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Physical Activity Among Older Women Living in Rural Areas in Canada: A Scoping Review

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Abstract

Although there is strong evidence linking physical activity in older age with well-being and health benefits, these relationships tend to be under-researched in a rural context. A scoping review was conducted to identify what is known about physical activity among older women living in rural Canada. The search strategy was intentionally broad, with eight databases, academic journals, and websites scanned for research and grey literature related to Canada, in English, from 2000 to 2022. 33 studies, reviews, and reports were included in the final selection. These articles indicate that physical activity among older women living in rural Canada is influenced by a multitude of layers, contexts, conditions, and environments, with outcomes dependent on a mixture of personal, relational, community, societal, and governmental factors. In general, the women are committed to creating and maintaining an active lifestyle, and supporting their local rural community to enable these activities. While the social environment can proscribe physical activity through ageist attitudes and restrictive socio-cultural norms, social support from family and community members mitigates against these constraints. Rural infrastructure, geography, climate (seasons and weather), as well as transportation and policy issues may also impede the physical activity opportunities of the women. Some of the problems related to sustaining and resourcing recreational activity in rural communities are partly addressed through the implications presented in the articles. Among others, these suggestions relate to leadership and learning opportunities, public engagement, and the partnership working involved in supporting physical activity in rural areas. However, further research is long overdue.

Keywords Older women · Rural areas · Physical activity · Canada

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The positive relationship between health and physical activity is well recognised globally (Fernhall et al., 2015, pp. 299, 304; Ozemek et al., 2019, p. 102; Pratt et al., 2015, p. 356; World Health Organisation, 2015), especially in the context of disease mitigation and management (Prohaska et al., 2006, pp. S268-S269; Taylor et al., 2004), and reducing the risk of morbidity and mortality (Katzmarzyk & Mason, 2009, p. 271; Ozemek et al., 2019, p. 106).

There is also strong evidence linking physical activity and quality of life and well-being in older adults (Marquez et al., 2020), for example mental health (Guthold et al., 2018). These benefits are particularly relevant for older women who characteristically live longer and are at higher risk for some chronic conditions (Guthold et al., 2008; Public Health Agency Canada, 2020).

Paradoxically, there is an age-related decline in physical activity in older people (Doyon et al., 2021; Hallal et al., 2012), especially women (Ozemek et al., 2019, p. 103). In an effort to counter this trend, and build on the successful ParticipACTION (ParticipACTION Report Card Development Team, 2021), Choose to Move (Franke et al., 2021), and Get Fit for Active Living (Stathokostas et al., 2017) campaigns, among others, Canada recently issued new movement guidelines for older people (Canadian Society for Exercise Physiology CSEP, 2020). Compared to the guidelines released by the World Health Organisation (Bull et al., 2020) and the United States of America (USA) (Piercy et al., 2018), for instance, Canada's guidance integrates physical activity, sedentary behaviour, and sleep patterns to formulate at a 24 h activity plan: "Replacing sedentary behaviour with additional physical activity and trading light physical activity for more moderate to vigorous physical activity, while preserving sufficient sleep, can provide greater health benefits." (CSEP, 2020).

These initiatives are complemented by research into the discipline of physical activity in general (Rhodes & Nasuti, 2011), and physical activity and ageing specifically (King & King, 2010; Muller et al., 2016). Many of these studies relate older people's activity to the physical and/or built environment and community neighbourhoods in an urban setting (Wasfi et al., 2016). As such, they underscore the importance of parks (Evenson et al., 2016; Kaczynski et al., 2007, 2009), in terms of older users' preferences for aesthetics, walkabilty (Cerin et al., 2022) and open green spaces (Moran et al., 2014).

However, the evidence linking the natural environment, *greenness*, and active living (Calogiuri & Chroni, 2014; Christie et al., 2021; McMorris et al., 2015), has not yet evolved into an upsurge in research centred on physical activity in rural areas (Chrisman et al., 2014, p. 353; Frost et al., 2010). For instance, Nykiforuk et al., (2018) found only four directly relevant articles in their comprehensive evidence review into the promotion of physical activity in Canadian rural, remote, and northern settings.

This rural "neglect" (Canadian Rural Revitalization Foundation, 2015, p. ii) has translated into a Canadian "Call for Action" (Nykiforuk et al., 2018):

> Access to supportive settings for physical activity is an important means to promote health and well-being by making it easier for individuals to incorporate physical activity into their day. The lack of policy, practice, and research action on physical activity and features of the physical, built, and natural environ-

> ments in rural, remote, and northern settings is a significant threat to population health equity in Canada. (p. 11)

Although this directive refers to physical activity in all ages, the situation is perhaps more concerning when contextualised to older adults. Many rural and remote areas in Canada are characterised by rapidly ageing populations, comprised of higher proportions of older women (Leclerc, 2021, pp. 12–13). To date, there is a paucity of research into physical activity among older people in rural Canada (Chrisman et al., 2014, p. 353; Schmidt et al., 2016); even fewer studies are centred on older women.

Accordingly, this scoping review aims to redress this deficit by focusing on physical activity among older women living in rural Canada.

Literature Review

The literature review is oriented to Canada where possible, with wider evidence referenced for additional breadth and depth as needed. Much of the research into physical activity, older women, and rurality is marked by divergent contexts and characteristics: often in tandem with the assumption of homogeneity (Dollman et al., 2016, p. 2).

Physical activity

Some studies categorise physical activity as a generic entity, such as leisure-time physical activity, without regard to the diversity represented by this genre. This disconnect is exemplified in Sun et al.'s (2013) review of physical activity in older people: their study was impeded by differences in definitions, domains, instrumentation, and cut-off points. Many of these designations overlap, and cover a broad spectrum of physical activity, ranging from types (leisure, occupational, transport, and home-based activity, Pratt et al., 2004); daily physical behaviours including steps (Mitchell et al., 2018), light, moderate to vigorous activity, active transport (Klicnik & Dogra, 2019); sport (Gayman et al., 2017); exercise (formal, structured, planned, and repetitive activities, Koeneman et al., 2011); physical fitness (Doyon et al., 2021), mobility (Hanson et al., 2012; Hirsch et al., 2017; Ottoni et al., 2016; Yen et al., 2014), to recreation (Canadian Parks and Recreation Association/Interprovincial Sport and Recreation Council, 2015). For many authors, physical activity is associated with unstructured daily lifestyle activity, often synonymous with walking.

Measurement of physical activity is equally variable, and encompasses objective instruments (accelerometers, pedometers), self-report, and/or indicators of intensity, frequency, and duration (Colley et al., 2018); physiological measures such as the Compendium of Physical Activities standardising Metabolic Equivalents of Tasks (METS) (Guthold et al., 2008; Ng & Popkin, 2012, pp. 661–662); and equivalency conversions (kilocalories used per kilogram of body weight per day into active, moderately active, and inactive categories) (Gilmour, 2007, p. 45). In Canada, national-level standards are embedded in The Canadian National Movement Guidelines (Ross

et al., 2020) and Active Canada 2020: A Physical Activity Plan for Canada (Spence et al., 2020).

From a public health perspective, physical activity is often treated as a health behaviour (Rhodes et al., 2017); an adjunct to nutrition–diet (Carlin et al., 2017); a contributor to the social environment (Kepper et al., 2019) or vice versa (Chaudhury et al., 2016; Mahmood et al., 2012). In some research, both physical and social environments are identified as *determinants* of physical activity, whereas individual level factors, including age and sex, are consistently *correlated* with physical activity (Bauman et al., 2012).

Older women

Age is regarded as a homogeneous entity in many studies. The literature is peppered with varying age ranges, inconsistent older age cut-off criteria, and non-uniform age disaggregation (World Health Organisation, 2020, p.19). To add to this complexity, perceptions of ageing and the experiences of ageism can negatively or positively influence the translation of physical activity in later life (Massie & Meisner, 2019). Ageing expectations (Meisner et al., 2013) and the "meanings of aging" (Dionigi et al., 2011) held by older women also influence the relationship of ageing and physical activity. For example, in their examination of physical activity and successful ageing, Dogra and Stathokostas (2012) and Meisner et al., (2010) found that moderately active, least sedentary older Canadians were more likely to age successfully.

In much of the research into physical activity, older women and men are grouped collectively as adults or older adults. However, for Bengoechea et al. (2006), there are gender differences in the perceived correlates of physical activity. They advise treating gender as a potential moderator of the link between the perceived environment and physical activity. Riva et al., (2007) also favour a gender-specific approach to policies and environmental interventions to promote physical activity. Conversely, in their systematic review of the individual contributors to physical activity, Notthoff et al., (2017) were unable to discern definitive gender differences in activity levels, but concluded that for some types of physical activity, gender could be relevant.

Nonetheless, there is a growing evidence base linking various socio-demographic factors such as age and gender (among others), with physical activity. At present, few of these studies are situated in rural areas.

Rural areas

Rural and remote areas are frequently characterised by assumptions of uniformity (Dollman et al., 2016, p. 2), but as Lavergne and Kephart (2012) observe, arriving at a definition that accounts for within and between community differences is notoriously difficult. However, a new Remoteness Index that allows "better differentiation, description and understanding of the very different realities of diverse rural communities" (Leclerc, 2021, pp. 5–6) was lately developed in Canada. The index is predicated on the relative remoteness of communities, and consists of five categories: easily accessible, accessible, less accessible, remote, and very remote areas (Subedi et al., 2020, p. 4), all based on the distance from large urban conurbations–Cen-

sus Metropolitan Areas (CMAs) and Census Agglomerations (CAs). An alternative classification system is also in use in Canada. This is based on Metropolitan Influenced Zones (MIZ) that account for the flow of workers commuting to nearby urban areas: a Strong MIZ corresponds to 30–50 per cent commuter flow, Moderate MIZ to 5–30 per cent, and Weak MIZ to 0–5 per cent movement of commuters (Lavergne & Kephart, 2012, p. 3). Additionally, some researchers describe rurality as a continuum (Umstattd Meyer et al., 2016, p. 2).

Further variance is evident when rurality is juxtaposed with physical activity. The environment associated with physical activity (Duncan et al., 2005; Fleig et al., 2016) may not be clearly identified, and/or it is broadly applied to all rural areas. A *one size fits all* approach to rural settings is debunked by two recent Canadian studies. In Québec, Levasseur et al., (2020) found that different environmental characteristics influenced older adults participation in social activities (and concomitantly, physical activity). These findings affirm Naud et al.'s (2019) earlier study examining locational (region) and socio-demographic (population size) effects on barriers and community activity participation by older Canadian women and men.

Additional reviews signalled the under-representation of older adults and residents of rural areas in Canada (Orstad et al., 2017, p. 918), especially in relation to "the interplay between physical activity, psychosocial cognitions, and perceived characteristics of the built environment." (Fleig et al., 2016, p. 1368).

The challenges involved in deriving definitive conclusions from a dissimilar evidence base are articulated by Nykiforuk et al., (2018, p. 430) in their review of physical activity in rural, remote and northern settings in Canada. Despite multiple definitions, designations, and relationships, the authors underscore "the importance of understanding how geographical differences can influence relationships between the built environment and health-related behaviours" (Nykiforuk et al., 2018 p. 430), and by extension, physical activity. Consequently, a scoping review was designed to investigate what is known about physical activity among older women living in rural Canada.

Methods

The scoping review was developed according to the guidance documented in the Joanna Briggs Institute (JBI) Manual for Evidence Synthesis (Aromataris & Munn, 2020). It was also informed by the original methodology outlined by Arksey and O'Malley (2005), and subsequently updated by Levac et al., (2010). For referential consistency and clarity, the following nomenclature was adopted: a *study* refers to primary academic research, whereas *articles* refer to all the evidence included in the review (studies, reviews, and reports).

Since physical activity among older Canadian women living in rural and remote areas is significantly under-researched, an exploratory scoping review was chosen as the preferred methodological approach, rather than a systematic review or a realist review (Munn et al., 2018). Furthermore, quality checks are not required in scoping reviews (as in systematic reviews) (Peters et al., 2020, pp. 410–411), and unlike

systematic reviews, scoping reviews summarise rather than synthesise the included literature (Peters et al., 2020, p. 421).

Scoping reviews are conducted for various reasons (Munn et al., 2018): in this case, the review aimed to provide an overview of the literature related to physical activity among older women living in rural Canada. Here, Levac et al.'s (2010) recommendation to combine a broad research question with a clearly articulated (narrow) scope of inquiry was followed. Hence, the research question has an intentionally wide envelope (Peters et al., 2020, p. 410): to identify what is known about physical activity among older women living in rural Canada.

Search Strategy

To facilitate a comprehensive scan, the preliminary search parameters were informed by the Population, Concept, Context (PCC) mnemonic (Peters et al., 2020, p. 415), and considered an expansive range of selection criteria, including type of evidence, purpose, socio-demographic information, geographic setting/location, results, conclusions, and implications (if provided). Although a three-phase search strategy was implemented in accord with the JBI guidance (Aromataris & Munn, 2020), the search process itself was highly iterative.

Phase one An initial, limited search of the PubMed and PsychInfo online databases was conducted to ascertain the relevance of the proposed key words and resultant articles. This preliminary *pilot* identified numerous studies and reviews situating physical activity among older adults in urban settings, but few exclusively focused on older women, and especially in rural areas, and/or in Canada. It also reaffirmed the conclusions of earlier work, and confirmed the need for research about older women, and Canadian rural contexts.

Phase two The second phase consisted of an extensive search of eight online databases, outlined in the flow chart (Fig. 1) modelled on the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) (Tricco et al., 2018). These searches were performed between the months of January to May 2022, by the author. Searches were delimited to: published, peer-reviewed, full-text, academic research (studies and reviews), conducted from 2000 to 2020, in English. To optimise a wide corpus, the following key word search terms were used: "older age* AND women*", "rural areas", "physical activity". Additional searches for grey literature (reports, presentations, editorials, and commentaries) were conducted via governmental and organisational websites.

Phase three Related articles obtained from the online search, and reference lists from selected reviews, studies, and reports were searched for additional sources. A key journal (Journal of Aging and Physical Activity), not available electronically to the author, was also hand-searched. During this phase, the inclusion criterion for the applicable time frame was expanded to the present (2000 to 2022) to allow for recently published literature, with the associated caveat that any Covid-related arti-

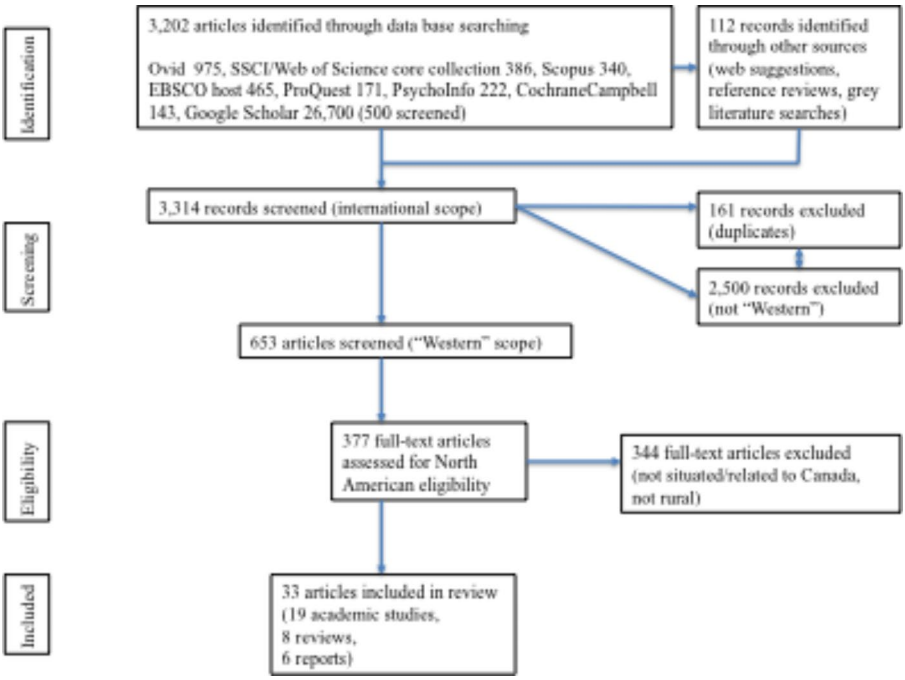

Fig. 1 Search Strategy

cles were excluded. (The author felt that potential results could be distorted by the specific conditions and contexts of the Covid pandemic).

Evidence Screening and Selection

Again, this was a highly iterative process, centred on the PCC criteria. The purposeful and repetitious sifting and re-screening of the article pool strengthened methodological rigour and contributed to the consistency of the final selection. 3,314 initial articles were filtered by title and abstract for relevance; with 161 duplicates and 2500 non-*Western* situated articles removed. Articles were also eliminated if they associated physical activity with specific medical conditions and/or health limitations. Full text screening with additional selectivity (North America, not interventions; leisure and recreational physical activity, not structured programmes; community-dwelling older adults, not residential care) refined the selection further. Physical activity interventions and articles relating to special populations (Indigenous, linguistic, religious, and immigrant groups) were also excluded on the grounds that their purpose and contexts exceeded the scope of the review, while seasons and weather; and travel and transportation, were retained because of their overall relevance to rural areas.

A final sort resulted in 33 articles focused on rural settings and Canadian contexts, and included academic studies, reviews, and reports.

Table 1 Characteristics of Research Studies Included in the Review

ACADEMIC RESEARCH									
RURAL FOCUS									
Study	Purpose/Aims	Methods		Demographics		Context		Physical Activity	
Author/Year		Design	Sample	Age	Gender	Setting	Indicators	Description	Measures
Graham & Connelly 2013	Shared values, beliefs, and behaviours related to exercise as self-care in older adults	Qualitative, focused ethnography	Size/(N) 17	≥65	Women, men	Rural	Sociodemographics, health/functional status, psychosocial attitudes/ behaviours (personal, sociocultural, environmental perceptions, experiences of physical activity as self-care)	Walking, structured exercise	Interviews (semi-structured) Observation, Field notes
Leipert et al. 2014	Curling and rural women	Qualitative, (National Curling and Health Study)	Size/(N) 48	Range 12–75, Mean range 50–60	Women 45 (3 youths)	Rural (3 regions)	Sociodemographics, identify influence of curling/clubs on health/social lives, understand curling activities/meanings for rural women, understand sport/ recreation within contexts of gender/community change in rural areas	Curling	Photo-Voice, Activity/ community logs
Mair et al. 2019	Curling clubs and women's health and wellbeing in rural Canada	Qualitative, (National Curling and Health Study)	Size/(N) 52	Range12-72	Women	Rural	Sociodemgraphics, explore the linkages between sport and recent trends shaping the health and wellbeing of rural women	Curling	Photo-Voice, Log Discussion group, Interviews
Paluck et al. 2006	Health promotion needs of rural women	Qualitative, pilot	Size/(N) 44	18+, 3 groups 18–44 45–64 ≥65	Women	Rural	Sociodemographics, social/physical environment	Leisure activity	Focus groups (8 groups)

Table 1 (continued)

ACADEMIC RESEARCH									
Schmidt et al. 2016	Beliefs around physical activity among older adults in rural Canada	Qualitative	Size/(N) 10	Range 69–94	Women, men	Rural	Sociodemographics, health/functional status, social environment (engagement), physical/neighbour-hood environment (access, safety)	Leisure activity	Interviews (semi-structured, in-person, telephone)
Witcher et al. 2007	Physical activity among older adults in rural Newfoundland Canada	Qualitative, case study	Size/(N) 10	Mean 82	Women, men	Rural	Sociodemographics, assess perceptions of leisure- time physical activity, from an historical perspective	Leisure activity	Interviews (semi-structured)
Witcher et al. 2016	Physical activity perceptions and influences among older adults in rural Nova Scotia	Qualitative	Size/(N) 20 adults	Range 68–79	Women, men	Rural, 14 areas	Sociodemographics, identify factors that influence physical activity participation, [and] explore how the rural context influences physical activity participation and promotion	Leisure activity	Interviews (semi-structured)

Table 2 Results From Each Article

ACADEMIC RESEARCH									
RURAL/URBAN FOCUS									
Study	Purpose/Aims	Methods		Demographics		Context		Physical Activity	
Author/Year		Design	Sample	Age	Gender	Setting	Indicators	Description	Measures
Barnett et al. 2008	Trajectories of leisure time physical activity	Quantitative, longitudinal 3 surveys	Size/ (N) 35	18+	Women, men	Rural, urban	Sociodemographics, health/ functional status, socio-economic profile, physical/neighbourhood environment (degree of urbanisation)	Leisure activity	Surveys (Canada Fitness Survey CFS, Campbell's Survey of Well-Being in Canada CSWB, Physical Activity Longitudinal Study PALS)
Belon et al. 2014	Perceptions of community and physical activity	Qualitative, community- based participatory research	Size/ (N) 35	Range 25–64	Women, men	Semi-rural, urban, 4 areas	Sociodemographics, socioeconomic profile, psychosocial attitudes/behaviours (perceptions of opportunities, barriers of physical activity), physical environment (neighbourhood), political environment	Leisure/ recreation activity	PhotoVoice

Table 2 (continued)

ACADEMIC RESEARCH									
Belon et al. 2016	Role of sociocultural environment on physical activity through community lenses	Qualitative, community- based participatory research	Size/ (N) 35	Range 25–64	Women, men	Semi-rural, urban, 4 areas	Sociodemographics, socioeconomic profile, psychosocial attitudes/behaviours (perceptions of opportunities, barriers of physical activity), sociocultural environmental attributes (aesthetics, safety, social involvement, motivation, cultural ideas of recreation, car culture)	Leisure/ recreation activity	PhotoVoice
Chan et al. 2006	Objective measures of physical activity and weather	Quantitative, longitudinal, (First Step Program FSP)	Size/(N) 203	Mean 44	Women, men	Rural, urban	Sociodemographics health/functional status, weather records	Walking	Pedometers, Activity logs
Kaplan et al. 2001	Demographic and psychosocial correlates of physical activity in late life	Quantitative, (Canadian National Population Health Survey NPHS 1996–1997)	Size/(N) 12,611	≥ 65	Women, men	Rural, urban	Sociodemographics, health/functional status, psychosocial attitudes/behaviours (psychological distress), social environment (perceived support), physical/neighbour-hood environment (geographic location)	In/frequent activity (moderate-intensity, duration)	Survey (NPHS)
Keats et al. 2017	Low levels of physical activity and multimorbidity in Atlantic Canada	Quantitative, cross-section (Atlantic Partnership for Tomorrow's Health PATH study)	Size/(N) 18,709	Range35-69	Women, men	Rural, urban	Sociodemographics, health/functional status, physical/ neighbour-hood environment (geographic location)	Leisure, sports, home-based activity, (in/active)	Survey (International Physical Activity Questionnaire. IPAQ)

Table 2 (continued)

ACADEMIC RESEARCH									
Merchant et al. 2007	Seasonal variation in leisure physical activity among Canadians	Quantitative, (Canadian Community Health Survey CCHS 2004–2005)	Size/(N) 20,197	≥ 19	Women, men	Rural, urban	Sociodemographics. physical/functional status, socio-economic status, season/weather records	Leisure activity (frequency, duration)	Survey (Minnesota Leisure-Time Physical Activity Questionnaire MLTPAQ modified Physical Activity Monitor)
Pelletier et al. 2021	Barriers to physical activity in rural and urban Canada	Quantitative, cross-section (Canadian Community Health Survey CCHS Barriers to Physical Activity Rapid Response 2017)	Size/(N) 24,499, 462	18+	Women, men	Rural, urban	Sociodemographics, health/functional status, psychosocial attitudes/behaviours (motivation), social environment (support, sense of belonging), physical/neighbour-hood environment (facilities), season		
Plotnikoff et al. 2004	Age, gender and urban-rural differences and physical activity	Quantitative, cross-section (Ontario Health Survey 1990)	Size/(N) 43,954	Range 18 > 60 4 groups 18–25, 26–45 46–59, 60+	Women, men	Rural, urban	Sociodemographics, psychosocial attitudes/behaviours social/physical environment	Leisure activity (frequency, duration)	Survey (U.S. National Health Interview Survey NHIS)

Table 2 (continued)

ACADEMIC RESEARCH									
Riva et al. 2007	Local area facility use for physical activity in Canada	Quantitative, (Public health infrastructurepolicies, and practices for promotion of physical activity in Canada project)	Size/(N) 3,191	Range 25–55	Women, men	Rural, urban (22 local areas, 3 regions)	Sociodemographics, socioeconomic profile, physical/neighbourhood environment (facilities)	Leisure activity (frequency, duration)	Interviews (telephone)
Spinney & Millward 2014	Active living among older Canadians	Quantitative, (General Social Survey on Time Use GSS-TU, 1992, 1998, 2005, 2010)	Size/(N) 1,382 (1992), 1,889 (1998), 3,589 (2005), 3,639 (2010)	15+, 4 groups 65–69 70–74 75–79 ≥80	Women, men	Rural, urban	Sociodemographics	Moderate, vigorous activity	Survey (Compendium of Physical Activities CPA Tracking Guide), Time-use diary
Yip et al. 2016	Social cohesion and physical activity in Canada	Quantitative, (Canadian Community Health Survey CCHS 2009–2014)	Size/(N) 245,150	Range 18–64	Women, men	Rural, urban 1570 groups	Sociodemographics, social environment (sense of belonging), physical/neighbour-hood environment	Activity (frequency, duration)	Survey (CCHS)

Because the literature search retrieved a low number of articles directly related to physical activity and older women living in rural Canada, some criteria *slippage* occurred (Baerta et al., 2011, p. 472; Nykiforuk et al., 2018, p. 421). Even though a wider age range (ages less than 65 years) comprised a number of the included articles, the resultant boundary *blurring* was carefully controlled by ensuring that the main selection criteria were priorised–for example, significantly more women than men in a mixed sample. It is also important to note that many of the articles sampling both women and men were population-level surveys. In all instances, only findings relevant to rural Canada were included in the results. (The term *rural areas* is used in preference to finer grained delineations in order to accommodate the full complement of articles related to rural Canada).

Data Extraction

The results are prefaced by an overview of the articles, together with a composite demographic profile. They are then presented in seven tables, followed by a detailed summary. Tables one and two provide a record of the characteristics of research studies only, while Tables three to seven feature key findings and related implications across all articles (studies, reviews, and reports). For convenience, the articles are categorised and sequenced in descending order: in Tables one and two (research studies)—at first, studies with an exclusively rural focus, then studies focused on both rural and urban settings; and for Tables three to seven (all articles)—studies (as above), reviews with a Canada-only focus, followed by reviews covering Canadian and international foci, and lastly, reports (all of which relate to Canada). To reduce the risk of interpretative bias, the results and implications recorded in Table 3, Table 4, Table 5, Table 6, Table 7 were quoted directly from the articles where feasible. Summaries (following) were then compiled to complement and expand the tabular results.

Results

Overview of the Articles

In general, the articles cover a broad spectrum of topics, approaches, socio-demographic indicators, contexts, and measures of physical activity.

The 19 research studies included qualitative and quantitative methods, with the five rural only studies employing a qualitative approach, and the remaining 12 studies are predominantly population based, employing quantitative methods. There is a relatively even spread across published dates, and although only two studies focus on women exclusively, 14 include older ages (65 years and over). A range of contextual indicators and physical activity measures are also utilised.

Eight reviews are included as well. As a group, they demonstrate considerable dissimilarity, encompassing an archival review, one scoping review, two systematic reviews, three literature reviews, and an international comparison. Their foci too, vary from neighbourhood built environment and walking, to climate change impacts

on health and wellbeing. Only one review was conducted prior to 2016, and not all reviews identify the number of included studies.

Four of the six reports are profiles compiled from Statistics Canada (national) data, with the remaining two situated at a provincial level. Again, the topics are relatively disparate, and extend from the transportation habits of older Canadians, to the socio-demographics of women in rural and remote communities.

Demographic Profile

Older adults aged 65 years and over comprised approximately 13.7 per cent of the Canadian population in 2006. The geographic distribution of these older Canadians varied across provinces, with the highest numbers located in Atlantic Canada (New Brunswick, Newfoundland and Labrador, Nova Scotia, and Prince Edward Island), Quebec, Saskatchewan, and British Columbia. In 2009, 22 per cent of older Canadians lived in rural and remote areas (Turcotte, 2012).

Although 68.5 per cent of women in Canada resided in metropolitan areas, the socio-demographic profile of women in rural and remote regions was characterised by population ageing–the average (median) ages of females in urban areas was 40.9 years and increased to 44.7 years in rural settings (Leclerc, 2021).

Age, gender, and locality also impacted the level of leisure-time physical activity in Canada. Keats et al., (2017) indicated that 82 per cent of Canadian adults (18–79 years) were physically inactive, particularly older women living in rural areas (Amini, 2022; Barnett et al., 2008; Gilmour, 2007; Yip et al., 2016). Again, provincial differences were noted, especially an east-to-west gradient, with older women in western Canada about twice as likely to be physically active than those in the Atlantic provinces (Gilmour, 2007; Kaplan et al., 2001).

Summary of the Results

Two frames of reference were chosen to summarise the results: namely, a social-ecological framework (Sallis et al., 2006) for findings, and Canada's "Let's Get Moving" (Federal Provincial and Territorial Physical Activity Framework Development Steering Committee, 2018) common vision for the implications of these findings.

Findings

Many authors advocate and adopt a multilevel approach to account for the various contributors to older adults physical activity (Pan et al., 2009; Rhodes et al., 2007)–in many instances, their choice relates to a social-ecological framework. In general, this framework outlines different layers of influence for the realisation of physical activity, including individual, social, organisational, societal, and political levels. It also accounts for the interconnectivity between the layers.

Individual/person related level of influence For older women, physical activity offered many benefits, namely: enjoyment (Graham & Connelly, 2013; Pelletier et al., 2021) and fun (Leipert et al., 2014); maintain independence (Graham & Con-

Table 3 Results From Each Article

RESEARCH STUDIES			
RURAL FOCUS			
Study (Author/s, date, focus)	Sample (Gender, age, location)	Findings	Implications
Graham & Connelly 2013 Shared values, beliefs, and behaviours related to exercise as self-care in older adults	Women, men ≥65 Maritime (Atlantic) provinces	"Participants perceived exercise broadly as movement and not as a central self-care behaviour [and] preferred exercise that was enjoyable and previously experienced." (p. 333) "Awareness of the importance and health-related benefits of exercise increased after a significant personal health-related event." (p. 333)	"Exercise for older adults may be [more] effective by focusing on enjoyable and previously experienced physical activity and incorporating guidelines/principles in relation to chronic conditions and potential health benefits." (p. 333)
Leipert et al. 2014 Curling and rural women	Women <65 (3 youth) Ontario, Manitoba, Nova Scotia provinces	The four main findings were: "building social connections, facilitating women's health and resilience, strengthening rural community life, and the past, present, and future of curling." (p. 130) Curling provided opportunities for "building social interactions which resulted in diverse friendships and personal strengths [and became] a catalyst for many of the women to take on additional sport and recreational activities at other times of the year." (p. 132) Rural "curling clubs represent a special gathering place, a hub of rural camaraderie and identity for all ages and abilities that open up new and exciting possibilities for women curlers and their rural communities." (p. 136)	"Past curling events instilled and reflected pride about the curling facilities, rural abilities, and rural communities" (p. 137) [but] "the sustainability and future of curling in isolated settings with low populations are precarious." (p. 139) "Further research is needed to reveal the significance and address the sustainability of curling and its important contributions to rural health and rural communities." (p. 127)
Mair et al. 2019 Curling clubs and women's health and wellbeing in rural Canada	Women, 12–72 Ontario, Manitoba, Nova Scotia provinces, North-west Territories	Participants "described how curling helped meet their health needs (physical, mental, and social) in the face of limited opportunities for socialising and being with friends." (p. 93) Participants also connected curling to "broader issues of health supports in their community." (p. 95)	[Curling enables] rural women "to craft opportunities to express their individual power to meet at least some of their health needs while their options are constrained by factors specific to rural life (choice, access, distance) and shaped by the contemporary political economic context." (p. 96) "Curling offers insights into one key way women meet these challenges; by 'making' health through self-care and community- care in their curling clubs." (p. 97)

Table 3 (continued)

RESEARCH STUDIES			
Paluck et al. 2006 Health promotion needs of rural women	Women 18+ Saskatchewan province	"Older women engaged in a balance of activities to promote their physical and mental health (keeping an "active mind." p. 113). Social support and the "rural way of life" were the most commonly reported community supports available to these women. Older women discussed the impact that loneliness and lack of appropriate exercise options had on healthy living in their community." (p. 111) "Cold weather and the travel distance to attend community activities were also considered barriers to exercise in the community." (p. 114)	"Health-promoting activities currently engaged in by the women, and the barriers and facilitators to staying healthy were found to differ for women of different ages." (p. 111)
Schmidt et al. 2016 Beliefs around physical activity among older adults in rural Canada	Women, men 69–94 Saskatchewan province	"Participants identified socio-ecological elements facilitating physical activity such as improved health, independence, and mobility, as well as social cohesion and having opportunities for physical activity. The most common perceived environmental barrier to engaging in physical activity was the fear of falling, particularly on the ice during the winter months. Participants also cited adverse weather conditions, aging (arthritis), and family members (encouraged to "take it easy") as barriers to physical activity." (e-abstract)	"Future programs and initiatives designed to increase physical activity participation among rural-dwelling older adults need to consider multilevel elements and their interactions to successfully promote and support physical activity." (e-discussion)
Witcher et al. 2007 Physical activity among older adults in rural Newfoundland Canada	Women, men Mean 82 Fogo Island	"Participants were socialized [from childhood] into a subculture of work activity. As a result of these historical and social forces, leisure-time physical activity did not form part of the participants' lives after retirement. Strategies for successful aging involved keeping busy, but this "busyness" did not include leisure-time physical activity." (p, 166)	The findings…"suggest that participants will most likely demonstrate a willingness to participate in activity that is deemed relevant and suitably purposeful or productive." (p. 179) "Results demonstrated the importance of developing a broader understanding of how past and present-day contexts can influence participation in leisure-time physical activity." (p, 166)

Table 3 (continued)

RESEARCH STUDIES			
Witcher et al. 2016 Physical activity perceptions and influences among older adults in rural Nova Scotia	Women, men Mean 77 Cape Breton Island	"Four factors that influence the prioritization of physical activity were historical context of activity, work, and productivity; already busy with day-to-day activities; being/staying on the go; cautionary approach (careful to limit their exertion and questioned the usefulness of participating in a variety of physical activities due to concerns about their capabilities and the perceived harmful effects)." (p. 115) "Physical activity participation within a leisure context more generally, could be foreign concepts" (p. 119)	(Physical activity) "promotion should be contextually salient, highlight the need for a shared understanding of what constitutes being "physically active". Effective promotion of physical activity among rural older adults may require a shift away from contemporary methods of physical activity promotion." (p. 115) "Promotional efforts would be better focused on activities perceived as relevant and to promote activities within an instrumental or "work", rather than a purely leisure, context. Physical activities need to be contextualized since participants may not be motivated to participate in leisure time physical activity, "for the sake of it", as a way to maintain health." (p. 123)

Table 4 Results From Each Article

RESEARCH STUDIES			
RURAL URBAN FOCUS			
Study (Author/s, date, focus)	Sample (Gender, age, location)	Findings	Implications
Barnett et al. 2008 Trajectories of leisure time physical activity	Women, Men 18+ Population Canada	"Four classes of activity were identified: inactive, increasers, active, decreasers. Women, older participants, those with lower household income, and with lower educational attainment, were significantly less likely to follow active (versus inactive) trajectories of leisure time physical activity." (e-abstract) "Compared with participants who lived in large urban areas in 1981, those who lived in rural areas were significantly less likely to follow a decreasing trajectory." (e-results)	"Longitudinal patterns of leisure time physical activity are strongly predicted by socio-economic and demographic factors. On a population scale, these findings suggest that social inequalities persist and may even be amplified over the life span." (e-conclusion)
Belon et al. 2014 Perceptions of community and physical activity	Women, men 25–64 Alberta province	"Participants' perceptions with respect to the enablers and restraints in their community environments were focused more on themes linked to the physical and sociocultural environments than those related to the economic and political environments." (p. 10)	"Sociocultural, economic, and political environments not only shape physical environments, but also play an important role in people's abilities and, therefore, should be given due consideration in future research and interventions." (p. 19)
Belon et al. 2016 Role of sociocultural environment on physical activity through community lenses	Women, men, 25–64 Alberta province	"Sociocultural environment is a complex, dynamic construct…that shapes beliefs, values, and practices, which, in turn, may foster or inhibit individual efforts to participate in physical activity." (p. e92) "Findings revealed six key themes…socio-cultural aesthetics, safety, social involvement, motivation for physical activity, cultural ideas of recreation, and car culture." (p. e95)	"This…study revealed how aspects of participants' sociocultural environments shaped their decisions to be physically active…Strategies should also account for the beautification and maintenance of communities, increasing feelings of safety, enhancement of social support among community members, popularization of physical activity, and mitigating car culture, among others." (p. e92)

Table 4 (continued)

RESEARCH STUDIES			
Chan et al. 2006 Objective measures of physical activity and weather	Women, men Mean 44 Prince Edward Island province	"Significant weather (conditions) impacting steps/day included: seasonal effects related to the interaction between weekday and month; mean temperature, total rainfall, interactions between gender, (body mass index) BMI and total snow, interactions between maximum wind speed and BMI, and the amount of snow on the ground. The estimated magnitudes for the various effects were modest, ranging from ~1% to ~20%." (e-abstract) "People with a strong commitment to physical activity…are willing to accept some unpleasant weather. Although temperature, rain and wind did have a significant effect, the actual changes in activity were relatively small." (e-discussion)	"Understanding the environmental factors that impact on physical activity is important for program coordinators and policy makers." (e-conclusion)
Kaplan et al. 2001 Demographic and psychosocial correlates of physical activity in late life	Women, men ≥65 Population Canada	"The decline of activity with age is noteworthy for both genders as is the increase in activity associated with education. Overall, men were more active than women. Social support is associated with increased physical activity for women but not for men, [whereas] psychological distress is associated with decreased physical activity for both women and men." (p. 308) "There is a strong relationship between geography and physical activity, with westerners and mid-continent individuals being more active than persons living on the eastern seaboard. Women outside the eastern region are roughly twice as likely to be physically active than their counterparts in the Atlantic provinces." (p. 309)	"Seniors (and especially older women) in the Atlantic region were notably less active than older Canadians elsewhere in the country." (p, 311) "From a public policy perspective, (this) regional variation in physical activity is noteworthy." (p. 311)
Keats et al. 2017 Low levels of physical activity and multimorbidity in Atlantic Canada	Women, men 35–69 Atlantic provinces	"Multimorbid individuals were significantly more likely to be physically inactive after adjusting for key sociodemographic and lifestyle characteristics. Additionally…the magnitude of the effect between multimorbidity and physical activity was stronger for men than women. Our findings…suggest that rural residents are more likely to be physically inactive and to report poorer health related outcomes (higher prevalence of obesity and chronic disease)" (p. 328)	"Given the generally low levels of physical activity across populations and a growing prevalence of multimorbidity, there is a need for a prospective study to explore causal associations between physical activity, multimorbidity, and health outcomes." (p. 326)

Table 4 (continued)

RESEARCH STUDIES			
Merchant et al. 2007 Seasonal variation in leisure physical activity among Canadians	Women, men ≥19 Population Canada	"Between about half and two thirds of all Canadians were inactive during the year. However, Canadians were substantially more physically active (31–48%) in the summer than in winter after accounting for age, sex, education, income adequacy and other potential explanatory factors. Season was a stronger predictor of physical activity in Saskatchewan, British Columbia, New Brunswick, and Prince Edward Island as compared with Newfoundland and Labrador." (p. 206)	"Seasonality impacts physical activity patterns in Canada" (p. 207)…[and] "additional studies to characterize the association between physical activity and daily temperature and precipitation are warranted." (p. 206) "The association between seasonality and physical activity is different across the provinces This needs to be taken into account in the development of programming for physical activity." (p. 207)
Pelletier et al. 2021 Barriers to physical activity in rural and urban Canada	Women, men 18+ Population Canada	"Over 70% of rural residents reported at least one environmental barrier and, after adjusting for sociodemographic factors, over 50% reported not having access to free or low-cost facilities in their neighbourhood. There were no interactions between sociodemographic factors and location in predicting barriers to facility access, suggesting facility access is an issue for rural residents independently of self-identified sex, age, income, education, body mass index (BMI), perceived health, sense of belonging and season of data collection." (e-discussion) "Rural residents showed 85% higher odds of reporting at least one social or built environmental barrier…[such as] facility access and a lack of social support to be active. Interactions between socioeconomic status and location were identified related to enjoyment and confidence to be active. There was no effect of location on predicting an individual resource-related variable (time, energy)." (e-abstract)	"Despite being more likely than urban residents to prefer and enjoy physical activity, rural residents have fewer opportunities and receive less social support to be active. It is important to consider geographic location when characterizing barriers to physical activity and in the development of context specific health promotion strategies." (e-abstract)
Plotnikoff et al. 2004 Age, gender and urban-rural differences and physical activity	Women, men 18–60+ Ontario province	"A number of correlates of physical activity (proportion of friends who exercise, injury from past physical activity, educational level, perceived health status, and alcohol consumption) were identified as being significant across all subgroups examined. Most differences in [these] correlates were found within different age groups rather than among urban and rural residents and gender." (p. 1115) "[However], women residing in urban areas were more likely to be inactive in comparison to women residing in rural areas." (p. 1123)	"Consistent results of social support, especially participation with others in physical activity, suggest that targeting this variable in intervention studies may be an effective method of increasing physical activity levels. Findings from this large population-based study extend the importance of social support to different age groups, men and women, and urban and rural locations." (p. 1119)

Table 4 (continued)

RESEARCH STUDIES			
Riva et al. 2007 Local area facility use for physical activity in Canada	Women, men 25–55 Ontario, Alberta, Quebec provinces	"Women living in local areas located in small urban areas were significantly more likely to use facilities in their local area for involvement in physical activity than women residing elsewhere. In more affluent local areas, women were significantly more likely to use local facilities. The number of physical activity organizations per 1000 residents was not significantly associated with the outcome." (p. 233) "Selected local area characteristics explained the between area variations in outcome which suggests that characteristics of the built and social environment might be crucial in investigating local facility use for physical activity over and above individual characteristics." (p. 234)	"Results reported in this paper indicate that both individual and local area characteristics are associated with the likelihood of using local facilities to engage in physical activity, but that the correlates differ across women and men. This suggests that policies and environmental interventions to promote physical activity might be more effective if a gender-specific approach is adopted. Also, using facilities for physical activity appears to be influenced by local area characteristics, independent of the characteristics of local population. This implies that environmental and policy interventions aimed at creating opportunities for engaging in physical activity, in conjunction with individual-oriented interventions, holds promise in increasing activity levels of population." (p, 234)
Spinney & Millward 2014 Active living among older Canadians	Women, men 15+ Population Canada	"Results indicate that 41.1% of older Canadians met recommended levels of physical activity in 1992, 40.6% in 1998, 43.5% in 2005, and 39.6% in 2010. Both rates of active living and daily duration of aerobic activity exhibit significant differences among sociodemographic groups, with age, sex, activity limitation, urban-rural, and season exhibiting the most significant influences." (p. 103) "Except for data from 2005, seniors living in rural areas exhibit significantly higher rates of active living than urban seniors, while median minutes per day of aerobic activity are higher for rural respondents over all four survey cycles (1992, 1998, 2005, 2010). Seasons have a significant impact on both rates of active living and daily duration of aerobic activity. Spring and summer exhibit the highest rates of active living, while winter and autumn are significantly lower." (p.107)	"This research has shown that only around 40% of older Canadians meet the current guidelines for physical activity…and underscore the need for positive policy interventions to improve rates of active living among seniors. To mitigate the impact of weather and seasons, programs and interventions are often aimed at increasing daily amounts of aerobic activity at indoor facilities. However, these structured activities require high levels of transport mobility…[and may] benefit from a community focus that promotes active modes of transportation (walking and, to a lesser extent, bicycling)… " (p. 111)

Table 4 (continued)

RESEARCH STUDIES			
Yip et al. 2016 Social cohesion and physical activity in Canada	Women, men 18–64 Population Canada	"Physical activity level tended to decline with age and increase with household income, education, and social cohesion. Overall, males tended to be more physically active than females, and residents of rural areas tended to be more physically active than their urban counterparts." (p. 720) "The finding that geographically-defined communities account for a significant proportion of the variation in physical activity suggests that the contextual effect of residing in a specific area may influence physical activity behaviour." (p. 721)	"Results…suggest that both an individual's extent of social inclusion and the contextual effect of the overall level of social cohesion in his or her community are positively associated with physical activity. These findings indicate that improvements in an individual's sense of cohesion in the local community and the overall level of social cohesion of that community could both be associated with increases in physical activity." (p. 722)

Table 5 Results From Each Article

REVIEWS			
CANADA FOCUS			
Review (Author/s, date, focus, type of review)	Scope	Findings	Implications
Brooks-Cleator & Giles 2016 Gaps and opportunities of physical activity policy for older adults in the Canadian North West Territories. Archival review	Policies NorthWest Territories	"Although the majority of the organisations had no physical activity policies specific to older adults…some organisations completed all five stages of policy cycle (agenda setting, policy formulation, decision making, implementation, and evaluation)." (p. 169) Analysis of policies concerning older adults and physical activity of both the Northwest Territory government and non-government organizations in the health, recreation, and sport…indicated that physical activity for older adults is not on the agenda for many organizations in the Northwest Territories and that often the policy process does continue past the decision-making. (p. 174)	"The need for connections between all stages of the policy cycle [may be addressed through] organizations collaborating across multiple sectors and with older adults to develop a territory-wide, age-friendly rural remote community strategy that is applicable to the Northwest Territories. Prioritizing age-friendly communities would, in turn, facilitate appropriate physical activity opportunities for older adults in the Northwest Territories and thus contribute to a healthier ageing population. (p. 169)
Farkas et al. 2019 Neighbourhood built characteristics and walking among Canadian adults. Systematised literature review	25 studies	"Most studies included data from a single Canadian province. All but two studies were cross-sectional. Objectively measured walkability, land use mix and destination proximity are associated with walking outcomes among Canadian adults. Recreational walking is studied less frequently than transportation walking or walking for any purpose." (p. 1)	"Our review findings suggest that the built environment is potentially important for supporting adult walking. Overall walkability, land use and proximity to destinations appear to be important given their association with transportation walking and walking for any purpose." (p.1)

Table 5 (continued)

REVIEWS			
Gadais et al. 2018 Environments favourable to healthy lifestyles. Systematic review of initiatives in Canada	264 studies	A sharp increase in the number of studies on environments favourable to healthy lifestyles was observed between 2010 and 2015 (57%). Two major lifestyle components— physical activity and nutrition—and 2 environmental aspects—neighborhood and built environment—were the elements most frequently examined regarding adults (48%), young people (34%), and seniors (9%), using quantitative (60%) and qualitative (18%) methods. (p. 7) Canadian research appears to define the concept of environments favourable to healthy lifestyles based on the environment (land use patterns, urban design characteristics, transportation system) and the influence of the local community and social relations. (p. 14) Our findings reveal that studies on seniors are few and far between. This silence is problematic because the elderly population in Canada is growing rapidly, and targeted solutions are needed. We also noticed there were few studies on girls and women ($n=2$). (p.14) The analysis reveals a greater focus on the municipal (53%) than the national or provincial levels (31%). (p.1, 14)	In terms of environments favourable to healthy lifestyles development across Canada, recommendations for improving physical activity include facilitating and encouraging access to active transportation by means of safe and attractive infrastructures (walking and cycling paths, parks, and services). The review outlines a new research agenda that includes dimensions of environments favourable to healthy lifestyles formerly neglected by researchers, namely, political and sociocultural spheres of action. (p. 15)

Table 6 Results From Each Article

REVIEWS			
CANADA INTERNATIONAL FOCUS			
Review (Author/s, date, focus, type of review)	Scope	Findings	Implications
Chan & Ryan 2009 Assessing the effects of weather conditions on physical activity participation using objective measures. Systematic Review	17 studies	"The number of published studies is small, but in general the data confirm the perception that precipitation has the largest correlation with physical activity. This correlation is generally negative but snow may, in fact, increase physical activity in men. In addition to gender, body mass index, socioeconomic status, the purpose of the activity and the age of those observed have been identified as potential contributing factors. [However] all of the reports to date have been observational studies; thus, causation is inferred but not proven." (p. 2650)	"Additional studies, conducted across a range of climactic zones, will be helpful in developing physical activity promotional materials and interventions that take the weather into account. Physical activity interventions that utilize outdoor spaces and facilities need to consider how to counteract the negative impact of precipitation; for example, by suggesting alternative indoor activities and emphasizing the need for protective clothing and proper footwear. Alternatives to walking, such as skating, snowshoeing and cross-country skiing, can be promoted in cold climates to take advantage of the snow. Furthermore, the limited data suggesting that individuals may be motivated to continue despite inclement weather merits further investigation as to how this potential can be maximized." (p. 2650)

Table 6 (continued)

REVIEWS			
Kipp et al. 2019 Climate change impacts on health and wellbeing in rural and remote regions of Canada. Literature synthesis	Not noted	"Many changing climate conditions and resultant environmental impacts negatively affect individual and community health and wellbeing in rural and remote regions, including: increased prevalence and severity of extreme weather events; changes to sea ice, vegetation…and water; and weather and environmental uncertainties. Characteristics of rural and remote regions may increase the sensitivity to health risks, such as remote geography and limited transportation infrastructure, reliance on natural resources, and under- resourced social and physical infrastructure. Additionally, vulnerability to climate change is influenced by the intersection of social, cultural, and political factors in rural and remote regions as well as individual characteristics and circumstances. The literature highlights Indigeneity, age, gender, and socioeconomic status as key factors influencing individual and community vulnerability to climate change in rural and remote regions." (p. 123)	"This synthesis highlights the importance of considering the specific socio-cultural, economic, and geographic elements and existing expertise of individuals and communities in rural and remote regions." (p. 122)
Luiu et al. 2017 Unmet travel needs of older population Literature review	29 studies	"Unmet travel needs can be defined as trips and activities that people need or would like to do more, but for a variety of reasons they are prevented from doing so." (p. 489) "On average at least one-third of older people report unmet travel needs. This situation was found to worsen with age, and women were reported to be more affected than men. The pursuit of leisure, and in particular visiting friends and family, was found to be the activity most associated with unmet travel needs." (p. 494) Barriers to older persons travel include health issues (impairments): transport issues (older people are less familiar with alternative transport solutions to cars in their local area, flexible/shuttle transport priorisation of medical needs rather pursuit of leisure activities, lack of rural infrastructure (sidewalks), and the more frequent longer distances to destinations inhibit walking and cycling); socio-demographic aspects; impact of the built environment (topography). (pp. 494–501)	"It is important to understand the difference between the activities older people need to do more and the ones they wish to do more." (p. 502) Three main issues need to be addressed by future policies and studies: gender effects, increased demand for leisure activities, ageing in place. (p. 503) "There is a need for more investigation of leisure activities and factors that influence these, as well as mobility patterns, accessibility, travel choice and lifestyle in order to meet not just basic and necessary needs." (p. 503)

Table 6 (continued)

REVIEWS			
Turrisi et al. 2021 Seasons, weather, and device measured movement behaviours Scoping review 2006–2020	110 studies	"Both physical activity volume and moderate-to-vigorous physical activity were greater in summer than winter. Sedentary behavior was greater in winter than either spring or summer, and insufficient evidence existed to draw conclusions about seasonal differences in light physical activity. Physical activity volume and moderate to vigourous duration were positively associated with both the photoperiod and temperature, and negatively associated with precipitation. Sedentary behavior was negatively associated with photoperiod and positively associated with precipitation." (e-abstract)	"Insufficient evidence existed to draw conclusions about light physical activity and specific weather indices. Many weather indices have been neglected in this literature (air quality, barometric pressure, cloud coverage, humidity, snow, visibility, windchill). The natural environment can influence health by facilitating or inhibiting physical activity. Behavioral interventions should be sensitive to potential weather impacts." (e-abstract)
Unsworth et al. 2021 Linking non/older drivers and activities through community mobility International comparison	7 countries	"Mobility patterns of drivers and non-drivers were compared in terms of city and rural areas, weather, as well as their respective differences in the number of out-of-home places accessed and quality of life. Results suggested inclement weather and place of residence negatively impacted out-of-home activities, but did not increase use of public transportation. Drivers accessed more out-of-home activities than non-drivers, suggesting higher community participation among this group, and quality of life was generally high among all participants, but slightly higher for drivers." (p. e1)	"Findings indicate that a complex myriad of factors can influence community mobility in older adults and further investigations are needed to understand patterns of transport in later life, particularly with regard to those factors that promote and maintain transport mobility, and relationships between transport mobility, community participation and quality of life." (p. e1)

Table 7 Results From Each Article

REPORTS			
Report (Author/s, date, focus, type of report)	Sample (Gender, location)	Findings	Implications
Amini 2022 Health and wellbeing of women/girls in remote communities in Canada. Statistical portrait	Women Population Canada	"The prevalence of women meeting the Canadian Physical Activity Guideline CPAG's recommendation was significantly lower in more remote communities – the largest difference was observed in very remote areas, where 46.7% of women met the guideline, compared with 53.5% in easily accessible areas. Conversely, compared with women living in easily accessible areas, no physical activity according to the CPAG was significantly more prevalent among those living in less accessible, remote and very remote areas. About one in five women in easily accessible areas (21.4%) reported no physical activity minutes according to the CPAG, while the proportions were approximately one in four in less accessible (25.2%) and remote areas (24.4%) and more than one in four in very remote areas (27.5%)." (p. 7)	"Women and Indigenous women aged 18 years and older who lived in very remote areas reported the lowest physical activity levels of all remoteness area categories. While physical activity is only one health behaviour indicator among many others, it may not be a coincidence that women living in more remote areas reported both lower physical activity and lower perceived health – especially when…Canadians who are not physically active usually fare worse than those who are physically active on many health measures. It is unknown if there were culturally safe and inclusive services in these remote areas, but studies have argued that services as such might be important to promote physical activity." (p. 8)
Dechaine & Witcher 2007 Rural route to active ageing in Alberta. Focus groups	Women, Men Alberta province	"Walking was the most common physical activity. Participants recognized the value of a physically active lifestyle (and reported physical, psychological and social benefits), many had not been regularly physically active pre-retirement, [and the] decision to adopt a more physically active lifestyle was often motivated by a physical health problem." (p. 5) "Participants perceived a lack of opportunities for physical activity, especially related to the weather [for example] fear of slipping and falling on snow. Participants may need information on indoor activity options (especially during the winter) as well as information on "safe" activity options (mall walking, benches near the outdoor track at the local school or ensuring that main trails are maintained year round for safe walking)." (p. 6)	"Rural seniors face more barriers than their urban counterparts to being physically active. There is also a lack of resources and information about physical activity suited to older adults living in rural communities." (p. 8)

Table 7 (continued)

REPORTS			
Gilmour 2007 Physically active Canadians Statistical report	Women, men Population Canada	"Physically active leisure time is more common among men than women. A higher percentage of men than women reported being at least moderately active in their leisure time, particularly at younger (less than 34) and older (65 or older) ages. On the other hand, nearly 2 million Canadians (8%) reported no or very little physical activity…a higher percentage of women than men (8% versus 7%), and for older rather than younger people (14% of seniors aged 65 or older versus 4% of 12- to 17-year-olds). Many who reported low levels of physical activity also reported activity restrictions (46%), which may, in part, account for their inactivity." (p. 45) "In 2005, Canadians' most popular leisure-time physical activity was walking. A majority of men and women (64% and 76%, respectively) reported walking in their leisure time in the past three months… Active people also reported participating in more types of leisure-time physical activities in the past three months (an average of 6), than did moderately active (4) or inactive (2) individuals." (pp. 46–47)	"The health benefits of physical activity are numerous and well-documented—a reduced risk of cardiovascular disease, some types of cancer, osteoporosis, diabetes, obesity, high blood pressure, depression, stress and anxiety. The economic impact of physical inactivity can [also] be substantial and has been estimated at $5.3 billion, or 2.6% of total health care costs in Canada in 2001.Even so, close to half (48%) of Canadians aged 12 or older, 12.7 million people, were inactive in their leisure time in 2005, meaning that they did the equivalent of less than a half hour of walking per day. As well, 25% (6.6 million) reported that they usually sit most of the day." (p. 45)
Leclerc 2021 Sociodemographics of women in rural and remote Canadian communities Statistical profile	Women Population Canada	"Population aging and the aging of the workforce have been evident in Canada's overall population. However, given that the age structure of the female population differed by varying levels of remoteness, the aging intensity varied from one remoteness area category to another. Less accessible and remote areas had a more pronounced aging phenomenon than the rest of Canada (with higher female median ages and percentages of senior women combined with lower proportions of women in the core working age), while very remote areas had the youngest female median age, the lowest proportion of women aged 65 years and over and were the only areas where the proportion of potential labour force entrants was higher than potential retirees." (p. 4)	"…less accessible and remote areas fared worse than any other remoteness area categories on all but one indicator used to measure the extent to which a population is aging. This higher share of senior women, combined with a low proportion of working age women, likely puts pressure on the workforce and on the federal, provincial or territorial, and municipal public programs and services (senior dependency), such as health and pension systems." (p. 14)

Table 7 (continued)

REPORTS			
Skinner & McCrillis 2019 Services for an aging rural population in Ontario. Foresight papers	Women, men Ontario province	"Public transportation is normally required for those with mobility challenges or as an alternative to driving." (p. 15) "Older people typically relate transportation access directly to their quality of life, particularly those who are single or live alone, are recently widowed and have health challenges. The ability to drive privately owned vehicles provides access to community services in the local or wider area, and public transportation programs typically do not exist." (p. 14) "Informal familial and social transportation resources may be available for some older people; however, consistent dependence may not be realistic or preferable. Most older people continue to drive given its importance to service access." (p. 15)	"Paratransit services may use smaller accessible vehicles with a flexible scheduling program, or door-to-door services through local healthcare organizations. Though these options are more flexible than public transportation, they may require longer-term bookings and significant wait times for riders. Sustainability challenges exist when these initiatives are municipally driven, however coordination of transportation policies at a larger regional level through comprehensive transportation strategies may be an effective alternative." (p. 15)
Turcotte 2012 Seniors' transportation habits Statistical profile	Women, Men Population Canada	"The current generation of seniors comprises a large number of women who have never driven. As a result, there is a substantial gap between the sexes with regard to having a driver's licence, particularly in the 85-and- over age group. In 2009, 67% of men aged 85 and over living in private households had a driver's licence, compared with 26% of women. The dependence of elderly women on their spouse or relatives and friends for transportation is expected to decline sharply in the future, since nearly as many women as men in the 45-to-64 age group have a driver's licence." (p. 3) "For both men and women, the proportion needing help getting around increased rapidly with more advanced age (28% of men and 54% of women aged 90 and over). This may be a problem, since the size of seniors' social networks tends to shrink as they age, while their need for assistance with transportation tends to grow." (p. 14) "The proportion of women aged 85 and over with a driver's licence varied by province, from 14% in Quebec to 44% in Saskatchewan" (p 7). "The association between income level and having a driver's licence, as well as the likelihood of having driven a car in the past month, was clearer among senior women than men. Among women, each increase in income quintile was associated with a substantial increase in the likelihood of having driven." (p. 8) "For women aged 85 and over however, transportation problems were the second most common reason after health problems for not participating in more social, recreational or group activities (24%). Transportation problems were mentioned by 10% of women aged 75 to 84." (p. 15)	"Older senior women are most likely to be limited in their day-to- day travel, either because they are passengers who have no driver's licence or, for those aged 85 and over, because they have to use accessible transit. Furthermore, 54% of women aged 90 and over needed assistance with transportation." (p. 16) "Seniors' main form of transportation is linked to their level of participation in social activities— such as family, educational or cultural activities done with others. In fact, seniors who mainly got around by driving their car or as a passenger with their own driver's licence were more likely to participate in such activities. Seniors who mainly travelled as a passenger without a licence or by using accessible transit or taxis were less likely to participate. People who depend on others for transportation have a greater tendency to be reluctant to ask for assistance in getting to leisure activities compared with activities perceived as more essential." (p. 14)

nelly, 2013) and ability to continue living in own home (Schmidt et al., 2016); well-being (Leipert et al., 2014); physical, social, and mental health (Mair et al., 2019); psychosocial stress reduction, social support, intellectual stimulation (Paluck et al., 2006); resiliency (Leipert et al., 2014); personal growth and confidence (Leipert et al., 2014; Pelletier et al., 2021); opportunities for socialisation (Graham & Connelly, 2013; Leipert et al., 2014); catalyst for engaging with other activities (kayaking, hiking, skiing) (Leipert et al., 2014). It also helps the women manage health problems (Dechaine & Witcher, 2007; Graham & Connelly, 2013), and cope with long dark cold winters (Leipert et al., 2014).

Although walking was the most common activity (Dechaine & Witcher, 2007; Farkas et al., 2019; Gilmour, 2007), work (domestic chores and physical labour) (Witcher et al., 2007), gardening and home repairs) (Belon et al., 2014), singing and motor cycling (Dechaine & Witcher, 2007) were regarded as physical activity as well. The related perception that "exercise is movement" (Graham & Connelly, 2013, p. 336), encompassed utility activity and leisure (Graham & Connelly, 2013), and a balance of activities (Paluck et al., 2006). Some women pursued a proactively active living approach to their daily activities (Dechaine & Witcher, 2007), whereas others viewed physical activity as work (Witcher et al., 2007), with leisure regarded as a foreign concept (Witcher et al., 2016). Additionally, older women were less likely to follow active, versus inactive, trajectories of physical activity (Barnett et al., 2008).

Participation in physical activity was facilitated by previous experience (Graham & Connelly, 2013); active role models (Plotnikoff et al., 2004); availability of resources (curling rink, walking club, golf links) (Paluck et al., 2006); encouragement by others (family and friends) (Dechaine & Witcher, 2007); and social inclusion (Yip et al., 2016).

Alternatively, many of the women faced considerable restrictions to their engagement with physical activity, including barriers related to: the individual– busyness (work), no discretionary time (Dechaine & Witcher, 2007; Witcher et al., 2016), and a cautious "take it easy" approach to activity (Schmidt et al., 2016; Witcher et al., 2016, p. 122); health status–scepticism about health benefits (Witcher et al., 2007), health challenges (pain, Plotnikhoff et al., 2004), physical and functional impairments (Schmidt et al., 2016; Spinney & Millward, 2014), fear of falling (Dechaine & Witcher, 2007; Schmidt et al., 2016), and multimorbidity (Keats et al., 2017); social environment–loneliness, social isolation (Paluck et al., 2006), social support (Pelletier et al., 2021), and family not close (Schmidt et al., 2016); physical environment–cold, ice, slush, strong winds (Dechaine & Witcher, 2007; Schmidt et al., 2016), rain, snowfall, and depth of snow (Chan et al., 2006; Chan & Ryan, 2009), winter season (Chan et al., 2006; Chan & Ryan, 2009; Gilmour, 2007; Merchant et al., 2007; Spinney & Millward, 2014), perceived safety (fear of darkness) (Dechaine & Witcher, 2007; resources–access, cost of recreation (gym, memberships, distance) (Belon et al., 2014; Pelletier et al., 2021; Riva et al., 2007; Schmidt et al., 2016), built environment (Farkas et al., 2019); and transportation–lack of transport (Dechaine & Witcher, 2007; Kipp et al., 2019), car culture (Belon et al., 2014); no driving licence (Turcotte, 2012).

Some of these characteristics present as both enablers and inhibiters of physical activity. On one hand, family members encouraged physical activity, while on the other, they adopted ageist *too old* (Schmidt et al., 2016) and *take it easy* (Witcher et al., 2016) attitudes. Similarly, car ownership allows access to distant recreation and leisure facilities, but also discourages physical activity (Belon et al., 2014). And although physical activity may be valued by the older women, in practice, "it would probably be pointless for them." (Witcher et al., 2016, p. 121).

Social/relational related level of influence As noted previously, engaging with other adults, such as family (Schmidt et al., 2016), peers (Belon et al., 2014), and community (Paluck et al., 2006) was a beneficial adjunct to the women's participation in physical activity (Plotnikoff et al., 2004). The older women regarded their social interactions (intentional and as part of daily routine) (Schmidt et al., 2016) as contributing to an active mind (Paluck et al., 2006). Physical activity in a social milieu forged community connections ("curling family" Leipert et al., 2014, p. 130), and fostered inclusivity and intergenerational solidarity, strengthened relationships, and expanded social networks (Leipert et al., 2014). However, rural residents have fewer opportunities and receive less social support to be active, than residents of urban areas (Pelletier et al., 2021).

These social relations were also impacted by the local socio-cultural environment. According to Belon et al., (2016), the "sociocultural environment is a complex, dynamic construct: it encompasses the community's social and cultural context that shapes beliefs, values, and practices, which, in turn, may foster or inhibit individual efforts to participate in physical activity." (pp. e92-e93) Here, the older women's opportunities to engage with leisure-time and recreational activities were often limited by age and ageist attitudes and beliefs as in Witcher et al.'s (2007, 2016) studies. The devaluing and marginalisation of non-work related activity was also adopted by some of the older women who raised concerns about the acceptability of some types of physical activity (Witcher et al., 2007). Different types of activity were ranked by the women in Graham and Connelly's (2013) study as well.

Organisational/community related level of influence However, participation in physical activity was reinforced by social cohesion (Yip et al., 2016), and a strong sense of belonging, investment, and ownership of the community (Graham & Connelly, 2013; Paluck et al., 2006) for the majority of the women. In fact, Yip et al., (2016) found that the association between community-level social cohesion and physical activity was approximately twice greater than the association between individual-level social cohesion and physical activity. Collectively identified as the *rural way of life*, these inter-relationships were instrumental in providing environments favourable to healthy lifestyles, including physical activity (Gadais et al., 2018). For example, women in local areas in small urban regions were significantly more likely to use local facilities for physical activity than women residing elsewhere (Riva et al., 2007).

Despite the importance of safe, supportive, and accessible community environments in facilitating physical activity, Schmidt et al., (2016) and Pelletier et al.,

(2021) suggest that facility access (social and built environmental barriers) is a challenge for rural residents. Both Paluck et al., (2006) and Skinner and McCrillis (2019) signal that adequate resources for physical activity, such as community infrastructure (access to parks and recreation facilities) and proximity to services or public transportation, may be limited in rural areas. The availability and condition of sidewalks, trails, natural spaces, and recreational resources (Belon et al., 2014; Farkas et al., 2019) underscore the mutuality between the physical environment and physical activity.

Community transportation issues are equally influential, whereby people who depend on others to provide transport are more reluctant to request travel assistance for leisure activities compared with more essential needs (Luiu et al., 2017; Turcotte, 2012). Hence, older people will utilise poor facilities and conditions in the absence of an alternative, and/or unrealistic travel distance to other facilities (Belon et al., 2014), and persevere with their activity in inclement weather (Chan et al., 2006). This determination underscores the resolve of older women to orchestrate their health and wellbeing in the face of limited resources and social outlets (Mair et al., 2019).

Society related level of influence These interdependencies are also impacted by Canada-wide, cross-cutting influences on physical activity among older women, namely, geographic location, climate change and weather, and travel and driving. For example, Kaplan and Newsome (2001) and Merchant et al., (2007) propose that the east-to-west gradient in physical activity levels in Canada is related to a more temperate climate in British Columbia (western Canada), as well as other cultural and environmental differences (Kipp et al., 2019). Additional studies suggest that older adults in rural and remote regions are vulnerable to severe weather conditions (Chan & Ryan, 2009), and seasonal (Turrisi et al., 2021) and climatic changes (Kipp et al., 2019), with obvious implications for transportation and travel (Unsworth et al., 2021). An extensive review of unmet travel needs by Luiu et al., (2017) found that at least one-third of older people, especially women and adults 75 years old and above, were affected by limited transportation options. This finding has particular resonance for older women who are non-car drivers (Turcotte, 2012), and in a rural setting, may restrict their community engagement and participation in a range of out-of-home activities (Unsworth et al., 2021, p. e21).

Government/policy related level of influence The comparison of the mobility patterns of older adults by Unsworth et al., (2021) attests to the complexity and interconnections embedded in providing adequate transportation and infrastructure to support active living for older adults. At a neighbourhood level, local government initiatives are critical (Dechaine & Witcher, 2007), and may involve clearing sidewalks of snow build-up and debris during winter (Belon et al., 2014), extending access to recreational facilities (Belon et al., 2014), maintaining and expanding physical activity opportunities (Paluck et al., 2006), and financial assistance and sponsorship for small community-based organisations (Paluck et al., 2006).

Governmental support at a provincial level also plays an integral part in driving physical activity in rural and remote regions. However, policy directives are not

always translated into practice, as identified by Brooks-Cleator and Giles (2016) in their investigation of physical activity policy for older adults in the North West Territories of Canada. There, the political landscape is largely devoid of policies, programmes, and opportunities for older residents to participate in physical activities.

Implications

"Let's Get Moving" (Federal Provincial and Territorial Physical Activity Framework Development Steering Committee, 2018) offers a common vision for increasing physical activity and reducing sedentary living in Canada. It is a national (except for the province of Québec) strategy that sets out six areas of focus for collaborative action: cultural norms, spaces and places, public engagement, partnerships, leadership and learning, and progress. As such, these *imperatives* form a fitting platform on which to summarise the implications arising from the articles selected in the review.

Focus on cultural norms The "Let's Get Moving" (Federal Provincial and Territorial Physical Activity Framework Development Steering Committee, 2018) strategy defines cultural norms as establishing social values and beliefs that contribute to making physical activity the default choice (p. 28), in effect, movement as a social norm. This socio-cultural perspective is reflected in some of the articles; for example, Witcher et al., (2016), who advocate for a shared understanding of what constitutes being "physically active", and recommends aligning activity to work. Other authors stress the value of the social environment, particularly in rural settings, where residents have fewer opportunities and receive less social support to be active (Pelletier et al., 2021). In this context, social support (Belon et al., 2014; Plotnikoff et al., 2004), and individual and collective social inclusion and cohesion (Yip et al., 2016), and culturally safe and inclusive services (Amini, 2022) are vital.

Focus on spaces and places Here, the "Let's Get Moving" (Federal Provincial and Territorial Physical Activity Framework Development Steering Committee, 2018) emphasis on a physical movement environment to support all forms of community is echoed in Leipert et al., (2014) and Mair et al.'s (2019) descriptions of curling and curling clubs in rural Canada. "Pride about the curling facilities, rural abilities, and rural communities" (Leipert et al., 2914, p. 137) underscores the synergy between the physical environment and activity, and encompasses neighbourhood walkability, land use, proximity to destinations (Farkas et al., 2019), and safe and attractive infrastructures (Belon et al., 2014; Gadais et al., 2018). The natural environment too, can facilitate or inhibit physical activity (Turrisi et al., 2021), with Chan & Ryan (2009), Kaplan et al., (2001), and Merchant et al., (2007) demonstrating that geography, seasons, and weather significantly affect activity in rural areas.

Focus on public engagement Mair et al., (2019) conclude that many options for physical activity are constrained by various conditions of rurality (choice, access, distance), with the use of recreational facilities influenced by local area characteristics, independent of the characteristics of local population (Riva et al., 2007). For Belon et al., (2014) and Unsworth et al., (2021), rural and remote regions are also

shaped by the socio-cultural, economic, and political environments, and revealed by the existing expertise of individuals and communities.

Focus on partnerships Partnership working in rural areas may be characterised by Mair et al.'s (2019) representation of curling clubs as "making health through self-care and community-care." Along similar lines, Brooks-Cleator and Giles (2016) recommend that multi-sectoral organisational partners collaborate with older adults at all stages of the policy cycle to develop age-friendly policies in Canada's North West Territories. And according to Skinner and McCrillis (2019), and Unsworth et al., (2021), community and transport mobility, community participation, and quality of life are important collaborative considerations for transportation policies at a larger regional level.

Focus on leadership and learning Building robust leadership and learning networks around physical activity among older adults living in rural Canada rest on a long-lens historical perspective (Witcher et al., 2007) of activity patterns (Luiu et al., 2017). These may incorporate socio-economic and demographic factors (Keats et al., 2017); positive policy interventions (Spinney & Milward. 2014), embracing political and socio-cultural spheres of action (Gadais et al., 2018); research exploring gender effects, and causal associations between physical activity, multimorbidity, and health outcomes (Keats et al., 2017); and finally, the sustainability of rural communities (Leipert et al., 2014) in relation to accessibility, travel choice and lifestyle, and ageing in place (Luiu et al., 2017). And according to Leipert et al., (2014) and Mair et al., (2019) curling clubs are exemplars of physical activity leadership and learning opportunities in small rural communities.

Focus on progress Although the remit of this review is not to comment on "what is working" (progress) per se, this summary provides selected insights about the implications of physical activity in rural populations, specifically older women, in Canada. These implications are most relevant to the Let's Get Moving (Federal Provincial and Territorial Physical Activity Framework Development Steering Committee, 2018) focus areas related to socio-cultural norms, community (public) engagement, and the partnership working involved in supporting physical activity in rural communities. Leadership and learning opportunities too, are often embedded in local activity-based organisations.

Discussion

To recapitulate, "what *is* known" about physical activity among older women living in rural Canada? This scoping review reveals that physical activity among older women living in rural Canada is influenced by an array of layers, contexts, conditions, and environments, with outcomes dependent on the relative mixture of personal, relational, community, societal, and governmental factors. Many articles indicate, that in general, the older women enjoy physical activity, and are committed to creating and

maintaining a healthy and active lifestyle, and support their local rural community to enable these activities– in effect, "making health through self-care and community-care." (Mair et al., 2019, p. 97)

A number of articles report social and physical environment challenges to the realisation of physical activity among older women in rural areas. While the social environment can proscribe the physical activity of some women through ageist and age related attitudes and restrictive socio-cultural norms, social support from family and community members mitigates against these constraints. Physical infrastructure, geography, climate (seasons and weather), as well as transportation and policy issues may also impede the physical activity opportunities of older women living in rural areas.

Some of the problems related to sustaining physical activity and recreation resources in small rural communities are partly addressed through the implications and recommendations presented in the articles. Among others, these suggestions relate to leadership and learning opportunities, community (public) engagement, and the partnership working involved in supporting physical activity in rural areas.

The purpose of this review is exploratory, so these findings paint a very broad canvas at best, and as such, do not directly relate to specific rural communities and contexts across Canada or internationally. And since this review is delimited to older women in a rural setting, age, gender, and location (independently and together), have significant and very divergent effects depending on orientation and context.

These differences are evident in the wider literature. For instance, rurally referenced research in the USA often embraces older women identifying with different ethnic groups, such as African Americans, Hispanic/Latinos, Native and Alaskan Americans, as in the early studies by King et al., (2000) and Wilcox et al., (2000). Here, it is important to acknowledge an equivalent cadre of Canadian studies related to physical activity in older Indigenous (Hopping et al., 2010; Kirby et al., 2007), linguistic (Imbeault et al., 2013), religious (Bassett et al., 2004), and immigrant (Salma et al., 2020; Tong et al., 2018) adults. (As indicated in the methods section, the inclusion of this literature is outside the scope of this review).

Similarly, by limiting the review to rural areas, many insightful studies pertaining to physical activity in Canada were not considered. These investigations examine various contributors to physical activity, but in general, not as a/n unitary concept. However, one example of cross-cutting related research is Hanson and Hildebrand's (2011) inquiry into the unmet travel needs of older Canadian drivers without a car. The authors advocate for a "community-supported, member-based rural shuttle service with volunteer and paid drivers that build on informal social networks and can provide service when friends and family are unavailable." (p. 975). Accordingly, this proposal offers a potential solution to the ubiquitous problem of transportation provision in rural Canada. Turcotte (2012) noted that transportation is a significant barrier to older women's participation in physical activity in general, and analogously, older Canadians' social participation (Levasseur et al., 2015, 2020), and presents an ongoing dilemma for service provision.

A number of the articles included in this review determined that social support from family and friends promoted the women's physical activity, but alternatively, age and ageist attitudes and restrictive socio-cultural norms held by family and com-

munity members had a dampening effect. This "support and sabotage" dichotomy was corroborated in a USA study examining how social relations promote or hinder health-related behaviours among midlife and older rural adults (Sriram et al., 2018). And in their analysis of the lived experience of older Canadians with differing gender, class, age, and health status, Rozanova et al., (2012) showed that care responsibilities, "compulsory altruism", individual resources, engagement opportunities, and ageism limited older Canadians choices to be socially engaged in their rural community.

Many articles referenced the interconnectivity between the ambient social and physical environment and the women's physical activity. For Ward et al., (2020), older Canadians living in northern and rural settings are "more likely to maintain physical activity when physical environments foster healthy aging and provide opportunity for social engagement." (p. 854) And although Leipert et al., (2014) and Mair et al., (2019) emphasise the critical role that curling clubs and comparable organisations play in promoting physical activity among older women in rural Canada, they also raise the issue of adequately resourcing and sustaining rural communities to support these recreational activities. In response, and building on the seminal work of Keating et al., (2011), Brooks-Cleator and Giles (2016) propose that age friendly rural and remote communities (Public Health Agency of Canada, 2010) could provide a rurally-oriented roadmap (Jeffery et al., 2018) for governments and non-governmental organisations to promote physical activity in their jurisdictions.

Limitations

This scoping review has been conducted by only one reviewer, and as such, contravenes the recommendations of JBI among others, to use a team-based approach. Consequently, "characterization and interpretation of the included reviews were… subject to reviewer bias." (Pham et al., 2014, p. 38) In spite of directed efforts to mitigate and manage this subjectivity (identified in the methods section), it remains a major limitation.

And as noted previously, the review was intentionally focused on older women living in rural Canada, resulting in the omission of some key areas of research, specifically physical activity interventions and in special populations. There is also a wealth of literature related to different ages, genders, locations, and types of activity (independently and together) that are not addressed in this review. Canadian articles published in the French language are also missed.

Although the review provides an overview of what is known about physical activity among older women in rural Canada to date, it is not directly generalisable or transferable to other settings and/or contexts. It was also difficult to tease out summaries of the findings and implications because of the inconsistent definitions, conceptualisations, contexts, and measures related to older women, rural areas, and physical activity across the articles.

Future Research Agenda

The extremely limited number of articles focusing on physical activity among older women living in rural Canada is a gaping hole in the research landscape. In addition to developing a foundational evidence base, there is a need to examine specific age, gender, location, and activity characteristics, contexts, and contributions independently, inter-dependently, and collectively. Further research is also required to expand the literature related to physical activity among special populations in rural areas and Canada generally, as well as interventions related to physical activity promotion in older women in rural Canada.

Conclusions

This scoping review investigated *what is known* about physical activity among older women living in rural Canada.

The diversity of articles included in the review reflects the multiplicity of layers, contexts, conditions, and environments that influence physical activity among older women living in rural Canada. These articles demonstrate that physical activity for the older women in these settings is dependent on an interconnected mix of personal, relational, community, societal, and governmental relationships, and underscore the critical role of the women's social and physical environments in promoting or restraining their activity. As such, this finding resonates with the multidimensional conception of successful ageing initially proposed by Rowe and Khan (1997), and more recently augmented by Cosco et al., (2014) and Urtamo et al., (2019), among others.

In conclusion, although the review makes a contribution to the literature about physical activity among older women living in rural Canada, it reinforces Nykiforuk et al.'s (2018) "Call to Action" for further research into the genre of rurality and physical activity, especially in relation to older Canadian women.

Declarations

Conflict of interest I have no known conflict of interest to disclose.

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