelter (Maslow, 1943) or psychosocial, such as the need for daytime activities or companionship (Roszmann et al., 2014). The literature shows that rates of unmet needs amongst PLWD in LTC range from four (Ferreira, Dias & Fernandes, 2016) to 17.8 (Roszmann et al., 2014). Findings of a study conducted by Ferreira et al. (2016, p. 4) showed that "cognitively impaired participants had unmet needs in the areas of daytime activities…memory…and psychotic symptoms…that differed significantly from those without decline". On average, persons living with cognitive decline in LTC in this study had four unmet needs, while for those living

without had three. A systematic review conducted by Cadieux, Garcia and Patrick (2103) identified a total of 19 needs amongst PLWD in LTC, with the need for behavioural management being the most significant. Other commonly identified needs in this review included personhood/emotional needs, social needs and “the need for individualized activities/care” (p. 729).

As responsive behaviours are commonly exhibited by PLWD in LTC, it is unsurprising that this need was noted to be of most importance to these persons (Cadieux et al., 2103). The number of unmet needs amongst PLWD is associated with the degree to which they exhibit responsive behaviours (Ferreira et al., 2016; Hancock, Woods, Challis & Orrell, 2006). Findings of one study (Hancock et al., 2006) determined that there was a positive correlation between the documentation of challenging behaviours as exhibited by PLWD and a higher number of unmet needs. Unmet needs amongst persons living in LTC were also been shown to increase in relationship to their age (Ferreira et al., 2016). Tools have been developed to assess and measure the needs of PLWD in LTC. The following sections will provide insight into two tools which were encountered during this literature review (Type of Unmet Need Assessment and Camberwell Assessment of Needs in the Elderly), their measures and the most commonly noted unmet needs for PLWD in LTC.

Type of Unmet Need Assessment. The Type of Unmet Need Assessment (TUNA) is an observational tool consisting of 21 ‘yes’ and ‘no’ items, nine which address unmet needs and 12 which address elements of discomfort (Cohen-Mansfield et al., 2015). Unmet needs measured with the TUNA include: “loneliness/need for social interaction”, sensory deprivation/boredom, a “need for meaningful activity”, need for

control, relaxation/anxiety, pain, other unmet needs and no need (Cohen-Mansfield et al., 2015, p. 62). During their observations of PLWD in LTC, observers monitor for agitated behaviours and "circle the type of unmet need that may affect the behaviour" on the TUNA (Cohen-Mansfield et al., 2015, p. 61). Observers score each question "on a 5-point scale ranging 1 ('completely unsure') to 5 ('completely confident'"; Cohen-Mansfield et al., 2015, p. 61). In a pilot study undertaken to assess the reliability of the TUNA, test and re-test results showed "an agreement rate of 85%" (Cohen-Mansfield et al., 2015, p. 61). A brief search of the literature did not uncover any studies other than Cohen-Mansfield et al.'s (2015) that utilized the TUNA to assess unmet needs amongst PLWD in LTC.

Measuring unmet needs. In their American study, Cohen-Mansfield et al. (2015) used the TUNA to assess the unmet needs of 89 PLWD in LTC. The TUNA was completed by both research assistants (RA) and nursing assistants (NA) (e.g., personal care workers) within the homes. The RAs observed participants and recorded their findings on the TUNA, while the NAs relied on their daily interactions with participants to complete the assessment. Findings from the two observations were compared and frequencies and means were scored. RAs and NAs reported similar averages of unmet needs amongst participants in this study, with averages of 2.9 (SD 1.3) and 2.6 (SD 1.4) per person. An agreement rate of 86% was noted between the findings of the RAs and the NAs within this study.

Reported unmet needs. The most commonly reported unmet needs in Cohen-Mansfield et al.'s (2015, p. 61) study were in the domains of "boredom/sensory deprivation" (RA 70.8%, NA 50.6%), "loneliness/need for social contact" (RA 68.5%,

NA 48.3%) and the “need for meaningful activity” (RA 59.6%, NA 46.1%). Findings suggested that participants who scored as having unmet needs in the domain of loneliness had a substantially higher score for verbal aggression than those without this need. While not statistically significant, these findings also showed that participants who scored as having unmet needs in the domains of sensory deprivation and boredom displayed “somewhat higher levels of physical nonaggressive behaviours” (p. 61).

Camberwell Assessment of Need for the Elderly. Developed by Reynolds el al. (2000), the Camberwell Assessment of Need for the Elderly (CANE) is frequently cited in literature measuring the needs of persons living with and without dementia in LTC. Designed as an interview tool to measure the met and unmet needs of seniors, CANE takes into consideration not only the views of the individual, but also those of staff and carers (Reynolds et al., 2000). CANE measures 24 potential needs, including food, self-care, accommodation, psychological distress and daytime activities (Reynolds et al., 2000). CANE also measure two caregivers needs (e.g., their need for information and their experience of psychological distress) (Reynolds et al., 2000). CANE takes approximately 30 minutes to administer and interviews for participants are conducted separately, facilitated by a researcher (Reynolds et al., 2000). For each need, the researcher scores a one (‘need met’) or a two (‘need unmet’) and tallies the scores. CANE has been shown to have good face, consensual and content validity, reasonable construct and criterion validity and generally, very high reliability (Reynolds et al., 2000).

Measuring unmet needs. Various studies included in this literature review utilized CANE to measure unmet needs. The findings of one study using CANE (Hancock et al., 2006) showed that on average, PLWD in LTC had 4.4 unmet needs.

Ninety four percent of participants in this study had “one or more unmet need[s]”, and “one in five…had seven or more unmet needs” (p. 46). The findings of a more recent study conducted by Ferreira et al. (2016) using CANE determined that on average, persons living with and without cognitive decline in LTC had 4 unmet needs. Nearly 97% of participants in this study presented with “one or more unmet needs” (p. 4). In another recent study conducted using CANE, Wieczorowska-Tobis et al. (2016) determined that on average, persons living with and without dementia in LTC had 1.3 unmet needs. Unlike the two previous studies, this study also took into consideration the needs of PLWD as perceived by staff in the LTC homes. On average, staff in this study perceived that persons had fewer unmet needs than were self-reported.

Roszmann et al. (2014) conducted a similar study using CANE to assess the needs of PLWD in LTC. Results of this study showed significantly greater needs of PLWD in LTC as compared to the previous studies. On average, participants had 17.8 unmet needs. Although this study does not discuss why their findings were so dissimilar to others which utilized CANE, it had the smallest sample size (n = 98) and lowest mean age (80.5 years) of all the above studies. Additionally, while the other studies indicated that their sample came from three (Ferreira et al., 2016; Wieczorowska-Tobis et al., 2016) to 24 (Hancock et al., 2016) LTC homes, Roszmann et al. (2014, p. 67) simply indicated that their sample came from “units within long-term care” in Poland. This could imply their sample came from the same LTC home, leading to an inaccurate representation of the sample population.

Inconsistencies were noted in some studies regarding the correlation between Mini-Mental Status Examination (MMSE) scores and unmet needs amongst PLWD. In

Hancock et al.'s (2016) study, 186 participants completed a MMSE with a mean score of 8.6. The authors determined that the severity of a participant's dementia "was not significantly associated with frequency of met or unmet needs on the CANE" (p. 47). These findings were inconsistent with those of a study conducted by Ferreira et al. (2016), which showed a significant negative correlation between individuals' number of unmet, met and global needs and their MMSE score. In this study, participants with cognitive decline were noted to have more unmet needs than those living without, at 4 and 3 respectively.

Reported unmet needs. The following sections present some commonly reported unmet needs amongst PLWD in LTC as cited in the above studies. These unmet needs include daytime activity, psychological distress and company.

Daytime activity. An unmet need in the domain of daytime activity was documented in 35.7% (Roszmann et al., 2014) to 84.2% (Ferreira et al., 2016) of PLWD/cognitive decline in LTC. Hancock et al.'s (2006) study determined that 76% of participants reported an unmet need in this domain. Their findings also showed that an unmet need in this domain was common for persons living with depression (84%) and anxiety (90%). Findings of Ferreira et al.'s (2016) study indicated that a need for daytime activity was the most common unmet need for both persons living with and without cognitive decline. Findings of this study also indicated the incidence of this unmet need amongst PLWD increased as their disease progresses, with a range of 73.3% (early dementia) to 100% (severe dementia). An unmet need for daytime activities was reported by roughly 13% of PLWD in Wieczorowska-Tobis et al.'s (2016) study. Roszmann et al.'s (2014) study did not note an unmet need in this domain.

Psychological distress. An unmet need in the domain of psychological distress was documented in approximately 43% (Wieczorowska-Tobis et al., 2016) to 72.4% (Roszmann et al., 2014) of persons living in LTC. It was the second most commonly reported unmet need for participants in the studies undertaken by Hancock et al. (2006) and Wieczorowska-Tobis et al. (2016), at 48% and 43% respectively. Staff in Wieczorowska-Tobis et al.'s (2016) study perceived this domain as an unmet need amongst persons living in LTC, reporting that it was unmet for approximately 28% of those individuals. Psychological distress was the third most common unmet need in Roszmann et al.'s (2014) study, as experienced by 72.4% of participants. Participants in this study stated they often felt worried, frightened, anxious or sad. Psychological distress was an unmet need for 52% of participants in Ferreira et al.'s (2016) study.

Company. An unmet need in the domain of company was experienced by approximately 40.6% (Ferreira et al. 2016) and 69.4% (Roszmann et al., 2014) of persons living in LTC. The need for company was the most commonly self-reported unmet need in the study undertaken by Wieczorowska-Tobis et al. (2016), as indicated by nearly 48% of participants. Staff in this study perceived the need for company as being unmet, remarking that nearly 14% of persons experienced an unmet need in this domain. This need was reported as unmet by 40.6% of participants in Ferreira et al.'s (2016) study and 41% of participants in Hancock et al.'s (2006). The need for company was unmet by 69.4% of participants in Roszmann et al.'s (2006) study. Participants in this study often felt isolated and lonely and had few social contacts.

Opportunities for Engagement in Long-Term Care

As unmet needs for daytime activities and the company of others can be understood to be a root cause of responsive behaviours, then frequent opportunities for engagement or participation in activities should be provided to PLWD in LTC. Cohen-Mansfield et al. (2009, p. 300) "define engagement as the act of being occupied with an external stimulus". The authors state (p. 300) that engaging PLWD in activities "creates a possibility for enhancing the level of their daily functioning and for preventing the manifestation of loneliness, boredom and the problem behaviours associated with dementia". Unfortunately, studies have shown that persons living in LTC care spend the majority of their time alone (den Ouden et al., 2015) or inactive (Nordin et al., 2016). Findings of a study conducted by den Ouden al. (2015) indicated that 45% to 77% of persons in LTC spent their days inactive, doing nothing, sleeping, or watching TV. During periods of observation, the majority of persons in this study (89% to 92%) "were observed primarily sitting or lying" (p. 966); lying was predominantly observed "in the early morning and late evening" (p. 967). In a similar study conducted by Nordin et al. (2016) in two residential care facilities, the authors observed that persons primarily spent their time in their private apartments/bedrooms (24.8% and 16.9%) or the dining room (17.2% and 10.5%). Persons in the two homes spent much of their time socially inactive (18.4% and 16.5%). The authors noted that persons spent much of their day dozing/sleeping or "independently engaged in self-care" (p. 730). One way in which isolation and loneliness within LTC can be mitigated is by engaging persons in social and leisure activities (e.g., TR).

Therapeutic recreation. According to the TRO (2017, para. 1), TR is:

> A process that utilizes functional intervention, education and recreation participation to enable persons with physical, cognitive, emotional and/or social limitations to acquire and/or maintain the skills, knowledge and behaviours that will allow them to enjoy their leisure optimally, function independently with the least amount of assistance and participate as fully as possible in society.

Trained professionals such as Recreation Therapists or Recreation Assistants implement TR in a variety of settings, including LTC (TRO, 2017). TR provides persons in LTC with opportunities to engage in organized social and leisure activities. The TRO (2017, para. 2) states that "the purpose of TR is to enable all individuals to achieve quality of life and optimal health through meaningful participation in recreation and leisure". According to TRO (2017), TR can improve individuals' cognitive abilities, coping skills and enhance their well-being. Examples of TR activities which may be implemented in LTC include sing-a-longs, baking, BINGO, chair yoga, gardening, knitting, brain games, active games (e.g., ball or bean bag toss) or reminiscing (Cohen-Mansfield & Jensen, 2018).

Although opportunities for engagement should be provided to all persons living in LTC, rates of TR attendance in Canada are low and declining. In 2013-2014, only 14.5% of persons living within Canadian LTC homes (*N* = 1,191) attended TR (CIHI, 2014).[11] By 2017-2018, rates of TR attendance within Canadian LTC homes (*n* = 1,360) had declined to 12.7% (CIHI, 2019b).[12] There are various factors which may be influencing

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[11] Statistic all publicly funded LTC homes in BC, YT, AB, and ON; partial coverage of SK, MB, NL and NS. (CIHI, 2014). Statistic will not total 100%; persons may have attended multiple therapies (CIHI, 2014).
[12] Statistic reflects full coverage of LTC homes with subsidized/publicly funded beds in BC, YT, AB, SK, ON and NL; partial coverage for MB (WRHA) and NS (CIHI, 2019b). Statistic will not total 100%; persons may have attended multiple therapies (CIHI, 2019b).

rates of TR attendance in LTC and a person's ability/desire to engage in social and leisure activities.

Attendance. Studies which measured PLWD's patterns of TR attendance indicated that on average, 60% (Cohen-Mansfield & Jensen, 2018) to 70% of enrolled participants attended scheduled sessions (Cohen-Mansfield, 2017). In Cohen-Mansfield and Jensen's (2018, p. 474) study, approximately 77% of participants who attended TR stayed for the whole session, while 92.9% stayed for half and 7.1% "for less than half". Rates of outright refusal within this study were low at a rate of only 9.71% of sessions. The authors (p. 474) noted that rates of refusal were more common amongst persons with "significantly lower levels of cognitive impairment", less functional impairment and greater mobility. A similar finding was noted in a Cohen-Mansfield's (2017, p. 377) study where the author noted a significant correlation between TR attendance duration and "higher levels of cognitive functioning".

Commonly noted grounds for nonattendance in one study (Cohen-Mansfield & Jensen, 2018) were: (a) competing activities (29.49%); (b) being absent from the home (7.75%); sleeping (6.81%); or (c) having visitors (3.48%). Findings of Cohen-Mansfield's (2017) study showed that participants' willingness to participate in recreational activities was influenced by their: (a) attitude towards other persons living within the home who are attending the activity; (b) attitude towards the person leading the activity; (c) interest in the activity being offered; (d) and ability to engage/participate in the activity that is being implemented. Cohen-Mansfield and Jensen's (2018) study also showed that the persons interest in the provided activity influenced their attendance

to TR. It is interesting to note that in this study, most persons who were approached to participate in TR in were either sleeping (20.7%) or doing nothing (36.6%).

Alberta. Section 10 of the Province of Alberta's (1985b, p. 16) *Nursing Homes Operation Regulation* touches on organized activities within LTC homes, referring to these activities as "life enrichment services". This section of the Regulation stipulates that operators of LTC homes in Alberta "shall establish and maintain on a regular basis organized activities suitable for the requirements of residents as life enrichment services" (p. 16). The provision of social and leisure activities in LTC homes in AB are not mentioned within the *Nursing Homes Act* or *Nursing Homes General Regulation*.

The provision of leisure or social activities in LTC in AB is addressed under Standard 12 in the Government of Alberta's (2010) *Long-term Care Accommodation Standards and Checklist.* According to this Standard, operators of LTC homes in AB who provide leisure and social activities should: (a) provide programming that addresses both the preferences and needs of persons within the home; (b) periodically ask for and consider the feedback of persons in the home with regards to planning and implementing leisure and social activities; and (c) respond to persons' feedback regarding these activities (Government of Alberta, 2010). Operators implementing leisure and social activities in LTC should ensure that persons in the home are provided with the appropriate information about these activities (Government of Alberta, 2010). Operators shall also ensure that those individuals tasked with developing, planning, and delivering these activities have the appropriate knowledge and training to provide programming

which addresses the needs of persons within the home (Government of Alberta, 2010). In 2017-2018, 28.8% of persons living in LTC homes in AB attended TR (CIHI, 2018c).[13]

Ontario. The provision of social and recreational activities within LTC homes in ON is mandated under Section 10 of the *Long-Term Care Homes Act, 2007* (Ontario, 2007). The Act stipulates that "every licensee of a long-term care home shall ensure that there is an organized program of recreational and social activities for the home to meet the interests of the residents" (Ontario, 2007, p. 12). LTC homes in ON *must* provide organized social and recreational programming that meets the interest of the persons in the home (Ontario, 2011). These programs must be available to, and inclusive of, persons who are confined to their room or those living with a cognitive impairment (Ontario, 2011). According to this Act, "every resident must be assisted and supported to participate in activities that may be of interest if [they are] not able to do so independently" (Ontario, 2011, p. 2-41). This statement is salient to this proposed research as it indicates that PLWD in LTC in Ontario must be given the opportunity to engage in social and recreational activities within the home.

In ON, it is the homes' responsibility to develop and implement organized social and recreational programs and to communicate the programming schedule with persons in the home and their families (Ontario, 2011). Social and recreational programs "must include a range of indoor and outdoor activities, leisure and outings that are of a type and frequency to benefit all residents and reflect their interest" (Ontario, 2011, p. 2-41). Programming within homes must be available at different times of the day (e.g., days, evenings and weekends), and supplies and equipment for programming must be provided

[13] Statistic reflects full coverage of LTC homes with subsidized/publicly funded beds in AB and will not total 100% as persons may have attended multiple therapies (CIHI, 2018c).

by the home itself (Ontario, 2011). It is necessary that persons residing within the home and their families be provided with opportunities to give feedback on the development and implementation of social and recreational programs (Ontario, 2011). Programming must be led by a designated individual who has: (a) a diploma or degree in TR, kinesiology or recreation and leisure (b) one years' experience working in the field (Ontario, 2011). In 2017-2018, only 4.7% of persons living in LTC homes in ON attended TR.[14] It is interesting to note that in 2017-2018, ON had the lowest rate of TR attendance amongst the Canadian LTC homes (CIHI, 2019b).[14]

Canadian Institute for Health Information. This study utilized secondary, aggregate RAI-MDS 2.0 data obtained from CIHI. Established in 1994, CIHI (2019a, p. 4) is a non-profit organization which "provides essential information on Canada's health systems and the health of Canadians". CIHI (2019a) has a history of providing Canadians, health care leaders and policy makers with the evidence and information needed to advance health care. CIHI (2019a, p. 19) provides users with "comparable and actionable data and information" which can be used to improve health care in Canada. They (CIHI, 2017) are committed to producing trustful information and take an active approach to maintaining both information and data quality. CIHI (2017) takes measure to ensure that the data they provide users is relevant, punctual/timely, coherent/comparable, clear/accessible and accurate/reliable.

The Continuing Care Reporting System (CCRS) is one of CIHI's (n.d.) 31 data holdings. Introduced in 2003-2004, the CCRS "contains demographic, clinical, functional and resource utilization information on individuals receiving continuing care services in

[14] Statistic reflects full coverage of LTC homes with subsidized/publicly funded beds and will not total 100% as persons may have attended multiple therapies (CIHI, 2018c).

hospitals or long-term care homes in Canada" (CIHI, 2020a, para. 1). The CCRS collects and reports RAI-MDS 2.0 data to CIHI (n.d., p. 2), which is then made "available across Canada for planning and monitoring care, understanding populations, improving quality and allocating resources". Aggregate CCRS data can be found on CIHI's (n.d., 2020a) website under their *Access Data and Reports* link or through a data request.

Resident Assessment Instrument–Minimum Data Set 2.0. RAI-MDS 2.0 is an electronic assessment tool used in many Canadian continuing care facilities (CIHI, n.d.; Hutchinson et al., 2010). Initial RAI-MDS 2.0 assessments are completed 14 days after persons are admitted into LTC, with subsequent assessments occurring quarterly, annually and following a significant change in health status (CIHI, 2019b). Unless otherwise stated, characteristics measured with RAI-MDS 2.0 reflect a 7-day period of observation (CIHI, 2019b). Assessments capture more than 500 functional and clinical characteristics, including health conditions, mood and behaviour, disease diagnosis and activity patterns (CIHI, 2020a). These assessments assist in detecting individuals' needs, strengths and prospective risks, and outcome measurements are used to develop individualized care plans and to monitor the health and well-being of the individual (Hutchinson et al., 2010).

Data collected with RAI-MDS 2.0 produces quality indicators, (QIs) which indicate "the quality of care provided" at both the individual and facility level (Hutchinson et al., 2010, p. 1). As RAI-MDS 2.0 assessments are completed routinely in many LTC homes, their outcomes can be used to monitor the quality of care within the home, both at the individual and facility level (Hutchinson et al., 2010). Aggregate, facility level RAI-MDS 2.0 data provides an estimate into the prevalence or occurrence

of QIs within a home (Hutchinson et al., 2010). These estimates are used to identify potential problems for persons or homes, which may result in the implementation of preventative or corrective measures (Hutchinson et al., 2010). Clinical profiles are created for each person in LTC based on the findings of their final RAI-MDS 2.0 assessment of the fiscal year (CIHI, 2019b).

This data is aggregated within the home and then collected and submitted to the CCRS (CIHI, 2019b). Not all persons in Canadian LTC homes which use the RAI-MDS 2.0 had assessment records included in this data set (CIHI, 2019b). A persons assessment may not be included if: (a) they stayed in a home for less than 14 days; (b) they were admitted to a home "close to the end of the fiscal year"; (c) they were discharged from a home "close to the beginning of the fiscal year"; or (d) their record was not successfully submitted to CIHI by the home (Table 1, line 15, CIHI, 2019b).

Reliability and validity. Several studies have been undertaken to assess the reliability and validity of the RAI-MDS 2.0 (Hirdes et al., 2013; Hutchinson et al., 2010; Poss et al., 2008; Wu, Mor & Roy, 2009). Findings of a systematic review undertaken by Hutchinson et al. (2010) to examine evidence supporting the validity and reliability of QIs of the RAI-MDS 2.0 were inconclusive. The authors argued that while one study demonstrated good validity and reliability, the findings may have been influenced by the fact that the study took place under research conditions. Studies which took place in the "real world" revealed potential biases with regards to the under and over reporting of certain quality indicators by nursing staff (Hutchinson et al., 2010, p. 11). The authors further noted that facility characteristics and location influenced coding differences and variations in the quality of data obtained with the RAI-MDS 2.0. A study conducted by

Wu et al. (2009) which assessed the reliability of the Minimum Data Set (MDS) in American LTC homes addressed the issue of under and over reporting with the RAI-MDS 2.0. Their findings showed nursing staff in LTC using the MDS over coded in some domains (specifically cognitive function amongst PLWD) and under coded in others (specifically pain amongst person 85 years or older). They also noted substantial variations in measurement errors between homes in different states, suggesting that state-level factors (e.g., practices and policies) may influence theses errors.

Potential Confounders

Two key measures for this study were the proportion of PIA use and the presence and severity of responsive behaviours in LTC. Medications and diagnoses which had the potential to influence these two measures and confound the outcomes of this study this were taken into consideration prior to its implementation. These medications included antidepressants, analgesics, hypnotics, anxiolytics and cholinesterase inhibitors. Analgesics are a class of medication administered for the management of acute and chronic pain. As the ASO (2013) states that physical discomfort or pain may trigger responsive behaviours, it was postulated whether analgesic use within LTC homes might influence their measure for responsive behaviours. Anxiolytics are a class of medication administered for the management of anxiety. As the ASO (2013) states that anxiety and tearfulness may trigger responsive behaviours, it was also postulated whether anxiolytic use too might influence this measure.

The use of antidepressants and hypnotics (e.g., sedatives) within LTC homes may also influence the measure for responsive behaviours. As LTC physicians have become more aware of the adverse effects associated with antipsychotic use amongst PLWD,

sedative antidepressants may be prescribed as an alternative to managing responsive behaviours (e.g., aggression or agitation; Vasudev et al., 2015). In a report published by CIHI (2018b) titled *Drug Use Among Seniors in Canada, 2016,* it was noted that while antipsychotic use amongst persons in LTC homes had been declining since 2011, the use of antidepressants was increasing. Vasudev and colleagues (2015) found evidence that sedative antidepressant use amongst persons in LTC had increased markedly over nearly 10 years, from 16% (2004) to 31% (2013). The authors demonstrated that sedative antidepressant use had increased from 16% (2004) to 31% (2013). Rates of atypical antipsychotic use in LTC were projected to continue to decline over a four year period (2014-2017) from 34% to 31% and rates of sedative antidepressant use were projected to continue to rise over the same four year period from 32% to 36% (Vasudev et al., 2015). As antidepressants may be administered to PLWD in LTC to manage responsive behaviours, their use within a LTC home may influence its mean ABS. Antidepressant, analgesic, anxiolytic and hypnotic use amongst persons in LTC is captured with the RAI-MDS 2.0 and were included as variables within this study.

Another medication which was taken into consideration prior to the implementation of this study was the use of cholinesterase inhibitor's amongst persons with Alzheimer's Disease in LTC (S. Bowles, personal communication, August 18, 2019). Cholinesterase inhibitors (ChEIs) are medications which decrease the brains ability to breakdown acetylcholine (an enzyme), enhancing cholinergic neurotransmission (Birks, 2006). The use of ChEIs amongst persons living with Alzheimer's disease has been associated with both improvement in some cases, or an emergence/worsening of responsive behaviours in other situations (Herrmann, Black, Li

& Lanctôt, 2011). Therefore, the use of ChEIs within LTC homes may influence the measure of responsive behaviours. Unlike the above-mentioned medications, the RAI-MDS 2.0 does not measure the use of ChEIs within LTC homes (R. Hastie, personal communication, July 26, 2019). This was taken into consideration when discussing the findings of this study.

A diagnosis of depression was also taken into consideration prior to the implementation of this study. As depression is a common diagnosis amongst PLWD in LTC homes (Majić et al., 2012), it was postulated whether this diagnosis might be associated with higher mean ABS score or PIA use. A diagnosis of depression is captured with the RAI-MDS 2.0 and was included as a variable within this study.

Summary

This literature review has provided insight into non-pharmacological and pharmacological interventions for responsive behaviours, the unmet needs of PLWD, opportunities for engagement and TR within LTC. It has also provided insight into CIHI, RA-MDS 2.0 and potential confounders for this study. It has been shown that PLWD in LTC have numerous unmet needs, with a need for daytime activity being one of the most common. As responsive behaviours are often exhibited in response to unmet needs, and as antipsychotics are often administered to manage them, it can be hypothesized PLWD in LTC who are provided with greater opportunities for engagement may in turn: (a) have their need for daytime activities met; (b) exhibit fewer responsive behaviours; and (c) have a decreased need for antipsychotic medication. This proposed thesis research will contribute to the field of health and social sciences as there is a noted gap in the literature

regarding TR attendance and PIA use in LTC. Although the author conducted a thorough search for literature in this area, their findings were insignificant.

Chapter IV: Methods

Research Questions

This study addressed the issue of TR attendance and PIA use in LTC homes in AB and ON. The research questions were:

1. Do LTC homes with higher rates of TR attendance have lower rates of PIA use?
2. Do LTC homes with a higher prevalence of aggressive behaviours have higher rates of PIA use and lower rates of TR attendance?
3. Do LTC homes with a higher proportion of dementia have higher rates of PIA use and lower rates of TR attendance?

It was hypothesized that: (a) there would be a negative correlation between TR attendance and PIA use; and (b) the correlation between these two variables would be moderated by the prevalence of aggressive behaviours and proportion of dementia.

Data

This study utilized secondary, aggregate (e.g., institutional level), unidentified data collected with the RAI-MDS 2.0. This data was gathered by continuing care facilities (e.g., LTC homes) in AB and ON during the 2018-2019 fiscal year and was submitted by these homes to CIHI's (n.d.) CCRS. If persons in these homes had multiple RAI-MDS 2.0 assessments during that year, only their latest assessment was included in the homes' aggregate data (usually from the last quarter; R. Hastie, personal communication, May 20, 2020). It is important to note that as persons in LTC homes typically have different periods of observations for their RAI-MDS 2.0 assessments, "facility rates [are] not based on the same 7-day observation period" (J. Bueck, personal

communication, June 8, 2020). This data was representative of all subsidized/publicly funded beds in LTC homes in AB and ON (CIHI, 2019b).

The data set, titled *Continuing Care Reporting System, 2018-2019*, was applied for at no cost through CIHI's (2020b) Graduate Student Data Access Program. To obtain this data, the author submitted required documents to CIHI (Appendix A). An analyst at CIHI processed this application, and the Aggregate Data Request application (Appendix B) was approved. The data was uploaded as an encrypted file to CIHI's online portal by their analysts. When the data was available, it was downloaded as a Microsoft Excel file by the author. All variables which were percentages were changed to proportions before the data was then imported into Statistical Package for the Social Sciences (SPSS) files. Variable names were adjusted, and appropriate labels, measures, decimal limits and values/missing values were assigned; variables were recoded as necessary. This data set reported findings for 804 LTC homes: 180 from AB and 624 from ON. Please be advised that "parts of this material are based on data and information provided by the Canadian Institute for Health Information. However, the analysis, conclusions, opinions and statements expressed herein are those of the author and not necessarily those of the Canadian Institute for Health Information" (an excerpt from CIHI's Non-Disclosure/Confidentiality Agreement for Aggregate Data, Appendix A).

Measures

Demographics for LTC homes within AB and ON were compared and included the: (a) total number of LTC homes within each province (n); (b) number of persons within each home (n; total, male and female); (c) mean age of persons in each home at the time of their last RAI-MDS 2.0 assessment (years; all, male and female); and (d) total

number of persons in the home assessed with the RAI-MDS 2.0 (n). Although the RAI-MDS 2.0 measures sex as “male”, “female” or “other”, CIHI has a policy of suppressing cells with counts of less than five (A-M, personal communication, January 8, 2020). As this can affect the overall/mean counts for homes, a measure of sex as “other” was excluded from this analysis (A-M. Martin, personal communication, January 8, 2020).

Dependent variable. The dependent variable for this study was the adjusted proportion (.00 – 1.00) of PIA use within each LTC home. According to CIHI (2020b, para. 4), PIA use is measured as “the percentage of [persons] who received antipsychotic drugs who did not have a diagnosis of schizophrenia, Huntington’s syndrome, hallucinations or delusions recorded in their [RAI-MDS 2.0] assessment”. This measure reflects antipsychotics used within a 7-day period of observation (Morris et al., 2012).

Independent variable. The independent variable in this study was the proportion (.00 – 1.00) of TR attendance within each LTC home. According to the RAI-MDS 2.0 user manual (Morris et al., 2012, p. 196), TR is a “therapy that provides therapeutic stimulation beyond the general activity program in a facility”. The user manual (p. 196) states that TR “must be provided by a…certified [TR] Specialist or [TR] Assistant” under the Specialists direction. Although TR provided by allied health professionals *other* than TR Specialists or Assistants is not documented as TR, the manual states that music therapists and art therapists may provide TR if they meet specific criteria (Morris et al., 2012). This variable does not take into account daily TR activities independently provided by nursing staff, support workers or volunteers.

The RAI-MDS 2.0 records TR attendance as the: (a) overall number of *minutes*; and; (b) number of *days* TR was administered for a minimum of 15 minutes within a 7-

day period of observation (Morris et al., 2012). The proportion of TR attendance was calculated by CIHI using the above two measures (e.g., days and total minutes; A-M Martin, personal communication, January 13, 2020). Data for the number of minutes and days of TR attendance were obtained for comparative purposes.

Moderators. The first moderator in this analysis was each LTC homes' mean Aggressive Behaviour Scale (ABS) score. In the context of this analysis, the ABS describes the degree of aggressive behaviours within each home (CIHI, 2013). Scores range from 0 to 12, with "higher [ABS] scores indicat[ing] higher levels of aggressive behaviour" (CIHI, 2013, p. 2). Four items from the RAI-MDS 2.0 are taken into consideration when calculating ABS scores: verbal abuse, physical abuse, resisting care and disruptive and/or socially inappropriate behaviour (CIHI, 2013). The ABS is comparable to the Cohen Mansfield Agitation Inventory (CMAI; CIHI, 2013). ABS scores were originally coded as an ordinal variable and were left as is for this analysis.

The second moderator in this analysis was each LTC homes' proportion (.00 – 1.0) of dementia. According to the RAI-MDS 2.0 user's manual (Morris et al., 2012), disease diagnoses such as dementia are ascertained from acute care/rehab discharge records, transfer documentation, medical records or statements made by the person themselves if there is clinical validity. The manual states that a physician should be consulted to confirm disease diagnoses. Although it appears that the RAI-MDS 2.0 does not document stages of dementia (e.g., early, middle, late), this could be implied from the Cognitive Performance Scale (CPS) score (see 'control variables' below). Data for the proportion of AD and dementia excluding AD were obtained for comparative purposes.

Control variables. The control variables (Table 1) for this study were each LTC homes': (a) province of origin; (b) size; (c) urban/rural status; (d) neighborhood income quintile (NIQ); (e) mean Cognitive Performance Scale (CPS); (f) mean Index of Social Engagement (ISE); (g) proportion of depression; (h) proportion of antidepressant, analgesic, hypnotic or anxiolytic medication use; and (i) number of initial RAI-MDS 2.0 assessments. It was postulated that these control variables might help to explain the hypothesized correlation between TR attendance and PIA use within LTC. As indicated in Table 1, many of these variables were recoded with different values for this analysis.

Table 1

Control Variables Used in the Linear Regression Analysis and Their Assigned Values

Variable	Assigned Values for Analysis
Province	Alberta (0) Ontario (1)
Home size	Small (0) Medium (1) Large (2)
Urban/rural status	Urban (0) Rural (1)
Neighbourhood income quintile (NIQ)	Lowest income quintile (0) 2nd quintile (1) 3rd quintile (2) 4th quintile (3) Highest income quintile (4)
Cognitive Performance Scale (CPS)	Relatively intact (0 to 1) Mild/moderate (2 to 3) Severe (4 to 6)
Index of Social Engagement (ISE)	Lowest social engagement (0) Social engagement score (1 to 5) Highest social engagement (6)
Diagnosis of depression (p)	.00 to 1.00
Antidepressant use (p)	.00 to 1.00
Analgesic use (p)	.00 to 1.00
Hypnotic use (p)	.00 to 1.00
Anxiolytic use (p)	.00 to 1.00
Initial RAI-MDS assessments (*n*)	0 to maximum

Note. p = proportion, *n* = number of cases.

Province. The variable "province" was originally coded as AB (Alberta) and ON (Ontario) and was recoded into a dichotomous variable.

Home size. The variable "home size" was originally coded as S (small, <30 beds), M (medium, 30 to 99 beds) or L (large, ≥ 100 beds) and was recoded into a trichotomous variable.

Urban/rural status. The variable "urban/rural status" was originally coded as 1 (urban) or 2 (rural) and was recoded for this analysis.

Neighbourhood income quintile. Neighbourhood income quintiles (NIQ) provides insight into the socioeconomic status of the neighbourhoods in which LTC homes are found. NIQs are "based on the average income per single-person equivalent in a dissemination area (DA) obtained from the…census" (Statistics Canada, 2016, para. 10). NIQ was coded originally coded as an ordinal variable with values of 1 (lowest income quintile) to 5 (highest income quintile) and was recoded for this analysis.

Cognitive Performance Scale. In the context of this analysis, the Cognitive Performance Scale (CPS) describes the degree of cognitive impairment within each LTC home (CIHI, 2013). CPS cores range from 0 (intact) to 6 (very severe impairment), such that higher CPS scores indicate a greater degree of cognitive impairment (CIHI, 2013). According to CIHI (2013, p. 2), the CPS has been "validated against the Mini-Mental Status Examination (MMSE)". Lower CPS scores correlate to higher MMSE scores and vice versa (e.g., a CPS score of 0 is equivalent to an MMSE score of 25; CIHI 2013). Mean CPS scores were originally coded as an ordinal variable with values of 0 to 6 and were left as is for this analysis.

Index of Social Engagement. In the context of this analysis, the Index of Social Engagement (ISE) describes the sense of social involvement and initiative within each LTC home (CIHI, 2013). Scores range from 0 (lowest social engagement) to 6 (highest social engagement), such that higher scores indicate a higher degree of social engagement (CIHI, 2013). Mean ISE scores were originally coded as an ordinal variable with values of 0 to 6 and were left as is for this analysis.

Depression. The proportion of depression was included as a control variable within this study. Diagnoses of depression are captured with the RAI-MDS 2.0 in the same manner as diagnoses of dementia (e.g., discharge/medical records, physician confirmed diagnosis, etc.; Morris et al., 2012).

Medication use. The proportion of antidepressant, analgesic, hypnotic or anxiolytic use within each LTC home were included as control variables within this study. Similar to PIAs, the use of these medications reflects a 7-day period of observation (Morris et al., 2012).

Initial RAI-MDS 2.0 assessments. It was postulated that there might be a positive correlation between proportion of PIA use and the number initial RAI-MDS 2.0 assessments within this data set. When persons are admitted into LTC, they may continue taking medications that were prescribed to them in the community, including antipsychotics. Although medication reviews are commonly done by a physician and pharmacist following an admission into LTC, PIAs which are not discontinued by the time an initial RAI-MDS 2.0 assessment is completed (14-days after admission) will be captured in their assessment. The number of initial assessments per LTC home was included in this analysis as a continuous variable.

Analysis

This analysis was undertaken by the author with the support of their thesis committee. SPSS was used for this analysis as well as Microsoft Office (Excel and Word). Descriptive statistics and/or frequencies were run for all variables utilized in this analysis within the total sample (*n*) and then split file by province for comparative purposes. T-tests for significant differences in provincial mean proportions were carried out as necessary (Blalock, 1976). Linear regression analyses were conducted to assess for a correlation between PIA use and other variables of interest. Linear regression analyses were also conducted to assess for interaction effects.

Sensitivity testing. Initial analyses indicated: (a) that a significant number of LTC homes had not reported TR attendance; (b) that AB had a younger population of persons living in LTC than ON; and (c) that findings of this analysis may be more accurate if proportions were converted to log-odds variables. Sensitivity testing was conducted to address these three issues; findings are discussed below.

Missing data. Reporting rates for TR attendance were highest in AB with 75.0% (n = 135) of LTC homes reporting this measure. Reporting rates were significantly lower in ON with only 27.6% (n = 172) of LTC homes reporting this measure. Frequency analyses (e.g., *n*, missing, *M*, *SD* and range) were conducted between LTC homes which did and did not report TR attendance within the total sample and within ON to assess for potential explanations as to why there might be underreporting; few significant findings were noted. CIHI was contacted regarding the issue of underreporting in ON. According to their clinical team (A-M. Martin, personal communication, February 21, 2020), this issue:

> is related to the [Resource Utilization Group; RUG]…grouping methodology that's used for funding in Ontario residential care facilities. Essentially, a facility's funding is impacted by several factors, but…[r]ecreation [t]herapy is not part of the algorithms that determine funding. As such, many homes have reduced their recreation therapy in favour of other therapies such as occupational therapy (OT) which are used in the funding calculation. The Ontario [M]inistry currently looks at the percentage of individuals in each RUG category for each home. Some homes and facilities have totally removed Recreation Therapy staff in favour of the other disciplines (A-M. Martin, personal communication, February 21, 2020).

To test for sensitivity, TR attendance was recoded into two different variables: one where homes which did not record TR attendance were given a value of .00 (TR_sensitivity_0), and another where they were given a value of 1.00 (TR_sensitivity_1). Linear regression analyses were run to predict the proportion of PIA use based on TR attendance, TR_sensitivity_0 and TR_sensitivity_1. Findings of this sensitivity testing are presented in Table 2 and indicate that the correlation between TR attendance and PIA use did not change significantly between the three variables.

Table 2

Sensitivity Testing for Therapeutic Recreation (TR) Attendance Within the Total Sample

Model	Variable	B	*SE*	β	t	*p*
1	(Constant)	.172	.007	-	23.129	.000
	TR attendance	.058	.020	.168	2.947	.003
2	(Constant)	.183	.003	-	55.471	.000
	TR_sensitivity_0	.038	.014	.094	2.666	.008
3	(Constant)	.180	.006	-	28.858	.000
	TR_sensitivity_1	.010	.008	.046	1.289	.198

Note. The dependent variable (constant) in this linear regression analysis was the proportion of potentially inappropriate antipsychotic (PIA) use. B = unstandardized beta coefficient; *SE* = standard error; β = standardized beta coefficient; t = Student's t distribution; *p* = p-value/significance.

As the proportion of TR attendance was the independent variable for this study and as findings of the significance testing were insignificant, LTC homes which did not report TR attendance were excluded from this analysis. This decreased the sample size (*N*) to 307 LTC homes: 135 in AB and 172 in ON.

Mean sample age. Initially analysis indicated that the mean age of persons in AB was 82.00 years (*SD* 3.35) while in ON it was 83.67 (*SD* 2.74). It was queried whether LTC homes with a mean age of <65 years might have a higher rate of PIA use or other medications due to a higher proportion of younger persons living in LTC with traumatic brain injuries or intellectual disabilities (S. Bowles, personal communication, February 21, 2020). Frequency analyses (e.g., *n*, missing, *M*, *SD* and range) were conducted between LTC homes who reported TR attendance with a mean age of <65 (*n* = 4) and >65 (*n* = 303), and findings indicated various differences (Appendix C). To maintain homogeneity of the sample, all LTC homes with a mean age of <65 years were excluded from this analysis, making the final sample size (*N*) 303 LTC homes.

Proportional data. As eight of variables utilized in this study were proportions, there was concern that the findings of this analysis would be difficult to interpret or inaccurate. Proportions are technically not a continuous measure as their values must fall within .00 or 1.00 (Z. Zimmer, personal communication, February 26, 2020). Although analyses conducted with proportional variables may produce similar outcomes as those conducted with continuous measures, results may become biased when many of the responses are close to .00 or 1.00 (Z. Zimmer, personal communication, February 26, 2020). To assess for these biases, proportion of PIA use was changed to a log-odds

variable and ordered categorical measure. Linear and ordinal linear regression were conducted to assess for similarities in the correlations.

Linear regression. Two linear regression analyses were conducted: one with PIA use as a proportional dependent variable, and with PIA use as a log odds variable. PIA use was recoded into a log odds variable using the formula: LN([variable] / (1 – [variable])). All other proportional variables were left as is. Outcomes of the linear regression analyses with a proportional (Table 14 in Appendix D) and log odds of the proportion dependent variable (Table 15 in Appendix D) were compared for similarities.

Ordinal regression. For the ordinal regression, the proportion of PIA use was recoded into a categorical variable based on its quartiles; the 4th quartile was used as the reference group. Ordinal regression was conducted to ensure that correlations of significance noted with the above linear regression analysis remained significant. All other proportional variables were left as is. Findings of this analysis (Table 16 in Appendix D) were compared to the linear models to assess for similarities. Seven out of nine of the significant correlations observed in the analysis with a proportional dependent variable remained significant in the models with a log-odds and categorical dependent variable. While findings of these three analyses were slightly different, they did confirm many of the outcomes of proportional linear regression.

When frequencies were run for all proportional variables in this study (Table 3) it was observed that many had minimum or maximum values close/equal to .00 or 1.00. Histograms of these variables also indicated that many of these proportions were skewed to the right. To normalize this data and increase the accuracy of this analysis, all proportions were recoded into log odds of the proportion (LOP) variables for the linear

regression and interaction effect analyses. These variables were left as proportions when calculating their mean, standard deviation and range. As values of .00 and 1.00 would have been excluded when these variables were recoded, frequency distributions were then run for all LOP variables to assess for missing values. Minimal missing values were observed: TR attendance and dementia each had one missing values and depression and analgesics each had two.

Table 3

Minimum and Maximum Values of All Proportions in The Linear Regression Model

	n		p
Variable	Valid	Missing	Range
PIA use	297	6	.03 - .72
TR attendance	303	0	.00 - 1.00
Dementia	302	1	.03 - 1.00
Depression	303	0	.00 - .78
Antidepressants	303	0	.05 - .80
Analgesics	303	0	.10 - 1.00
Hypnotics	282	21	.00 - .71
Anxiolytics	294	9	.01 - .39

Note. n = number of cases; p = proportion; PIA = potentially inappropriate antipsychotic; TR = therapeutic recreation.

Excluded data. Although 303 LTC homes were included in this study, not all reported the variables utilized in this analysis. Fifty-nine homes had missing data for the variable “initial RAI-MDS 2.0 assessment”. When this variable was included in the linear regression model, the sample size (*N*) decreased from to 267 to 226. To increase the final sample size of the main regression model, this variable was excluded from this analysis. Frequencies were run for this variable. The number of initial RAI-MDS 2.0 assessments in the total sample (*N*= 244, missing = 59) was 38,931 (*M* 24.01, *SD* 31.79). ON had

significantly more initial assessments than AB. The mean of initial RAI-MDS 2.0 assessments was also higher in ON (*M* 24.15, *SD* 37.82) than AB (*M* 18.36, *SD* 14.52).

Linear regression. Nested, linear regression analyses were undertaken to assesses for a correlation between the LOP of PIA use and the independent variable, the two moderators and the 11 control variables discussed earlier in this chapter. Seven linear regression models were developed through nested regression. The LOP of TR attendance was the only variable added in Model 1. The moderators were added in Models 2 (mean ABS scores) and 3 (the LOP of dementia), province of origin was added in Model 4 and home size was added in Model 5. Small homes were used as the reference group in the regression analysis and therefore do not appear on any regression models in this study. The remining variables were added in Models 6 (urban/rural status, NIQ, CPS and ISE) and 7 (the LOP of depression and other medications). Model 7 was the main regression model for this analysis. Outcomes of the nested regression analysis were assessed for significance as necessary. A total of 267 LTC homes were included in the main regression model.

Interaction effects. Further analysis was undertaken to assess for interaction effects between the LOP of PIA use and LOP of TR attendance based on all variables within the main regression model. Interaction effects are defined as “the simultaneous effect of two or more independent variables on at least one dependent variable in which their joint effect is significantly greater…than the sum of the parts” (SAGE, 2008, p. 339). Fourteen new variables were computed by multiplying mean TR attendance by each secondary independent variable (IV) used within the main regression model. Each new interaction variable was added to the main regression model one at a time, and

results were assessed for significance. Thirteen models for interaction effects were developed (both medium and large homes were added to the same interaction model).

Prediction equations were calculated to confirm the presence of select interaction effects using the formula: $\hat{y} = b_0 + b_1X_1 + b_2X_2 \ldots + b_{16}X_1X_2$. In this formula, ‘$\hat{y}$’ represents the predicted value of PIA use, ‘b’ represents the unstandardized beta coefficient of each prediction variable (PV) within the regression model, and ‘X’ represents the mean of every PV. Six prediction equations were generated for each significant interaction with the goal of plotting the outcomes on an interaction plot as three lines (two equations for each line). The unstandardized beta coefficients and means of each PV in the significant interaction effects’ regression model were imported into tables in Microsoft Excel (a sample of this equation is provided in Table 4). Prediction equations based on lowest and highest TR attendance were calculated for: (a) the mean of the secondary PV; (b) the value at one *SD* above the mean of the secondary PV; and (c) the value at one *SD* below the mean of the secondary PV.

The predicted log odds values that resulted from these equations were then transformed into probabilities (using the formula: odds/[odds + 1]), and graphed onto interaction plots. The probability of PIA use was on the Y axis, the LOP of TR attendance was on the X axis (lowest and highest) and the three plotted lines represented the secondary PVs’ interaction effects. Parallel lines on an interaction plot indicate there is no interaction, while intersecting lines indicate the presence of an interaction effect.

Table 4

Sample of Prediction Equation Table for Significant Interaction Effects

Variable	b	X	b*X
PIA use (constant)	b_0	1	b_0*1
TR attendance (first PV)	b_1	X_1	b_1*X_1
Second PV	b_2	X_2	b_2*X_2
Remaining PVs	b_3	X_3	b_3*X_3
“	b_4	X_4	b_4*X_4
“	b_5	X_5	b_5*X_5
“	b_6	X_6	b_6*X_6
“	b_7	X_7	b_7*X_7
“	b_8	X_8	b_8*X_8
“	b_9	X_9	b_9*X_9
“	b_{10}	X_{10}	b_{10}*X_{10}
“	b_{11}	X_{11}	b_{11}*X_{11}
“	b_{12}	X_{12}	b_{12}*X_{12}
“	b_{13}	X_{113}	b_{13}*X_{13}
“	b_{14}	X_{14}	b_{14}*X_{14}
“	b_{15}	X_{15}	b_{15}*X_{15}
TR* second PV	b_{16}	X_1X_2	b_{16}*(X_1X_2)
			Sum = predicted value ($\hat{y}$)

Note. The dependant variable in this model was the log odds proportion of potentially inappropriate antipsychotic (PIA) use. b = unstandardized beta coefficient; X = mean; b*X = unstandardized beta coefficient multiplied by the mean; TR = therapeutic recreation; PV = predictor variable.

Bivariate matrix. A bivariate matrix (Table 17 in Appendix E) was created to assess for correlations between all variables used in the main regression model. Findings of the matrix were primarily used to interpret and provide context to the outcomes of the main regression model and interaction effects, and to answer this study’s three research questions. As such, only significant bivariate correlations associated with PIA use, TR attendance, ABS scores and dementia are described in detail in the following analysis. For a more comprehensive list of bivariate correlations, please see Appendix E.

Ethics

This thesis was successfully proposed (Appendix F), and ethical clearance was obtained from the MSVU University Research Ethics Board (UREB; Appendix G). Legal parameters set out by CIHI were adhered to. Only the author and select members of their thesis committee had access to this data. Electronic documents (e.g., secondary data, SPSS files, word documents, etc.) were/are being stored on MSVU's password encrypted network and the authors personal laptop, while paper documents (e.g., notes) were/are being stored in a locked filing cabinet at MSVU or in the authors home. Documents will be retained for five years before they are confidentially destroyed by the author.

Chapter V: Findings

The total sample (*N* = 303) included data from LTC homes in AB (*n* = 131) and ON (*n* = 172). In 2018-2019, approximately 48,816 persons were living in LTC homes in AB and ON, with an average 162.18 persons per home (*SD* 132.36, range: 7.00 - 851.00). More females were living in LTC than males (31,4505 vs. 17,197), and homes in ON had a higher mean population than AB. The mean age of persons in LTC at the time of their last RAI-MDS 2.0 assessment was 83.19 years (*SD* 3.68, range: 65.89 - 93.20). Females had a higher mean age than males (84.65 vs. 80.48). A total of 38,572 RAI-MDS 2.0 assessments were included in this data set, and ON had more than double the number of assessments than AB. Provincial demographic findings are presented in Table 5.

Table 5

Provincial Demographic Findings for LTC Homes in AB and ON; 2018-2019

Variable		*n*	*M*	*SD*	Range
Number of LTC homes (n)					
Alberta		131	-	-	-
Ontario		172	-	-	-
Number of persons in LTC (n)					
Alberta	Total	12,658	98.12	82.74	7.00 - 364.00
	Males	4,851	39.44	32.25	5.00 - 165.00
	Females	7,729	62.84	54.93	5.00 - 263.00
Ontario	Total	36,158	210.22	142.12	14.00 - 851.00
	Males	12,346	73.05	56.92	5.00 - 341.00
	Females	23,676	140.09	91.76	10.00 - 602.00
Average age of persons at time of last RAI-MDS 2.0 assessment (years)					
Alberta	Total	-	82.34	4.12	65.89 - 91.47
	Males	-	79.65	5.02	63.00 - 91.11
	Females	-	84.07	3.81	67.51 - 91.61
Ontario	Total	-	83.82	3.15	68.19 - 93.20
	Males	-	81.10	3.66	64.24 - 92.89
	Females	-	85.09	2.94	71.28 - 94.79
Number of RAI-MDS 2.0 assessments (n)					
Alberta		11,428	89.28	76.47	6 - 339
Ontario		27,144	157.81	100.99	11 - 571

Note. Two homes in ON did not report number of all persons; Eleven homes did not report number of males (AB = 8, ON = 3) or females (AB = 8, ON = 3); One home in AB did not report mean age of females; Three homes in AB did not report number of RAI-MDS 2.0 assessments; *n* = number of cases; *M* = mean; *SD* = standard deviation.

Potentially Inappropriate Antipsychotic Use

In the total sample (*N* = 297, missing = 6), the mean proportion of PIA use within a 7-day period was .19 (*SD* .09). Only an approximate .02 absolute difference in the mean proportion of PIA use was observed in AB (.20, *SD* .10) and ON (.18, *SD* .08).

Therapeutic Recreation

The mean proportion of TR attendance within the total sample (*N* = 303), was .27 (*SD* .28). On average, TR was attended for 34.98 minutes (*SD* 48.49) or 0.73 days (*SD* 0.88.) in a seven-day period.

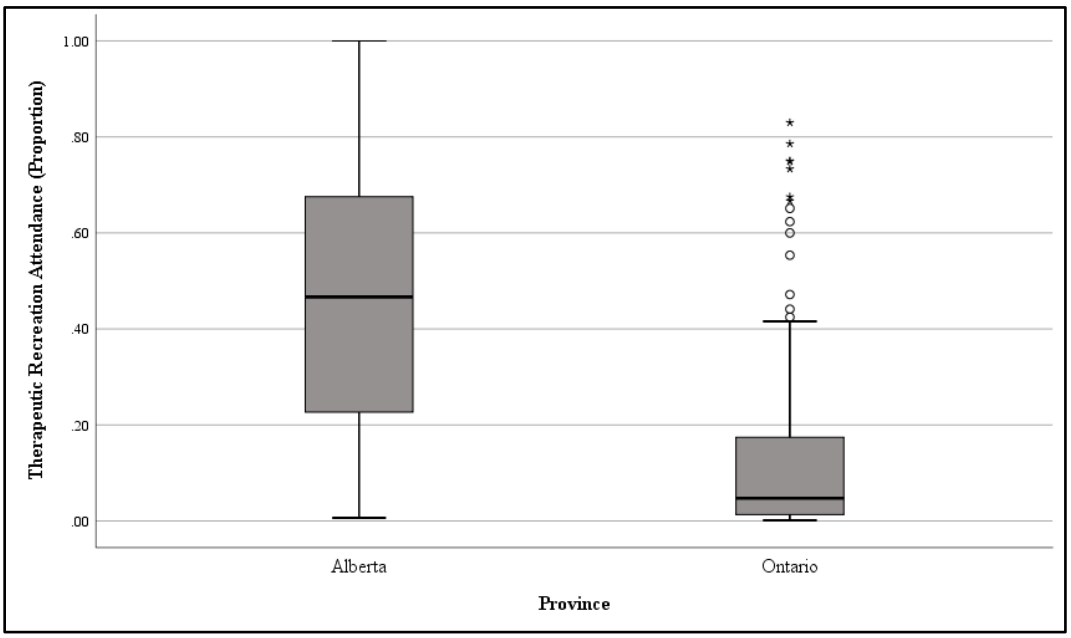

Figure 4. Boxplots for the mean proportion of TR attendance in LTC homes in AB (*n* = 131) and ON (*n* = 172); 2018-2019. Significant differences are observed between provincial means.

Boxplots for TR attendance (Figure 4) indicated considerable differences in provincial means, as did the results of a t-test ($p < .001$). In AB, the mean proportion of TR attendance was .46 (*SD* .27, range: .00 – 1.00). On average, TR was addended for 66.84 minutes (*SD* 56.42, range: 0.26 - 365.00) or 1.27 days (*SD* 0.95, range: 0.01 - 4.85)

in a 7-day period in AB. The mean proportion of TR attendance was significantly lower in ON (.13, *SD* .18, range: .00 - .83). On average, TR was attended for 10.71 minutes (*SD* 19.02, range: 0.09 - 108.21) or 0.32 days (*SD* 0.56, range: 0.00 - 2.66) in ON.

Aggressive Behaviours

The greatest proportion of LTC homes (.59) within the total sample (*N* = 303) reported mean ABS scores which corresponded to "some aggressive behaviours". The smallest proportion LTC homes (.05) within the total sample reported mean ABS scores which corresponded to "severe aggressive behaviour". In both AB and ON (Table 6) aggressive behaviours (ABS score of ≥1) were observed in LTC homes more often than "no aggressive behaviours" (ABS score of 0).

Table 6

Proportions of Mean Aggressive Behavior Scale (ABS) Scores in AB and ON; 2018-2019

	AB		ON	
Aggressive Behaviours Scale	*n*	p	*n*	p
No aggressive behaviours (score of <1)	43	.33	66	.38
Some aggressive behaviours (score 1-2)	81	.62	99	.58
Severe aggressive behaviours (score of 3-5)	7	.05	7	.04
Very severe aggressive (score of ≥6)	-	-	-	-

Note. AB = Alberta; ON = Ontario; *n* = number of cases; p = proportion.

Dementia

The mean proportion of dementia within the total sample (*N* = 302, missing = 1) was .50 (*SD* .14). The proportion of dementia not AD was higher than AD (.43 vs. .12) in the total sample. No significant difference in the mean proportion of dementia was observed between AB or ON. The proportion of dementias are presented in Table 7. Both provinces had homes where the proportion of AD and dementia not AD was .00. AB had homes where the proportion of dementia and dementia not AD was 1.00.

Table 7

Proportion of Dementias in LTC Homes in AB and ON; 2018-2019

			p		
Province	Variable	*n*	*M*	*SD*	Range
Alberta	Dementia	130	.52	.16	.03 - 1.00
	Alzheimer's disease (AD)	130	.12	.09	.00 - .43
	Dementia not AD	131	.45	.16	.00 - 1.00
Ontario	Dementia	172	.49	.12	.09 - .81
	Alzheimer's disease (AD)	172	.12	.06	.00 - .37
	Dementia not AD	172	.42	.11	.00 - .75

Note. One LTC home in AB had missing values for proportion of dementia. This home had 20 persons living in it. Another LTC homes in AB had missing values for both proportion of Alzheimer's disease and the number of persons living there. As CIHI supresses cells with counts of less than 5, it is possible that the first home had less than five people living with dementia and the second home had less than five persons living in it. p = proportion; *n* =number of cases; *M* = mean; *SD* = standard deviation.

Control Variables

Findings of the frequency analyses of the control variables of the main linear regression model to predict PIA use in LTC homes are presented by province in Table 8.

Home size. Nearly half of the proportion of LTC homes within the total sample were large (.47), with the remainder of the homes being medium (.40) and smaller (.13) in size. LTC home sizes were predominantly medium in AB (*M* 1.03, *SD* .73) and large in ON (*M* 1.58, *SD* .57). Although the smallest proportion of homes in both provinces were small, ON had significantly fewer small homes (absolute difference of .21).

Urban/rural status. Mean urban/rural status within the total sample (*N* = 303) was .33 (*SD* .47), with the largest proportion of LTC homes bring urban (.67). Mean urban/rural status in AB was .51 (*SD* .50), with similar proportions of LTC homes being urban and rural. In ON, mean urban/rural status was .20 (*SD* .40). LTC homes in ON were predominantly urban, with only one-fifth of homes being rural.

Table 8

Control Variables of The Main Linear Regression Model to Predict PIA Use in LTC Homes AB and ON; 2018-2019

	AB		ON	
Variable	*n*	p	*n*	p
Home size				
Small (<30 beds)	33	.25	7	.04
Medium (30 to 99 beds)	61	.47	59	.34
Large (≥ 100 beds)	37	.28	106	.62
Urban/rural status				
Urban	64	.49	138	.80
Rural	67	.51	34	.20
Neighbourhood income quintile (NIQ) (0 to 5)				
Lowest income quintile	40	.31	52	.30
2nd quintile	34	.26	34	.20
3rd quintile	26	.20	31	.18
4th quintile	17	.13	33	.19
Highest income quintile	12	.09	21	.12
Cognitive Performance Scale (CPS) (0 to 6)				
Intact (0)	-	-	-	-
Borderline intact (1)	3	.02	4	.02
Mild impairment (2)	60	.46	61	.36
Moderate impairment (3)	64	.49	105	.61
Moderate/Severe impairment (4)	4	.03	2	.01
Severe impairment (of 5)	-	-	-	-
Very severe impairment (6)	-	-	-	-
Index of Social Engagement Score (ISE) (0 to 6)				
Lowest social engagement (0)	-	-	2	.01
Social engagement score (1)	16	.12	11	.06
Social engagement score (2)	67	.51	80	.47
Social engagement score (3)	40	.31	68	.40
Social engagement score (4)	8	.06	9	.05
Social engagement score (5)	-	-	2	.01
Highest social engagement (6)	-	-	-	-
	n	*M*	*n*	*M*
Depression (p)	131	.34	172	.26
Antidepressants (p)	131	.48	172	.44
Analgesics (p)	131	.64	172	.53
Hypnotics (p)	128	.16	154	.03
Anxiolytics (p)	123	.11	171	.08

Note. AB = Alberta; ON = Ontario; *n* = number of cases; p = proportion; *M* = mean.

Neighbourhood income quintile. The mean NIQ within the total sample (*N* = 300, missing = 3) was 1.55 (*SD* 1.36), with the greatest proportion of homes falling into the lowest income quintile (.30). The proportion of LTC homes in each quintile was observed to decrease as NIQ increased: 2nd quintile (.22), 3rd quintile (.19), 4th quintile (.17) and highest quintile (.11). The mean NIQ for AB (*M* 1.43, *SD* 1.30) and ON (*M 1*.63, *SD* 1.41) were similar. Nearly a third of homes in both provinces were in lowest income quintile, while the fewest number were in the highest.

Cognitive Performance Scale. The mean CPS score within the total sample (*N* = 303) was 3.05 (*SD* .50), with the greatest proportion of homes reporting "moderate impairment" (.56) and "mild impairment" (.40). The smallest proportion of LTC home within the total sample reported mean CPS scores for "borderline intact" (.02) or "moderate/severe impairment" (.02). No LTC homes reported mean CPS scores for "intact", "severe impairment" or "very severe impairment". Mean CPS scores were similar in ON (*M* 3.08, *SD* .46) and AB (*M* 3.00, *SD* .54).

Index of Social Engagement. The mean ISE within the total sample (*N* = 303) was 2.87 (*SD* .72). The greatest proportion of LTC homes reported a mean ISE score of 2 (.49) or 3 (.36), while fewer homes reported mean ISE scores of 0 (.07), 1 (.09), 4 (.06) or 5 (.07). No LTC homes reported mean ISE scores of 6 ("highest social engagement"). Mean ISE was similar in AB (*M* 2.8, *SD* .70) and ON (*M* 2.9, *SD* .75). ON had two LTC homes with mean ISE scores for "lowest social engagement" (e.g., 0).

Depression. Within the total sample (*N* = 303), the mean proportion of depression was .29 (*SD* .12). No significant difference in the mean proportion of depression was

observed between AB (*M* .34, *SD* .13) and ON (*M* .26, *SD* .10). Both provinces had LTC homes in which the proportion of depression was .00.

Antidepressants. The mean proportion of antidepressant use within the total sample (*N* = 303) was .46 (*SD* .12). No significant difference in the mean proportion of antidepressant use was observed between AB (*M* .48, *SD* .13) and ON (*M* .44, *SD* .11).

Analgesics. The mean proportion of analgesic use within the total sample (*N* = 303) was .58 (*SD* .14). No significant difference in the mean proportion of analgesic use was observed between AB (*M* .64, *SD* .15) and ON (*M .53, SD* .11). AB had both the lowest and highest proportion of use, with two homes reporting 1.00 analgesic use in a 7-day period. Both of these homes were small with seven and 11 people in them.

Hypnotics. The mean proportion of hypnotic use within the total sample (*N* = 282, missing = 21) was .09 (*SD* .09). Boxplots for proportion of hypnotic use (Figure 5) indicated considerable differences in provincial means, as did the findings of a t-test ($p < .001$). Mean hypnotic use was significantly higher in AB (*M* .16 *SD* .10, range: .02 - .71) than ON (*M* .03, *SD* .03, range: .00 - .19), with a difference of .13 between means. Boxplots for proportion of hypnotic use (Figure 5) indicated considerable differences in provincial means, as did the findings of a t-test ($p < .001$). Mean hypnotic use was significantly higher in AB (*M* .16 *SD* .10, range: .02 - .71) than ON (*M* .03, *SD* .03, range: .00 - .19), with a difference of .13 between means.

Anxiolytics. The mean proportion of anxiolytic use within the total sample (*N* = 294, missing = 9) was .09 (*SD* .05). No significant difference in the mean proportion of anxiolytic use was observed between AB (*M* .11, *SD* .06) or ON (*M* .08, *SD* .04)

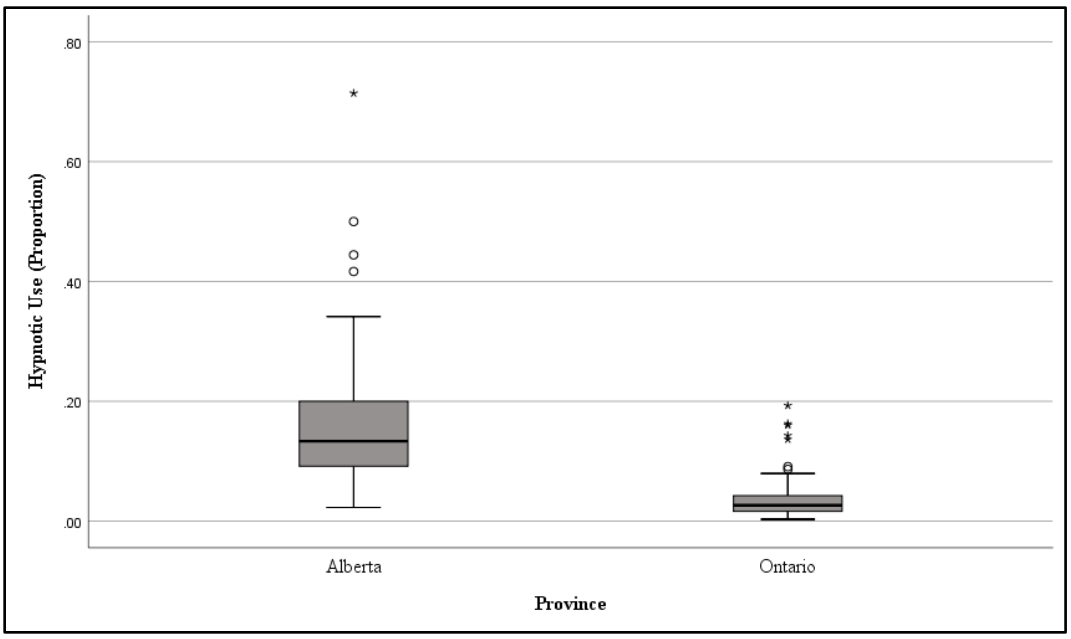

Figure 5. Boxplots for the mean proportion of hypnotic use in LTC homes in AB (*n* = 128) and ON (*n* = 154); 2018-2019. Significant differences are observed between provincial means.

Linear Regression

All seven nested regression models and the unstandardized beta coefficients of each PV are presented in Table 9. Model 7, the main regression model, included a total of 267 LTC homes. Eleven percent of the variance (R-squared) of LOP of PIA use was accounted for by this model. Findings of this analysis indicated that the LOP of TR attendance, home size and the LOP of depression were significant predictors of the LOP of PIA use in LTC homes. Mean ABS scores and the LOP of dementia were not significantly correlated with PIA use in any of the nested regression models or within the bivariate matrix (Appendix E), suggesting that neither variable are predictors of PIA use in LTC.

Table 9

Nested Regression for the Development of the Main Linear Model to Predict PIA Use in LTC, Total Sample

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
TR attendance	.045**	.044**	.048***	.051**	.032	.036	.045*
ABS	-	.056	.069	.070	.068	.060	.051
Dementia	-	-	-.073	-.073	-.032	-.078	.006
Province	-	-	-	.020	.071	.049	.102
Size M (vs. S)	-	-	-	-	-.389***	-.405***	-.457***
Size L (vs. S)	-	-	-	-	-.466***	-.488***	-.583***
Urban/rural status	-	-	-	-	-	-.075	-.128
NIQ	-	-	-	-	-	.018	.010
CPS	-	-	-	-	-	.076	.082
ISE	-	-	-	-	-	-.041	-.011
Depression	-	-	-	-	-	-	-.246**
Antidepressants	-	-	-	-	-	-	.119
Analgesics	-	-	-	-	-	-	-.049
Hypnotics	-	-	-	-	-	-	.051
Anxiolytics	-	-	-	-	-	-	.054
Number of cases (N)	295	295	294	294	294	291	267
Constant	-1.509	-1.587	-1.598	-1.605	-1.286	-1.357	-1.269
R-square	.020	.024	.029	.029	.068	.075	.110
F-test	6.103**	3.635**	2.884**	2.167*	3.489***	2.271**	2.082**

Note. The dependent variable (constant) in this analysis was the log odds of the proportion of potentially inappropriate antipsychotic use. The corresponding unstandardized beta coefficients of each variable are presented in this table. TR = therapeutic recreation; ABS = Aggressive Behaviour Scale; NIQ = Neighbourhood Income Quintile; CPS = Cognitive Performance Scale; ISE = Index of Social Engagement. TR attendance, dementia, depression, antidepressants, analgesics, hypnotics and anxiolytics are all log odds of the proportion variables in this analysis.
* p < .10, ** p < .05, ***p < .01.

The LOP of TR attendance was shown to have a significant, positive correlation with the LOP of PIA use in all but two models (Models 5 and 6). It was most significantly correlated with PIA use in Model 3 when only TR attendance, ABS scores and dementia were controlled for, $r(294) = .154$, $p = .009$. Although TR attendance lost its significance when home size was added (Model 5), it regained significance when all variables were controlled for (Model 7). Findings of the main regression model indicate that PIA use had a weak, positive correlation to TR attendance, $r(267) = .145$, $p = .069$, implying that a one unit increase in the LOP of TR attendance correlates with a .045 *increase* in the LOP of PIA use. Outcomes of this analysis suggest that the proportion of TR attendance in a LTC home is a significant predictor of PIA use. The bivariate matrix (Appendix E) indicated a weak, positive correlation between PIA use and TR attendance in LTC, $r(295) = .143$, $p = .014$.

The nested linear regression analysis revealed that home size (medium vs. small; large vs. small) was significantly correlated with the LOP of PIA use in every model in which it was controlled for (Models 5, 6 and 7). Findings of the main linear regression model indicate that PIA use had a moderate, negative correlation with medium, $r(267) = -.352$, $p = .002$, and large sized homes, $r(267) = -.460$, $p = .001$. As small homes were used as the refence group in this analysis, this finding implies that PIA use in the reference group is higher than in medium or large homes. Outcomes of this analysis suggests that home size is a significant predictor of PIA use in LTC. The bivariate matrix (Appendix E) reflected that PIA use had a weak, positive correlation with small homes, $r(296) = .209$, $p < .001$, no correlation to medium homes, and a weak, negative correlation with large homes, $r(296) = -.140$, $p = .015$.

The LOP of depression was added to the nested, linear regression analysis in Model 7. In this model, PIA use was shown to have a weak, negative correlation to depression, r(267) = -.208, p = .011, indicating that a one unit increase in the LOP of depression correlates with a -.246 *decrease* in the LOP of PIA use. Outcomes of this analysis suggest that the proportion of depression in a LTC home is a significant predictor of PIA use. The bivariate matrix (Appendix E), indicated no significant association between PIA use and proportion of depression in LTC. This suggests that other variables within the main regression model are influencing or confounding depression's correlation with PIA use.

Interaction Effects

Thirteen interaction effect models and the unstandardized beta coefficients of each PV are presented in Table 10. Eight significant interaction effects were observed. The strongest, positive correlation was observed between PIA use and TR attendance based on mean CPS scores, r(267) = 1.025, p = .005. A moderate, correlation effect was observed between PIA use and TR attendance based on: (a) mean ABS scores, r(267) = .425, p = .002; (b), mean CPS scores, r(267) = 1.031, p = .004; and (c) the LOP of hypnotic use, r(267) = .524, p = .020. A weak, positive correlation was observed between PIA use and TR attendance based on: (a) the LOP of dementia, r(267) = .220, p = .002; (b) urban/rural status, r(267) = .128, p = .099; (c) the LOP of depression, r(267) =.256, p = .096; (d) and the LOP of antidepressant use, r(267) = .152, p = .087. A moderate, negative correlation was observed between PIA use and TR attendance based on mean ISE scores, r(267) = -.474, p = .086.

Table 10

The Interaction Effects of Potentially Inappropriate Antipsychotic Use and Therapeutic Recreation Attendance Based on Variables of Interest, Total Sample

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
TR attendance	-.068	.042*	.067*	.037	.027	.022	-.262**
ABS	.182**	.044	.057	.049	.057	.054	.044
Dementia	-.030	.079	.004	.003	-.011	.006	-.016
Province	.092	.111	.057	.118	.129	.095	.108
Size M (vs. S)	-.450***	-.471***	-.460***	-.423***	-.433***	-.458***	-.439***
Size L (vs. S)	-.565***	-.607***	-.585***	-.645***	-.575***	-.592***	-.580***
Urban/rural	-.113	-.143	-.135	-.131	-.034	-.136	-.135
NIQ	.012	.011	.011	.012	.008	.035	.009
CPS	.121	.155	.085	.095	.093	.080	.314**
ISE	-.021	-.008	-.014	-.007	-.012	-.008	-.015
Depression	-.267***	-.242**	-.244**	-.246**	-.247**	-.242**	-.217**
Antidepressants	.169	.150	.119	.125	.155	.120	.144
Analgesics	-.035	-.025	-.051	-.044	-.065	-.044	-.067
Hypnotics	.066	.060	.055	.051	.062	.050	.060
Anxiolytics	.035	.044	.051	.060	.046	.057	.035
TR-ABS	.081***	-	-	-	-	-	-
TR-Dementia	-	.091***	-	-	-	-	-
TR-Province	-	-	-.036	-	-	-	-
TR-Size M (vs. S)	-	-	-	.039	-	-	-
TR-Size L (vs. S)	-	-	-	-.013	-	-	-
TR-Urban/rural	-	-	-	-	.076*		-
TR-NIQ	-	-	-	-	-	.013	-
TR-CPS	-	-	-	-	-	-	.102***
TR-ISE	-	-	-	-	-	-	-
TR-Depression	-	-	-	-	-	-	-
TR-Antidepressants	-	-	-	-	-	-	-
TR-Analgesics	-	-	-	-	-	-	-
TR-Hypnotics	-	-	-	-	-	-	-
TR-Anxiolytics	-	-	-	-	-	-	-
Constant	-1.579	-1.490	-1.261	-1.309	-1.353	-1.302	-1.930
R-square	.145	.143	.112	.116	.120	.113	.139
F-test	2.661 ***	2.626 ***	1.982**	1.923**	2.136 ***	2.007**	2.523 ***

Note. N = 267. The dependent variable (constant) in this analysis was the log odds of the proportion of potentially inappropriate antipsychotic use. The corresponding unstandardized beta coefficients of each variable are presented in this table. TR = therapeutic recreation; ABS = Aggressive Behaviour Scale; NIQ = neighbourhood income quintile; CPS = Cognitive Performance Scale; ISE = Index of Social Engagement. TR attendance, dementia, depression, antidepressants, analgesics, hypnotics and anxiolytics are all log odds of the proportion variables in this analysis.
* p < .10, ** p < .05, ***p < .01.

Table 10 (Continued)

Variable	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
TR attendance	.185**	.104**	.057*	.029	.171***	.076
ABS	.056	.048	.060	.058	.064	.052
Dementia	-.006	.003	.011	.017	-.005	.005
Province	.123	.109	.109	.103	.137	.099
Size M (vs. S)	-.471***	-.446***	-.422***	-.439***	-.474***	-.451***
Size L (vs. S)	-.593***	-.579***	-.557***	-.572***	-.600***	-.581***
Urban/rural	-.138	-.126	-.107	-.129	-.135	-.128
NIQ	.007	.015	.015	.014	.010	.011
CPS	.100	.116	.100	.079	.094	.082
ISE	-.090	-.013	-.002	-.009	-.021	-.010
Depression	-.234**	-.168	-.252***	-.252***	-.240**	-.243**
Antidepressants	.108	.126	.217	.125	.140	.113
Analgesics	-.049	-.053	-.040	.000	-.047	-.042
Hypnotics	.061	.063	.061	.059	.146	.049
Anxiolytics	.041	.059	.053	.060	.029	.074
TR-ABS	-	-	-	-	-	-
TR-Dementia	-	-	-	-	-	-
TR-Province	-	-	-	-	-	-
TR-Size M (vs. S)	-	-	-	-	-	-
TR-Size L (vs. S)	-	-	-	-	-	-
TR-Urban/rural	-	-	-	-	-	-
TR-NIQ	-	-	-	-	-	-
TR-CPS	-	-	-	-	-	-
TR-ISE	-.047*	-	-	-	-	-
TR-Depression	-	.062*	-	-	-	-
TR-Antidepressants	-	-	.087*	-	-	-
TR-Analgesics	-	-	-	.040	-	-
TR-Hypnotics	-	-	-	-	.045**	-
TR-Anxiolytics	-	-	-	-	-	.013
Constant	-1.086	-1.279	-1.395	-1.302	-1.136	-1.240
R-square	.121	.120	.121	.116	.129	.111
F-test	2.153***	2.14***	2.151***	2.065**	2.331***	1.955**

Note: The dependent variable (constant) in this analysis was the log odds of the proportion of potentially inappropriate antipsychotic use. The corresponding unstandardized beta coefficients of each variable are presented in this table. TR = therapeutic recreation; ABS = Aggressive Behaviour Scale; NIQ = neighbourhood income quintile; CPS = Cognitive Performance Scale; ISE = Index of Social Engagement. TR attendance, dementia, depression, antidepressants, analgesics, hypnotics and anxiolytics are all log odds of the proportion variables in this analysis.
* p < .10, ** p < .05, ***p < .01.

These observed interactions imply that the effect of a one-unit increase in the LOP of TR attendance on the LOP of PIA use differs depending on the values of each PV. The bivariate matrix (Appendix E) indicated that on its own, PIA use was not correlated with any of the above secondary variables. TR attendance was shown to be significantly correlated to all of the above secondary variables in bivariate matrix except mean ABS, CPS and ISE scores. Curiously, of the significant interaction effect models in which TR attendance was a significant predictor of PIA use, all but one model indicated a positive correlation. A moderate, negative correlation between TR attendance and PIA use based on mean CPS scores was observed in Model 7, $r(267) = -.853$, $p = .017$. This suggests that the effects of mean CPS scores and TR attendance on PIA use in LTC are more significant when they are combined. Table 11 presents the significant interaction effect models in which TR attendance was a significant predictor of PIA use and whether the correlation was positive or negative. The significant interaction effects observed between PIA use and TR attendance based on mean ABS scores and the dementia are discussed in greater detail below as they pertain to this studies research questions.

Table 11

Therapeutic Recreation Attendance Correlations Based on Significant Interaction Effects

Model	Significant Interaction	Therapeutic Recreation Attendance	
		Increased	Decreased
2	TR_Dementia	β = .139*	
7	TR_CPS		β = -.853**
8	TR_ ISE	β = .602**	
9	TR_Depression	β = .340**	
10	TR_Antidepressants	β = .186**	
12	TR_ Hypnotics	β = .558***	

Note. β = standardized beta coefficient; TR = therapeutic recreation, CPS = Cognitive Performance Scale; ISE = Index of Social Engagement.
[a] "Significant interactions\" are models in which both the interaction variable and TR attendance had significant p-values.
* $p < .10$, ** $p < .05$, ***$p < .01$.

Aggressive behaviours. As indicated in Table 8, Model 1, a moderate, positive interaction effect was observed between the LOP of PIA use and the LOP of TR attendance based on ABS scores, r(267) = .425, p = .002. This finding suggests that the effect of TR attendance on PIA use differs depending on the ABS score. This finding is supported by the outcomes of the interaction plot in Figure 6. For LTC homes with ABS scores that fall around the mean (1.38) or higher, it is predicted that there would be a positive correlation between PIA use and TR attendance. It is predicted that this correlation would be significantly stronger in LTC homes with mean ABS scores one *SD* above the mean (2.14). For LTC homes with mean ABS scores one *SD* below the mean (0.62), it is predicted that there would be a negative correlation between PIA use and TR attendance.

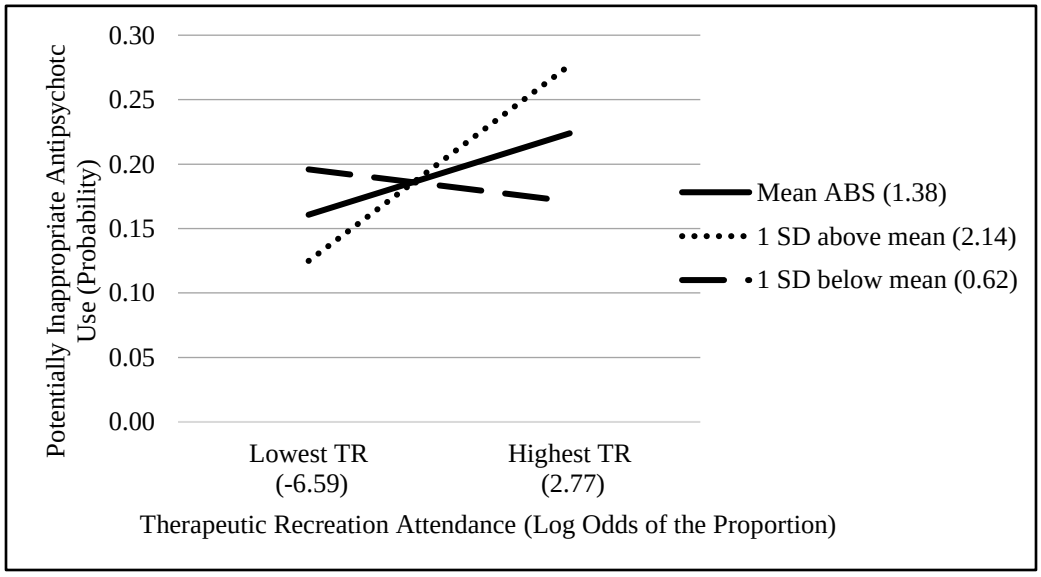

Figure 6. Plots for interaction effects of PIA use and TR attendance based on Aggressive Behaviour Scale (ABS) scores suggest that effect of TR attendance on PIA use differs depending on ABS scores.

Dementia. As indicated in Table 8, Model 2, a weak, positive interaction effect was observed between PIA use and TR attendance based on dementia, r(267) = .220, p = .002. This finding suggests that the effect of TR attendance on PIA use differs depending on the proportion of dementia in LTC homes. This finding is supported by the outcomes of the interaction plot in Figure 7. For LTC homes with a proportion of dementia that falls around the mean of the LOP (0.00) or higher, it is predicted that there would be a positive correlation between PIA use and TR attendance. It is predicted that this correlation would be significantly stronger in LTC homes with mean proportion of dementia one *SD* above the mean (0.64) of the LOP. For LTC homes with a mean proportion of dementia one *SD* below the mean (-0.64) of the LOP, it is predicted that there would be a negative correlation between PIA use and TR attendance.

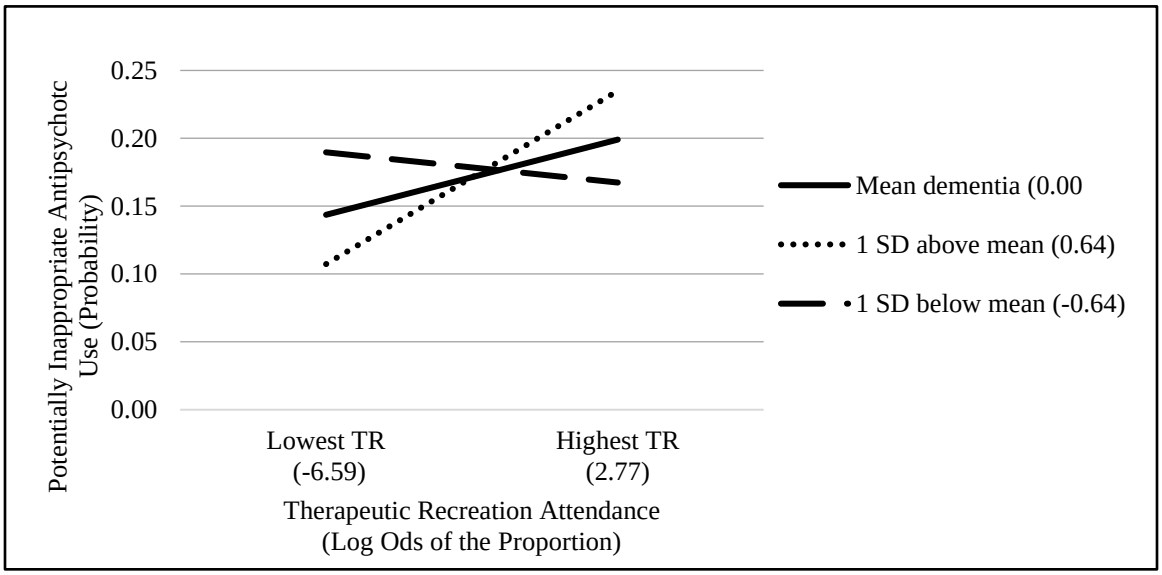

Figure 7. Plots for interaction effects of PIA use and TR attendance based on the log odds proportion of dementia suggest that the effect of TR attendance on PIA use differs depending on the proportion of PLWD.

Chapter VI: Discussion

The purpose of this research was to determine whether there was a correlation between TR attendance and PIA use in LTC homes. It was hypothesized that there would be a negative correlation between these two variables. It was also hypothesized that the correlation between these two variables would be moderated by the homes' prevalence of aggressive behaviours and proportion of dementia. This chapter will review the three research questions proposed for this study, outcomes of the main linear regression model, significant interaction effects and other significant correlations. Policy implications and limitations will also be discussed.

Potentially Inappropriate Antipsychotic Use

The first research question proposed in this study examined whether LTC homes with higher rates of TR attendance would have lower rates of PIA use. It was theorised that there would be a negative correlation between these two variables. The main regression model (Table 9) indicated that TR attendance, along with home size and a diagnosis of depression, were significant predictors of PIA use in LTC homes.

Therapeutic recreation. In contrast to what was hypothesized, TR attendance was shown to have a positive correlation to PIA use in the main linear regression model, suggesting that TR attendance was a significant predictor of PIA use in LTC homes. This finding was also supported by the outcomes of the bivariate matrix which indicated a weak, positive association between TR attendance and PIA use in LTC. TR attendance had a significant, positive correlation to PIA use in Models 1 through 4 of the nested linear regression models. When home size was added in Models 5, TR attendance's significance was reduced to an insignificant level. TR attendance was not a significant

predictor of PIA use when NIQ, CPS or ISE were added in Model 6. When all variables were controlled for in Model 7, TR attendance became statistically significant again. This suggests that home size and one or more variables added in Model 7 may be confounding or interacting with TR attendances correlation with PIA use within the main linear regression model.

There is a noticeable gap in the literature surrounding PIA use and TR attendance in LTC homes. A search for academic literature to support or negate the outcomes of this study turned up few results. The results of studies in this domain were contrary to those of this study, supporting the need for further research to understand the correlation between TR and PIA use. Outcomes of a multiple linear regression analysis conducted by Frankenthal, Zandman-Goddard, Ben-Muvhar and Porat-Katz (2016) in Israel indicated that LTC homes which lacked adequate/diverse recreational (nearly 50% of homes in this study) were predictors of antipsychotic use ($\beta = .32$, $p = .018$). Findings of another study (Tordoff, Ailabouni, Browne, Al-Sallami & Gray, 2016, p. 948) indicated that the implementation of recreational interventions in LTC "lead to statistically significant improvements in the…administration" of antipsychotics.

It is queried whether LTC homes may be administering PIAs to facilitate TR attendance. Outcomes of one study suggest that antipsychotics which are prescribed cautiously to older persons in LTC may improve their ability to socially engage, increasing their psychological and physical well-being (Saleh et al., 2017). It is also queried whether LTC homes with higher rates of TR attendance may be administering more PIAs to manage responsive behaviours resulting from of over-stimulation. According to the ASO (2013), some responsive behaviours can be triggered by

environmental factors such as loud noises or large crowds. As TR is often provided in a group setting, it could be postulated that over stimulation is contributing to the expression of responsive behaviours and the need to administer PIAs.

Providing individuals with person-centered care may be effective in managing responsive behaviours (ASC, 2017b; Cohen-Mansfield et al., 2011). Unfortunately, providing person centered care is not always possible. According to a systematic review conducted by Walsh et al. (2017, p. 898.e7), understaffing in LTC homes is a fundamental issue, which leads to nursing staff having "insufficient time and ability to preform person-centered care". Staffing shortages may be influencing the positive correlation between PIA use and TR attendance. There may also be other confounders not measured within this study could be contributing to this positive correlation such as the type of activities being provided, group size and setting; Further research should be conducted into this area.

As discussed in Chapter III, both AB and ON are taking action to ensure that antipsychotics are being used appropriately in LTC, specifically with regards to PLWD. In AB, antipsychotic use amongst PLWD in LTC is influenced by *The Alberta Guideline on the Appropriate Use of Antipsychotic (AUA) Medication* (AHS, 2016b). In ON, an algorithm developed by Bjerre et al. (2016) is used to support LTC clinicians with deprescribing antipsychotic medications amongst PLWD. It appears that these initiatives are working. A comparison of publicly available, aggregate CCRS data indicates that between 2013 and 2019, the adjusted rate of PIA use in Canadian Continuing Care facilities declined by 9.6% (CIHI, 2014, 2019b). In that same time period, the adjusted rate of PIA in LTC declined by 8.6% in AB and 11.5% in ON (CIHI, 2014, 2019b).

Outcomes of this analysis indicated that the mean proportion of PIA use within this data set were similar in LTC homes in AB (.20) than ON (.18). This finding is contrary to what has been reported in previous years, as historically rates of PIA use have been lower in AB than ON. It was speculated whether this observed difference was due to the aggregate nature of the data utilized within this analysis. It was also speculated whether this difference was a result of the exclusion of several LTC homes from the original sample. When frequencies for PIA use were run within the total original sample (N = 804), proportions changed marginally for both AB (.19) and ON (.19).

Home size. Home size (medium vs. small/large vs. small) was shown to have a significant negative correlation to PIA use within all iterations of the nested regression models it was included in. Superficially, findings of this analysis suggest that when compared to small LTC homes, PIA use in medium and large LTCs is negatively correlated. This implies that home size is a significant predictor of PIA use in LTC. Higher occupancy rates and increasing home size have been shown to be associated with lower rate of antipsychotic use in LTC (Hughes, Lapane & Mor 2000). This could be due to variations in staffing ratios between small, medium and large homes. LTC homes with higher numbers of nursing staff (e.g., personal support workers and nurses) may be better equipped to better support persons when they are exhibiting responsive behaviours or experiencing an emotional crisis. Low staffing ratios and a “perceived lack of time” have been perceived as barriers to implementing non-pharmacological interactions for responsive behaviours (Janzen, Zecevic, Kloseck & Orange, 2013, p. 524). In contrast, higher staffing ratios (e.g., personal support workers and nurses) in LTC homes have been associated with lower rates of antipsychotic use (Hughes et al., 2000).

Depression. In Chapter V, it was postulated whether a diagnosis of depression might be associated with higher rates of potentially inappropriate antipsychotic use. Contrary to what was hypothesized, depression was shown to have a significant, negative correlation to PIA use in the main regression model. This suggest that there is an inverse association between PIA use and proportion of depression within LTC homes. Findings of this analysis are counter to those of a study conducted by Nijk, Zuidema and Koopmans (2009) which found no correlation between antipsychotic use and depression in LTC homes. When the interaction between these two variables was assessed on the bivariate matrix (Appendix E), no significant association was noted. This suggests that other variables within the main regression model are contributing to the correlation between PIA use and depression.

Depression appears to be a common diagnosis in LTC. A publicly available, aggregate CCRS data set from 2018-2019 indicated that depression was the third most common disease diagnosis amongst persons living in LTC (30% of persons), the most prevalent being dementia (60.6% of persons) and hypertension (58.9% of persons; CIHI, 2019b).[15] Rates of depression in Canadian LTC homes have remained stable since 2013 (CIHI, 2014). Studies have shown that rates of depression amongst PLWD are similar to (van Asch et al., 2013) or slightly higher the same as those living without (Hiltunen et al., 2016). Depression is a common diagnosis amongst PLWD in LTC homes (Majić et al., 2012), affecting between 40% to 50% of persons at some point during the disease process (ASC, 2017a). Risk for depression rises significantly in correlation to dementia severity,

[15] Statistic reflects full coverage of LTC homes with subsidized/publicly funded beds in BC, YT, AB, SK, ON and NL; partial coverage for MB (WRHA) and NS (CIHI, 2019b). Statistic will not total 100%; persons may have had multiple diagnoses (CIHI, 2019b).

with one study showing that 24% for persons with mild dementia had depression versus 55% of those with severe dementia (Majić et al., 2012).

Organizational context. Although several variables were included in the main regression model to predict PIA use in LTC, only three significant correlations were noted. This suggests there may be other factors influencing their use in LTC. One factor that should be taken into consideration when assessing PIA use and the outcomes of this analysis is the organizational context of each LTC home. "Organizational context describes the characteristics of the work environment" (Chamberlain, Hoben, Squires & Estabrooks, 2016, p. 2). One tool which has been used to measure organizational context in LTC is the Alberta Context Tool (ACT; Squires et al., 2014). Developed as a Likert scale survey for health care providers (e.g., healthcare aides, nurses, physicians, allied health professionals, etc.), the ACT measures eight dimensions of organizational context including: culture, social capital, formal interactions, informal interactions, leadership, structural/electronic resources, evaluation and organizational slack (Squires et al., 2014). The ACT can be "used with individual healthcare providers to measure their perceptions of context" (Squires et al., 2014, p. 1). Results of the survey can also be combined to provide higher level estimates of context in healthcare settings (Squires et al., 2014).

Outcomes of one study which used the ACT revealed that there was a statistically significant difference in PIA use between low- and high- context LTC homes (Estabrooks et al., 2015). Although high-context LTC homes were observed to have lower rates of PIA use in this study, they were also observed to have a higher prevalence of responsive behaviours, especially amongst PLWD. Although not related to PIA use, outcomes of other studies which used the ACT indicated that organizational context within LTC

homes has also been shown to influence both personal support workers' job satisfaction (Chamberlain et al., 2016) and experience of burnout (Chamberlain et al., 2017).

Another factor which should be taken into consideration when assessing PIA use in LTC are the characteristics of the homes themselves and the ways in which they are staffed. In a study conducted by Frankenthal et al. (2016), the authors conducted linear regression analyses and determined that antipsychotics were more commonly prescribed in LTC homes that: (a) were for-profit; (b) had a medical director who was not a geriatrician; (c) had a "mentally frail" unit; (d) were short OTs and Social Workers; (e) were lacking well-fitting/safe equipment; and (f) lacked adequate/diverse. This study also determined that a shortage of nurses, physiotherapists, dietitians and physicians were not predictors for antipsychotic prescription in LTC. Contrary to what has been noted in this study, it appears that physicians may in fact be a predictor of PIA use in LTC. Homes with greater than 20 general practitioners have been shown to have higher rates of PIA use (Laffon de Mazières, Lapeyre-Mestre, Vellas, de Souto Barreto & Rolland, 2015), while those " with an affiliated physician were significantly less likely to use [PIAs]" (Stock, Amuah, Lapane, Hogan & Maxwell, 2017, p. 49).

Interaction effects. In addition to the organizational context and characteristics of LTC homes, the significant interaction effects (Table 10) observed within this analysis also need to be taken into consideration when assessing PIA use and the outcomes of this study. Similar to the nested regression models (Table 9), the LOP of TR attendance, home size (medium vs. small, large vs. small) and the LOP of depression were the most commonly observed significant PVs in the interaction effect models. Eight of the 13 models also indicated significant interaction effects between the LOP of PIA use and the

LOP of TR attendance based on the PVs of the main regression model. These significant interaction effects (e.g., TR*secondary PV) included: mean ABS scores, the LOP of dementia, urban/rural status, mean CPS scores, mean ISE scores and the LOP of depression, antidepressant use and hypnotic use. It is interesting to note that other than depression, none of these PVs were significant predictors of PIA use in the main regression model.

Although the findings of the main regression model (Table 9) indicated that mean ABS scores and the LOP of dementia were not significant predictors of the LOP of PIA use, significant interaction effects were observed amongst these variables and the LOP of TR attendance (Table 10). This suggests that although theses variables do not independently influence PIA use in LTC, the effect of TR attendance on PIA use differs depending on the values of these two secondary variables. Interaction plots for mean ABS scores (Figure 6) and the probability of dementia (Figure 7) confirmed the presence of these effects. It is interesting to note that both plots precited that the interaction effect of TR attendance and PIA used based on these variables would be strongest in homes where the value of the secondary variable was one *SD* above the mean.

Only one linear regression model in this analysis supported the hypothesis that there would be a negative correlation between PIA use and TR attendance in LTC homes. In Model 7 of the interaction effects (Table 11), TR attendance was shown to have a significant ($p < .05$) negative correlation to PIA use (home size and depression were also significant predictors in this model). This finding suggests that both mean CPS scores and therapeutic recreation attendance are simultaneously affecting PIA use (SAGE, 2008),

and that it is predicted that TR attendance would have a stronger negative correlation with PIA use as the mean CPS score increases.

In the context of this analysis, the CPS describes the degree of cognitive impairment within each LTC home, with higher scores corresponding to a greater degree of cognitive impairment (CIHI, 2013). Interestingly, Model 7 was the only interaction effect model in which a secondary PV other than TR attendance, home size or depression (and not including interaction effects) was noted to be a significant predictor of PIA use. In this model, CPS scores were observed to have a significant ($p < .05$) positive correlation with PIA use in LTC. Mean CPS scores were not significantly correlated to PIA use in any of the nested regression models (Table 10) or within the bivariate matrix (Appendix E). This suggests that on its own, mean CPS scores are not a predictor of PIA use or TR attendance in LTC. The complexities of the interaction effects observed within this analysis need to be taken into consideration when assessing the outcomes of this research, as an absence of a significant correlation with PIA use within the main regression model may not negate the presence of a significant interaction effect.

Therapeutic Recreation Attendance

As discussed in Chapter III, the provision of leisure or social activities in LTC homes in AB is and ON is guided by provincial standards or Acts. In AB, leisure or social activities in LTC is addressed under Standard 12 in the Government of Alberta's (2010) *Long-term Care Accommodation Standards and Checklist.* In ON, Section 10 of the *Long-Term Care Homes Act, 2007* (Ontario, 2007*)* speaks to the provision of these services. Comparable to previous CCRS data sets, mean rates of TR attendance were higher in LTC homes in AB than ON. This finding was supported by a statistically

significant t-test for a difference in means proportions of TR attendance in AB and ON. The bivariate matrix indicated a significant, negative association between TR and province (ON =1) suggesting that when no other variables are controlled for, province is a significant predictor of TR attendance in LTC. In AB, mean rates of TR attendance were more than double those of ON. The average number of days and minutes of TR attendance were significantly higher in AB as compared to ON. On average, LTC homes in AB had nearly 60 more minutes of TR attendance within a 7-day period than in ON.

Although both AB and ON have documentation which supports the implementation of leisure or social activities in LTC, rates of recorded TR attendance as captured with the RAI-MDS 2.0 remain low and are declining. A comparison of publicly available, aggregate CCRS data indicates that between 2013 and 2019, rates of TR attendance in Canadian Continuing Care facilities declined by 2.2% (CIHI, 2014, 2019b). TR attendance within LTC homes in AB and ON were also noted to decline during that time, significantly more so in AB (-15.8%) than ON (-2.7%; CIHI, 2014, 2019b). It is queried whether other variables or confounders not measured in this research may be influencing rates of TR attendance in LTC homes, such as the implementation of recreational activities by volunteers or other health care providers (e.g., Occupational Therapists [OTs] or personal support workers).

A significant number of LTC homes from ON (n = 452) were excluded from this analysis as they did not report the proportion of TR attendance. Significantly fewer LTC homes from AB were excluded, further supporting the finding that rates of TR attendance were higher in this province. As noted in Chapter IV, LTC homes in ON may be using OTs to facilitate leisure and social activities in LTC in lieu of Recreation Therapists due

to the ways in which funding is allocated within the province (A-M Martin, personal communication, February 21, 2020). Similar to Recreation Therapists, OTs support individuals to engage and participate in leisure and social activities (Ontario Society of Occupational Therapists [OSOT], 2015). According to the OSOT (2015, p. 4), "the goal of [OT is] to enable clients' ability to function to their fullest potential to enable engagement inactivity that is meaningful to them". As noted in Chapter IV, TR must be provided by a "certified Therapeutic Recreation Specialist or Therapeutic Recreation Assistant" under the Specialists direction to be recorded as TR (Morris et al., 2012, p. 196). Any recreation or leisure activities provided by an OT in LTC would be recorded as occupational therapy and not TR.

Although it was indicated that LTC homes in ON may be utilizing OTs in lieu of Recreation Therapists, publicly available, aggregate CCRS data from 2108-2019, indicated that rates of OT attendance in LTC in ON were low, at only 1.0% (CIHI 2019b).[16] This finding is substantial, considering this data set held RAI-MDS 2.0 assessments from 626 LTC homes in ON. While AB had significantly fewer LTC homes in this data set (n = 177), rates of OT were considerably higher (17.0%).[16] Similar to TR, OT attendance reflects a 7-day period of observation and is determined using both the total number of days (for 15 minutes or more) and minutes it is administered (Morris et al., 2012). A comparison of publicly available, aggregate CCRS data reveals that from 2013 to 2019, rates of OT in LTC declined by 5.2% in AB and by 0.8% in ON (CIHI, 2014, 2019b). Rates of OT attendance in Canadian LTC homes has been shown to be

[16] Statistic reflects full coverage of LTC homes with subsidized/publicly funded beds in and ON (CIHI, 2019b). Statistic will not total 100%; persons may have attended multiple therapies (CIHI, 2019b).

low, with 64% to 89% of persons receiving no OT in the week prior to their last RAI-MDS 2.0 assessment (McArthur, Hirdes, Berg & Giangregorio, 2015).

Aggressive Behaviours

The second research question in this study examined whether LTC homes with a higher prevalence of aggressive behaviours would have higher rates of PIA use and lower rates of TR attendance. It was hypothesized that there would be a positive correlation between the proportion of PIA use and mean ABS scores. It was also hypothesized that there would be a negative correlation between the proportion TR attendance and mean ABS scores. Although antipsychotics are often administered to alleviate or manage responsive behaviours in LTC, no correlation was observed between mean ABS scores and PIA use in any of the nested regression models (Table 9) or within the bivariate matrix (Appendix E). According to CIHI (2018a), ABS score of ≥ 1 indicate the presence of responsive behaviours. Findings of this analysis suggests that responsive behaviours are not a predictor of PIA use in LTC homes in AB and ON. This finding is contrary to what was expected and may be due to the aggregate nature of the data utilized in this study. Research on the topic appears to be of differing opinions. Outcomes of one study from British Columbia indicated that antipsychotics were administered to 31.8% of persons exhibiting no aggressive behaviours, while 27.5% of persons exhibiting “severe aggressive behaviours did not receive antipsychotics” (Saleh et al., 2017, p. 147). In contrast, a study conducted by Majić et al. (2012) found that rates of antipsychotic use were correlated to physical aggression, physical non-aggression and verbal agitation amongst PLWD in LTC.

A comparison of publicly available, aggregate CCRS data indicates that between 2013 and 2019, documented responsive behaviours (mean ABS score of ≥ 1) in Canadian Continuing Care facilities declined slightly by 3.1% (CIHI, 2014, 2019b). In that time, LTC homes in AB saw a decline in responsive behaviours of 5.8%, while ON saw a decline of 2.6% (CIHI, 2014, 2019b). While the incidence of responsive behaviours in LTC homes appears to have declined marginally over the years, findings of this study suggest that they are commonly exhibited by persons in LTC, with more than half of the homes in both AB and ON recording mean ABS scores of ≥ 1.

Although TR is considered a non-pharmacological intervention for responsive behaviours, no nested regression models (Table 9) were generated wherein both TR attendance and mean ABS scores were significant predictors PIA use. There was also no correlation observed between mean ABS scores and TR attendance in the bivariate matrix (Appendix E). This suggests that responsive behaviours are not a predictor of TR attendance in LTC homes in AB or ON. As discussed in Chapter III, both AB and ON have guidelines regarding the use of non-pharmacological interventions for responsive behaviours in LTC. In AB, non-pharmacological interventions are discussed in AHS's (2016b) *Appropriate Use of Antipsychotic Medication* Guideline. In ON, these interventions are addressed in Ontario's (2010) *Regulation 79/10.* Although the findings of this analysis are contrary to what was expected, other variables or confounders not measured in this study may be influencing this outcome, such as the implementation of other non-pharmacological interventions not captured within this data set, OT attendance or the use of cholinesterase inhibitors (ChEIs).

Dementia

The final research question addressed in this study examined whether LTC homes with a higher proportion of dementia would have higher rates of PIA use and lower rates of TR attendance. It was hypothesized that there would be a positive correlation between PIA use and proportion of dementia. It was also hypothesized that there would be a negative correlation between TR attendance and proportion of dementia. Although rates of PIA use are disproportionately higher for PLWD as compared to those without (CIHI, 2018a), no significant correlation was observed between proportion of dementia and PIA use in any of the nested regression models (Table 9) or in the bivariate matrix (Appendix E). Contrary to what was hypothesized, this suggests that the proportion of dementia in a LTC homes is not a significant predictor of PIA use. A comparison of publicly available, aggregate CCRS data indicates that the prevalence of dementia in Canadian continuing care facilities did not change significantly between 2013 (61.4%) and 2019 (61.6%; CIHI, 2014, 2019b). During that same time, the prevalence of dementia in LTC homes in AB and ON remained fairly stable.

Contrary to what was hypothesized, no nested regression models (Table 9) were generated wherein both TR attendance and proportion of dementia were significant predictors PIA use. A weak positive correlation was observed between proportion of dementia and TR attendance in the bivariate matrix (Appendix E) suggesting that when no other variables are controlled for, proportion of dementia may be a predictor of TR attendance in LTC. A study conducted by Janzen et al. (2013, p. 528) found that LTC staff perceived non-pharmacological interventions including TR, to be “effective in reducing agitation” exhibited by PLWD. According to this study, non-pharmacological

interventions provide PLWD with “a sense of purpose” and opportunities to refocus their energy, lessen the possibility of unsafe behaviours and support relaxation and mental stimulation (p. 528). While recreational activity interventions can be effective in preventing responsive behaviours, they are less effective when individuals are already in an emotional crisis (Janzen et al., 2013; Kolanowski, Fick & Buettner, 2009). Recreational activity interventions for responsive behaviours work best when they are implemented on a regular basis (Kolanowski et al., 2009). Although the findings of this analysis are different than what was expected, other variables or confounders not measured in this research may be influencing this outcome.

Significant Correlations

The bivariate matrix indicated several significant correlations between variables used within the main regression model. The matrix was assessed during the analysis to interpret and provide context to the findings of the main linear regression model and interaction effects. While the main linear regression model was central to answering this studies research questions, several other interesting correlations were observed between variables utilized within this analysis. These variables included home size, urban rural status, mean CPS scores, proportion of persons living with a diagnosis of depression, and antidepressant, analgesic and hypnotic use. For more information on significant bivariate correlations observed within this analysis, please see Appendix E.

Recommendations and Policy Implications

Results of this study were contrary to what was hypothesized, supporting further inquiry into PIA use and the provision of social and leisure activities in LTC homes. TR attendance was shown be a predictor of PIA use in LTC, demonstrating a significant,

positive correlation to between these two variables. It was also observed that home size (small = 0) was negatively correlated to PIA use, and that there was a significant difference in mean TR attendance between AB and ON. Based on the above observations and the findings of this analysis, three suggestions are made for improving quality of life in LTC: (a) ensure the effective utilization of allied health professionals; (b) allocate funding for regular social and leisure activities; and (c) improve staffing ratios in smaller homes. These suggestions as well as recommendations for future research and policy implications are discussed below.

Ensure the effective use of allied health professionals. Persons who live in LTC homes spend much of their time inactive (den Ouden et al., 2015) or alone (Nordin et al, 2016). Inactivity and isolation can lead to lead to decreased quality of life for persons in LTC. TR provides those who live in LTC with opportunities to participate and engage in leisure and social activities. Although TR has the potential to enhance a person's well-being (TRO, 2017), the mean proportion of TR attendance within this analysis was only .27. Significant differences were observed between rates of TR attendance in AB and ON, and a considerable number of LTC homes from ON were excluded from this analysis as they did not report rates of TR.

This study utilized secondary RAI-MDS 2.0 data to examine rates of TR attendance in LTC. This analysis did not consider the ways in which other allied health professionals or volunteers may be implementing leisure and recreation activities in LTC. To address the issue of allied health use, it is recommended that further research be conducted into: (a) the ways in which TR is being substituted for OT in LTC; (b) differences in participant outcomes for TR and OT; (c) the role of the volunteer in the

implementation of leisure and recreation activities; and (d) why rates of TR appear to be declining in LTC. It is also recommended that policies regarding the implementation of leisure and social activities within LTC homes, especially those in ON, be reviewed to ensure that appropriate and person-centred programming is being offered to all those in LTC.

Allocate funding for regular social and leisure activities. Funding appears to be a barrier to the provision of TR in LTC homes, especially in ON. In May 2019, the Ministry of Health and Long-Term Care (MHLTC; 2019a) released a policy titled *Long-Term Care Homes Level-of-Care Per Diem, Occupancy and Acuity-Adjustment Funding Policy.* According to this Policy, funding for licensees of LTC homes in ON is provided on "Level-of-Care (LOC) per diem" approach (MHLTC, 2019a, p. 1). This funding is determined by the RUG-III grouping methodology that was discussed in Chapter IV. The LOC per diem approach takes into consideration four components of funding, including Program and Support Services (e.g., programs and therapies; MHLTC, 2019a).

Program and Support Services funding can be used to purchase services from Occupational Therapists, Physiotherapists, Social Workers or Physiotherapist Support Personnel (MHLTC, 2019a). The MHLTC (2019b) sets the LOC per diem which is currently $12.06 for Program and Support Services. According to this Policy, "increased funding flexibility for purchasing occupational and recreational therapy services…will help provide a broader range of professional care for residents and ultimately aims to enable improved quality of life" (MHLTC, 2019a, p. 6). Although this policy acknowledges that per diem funding should be used for "recreational therapy", TR Specialists do not appear to be factored into this funding approach.

To address the issue of funding within LTC homes, it is recommended that further research be conducted into: (a) differences in provincial RUG-III groupings; (b) differences in provincial funding allocation for TR in LTC; (c) ways in which TR is funded in profit, non-profit and municipal LTC homes; and (d) staffing ratios for certified TR Specialists and OTs in small, medium and large sized LTC homes. It is also recommended that policies regarding the allocation of funds for leisure and social activities within LTC homes, especially those in ON, be reviewed to ensure that sufficient programming is being offered to all persons in LTC.

Improve staffing ratios in smaller homes. Home size was observed to be a significant predictor of PIA use in all of the nested regression models in which it was incorporated in; small homes were the reference group. As discussed earlier in this chapter, higher occupancy rates and increasing home size have been linked to lower rates of antipsychotic use in LTC (Hughes et al., 2000). It is queried whether staffing ratios within smaller LTC homes may influence rates of PIA use. In this analysis, small LTC homes were those with < 30 beds. Homes this small may only have a handful of nurses and personal support workers on a unit. It is queried whether smaller LTC homes are administering PIAs to manage responsive behaviours. Although non-pharmacological interventions should be implemented first when addressing responsive behaviours (Fick et al., 2019), nursing staff may face barriers to their implementation, including time constraints, heavy workloads and inadequate staffing ratios (Janzen et al., 2013)

To address the issue of increased PIA use in smaller LTC homes, it is suggested that further research be conducted into: (a) differences in staffing ratios between small, medium and large LTC homes; (b) differences in the staffing ratios of urban and rural

LTC homes; (c) opportunities for professional development within small LTC homes; (d) staff turnover; (e) managerial support in smaller homes; and (f) whether a collaborative approach to care is being implemented within smaller LTC homes.

Neither AB nor ON appear to have policies in place regarding staffing ratios in LTC. According to a report published by the Auditor General of Alberta (2014, p. 85), Alberta Health Services "set[s] staffing level requirements for each individual facility based on the unique care needs of residents who live there". According an annual report published by the Office of the Auditor General of Ontario (2015, pp. 30-31), "Ontario does not legislate a minimum front-line staff-to-resident ration in long term care homes". It is recommended that policies regarding minimal staffing ratios in all LTC homes be developed. These policies should take into consideration not only the rights of persons living in LTC care, but also the safety and well-being of those who care for and support them.

Limitations

One limitation of this study was that a substantial number of LTC homes were excluded from the analysis due to the fact that they did not report rates of TR attendance. More than half of the LTC homes in ON were excluded from this study as well as a small portion of homes in AB, meaning that means observed within this study may not be reflective of actual true means for both provinces. When possible, further studies in this area should ensure that all LTC homes are representative of the variables intended to be utilized within the study. A second limitation of this study was that LTC homes in ON may be utilizing Occupational Therapists (OTs) in lieu of Recreation Therapists for the provision of leisure and social activities. Although OT is captured with the RAI-MDS

2.0, this was an unknown confounder when the data was applied for. Further research in this area should include RAI-MDS 2.0 measures for OT for both provinces.

A third limitation of this study was that rates of PIA use, TR attendance and proportion of PLWD were proportion and not continuous variables. While ordinal regression was done to ensure that outcomes of this study were similar, future studies using RAI-MDS 2.0 data should include both the sample size and the proportion for measures so as to ensure a more accurate analysis. Another limitation of this study was that it used data which was not longitudinal and that therefore comparisons could not be made as to whether the trends for variables had increased or declined over time. Future research using aggregate RAI-MDS 2.0 data should include data from two different fiscal years so that outcomes can be compared for significant changes. A final limitation of this research was that it utilized secondary data, meaning the author could not control for human error which may have occurred during data collection process.

Conclusion

In summary, the findings of this analysis indicated that TR attendance was positively correlated to PIA use in LTC homes. Contrary to previous findings, rates of PIA use were similar in homes in AB and ON. Outcomes of this study and a significant knowledge gap indicate that further research should be conducted into PIA use and TR attendance in LTC. The rate of TR attendance was significantly lower in ON and more than half of the LTC from that province did not report TR attendance in this data set. This implies that further research should also be done into the ways in which persons living in LTC are provided with opportunities to engage in social and leisure activities. Responsive behaviours and the proportion of PLWD were not predictors of PIA use in

LTC. This too is contrary to what was hypothesized warranting further examination. Lastly, home size and a diagnosis of depression were both significant predictors of PIA use in LTC. As PIA appeared to be higher in smaller homes when compared to medium/large, it is necessary to develop an understanding of the contributing factors. The outcomes of this analysis are intended to be used to inform policy regarding antipsychotic use amongst PLWD in LTC, staffing models, program development and to improve the quality of life of all those living in LTC homes.

References

Alberta Health Services. (2016a). Clinical indicators for prescribing antipsychotic medication [PDF file]. Retrieved from https://www.albertahealthservices.ca/assets/about/scn/ahs-scn-srs-aua-prescribing-antipsychotic.pdf

Alberta Health Services. (2016b). The Alberta guideline on the appropriate use of antipsychotic (AUA) medication [PDF file]. Retrieved from https://extranet.ahsnet.ca/ teams/policydocuments/1/clp-ahs-appropriate-use-antipsychotic-med-ltc-guideline-ps-26-01.pdf

Alberta Health Services. (2020). Appropriate Use of Antipsychotics (AUA) toolkit. Retrieved from https://www.albertahealthservices.ca/scns/auatoolkit.aspx

Alzheimer Society of British Columbia. (2017). Responsive behaviours. Retrieved from https://alzheimer.ca/en/bc/Living-with-dementia/Caring-for-someone/Understanding-symptoms/Responsive-behaviours

Alzheimer Society of Canada. (2017a). Depression. Retrieved from https://alzheimer.ca/en/Home/Living-with-dementia/Understanding-behaviour/Depression

Alzheimer Society of Canada. (2017b). Use of antipsychotic medication to treat people with dementia in long-term care homes: Position statement. Retrieved from https://alzheimer.ca/sites/default/files/files/national/position-statements/use%20of%20antipsychotic%2 0medications%20to%20treat%20people%20with%20dementia%20in%20long-term%20care%20homes.pdf

Alzheimer Society of Canada. (2019). Dementia numbers in Canada. Retrieved from https://alzheimer.ca/en/Home/About-dementia/What-is-dementia/Dementia-numbers

Alzheimer Society of Ontario. (2013). Shifting focus: A guide to understanding dementia behaviour [PDF file]. Retrieved from https://alzheimer.ca/sites/default/files/files/on/shifting-focus/shifting_focus_full_guide.pdf

Alzheimer Society of Ontario. (2107a). Examples of responsive behaviours. Retrieved from https://alzheimer.ca/en/on/We-can-help/Resources/Shifting-Focus/Examples-of-responsive-behaviour

Alzheimer Society of Ontario. (2107b). What are responsive behaviours. Retrieved from https://alzheimer.ca/en/on/We-can-help/Resources/Shifting-Focus/What-are-responsive behaviours

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5.* (5th ed.). Arlington, VA: American Psychiatric Association

Azermai, A., Vander Stichele, R. R. H., Van Bortel, L. M., & Elseviers, M. M. (2014). Barriers to antipsychotic discontinuation in nursing homes: An exploratory study. *Aging & Mental Health*, *18*(3), 346-353. doi:10.1080/13607863.2013.832732

Auditor General of Alberta. (2014). Seniors care in long-term care facilities Follow-up [PDF file]. Retrieved from https://www.oag.ab.ca/reports/health-ahs-seniors-care-long-term-care-facilities-follow-october-2014/

Behavioural Supports Ontario. (2019). Background. Retrieved from https://www.behaviouralsupportsontario.ca/29/Background/

Birks, J. S. (2006). Cholinesterase inhibitors (ChEIs), donepezil, galantamine and rivastigmine are efficacious for mild to moderate Alzheimer's disease. *The Cochrane Database of Systematic Reviews*, *25*(1), CD005593. doi:10.1002/14651858.CD005593

Blalock, H. (1976). *Social statistics* (2nd ed.). New York: McGraw Hill

Bjerre, L. M., Farrell, B., Hogel, M., Lemay, G., McCarty, L., Rojas-Fernandez, C., Sinha, S….Wiens, A. (2016). Deprescribing antipsychotics for behavioural and psychological symptoms of dementia (BPDS) and insomnia: An evidence-based clinical practice guideline [PDF file]. Retrieved from http://52.207.93.195/wp-content/uploads/antipsychotic-deprescribing-algorithm.pdf

Cadieux, M-A., Garcia, L. J., & Patrick, J. (2013). Needs of people with dementia in long-term care: A systematic review. *American Journal of Alzheimer's Disease and Other Dementias*, *28*(8), 723-733. doi:10.1177/1533317513500840

Canadian Institute for Health Information. (n.d.). Continuing Care Reporting System and RAI-MDS 2.0 [PDF file]. Retrieved from https://www.cihi.ca/sites/default/files/ document/ccrs-rai-mds-overview-infosheet-en.pdf

Canadian Institute for Health Information. (2013). Describing outcome scales (RAI-MDS 2.0). Retrieved from https://www.cihi.ca/en/outcome_rai-mds_2.0_en.pdf

Canadian Institute for Health Information. (2014). Continuing care reporting system, 2013-2014 [Excel doc]. Retrieved from https://www.cihi.ca/en/quick-stats

Canadian Institute for Health Information. (2016). Use of antipsychotics among seniors living in long-term care facilities, 2014: Report [Report]. Retrieved from https:// secure.cihi.ca/ free_products/LTC_AiB_v2_19_EN_web.pdf

Canadian Institute for Health Information. (2017). CIHI's information quality framework [PDF file]. Retrieved from https://www.cihi.ca/sites/default/files/ document/iqf-summary-july-26-2017-en-web_0.pdf

Canadian Institute for Health Information. (2018a). Dementia in Canada. Retrieved from https://www.cihi.ca/en/dementia-in-canada/dementia-across-the-health-system/dementia-in-long-term-care

Canadian Institute for Health Information. (2018b). Drug use among seniors in Canada, 2016 [PDF file]. Retrieved from https://www.cihi.ca/sites/default/files/document/drug-use-among-seniors-2016-en-web.pdf

Canadian Institute for Health Information. (2018c). Profile of residents in residential and hospital-based continuing care, 2017-2018 [Excel file]. Retrieved from https://www.cihi.ca/en/access-data-reports/results?query=Profile+of+Residents+in+Residential+and+ Hospital-Based+Continuing+Care%2C+2017%E2%80%932018&Search+Submit=

Canadian Institute for Health Information. (2019a). CIHI's Annual Report, 2018–2019: 25 Years of CIHI [PDF file]. Retrieved from https://www.cihi.ca/sites/default/files/document/cihi-annual-report-2018-2019-en-web.pdf

Canadian Institute for Health Information. (2019b). Profile of residents in residential and hospital-based continuing care, 2018-2019 [Excel file]. Retrieved from http://www.cihi.ca/sites/default/files/document/ccrs-quick-stats-2018-2019-en.xlsx

Canadian Institute for Health Information. (2020a). Continuing care metadata. Retrieved from https://www.cihi.ca/en/continuing-care-metadata

Canadian Institute for Health Information. (2020b). Potentially inappropriate use of antipsychotics in long-term care. Retrieved from https://yourhealthsystem.cihi.ca/hsp/ enbref?lang=en#!/indicators/008/potentially-inappropriate-use-of-antipsychotics-in-long-term-care/;mapC1;mapLevel2; overview;/

Centre for Effective Practice. (2016). Use of antipsychotics in behaviours and psychological symptoms of dementia (BPSD) discussion guide: Long-term care (LTC) 2nd edition. [PDF file]. Retrieved from https://cep.health/tool/download/6/

Chamberlain, S., Gruneir, A., Hoben, M., Squires, J., Cummings, G., & Estabrooks, C. (2017). Influence of organizational context on nursing home staff burnout: A cross-sectional survey of care aides in Western Canada. *International Journal of Nursing Studies*, *71*, 60-69. doi:10.1016/j.ijnurstu.2017.02.024

Chamberlain, S., Hoben, M., Squires, J., & Estabrooks, C. (2016). Individual and organizational predictors of health care aide job satisfaction in long term care. *BMC Health Services Research*, *16*(1), 577. doi:10.1186/s12913-016-1815-6

Chiabrando, G., Bianchi, S., Poluzzi, E., Montanaro, N., & Scanavacca, P. (2010). Profile of atypical-antipsychotics use in patients affected by dementia in the University Hospital of Ferrara. *European Journal of Clinical Pharmacology*, *66*(7), 661-669. doi:10.1007/ s00228-010-0828-z

Cohen-Mansfield, J. (2013). Nonpharmacologic treatment of behavioural disorders in dementia. *Current Treatment Options in Neurology*, *15*(6), 765-785. doi:10.1007/ s11940-013-0257-2

Cohen-Mansfield, J. (2017). Activity groups for persons with dementia: Person predictors of participation, engagement and mood. *Psychiatry Research*, *257*(), 375-380. doi: 10.1016/j.psychres.2017.07.045

Cohen-Mansfield, J., Dakheel-Ali, M., & Marx, M. S. (2009). Engagement in persons with dementia: The concept and its measurement. *The American Journal of Geriatric Psychiatry*, *17*(4), 299-307. doi:10.1097/JGP.0b013e31818f3a52

Cohen-Mansfield, J., Dakheel-Ali, M., Marx, M. S., Thein, K., & Regier, N. G. (2015). Which unmet needs contribute to behaviour problems in persons with advanced dementia? *Psychiatry Research*, *228*(1), 59-64. doi:10.1016/j.psychres.2015.03.043

Cohen-Mansfield, J., & Jensen, B. (2018). Attendance in recreational groups for persons with dementia: The impact of stimulus and environmental factors. *American Journal of Alzheimer's Disease & Other Dementias*, *33*(7), 471-478. doi:10.1177/1533317518788158

Cohen-Mansfield, J., Jensen, B., Resnick, B., & Norris, M. (2011). Knowledge of and attitudes toward nonpharmacological interventions for treatment of behavior symptoms associated with dementia: A comparison of physicians, psychologists, and nurse practitioners. *The Gerontologist*, *52*(1), 34-45. doi:10.1093/geront/gnr081

Cornegé-Blokland, E., Kleijer, B. C., Hertogh, C. M. P. M., & van Marum, R. J. (2012). Reasons to prescribe antipsychotics for the behavioural symptoms of dementia: A survey in Dutch nursing home among physicians, nurses, and family caregivers. *Journal of the American Medical Directors Association*, *13*(1), 80.ee-6. doi:10.1016/j.jamda.2010.10.004

Cunningham, E. L., McGuinness, B., Herron, B., & Passmore, A. P. (2015). Dementia. *The Ulster Medical Society*, *84*(2), 79-87. doi:10.1093/ageing/afv056

den Ouden, M., Bleijlevens, M. H. C., Meijers, J. M. M., Zwakhalen, S. M. G., Braun, S. M., Tan, F. E. S., & Hamers, J. P. H. (2015). Daily (in)activities of nursing home residents in their wards: An observational study. *The Journal of American*

Medical Directors Association, *16*(11), 963-968. doi:10.1016/j.jamda.2015.05.016

Duxbury, J., Pulsford, D., Hadi, M., & Sykes, S. (2013). Staff and relatives' perspectives on the aggressive behaviour of older people with dementia in residential care: A qualitative study. *Journal of Psychiatric and Mental Health Nursing*, *20*(9), 792-800. doi:10.1111/ jpm.12018

Estabrooks, C. A., Hoben, M., Poss, J. W., Chamberlain, S. A., Thompson, G. N., Silvius, J. L. & Norton, P. G. (2015) Dying in a nursing home: Treatable symptom burden and its link to modifiable features of work context. *The Journal of the American Medical Association*, *16*, 515-520. doi:10.1016/j.amda.2015.02.007

Frankenthal, D., Zandman-Goddard, G., Ben-Muvhar, Y., & Porat-Katz, B. (2016). The impact of facility characteristics on the use of antipsychotic medications in nursing homes: A cross-sectional study. *Israel Journal of Health Policy Research*, *5*(12), 12. doi:10.1186/s13584-016-0070-y

Federal/Provincial/Territorial Ministers Responsible for Seniors. (2012). Thinking about aging in place [PDF file]. Retrieved from https://www.canada.ca/content/dam/esdc-edsc/documents/corporate/seniors/forum/place.pdf

Feng, Z., Hirdes, J. P., Smith, T. F., Finn-Soveri, H., Chi, I., Du Pasquier, J., Gilgen, R.,…Mor, V. (2009). Use of physical restraints and antipsychotic medications in nursing homes: A cross-national study. *International Journal of Geriatric Psychiatry*, *24*(10), 1110-1118. doi:10.1002/gps.2232

Ferreira, A. R., Dias, C. C., & Fernandes, L. (2016). Needs in nursing homes and their relation with cognitive and functional decline, behavioral and psychological

symptoms. *Frontiers in Aging Neuroscience*, *8*(72), 1-10. doi:10.3389/fnagi.2016.00072

Fick, D. M., Semla, T. P., Steinman, M., Beizer, J., Brandt, N., Dombrowski, R…. Sandhu, S. (2019). American Geriatrics Society 2019 updated Beers Criteria ® for potentially inappropriate medication use in older adults. *Journal of the American Geriatrics Society*, *67*(4), 674-694. doi:10.1111/jgs.15767

Gale, S., Acar, D., & Daffner, K. (2018). Dementia. *The American Journal of Medicine*, *131*(10), 1161-1169. doi:10.1016/j.amjmed.2018.01.022

Government of Alberta. (2010). Long-term care accommodation standards and checklist [PDF file]. Retrieved from https://open.alberta.ca/dataset/e4fe0e7e-d382-4d9d-878c-8f3b29886712/resource/93a7ba07-f476-4a34-a86e-4bfd73e5d51d/download/4840070-2010-long-term-care-accommodation-standards-checklist-effective-april-2010.pdf

Hancock, G. A., Woods, B., Challis, D., & Orrell, M. (2006). The needs of older people with dementia in residential care. *International Journal of Geriatric Psychiatry*, *21*(1), 43-49. doi:10.1002/gps.1421

Health Canada. (2005). Atypical antipsychotic drugs and dementia-advisories, warnings and recalls for health professionals. Retrieved from http://www.healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2005/14307a-eng.php

Health Canada. (2015). Risperidone- Restriction of the dementia indication. Retrieved form http://healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2015/43797a-eng.php

Herrmann, N., Black, S. E., Li, A., & Lanctôt, K. L. (2011). Discontinuing cholinesterase inhibitors: Results of a survey of Canadian dementia experts. *International Psychogeriatrics*, *23*(4), 539-545. doi:10.1017/S1041610210001535

Hiltunen, H., Tan, E., Ilomäki, J., Hilmer, S., Visvanathan, R., Emery, T., . . . Bell, J. (2016). Factors associated with antidepressant use in residents with and without dementia in Australian aged care facilities. *Therapeutic Advances in Drug Safety*, *7*(3), 79-88. doi:0.1177/2042098616641355

Hirdes, J. P., Poss, J. W., Caldarelli, H., Fries, B. E, Morris, J., Teare, G. F, . . . Jutan, N. (2013). An evaluation of data quality in Canada's Continuing Care Reporting System (CCRS): Secondary analyses of Ontario data submitted between 1996 and 2011. *BMC Medical Informatics and Decision Making*, *13*(1), 1-27. doi:10.1186/1472-6947-13-27.

Hughes, C. M., Lapane, K. L., & Mor, V. (2000). Influence of Facility Characteristics on Use of Antipsychotic Medications in Nursing Homes. *Medical Care*, *38*(12), 1164-1173. Retrieved from https://www-jstor-org.ezproxy.msvu.ca/stable/3767994?seq=1#metadata_info_tab_contents

Hutchinson, A. M., Milke, D. L., Maisey, S., Johnson, C., Squires, J. E., Teare, G., & Estabrooks, C. A. (2010). The Resident Assessment Instrument-Minimum Data Set 2.0 quality indicators: a systematic review. *BCM Health Services Research*, *10*(166), 1-14. doi:10.1186/1472-6963-10-166

Janzen, S., Zecevic, A. A., Kloseck, M., & Orange, J. B. (2013). Managing agitation using nonpharmacological interventions for seniors with dementia. *American*

Journal of Alzheimer's Disease & Other Dementias, *28*(5), 524–532. doi:10.1177/1533317513494444

Kirkham, J., Sherman, C., Velkers, C., Maxwell, C., Gill, S., Rochon, R., & Seitz, D. (2017). Antipsychotic use in dementia: Is there a problem and are there solutions? *The Canadian Journal of Psychiatry*, *62*,(2),170-181. doi:10.1177/0706743716673321

Kolanowski, A., Fick, D. M., & Buettner, L. (2009). Recreational activities to reduce behavioural symptoms in dementia. *Geriatrics & Aging, 12*(1), 37–42. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2780321/

Kuronen, M., Kautiainen, H., Karppi, P., Hartikainen, S., & Koponen, H. (2016). Antipsychotic drug use and associations with neuropsychiatric symptoms in persons with impaired cognition: A cross-sectional study. *Nordic Journal of Psychiatry*, *70*(8), 621-625. doi:10.1080/08039488.2016.1191537

Laffon de Mazières, C., Lapeyre-Mestre, M., Vellas, B., de Souto Barreto, P., & Rolland, Y. (2015). Organizational factors associated with inappropriate neuroleptic drug prescribing in nursing homes: A multilevel approach. *Journal of the American Medical Directors Association, 16*(7), 590-597. doi:10.1016/j.jamda.2015.01.092

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, *50*(4), 370-396. doi:10.1037/h0054346

Majić, T., Pluta, J. P., Mell, T., Treusch, Y., Gutzmann, H., & Rapp, M. A. (2012). Correlates of agitation and depression in nursing home residents with dementia. *International Psychogeriatrics, 24*(11), 1779–1789. doi:10.1017/S104161021200066X

McArthur, C., Hirdes, J., Berg, K., & Giangregorio, L. (2015). Who receives rehabilitation in Canadian long-term care facilities? A cross-sectional study. *Physiotherapy Canada, 67*(2), 113–121. doi:10.3138/ptc.2014-27

Ministry of Health and Long-Term Care. (2019a). Long-term care homes Level-of-Care per diem, occupancy and acuity-adjustment funding policy [PDF file]. Retrieved from http://www.health.gov.on.ca/en/public/programs/ltc/docs/level_of_care_ per_ diem_funding_policy.pdf

Ministry of Health and Long-Term Care. (2019b). Policy: LTCH Level-of-Care per diem funding summary [PDF file]. Retrieved from http://www.health.gov.on.ca/en/ public/programs/ltc/docs/level_of_care_per_diem_funding_summary_201908.pdf

Morris, J. M., Hawes, C., Mor, V., Phillips, C., Fries, B. E., Nonemaker, S., & Murphy, K. (2012). *Resident assessment instrument (RAI) RAI-MDS 2.0 user's manual, Canadian version*. Washington, DC: interRai 2010.

Nijk, R. M., Zuidema, S. U., & Koopmans, R. T. C. M. (2009). Prevalence and correlates of psychotropic drug use in Dutch nursing-home patients with dementia. *International Psychogeriatrics, 21*(3), 485–493. doi:10.1017/ S1041610209008916

Nordin, S., McKee, K., Wallinder, M., von Koch, L., Wijk, H., & Elf, M. (2016). The physical environment, activity and interaction in residential care facilities for older people: a comparative case study. *Scandinavian Journal of Caring Sciences*, *31*(4), 727-738. doi:10.1111/scs.12391

Office of the Auditor General of Ontario. (2015). Annual report: 2015 [PDF file]. Retrieved from https://www.auditor.on.ca/en/content/annualreports/arreports/en15/2015AR_en_final.pdf

Ontario. (2007). *Long term care homes act* [Word doc]. Retrieved from https://www.ontario.ca/laws/statute/07l08

Ontario. (2010). Ontario regulation 79/10 [Word doc]. Retrieved from https://www.ontario.ca/laws/regulation/100079

Ontario. (2011). A guide to the *Long-Term Care Homes Act, 2007* and Regulation 79/10 [PDF file]. Retrieved from http://www.hqontario.ca/Portals/0/Documents/pr/ltc-mohltc-ltcha-guide-phase-1-1206-en.pdf

Ontario Pharmacy Evidence Network. (n.d.). Antipsychotic de-Rx. Retrieved from https://www.open-pharmacy-research.ca/evidence-based-deprescribing-algorithm-for-antipsychotics/

Ontario Society of Occupational Therapists. (2015). Occupational therapy in Ontario long-term care homes: Strategies to achieve capacity to meet resident needs [PDF file]. Retrieved from http://www.osot.on.ca/CMDownload.aspx?ContentKey=c7294dbd-fe33-48ad-bc77-48d6b7f5122f&ContentItemKey=7cdeb1f2-58c8-4b07-b076-c7f5c4b33043

Poss, J. W., Jutan, N. M., Hirdes, J. P., Fries, B. E., Morris, J. N., Teare, G., F. & Reidel, K. (2008). A Review of evidence on the reliability and validity of Minimum Data Set Data. *Healthcare Management Forum*, *21*(1), 33-39. doi:10.1016/S0840-4704(10)60127-5

Province of Alberta. (1985a). Nursing homes act [PDF file]. Retrieved from http://www.qpalberta.ca/documents/Acts/N07.pdf

Province of Alberta. (1985b). Nursing homes act: Nursing homes operation regulation [PDF file]. Retrieved from http://www.qp.alberta.ca/documents/Regs/1985_258.pdf

Rappaport, P., Livingston, G., Hamilton, O., Turner, R., Stringer, A., Robertson, S., & Cooper, C. (2018). How do home care staff understand, manage and respond to agitation in people with dementia? A qualitative study. *BMJ Open*, *8*(6), 1-9. doi:10.1136/bmjopen-2018-022260

Reynolds, T., Thornicroft, G., Abas, M., Woods, B., Hoe, J., Leese, M., & Orrell, M. (2000). Camberwell assessment of need for the elderly (CANE): Development, validity and reliability. *The British Journal of Psychiatry*, *176*(5), 444-452. doi:10.1192/bjp.176.5.444

Rios, S., Perlman, C. M., Costa, A., Heckman, G., Hirdes, J. P., & Mitchell, L. (2017). Antipsychotics and dementia in Canada: A retrospective cross-sectional study of four health sectors. *BMC Geriatrics*, *17*(1), 1-8. doi:10.1186/s12877-017-0636-8

Roszmann, A., Żuralska, R., Sitek, E., Sławek, J., Skrzypek-Czerko, M., Domagała, P., & Mziray, M. (2014). Needs assessment of long term care institutions residents with dementia. *ACTA Neuropsycholica*, *12*(1), 66-72. doi:10.1177/1533317513500840

SAGE. (2008). Encyclopedia of survey research methods, Volume 1 (Ed. P. J. Lavrakas). Thousand Oaks: CA, SAGE Publications.

Saleh, N., Penning, M., Cloutier, D., Mallidou, A., Nuernberger, K., & Taylor, D. (2017). Social engagement and antipsychotic use in addressing the behavioral and psychological symptoms of dementia in long-term care facilities. *Canadian Journal of Nursing Research*, *49*(4), 144–152. doi:10.1177/0844562117726253

Schölzel-Dorenbos, C. J. M., Meeuswen, E. J., Olde Rikkert, M. G. M. (2010). Integrating unmet needs into dementia health-related quality of life research and care: Introduction of the Hierarchy Model of needs in Dementia. Aging & Mental health, 14(1), 113-119. doi:10.1080/13607860903046495

Schneider, L., Dagerman, K., & Insel, P. (2006). Efficacy and adverse effects of atypical antipsychotics for dementia: Meta-analysis of randomized, placebo-controlled trials. *The American Journal of Geriatric Psychiatry*, *14*(3), 191-210. doi:10. 1097/01.JGP.0000200589.01396.6d

Simmons, S. F., Bonnett, K. R., Hollingsworth, E., Kim, J., Powers, J., Habermann, R.,…& Schlundt, D. G. (2018). Reducing antipsychotic medication use in nursing homes: A qualitative study of nursing staff perceptions. *The Gerontologist*, *58*(4), e239-e250. doi:10.1093/geront/gnx083

Smalbrugge, M., Zwijsen, S. A., Koopmans, R. C. T. M., & Gerritsen, D. L. (2017). Challenging behaviours in nursing home residents with dementia. In S. Schüssler & C. Lohrmann (Eds.) *Dementia in nursing homes* (pp. 55-66). Switzerland: Springer International.

Squires J. E., Hutchinson, A., Hayduk, L., Cranley, L. A., Cummings, G., Norton, P. G. & Estabrooks, C. A. (2014). Alberta context tool: User manual [PDF file]. Retrieved from https://trecresearch.ca/alberta_context_tool#manual

Statistics Canada. (2016). Health system indicators (Canadian Institute for Health Information [CIHI]). Retrieved from https://www150.statcan.gc.ca/n1/pub/82-221-x/2013001/quality-qualite/qua8-eng.htm

Stock, K., Amuah, J., Lapane, K., Hogan, D., & Maxwell, C. (2017). Prevalence of, and resident and facility characteristics associated with antipsychotic use in assisted living vs. long-term care facilities: A cross-sectional analysis from Alberta, Canada. *Drugs & Aging*, *34*(1), 39-53. doi:0.1007/s40266-016-0411-0

Therapeutic Recreation Ontario. (2017). What is therapeutic recreation? Retrieved from https://www. trontario.org/about/about-therapeutic-recreation/index.html

Thompson Coon, J., Abbott, R., Rogers, M., Whear, R., Pearson, S., Lang, I.,…Stein, K. (2014). Interventions to reduce inappropriate prescribing of antipsychotic medications in people with dementia resident in care homes: A systematic review. *Journal of the American Medical Directors Association*, *15*(10), 706-718. doi:101012/j.jamda.2014.06. 012

Tordoff, J., Ailabouni, M., Browne, N., Al-Sallami, J., & Gray, D. (2016). Improvements in the prescribing of antipsychotics in dementia and psychogeriatric units in New Zealand. *International Journal of Clinical Pharmacy*, *38*(4), 941-949. doi:10. 1007/s11096-016-0318-1

van Asch, I., Nuyen, J., Veerbeek, M., Frijters, D., Achterberg, W., & Pot, A. (2013). The diagnosis of depression and use of antidepressants in nursing home residents with and without dementia. *International Journal of Geriatric Psychiatry*, *28*(3), 312-318. doi:10.1002/gps.3830

Vasudev, A., Shariff, S. Z., Liu, K., Burhan, A. M., Herrmann, N., Leonard, S., & Mamdani, M. (2015). Trends in psychotropic dispensing among older adults with dementia living in long-term care facilities: 2004-2013. *The American Journal of Geriatric Psychiatry*, *23*(12), 1259-1269. doi:10.1016/j.jagp.2015.07.001

Walsh, K., Dennehy, R., Sinnott, C., Browne, J., Byrne, S., Mcsharry, J., . . . Timmons, S. (2017). Influences on decision-making regarding antipsychotic prescribing in nursing home residents with dementia: A systematic review and synthesis of qualitative evidence. *Journal of the American Medical Directors Association*, *18*(10), 897.e1-897.e12. doi:10.1016/j.jamda.2017.06.032

Wieczorowska-Tobis, K., Talarska, D., Kropińska, S., Jaracz, K., Tobis, S., Suwalska, A., . . . Rymaszewska, J. (2016). The Camberwell Assessment of Need for the Elderly questionnaire as a tool for the assessment of needs in elderly individuals living in long-term care institutions. *Archives of Gerontology and Geriatrics*, *62*, 163-168. doi:10.1016/j.archger.2015.10.005

World Health Organization. (2019). Dementia. Retrieved from https://www.who.int/news-room/fact-sheets/detail/dementia

Wu, N., Mor, V., & Roy, J. (2009). Resident, nursing home, and state factors affecting the reliability of Minimum Data Set Quality measures. *American Journal of Medical Quality*, *24*(3), 229-240. doi:10.1177/1062860609332510

Appendix A: Documentation for the Canadian Institute for Health Information

MOUNT SAINT VINCENT UNIVERSITY

Excellence • Innovation • Discovery

Canadian Institute of Health Information
495 Richmond Road, Suite 600
Ottawa, ON. K2A 4H6

Phone: 613-241-7860
Fax: 613-241-8120

November 15, 2019

To whom it may concern,

Please be advised that the applicant, henceforth known as Rowen McKenzie, is enrolled as a full-time graduate student in the Family Studies and Gerontology program at Mount Saint Vincent University in Halifax, Nova Scotia. The analysis of the requested data will be undertaken by Rowen McKenzie and will used to fulfill her Master of Arts degree requirements.

Sincerely,

[Redacted]
Rowen McKenzie, BScN
Applicant/Graduate Student
Department Family Studies and Gerontology
Mount Saint Vincent University

[November 15, 2019]
Date

[Redacted]
Janice Kedfe, PhD.
Thesis Supervisor
Professor, Department Family Studies and Gerontology
Mount Saint Vincent University

[November 15, 2019]
Date

[Redacted]
Deborah Norris, PhD.
Acting Chair, Department of Family Studies and Gerontology
Mount Saint Vincent University

[November 15, 2019]
Date

166 Bedford Hwy Halifax Nova Scotia B3M 2J6 Canada
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Canadian Institute for Health Information

Graduate Student Data Access Program
Project Funding Disclosure Form

GENERAL INFORMATION AND INSTRUCTIONS

a)The purpose of this form is for disclosure of funding that has been provided to the student or supervisor to undertake the research described in the application.

b)Both the student and the student's supervisor are required to disclose any available funding.

PART A. REQUESTOR INFORMATION

1.Student:

Last name	First name	Initials
MCKENZIE	JENNIFER	ROWEN

School	Department	Faculty
Mount Saint Vincent University	Family Studies & Gerontology	

2.Student's Supervisor:

Last name	First name	Initials
KEEFE	JANICE	M

School	Department	Faculty
Mount Saint Vincent University	Family Studies & Gerontology	

PART B. FUNDING DISCLOSURE

1.Funding:

a)Have you or your supervisor applied for or received funding and/or grants to support some or all of the research related to the project described in this Graduate Student Data Access Program application? Yes ○ No ◉

b)If yes, was any portion of this funding to support the acquisition of data related to the project? Yes ○ No ○

2.If yes to either of the above questions, please specify which agency and for what dollar amount.

Failure to disclose potential funding sources on the part of the student or the student's supervisor is cause for termination of the agreement.

Client Information Request Form for Aggregate Data

June 2015

DaRT Number: _____

Date Received: November 15, 2019

General Information and Instructions

- Use this form to request aggregate data. (To request record-level data, please use the Third-Party Record-Level Data Request Form and Non-Disclosure/Confidentiality Agreement.)
- Before completing the form, we recommend that you contact the appropriate CIHI program area to discuss your data requirements and applicable fees.
- Data recipients must sign CIHI's Non-Disclosure/Confidentiality Agreement for Aggregate Data (the "Agreement") which sets out the terms and conditions under which CIHI will provide data to the data recipient. The Agreement must be signed by someone who is a representative of the Principal Organization with the right to legally bind the Principal Organization to the terms and conditions of the Agreement.
- CIHI's website (www.cihi.ca) provides information about CIHI's data request process, CIHI's program area and database contacts, privacy and data protection at CIHI and CIHI's Graduate Student Data Access Program (GSDAP).

Canadian Institute for Health Information

Institut canadien d'information sur la santé

Part A: Requestor Details

1. Requestor (or Principal Individual)

McKenzie	Jennifer		Rowen (preferred name)
Last Name	First Name		Initials
Mount Saint Vincent University	Family Studies and Gerontology	Graduate Student	
Organization/Affiliation	Department	Position/Title	
Street	City	Province	Postal Code
Phone Number / Fax Number	Email Address		

Requestor/Organization Type:

- ☐ Federal Government
- ☐ Researcher/Academic
- ☐ General Public
- ☐ Provincial/Territorial Government
- ☐ Health Care Facility
- ☒ Student
- ☐ Commercial/Private Sector
- ☐ Regional Health Authority
- ☐ Advocacy Group
- ☐ Other (Specify) _____

2. Check the appropriate response (provide additional information as required)

Data is requested

☐ On behalf of the individual and organization identified in A1; **or**

☒ Under the **Graduate Student Data Access Program (GSDAP)** → Graduate student, please supply additional information below and then proceed to Part B; **or**

☐ **On behalf of another party** not already identified → Other party, please supply additional information below and proceed with the remainder of the form.

Last Name	First Name	Initials
McKenzie	Jennifer	Rowen (preferred name)

Will you require access to the data? ☒ Yes ☐ No

Position/Title	Organization (Academic Institution if GSDAP)
Graduate Student	Mount Saint Vincent University

Street	City	Province	Postal Code
166 Bedford Hwy	Halifax	Nova Scotia	B3M 2J6

Phone Number	Fax Number	Email Address
902-457-6788		

3. Billing Information (if applicable)

As identified in ☐ A1 or ☐ A2 or ☐ Bill to → Provide additional information below

Last Name	First Name	Initials

Position/Title

Organization	Department

Street	City	Province	Postal Code

Phone Number	Fax Number	Email Address

Part B: Data Requested

1. Please identify each CIHI data holding from which you are requesting data, including the years of data required from each (e.g., NDB, 2005 to 2007):

   Continuing Care Reporting System, 2018-2019.
   Alberta and Ontario residential care (long-term care) data only.

2. Please provide high-level specifications of the aggregate data required for your research or analytical project (e.g., total acute myocardial infarctions by province with breakdown by 5-year age group and gender):

   Demographics:
   - Province/Territory in which the CCRS facility is located
   - Number of persons in the CCRS facility (total, male, female and other)
   - Average age of all persons in the CCRS facility
   - Average age of all sexes in the CCRS facility (male, female, other)
   - Number of persons assessed with the RAI-MDS 2.0 in the CCRS facility

   Independent Variable:
   - Percentage of persons who attended recreational therapy in the CCRS facility (all persons as well as average number of p1bfa_days_recreation_therapy and p1bfb_mins_recreation_therapy)

   Dependant Variable:
   - Percentage of persons on an antipsychotic without a diagnosis of psychosis in the CCRS facility

   Moderators:
   - Prevalence of dementia in the CCRS facility (all dementias as well as i1r_alzheimers, i1v_dementia_not_alzheimers)
   - Average aggressive behaviours scale score of the CCRS facility (abs)

   Control Variables:
   - Facility size
   - Urban/rural status of the CCRS facility
   - Neighbourhood income quintile of the CCRS facility
   - Average Cognitive Performance Scale (cps) of the CCRS facility
   - Average Index of Social Engagement (ISE) for the CCRS facility
   - Prevalence of depression in the CCRS facility (i1gg_depression)
   - Use of antidepressants in the CCRS (o4c_days_antidepressants)
   - Use of analgesics in the CCRS (o4f_days_analgesic)
   - Use of hypnotics in the CCRS (o4d_days_hypnotic)
   - Use of anxiolytics in the CCRS (o4b_days_antianxiety)
   - Number of persons whose first RAI/admission assessment is included in the CCRS

- Number of persons whose repeat (e.g., quarter/annual, not first/admission) RAI assessment is included in the CCRS facility's data

3. Target date to receive data:

[insert date; dependant on approval date for ethics application]

Part C: Details of the Research Project/Analytical Study

1. Research project title:

Assessing therapeutic recreation attendance and potentially inappropriate antipsychotic use in long-term care.

2. Describe the public and/or scientific benefits to be derived from using CIHI data in the project:

Canada will see a considerable increase in the number of persons living with dementia (PLWD) in long-term care (LTC) homes in the coming years. Responsive behaviours, such as agitation, aggression and repetitive vocalizations, are commonly exhibited by PLWD in LTC. When present, these behaviours can impact not only the individuals' quality of life, but that of other residents within the home and the health care professionals that care for and support them. Responsive behaviours are often exhibited by PLWD as a means of expressing unmet needs. One commonly reported unmet need amongst these individuals is the unmet need for daytime activity. PLWD in LTC spend much of their time by themselves. Minimal opportunities for engagement or daytime activity in LTC may lead to the expression of responsive behaviours.

Pharmacological and non-pharmacological interventions are often employed by health care professionals in LTC to alleviate, mitigate or halt the expression of these behaviours. Despite their known risk of harm and evidence which supports the use of nonpharmacological interventions, antipsychotics continue to be administered to PLWD in LTC. This proposed graduate thesis research will utilize secondary, aggregate CIHI data to assess rates of therapeutic recreation attendance and potentially inappropriate antipsychotic use in LTC homes in Alberta and Ontario. It is hypothesized that Canadian LTC homes which have higher rates of therapeutic recreation attendance will have lower rates of potentially inappropriate antipsychotic use. The outcomes of this research are intended to be used to inform policy regarding antipsychotic use amongst PLWD in LTC, staffing models, program development and to improve the quality of life of all those living in long-term care.

3. Describe the purpose(s) and objective(s) of the project:

This proposed thesis research will address the issue of therapeutic recreation (TR) attendance and potentially inappropriate antipsychotic use in Canadian LTC homes in

This proposed thesis research will address the issue of therapeutic recreation (TR) attendance and potentially inappropriate antipsychotic use in Canadian LTC homes in Alberta and Ontario. The purpose of this research is to determine whether there is a correlation between TR attendance in LTC and inappropriate antipsychotic use. Specifically, whether LTC homes with a higher prevalence of dementia and therapeutic recreation attendance administer fewer potentially inappropriate antipsychotics.

The objective of this study is to answer the following three research questions:

1. Do LTC homes with higher rates of TR attendance have lower rates of potentially inappropriate antipsychotic use?

2. Do LTC homes with a higher prevalence of aggressive behaviours have higher rates of potentially inappropriate antipsychotic use and lower rates of TR attendance?

3. Do LTC homes with a higher prevalence of dementia have higher rates of potentially inappropriate antipsychotic use and lower rates of TR attendance?

The requestor hypothesizes that Canadian LTC homes which have higher rates of TR attendance will have lower rates of potentially inappropriate antipsychotic use. The requestor also hypothesizes that the correlation between these two variables is moderated by the homes' prevalence of both aggressive behaviours and dementia (e.g., that homes with a higher prevalence of dementia/aggressive behaviours have higher rates of potentially inappropriate antipsychotic use and lower rates of therapeutic recreation attendance).

4. Describe the data analyses to be conducted and the duration of the research:

Statistical software (e.g., Statistical Package for the Social Sciences [SPSS]) will be used in the analysis of this data. Categorical and dummy variables will be developed for each measure, and linear regression analyses will be undertaken.

Firstly, the correlation between therapeutic recreation attendance and potentially inappropriate antipsychotic use in LTC homes in both Alberta and Ontario will be analyzed. The data will be plotted onto two graphs (one for Alberta and one for Ontario) as a scatterplot and a linear regression analysis will be done to determine the Pearson correlation (r), mean (u), confidence intervals (CI) and standard deviation (SD) for both provinces. It is expected that there will be a negative correlation between the two variables as the requestor hypothesizes that LTC homes with higher rates of therapeutic recreation attendance will have lower rates of potentially inappropriate antipsychotic use.

Secondly, the correlation between the above two variables will be analyzed taking the moderators (the prevalence of aggressive behaviours and dementia within each LTC home) into consideration. The data will be plotted onto four graphs (two for each province) as a scatterplot and a linear regression analysis will be done to determine the Pearson

correlation (r), mean (u), confidence intervals (CI) and standard deviation (SD) for both provinces. It is expected that this analysis will show a negative correlation as the requestor hypothesizes that LTC homes with a higher prevalence of dementia and the presence of aggressive behaviours will have higher rates of potentially inappropriate antipsychotic use and lower rates of therapeutic recreation attendance.

Lastly, the correlation between the control variables and the independent and dependent variables will be assessed using dummy coding. As the use of antidepressants, analgesics, hypnotics and anxiolytics in LTC can influence the measure of responsive/aggressive behaviours, they will be treated as potential confounders in this research. The requestor will assess for consistency in their use across LTC homes in Alberta and Ontario. If their use is noted to be consistent across these homes, then the requestor postulates that their use would not significantly impact the outcomes of this research. If their use is noted to be inconsistent across LTC homes, then these confounders will be taken into consideration when interpreting the findings of this proposed research; Outliers may be excluded. The prevalence of depression within each LTC home will also be taken into consideration when assessing the use of antidepressants and recreation therapy attendance.

5. Are you requesting data that identifies health facilities by name? ☐ Yes ☒ No

6. How do you plan to disseminate the results of your analyses?

☒ For internal use (please describe):

The findings of this research will be disseminated at the requestor's thesis defense and within their printed, unpublished thesis.

☒ For external release where facilities are not identified by name (please describe):

A digital copy of the requestor's thesis will be uploaded to the Mount Saint Vincent University's library website; this copy will be available to the general public. The requestor intends to submit their thesis (in part or in whole) for publication following their defense. They also intend to submit manuscripts of their findings to academic, peer reviewed journals within the field health and social sciences. The requestor may also present the findings of their research at various conferences (e.g., the Canadian Association for Gerontology's 2020 annual conference).

☐ For external release where facilities are identified by name (please describe):

Note: For external releases where facilities are identified by name, CIHI will send the following information to the deputy ministers of health of the jurisdictions whose data is included in the release:

- Name of the data requestor;
- Contact information for the data requestor;
- Purpose of the data request; and
- A complete copy of the data for all jurisdictions included in the request.

If any external release is contemplated at any time other than as described above in section 6, you must inform CIHI at least 30 days prior to release.

November 15, 2019 [Redacted]

Date Signature of Requestor

Non-Disclosure/Confidentiality Agreement for Aggregate Data

June 2015

DaRT Number: _____

Effective Date: November 15, 2019

The **Canadian Institute for Health Information** ("**CIHI**") and the party identified below as receiving the information under this agreement ("**recipient**") agree that

1. (a) The term "**health facility**" means any institution in a province or territory in Canada that, in part or in whole, provides health services. A health facility includes but is not limited to acute care/specialty hospitals; long-term care facilities; and ambulatory agencies such as outpatient clinics, rehabilitation centres, community health centres and home care agencies.

   (b) The term "**information**" means any aggregate health, health workforce, health facility or other aggregated information, including indicators or rates, obtained from CIHI under this agreement as described in Part B of the recipient's Client Information Request Form for Aggregate Data.

2. The parties' representatives for disclosing or receiving information are

   CIHI:

   Recipient: Rowen McKenzie

3. The Client Information Request Form for Aggregate Data and any attachments are considered part of this agreement.

4. The recipient shall use information disclosed to it under this agreement only for the purpose(s) described in Part C of the Client Information Request Form for Aggregate Data.

5. Where the information is an indicator or a rate for a named health facility, the recipient agrees to use caution when the number of cases in the denominator is low, due to the instability of rates, and should avoid including such results in any publication, report or other disclosed material. Where the number of cases in the denominator is less than 50, the recipient must include an "interpret with caution" statement in any publication, report or other disclosed material.

6. (a) The recipient shall include in any publication, report or other disclosed material an acknowledgement in the following form: "Parts of this material are based on data and information provided by the Canadian Institute for Health Information. However, the analyses, conclusions, opinions and statements expressed herein are those of the author and not necessarily those of the Canadian Institute for Health Information."

   (b) Where information is preliminary in nature, the recipient shall indicate in any publication, report or other publication that such information is preliminary and therefore subject to revisions.

7. At CIHI's request, the recipient will provide CIHI with copies of any published, reported or otherwise utilized or disclosed material.

8. CIHI does not warrant the quality, accuracy, validity, reliability or completeness of the information, which is provided "as is" without representation, warranty or condition of any kind. CIHI shall not be responsible for any liability of any kind arising, directly or indirectly, in connection with the information.

CIHI ICIS
Canadian Institute for Health Information
Institut canadien d'information sur la santé

9. Unless expressly provided herein, neither party acquires any right or licence under this agreement in or to any intellectual property rights of the other party.

10. All additions or modifications to this agreement must be made in writing and signed by both parties. This agreement is made under and shall be construed in accordance with the laws in force in the Province of Ontario.

11. Upon reasonable notice, the recipient will permit CIHI to visit the recipient's premises to verify the recipient's compliance with the terms of this agreement.

12. The recipient shall immediately report to CIHI in writing if the recipient breaches any term or condition of this agreement or if there is any event that may cause the recipient to believe that an actual or potential breach has occurred.

13. If the recipient is in breach of any term or condition of this agreement, the recipient shall stop using the information, in whole or in part, immediately upon notice from CIHI.

14. Failure of the recipient to comply with the terms and conditions of this agreement may, where applicable, result in a complaint to the Information and Privacy Commissioner or equivalent data protection authority.

Canadian Institute for Health Information	**Recipient**
495 Richmond Road, Suite 600 Ottawa, Ontario K2A 4H6 Phone: 613-241-7860 Fax: 613-241-8120	Mount Saint Vincent University Principal Organization 166 Bedford Hwy, Halifax, Nova Scotia. B3M 2J6 Address [Redacted] Signature of Principal Individual
Signature	J. Rowen McKenzie Name of Principal Individual (please print)
Name (please print)	Graduate Student Title
Title	November 15, 2019 Date Signed
Date Signed	[Redacted] I am authorized to legally bind the organization.

Appendix B: Aggregate Data Request Form

Canadian Institute for Health Information
Institut canadien d'information sur la santé

At the heart of data
Au coeur des données

www.cihi.ca
www.icis.ca

Agreggate Data Request

Data Specification Form

DaRT Number (If available)	

12/20/2019	Specialized Care Data Management
Date	Prepared by
Draft	Rowen McKenzie
Specification Status	Principal Requestor
Mount Saint Vincent University – Graduate Student	
Principal Organization	
Assessing therapeutic recreation attendance and potentially inappropriate antipsychotic use in long-term care	
Project Title	
High-level Description of the Scope of Request	
This study will address the issue of therapeutic recreation (TR) attendance and potentially inappropriate antipsychotic use in Canadian LTC homes in Alberta and Ontario. The purpose of this research is to determine whether there is a correlation between TR attendance in LTC and inappropriate antipsychotic use. Specifically, whether LTC homes with a higher prevalence of dementia and therapeutic recreation attendance administer fewer potentially inappropriate antipsychotics.	
Excel	
File Format Requested	

2

Continuing Care Reporting System (CCRS) FY2018-2019

Databases and years of data included

All CCRS episodes of care for Ontario or Alberta long-term care facilities (sector_code = 4 – residential) that took place in FY2018-2019, where there is an assessment that occurred in that given fiscal year.

For analyses, use the latest assessment in the fiscal year for a given episode where multiples exist.

Inclusion Criteria

Exclude data from all facilities outside of Ontario & Alberta
Exclude data from all "hospital-based" facilities (exclude assessments where sector_code = 3 - Hospital-based)
Exclude episodes where aa2_sex_code = "other"

Exclusion Criteria

Methodological Notes

Please see aggregate template for layout included in the analysis.

Include the following variables (by facility) to populate the table:

province_code
aa1_uri
aa2_sex_code
age_assessment
fiscal_year_ax (to calculate count of assessed residents, all, N)
p1bfa_days_recreation_therapy (also used to calculate residents who attended recreational therapy, all, %)
p1bfb_mins_recreation_therapy
Residents Who Received an Antipsychotic Without a Diagnosis of Psychosis (All, %): qi_code = DRG01, and variable named: adjusted (for quality indicator adjusted rate)

Include the following "moderators":

Prevalence of All Dementias in Facility (All, %): based on a combination of i1r & i1v
Prevalence of Alzheimer's in Facility (All, %): i1r_alzheimers variable

Prevalence of Dementia Not Alzheimer's in Facility (All, %):
i1v_dementia_not_alzheimers variable
Average Aggressive Behaviours Scale (ABS) Score (All): ABS variable

Include the following control variables:

Facility Size (S/M/L): defined as < 30 beds = Small facility, 30-99 beds = Medium facility and 100 or more beds = Large facility
Urban/Rural Status of Facility: based on PCCF+
Neighbourhood Income Quintile of Facility: based on PCCF+
AVG Cognitive Performance Scale (CPS) (All): CPS variable
AVG Index of Social Engagement (ISE) (All): ISE variable
Prevalence of Depression in Facility (All, %): i1gg_depression variable
Residents Who Received an Antidepressant (All, %): O4C_days_antidepressants variable
Residents Who Received an Analgesic (All, %): O4F_days_analgesic variable
Residents Who Received a Hypnotic (All, %): O4D_days_hynotic variable
Residents Who Received an Anxiolytic (All, %): O4B_days_antianxiety variable
Count of Residents where Assessment Type is "initial Assessment" for RAI-MDS 2.0 (All, N): aa8_assessment_type variable

Data Request Pricing

CIHI responds to data requests on a cost-recovery basis, as follows:

Price A: $160/hour for Canadian health care facilities, governments, media (data requests only), not-for-profit health agencies, universities (except for students through the Graduate Student Data Access Program), health professionals and researchers from the public sector. The first two hours of service will be waived by CIHI, except for media, for whom 10 free hours of staff time are provided per topic per 12-month period.

Price B: $320/hour for private commercial operations (including but not limited to software vendors and consultants), foreign clients and others not qualifying for Price A.

If applicable, GST/HST will be added to the invoice.

The billing time includes consulting with clients and other CIHI support areas, developing specifications, programming, verifying data and preparing data for release.

Preliminary Cost Estimate

Key Components	Cost Estimate

Consulting phase (*range of hours* @ $160/hour)	$0
Developing specifications, programming, verifying data and preparing for release (*range of hours* @ $160/hour)	$0
Other (specify) (*range of hours* @ $160/hour)	
Subtotal	
First two hours of production time are waived by CIHI for Price A clients	$0
Ten free hours of staff time are provided per topic per 12-month period for media	$0
Preliminary Cost Estimate (excluding all applicable taxes)	**$0**

Please note that this preliminary estimate is based on the current information that you have provided regarding your data needs. The preliminary cost estimate may change (increase or decrease) based on additional/new requirements identified during the data request process.

Appendix C: Sensitivity Testing for Age

Table 12

Frequencies of all Variables in LTC Homes with Mean Age <65 Years; 2018-2019

	N					
	Valid	Missing	*M*	*SD*	Range	
Total homes (*n*)	4	0	0.00	0.00	0.00	0.00
Persons (all; *n*)	4	0	95.50	77.27	51.00	211.00
Persons (male; *n*)	4	0	51.25	43.35	24.00	116.00
Persons (female; *n*)	4	0	44.25	34.51	18.00	95.00
Age (all; years)	4	0	59.48	4.40	53.88	64.63
Age (male; years)	4	0	56.46	3.64	51.30	59.29
Age (female; years)	4	0	62.19	6.31	56.15	71.07
RAI-MDS 2.0 assessments (*n*)	4	0	89.75	69.11	50.00	193.00
TR attendance (p)	4	0	.16	.13	.06	.32
TR attendance (days)	4	0	0.27	0.25	0.06	0.59
TR attendance (minutes)	4	0	15.43	16.47	2.31	37.42
PIA use (p)	4	0	.25	.12	.14	.38
Dementia (all; p)	4	0	.10	.04	.06	.16
Alzheimer's disease (AD; p)	4	0	.01	.01	.00	.02
Dementia not AD (p)	4	0	.09	.05	.05	.16
ABS score	4	0	2.17	1.64	0.78	4.40
Home size	4	0	1.25	0.500	1	2
Urban/rural status	4	0	0.00	0.00	0.00	0.00
NIQ	4	0	.25	0.50	0.00	1.00
CPS	4	0	2.06	0.59	1.19	2.50
ISE	4	0	3.60	0.65	2.96	4.47
Depression (p)	4	0	.32	.17	.12	.46
Antidepressants (p)	4	0	.51	.09	.38	.59
Analgesics (p)	4	0	.61	.14	.47	.80
Hypnotics (p)	4	0	.19	.10	.10	.33
Anxiolytics (p)	4	0	.27	.12	.12	.41
Initial RAI-MDS 2.0 assessments (*n*)	1	3	12.00	-	12.00	12.00

Note. N = total number of cases; *M* = mean; *SD* = standard deviation; *n* = number of cases; p = proportion; RAI-MDS 2.0 = Resident Assessment Instrument-Minimum Data Set 2.0; TR attendance = therapeutic recreation attendance; PIA use = potentially inappropriate antipsychotic use; ABS = Aggressive Behaviour Scale; NIQ = Neighbourhood Income Quintile; CPS = Cognitive Performance Scale; ISE = Index of Social Engagement.

Table 13

Frequencies of all Variables in LTC Homes with Mean Age >65 Years; 2018-2019

	N					
	Valid	Missing	*M*	*SD*	Range	
Total homes (*n*)	303	0	0.57	0.50	0	1
Persons (all; *n*)	301	2	162.18	132.37	7.00	851.00
Persons (male; *n*)	292	11	58.89	50.83	5.00	341.00
Persons (female; *n*)	292	11	107.55	87.10	5.00	602.00
Age (all; years)	303	0	83.18	3.68	65.89	93.20
Age (male; years)	303	0	80.48	4.35	63.00	92.89
Age (female; years)	302	1	84.65	3.37	67.51	94.79
RAI-MDS 2.0 assessments (*n*)	300	3	128.57	97.31	6	571
TR attendance (p)	303	0	.27	.28	.001	1.00
TR attendance (days)	303	0	0.73	0.88	0.00	4.85
TR attendance (minutes)	303	0	34.98	48.49	0.09	365.00
PIA use (p)	297	6	0.19	0.09	0.03	0.72
Dementia (all; p)	302	1	.50	0.14	.03	1.00
Alzheimer's disease (AD; p)	302	1	.12	.07	.00	.43
Dementia not AD (p)	303	0	.43	.13	.00	1.00
ABS score	303	0	1.38	0.76	0.18	4.33
Home size	303	0	1.34	0.70	0	2
Urban/rural status	303	0	0.33	0.47	0.00	1.00
NIQ	300	3	1.55	1.36	1.00	4.00
CPS	303	0	3.05	0.50	1.30	4.50
ISE	303	0	2.87	0.73	0.11	5.26
Depression (p)	303	0	.29	.12	.00	.78
Antidepressants (p)	303	0	.46	.12	.05	.80
Analgesics (p)	303	0	.58	.14	.10	1.00
Hypnotics (p)	282	21	.09	.09	.003	.71
Anxiolytics (p)	294	9	.09	.05	.01	.39
Initial RAI-MDS 2.0 assessments (*n*)	244	59	24.01	31.79	5	319

Note. N = total number of cases; *M* = mean; *SD* = standard deviation; *n* = number of cases; p = proportion; RAI-MDS 2.0 = Resident Assessment Instrument-Minimum Data Set 2.0; TR attendance = therapeutic recreation attendance; PIA use = potentially inappropriate antipsychotic use; ABS = Aggressive Behaviour Scale; NIQ = Neighbourhood Income Quintile; CPS = Cognitive Performance Scale; ISE = Index of Social Engagement.

Table 14

Differences Between Means of all Variables in LTC Homes with Mean Age >65 and <65 Years; 2018-2019

	M		
Variable	>65 years	<65 years	Difference
Total homes (*n*)	0.57	0.00	0.57
Persons (all; *n*)	162.18	95.50	66.68
Persons (male; *n*)	58.89	51.25	7.64
Persons (female; *n*)	107.55	44.25	63.30
Age (all; years)	83.18	59.48	23.70
Age (male; years)	80.48	56.46	24.02
Age (female; years)	84.65	62.19	22.46
RAI-MDS 2.0 assessments (*n*)	128.57	89.75	38.82
TR attendance (p)	.27	.16	.11
TR attendance (days)	0.73	0.27	0.46
TR attendance (minutes)	34.98	15.43	19.55
PIA use (p)	.19	.25	-.06
Dementia (all; p)	.50	.10	.40
Alzheimer's disease (AD; p)	.12	.01	.11
Dementia not AD (p)	.43	.09	.34
ABS score	1.38	2.17	-0.79
Home size	1.34	1.25	0.09
Urban/rural status	0.33	0.00	0.33
NIQ	1.55	0.25	1.30
CPS	3.05	2.06	0.99
ISE	2.87	3.60	-0.73
Depression (p)	.29	.32	-.03
Antidepressants (p)	.46	.51	-.05
Analgesics (p)	.58	.61	-.03
Hypnotics (p)	.09	.19	-.10
Anxiolytics (p)	.09	.27	-.18
Initial RAI-MDS 2.0 assessments (*n*)	24.01	12.00	12.01

Note. A difference in means was determined by subtracting the mean of variables in LTC homes with a mean age <65 years from those with a mean age of >65 years. *N* = total number of cases; *M* = mean; *SD* = standard deviation; *n* = number of cases; p = proportion; RAI-MDS 2.0 = Resident Assessment Instrument-Minimum Data Set 2.0; TR attendance = therapeutic recreation attendance; PIA use = potentially inappropriate antipsychotic use; ABS = Aggressive Behaviour Scale; NIQ = Neighbourhood Income Quintile; CPS = Cognitive Performance Scale; ISE = Index of Social Engagement.

Appendix D: Sensitivity Testing for Proportions

Table 15

Linear Regression Model to Predict Potentially Inappropriate Antipsychotic Use, Proportional Dependent Variable

	B	95% CI	β	t	*p*
(Constant)	.148	[.021, .274]		2.299	.022
TR attendance (p)	.067	[.013,.120]	.205	2.467	.014
ABS	.004	[-.014, .021]	.030	.410	.682
Dementia (p)	.056	[-.082, .193]	.080	.795	.428
Province	.039	[.001,.078]	.223	2.004	.046
Medium size	-.070	[-.144, .004]	-.398	-1.860	.064
Large size	-.096	[-.174, -.017]	-.552	-2.407	.017
Urban/rural	-.010	[-.040, .021]	-.049	-.632	.528
NIQ	.001	[-.007, .009]	.013	.195	.846
CPS	.013	[-.017, .044]	.078	.865	.388
ISE	-.003	[-.019, .014]	-.023	-.343	.732
Depression (p)	-.175	[-.324, -.026]	-.207	-2.322	.021
Antidepressants (p)	.165	[.000, .330]	.196	1.973	.050
Analgesics (p)	-.122	[-.265, .020]	-.184	-1.698	.091
Hypnotics (p)	.325	[.045, .606]	.271	2.285	.023
Anxiolytics (p)	.218	[-.068, .505]	.110	1.505	.134
Initial RAI-MDS 2.0	.000	[.000, .001]	.152	1.929	.055

Note. I = 268. The dependent variable (constant) in this analysis was the proportion of potentially inappropriate antipsychotic (PIA) use. B = unstandardized beta coefficient; CI = confidence interval; β = standardized beta coefficient; *p* = p-value/significance; p = proportion; RAI-MDS 2.0 = Resident Assessment Instrument-Minimum Data Set 2.0; TR attendance = therapeutic recreation attendance; ABS = Aggressive Behaviour Scale; NIQ = Neighbourhood Income Quintile; CPS = Cognitive Performance Scale; ISE = Index of Social Engagement.

Table 16

Linear Regression Model to Predict Potentially Inappropriate Antipsychotic Use, Log Odds Dependent Variable

	B	95% CI	β	t	*p*
(Constant)	-1.699	[-2.655, -.742]		-3.500	.001
TR attendance (p)	.451	[.049, .854]	.190	2.209	.028
ABS	.011	[-.123, .145]	.012	.164	.870
Dementia (p)	.323	[-.718, 1.363]	.064	.612	.541
Province	.273	[-.019, .565]	.212	1.845	.066
Medium size	-.503	[-1.063, .057]	-.391	-1.769	.078
Large size	-.633	[-1.226, -.040]	-.498	-2.104	.037
Urban/rural	-.135	[-.366, .097]	-.091	-1.147	.253
NIQ	.003	[-.060, .065]	.006	.085	.932
CPS	.079	[-.153, .310]	.063	.672	.502
ISE	-.028	[-.153, .098]	-.031	-.436	.663
Depression (p)	-.976	[-2.098, .147]	-.158	-1.713	.088
Antidepressants (p)	.855	[-.391, 2.101]	.139	1.352	.178
Analgesics (p)	-.640	[-1.714, .433]	-.132	-1.176	.241
Hypnotics (p)	1.919	[-.201, 4.039]	.219	1.785	.076
Anxiolytics (p)	.870	[-1.290, 3.031]	.060	.794	.428
Initial RAI-MDS 2.0	.003	[.000, .006]	.138	1.703	.090

Note. N = 268. The dependent variable (constant) in this analysis was the log odds proportion of potentially inappropriate antipsychotic (PIA) use. B = unstandardized beta coefficient; CI = confidence interval; β = standardized beta coefficient; *p* = p-value/significance; p = proportion; RAI-MDS 2.0 = Resident Assessment Instrument-Minimum Data Set 2.0; TR attendance = therapeutic recreation attendance; ABS = Aggressive Behaviour Scale; NIQ = Neighbourhood Income Quintile; CPS = Cognitive Performance Scale; ISE = Index of Social Engagement.

Table 17

Ordinal Regression Model to Predict Potentially Inappropriate Antipsychotic Use, Categorical Dependent Variable

		Estimate	*SE*	Wald	df	*p*
Threshold	PIA use, 1st quartile	-1.957	1.472	1.767	1	.184
	PIA use, 2nd quartile	-.584	1.468	.158	1	.691
	PIA use, 3rd quartile	.755	1.469	.264	1	.607
Location	TR attendance (p)	1.246	.612	4.143	1	.042
	ABS	.034	.200	.029	1	.866
	Dementia (p)	-.653	1.558	.176	1	.675
	Province	.883	.442	3.991	1	.046
	Medium size	-1.560	.894	3.041	1	.081
	Large size	-1.529	.940	2.646	1	.104
	Urban/rural	.396	.346	1.309	1	.253
	NIQ	.034	.094	.134	1	.715
	CPS	-.159	.347	.210	1	.647
	ISE	-.057	.187	.092	1	.761
	Depression (p)	-3.400	1.705	3.976	1	.046
	Antidepressants (p)	3.176	1.879	2.855	1	.091
	Analgesics (p)	-1.347	1.615	.695	1	.404
	Hypnotics (p)	3.370	3.203	1.107	1	.293
	Anxiolytics (p)	7.189	3.274	4.822	1	.028
	Initial RAI-MDS 2.0	.004	.005	.761	1	.383

Note. N = 269. The dependent variable (threshold) in this analysis was the quartiles of the proportion of potentially inappropriate antipsychotic (PIA) use. The fourth quartile was used as the reference group in this analysis. SE = standard error; Wald = Wald chi-square test; df = degrees of freedom; *p* = p-value/significance; p = proportion; RAI-MDS 2.0 = Resident Assessment Instrument-Minimum Data Set 2.0; TR attendance = therapeutic recreation attendance; ABS = Aggressive Behaviour Scale; NIQ = Neighbourhood Income Quintile; CPS = Cognitive Performance Scale; ISE = Index of Social Engagement.

Appendix E: Bivariate Matrix and Correlations

Although the bivariate matrix indicated several significant correlations within this analysis, only those related to the LOP of PIA use, the LOP of TR attendance, ABS scores and the LOP of dementia are reviewed below as these variables were pertinent to this studies research questions.

Potentially inappropriate antipsychotic use. The LOP of PIA use in LTC homes was shown to have: (a) a weak, positive correlation with the LOP of TR attendance, small home size and the LOP of anxiolytic use; and (b) a weak negative correlation with large sized homes.

Therapeutic recreation attendance. The LOP of TR attendance in LTC homes was shown to have: (a) a moderate, positive correlation with urban/rural status (rural = 1), the LOP of depression, and the LOP of analgesic and hypnotic use; (b) a weak, positive correlation with the LOP of PIA use, the LOP of dementia, small and medium sized homes, and the LOP of anxiolytic and antidepressant use; and (c) a moderate, negative correlation with large sized homes and province (ON =1).

Aggressive Behaviour Scale. Mean ABS scores in LTC were shown to have: (a) a moderate, positive correlation with mean CPS scores; and (b) a weak, positive correlation with the LOP of dementia, urban/rural status, the LOP of depression, and the LOP of antidepressant, hypnotic and anxiolytic use.

Dementia. The LOP of dementia in LTC was shown to have: a moderate, positive correlation with CPS scores and the LOP of depression, antidepressant and analgesic use; (b) a weak, positive correlation with the LOP of TR attendance and mean ABS scores; and (c) a weak, negative correlation with small home size and mean ISE scores.

Table 18

Bivariate Correlation Matrix for All Variables of Interest in the Main Linear Regression Analysis, Total Sample; 2018-2019

Variable		PIA use	TR attendance	ABS score	Dementia	Province	Small homes	Medium homes	Large homes
PIA use (p)	Pearson's *r*	1	.143*	.055	-.023	-.072	.209**	.004	-.140*
TR attendance (p)	Pearson's *r*	.143*	1	.041	.162**	-.600**	.297**	.197**	-.392**
ABS score	Pearson's *r*	.055	.041	1	.235**	-.077	.068	-.036	-.011
Dementia (p)	Pearson's *r*	-.023	.162**	.235**	1	-.094	-.138*	.097	-.004
Province	Pearson's *r*	-.072	-.600**	-.077	-.094	1	-.309**	-.124*	.331**
Small homes	Pearson's *r*	.209**	.297**	.068	-.138*	-.309**	1	-.316**	-.369**
Medium homes	Pearson's *r*	.004	.197**	-.036	.097	-.124*	-.316**	1	-.766**
Large homes	Pearson's *r*	-.140*	-.392**	-.011	-.004	.331**	-.369**	-.766**	1
Urban/rural	Pearson's *r*	.090	.337**	.154**	-.023	-.330**	.427**	.243**	-.528**
NIQ	Pearson's *r*	.051	-.055	-.022	.040	.072	.037	.033	-.057
CPS	Pearson's *r*	.039	-.056	.375**	.493**	.088	-.049	-.044	.076
ISE	Pearson's *r*	-.048	.031	-.101	-.163**	.081	.019	-.027	.014
Depression (p)	Pearson's *r*	-.064	.348**	.196**	.338**	-.338**	.167**	.122*	-.232**
Antidepressants (p)	Pearson's *r*	.007	.232**	.145*	.430**	-.153**	-.024	.185**	-.165**
Analgesics (p)	Pearson's *r*	-.021	.373**	.052	.371**	-.380**	.070	.176**	-.219**
Hypnotics (p)	Pearson's *r*	.093	.526**	.128*	.022	-.771**	.303**	.163**	-.354**
Anxiolytics (p)	Pearson's *r*	.120*	.154**	.130*	.113	-.219**	.142*	.111	-.200**

Note. PIA = potentially inappropriate antipsychotic use; TR attendance = therapeutic recreation attendance; ABS = Aggressive Behaviour Scale; NIQ = Neighbourhood Income Quintile; CPS = Cognitive Performance Scale; ISE = Index of Social Engagement; p = proportion.
* $p < 0.05$ (2-tailed); ** $p < 0.01$ level (2-tailed).

Table 18 (Continued)

Variable		Urban/rural	NIQ	CPS	ISE	Depression	Antidepressants	Analgesics	Hypnotics	Anxiolytics
PIA use (p)	Pearson's *r*	.090	.051	.039	-.048	-.064	.007	-.021	.093	.120*
TR attendance (p)	Pearson's *r*	.337**	-.055	-.056	.031	.348**	.232**	.373**	.526**	.154**
ABS score	Pearson's *r*	.154**	-.022	.375**	-.101	.196**	.145*	.052	.128*	.130*
Dementia (p)	Pearson's *r*	-.023	.040	.493**	-.163**	.338**	.430**	.371**	.022	.113
Province	Pearson's *r*	-.330**	.072	.088	.081	-.338**	-.153**	-.380**	-.771**	-.219**
Small homes	Pearson's *r*	.427**	.037	-.049	.019	.167**	-.024	.070	.303**	.142*
Medium homes	Pearson's *r*	.243**	.033	-.044	-.027	.122*	.185**	.176**	.163**	.111
Large homes	Pearson's *r*	-.528**	-.057	.076	.014	-.232**	-.165**	-.219**	-.354**	-.200**
Urban/rural	Pearson's *r*	1	.033	-.017	-.007	.227**	.053	.141*	.346**	.130*
NIQ	Pearson's *r*	.033	1	.010	.049	-.034	.066	.066	-.013	-.059
CPS	Pearson's *r*	-.017	.010	1	-.230**	.146*	.177**	.013	-.136*	.044
ISE	Pearson's *r*	-.007	.049	-.230**	1	-.019	.022	.030	-.068	-.030
Depression (p)	Pearson's *r*	.227**	-.034	.146*	-.019	1	.592**	.584**	.359**	.262**
Antidepressants (p)	Pearson's *r*	.053	.066	.177**	.022	.592**	1	.688**	.187**	.313**
Analgesics (p)	Pearson's *r*	.141*	.066	.013	.030	.584**	.688**	1	.418**	.212**
Hypnotics (p)	Pearson's *r*	.346**	-.013	-.136*	-.068	.359**	.187**	.418**	1	.364**
Anxiolytics (p)	Pearson's *r*	.130*	-.059	.044	-.030	.262**	.313**	.212**	.364**	1

Note. PIA = potentially inappropriate antipsychotic use; TR attendance = therapeutic recreation attendance; ABS = Aggressive Behaviour Scale; NIQ = Neighbourhood Income Quintile; CPS = Cognitive Performance Scale; ISE = Index of Social Engagement; p = proportion.
* $p < 0.05$ (2-tailed); ** $p < 0.01$ level (2-tailed).

Appendix F: Thesis Proposal Presentation Report

MOUNT SAINT VINCENT UNIVERSITY

Office of Graduate Studies
Thesis Proposal Presentation Report
(see Policy on reverse)

Student Name: J. Rowen McKenzie Student ID: September 3, 2019

Degree Program: M.A. of Family Studies and Gerontolgy

Thesis Title: Assessing Therapeutic Recreation Attendance and Potentially Inappropriate Antipsychotic Use in Long-Term Care

Date of Presentation: September 3, 2019

Outcome of Presentation:

- ☐ Proposal approved subject to minor revisions. [If the thesis is approved subject to minor revisions, the thesis supervisor will sign and forward the report once the revisions are completed.]
- ☐ Proposal approved subject to revisions. [If the thesis is approved subject to revisions, the thesis supervisor and committee members will sign and forward the report once the revisions are completed].
- ☑ Proposal approved
- ☐ Proposal not approved. Student required to resubmit the proposal for presentation. [Supervisor to submit report of reasons for decision and changes required attached to this form.]
- ☐ Proposal resubmission not approved – grade of "F" to be assigned and copied to the Registrar.

Ethics Clearance Required:

- ☑ Yes [The proposed research may not start until the student receives the Certificate of Ethics Clearance from the University Research Ethics Board. The Certificate will be required to be attached to the thesis defence notification form submitted to the Dean of Graduate Studies.]
- ☐ No

Signatures:

Thesis Supervisor:

Name		Date
Janice Keefe, PhD.	[Redacted]	September 3, 2019

Thesis Committee Members:

Name		Date
Zachary Zimmer, PhD.	[Redacted]	September 3, 2019
Susan Bowles, Pharm.D.	[Redacted]	September 3, 2019

Student:

Name		Date
Rowen McKenzie	[Redacted]	September 3, 2019

The completed form will be copied by the Thesis Supervisor to:
Dean of Graduate Studies - Student – Graduate Program Coordinator (to be placed in the student's file)
Grades of "F" will be copied to the Registrar.

Use this form effective 1 September 2018

Appendix G: Certificate of Research Ethics Clearance

MOUNT SAINT VINCENT UNIVERSITY

University Research Ethics Board (UREB)

Certificate of Research Ethics Clearance

☐	Clearance	☒	Secondary Data Clearance	☐	Renewal	☐	Modification	☐	Change to Study Personnel

Effective Date	November 13, 2019	**Expiry Date**	November 12, 2020

File #:	2019-088
Title of project:	Assessing therapeutic recreation attendance and potentially inappropriate antipsychotic use in long-term care
Researcher(s):	J Rowen McKenzie
Supervisor (if applicable):	Janice Keefe
Co-Investigators:	Zachary Zimmer
Version :	1

The University Research Ethics Board (UREB) has reviewed the above named research proposal and confirms that it respects the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* and Mount Saint Vincent University's policies, procedures and guidelines regarding the ethics of research involving human participants. This certificate of research ethics clearance is valid for a period of one year from the date of issue.

Researchers are reminded of the following requirements:	
Changes to Protocol	Any changes to approved protocol must be reviewed and approved by the UREB **prior** to their implementation. **Form: REB.FORM.002 Info: REB.SOP.113 Policy: REB.POL.003**
Changes to Research Personnel	Any changes to approved persons with access to research data must be reported to the UREB immediately. **Form: REB.FORM.002 Info: REB.SOP.113 Policy: REB.POL.003**
Annual Renewal	Annual renewals are contingent upon an annual report submitted to the UREB **prior** to the expiry date as listed above. You may renew up to four times, at which point the file must be closed and a new application submitted for review. **Form: REB.FORM.003 Info: REB.SOP.116 Policy: REB.POL.003**
Final Report	A final report is due on or before the expiry date. **Form: REB.FORM.004 Info: REB.SOP.116 Policy: REB.POL.003**
Privacy Breach	Researchers must inform the UREB immediately and submit the Privacy Breach form. The breach will be investigated by the REB and the FOIPOP Officer. **Form: REB.FORM.015**
Unanticipated Research Event	Researchers must inform the UREB immediately and submit a report to the UREB within seven (7) working days of the event. **Form: REB.FORM.008 Info: REB.SOP.115 Policy: REB.POL.003**
Adverse Research Event	Researchers must inform the UREB immediately and submit a report to the UREB within two (2) working days of the event. **Form: REB.FORM.007 Info: REB.SOP.114 Policy: REB.POL.003**

*For more information: http://www.msvu.ca/ethics

Dr. Daniel Séguin, Chair
University Research Ethics Board

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