No Place Like Home: A Systematic Review of Home Care for Older Adults in Canada

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RÉSUMÉ

Les prévisions liées au vieillissement de la population canadienne impliquent que la demande en soins à domicile augmentera significativement. À ce jour, peu d'études ont été menées au Canada sur les soins à domicile pour les personnes âgées, notamment sur les caractéristiques des bénéficiaires de soins à domicile, les lacunes dans les services, ou les interventions permettant de répondre aux besoins des clients en matière de soins à domicile. Une revue systématique de sept bases de données électroniques a été réalisée pour les années 2000-2016 afin d'examiner les connaissances actuelles dans le domaine des soins à domicile pour les personnes âgées au Canada. Cette synthèse était centrée sur quatre principaux thèmes retrouvés dans la littérature : les prédicteurs au niveau de la personne âgée, les besoins de soins non comblés, les interventions, les enjeux et les défis dans les soins à domicile. Cette revue a mis en évidence plusieurs lacunes dans les connaissances liées aux soins à domicile pour les personnes âgées au Canada, considérant que plus de la moitié des études étaient centrées sur le contexte ontarien. Bien que des stratégies prometteuses aient été mises en évidence, davantage de recherche et d'évaluation des interventions et des résultats sont requises pour appuyer efficacement le système de soins à domicile au Canada, à court et à long terme.

ABSTRACT

Given Canada's aging population, the demand for home care is expected to increase significantly. To date, little is known about home care for older adults in Canada such as characteristics of home care recipients, gaps in services, or interventions designed to support home care client needs. Consequently, we conducted a systematic review of seven electronic databases for the years 2000–2016 to examine the current knowledge of home care services for Canada's older adults. This synthesis examined four main themes in the literature: older adult client-level predictors; unmet care needs; interventions; and issues and challenges in home care. This review found significant knowledge gaps on home care for older adults across the country, as over half of the studies were focused primarily in Ontario. Although promising strategies were evident, more research and evaluation of interventions, and outcomes are required to effectively support Canada's home care system now and over time.

Introduction

With global population aging, there is a growing need for home-based care to address the health needs of older adults. It is estimated that there are nearly two million users of publicly funded home care services in Canada, with 70 per cent of the recipients age 65 years and older (Canadian Home Care Association, 2016; Government of Canada, 2016; Turcotte, 2014). Home care supports and services are designed to enable older adults to remain safely in their own homes for as long as they can, by providing support services such as nursing; rehabilitation; personal support services such as bathing, transferring, and repositioning; grooming assistance; and caregiver respite and support (Ayalon, Fialová, Areán, & Onder, 2010; Government of Canada, 2016).

Although Canadians consider home care to be an integral component of the health care system, it is not part of the so-called "Medicare core" (Marchildon, 2013) and is not subject to the national standards of the Canada Health Act (CHA). The core services, essentially those provided by physicians and hospitals, are subject to first dollar coverage under provincial health insurance schemes supported by provincial tax dollars and federal transfers. Thus, each province is left to decide and design how and to what extent it will provide home care services and how it will pay for them. Not surprisingly, a recent environmental scan showed considerable variability in service provisions and priorities (Johnson et al., 2017). Since 2007, Ontario, Manitoba, Quebec, and Prince Edward Island do not charge any direct fees for home care services (Mery, Wodchis, & Laporte, 2016). The other provinces have systems that determine a fee based on income testing.

Given the aging population, the demand for home care has been identified as a top challenge in Canada (Canadian Home Care Association, 2016). Older adults living with chronic conditions and disabilities have the greatest need for home care (Carpenter et al., 2004; Turcotte et al., 2015). Recently, a national study showed that approximately 40 per cent of those who were receiving home care had unmet needs related to mobility, fitness, and social activities (Turcotte, 2014). These and other challenges have resulted in urgent and repeated calls to strengthen home care in Canada (Canadian Home Care Association, 2016; Conference Board of Canada, 2015).

When asked how important home care is as a health policy priority, Canadians have tended to put it somewhere in the middle among general concerns such as "better access" or "more medical equipment". When asked specifically to rank home care against other policy options and priorities such as pharmacare or electronic health records, home care "was one of the foremost issues … [and] there is strong support for the development of further home care programs" (Siroka, 2007, p. 16).

In 2002, the federally appointed Commission on the Future of Health Care in Canada (CFHCC) acknowledged the growing significance of home care and recommended revisions to the Canada Health Act (CHA) to include home care as an entitlement (Romanow, 2002). Subsequent work by the Health Council of Canada/Conseil canadien de la sante (HCC/CCS) has reaffirmed the importance placed on integrating home care into the Canadian Medicare core (HCC/CCS, 2005; 2012). In the most recent health accord negotiations in Canada, home care was a priority in the discussions of the Canada Health Transfer payment program between the federal and provincial/territorial governments. In recognition of the growing importance of home care, the federal government committed to contributing $3 billion to home care over four years (Sibbald, 2015).

With the increasing demands and challenges, there is a growing call to evaluate the current home care system to identify cost-effective and innovative ways to improve processes and services offered. Although there have been reviews of research related to home-based care in Europe and the United States (Ayalon et al., 2010; Burton, Lewin, & Boldy, 2015; Genet et al., 2011; Rosenfeld & Russell, 2012), there has not been a systematic review of the research related to home care in Canada. Given Canada's aging population and the increasing need for home care services, such a review is timely to inform and support future home care policy, practice, and programs across the country.

Methods

This systematic review was conducted by a team of six experts in the fields of aging, public policy, and population health research with their involvement in different phases of the project. This combined effort followed the guidelines recommended by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) to ensure transparency and complete reporting (Moher, Liberati, Tetzlaff, & Altman, 2009). This systematic review focused on addressing the research question: "What is known from the existing literature on home care for older adults in Canada?"

We aimed to examine how the existing literature characterizes older adults, focusing on topics such as home care users, challenges and gaps in home care, and interventions used to support home care services for older adults.

Study Inclusion and Exclusion Criteria

The research parameters included records of any study about home care in Canada or part of Canada with the study population of older adults aged 65 years or older. The records included studies of any research designed and published in the English language between 2000 and 2016 that were scholarly and peer-reviewed. Focusing on the past 16 years helped to ensure that this synthesis included the most contemporary and up-to-date studies. The search excluded studies in the context of long-term care, nursing homes, or care provided in a hospital or in the community exclusively by family and/or friends (e.g., informal caregivers).

Search Strategy

In order to identify relevant studies, we searched seven electronic health science databases including MEDLINE, PubMed, Embase, CINAHL, Web of Science, Global Health, and Cochrane Library. We used health science databases for this review as home care is primarily identified as a health care issue. In addition, we hand-searched reference lists of relevant studies. We initially developed the search strategy for MEDLINE with the help of an academic librarian, guided by three components: a focus on home care; a target population of community-dwelling older adults; and the study location focused within Canada. The search criteria and databases were circulated to the team members for feedback prior to finalizing for use in this study. The search strategy developed for MEDLINE is shown in Table 1. We then adapted this strategy for use with six other databases. We conducted the final search in December 2016.

Data Extraction

We used RefWorks to store and organize all of the studies retrieved from the seven electronic databases. RefWorks let us conduct a systematic de-duplication to remove duplicate citations. Two independent reviewers screened for titles and abstracts. A full-text review for eligibility was then carried out by one author and results confirmed by another author. Uncertainties relating to the eligibility of studies were discussed between the two reviewers before they came to a conclusion. We hand-searched the reference lists of eligible studies to identify further studies which were added to the same pool. The RefWorks folder was shared among the reviewers to provide additional information on the data records. One of the authors carried out a methodological quality assessment of the quantitative studies with the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool and the accompanying dictionary (Effective Public Health Practice Project, 2009; National Collaborating Centre for Methods and Tools, 2016). After the initial identification of the study records, the two primary reviewers discussed the data extraction process for summarizing the studies. Data was collected on the study location, design, target population, and main study findings. For the quantitative studies, we also collected data to complete the methodological quality assessment scores such as selection bias, confounders, blinding, data collection, withdrawals/dropouts, and global rating. We then extracted the data onto a data extraction sheet, which was subsequently converted into the manuscript's tables before we developed the synthesis of the study's results. Following this step, one of the primary reviewers and an additional author of this article cross-checked and reviewed the data extraction sheets. The remaining team members reviewed and provided feedback to ensure clarity of the synthesis findings.

Results

The initial search of seven electronic databases resulted in a total of 1,814 records. This number was reduced to 1,153 once the duplicates were removed. A screening of the titles and abstracts identified 1,073 records that were not relevant and were consequently removed, leaving 80 records for full-text review. During this step, 30 records were excluded as they were not relevant to this review based on pre-set inclusion and exclusion criteria. The reasons for exclusion were because they were (a) not peer-reviewed studies (2 studies),

Table 1: Search strategy developed for MEDLINE

Concept	Keywords / Synonyms
Home care	(Home Care Services/ OR Community Health Services/ OR Home Health Nursing/ OR 'complex care'.mp. OR 'continuing care'.mp. OR Homebound Persons/) AND
Health promotion	(Health Promotion/ OR Exercise Therapy/ OR Physical Therapy Modalities/ OR Nutrition Therapy/ OR 'meal support*'.mp. OR Telemedicine/ OR 'functional capacity'.mp. OR 'physical function*'.mp. OR "Activities of Daily Living"/ OR Health Personnel/ed [Education]) AND
Population of interest	(Aged/ OR senior*/ OR "aged, 65 and over"/ OR geriatric*.mp. OR elderly.mp.) AND
Region	Canada/

Note. The slash symbol – / – denotes a Medical Subject Headings (MeSH) heading; .mp. denotes a multi-purpose keyword search.

(b) published before the pre-determined year of publication (11 studies), (c) not specifically about home care (5 studies), (d) not in full-text English (3 studies), (e) not focused on the Canadian context (2 studies), (f) focused on different study populations (4 studies), or (g) were study protocols (3 studies). At the conclusion of this step, 50 relevant studies remained. The results of this systematic review are shown in Figure 1.

Methodological Quality Assessment Results

Of the 50 reviewed studies, 36 underwent a methodological quality assessment using the EPHPP Quality Assessment Tool. Thirteen studies did not undergo this assessment process as they were qualitative in nature. One study was an evaluation of three other studies, thus was not subject to quality assessment. Of the studies that were assessed with respect to methodological quality, three (8.3%) were rated as "strong", 11 (30.6%) as "moderate", and 22 (61.1%) as "weak". Note that several studies did not address the issue of confounders and blinding of study participants or researchers. The information for the methodological quality assessment results of the individual studies is shown in Table 2.

Study Setting

Eighteen studies were published between 2013 and 2016; 14 studies, between 2008 and 2012, and 18 studies,
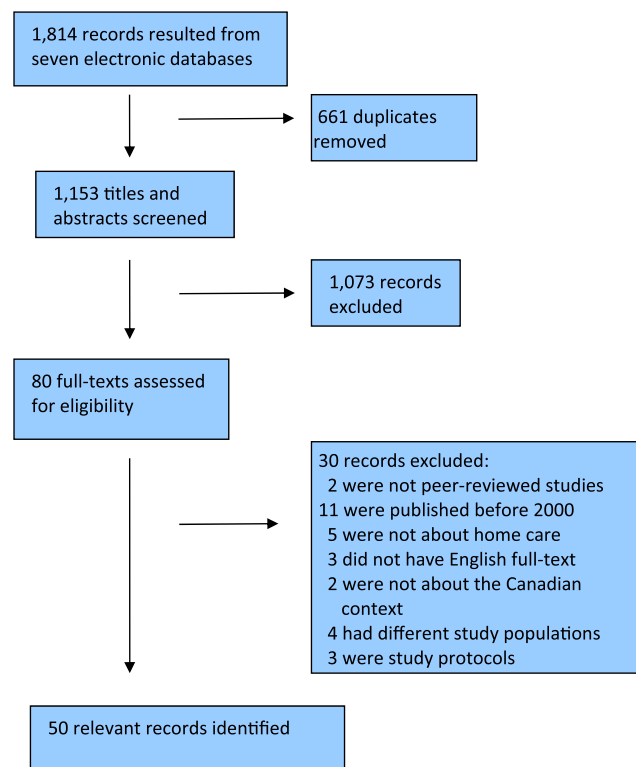

Figure 1: Flow diagram of the article selection process

from 2000 to 2007. Half of the studies focused on Ontario (25), with the remainder from British Columbia (9), Quebec (4), and Nova Scotia (2). There was one study each from Alberta and New Brunswick. Six studies were conducted across multiple provinces using existing data sets. Characteristics of the individual studies are shown in Table 3.

Study Design

The majority of the research (38 studies) involved observational studies. In addition, there were 12 intervention studies on home care clients. Further, 17 studies used the Resident Assessment Instrument-Minimum Data Set (RAI-MDS) for Home Care data that is provincially mandated for home care clients in Canada. Others used clients' or deceased clients' health records. A total of 11 studies focused on home care staff (e.g., case managers, dietitians, home care nurses, or home support workers).

Study Findings

Here we discuss the four primary themes that we examined within the systematic review: older adult client-level predictors; unmet needs; home care interventions; and home care issues and challenges. Each of the themes includes various subthemes. For example, the theme of older adult client-level predictors consisted of four subthemes: (a) cognitive impairment, mobility issues, and chronic conditions; (b) location of residence; (c) gender differences; and (d) mental health and well-being. Five subthemes were identified under unmet needs: nutritional health; mental health; primary treatment and heart failure; limited funding and eligibility criteria; and home care satisfaction. Home care interventions included three subthemes: (a) nurse-led interventions; (b) exercise, fall prevention, physiotherapy, and occupational therapy; and (c) technological interventions. Home care issues and challenges consisted of four subthemes: lack of knowledge and education; organizational issues; ethical challenges; and safety issues. The primary themes and their respective subthemes are discussed next.

Older Adult Client-Level Predictors

Cognitive Impairment, Mobility Issues, and Chronic Conditions

Many of the studies focused on describing the predictors and characteristics of home care recipients in Canada. Older adult client-level predictors typically included factors such as cognitive impairment, mobility issues, chronic conditions, and age. For example, Armstrong, Zhu, Hirdes, and Stolee (2012; 2015) used RAI-HC data of home care clients to identify relatively

Table 2: Methodological quality assessment scores of individual studies

Study	Selection Bias	Study Design	Confounders	Blinding	Data Collection Methods	Withdrawals and Dropouts	Global Rating
Armstrong et al., 2012	2, 4 [3]	8, no [3]	3, 4 [3]	3, 3 [2]	1, 1 [1]	4, 5 [2]	Weak
Armstrong et al., 2015	1, 1 [1]	8, no [3]	1, 1 [1]	3, 3 [2]	1, 1 [1]	4, 5 [2]	Moderate
Bartfay et al., 2016	1, 1 [1]	8, no [3]	3, 4 [3]	3, 3 [2]	1, 1 [1]	4, 5 [2]	Weak
Blais et al., 2013	1, 1 [1]	5, yes, yes [2]	3, 4 [3]	3, 2 [2]	3, 3 [3]	4, 5 [2]	Weak
Bocock et al., 2008			A qualitative study				
Cook et al., 2013	1, 1 [1]	7, no [3]	3, 4 [3]	3, 2 [2]	1, 1 [1]	4, 5 [2]	Weak
Craven et al., 2012			A qualitative study				
Dalby et al., 2008	1, 1 [1]	7, no [3]	3, 1 [1]	3, 2 [2]	1, 1 [1]	4, 5 [2]	Moderate
Fernandes et al., 2015	1, 1 [1]	7, no [3]	3, 4 [3]	3, 2 [2]	1, 1 [1]	4, 5 [2]	Weak
Fletcher et al., 2004	1, 1 [1]	7, no [3]	3, 4 [3]	3, 2 [2]	1, 1 [1]	4, 5 [2]	Weak
Foebel, Heckman, et al., 2011	1, 1 [1]	7, no [3]	1, 1 [1]	3, 2 [2]	1, 1 [1]	4, 5 [2]	Moderate
Foebel, Hirdes, et al., 2011	1, 1 [1]	7, no [3]	3, 2 [2]	3, 2 [2]	1, 1 [1]	4, 5 [2]	Moderate
Funk et al., 2011			A qualitative study				
Gallagher et al., 2002			A qualitative study				
Hebert et al., 2007	1, 1 [1]	7, no [3]	3, 2 [2]	3, 2 [2]	3, 3 [3]	4, 5 [2]	Weak
Hebert et al., 2010	1, 3 [3]	3, no [2]	2, 4 [1]	3, 3 [2]	1, 1 [1]	1, 1 [1]	Moderate
Hirdes et al., 2006	1, 1 [1]	8, no [3]	3, 1 [1]	3, 2 [2]	1, 1 [1]	4, 5 [2]	Moderate
Johnson et al., 2003	2, 5 [2]	3, no [2]	2, 4 [1]	1, 3 [3]	3, 3 [3]	1, 2 [2]	Weak
Johnson & Noel, 2007	3, 5 [3]	8, no [3]	3, 4 [3]	3, 3 [2]	1, 1 [1]	1, 3 [3]	Weak
Johnson & Begum, 2008	3, 5 [3]	8, no [3]	3, 3 [3]	3, 3 [2]	1, 1 [1]	4, 5 [2]	Weak
Kadowaki et al., 2015	1, 4 [2]	7, no [3]	3, 1 [1]	3, 3 [2]	1, 1 [1]	4, 5 [2]	Moderate
Kelly & Godin, 2015	2, 4 [2]	8, no [3]	3, 1 [1]	3, 3 [2]	1, 1 [1]	4, 5 [2]	Moderate
Lehoux, 2004			A qualitative study				
Livadiotakis et al., 2003			A qualitative study				
Lo et al., 2015	1, 4 [2]	7, no [3]	1, 1 [1]	3, 3 [2]	1, 1 [1]	4, 5 [2]	Moderate
Markle-Reid et al., 2013			Not applicable as this is an evaluation of three other studies				
Markle-Reid et al., 2014	1, 2 [2]	5, no [2]	3, 2 [2]	3, 3 [2]	1, 1 [1]	1, 2 [2]	Strong
Markle-Reid et al., 2006	1, 3 [3]	1, yes, yes, yes [1]	1, 4 [3]	2, 3 [2]	1, 1 [1]	1, 1 [1]	Weak
Martin-Matthews & Sims-Gould, 2008			A qualitative study				
McWilliam et al., 2014	2, 5 [2]	7, no [3]	1, 2 [2]	3, 3 [2]	3, 3 [3]	2, 4 [3]	Weak
Mery et al., 2016	1, 4 [2]	7, no [3]	3, 4 [3]	3, 3 [2]	1, 1 [1]	4, 5 [2]	Weak
Mierdel & Owen, 2015	1, 4 [2]	5, no [2]	3, 4 [3]	3, 3 [2]	3, 3 [3]	4, 5 [2]	Weak
Mitchell et al., 2007	2, 5 [2]	7, no [3]	1, 1 [1]	3, 3 [2]	1, 1 [1]	2, 3 [3]	Weak
Mofina & Guthrie, 2014	1, 4 [2]	7, no [3]	1, 4 [3]	3, 2 [2]	1, 1 [1]	4, 5 [2]	Weak
Neufeld et al., 2015	1, 4 [2]	7, no [3]	1, 1 [1]	3, 2 [2]	1, 1 [1]	4, 5 [2]	Moderate
Nugent, 2007	2, 3 [3]	7, no [3]	3, 4 [3]	3, 3 [2]	2, 2 [3]	4, 5 [2]	Weak
Paddock & Hirdes, 2003	1, 4 [2]	7, no [3]	3, 4 [3]	3, 2 [2]	1, 1 [1]	4, 5 [2]	Weak
Payette et al., 2002	1, 2 [2]	1, yes, yes, yes [1]	1, 1 [1]	2, 3 [2]	1, 1 [1]	1, 1 [1]	Strong
Rockwell, 2010			A qualitative study				
Scott et al., 2006	3, 5 [3]	5, no [2]	2, 4 [1]	1, 3 [3]	1, 3 [2]	1, 1 [1]	Weak
Sims-Gould et al., 2010			A qualitative study				
Sims-Gould et al., 2010			A qualitative study				
Sims-Gould et al., 2013			A qualitative study				
Szczerbinska et al., 2012	1, 4 [2]	7, no [3]	3, 1 [1]	3, 2 [2]	1, 1 [1]	4, 5 [2]	Moderate
Tong et al., 2016			A qualitative study				
Tousignant et al., 2007	1, 4 [2]	7, no [3]	3, 4 [3]	3, 2 [2]	1, 1 [1]	4, 5 [2]	Weak
Turcotte et al., 2015			A qualitative study				
Wilkins & Beaudet, 2000	1, 1 [1]	5, no [2]	3, 1 [1]	3, 3 [2]	1, 1 [1]	1, 1 [1]	Strong
Zhu, Chen, et al., 2007	1, 4 [2]	7, no [3]	3, 4 [3]	3, 2 [2]	1, 1 [1]	4, 5 [2]	Weak
Zhu, Zhang, et al., 2007	1, 4 [2]	7, no [3]	3, 4 [3]	3, 2 [2]	1, 1 [1]	4, 5 [2]	Weak

Note. **1, 2, and 3 within square brackets in each of the components represent strong, moderate, and weak component ratings respectively.**

homogeneous client-level predictors for home care usage such as cognitive impairment, being female, requiring assistance with instrumental activities of daily living (IADL) and/or some activities of daily living (ADL), and mobility issues (Armstrong et al., 2012; 2015).

A longitudinal study found that those with at least one chronic condition, who were older, newly dependent on others for help with daily activities, had been hospitalized in the previous year, and had a low income were more likely to use home care (Wilkins & Beaudet, 2000).

Table 3: Characteristics of individual studies from the systematic review of seven databases

Author(s) and Year of Publication	Study Design and Location	Study Population/Type of Home Care Clients	Main Study Findings
Armstrong et al., 2012	Observational study – Ontario	150,253 home care clients who received rehabilitation services (OT = occupational therapy or PT = physical therapy) within the first 3 months of their initial home care assessment	Seven relatively homogeneous subgroups: dependent and immobile clients with cognitive problems; dependent but mobile clients with cognitive problems; primarily women requiring assistance with IADLs and some ADLs; primarily women requiring assistance with independent activities of daily living (IADL); clients requiring assistance with IADL and bathing, activities of daily living (ADL); independent cognitively intact younger clients; and clients who lived alone and required some assistance with housework and bathing) that differed on characteristics such as age, sex, cognition, and functional impairment.
Armstrong et al., 2015	Observational study – Ontario	299,262 older long-stay home care clients	Hip fracture, impairments in ADL/IADL, cerebrovascular accidents, and cognitive impairment were the most highly associated client characteristics related to PT service provision. For OT service provision, hazards in the home environment were the most powerful predictor. Regional differences accounted for 9% (PT) and 20% (OT) service provision.
Bartfay et al., 2016	Population-based secondary data analysis – Ontario	39,604 and 21,153 who received either residential care or home care and had dementia	Residential care clients were 4 times more likely than home care clients to be diagnosed with dementia at a later stage.
Blais et al., 2013	A retrospective cohort study – Manitoba, Quebec, and Nova Scotia	1,200 client health records of clients from publicly funded home care programs	4.2% (95% CI 3.0%, 5.4%) of home care patients discharged experienced an Adverse Event (AE). The most frequent AEs were injuries from falls, wound infections, psychosocial, behavioural, or mental health problems and adverse outcomes from medication errors. More co-morbid conditions (OR = 1.15; 95% CI[1.05, 1.26]) and a lower instrumental ADL score (OR = 1.54; 95% CI[1.16, 2.04]) were associated with a higher risk of experiencing an AE.
Bocock et al., 2008	Literature review, focus groups, key informant interviews, nominal group – Canada	Case managers and registered dieticians directly involved with the coordination and delivery of home care nutrition services	7 malnutrition indicators (dietary intake, appetite, dysphagia, nutrition support, end-stage disease, weight status, and fluid intake) and 7 risk factors (health status, functional ability, self-reported poor health, mood status, social function, cognitive performance, and trade-offs) were identified.
Cook et al., 2013	Observational study – Ontario	99,764 long-stay home care clients with musculoskeletal disorders	Patients with deficiencies in instrumental activities of daily living and/or activities of daily living at baseline and who received home-based rehabilitation had significantly increased odds of showing functional improvements by their next assessment. Receipt of PT/OT also significantly reduced the odds of mortality and institutionalization.
Craven et al., 2012	In depth interviews – British Columbia	115 Home support workers (HSWs)	4 types of safety concerns (physical, spatial, interpersonal, and temporal) were identified by the HSWs. A conceptual model is developed to demonstrate the types of safety concerns, the multi-dimensional and intersectional nature of safety concerns, and the factors that intensify or mitigate safety concerns.
Dalby et al., 2008	Cross-sectional study – Ontario	3,321 clients receiving services from Community Care Access Centres	Over half (64.5%) of clients with depressive symptoms received potentially inappropriate pharmacotherapy (including potential under-treatment). Age 75 years or older, higher levels of caregiver stress, and the presence of greater co-morbidity were associated with a higher risk of potentially inappropriate pharmacotherapy.
Fernandes et al., 2015	Secondary analysis of existing data – Ontario	1,475 older home care clients who had a prognosis of survival less than 6 months or severe health instability	Clients with heart failure experienced higher rates of impairment in ADL, cognitive impairment, and severe health instability, but were less likely to have a prognosis of surviving less than 6 months. Clients with heart failure had needs similar to those with cancer yet are typically not identified as having a terminal prognosis.
Fletcher et al., 2004	Cross-sectional study (secondary analysis of health record data) – Ontario	2,304 older adults receiving home care services	41.2% of participants restricted their activity for fear of falling. They were more likely to do so if they were female, had various impairments/limitations, lack of support, and being a multiple faller. They were less likely to do so if they used antipsychotics and had Alzheimer's disease.

Table 3: Continued

Author(s) and Year of Publication	Study Design and Location	Study Population/Type of Home Care Clients	Main Study Findings
Foebel, Heckman, et al., 2011	Retrospective, cross-sectional study – Ontario	176,866 home care clients with heart failure (HF)	HF prevalence = 12.4%. 28.6% of them did not receive any first-line pharmacotherapy, which declined by 6% over the 4 years. 28% received recommended pharmacotherapy.
Foebel, Hirdes, et al., 2011	Cross-sectional study – Ontario	264,030 home care clients with the most recent RAI-HC assessment between 2004 and 2007	14.9% of the assessed clients had HF. These clients with HF had more health instability, took more medications, experienced more co-morbid conditions, received more nursing, homemaking, and meal services, hospitalized more frequently, had more emergency visits, and used more emergent care compared to other clients.
Funk et al., 2011	Secondary analysis of qualitative data – Western Canadian health authority	27 home care nurses	Three main areas were identified in the "empowerment" discourse manifested in home care nurses: (1) Respecting decisions (of the family), (2) Promoting (family) choice and control, (3) Promoting (family) independence (and avoiding dependence).
Gallagher et al., 2002	Focus groups – 10 health regions across Canada	89 home care case managers	Four main themes emerged in relation to ethical concerns and dilemmas: (1) Issues related to equity, (2) Beneficence, (3) Non-maleficence, and (4) Autonomy and power imbalances. System changes to address these issues are proposed.
Hebert et al., 2007	A retrospective study – Calgary	354 palliative home care health records of deceased clients	Based on professional nursing judgement, 43% of the visits were appropriate for video-visits. Four factors inform eligibility and decision on client's suitability for video-visits; (1) Diagnosis (cancer vs. non-cancer), (2) Low Edmonton Symptom Assessment System (ESAS) score, (3) No caregiver present, (4) Number and types of interventions required. Patients with a cancer diagnosis were more likely to be suitable for video-visits, which suggests that disease trajectory, rather than diagnosis of "palliative", may be more influential in determining the care required and appropriateness of videophone use.
Hebert et al., 2010	A population-based quasi-experimental study – Quebec	1,501 persons (728 experimental and 773 comparison) at risk of functional decline	The intervention reduced the prevalence and the annual incidence rates of functional decline by 62 and 137 cases per 1,000, respectively. Patient satisfaction with services and patient empowerment improved in the experimental group. The proportion of clients with unmet needs was half in the intervention area. Emergency room use showed no significant increases in the study area. Fewer contacts with nurses in the experimental group, but physician visits were unchanged.
Hirdes et al., 2006	Secondary analysis of data – Ontario	7,346 home care clients	The rate of influenza immunization was 80% (in 2002). Higher uptake was associated with age, respiratory problems, diabetes, and congestive heart failure. Lower uptake was associated with low education, smoking, and poor medication adherence.
Johnson et al., 2003	A before-after study – Ontario	60 (intervention) and 38 (comparison) home care clients	The intervention group showed good compliance and significant improvement on indicators such as timer up-and-go, sit-to-stand, 6-min walk, balance confidence, and well-being. 46% of the comparison group declined on 5 or more of the indicators.
Johnson & Noel, 2007	A cross-sectional study – Nova Scotia	64 HSWs providing care in home care and continuing care	Majority of HSWs were middle-aged (mean age: 46 years) women with low health knowledge scores. Empowerment level and formal power were at a moderate level. Their perceptions related to health of older adults' knowledge (general knowledge, falls prevention, physical activity, and nutrition) were low to moderate.
Johnson & Begum, 2008	A cross-sectional study – Ontario	98 frail older adults receiving home care	Both micro- and macro-nutrient intakes were inadequate. All age groups consumed less than the recommended amount of vitamins and minerals except for B vitamins. However, protein intake was reported as more than the recommended amount. More than 50% of the participants were overweight or obese.

Table 3: Continued

Author(s) and Year of Publication	Study Design and Location	Study Population/Type of Home Care Clients	Main Study Findings
Kadowaki et al., 2015	Secondary data analysis – throughout Canada	3,244 older adults receiving home care	71.4% of respondents had their home care needs met, while 28.6% had unmet home care needs. Of those who had unmet home care needs, 7.9% received some home care services. Participants who had their home care needs met reported higher levels of life satisfaction, and lower levels of loneliness and life stress than those with unmet needs.
Kelly and Godin, 2015	Fraser Health home care program – British Columbia	Community-dwelling older adults (intervention: $n = 930$ and control: $n = 930$) in a home care program	Compared to the treatment (surveillance nurse telephone support intervention) group, control group experienced more terminal events, had shorter HC episodes, and had higher rates per 100 days of emergency room registrations, hospital admissions, and hospital days. No change observed in emergency room registrations, hospital admissions, or total days in hospital.
Lehoux, 2004	Qualitative study; interviews and direct observation – Quebec	32 home care clients and 6 carers	All interventions – antibiotic intravenous therapy, parenteral nutrition, peritoneal dialysis, and oxygen therapy – were minimally user friendly. Their user-acceptance was linked to user-competence. Maintaining a regular job was difficult for most patients due to the high frequency of treatment. Autonomy and social lives were restricted by these interventions for some carers. There was a tendency among patients to withdraw from social activities due to the social stigmatization and technical barriers of these interventions.
Livadiotakis et al., 2003	Qualitative study; personal interviews – Simon Fraser Health Region, British Columbia	137 senior clients discharged from home support services	19 to 21 months after discharge clients' coping themes; 34.3% of clients were "home alone and suffering in silence" including feeling abandoned, lonely, and betrayed; 29.2% were receiving assistance from informal sources or reported paying out-of-pocket for private care; and 28.4% were able to do their work better themselves as they were unhappy with formal service, and 8% were having "mixed feelings".
Lo et al., 2015	Retrospective cohort study – Ontario	119,795 older clients receiving long-stay home care services	In unadjusted analyses, sex differences were observed on all indicators (decline or failure to improve in ADL, cognitive decline, depressive symptoms, and pain control). After risk-adjustment, the significant differences between the two sexes in outcomes for each indicator were nil.
Markle-Reid et al., 2013	An exploration of the lessons learned from 3 health promotion and disease prevention (HPDP) interventions – Southern Ontario	Three randomized controlled trials that included 498 frail older adults using home care services	Main lesson: nurse-led HPDP interventions provide greater improvements in health-related quality of life (HRQoL) compared with usual home care. These approaches are highly acceptable to this population and can be implemented using existing home care resources. These interventions should include multiple home visits, multidimensional screening and assessment, multi-component evidence-based HPDP strategies, intensive case management, interprofessional collaboration, providers with geriatric training and experience, referral to and coordination of community services, and theory use.
Markle-Reid et al., 2014	Prospective one-group pre-test/post-test – Ontario	142 long-stay (> 60 days) older home care clients with depressive symptoms	56% of participants had clinical depressive symptoms while 38% had moderate to severe symptoms. The clients found the intervention feasible and acceptable. Depressive symptoms were effectively reduced and HRQoL was improved at the 6-month follow-up. Anxiety was also reduced by one year. The number of hospitalizations, use of ambulance services, and emergency room visits were significantly reduced over the study period.
Markle-Reid et al., 2006	A randomized controlled trial – Ontario	288 older home care clients	The intervention group showed better mental health functioning, reduced depression, and enhanced perceptions of social support at no additional cost from a societal perspective. Proactively providing health care needs enhances the quality of life while not increasing the overall costs of health care.

Continued

Table 3: Continued

Author(s) and Year of Publication	Study Design and Location	Study Population/Type of Home Care Clients	Main Study Findings
Martin-Matthews and Sims-Gould, 2008	A qualitative study (in-depth interviews) – British Columbia	11 home support employers, 32 home support workers, and 14 older clients	Employers: recruitment and retention; the increasing complexity of client needs; questioned about the appropriateness of home support as part of the health care continuum. Home support workers: scheduling and time demands; tension in providing intimate ongoing care at an emotional distance; balance between tasks outlined in the care plan and the needs and wants of older clients. Older clients: ongoing need to prepare for and manage services; a need for companionship.
McWilliam et al., 2014	An exploratory quasi-experimental (with a post-test-only design using an independent pre-test sample) – Ontario	791 senior home care clients with chronic conditions	The intervention group achieved significantly greater client partnering experience and health-promoting partnering effort than the usual in-home-care interactions. Intervention also improved the client–provider partnering, thereby interdependence, promoting clients' health.
Mery et al., 2016	Secondary analysis of data – throughout Canada	7,255 (total number longitudinally) who received either home health care (HHC) or homemaking/personal support (HMPS) within home care	Receiving HMPS services increased the likelihood of receiving HHC (and was complementary). Dependence on help with ADL, health status, household arrangement, and income were determinants of receiving both HHC and HMPS services. Older male clients were highly likely to receive both services, while those with immigrant status were less likely to receive HMPS services.
Mierdel and Owen, 2015	A pre-post evaluation of an intervention – Central West Ontario	466 telehome care participants for ore- and post-enrolment group 125 patients in the pre- and post-enrolment/post-discharge group	57% reduction in six-month emergency department activity rates across the three periods. 64% reduction in six-month in-patient activity rates. 63% net reduction in accumulated in-patient days. A 46% reduction in emergency department use and a 53% reduction in hospitalizations post-enrollment compared to pre-enrollment. Average length of stay dropped by 25% of a day compared to pre-enrollment.
Mitchell et al., 2007	A longitudinal follow-up study – Manitoba	855 community-dwelling, cognitively intact older adults	Urban residents (16%) were more likely to receive home care than those in small towns (11%) or predominantly rural (9%) areas. Living in an urban setting, being older, and having some limitations in physical functioning at baseline predicted the use of home care at five years for the total sample. Further, becoming cognitively impaired, experiencing a decline in physical functioning, and beginning to show possible depression by five years also predicted using home care at five years.
Mofina and Guthrie, 2014	Cross-sectional (secondary analysis of data) study – Ontario and Winnipeg	Ontario ($n = 102,504$) and Winnipeg ($n = 9,250$) older home care clients	Client characteristics: mean age 83.2 years; female 68.6%; 92.4% of clients required full assistance with IADL; 35% had ADL impairments; 50% had some degree of cognitive impairment. Home care quality indicator rates: the highest were related to clients who had ADL/rehabilitation potential but were not receiving therapy and experienced cognitive decline.
Neufeld et al., 2015	Secondary analysis of data – Ontario	222,149 long-stay home care clients	9.3 cases per 1,000 clients had hospital records of intentional self-harm (ISH). Risk factors for ISH were younger age (60-–4 years), psychiatric diagnosis, alcohol use and dependence, psychotropic medication, and depressive symptoms. Protective factors for ISH were marital status and positive social relationships, particularly for men. Older home care clients with cognitive impairment show increased risk for suicide-related behaviour.
Nugent, 2007	A descriptive exploratory study, using a survey instrument – southern and central regions of New Brunswick	463 HSWs	Majority (97.2%) of HSWs were female, and had a mean age of 43.6 years. 86.4% of respondents identified the need for change to their current work situation; three most prevalent changes were (1) better wages, (2) improved benefits, (3) work schedule (either a consistent schedule, rotating schedules, or scheduling work closer to their homes).
Paddock and Hirdes, 2003	Cross-sectional study – Ontario and Quebec	683 older home care clients	Home care clients with nutritional problems were 2.58 times more likely to use acute health care services. Poor self-rated health and higher functional dependency significantly predicted acute health care use.

Continued

Table 3: Continued

Author(s) and Year of Publication	Study Design and Location	Study Population/Type of Home Care Clients	Main Study Findings
Payette et al., 2002	A randomized trial – Sherbrook, Quebec	83 (intervention group = 42, and control group = 41) older home care clients at high risk for under-nutrition	Intervention group showed significant improvements in total energy intake and weight gain. No significant changes were shown in other anthropometric indexes, muscle strength, or functional variables. Positive effects were seen in emotional role functioning and the number of days spent in bed.
Rockwell, 2010	A qualitative study: case study – British Columbia	A case study of an older couple	A careful examination of a case of an elderly couple with implications for practice are discussed: the technical aspects of who gets home support; the social construction of gender roles and the role of unpaid labor; and the factors that involve life experiences, values, and social support. Gendered effects of lack of subsidized housekeeping services: women are more likely to take up these activities on behalf of the discharged elder. If the elder is female, she feels more pressure to recover and resume domestic duties.
Scott et al., 2006	A quasi-experimental study – British Columbia	51 community health workers and 70 clients receiving community home support services	43% reduction in falls and a 44% reduction for fallers (those who fell once or more) by six months. The proportion of falls resulting in any injury did not decrease. The number of fractures reduced from 7 to 1 during the six months.
Sims-Gould and Martin-Matthews, 2010	A qualitative study: interviews – British Columbia	118 HSWs who provide primarily non-medical services	93% of HSWs were female in age between 27 to 65 years old. Study findings were discussed under four domains of home support: (1) organizational: pros and cons of having a care plan that drive their work; (2). spatial: conflicts that arise when working in the private space of clients' homes; (3) temporal: compression of time to provide care and reallocation of tasks when you have no more time; (4) social: the social relationship between clients and workers influence how care is negotiated.
Sims-Gould et al., 2010	A qualitative study: interviews – British Columbia, Ontario, Nova Scotia	57 HSWs	96% of HSWs were female in age between 22 to 70 years old. 47% of workers were born outside Canada. Three key themes emerged from the interview: (1) caring and sharing (enjoy working with people), (2) experience and exposure, (3) finances and flexibility.
Sims-Gould et al., 2013	A qualitative study: interviews – British Columbia	118 HSWs of older persons	91% of HSWs experienced a crisis (bodily, environmental, relational, or organizational in nature; happened "to" the worker or the client) when providing care. Strategies followed by workers to manage adverse events: following agency protocol, bending or breaking the rules, working to avert crises.
Szczerbinska et al., 2012	Observational study – Ontario	191,987 persons from home care (HC) and complex continuing care (CCC) hospitals/units	Depressive symptoms were recorded at 12% among HC clients and this decreased with age. Among the CCC the rate of depressive symptoms was higher at 23.6% with no substantial age difference. Cognitive impairment, instability of health, daily pain, disability in ADL were associated with depressive symptoms in both types of care. Less than half of the clients with depressive symptoms in both types of care received antidepressant treatment.
Tong et al., 2016	A qualitative study: interviews – British Columbia	82 home care clients and 55 family caregivers	Majority of clients were women over 80 years old, and majority of caregivers were also women, over 65 years old. Three types of safety concerns were identified by the participants: (1) physical: (worried about trips and falls), (2) spatial: (concerns about unsafe spaces, including bathing and cooking areas), and (3) interpersonal: those arising from interactions between clients, their family caregivers, and home care workers. These thee concerns were multi-dimensional and intersectional. A conceptual model of client and caregiver safety concerns is presented.
Tousignant et al., 2007	A cross-sectional study – Quebec	8,434 older home care clients with disabilities	Majority of clients were women (68%). This sample had moderate level of disability (mean Functional Autonomy Measurement System (SMAF) score = 23.1 out of 87). 46% had mainly IADL problems, 36% had motor disabilities, 14% had mental disabilities, 4% had mixed and severe disabilities. Adequacy of services provided in relation to services required: 13% for nursing care, 8% for personal care and support services.

Table 3: Continued

Author(s) and Year of Publication	Study Design and Location	Study Population/Type of Home Care Clients	Main Study Findings
Turcotte et al., 2015	A qualitative study: interviews – Quebec	11 triads of older home care client, his/her caregiver, and a health care provider	Home care clients had moderate to severe functional decline due to physical disabilities (5) mild cognitive impairment, (5) and psychological problems (l). Participation needs that were met included those related to daily activities, such as personal care, nutrition, and housing. Needs that were not met included social activities involving leisure, other community life activities and interpersonal relationships, and some daily activities (fitness and mobility). Few social needs (e.g., shopping) were being met.
Wilkins & Beaudet, 2000	A longitudinal study – throughout Canada	2,044 people aged 65 or older	7% of the sample received home care at the end of the follow-up period (2 years later). The likelihood of home care entry was higher for older adults, for those who were newly dependent on others for help with daily activities, for those who had at least one chronic condition, for those who had been hospitalized in the previous year, and for those with low income.
Zhu, Chen, et al., 2007	Secondary analysis of data – Ontario	24,724 long-term home care clients	The k-nearest neighbors (KNN) showed a lower false positive rate in 7 out of 8 regions, and lower false negative rates in all regions. Use of KNN is more informative than the current protocol used (ADL Clinical Assessment Protocol/ADLCAP).
Zhu, Zhang, et al., 2007	Secondary data analysis – Ontario	24,724 long-term home care clients	Support vector machine (SVM) predicts rehabilitation potential better than the ADL Clinical Assessment Protocol (ADLCAP), but KNN and SVM are statistically not different. SVM analysis revealed that independence in bathing, client optimistic about functional improvement, and client rated as having good prospect of recovery are the most important variables for predicting rehabilitation potential.

In a study of older home care clients in Ontario and the Winnipeg Regional Health Authority of Manitoba, almost 69 per cent of home care clients were female and had a mean age of 83.2 years; approximately 60 per cent of home care clients were divorced, separated, or widowed (Mofina & Guthrie, 2014). This study also revealed that almost 50 per cent of clients had some degree of cognitive impairment, nearly all (92.4%) required full assistance with IADL, and 35 per cent had impairments with ADL (Mofina & Guthrie, 2014).

Location of Residence

Only two studies examined home care usage in relation to location of residence. A longitudinal follow-up study of older adults found that proportionately more urban older adults were receiving home care (16%) compared to those in small towns (11%) or rural areas (9%) (Mitchell, Strain, & Blanford, 2007). This study further reported that being older and having physical and/or cognitive impairments predicted the use of home care services among seniors (Mitchell, Strain, & Blanford, 2007). Another study described regional issues of access to rehabilitation therapy for home care clients living in different health regions across Ontario (Armstrong, Zhu, Hirdes, & Stolee, 2015). However, Armstrong et al. (2015) asserted that home care clients should have equal access to rehabilitation services irrespective of where they reside.

Gender Differences

Some studies described home care usage in terms of gender differences. A study by Tousignant, Dubuc, Herbert, and Coulombe (2007) found that older home care clients with disabilities were mainly female (68%), and 46% primarily had IADL problems while 36 per cent had motor disabilities and 14 per cent had mental disabilities. The research also identified differences among men and women in home care performance indicators such as improvements in ADL, cognitive functions, depressive symptoms, and pain management (Lo, Gruneir, Bronskill, & Bierman, 2015). In a separate study, male clients were found to be highly likely to receive both services of home health care and homemaking or personal support (Mery, Wodchis, & Laporte, 2016).

Mental Health and Well-Being

Some studies described home care recipients in terms of mental health and well-being. A study by Szczerbinska, Hirdes, and Zyczkowska (2012) found that the prevalence of depressive symptoms among home care clients was 12 per cent, which decreased with age. Among clients with complex health conditions, however, the rate was higher at 23.6 per cent (Szczerbinska, Hirdes, &

Zyczkowska, 2012). Analysis of hospital records of home care clients identified intentional self-harm in 9.3 cases per 1,000 clients (Neufeld, Hirdes, Perlman, & Rabinowitz, 2015). Younger clients with psychiatric conditions, alcohol use and dependence, and depressive symptoms were at a higher risk for intentional self-harm behaviours, whereas marital status and positive social relationships were protective of self-harm (Neufeld, Hirdes, Perlman, & Rabinowitz, 2015).

Unmet Needs

Nutritional Health

The issue of unmet needs among home care recipients is highlighted in several studies ranging from topics on nutritional health to mental well-being. Although few studies examined the nutritional health of home care recipients, existing literature suggests that there are unmet nutritional needs. For example, a study found that both the micro- and macro-nutrient intakes of home care recipients were inadequate, yet the protein intake was reported to be at more than the required amount (Johnson & Begum, 2008). The study further reported that 23.9 per cent of participants were overweight and 29.9 per cent were obese, emphasizing the need to evaluate the nutritional adequacy of older home care clients (Johnson & Begum, 2008). Another study identified that risk factors of malnutrition among home care clients included health status, functional ability, self-reported poor health, mood status, social function, and cognitive performance (Bocock, Keller, & Brauer, 2008). A cross-sectional study involving older home care clients identified that those clients with nutritional problems were 2.58 times more likely to use acute health care services (Paddock & Hirdes, 2003). An intervention study on the nutritional supplementation for older home care clients at high risk for under-nutrition showed significant improvements in total energy intake and weight gain in the short term (Payette, Boutier, Coulombe, & Gray-Donald, 2002).

Mental Health

Unmet home care needs surrounding mental health issues were identified in the literature. For example, a cross-sectional study of clients with depressive symptoms found that 64.5 per cent of clients received potentially inappropriate pharmacotherapy including under-treatment (Dalby et al., 2008). Unmet needs were also described in terms of client safety and post-discharge care. A retrospective cohort study on home care client safety reported that 4.2 per cent of recently discharged patients experienced adverse events such as psychosocial, behavioural, and/or mental health problems, falls, wound infections, and medical error-related issues (Blais et al., 2013).

Primary Treatment and Heart Failure

Two studies focused on unmet care requirements and the issue of heart failure among home care recipients. In Ontario, research found that almost a third of home care clients did not receive the recommended primary treatment for heart failure with a prevalence of 12.4 per cent (Foebel, Heckman, et al., 2011) and 14.9 per cent (Foebel, Hirdes, Heckman, Tyas, & Tjam, 2011). Further studies that focused on seriously ill home care clients identified that those with heart failure were faced with greater disability in their daily activities, decreased cognitive functions, health instability, and co-morbid conditions compared to other clients (Fernandes & Guthrie, 2015; Foebel, Hirdes, et al., 2011); however, heart failure patients were not typically identified as having a terminal prognosis.

Limited Funding and Eligibility Changes

Existing literature suggests that financial cutbacks and changes to eligibility criteria have contributed to unmet home care needs among older adults. Provincial budget cuts to home care services and the resulting changes to the eligibility criteria along with eliminating a certain level of services have led to discharge of senior clients from the service. A qualitative study investigated coping strategies among those clients and revealed that 34 per cent were suffering in silence with feelings of abandonment, loneliness, and betrayal (Livadiotakis, Gutman, & Hollander, 2003). Another 29 per cent were receiving assistance from informal sources or were paying for private care, while 28 per cent adapted to doing the activities previously supported through home care by themselves (Livadiotakis, Gutman, & Hollander, 2003).

Home Care Satisfaction

There is a growing body of research on satisfaction with home care services and supports. A national study reported that approximately 40 per cent of home care recipients had unmet needs related to social interaction, mobility, and physical activity (Turcotte, 2014). Contrary to this study, Kadowaki, Wister, and Chappel (2015) reported that 71.4 per cent of older adults receiving home care had their needs met with higher levels of life satisfaction, lower levels of loneliness, and perceived life stress, whereas only 28.6 per cent had unmet home care needs. Given this difference between the two studies, more research is required to examine home care satisfaction among older adults.

Interventions

Nurse-led Interventions

The results of this synthesis identified various nurse-led interventions to support older adult home care

clients ranging from telephone-support interventions to mental-health interventions. A study on a "surveillance nurse" telephone support intervention for home care clients in British Columbia was found to have a beneficial effect on reducing the rate of service utilization by increasing the duration of the home care visit (Kelly & Godin, 2015). This intervention involved scheduled telephone calls from a surveillance nurse to regularly assess the client's well-being, care plan status, use and need for services (e.g., adult day programs, physiotherapy, home support), and home environment (e.g., family caregiver support). The nurse provides the client with information, education, and coaching, and if necessary collaborates with other health care and support professionals (e.g., occupational therapists, physiotherapists, social workers, dietitians, home care nurses, general or nurse practitioners), and community resources (e.g., Alzheimer's Society, meals on wheels) (Kelly & Godin, 2015).

A randomized, controlled trial evaluated a proactive nursing health promotion intervention in addition to customary home care in Ontario (Markle-Reid et al., 2006). The intervention consisted of a health assessment combined with regular home visits and/or telephone check-ins, coordination of community services, health education to support illness management, and empowerment strategies to promote independence (Markle-Reid et al., 2006). The intervention group demonstrated better mental health functioning, reduced depression, and enhanced quality of life and perceptions of social support at no additional cost (Markle-Reid et al., 2006). An evaluation of three similar nurse-led health promotion and disease prevention interventions concluded that these interventions are a better way of improving the health-related quality of life (HRQoL) of older home care clients compared to that achieved with the usual home care services (Markle-Reid, Browne, & Gafni, 2013). These interventions are advantageous since they are viewed as highly acceptable by this population and require no additional resources (Markle-Reid et al., 2013). An evaluation of a self-management training tele-home care intervention by specially trained clinicians and technology for home care clients with chronic disease showed reductions in emergency department activity, in-patient activity, emergency department use, and hospitalizations (Mierdel & Owen, 2015).

Another nurse-led mental health promotion intervention targeting long-stay older home care clients with depressive symptoms was effective in reducing depressive symptoms and anxiety, number of hospitalizations, use of ambulatory services, and emergency room visits, while improving their HRQoL (Markle-Reid et al., 2014). This was a multi-component intervention offered by an inter-professional team who provided intensive case management, community navigation of services, psychosocial support and advocacy, and coordinated communication among the client, family, and health care team.

Exercise, Fall Prevention, Physiotherapy, and Occupational Therapy

Other interventions identified in the literature included exercise, fall prevention, physiotherapy (PT), and occupational therapy (OT) programs to support even frail older adults in home care. Johnson, Myers, Scholey, Cyarto, and Ecclestone (2003) found that having home care clients do a simple set of exercises during regular home care visits was shown to improve their functional performance in the intervention group compared to a comparison group. A multi-factor intervention on falls prevention delivered by community health workers yielded a 43 per cent reduction in falls during a six-month period (Scott, Votova, & Gallagher, 2006). In addition, an observational study on long-stay home care clients with musculoskeletal disorders reported that those clients who received PT and OT showed significant functional improvements (Cook et al., 2013).

Technological Interventions

Some studies examined the role of technology in home care interventions for older adults. A study by Lehoux (2004) examined four frequently used technology-enhanced home care interventions including antibiotic intravenous therapy, parenteral nutrition, peritoneal dialysis, and oxygen therapy. The study found a tendency among home care clients to withdraw from social activities as a result of intervention-associated technical barriers and social stigmatization (Lehoux, 2004).

Another technological intervention discussed in the literature was the use of computer-modeling and algorithms to help inform and support clinical decision-making in home care. For example, two studies focused on a single study using computer-modeling techniques and machine-learning algorithms to guide rehabilitation planning and clinical decision-making around home care (Zhu, Chen, Hirdes, & Stolee, 2007; Zhu, Zhang, Hirdes, & Stolee, 2007). In particular, the authors examined the potential of using automatic, data-driven, machine learning algorithms – support vector machine (SVM) and *k*-nearest neighbors (KNN) – to inform rehabilitation delivery for home care clients. The study concluded that the tested algorithms provided better predictions than the currently used protocols, although the results were less interpretable in some instances (Zhu, Chen, et al. 2007; Zhu, Zhang, et al., 2007).

Home Care Issues and Challenges

Lack of Knowledge and Education

Although literature was limited on home care workers' education and training, a lack of knowledge among workers was identified as an important issue in areas ranging from falls prevention to cognitive health (Bartfay, Bartfay, & Gorey, 2016; Johnson & Noel, 2007; McWilliam et al., 2014). A Nova Scotia study evaluated perceptions and knowledge related to health of older adults among home support workers (Johnson & Noel, 2007). The study revealed that the majority of these workers were middle-aged women with low levels of empowerment and health knowledge on issues important to older adults such as general knowledge related to falls prevention, physical activity, and nutrition (Johnson & Noel, 2007). This review also found that additional education and training in cognitive health is required because home care recipients were generally under-diagnosed in terms of dementia and cognitive impairment (Bartfay et al., 2016).

Organizational Issues

Various organizational issues were identified such as poor wages and inconsistent work schedules. A study from New Brunswick reported that 97 per cent of home support workers were middle-aged women, over three quarters of whom identified organizational issues related to poor wages and benefits, inconsistent and/or rotating work schedules, and working far geographical distances from their homes (Nugent, 2007). A study in British Columbia found that almost 91 per cent of workers experienced physical, environmental, relational, and/or organizational issues while caring for their older clients (Sims-Gould, Byrne, Beck, & Martin-Matthews, 2013). These workers followed strategies such as agency protocol, bending or breaking rules, and working to avert the crisis to manage adverse events (Sims-Gould, Byrne, Beck, & Martin-Matthews, 2013). Another study in British Columbia described issues faced by home care workers such as time pressures and tight scheduling when providing care, advantages and disadvantages of having a care plan, and conflicts that arise when working in the private space of clients' homes (Sims-Gould & Martin-Matthews, 2010).

Additional organizational issues included issues in the delivery and receipt of home support services (Martin-Matthews & Sims-Gould, 2008). Employers found themselves challenged by recruitment and retention of employees and the increasing complexity of client needs (Martin-Matthews & Sims-Gould, 2008). The workers found difficulties arising from scheduling and time demands, tension in providing intimate ongoing care at an emotional distance, and the balance between outlined tasks, needs, and wants of older clients (Martin-Matthews & Sims-Gould, 2008). Moreover, older clients said they found that the ongoing need to prepare for and manage services in relation to inconsistent scheduling was often difficult (Martin-Matthews & Sims-Gould, 2008).

One study focused on addressing organizational issues by assessing the positive factors that attracted workers to home care employment. These factors included (a) enjoyment from working with people, (b) diverse experiences, (c) reliable finances, and (d) job flexibility (Sims-Gould, Byrne, Craven, Martin-Matthews, & Keefe, 2010). These factors may play an important role in facilitating recruitment efforts of new workers to support the growing demand of home care services in Canada.

Ethical Issues

Home care case managers faced ethical concerns and dilemmas related to issues of equity, beneficence, non-maleficence, and autonomy and power imbalances while providing their services (Gallagher, Alcock, Diem, Angus, & Medves, 2002). Sims-Gould and Martin-Matthews (2010) identified ethical issues related to social relationships with clients such as a sense of conflict in providing social support to their clients while maintaining a professional distance. In addition, Sims-Gould and Martin-Mathews (2010) identified ethical issues related to interpersonal conflict such as client refusal of service, or an argument between home care workers and family members.

Only a few studies provided recommendations and strategies for addressing ethical issues. Gallagher et al. (2002) proposed substantial home care system changes to address ethical concerns and dilemmas among home care case managers. In particular, the authors identified the need for more supportive housing options with on-site management and coordination of services, funding to address the increasing care needs of older adults, better organization of client waitlists to identify those with the greatest needs, and improved interdisciplinary teamwork to support collaborative decision-making to reduce ethical dilemmas. In another study, ethical issues in regards to the family were addressed by respecting decisions of the family, promoting family choice and control, and supporting family independence in the "empowerment" discourse through staff training and engagement (Funk, Stajduhar, & Purkis, 2011).

Safety Issues

Safety issues were identified among both home care clients and workers. Tong, Sims-Gould, and Martin-Matthews (2016) found that home care clients identified

physical (e.g., potential trips and falls), spatial (e.g., unsafe spaces such as bathing and cooking areas), and interpersonal (e.g., those arising from interactions between clients, their family and home care workers) safety concerns in the home care environment. Another study identified safety concerns of the staff while they were serving their home care clients, noting four main types: physical, spatial, interpersonal, and temporal issues (Craven, Byrne, Sims-Gould, & Martin-Matthews, 2012). Subsequently, the authors developed a conceptual model to highlight these concerns as well as those factors which intensify or mitigate them (Craven et al., 2012). Similarly, the article by Tong et al. (2016) described this conceptual model to address client and caregiver safety concerns in home care. The authors noted that some of the mitigating factors to improve safety concerns included home modifications and the presence of home care workers to offer support with physically demanding tasks such as cleaning.

Discussion

As Canada's population ages, the demand for home care services is expected to increase. In 2012, Statistics Canada estimated that more than 2 million people used home care services (Turcotte, 2014). Recently, home care has been recognized as a national priority in Canada (Sibbald, 2015); accordingly, research on effective interventions and strategies to support home care is needed to support informed actions and partnerships to advance this priority (Canadian Medical Association, 2016).

We conducted this systematic review to examine the existing literature on home care for seniors in Canada. In particular, we aimed to identify how existing literature characterizes home care users, challenges and gaps in the home care system, and interventions and strategies used to support home care services. After a comprehensive search of seven relevant electronic databases, screening, and assessing for eligibility, we reviewed 50 studies.

This study identified four main themes in the literature including: older adult client-level predictors; unmet home care needs; interventions; and home care issues and challenges experienced by home care staff and/or clients. Each of these themes were broken down into various subthemes. Although each of these themes and subthemes were discussed in isolation for clarity, it is important to note that the themes had significant overlap and interconnections. For example, the themes of unmet needs and issues substantially overlapped with the challenges related to limited worker education and knowledge related to physical activity.

Our review found that there was an imbalance in the source province/territory for much of the relevant literature related to home care in Canada. There were also few comparative national studies. Half of the studies focused on Ontario followed by studies in Quebec and British Columbia, while there was no research which met the inclusion criteria from Newfoundland, Prince Edward Island, Saskatchewan, or the Territories. This has, in our view, certain consequences for future research. First, there is a need to fill in the gaps in our understanding of how home care services are organized, delivered, and experienced in those missing Canadian jurisdictions. This will give us a more robust picture of the variations across the country and allow us to seriously assess what best practices might be in Canada. Second, only with a robust picture of the Canadian scene can we look internationally for additional best-practice models and suggestions for policy and service delivery reform.

No studies focused on home care for older Indigenous adults or among immigrant and refugee seniors in Canada. Beatty and Berdahl (2011) asserted that policymakers and researchers have paid limited attention to the health care needs of this aging demographic. However, among Indigenous older adults the incidence of chronic conditions such as hypertension, heart problems, diabetes, and arthritis is double or triple the rate of Canadian seniors overall (First Nations and Inuit Health Branch, 1999). Recent government funding cuts have raised substantial concerns with the increasingly higher costs of private and public care being unaffordable and inaccessible for many Indigenous older adults (Beatty & Berdahl, 2011). In addition, older ethno-cultural adults is the fastest growing segment of the population (Johnson, Bacsu, McIntosh, Jeffery, & Novik, 2017; Statistics Canada, 2011). Future research is needed to address the home care needs of Indigenous and ethno-cultural older adults in Canada. And again, cross-national studies comparing the experiences of older Indigenous populations in Canada and other "white settler colonies" (e.g., Australia, New Zealand, South Africa, and the United States) would be a starting point to identify best practices.

According to the EPHPP Quality Assessment Tool that we used, the majority of the quantitative studies were rated as "weak"; a few were rated as "moderate. Only three of the studies were rated as having "strong" quality. A potential explanation for the low ratings is that most of the studies were observational and relied on secondary data. Moreover, many of the studies failed to address the issue of confounders and blinding of study participants or researchers. However, it is noteworthy that almost all of the studies used reliable and valid data collection tools.

The findings from our review identified useful interventions for supporting older adults' quality of life and health outcomes (Blais et al., 2013; Hirdes et al., 2006;

Markle-Reid et al., 2006, 2013; Mierdel & Owen, 2015). A little over one fifth of the studies were intervention evaluations. The intervention studies typically examined simple exercise programs, fall prevention, physiotherapy, occupational therapy, nurse-led interventions such as telephone support, inter-professional collaboration, working with providers with geriatric training and experience, and increased coordination and awareness of community services. These interventions required only minimum additional costs and generally resulted in positive improvements among the home care recipients. This research suggests that slight modifications to home care services could have a strong impact on improving older adults' health outcomes. Recent studies have evidenced growing interest in the role of technological interventions to support home care needs among older adults.

Many older adults in the studies who received home care suffered from cognitive impairment, mobility issues, and chronic conditions. Additional predictors of home care usage included an urban location of residence, older age, and being female. Home care has been shown to reduce financial costs related to hospitalization of older adults such as palliative care, emergency visits, and length of hospital stay (Canadian Home Care Association, 2016). However, little research is available to understand the gaps in home care utilization related to location of residence, age, and gender. Future policy and programs need to examine how to better address these gaps to support equitable access while also exploring ways to improve value for money to ensure sustainability of the home care system over time.

Ethical and safety issues were key concerns among home care workers. Gallagher et al. (2002) proposed substantial system changes to address ethical concerns and dilemmas among home care case managers. Other studies developed a conceptual model to support client and caregiver safety concerns in home care (Craven et al., 2012; Tong et al., 2016). Research and knowledge to address safety and ethical issues may play a key role in supporting the recruitment and retention of home care workers.

This synthesis identified a substantial need for more education, knowledge, and training of home care staff or continuing care workers (Johnson & Noel, 2007; McWilliam et al., 2014). In particular, more education and training are required regarding falls prevention, physical activity, and nutrition. Falls and issues of malnutrition can often be prevented through evidence-informed interventions. However, the identification of at-risk older adults is critical in the delivery of preventive interventions. Our review also found that home care recipients were generally under-diagnosed in terms of dementia and other cognitive impairment issues

(Bartfay et al., 2016). Subsequently, more training, screening, and education are required to support older adults' cognitive health as well as the necessary resources to support these activities.

Depression and mental health also emerged in our review as common issues among older home care recipients (Ayalon, Fialová, Areán, & Onder, 2010). The World Health Organization has noted that approximately 15 per cent of older adults age 60 and older suffer from a mental health disorder (World Health Organization, 2016). We found only a few studies that examined the issue of mental health among home care recipients (Blais et al., 2013; Markle-Reid et al., 2014; 2006). Further research is necessary to examine effective interventions for improving depression and mental health issues among home care clients.

Our review did identify some effective interventions and strategies to support home care across Canada; however, more research will enable researchers to fully understand and identify interventions and models that are best suited to supporting home care recipients' health outcomes over time. Further research is also required to examine best practices to support training, retention, and education of home care staff and workers (Johnson & Begum, 2008; Johnson & Noel, 2007; Martin-Matthews & Sims-Gould, 2008).

In moving forward, future research directions could include a synthesis to examine international examples of best practices and innovations from different countries to support effective and sustainable models of home care. In particular, this synthesis could examine how different models of home care are governed, financed, and organized to support older adults' needs. For example, in Australia the Home Independence program was developed as an alternative model from home care to assist seniors in maximizing their functional independence and well-being. A randomized control study comparing Home Independence clients and those receiving traditional home care found that 12 months after initial recruitment, Home Independence clients were 6.5 times less likely to require ongoing care and 30 per cent less likely to use emergency or hospital services (Lewin & Vandermeulen, 2010). Similarly, the United Kingdom has introduced an intensive, short-term (e.g., usually about 6-8 weeks) re-ablement program that generally works with clients after rehabilitation from an acute event to teach clients about managing daily activities, coping at home, and remaining independent. One study reported that 60 per cent of re-ablement clients did not require home care at the end of the program and that 40 per cent of graduates continued to be independent (Glendinning & Newbronner, 2008). By studying models from different countries, policymakers would benefit by acquiring new insight

and innovative knowledge to improve home care services for older adults.

Limitations

Although our review adopted a systematic method, it is not without limitations. For example, we searched only seven electronic databases for published literature in the English language between the years 2000 and 2016. It is possible that relevant studies may have been left out, especially studies from Quebec published in French as the search was limited to English-language articles.

Since home care is primarily identified as a health care issue, our systematic review focused on health science databases. For example, health care budgets and funding for home care typically emphasize post-acute care rather than long-term care that focuses on maintenance of skills and preventive care (Beatty & Berdahl, 2011). In the future, a more comprehensive search strategy should include social science databases, as home care clients often experience socially related challenges such as housing, transportation, and social isolation. In addition, it is possible that we overlooked relevant, grey literature documents because our search focused on journal publications.

Conclusion

As Canada's demographic ages, the demand for home care will steadily rise. Research on effective and sustainable strategies to support home care is imperative. Currently, there is little knowledge on home care for older adults in Canada related to characteristics of home care users, issues and gaps in services, and interventions designed to support home care clients' needs. This synthesis examined four main themes in the home care literature including older adult client-level predictors; unmet home care needs; interventions; and home care issues and challenges experienced by home care staff and/or clients. Given Canada's aging population, this synthesis is timely to inform future policy, practice, and programs on home care across the country.

Although this review identified useful interventions and strategies to support home care in Canada, additional research is needed to identify best practices and models for service provision within unique geographical contexts and among diverse populations. In addition, national standards for home care are required to ensure equity of services across jurisdictions. Although formal home care is often supported at many levels by informal caregivers, the conversation and research should also address the contributions of informal caregivers. Moving forward, research, knowledge, and education are pertinent to fostering innovative strategies and best practices to supporting Canada's home care system and clients over time.

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