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Rural Older Adult Physical Activity Promotion: Past, Present and Future

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Abstract

The last three decades of research in Exercise Science have demonstrated the role of physical activity (PA) in maintaining, as well as improving, a variety of health outcome measures in older adults. However, rates of regular participation in PA remain relatively low. This is a significant public health issue as inactive and insufficiently physically active older adults are more likely to develop chronic diseases such as heart disease, stroke and diabetes. Furthermore, disparities in PA exist. For example, older adults in rural areas are less physically active than those in urban areas. Determining why such disparities in health and PA participation exist is a complex, but important endeavor and presently, the underlying mechanisms are not well understood. By adopting interpretive research methodologies and methods (i.e., “qualitative”), we can explore various contextual factors such as historical influences, social norms and the cultural milieu of particular locations which may influence area-specific participation in PA. Drawing upon research conducted in Canada, this paper discusses the PA perceptions, preferences and experiences of rural older adults, contextualizes these findings for practice, and considers to what extent a “rethink” of approaches to PA promotion may be necessary in order to serve future generations of rural older adults.

Key words: Physical activity, rural, qualitative, work ethic, millennials

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The proportion of older adults age 65+ in Canada increased from 13.7% in 2005¹ to 16.1% in 2015². By 2050, the number of older adults age 65+ is projected to account for approximately 25% of the total population of Canada³. The effect this “greying”⁴ may have on the population has garnered increased attention over the last 10-15 years as demographers, gerontologists, health economists, health care professionals and others have presented arguments to support⁵⁻⁸ or refute⁹⁻¹² claims that health care expenditures related to the diagnosis and treatment of age-associated disease/disability will increase substantially.

My view on Canada’s future health care sustainability is consistent with Chappell and Hollander^{13p.3}. Although, “...reports note that costs are inexorably rising, and that caring for a growing elderly population may eventually bankrupt our health care system.” “...with good policy, it is possible to both provide better care and reduce costs. This can be accomplished, for example, by developing improved, integrated systems of care delivery for older adults...”^{13p.6}. In short, “...the increased numbers and proportions of older adults is cause for attention but not for alarm”^{13p.6}.

Another key way health care costs can be reduced at the population level is to invest heavily in health promotion initiatives toward supporting individuals’ health and wellness across the lifecourse. One area which holds particular promise is the promotion of physical activity, given its impact on health and quality of life for adults in general, and older adults in particular¹⁴. According to Canada’s PA Guidelines for Older Adults, to receive health benefits, older adults should engage in a minimum of 150 minutes of moderate to vigorous-intensity aerobic activity per week (in bouts of 10 minutes or more), and add muscle and bone-strengthening activities that use major muscle groups at least two days per week. Those with poor mobility should engage in PA to enhance balance and prevent falls¹⁵.

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Despite early concerns regarding the, "...potential 'catastrophic' cardiovascular risks of exercise" and that, "...strength-related activities were...too dangerous for older adults,"^{16p.18} the last three decades of research in Exercise Science have demonstrated the role of PA and exercise in maintaining, as well as improving, a variety of health outcome measures in older adults, in addition to preventing all-cause mortality.¹⁷⁻¹⁹ Although advancing age is associated with declines in numerous physiological systems including aerobic capacity, muscular strength and cardiovascular/pulmonary function²⁰, regular participation in exercise/physical activity can minimize the physiological effects of biological aging²⁰.

Specifically, regular participation in moderate intensity PA improves overall cardiovascular health^{21,22}, glycemic control in type-II diabetics^{23,24}, and functional mobility^{18, 25,26}. Even among frail, institutionalized older adults, strength training improves muscle strength/size and measures of functional mobility^{27,28} demonstrating that it is 'never too late' to benefit from regular PA²⁹. Regular participation in moderate levels of PA also reduces the incidence of falls among older adults,^{30,31} which is an important public health issue in Canada since more than two billion dollars is spent annually to treat fall-related injuries among those age 65+³².

Although the benefits of PA participation, even among those with chronic disease or who are physically frail, are well established, rates of regular participation in leisure-time PA (LTPA) are relatively low. In fact, the majority of Canadians age 65 years and older are physically inactive; over 58% do not participate in PA at a level sufficient for health benefits.³³ This is a significant public health issue as inactive and insufficiently physically active older adults are more likely to develop chronic diseases such as heart disease, stroke and diabetes.³⁴⁻³⁶ Blair³⁴ referred to physical inactivity as the greatest issue facing public health in the 21st century.

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The proliferation of chronic disease and population aging are two factors that have stimulated increased efforts to design PA interventions that can reduce rates of chronic disease.^{37,38} Although interventions targeting individual behaviour change have had some level of success in promoting health behaviour,^{39,40} the conceptualization of health behaviour *solely* in terms of individual level factors, such as cognitions and motivation, has been criticized in terms of its ability to bring about sustained health behaviour change; particularly at a population level. In response, King and Sallis,⁴¹ Sallis, Owen and Fisher⁴² and Spence and Lee⁴³ advocated for the adoption of multi-level, ecological approaches to the conceptualization of PA and health behaviour change. Ecological approaches conceptualize health behaviour/PA as influenced by multiple levels including intrapersonal (biological, psychological), interpersonal (social, cultural), organizational, community, physical environment and policy. Such an interpretation means that beyond the individual-level, factors such as social environments, cultural contexts, characteristics of the community and physical environments, as well as existing policies and political forces are assumed to influence health behaviour (e.g., PA).⁴²

Toward greater adoption of regular PA participation, Das and Horton⁴⁴ called for increased attention to the role of social and physical environments. Such an approach is consistent with long-standing perspectives within public health that emphasize the importance of broader societal and environmental contexts to health and well-being.^{45,46} Perspectives such as these have encouraged an increased focus on health promotion within public health; in no small part a result of the landmark Ottawa Charter for Health Promotion.⁴⁷ As Kickbusch^{48p.383} explained,

The Ottawa charter initiated a redefinition and repositioning of institutions, epistemic communities, and actors at the 'health' end of the disease-health continuum... In

overcoming an individualistic understanding of *lifestyles* and in highlighting *social environments* and *policy*, the orientation of health promotion began to shift from focusing on the modification of individual risk factors or risk behaviors to addressing the 'context and meaning' of health actions and the determinants that keep people healthy.

With respect to the context of health actions, one way to begin to assess possible contextual influences and interactions is to compare population health outcomes and health behaviour by geographic location – represented in its most simple form as comparisons between “rural” and “urban.” When we compare the health outcomes of rural and urban Canadians, those who reside in rural areas are generally in poorer health, exhibit less healthy behaviours and have higher mortality rates than urban residents.⁴⁹ Specifically, Mitura and Bollman⁵⁰ reported rural residents were more likely to smoke and be overweight compared to urban residents. In addition, lower proportions of rural Canadians reported their health as “excellent” compared to those from urban regions. Similarly, Pong, DesMeules and Lagacé⁵¹ reported a gradient of health status decline - health indicators were poorest among those residing in the most rural areas.

A comparable pattern has been reported with respect to PA. For example, Van Dyck, Cardon, Deforche and Bourdeaudhuij⁵² used an objective measure of PA (pedometers) to compare the step counts of rural and urban Belgian adults aged 20-65 and reported that citizens residing in urban areas took significantly more steps on weekdays (9,933) compared to those from rural areas (9,111) ($p < .05$); overall, urban participants took more steps per day (9,323) than rural participants (8,775) ($p < 0.1$). Similarly, urban adult Australians were found to participate in significantly more leisure time PA than rural adults ($p < .001$).⁵³ Among older adults age 52-77, Fogelholm et al.⁵⁴ compared the walking frequency of rural, semi-urban and

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urban residents of Finland and reported that urban participants were significantly more likely to walk more than twice per week compared to rural participants ($p < .001$).

Determining why such disparities in health and PA participation exist is a complex, but important endeavor and presently, the underlying mechanisms are not well understood. By adopting interpretive research methodologies and methods (i.e., “qualitative”), we can explore various contextual factors which may influence area-specific participation in PA such as historical influences, social norms and the cultural milieu of particular areas/regions. Embracing the complexity of context and “grounding” understanding in the perceptions and experience of individuals will broaden our understanding of disparities in PA participation and facilitate the development of effective LTPA promotion interventions.⁵⁵

My research over the past 10+ years has explored rural older adults’ experiences and perceptions of PA in various rural Canadian locations (particularly those in Atlantic Canada). In writing this paper, my first goal is to highlight the main findings from this research. In doing so, I hope to provide some answers to the following question: “What are rural older adults’ perceptions of, and preferences for, PA? My second goal, is to contextualize these findings for practice – that is, how might these findings inform current approaches to older adult PA promotion? Finally, by shifting our gaze toward the “new wave” of rural older adults – rural “seniors in training,”⁵⁶ I present my thoughts regarding how the PA experiences, perceptions and preferences of future older adult cohorts may compare to the current generation of older adults. Will our approaches need to change in order to serve future generations? I now turn to these issues and questions for the remainder of this paper.

Understanding Rural Older Adult PA Participation

Within Gerontology broadly, and particularly within a geriatric rehabilitation context, PA interventions of various types are prescribed and delivered to restore, improve and maintain physical function to enhance quality of life. Beyond the clinical setting, the importance of PA promotion at a population level has also been a focus within public health and other allied health fields (e.g., Kinesiology), given its role in improving health outcomes and decreasing chronic disease risk.³⁸ Population health interventions that are comprehensive (i.e., consider numerous health determinants), and recognize the importance of context, are necessary to capture the complexity of PA promotion. By adopting a rural lens, my research program explores the unique needs of rural older adults; an underserved population.^{55,57} My findings to date^{58,59} problematize a “one-size fits all” approach to older adult PA promotion and illustrate some of the possible nuances associated with rural older adult PA.

The Importance of Historical Context

The first broad theme of my research with rural older adults relates to the historical context and its various dimensions; defined as the historical and cultural milieu as it relates to work and leisure-time activity participation. Understanding the historical context in which current older adults were raised and matured provides insight into current beliefs and experiences of PA. With respect to activity participation, current older adults were often socialized into a culture of physical labour. The importance of various forms of work-related activities which supported the family were stressed, as well as the utility of focusing on productivity – that is, engaging in activities perceived as useful and beneficial. This historical and cultural milieu as it related to activity participation has influenced the nature of current PA perceptions and experiences in a number of respects; namely the marginalization of leisure-time PA, strong

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preference for productive and “active” tasks, and concerns expressed regarding PA participation in older adulthood.^{58,59}

Marginalization of leisure-time PA. The prioritization of work activity throughout the lifecourse for many older adults, who grew up and lived in a rural area, meant that participation in many forms of leisure was marginalized. Although rural older adults did have a history of engaging in a variety of leisure activities, their experiences of PA were often work-related – as it was work that provided the structure to daily living. Given this context, an examination of the current activity participation and preferences of rural residents in older adulthood reveals some interesting consistencies with well-established norms from her/his childhood and adulthood. For example, rural older adults often had a structured routine of activities – consisting of productive/work-related activities which were not necessarily physical activities. Participation in LTPA was usually minimal.

Activity preferences. As mentioned in the previous section, older adult rural men and women exhibited a strong affinity toward activities perceived as productive/useful. Interestingly, when rural older adults spoke about the importance of being (and staying) “active,” she/he often associated this concept (i.e., being active), with engagement in work-related tasks – reflecting the perceived importance of being (and staying) busy. What appears less common among rural older adults is the same tenacious commitment to PA (and in particular, LTPA). Although rural older adults believed PA was beneficial, it was not usually prioritized over other, less physically active, forms of being “active”/busy. Theoretical concepts discussed by Weber⁶⁰ and Ekerdt⁶¹ are particularly relevant here. For example, the activity preferences of rural older adults as articulated above are consistent with the “Protestant work ethic” – the notion that participation in labour is divine and wasting time immoral⁶⁰. Furthermore, the patterned activity routines of rural

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older adults as described reflect a “busy ethic”⁶¹ whereby older adults focus on keeping busy in retirement.

The importance of keeping busy for rural older adults has been reported elsewhere,^{62,63} as has engaging in work/work-related activities viewed as productive and useful.^{64,65} Although premature to declare these values and activity preferences universal among rural older adults, it is the case that these factors have been identified as important among rural older adults across numerous contexts. The extent to which these values and preferences are uniquely rural (i.e., not applicable to urban older adults), however, is currently unclear. More investigation is warranted given the dearth of studies that have used qualitative methods and interpretive methodologies to explore older adult preferences for, and perceptions of, PA. Furthermore, comparisons among rural and urban older adults with respect to PA have focused on statistical differences across quantitative variables – limiting our ability to explain *why* discrepancies may exist and explore these issues in-depth. Based on current evidence, it does appear reasonable to suggest values related to being busy, and preferences for productive activities, are not exclusively characteristics of rural older adults. For example, Grant⁶⁶ has discussed the value of being busy among urban older adults. However, although likely not uniquely rural, the evidence to date supports the view that being busy and productive is important among rural older adults.

Relevance and Appropriateness of PA. An important finding which may reflect the historical context in which rural older adults were raised and matured pertains to the perceived relevance of PA. More particularly, PA in and of itself does not appear to be perceived as inherently productive or useful. Therefore, rural older adults may not participate in LTPA, “for the sake of it.” Rather, its perceived relevance and value may depend on whether, and to what

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extent, engaging in a particular PA is perceived to assist in accomplishing something viewed as productive (as discussed previously).

It would be premature to suggest marked differences exist between rural and urban older adults with respect to activity relevance, as comparisons of this nature have not been sufficiently explored within the literature. However, compared to urban older adults, rural older adults do appear less likely to incorporate LTPA into her/his daily routine of activities.^{58,59} For many rural older adults, LTPA (at least as it is conventionally understood) is not prioritized; often positioned as lacking purpose. As a result, more contextually and culturally relevant activities take priority. What does appear to be more universal is the perception among older adults more generally that PA participation may be risky and less appropriate for “someone my age,” compared to someone younger.⁶⁷ Similarly, rural older adults typically approach PA in a cautious manner, expressing concerns regarding overexertion; preferring, “low-risk,” mostly light-intensity activities.^{58,59}

The preceding information offered an overview of the main themes arising from in-depth qualitative interviews, conducted with older adults age 65-97 who resided in numerous rural communities across multiple Canadian provinces. Although additional data collection is necessary to generalize these findings more broadly (i.e., to additional rural contexts within Canada and beyond), data recently obtained in Alberta,^{68,69} support the notion that the main themes identified are not unique to Atlantic Canada – consistent with the other studies referred to previously. With that in mind, I now turn to the question of application: Assuming the themes identified provide meaningful insight into rural older adult PA, how might this understanding inform practice?

Implications for PA Promotion

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The findings presented in the previous section help broaden our understanding of rural older adult PA and draw attention to key ways in which rural older adults may conceptualize, approach and prioritize particular types of PA. Although many questions remain unanswered, a clearer picture of rural older adult PA is beginning to emerge – one which illustrates the importance of tailoring our approaches and messaging. The following population-level strategies are offered to guide the development and implementation of PA interventions that are sensitive to the unique needs of rural older adults. Each considers how we might use the information gathered to date to tailor particular messages and improve upon our ability to reach rural older adults. To promote PA among rural older adults, I invite a (re)consideration of activity salience, the reframing of the “activity”/“physical activity” message and a critical analysis of Canada’s PA guidelines for older adults as a promotional tool.

Promoting salient physical activities

Portrayals of PA are often conventional and promotional messages narrowly focused. For example, popular images often depict people, “working out” on various pieces of fitness equipment such as treadmills and using free weights; promotional messages often position PA as a way to improve health. Although there is an audience receptive to such images and promotional strategies, it is important to recognize and acknowledge the limitations of these approaches and, in particular, who may be overlooked. Similarly, a critical perspective questions the extent to which rural older adults can, “see themselves” in conventional images and promotional strategies; (re)presenting, to a large degree, a distinctly urbanized interpretation of PA – one not particularly salient for rural older adults. Rural older adults’ prioritization of work-related activities and preference for activities that are perceived as productive and useful means

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physical activities need to be contextualized – since participants may not be motivated to participate in leisure-time PA, “for the sake of it,” as a way to maintain health.

A less conventional approach to promoting PA – one which is tailored to rural older adults – would place greater emphasis upon culturally relevant and salient physical activities. These activities could include those associated with property upkeep/maintenance, the gathering of kindling, weeding, chopping firewood, shoveling snow, etc.; rather than promoting physical activities which may be perceived as “artificial” (e.g., walking indoors on a treadmill). With respect to energy expenditure, the aforementioned activities range from 3.3 to 5.3 METS⁷⁰ (considered moderate intensity PA – as recommended by Canada’s PA Guidelines for Older Adults).¹⁵

Suggesting a move away from more prescriptive approaches toward a “lifestyle” or “active living” approach to the promotion of PA is not new as many individuals prefer to be physically active outside of a formal exercise setting; engaging in activities deemed meaningful and enjoyable. However, the extent to which historical and cultural contexts may shape PA behaviour and how activity prioritization and preferences may differ between urban and rural areas has not been sufficiently explored. Future work in this area would increase our understanding of what activities are considered salient for rural older adults; serving to inform future PA promotion strategies. In addition, it should be pointed out that although the MET values quoted in the previous paragraph are consistent with moderate intensity PA, it is important to determine how rural older adults’ usual activity routines may compare to the recommended 150 minutes of aerobic activity. Further, to what extent does the repertoire of physical activities prioritized and routinely practiced by rural older adults reflect muscle/bone strengthening and balance components?

Translating and Tailoring the Physical Activity Guidelines

With respect to tailoring particular promotional messages to rural older adults in such a way as to encourage the expansion of one's repertoire (i.e., to adhere to aerobic, and/or strength, and/or balance recommendations), it is important to move beyond an emphasis on specific health benefits. Rather, greater emphasis should be placed on how certain physical activities can play an important role in maintaining the ability to perform valued, work-related (i.e., productive), activities into advanced age. For example, PA promotional initiatives that target rural older adults could emphasize how various endurance, strength and flexibility activities can improve one's ability to perform specific culturally relevant activities such as those listed in the previous paragraph. By doing so, we advance beyond relying on PA to, "sell itself" (i.e., being physically active, 'for the sake of it').

As mentioned, Canada's Physical Activity Guidelines for Older Adults¹⁵ outline the frequency, intensity, duration and type of physical activities recommended to receive health benefits. However, although this information is readily accessible online, awareness of these guidelines remains low in adults; declining with age.⁷¹ These guidelines offer researchers, clinicians and health professionals an opportunity to educate participants/patients/clients and translate the recommendations into 'real world' activities. The professional's role as translator may be particularly important given the guidelines' recommendations are not easily translated into everyday activities for most rural older adults – but couldn't (or shouldn't) this be the case? Guidelines, supplemented with materials that translated the recommendations into activities considered salient and/or productive would help the professional and client understand how the recommendations may be addressed in an appropriate and relevant manner. For example, we might expect materials that illustrate and incorporate rural older adults' physical activity

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preferences (e.g., work-related, productive physical activities) to be more readily translated to individuals' daily lives than generic, stand-alone recommendations.

Recognizing the limitations of an educational approach to PA promotion with respect to facilitating sustained long-term behaviour change, allowing rural older adults to “see themselves” in promotional materials can serve as an important first step toward increasing PA. Adequate translation also requires addressing the gap between the guidelines' recommendations and rural older adults' tendency to overestimate their levels of PA (although, ironically often being unaware any guidelines exist). Furthermore, given rural older adults' concerns regarding over-exertion, we should take special care to work with clients to demonstrate her/his physical capabilities and not focus solely on her/his limitations.

“The Next Wave” – What Should/Can we Expect?

Having provided an overview of the main themes arising from my research with rural older adults, and made suggestions with respect to how these findings can guide future PA promotion strategies, I turn now to an important but challenging set of questions: “Will future rural older adults (e.g., Generation X and Y – the ‘Millennial’ cohorts) have different PA experiences than previous generations? Will Generation X and Y older adults have different PA preferences? Will the approaches which seem appropriate to promote PA among rural older adults currently need to change for future generations of rural older adults?” To be clear, I believe the answers to these questions are complex and claim no authority with respect to being able to respond to them definitively. However, based on my research experiences and other studies, I believe we can begin to formulate a reasonable hypothesis.

“Rural” Preamble

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Before turning to the aforementioned questions, the term (and idea of) “rural” requires some deconstruction. With respect to the findings reported in this paper, data were obtained in areas which satisfy various geographical/ecological definitions of “rural.”⁷² Although geographical categories reflect the most common usage of “rural,” they are lacking in certain respects. As Rowles⁷³ so aptly pointed out, rural environments are perhaps best understood as socio-cultural contexts or as personal lived experience. Consistent with these contextualized interpretations is a view that there are unique features and values associated with rurality and that behaviour can both shape, and be shaped, by the rural setting. At the same time, it is important to point out that rural areas are fluid rather than static and that, although the suggestion here is that patterning does exist, rurality is not a uniform concept that is consistent across all rural settings.

Consistency or change?

The question of consistency vs. change between different cohorts is, of course, not a new question and it is important, therefore, to examine research that has explored this idea. For example, the “baby boom” generation was predicted to be fundamentally different than earlier cohorts in many respects, including leisure activities,⁷⁴ health behaviours and health outcomes.⁷⁵ However, despite these predictions, baby boomers have poorer health outcomes,⁷⁶ more compressed age identities⁷⁷ and are less physically active⁷⁸ than previous generations. With respect to how we perceive and talk about aging, it would also appear safe to suggest significant shifts toward more positive conceptualizations and framing of discourses are unlikely to occur anytime soon.⁷⁹ These findings attest to the difficulty associated with making generation-based predictions and confirm popularly held notions may not be supported empirically.

The research I have conducted to date has included rural older adult “boomers” as well as those born prior to 1946 and reveals similar activity preferences among participants. However,

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heeding the ‘cautionary tale’ of evidence cited above, it is plausible that Generation Y (Millennials) may experience PA differently than previous generations. As a result, a rethink of PA promotion strategies may be required. Supporting this perspective are studies that have examined generational differences in work ethic as well as values associated with work and leisure.

The PA promotion strategies made in this paper are guided by rural older adult participants’ preference for, and prioritization of, productive activities; reflective of a particular work/busy ethic. However, the extent to which work/work-related activity is intrinsically valued and prioritized may be changing. For example, within the Business and Management literature, Meriac, Woehr and Banister⁸⁰ reported that Millennials scored significantly lower than boomers on ‘hard work’ and ‘centrality of work’ dimensions of work ethic; indicating lower work salience for Millennials. Similarly, Twenge, Campbell, Hoffman and Lance⁸¹ identified decreased value placed on work, associated with an increased value for leisure for Millennials (Generation Y), compared to boomers and Generation X participants. Millennials appear less likely than other generations to value work intrinsically;⁸² indicative of a changing work ethic and emergence of leisure-orientated lifestyles.⁸³

In light of the evidence provided in the previous paragraph, it seems reasonable to suggest PA promotional strategies guided by the salience of work/productive activities may not be effective for Millennial older adults. The extent to which this is valid for *rural* older adult Millennials, however, is unclear as this does not appear to have been addressed within the literature to date. Although it is reasonable to suggest change will occur with respect to values of work and leisure among rural older adult Millennials as well, change may occur more slowly.⁸⁴ It also remains unclear how urban and rural Millennials compare with respect to values associated

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with, and preferences for, work and leisure activities – are Millennials more similar than different with respect to these values and preferences regardless of geographical setting?

Returning to the notion of increased value placed upon leisure by Millennials, might we expect increases in PA participation compared to previous older adult generations? The answer to this question is unclear. Although current rates of directly measured PA among Canadian adults are highest among those age 18-39,⁸⁵ (capturing the majority of Millennials by most definitions and therefore offering some hope for optimism), Canadian trends continue to reveal a relatively consistent pattern of decline in PA with age.^{85,86} These data highlight the complexity of PA promotion and point to the importance of ecological approaches to promoting PA. Consistent with such an approach, future studies should investigate the extent to which rurality/the rural context for Millennials compares to the lived experience of previous generations and how this may shape our understanding of future activity salience for Millennial “seniors in training.”⁵⁶

Summary

Over the past 10+ years I have utilized interpretive research methodologies and methods (i.e., “qualitative”), to explore various contextual factors which may influence rural older adult participation in PA. The unique historical context in which rural older adults came of age has influenced the types of present-day activities prioritized (and marginalized), as well as current activity preferences and perceptions regarding the relevance and appropriateness of particular activities. As a result, rural older adult PA promotion should focus on promoting salient physical activities; aided by PA information that is tailored in such a way as to allow rural older adults to “seem themselves” in it.

Looking to the future, there is reason to believe our approaches to promote PA among Millennial older adults may need to change. However, the extent to which this applies to *rural*

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Millennial older adults is currently unclear. Recognizing that a certain degree of change with respect to activity values and preferences is likely, future research should examine the rural context in which Millennials came of age and, particularly, to what extent this may reflect a broader and changing reality with respect to these activity values and preferences.

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