



Profile of Residents with Mental Disorders in Canadian Long-Term Care Facilities: A Cross-Sectional Study

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Brief Summary: Residents in long-term care facilities in Canada with mental and cognitive disorders have complex care needs. To meet these needs an integrated model of care is recommended.

Context: The high prevalence of mental disorders in residents of long-term care (LTC) facilities raises serious concerns for facility operators and staff. These residents have multiple vulnerabilities that facility staff should have the necessary knowledge and skills to properly meet their needs.

Objectives: To describe the profile of residents with mental disorders (MD) and Alzheimer’s Disease and Related Dementias (ADRD) in Canadian long-term care (LTC) facilities.

Findings: Seventy-six percent of residents had MD (40%) and ADRD (36%). These residents compared to those without such disorders were more likely to be cognitively impaired, manifest aggressive behavior, receive psychotropic drugs, and physically restrained, and less likely to be socially engaged.

Strengths and Limitations: The large representative sample was a key strength. The findings add to the knowledge about the profile of LTC residents. The cross-sectional design of the study limits the findings to the population studied.

Implications: Residents with MD and ADRD compared to those without such disorders are highly vulnerable because of their double burden of mental and physical comorbidities. Their profile may be of interest to LTC facility operators, clinicians, and policy makers about their complex care needs. Our findings raise awareness of the need for trained LTC facility staff for knowledge and skills in psychogeriatric conditions to assess, plan, and implement appropriate interventions for these residents. Coordinated and integrated models of care with access to psychogeriatric specialists such as psychiatrists or advanced practice nurses will also be of benefit to them.

Keywords: long-term care facilities; interRAI; mental disorders; Alzheimer’s Disease and Related Dementias; care models

Introduction

The high prevalence of mental disorders in residents of long-term care (LTC) facilities raises serious concerns for facility operators and staff. A quarter of admissions to LTC facilities have mental health diagnoses such as depression, anxiety disorders, schizophrenia, and bipolar disorder (Grabowski *et al.*, 2009; Rahman *et al.*, 2013). A systematic review of 30 studies showed that dementia, depression, and anxiety disorders were the most common diagnoses in LTC facilities (Seitz *et al.*, 2010). However, estimates of the prevalence of LTC facility residents’ mental disorders may vary due to study design, source of data, variation in definitions of LTC facilities, diagnostic criteria used, and the time period in which the research was conducted (Bagchi *et al.*, 2009). Residents with mental and cognitive disorders live with the dual burden of their mental disorder and physical comorbidities (Benjenk *et al.*, 2019).

While the prevalence of mental and cognitive disorders in LTC facility residents is very high, LTC facility staff often do not have the requisite knowledge or skills to respond to the unique needs of these residents (Grabowski *et al.*, 2010; Koekkoek *et al.*, 2016). Previous research suggests that nursing staff lack specialized training in psychogeriatrics to enable them to provide resident-centered care (Blair *et al.*, 2012). This issue is further compounded by the lack of appropriate access to specialized mental health services available to them resulting in poor or inappropriate care to residents with mental disorders (Grabowski *et al.*, 2010). While nursing staff are of the view that geropsychiatric consultations would benefit residents with mental disorders, such consultations are typically not available (Wilson *et al.*, 2019). The most common reported intervention for mental disorders in LTC facilities is the use of antipsychotic drugs (Foebel *et al.*, 2016). A retrospective study in LTC facilities in Canada reported that the prevalence of antipsychotic use in residents with dementia was 48% (Rios *et al.*, 2017). Others also have reported excessive use of antipsychotics in these settings (Barnett *et al.*, 2011; Heckman *et al.*, 2017; Snowdon *et al.*, 2011). Further, it

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has also been shown that some residents without qualifying diagnoses of mental disorders have received antipsychotic medications (Foebel *et al.*, 2015; Phillips *et al.*, 2018). It is now generally recognized that inappropriate antipsychotic use can increase risks to the health and well-being of LTC residents (Berry *et al.*, 2016; Chatterjee *et al.*, 2012; Chiu *et al.*, 2015; Fraser *et al.*, 2015). Hence, several Canadian initiatives are underway to reduce this type of inappropriate prescribing in Canada (Hirdes *et al.*, 2020).

Despite the high prevalence of mental disorders and dementia in residents in LTC facilities, current evidence of their distinctive health status, clinical outcomes and health service utilization of these residents is lacking. A comprehensive description of the unique characteristics of these residents will enable LTC program providers and policy makers to design appropriate care models that will meet the specific needs of this population. Therefore, the purpose of this study was to develop a current understanding of the characteristics of LTC facility residents in Canada with mental and cognitive disorders and to identify implications for practice, policy, and research.

For the purpose of this study, mental disorders (MD) included those listed in **Table 1** such as schizophrenia, depression, bipolar disorder, and anxiety disorders as recorded by clinicians in the RAI-MDS 2.0 (Resident Assessment Instrument – Minimum Data Set) assessment or documented as ICD 10 codes. Alzheimer's Disease and Related Dementias (ADRD) were recorded by clinicians in the RAI-MDS assessment.

Method

Design

This was a retrospective, cross-sectional study of Canadian LTC facility residents using the Resident Assessment Instrument – Minimum Data Set (RAI-MDS) 2.0. Sociode-

mographic, functional, clinical, and health resource use data were extracted from the RAI-MDS 2.0. The profile of residents with mental disorders and those with ADRD were compared with residents without MD or ADRD (the comparison group).

Source of Data

The source of the data for this study was from the RAI-MDS assessment form ('the Form'), which captures comprehensive clinical information about persons receiving health and social services in LTC facilities settings (Morris *et al.*, 2012). The RAI-MDS is typically completed by registered nurses who are trained to complete the assessment using their clinical judgement after considering multiple sources of information including direct communication with the person and primary caregiver/family member (if available), observation of the person, and review of charts and other secondary documents available, and feedback from other staff members, including personal support workers (Morris *et al.*, 2012).

The RAI-MDS 2.0 assessment includes several outcome scales that measure performance in specific functions such as cognition, depression, and activities of daily living. These scales include the Cognitive Performance Scale (Morris *et al.*, 1994); the Depression Rating Scale (Burrows *et al.*, 2000); the Activities of Daily Living Hierarchy (ADLH) Scale (Morris *et al.*, 1999); the Aggressive Behaviour Scale (Perlman and Hirdes, 2008); the Pain Scale (Fries *et al.*, 2001); the Changes in Health, End Stage Disease and Signs and Symptoms (CHESS) Scale (Hirdes *et al.*, 2003); and the Index of Social Engagement (Mor and Branco, 1995). Detailed descriptions of these scales are provided elsewhere (Dalby *et al.*, 2009; Kehyayan *et al.*, 2015). The interRAI assessment instruments and their embedded scales have been shown to have strong evidence of

Table 1: Diagnoses of Mental Disorders and Alzheimer's Disease and Related Disorders and their Sources.

Mental Disorders and Alzheimer's Disease and Related Disorders	
Sources (Minimum Data Set 2.0 Canadian Version, 2012)	
Delusions	Checkbox (j1e)
Hallucinations	Checkbox (j1i)
Schizophrenia	Checkbox (i1ii)
Bipolar Disorder	Checkbox (i1hh)
Depression	Checkbox (i1gg)
Anxiety Disorder	Checkbox (i1ff)
Alzheimer's Disease	Checkbox (ir1)
Dementia other than Alzheimer's Disease	Checkbox (iv1)
ICD-10-CA Codes – Version 2016 (F00–F99)	
Mental disorders not otherwise specified	
Schizophrenic disorders	
Episodic mood disorders, including episodic affective disorders	
Delusional disorders including paranoid disorders	
Depressive disorders	
Neurotic disorders	

both reliability and validity (Hirdes *et al.*, 2008; Poss *et al.*, 2008).

Study Population

The study population came from 1,319 LTC facilities in eight of the ten Canadian provinces and one territory where the RAI-MDS 2.0 instrument is used. The completion of the RAI-MDS is mandatory and has been so in these geographical areas with different starting dates (Hirdes and Kehyayan, 2014; Hirdes *et al.*, 2011). **Table 2** shows the distribution of the number of unique LTC facility residents across the provinces and one territory in the study sample of 514,208 unique individuals spanning a 16-year period. This is compared with 2018–19 national reports of the number of unique individuals assessed with the RAI-MDS 2.0 in long-term care prepared by the Canadian Institute for Health Information (Canadian Institute for Health Information, 2020, CIHI). The distribution of the study sample closely matched that of the 2018–19 report by CIHI, with only an absolute 3.1% difference in over-representation of Ontario relative to other provinces in the study sample. Residents' most recent assessments were chosen for the following reasons:

- i. To maximize the sample size by retaining all persons who had serious mental illness (SMI) in the sample. For rare populations, cross-sectional samples at one point in time will result in small number. The intent was to boost the sample size for the SMI group.
- ii. To make observations closest to current practice.
- iii. To avoid having multiple observations per resident if all assessments in a year were included.

The overall aim was to have a near-level census data on the study population (Turcotte *et al.*, 2018). This approach has been used elsewhere in research on a variety of neurological conditions among long term care home residents and home care clients in the community (see, for example,

(Bansal *et al.*, 2016; Colantonio *et al.*, 2015; Danila *et al.*, 2014; Foebel *et al.*, 2011; Foebel *et al.*, 2015; Kehyayan and Hirdes, 2018; Turcotte *et al.*, 2018; Vu *et al.*, 2014). Alternative approaches including selecting of the first assessment in time or assessments centred around a specific time period were considered but were not used for the reasons noted above and because the study sample corresponded closely to the single year provincial/territorial distributions noted in **Table 2**. All residents who had any of the mental disorder diagnoses or dementia listed in **Table 2** were included. Validity of the diagnostic information in interRAI assessment instruments has been reported elsewhere (Foebel *et al.*, 2013; Gambassi *et al.*, 1998).

The comparison group used in this study included residents in these same facilities without any of the mental disorders listed in **Table 1** or dementia. Case ascertainment of mental disorders, Alzheimer's Disease, or Dementias other than Alzheimer's Disease was based on documented text in the diagnostic section of the RAI-MDS 2.0 Form. To obtain accurate diagnostic data from the free text entry fields in the RAI-MDS 2.0 Form an iterative process was used in consultation with clinical and/or epidemiological expertise. Following such consultations, a clinician-approved list of terms was prepared, and the database was searched to identify residents with the diagnoses listed in **Table 1**. Another source of the diagnostic information was the ICD-10-CA Codes (Version 2016; F00–F99) that clinicians recorded in the RAI-MDS 2.0 Form. Diagnostic information in interRAI assessment instruments has been demonstrated to have high specificity (range 0.80–1.00) (Foebel *et al.*, 2013).

Analysis

Descriptive analyses were conducted to describe the profiles of the study population. Chi-square tests of significance were calculated to compare the frequency and percentage distributions between residents with mental disorders and ADRD and the comparison group. All vari-

Table 2: Sources of RAI-MDS 2.0 Data in Long-term Care Facilities from Participating Canadian Provinces from March 1, 2002 to March 31, 2018 Compared with National Distributions Reported by Canadian Institute for Health Information 2018–19.

Province/Territory	Study Sample (2002–2018)		Continuing Care Reporting System (2018–2019)	
	Number of Individuals	%	Number of Individuals	%
Alberta	55,671	10.8	22,095	11.5
British Columbia	96,433	18.8	36,829	19.2
Manitoba	21,330	4.2	7,632	4.0
New Brunswick	462	0.1	–	–
Newfoundland	7,471	1.5	3,733	1.9
Nova Scotia	2,592	0.5	–	–
Ontario	310,891	60.5	110,161	57.4
Saskatchewan	18,783	3.7	11,069	5.8
Yukon	575	0.1	316	0.2
Total	514,208	100	191,835	100

ables were compared between the three groups using the Chi-square test. Moreover, Chi-square tests were used for pairwise comparisons adjusting for multiple testing using the Bonferroni method. All comparisons described in this paper are significant at the $p < 0.0001$ level with exceptions noted in the tables. The SAS version 9.4, SAS Institute Inc., Cary, North Carolina, was used for all data analyses (<http://www.sas.com/>).

Ethics Approval

Data were obtained through an existing license agreement between interRAI and the Canadian Institute for Health Information. Ethics approval for this project was

received from the Office of Research Ethics, University of Waterloo (ORE#30372).

Results

All comparisons described in this section are between MD and ADRP groups with the comparison group. The pairwise comparisons in **Tables 3, 4** and **5** are noted by the letters a, b, and c with different letters signifying significant differences between the groups.

Table 3 provides the basic sociodemographic and functional profile of the study population. From the LTC population of 514,208 residents with completed RAI-MDS assessments, 203,256 (39.5%) had mental

Table 3: Demographic, Social and Functional Profile of Residents with Mental Disorders, Alzheimer's Disease and Related Dementias and the Comparison Group.

N	CG	ADRD	MD	p-values
	127,326	183,626	203,256	
Female	61.3 ^a	62.9 ^b	68.6 ^c	<.0001
Age Group				
0–44	1.1 ^a	0.1 ^b	0.4 ^c	<.0001
45–54	1.9 ^a	0.2 ^b	1.2 ^c	<.0001
55–64	5.0 ^a	1.1 ^b	4.3 ^c	<.0001
65–74	10.5 ^a	5.2 ^b	10.7 ^a	<.0001
75–84	25.0 ^a	25.7 ^b	27.9 ^c	<.0001
85+	56.4 ^a	67.8 ^b	55.6 ^c	<.0001
Married				
Male	21.4 ^a	22.7 ^b	17.6 ^c	<.0001
Female	8.5 ^a	7.3 ^b	6.8 ^c	<.0001
Overall	13.5 ^a	13.0 ^b	10.2 ^c	<.0001
Conflict with others	8.7 ^a	8.9 ^a	13.9 ^b	<.0001
Absence of personal contact with family or friends	2.5 ^a	3.5 ^b	5.0 ^c	<.0001
Index of Social Engagement				
0 (lowest level of social engagement)	10.6 ^a	22.7 ^b	18.5 ^c	<.0001
1	14.4 ^a	19.8 ^b	18.0 ^c	<.0001
2	15.8 ^a	19.3 ^b	18.6 ^c	<.0001
3	18.5 ^a	17.2 ^b	18.0 ^c	<.0001
4	17.6 ^a	10.9 ^b	13.3 ^c	<.0001
5	11.5 ^a	5.8 ^b	7.6 ^c	<.0001
6 (highest level of social engagement)	11.7 ^a	4.3 ^b	6.1 ^c	<.0001
ADL Hierarchy Scale				
0 (Independent)	5.5 ^a	1.9 ^b	2.8 ^c	<.0001
1–2 (Supervision required-limited impairment)	16.9 ^a	10.3 ^b	10.7 ^c	<.0001
3+ (Extensive assistance – total dependence)	77.6 ^a	87.9 ^b	86.5 ^c	<.0001

^{a,b,c} Groups with different letters are significantly different and those with common letter are not.

Codes: CG = Comparison Group; ADRD = Alzheimer's Disease and Related Dementia; MD = Mental Disorder; ADL = Activities of Daily Living.

disorders, 183,626 (35.7%) had ADRD, and 127,326 residents (24.8%) comprised the comparison group of persons without ADRD or other mental disorders.

Sociodemographic, social and functional characteristics

Residents with mental disorders (MD) and ADRD were more than likely to be female than those in the comparison group. They were least likely to be married, more likely

to be in-conflict-with others, more than likely to have no personal contact with family or friends, and less likely to have a high level of social engagement compared to the comparison group. Finally, regarding functional independence, residents with MD and ADRD were more likely to require extensive assistance or be totally dependent in activities of daily living (ADL Hierarchy scores of 3+) than the comparison group.

Table 4: Mental Health Performance of Residents with Mental Disorders, Alzheimer’s Disease and Related Dementias and the Comparison Group.

N	CD	ADRD	MD	p-values
	127,326	183,626	203,256	
Cognitive Performance Scale				
0 (Intact)	26.9 ^a	1.5 ^b	7.9 ^c	<.0001
1–2 (Borderline intact-mild impairment)	34.8 ^a	14.1 ^b	20.9 ^c	<.0001
3–4 (Moderate-moderate severe impairment)	26.4 ^a	43.7 ^b	41.6 ^c	<.0001
5–6 (Severe-very severe impairment)	12.0 ^a	40.7 ^b	29.6 ^c	<.0001
Depression Rating Scale				
0 (Not depressed)	51.0 ^a	40.5 ^b	30.4 ^c	<.0001
1–2 (Some depressive symptoms)	27.4 ^a	33.5 ^b	31.3 ^c	<.0001
3+ (Potential minor -major depressive episode)	21.7 ^a	26.0 ^b	38.3 ^c	<.0001
Aggressive Behaviour Scale				
0 (Not aggressive)	75.5 ^a	50.2 ^b	50.4 ^b	<.0001
1–2 (Mild severity)	15.1 ^a	23.8 ^b	23.4 ^c	<.0001
3–4 (Moderate)	6.3 ^a	15.0 ^b	14.4 ^c	<.0001
5+ (Severe)	3.1 ^a	11.1 ^b	11.7 ^c	<.0001
Psychotropic Drug Use				
Antipsychotics	10.8 ^a	28.1 ^b	37.0 ^c	<.0001
Antidepressants	30.1 ^a	36.7 ^b	69.6 ^c	<.0001
Anxiolytics	11.2 ^a	9.3 ^b	18.7 ^c	<.0001
Sedatives	11.1 ^a	7.8 ^b	11.6 ^c	<.0001
Physical Restraints				
0 (Not used)	93.5 ^a	85.3 ^b	87.9 ^c	<.0001
1 (Used less than daily)	5.7 ^a	13.5 ^b	11.1 ^c	<.0001
2 (Used daily)	0.8 ^a	1.3 ^b	1.1 ^c	<.0001
Activities				
More than 2/3 of time	17.6 ^a	11.4 ^b	12.7 ^c	<.0001
From 1/3 to 2/3 of time	43.4 ^a	42.3 ^b	42.7 ^c	<.0001
Less than 1/3 of time	31.3 ^a	37.6 ^b	36.1 ^c	<.0001
None	7.8 ^a	8.7 ^b	8.5 ^b	<.0001
Wake Times				
Awake morning	77.3 ^a	73.7 ^b	73.1 ^c	<.0001
Awake afternoon	54.8 ^a	50.2 ^b	52.5 ^c	<.0001
Awake evening	72.4 ^a	66.8 ^b	67.8 ^c	<.0001

^{a,b,c} Groups with different letter are significantly different and those with common letter are not.

Codes: CG = Comparison Group; ADRD = Alzheimer’s Disease and Related Dementia; MD = Mental Disorder.

Table 5: Health and Health Resource Utilization of Residents with Mental Disorders, Alzheimer's Disease and Related Dementias and the Comparison Group.

N	CD	ADR	MD	p-values
	127,326	183,626	203,256	
Diagnosis				
Heart Failure	20.2 ^a	13.6 ^b	15.4 ^c	<.0001
Emphysema/COPD	18.0 ^a	13.6 ^b	18.9 ^c	<.0001
Diabetes	28.1 ^a	22.9 ^b	26.1 ^c	<.0001
Cancer	12.7 ^a	9.8 ^b	10.5 ^c	<.0001
Other CVD	64.7 ^a	63.1 ^b	65.6 ^c	<.0001
CHESS Scale				
0 (Not at all unstable)	35.2 ^a	31.4 ^b	28.6 ^c	<.0001
1–2 (Little – some instability)	48.2 ^a	49.4 ^b	49.3 ^b	<.0001
3+ (Moderately – highly unstable)	16.5 ^a	19.2 ^b	22.1 ^c	<.0001
Pain Scale				
0 (No pain)	49.6 ^a	64.2 ^b	54.4 ^c	<.0001
1 – 2 (Less than daily pain – daily pain not severe)	46.1 ^a	33.6 ^b	41.7 ^c	<.0001
3 and over (Daily severe pain)	4.3 ^a	2.2 ^b	4.0 ^c	<.0001
Emergency department visits				
None	79.2 ^a	86.1 ^b	84.8 ^c	<.0001
1	17.7 ^a	11.8 ^b	12.6 ^c	<.0001
2+	3.0 ^a	2.1 ^b	2.6 ^c	<.0001
Hospitalizations				
None	78.5 ^a	89.7 ^b	88.6 ^c	<.0001
1	19.2 ^a	9.1 ^b	9.9 ^c	<.0001
2+	2.3 ^a	1.1 ^b	1.5 ^c	<.0001
Any rehabilitation	56.7 ^a	50.7 ^b	52.7 ^c	<.0001
Willing to return to community	26.9 ^a	6.1 ^b	10.1 ^c	<.0001
Support person positive to discharge	24.0 ^a	3.0 ^b	5.9 ^c	<.0001
Skills training for returning to community	7.9 ^a	0.3 ^b	1.5 ^c	<.0001
Intervention programs	1.7 ^a	3.8 ^b	5.9 ^c	<.0001

^{a,b,c} Groups with different letter are significantly different and those with common letter are not.

Codes: CG = Comparison Group; ADRD = Alzheimer's Disease and Related Dementia; MD = Mental Disorder; CHESS = Changes in Health, End Stage Disease and Signs and Symptoms; COPD = Congestive Obstructive Pulmonary Disease; CVD = Cardiovascular Disease.

Mental health performance

Table 4 shows characteristics of residents' mental health as measured by various interRAI scales. It was more likely for residents with MD and ADRD to have moderate to very severe cognitive impairment (CPS scores of 3–6) than the comparison group. They were more than likely to have high levels of depressive symptoms (DRS score of 3+) than the comparison group. Of particular note, the rates of severe aggressive behavior were more than three times higher in the MD and ADRD groups compared with the comparison group. Not unexpectedly, they were also more than likely to have received antipsychotics and antidepressants than

the comparison group. However, they were also about twice as likely to be physically restrained than the comparison group (11.1% and 13.5% vs. 5.7%). Finally, residents with MD and ADRD were less likely to be involved in activities and somewhat more likely not to be awake during the day, afternoon, or evening than the comparison group.

Health and health service utilization

Table 5 shows the health and health service utilization profiles of the study population. Residents with MD and ADRD were less likely than the comparison group to have had heart failure. With regards to the CHESS scale, which

is a measure of health instability, residents with MD and ADRD were more likely to have moderate to high health instability (CHESS score of 3+) than either the ADRD or the comparison groups (22.1% and 19.4% vs. 16.5%). On the measurement of pain, those with MD and ADRD were less likely to have pain than the comparison group (54.5% and 64.16% vs. 49.62%).

In terms of emergency department use and hospitalization in the past 90 days, residents in both MD and ADRD groups were less likely to have used these health services compared to the comparison group. They also received less rehabilitation services and training in skills to return to the community than the comparison group. They were also less likely to be willing to return to the community and less likely to have a support person who was positive to the resident's discharge into the community. However, they were more than likely to have received intervention programs for mood, behaviors, or cognition than the comparison group.

Discussion

This study described the sociodemographic, clinical, and functional characteristics and health service utilization of LTC facility residents with diagnoses of MD and ADRD. Data for this study came from the RAI-MDS 2.0 database that provided standardized, comprehensive clinical and functional profiles for the study's population. Our data showed that these residents are highly vulnerable because of their double burden of mental and physical comorbidities compared to the comparison group.

Consistent with other studies and national surveys (Ahn and Horgas, 2013), the majority (76%) of residents were diagnosed with MD (40%) or ADRD (36%). In that sense, mental health should be considered as a major focus for LTC rather than an afterthought. Residents with such diagnoses in LTC facilities can be characterized as vulnerable populations due to multiple deficits in their socialization skills, functioning, mental capacities and behaviors, and in their health resource needs. These residents often had the same or higher level of physical comorbidities as the comparison group making them more complex in their health care needs.

A majority of the residents with MD and ADRD have moderate to severe cognitive impairments that may contribute to their low quality of life (Abrahamson *et al.*, 2012). Their cognitive impairment may also contribute to their dependence in ADL. This is consistent with other studies that showed an association between mental capacities and functional dependence (Durant *et al.*, 2016; Millan-Calenti *et al.*, 2012). Residents' cognitive impairment may also be a factor in their low level of social engagement and inability to enter into meaningful relationships with others. Good social connection has been associated with good mental health outcomes in LTC residents (Bethell *et al.*, 2021). Meaningful social engagements are essential as they are associated with quality of life in LTC facility residents (Kehyayan *et al.*, 2015; Morris *et al.*, 2018).

Consistent with other research, residents with MD and ADRD also exhibited higher rates of aggressive or other behavioral disturbances (Hirdes *et al.*, 2020). Several

factors have been identified for such behaviors, including resident's physical and psychological characteristics and facilities' structural (e.g., organizational culture) and social (e.g., resident mix) characteristics (Foebel *et al.*, 2015; Heckman *et al.*, 2017; Hirdes *et al.*, 2020; Thériault and Grant, 2020). The under-detection and under-management of pain in these residents because of their cognitive impairment may also have contributed to their disruptive behaviors (Ahn and Horgas, 2013; Miu and Chan, 2014; Tosato *et al.*, 2012). A large proportion of the participants in our study had not reported pain or had reported less than daily pain. This may have been due to several factors, including their cognitive impairment and possibly their inability to express their pain (Husebo *et al.*, 2011; Proctor and Hirdes, 2001; Zyczkowska *et al.*, 2007). Unmanaged pain may result in poor quality of care and quality of life in residents (International Association for the Study of Pain [IASP], 2018) and may increase their dependence in ADL (Lapane *et al.*, 2012).

Residents with MD and ADRD were more than likely to have received antipsychotics and antidepressants than the comparison group. While our primary interest was in residents with MD and ADRD, it is worth noting that a large proportion of those in the comparison group without a qualifying mental disorder diagnosis also received psychotropic drugs. This is consistent with findings from other studies where residents without mental disorders were receiving antipsychotic drugs (Phillips *et al.*, 2018). The adoption of non-pharmacological, psychosocial interventions for the treatment of behavioral problems may lead to reduction in the use of psychotropic medications (Hirdes *et al.*, 2020; Hirdes *et al.*, 2019; Seitz *et al.*, 2010). The participants in our study with MD and ADRD were also twice as likely to have been physically restrained. Other studies have also shown the high prevalence of restraint use in such residents (Kuronen *et al.*, 2017). Physical restraints have been shown to cause negative consequences in residents such as higher risk of cognitive and functional decline (Foebel *et al.*, 2016). The use of psychotropic drugs may have contributed to the residents being unawake for most of the day and their poor activity levels. They may also pose fracture risks in these residents (Rigler *et al.*, 2013). The use of psychotropic drugs and physical restraints may also have contributed to residents' low social engagement, being less likely to have received any rehabilitation (i.e., physical, occupational, psychological or recreational therapies), or skills training in ADL or IADL for returning to the community. The inappropriate use of antipsychotics and restraints are inconsistent with person-centered care and quality improvement (Feng *et al.*, 2009). The Institute of Medicine has recommended the adoption and implementation of patient-centered care models to promote interprofessional collaboration and integration of care to better achieve patient outcomes (Institute of Medicine, 2011). The Institute deems patient-centered care as a critical competence in all healthcare professionals.

Residents in the MD and ADRD groups had lower rates of hospitalization and emergency department use than the comparison group. It is not clear from the available

data if they needed such services; however, the diagnostic data suggest that they had similar physical comorbidities as the comparison group. Avoidance of unnecessary hospitalization or emergency department visits of residents would be an important priority for LTC facilities because of associated iatrogenic outcomes (Ouslander and Berenson, 2011). Still, it would be surprising if having MD or ADRD would be a basis for differentials in care requirements. Future studies may explore this phenomenon.

Implications to Practice and Policy

The findings of this study will be of interest to LTC facility operators, clinicians, and health care policy makers about the complex needs of residents with MD and ADRD.

Perlman *et al.* (2019) reported that access to psychiatric services for LTC facility residents is limited and they have recommended better distribution of such services including use of telepsychiatry option (see also Hsu *et al.*, 2010). Other alternatives for the delivery of psychiatric services may be provided by visiting or on-call psychiatrists or clinical nurse specialists who are trained in psychogeriatrics, to assess, plan and implement appropriate interventions for residents with mental and cognitive disorders (Bartels *et al.*, 2002; Koekkoek *et al.*, 2016).

Specialist mental health services should be available and accessible for consultative and collaborative, integrated care. Such models would support comprehensive and improved care of residents with MD and ADRD (Institute of Medicine, 2011; Morris, 2012). Nurse-led multidisciplinary psychiatric consultations in nursing homes have been shown to be effective in reducing the frequency and severity of residents' psychiatric symptoms such as agitation, aggression, depression, anxiety and disinhibition (Koekkoek *et al.*, 2016).

Others have suggested special training of LTC staff to ensure core competencies in mental health and aging, including understanding how to identify and respond to mental health conditions (Ahn and Horgas, 2013; Blair *et al.*, 2012; Moyle *et al.*, 2010; Muralidharan *et al.*, 2019). However, as simple as such a measure seems, it presents a challenge in LTC facilities because registered nurses (RN) make up a very small proportion of LTC facility staffing (Harrington *et al.*, 2020; Hirdes *et al.*, 2020) in contrast to personal support workers (PSW) or nursing assistants (NA) who make up the majority and who have the primary responsibility of providing direct care to residents on a daily basis (Boscart *et al.*, 2018; Harrington *et al.*, 2020). As PSWs and NAs have more and direct contact with residents, it is critical that targeted training be provided to them for the early recognition of mental health issues in residents.

Provision of medical services in LTC facilities presents a further challenge because of the limited availability of physicians to LTC. According to a survey of conducted by the American Medical Association, the majority of physicians (77%) reported that they did not devote time for treating residents in LTC facilities (Levy *et al.*, 2007). Most medical services in Canada are provided by visiting family practitioners or family physicians who require quality improvement efforts (Lam *et al.*, 2012). Customized training should be provided to increase their knowledge and

skills in the proper assessment, diagnosis, and management of residents' mental health problems.

Further suggestions to better meet the needs of this vulnerable population include the necessity for clinicians to integrate residents' mental and physical care needs (Attoe, 2018). Patient-centered care is one mechanism for the integration of care (Institute of Medicine, 2011). A clinical review has demonstrated that shared integrated care of older people with dementia and/or frailty leads to their humane and effective care (Morris, 2012).

In sum, our study showed that residents with MD and ADRD, compared to those without either one of these conditions, presented unique functional and clinical characteristics and health care resource use. To meet their complex care needs novel mechanisms for training clinical and support staff and the availability and accessibility of psychiatric and mental health services should be introduced.

Strengths and Limitations

This study had several strengths and limitations, which need to be highlighted. We consider the very large sample size (514, 208) and the number of facilities (1,319) involved across Canada (except for Quebec) is representative of the LTC population and constitute one of the key strengths of this study. The interRAI system of comprehensive assessment, with its embedded clinical scales, made it possible for the systematic and comprehensive evaluation of the study populations and their unique functional and health care needs. This study will add to the scientific knowledge arising from published interRAI data (Foebel *et al.*, 2016; Hirdes *et al.*, 2020; Hirdes *et al.*, 2013; Hirdes *et al.*, 2011; Kehyayan and Hirdes, 2018; Kehyayan *et al.*, 2016; Kehyayan *et al.*, 2014; Turcotte *et al.*, 2018).

The study also had a few limitations. First, this was a cross sectional study limiting the findings to the population studied. As well, its design makes it difficult to discern causal relationships because it is not possible to discern temporal order which longitudinal data may provide. Another limitation may be that while we were diligent in identifying distinct populations of residents with MD and ADRD, there may have been residents with both diagnoses. One final limitation is that we were unable to explain why certain drugs were prescribed for the residents because the reasons for prescription of medications are not documented in the RAI-MDS. Despite its limitations, however, the findings may allow the generation of ideas for future studies. For instance, studies may examine the reasons for prescribing medications particularly psychotropic drugs; another may examine temporal trends in some resident characteristics such as the use of anti-psychotics; others could explore the impact of access to formal mental health services on resident outcomes; and finally, a follow-up study could examine differences in residents' profiles between provinces/territory.

Conclusions

In summary, our study found that residents with MD and ADRD in LTC facilities have multiple vulnerabilities that facility operators and clinicians should be mindful. These

residents present challenges to staff because of the double burden of their physical and mental comorbidities. The findings of this study will be of interest to LTC facility operators, clinicians, and health care policy makers about the complex needs of residents with MD and ADRD. Novel mechanisms are needed to address the psychiatric and mental health needs of the LTC facility residents.

Competing Interests

The authors have no competing interests to declare.

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