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Perceived Community Age-friendliness is Associated With Quality of Life Among Older Adults

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Abstract

We examined the positive association between perceived community age-friendliness and self-reported quality of life for older adults. A total of 171 participants, aged 77–96 years, completed a mail-in questionnaire package that included measures of health (SF-36 Physical), social participation (Social Participation Scale), community age-friendliness (Age-Friendly Survey [AFS]), and quality of life (WHO Quality of Life). Hierarchical regression models including age, gender, driving status, finances, health, social participation, and AFS scores explained 8 to 21 per cent of the variance in quality of life scores. Community age-friendliness was a statistically significant variable in all models, accounting for three to six and a half per cent of additional variance in quality of life scores. Although the proportion of variance explained by age-friendliness was small, our findings suggest that it is worthwhile to further investigate whether focused, age-friendly policies, interventions, and communities could play a role towards successful and healthy aging.

Keywords

community, aging, participation, well-being

The concept of age-friendliness has gained momentum due to aging populations worldwide, the implementation of policies to support aging in place, and the World Health Organization's (WHO) emphasis on developing age-friendly cities to promote active aging (Lui et al. 2009; Plouffe & Kalache, 2010; Plouffe & Kalache, 2011; World Health Organization, 2007). Age-friendly environments are those that promote healthy aging by "building and maintaining intrinsic capacity across the life-course and enabling greater functional ability in someone with a given level of capacity" (World Health Organization, 2015, pp. 225). Such communities have policies, systems, services, and technologies to promote and maintain physical and mental health. They enable individuals to be involved in the activities they choose, irrespective of changes in their capacity (WHO, 2015). In Canada, the concept of age-friendly communities has been promoted by the federal government and adopted by many municipalities across the country (Public Health Agency of Canada, 2010).

There is a growing body of scholarship investigating the aspects of a community that contribute to age-friendliness and how to develop an age-friendly community (Buffel et al. 2014; Smith et al. 2013; Yan et al., 2014). Based on the concept of active aging, the WHO identified dimensions of age-friendly communities that support healthy aging: housing, transportation, outdoor spaces and buildings, community support and health services, social participation, respect and social inclusion, communication and information, and civic participation and employment (WHO, 2007). Subsequent research categorized the age-friendly domains as belonging to either physical, social, or service environments (John & Gunter, 2016).

Research on age-friendliness has been approached from an ecologic perspective (e.g., Scharlach & Lehning, 2013).

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Ecologic theory posits an interaction between individuals and their environments; it highlights the view that quality of life will be highest for those individuals experiencing the greatest fit between their personal characteristics and needs, and their physical and social environment (Menec et al., 2011). Taking this perspective, Choi et al. (2020) examined the relationship between the social environment and perceived age-friendliness in a sample of 264 participants age 50 years and above. Age-friendliness was captured using two items, each on a five-point scale; participants were asked to rate their city and neighborhood as a good place to live as they aged. Their findings showed that access to community events, volunteer resources, and community events were associated with subjective ratings of age-friendliness. In addition, the authors showed that connection to community mediated the relationship between access to events and perceived age-friendliness. Most recently, Tang et al. (2021) examined the relationships between the built environment, sense of community, and health outcomes in a large sample (n = 2247) of community-dwelling middle-aged and older adults living in Hong Kong. The authors found that sense of community mediated the relationships between the environment and physical and mental health outcomes. Taken together, these studies highlight the relevance of the social environment to older adults' perceptions of age-friendliness and to health outcomes.

Theoretical underpinnings of quality of life research suggest that people create their own well-being using the resources available within their neighborhood and that neighborhood features can positively or negatively impact quality of life (Nieboer & Cramm, 2018). Community features may act as a resource for older adults to maintain quality of life as they adjust to losses, such as changes in health. Theoretical approaches to studying both quality of life and age-friendliness emphasize the role of the environment and align with other frameworks that allow us to study the multiple dimensions of aging. For example, in their comprehensive framework of mobility in older adults, Webber et al. (2010) emphasized the importance of maintaining community mobility in older adulthood, and that community features can act as important determinants of health and quality of life outcomes. However, researchers have noted that empirical evidence specifically supporting the relationship between age-friendly communities and quality of life is sparse (Menec et al., 2011).

Of the limited research available, some researchers investigating age-friendliness have found that different aspects are associated with various quality of life measures in samples of older adults (Friedman et al. 2012; Lehning et al. 2014; Menec et al. 2015; Nieboer & Cramm, 2018; Park & Lee, 2017). For example, Lehning et al. (2014) found that access to health care, social support, and community engagement were positively associated with self-rated health, while neighborhood problems were negatively associated with self-rated health. Friedman et al. (2012) found that neighborhood safety and social cohesion, but not neighborhood walkability, were associated with quality of life for older adults in New York City. Using a composite measure of age-friendliness (perceived safety, access to services, and walkability) with residents from four cities in Ireland, Gibney et al. (2019) found that people living in more age-friendly cities were more likely to report higher quality of life and well-being. However, this research has investigated only one or a few dimensions of age-friendliness, rather than encompassing all domains.

To fully investigate the impact of community age-friendliness on quality of life, it was necessary to develop a tool to measure all of the domains of age-friendliness. Menec and Nowicki (2014) created the Age-Friendly Survey (AFS), a full-scale measure of self-reported age-friendliness of one's neighborhood. The measure incorporates the WHO framework (Menec & Nowicki, 2014), and congruence has subsequently been demonstrated between subjective AFS scores of age-friendliness completed by community residents and objective measures completed by municipal officials (Menec et al., 2016). Investigating age-friendliness and satisfaction with life, Menec and Nowicki (2014) found that perceived age-friendliness was associated with self-rated health and life satisfaction in a sample of older adults from rural Manitoba. However, these outcome measures were based on single items each capturing health and life satisfaction rather than utilizing composite measures to more fully capture health and life satisfaction.

Existing evidence has focused on one element of age-friendliness (e.g., physical, social, or service environments) or has relied on single items to quantify outcomes. Moreover, existing research in this field tends to include few covariates known to influence quality of life and health outcomes. The purpose of the present study was to extend previous work (e.g., Menec & Nowicki, 2014) in two ways; first, by examining the association between perceived community age-friendliness and self-reported quality of life using full-scale measures of community age-friendliness (i.e., the AFS) and quality of life; and second, to examine the association while accounting for other variables that could influence the person-environment fit and impact quality of life (e.g., demographics, income adequacy, health status, and social participation; Eales et al., 2008). Demographic variables of age, gender, driving status, and financial situation were included because previous research has shown that quality of life can be lower for older compared with younger adults (Garner et al., 2012), older women compared with older men (Kirchengast & Haslinger, 2008), older adults who have stopped driving (Oxley & Whelan, 2008), and those who have a lower socioeconomic status (Read et al., 2016). Measures of health and social participation were also included as research has shown that older adults who have poorer health (Miret et al., 2014, 2017) and less social participation (Gilmour, 2012) can have lower quality of life. Considering existing evidence, we hypothesized that

perceived age-friendliness would be positively associated with quality of life, after controlling for these variables.

Method

Participants

The recruitment pool for participants consisted of a subsample of older adults who were already participating in the Canadian Driving Research Initiative for Vehicular Safety in the Elderly (Candrive II). The Candrive study was a multicentre prospective cohort study of 928 active drivers aged 70 years and older at baseline. One main objective of Candrive II was to develop a risk stratification tool that would assist physicians in identifying older drivers who may need further investigation of their fitness-to-drive. Eligibility criteria for participating in Candrive were comprehensive, ensuring participants were healthy, active, older drivers (see Marshall et al., 2013). All participants were volunteers. Evidence has shown that the Candrive II sample is equivalent to the broader Canadian population of community-dwelling older drivers in terms of sociodemographic and health variables; however, Candrive II participants were found to drive more frequently than the Canadian population (Gagnon et al., 2016).

Candrive II participants were invited to participate in a longitudinal study on driving cessation; those who agreed served as participants in the present study. The longitudinal study involved participants, both current drivers and former drivers, annually completing a mail-in questionnaire package. In the present study, we examined cross-sectional data from the sixth year of the longitudinal study. This was the single year in which age-friendliness data were collected.

One hundred and 71 older adults participated, 61% of whom were men (104 men, 67 women; in the full Candrive cohort 62% of the participants were men). The participants lived in one of four Canadian cities: Ottawa, Thunder Bay, Toronto, or Victoria. All participants provided written informed consent before participating, and the project was approved by the Ottawa Hospital Research Ethics Board, Lakehead University Research Ethics Board, University Health Network Research Ethics Board, and University of Victoria Human Research Ethics Board.

Measurements

Demographics. We collected participants' age, gender (man or woman), and driving status (current driver or former driver). As a measure of financial situation, participants were asked to indicate, on a five-point Likert-type scale, how well their income currently satisfied their needs (response options were "very well," "adequately," "with some difficulty," "not very well," and "totally inadequate"). The age-friendly communities concept is based on the active aging framework, which highlights the salience of gender and economic determinants of aging. Driving status is linked to community mobility and other research has associated it with quality of life outcomes (Webber et al., 2010).

Health. The MOS 36-Item Short-Form Health Survey (SF-36) is a measure of health-related quality of life (Ware & Sherbourne, 1992). The health-related concepts that the SF-36 measures are as follows: limitations in physical activities, limitations in social activities, limitations in usual role activities because of physical health problems, limitations in usual role activities because of emotional problems, bodily pain, general mental health, vitality (energy and fatigue), and general health perceptions. These health domains each contribute to two summary measures: a physical component summary measure (SF-36 physical) and a mental component summary measure (SF-36 mental). For the purposes of this study, only the SF-36 physical measure was used. The SF-36 was constructed for use in research, clinical settings, and general population surveys (Ware & Sherbourne, 1992). The SF-36 has good test-retest reliability, excellent internal consistency, and high criterion validity (Jenkinson et al., 1994; Mishra et al., 2011).

Social participation. The Social Participation Scale (SPS) is a self-report measure of social engagement in activities such as visiting friends and family, shopping, and volunteering (Richard et al., 2009). The SPS has ten Likert-type items, with items based on the Elderly Activity Inventory (Lefrancois et al., 2001), and shows high internal consistency (Richard et al., 2009). In its original conceptualization of age-friendliness, the WHO (2007) identified opportunities for social participation as one of the eight domains of an age-friendly community. Plouffe and Kalache (2010) highlight the importance of social participation for age-friendliness in that "age-integrated as well as age-targeted social participation fosters strong social connections and personal empowerment" (p. 737).

Community Age-friendliness. The Age-Friendliness Survey (AFS) measures perceptions of community age-friendliness (Menec & Nowicki, 2014). The AFS has 54 items, which span nine domains: housing, transportation, safety, outdoor spaces and buildings, information/advocacy, respect and social inclusion, social participation/recreation, community/work force participation, and health and community services. Items are answered on five-point Likert-type scales, and the tool demonstrates good internal reliability, sensitivity, and specificity (Menec et al., 2016; Menec & Nowicki, 2014).

Quality of life. Quality of life was measured with the WHOQOL-BREF—an abbreviated version of the WHOQOL-100 (WHO, 2004). It has 26 questions, using a five-point Likert scale. The WHOQOL-BREF measures quality of life in four independent areas: physical health, psychological health, social relationships, and environment;

this tool provides a quality of life score for each dimension. The WHOQOL-BREF has demonstrated good reliability and validity in a variety of contexts (Skevington et al., 2004; WHO, 2004).

Analysis

We present descriptive statistics using means and standard deviations. A series of hierarchical multiple regressions were performed to examine the relationship between community age-friendliness and self-reported quality of life. For each WHOQOL-BREF domain, a hierarchical regression was performed with control variables (age, gender, driving status, finances, health, and social participation) entered at Step 1, and control variables plus community age-friendliness entered at Step 2. Of particular interest was whether the change between models (change in the *F*-value) was statistically significant, and the additional proportion of variance that age-friendliness explained.

Table 1. Descriptive Statistics for All Continuous Variables.

	M	*SD*	Min	Max
Age (years)	83.15	4.18	77.00	96.00
SF-36 PCS[a]	44.47	9.86	20.21	62.28
Social Participation Scale[b]	4.03	1.98	0.40	12.60
Age-Friendly Survey[c]	27.75	8.88	9.00	51.00
WHOQOL-BREF: Physical health	14.10	1.32	9.14	16.57
WHOQOL-BREF: Psychological health	14.80	1.42	10.00	18.00
WHOQOL-BREF: Social relationships	15.55	2.42	5.33	20.00
WHOQOL-BREF: Environment	18.24	1.39	14.50	20.00

[a]SF-36 Physical health.
[b]Social Participation Scale.
[c]Age-Friendly Survey.

Results

A total of 171 questionnaires were available for the analyses. We used listwise deletion to remove any participant who had one or more missing data point, leaving 144 questionnaires with complete data for analysis. These questionnaires were completed by 85 men and 59 women, and included 140 drivers and four former drivers. Participants were aged 77–96 years (M = 83.15 years, SD = 4.18 years). Most participants felt their finances met their needs, with 79 and 54 participants, respectively, indicating that that their income satisfied their needs "very well" or "adequately" (nine responded "with some difficulty," one responded "not very well," and one indicated "totally inadequate"). Descriptive statistics for all continuous variables are in Tables 1 and 2 shows the correlation matrix.

As shown in Table 3, the hierarchical regression conducted to determine whether community age-friendliness was associated with WHOQOL-BREF: Physical health showed that the control variables entered at Step 1 (age, gender, driving status, finances, SF-36 physical, and SPS) explained 5.0 per cent of the variance in WHOQOL-BREF: Physical health scores, $F(6,137) = 2.25$, $p < .05$. At Step 1, SF-36 physical (*b*

Table 2. Correlation Matrix.

	Age	Gender	Driving status	Finances	SF-36 PCS[a]	The Social Participation Scale[b]	Age-Friendly Survey[c]	WHOQOL: Phy[d]	WHOQOL: Psy[e]	WHOQOL: Soc[f]	WHOQOL: Env[g]
Age (years)	1.00	.03	.17*	−.14	−.12	−.07	−.02	.00	.01	.14	.15
Gender		1.00	.12	.03	−.18*	.15	−.01	−.08	.00	.22**	.07
Driving status			1.00	−.01	−.12	−.13	.13	.07	−.12	.03	−.09
Finances				1.00	−.10	−.06	−.07	−.09	−.06	−.17*	−.31**
SF-36 PCS[a]					1.00	.21*	−.09	.21	.07	.04	.19*
Social Participation Scale[b]						1.00	.21*	.19*	.26**	.09	.25**
Age-Friendly Survey[c]							1.00	.23**	.29**	.19*	.25**
WHOQOL: Phy[d]								1.00	.50**	.34**	.44**
WHOQOL: Psy[e]									1.00	.49**	.50**
WHOQOL: Soc[f]										1.00	.42**
WHOQOL: Env[g]											1.00

[a]SF-36 Physical health.
[b]Social Participation Scale.
[c]Age-Friendly Survey.
[d]WHOQOL: Physical health.
[e]WHOQOL: Psychological health.
[f]WHOQOL: Social relationships.
[g]WHOQOL: Environment.
*$p < .05$. **$p < .01$.

Table 3. Hierarchical Regressions for Each WHOQOL-BREF Domain.

Model	*F*	R^2	Adj. R^2[a]	b		Δ F	Δ Adj. R^2
WHOQOL-BREF: Physical health							
1	*F*(6,137) = 2.25*	.090	.050	Age (years)	0.00		
				Gender	−0.23		
				Driving status	0.97		
				Finances	−0.11		
				SF-36 PCS[b]	0.02*		
				SPS[c]	0.12*		
2	*F*(7,136) = 2.84**	.128	.083	Age (years)	0.01	F(1,136) = 5.95*	.033
				Gender	−0.18		
				Driving status	0.69		
				Finances	−0.08		
				SF-36 PCS	0.03*		
				SPS	0.08		
				Age-Friendly Survey[d]	0.03*		
WHOQOL-BREF: Psychological health							
1	*F*(6,137) = 1.93	.078	.038	Age (years)	0.01		
				Gender	−0.09		
				Driving status	−0.73		
				Finances	−0.07		
				SF-36 PCS	0.00		
				SPS	0.18**		
2	*F*(7,136) = 3.35**	.147	.103	Age (years)	0.02	F(1,136) = 11.00**	.065
				Gender	−0.02		
				Driving status	−1.14		
				Finances	−0.03		
				SF-36 Social Participation Scale	0.01		
				Social Participation Scale	0.13*		
				Age-Friendly Survey	0.04**		
WHOQOL-BREF: Social relationships							
1	*F*(6,137) = 2.52*	.099	.060	Age (years)	0.07		
				Gender	1.11**		
				Driving status	−0.05		
				Finances	−0.53		
				SF-36 Social Participation Scale	0.02		
				Social Participation Scale	0.05		
2	*F*(7,136) = 3.09**	.137	.093	Age (years)	0.08	F(1,136) = 5.95*	.033
				Gender	1.21**		
				Driving status	−0.55		
				Finances	−0.48		
				SF-36 PCS	0.03		
				Social Participation Scale	−0.02		
				Age-Friendly Survey	0.06*		
WHOQOL-BREF: Environment							
1	*F*(6,137) = 5.49***	.194	.159	Age (years)	0.05*		
				Gender	0.24		
				Driving status	−0.75		
				Finances	−0.52**		
				SF-36 PCS	0.02		
				Social Participation Scale	0.13*		

(continued)

Table 3. (continued)

WHOQOL-BREF: Physical health							
Model	*F*	R^2	Adj. R^{2a}	b		Δ F	Δ Adj. R^2
2	*F*(7,136) = 6.40***	.248	.209	Age (years)	0.06*	F(1,136) = 9.73**	.050
				Gender	0.31		
				Driving status	−1.10		
				Finances	−0.48**		
				SF-36 PCS	0.03*		
				Social Participation Scale	0.09		
				Age-Friendly Survey	0.04**		

[a]Adjusted-R^2.
[b]SF-36 Physical health.
[c]Social Participation Scale.
[d]Age-Friendly Survey.
*p < .05. **p < .01.

= .02, p = .049) and SPS (b = .12, p = .043) were the only variables contributing significantly to the model. When community age-friendliness (AFS) was added to the model at Step 2, the model remained statistically significant, $F(7,136) = 2.84$, $p < .01$, and explained 8.3 per cent of the variance in WHOQOL-BREF: Physical health scores. The additional variance that AFS explained (adjusted-R^2 change = 3.3 per cent) was a significant increase over Step 1, $F(1,136) = 5.95$, $p = .016$. The variables contributing significantly to the model at Step 2 were SF-36: PCS (b = .03, p = .019) and AFS (b = .03, p = .016). After controlling for covariates, the more age-friendly a community was perceived to be, the higher participants' quality of life was in the physical health domain.

This pattern of results was repeated for the other three hierarchical regressions for quality of life scores (WHOQOL-BREF: Psychological health, WHOQOL-BREF: Social relationships, WHOQOL-BREF: Environment), with control variables accounting for between 4 to 16 per cent of the variance for each quality of life measure (see Table 3). When AFS was added to the models, there was a statistically significant increase of three to six and a half per cent in the variance explained. After controlling for covariates, the more age-friendly a community was perceived to be, the higher participants' quality of life was in the psychological health domain, social relationships domain, and environment domain.

The regression models showed that AFS was associated with all four quality of life domains. This raised the question of whether all nine AFS domains were equally contributing to quality of life, or whether some AFS domains were more influential than others. To investigate, we conducted Pearson correlations between the nine AFS domains and the four WHOQOL domains (see Table 4). Due to the exploratory nature of these analyses, we did not adjust alpha for multiple comparisons. Significant correlations were found for all four quality of life domains and the AFS domains of Safety and Information/advocacy. Significant correlations were found between two of the four quality of life domains and the AFS domains of transportation, outdoor spaces and buildings, and respect and social inclusion. No significant correlations were found between any WHOQOL domain and the AFS domains of Housing, Social participation/recreation, Community/work force participation, and Health and community services.

Discussion

We aimed to determine the association between perceived age-friendliness of communities and quality of life. The hierarchical regression models including AFS scores and other covariates explained 8 to 21 per cent of the variance in WHOQOL scores. Community age-friendliness was a statistically significant variable in all models, accounting for 3.3 to 6.5 per cent of additional variance. Thus, this research suggests that a community's perceived age-friendliness is associated with quality of life for older adults, albeit to a small extent. These results are in accordance with Menec and Nowicki's (2014) and Nieboer and Cramm's (2018) research, where higher age-friendliness scores were associated with greater life satisfaction or well-being, and corroborate theories of age-friendliness affecting quality of life (Menec et al., 2011; Nieboer and Cramm, 2018).

Ecologic theory holds that health and quality of life are influenced by the interaction between people and their environment; age-friendly communities have been conceptualized as a solution to support healthy aging (Menec et al., 2011). Using a multiple-item measure of quality of life (rather than a single item as in Menec and Nowicki's (2014) research), this project provides further confirmation of the association between age-friendliness and quality of life in a

Table 4. Correlations of Age-Friendly Survey Domains and WHOQOL Domains.

Age-Friendly Survey domain	WHOQOL: Phy[a]	WHOQOL: Psy[b]	WHOQOL: Soc[c]	WHOQOL: Env[d]
Housing	.11	.14	.16	.02
Transportation	.17*	.15	.06	.21*
Safety	.25**	.17*	.18*	.24**
Outdoor spaces and buildings	.14	.29**	.13	.19*
Information/advocacy	.17*	.28**	.19*	.21*
Respect and social inclusion	.20*	.23**	.07	.15
Social participation/recreation	.10	.10	.13	.12
Community/work force participation	.13	.16	.14	.15
Health and community services	.11	.16	.07	.15

[a]WHOQOL: Physical health.
[b]WHOQOL: Psychological health.
[c]WHOQOL: Social relationships.
[d]WHOQOL: Environment.
*$p < .05$. **$p < .01$

sample of Canadian older adults. This research also builds on existing knowledge by quantifying the extent to which age-friendliness contributes to quality of life after accounting for other variables known to affect quality of life.

Communities investing in age-friendliness initiatives have had difficulty sustaining initial momentum (Russell et al., 2019). Although in this study the contribution of age-friendliness to quality of life was small, even a small contribution can be valuable. Menec and Nowicki (2014) found that higher age-friendliness ratings were associated with better perceived health in older adults. Our study found associations between better perceived health and higher quality of life in the physical health and environment domains. This study lends support to continuing research with age-friendly initiatives; these could lead to an even greater impact over time. Furthermore, the older adults in this study were in reasonably good physical health, and it is possible that age-friendliness would show greater contributions to quality of life for adults with reduced capacities. For example, most of the participants were current drivers (97%). Community age-friendliness, particularly the domain of transportation, could have a greater impact on quality of life for people who have stopped driving.

A strength of this study is the operationalization of age-friendliness as a multifaceted construct, aligning with policy and program efforts. Rather than relying on a single item (e.g., Menec & Nowicki, 2014), we employed a validated self-report measure that captured the multiple domains of the age-friendly framework. It is possible that some aspects of age-friendliness contribute to quality of life more than others. Consequently, one could have surmised that the nine domains incorporated in the AFS would not contribute equally to quality of life. Our exploratory analyses suggest that the most influential AFS domains are transportation, safety, outdoor spaces and buildings, information/advocacy, and respect and social inclusion. However, we did not make adjustments for multiple comparisons; hence, these correlations should be interpreted with caution. Future research should be undertaken to identify more definitively the most influential AFS domains. Identifying those domains with the greatest influence on quality of life could assist with ensuring resources to improve a community's age-friendliness are directed where they will be most beneficial and have the greatest impact.

While our research shows that age-friendliness and quality of life are associated, the cross-sectional nature of the data precludes discussion of causality. Longitudinal research could better determine whether quality of life increases as a community becomes more age-friendly, or whether an unanticipated change in quality of life (e.g., changes in health significantly reducing mobility) affects perceptions of community age-friendliness. It would also enable the investigation of long-term effects of age-friendliness, and the effectiveness of community interventions aimed at older adults. Future research should also include objective measures of age-friendliness to determine their degree of alignment with subjective measures. Researchers to date have found reasonable congruence between objective and subjective measures, with a bias towards objective measures (provided by municipal officials) overestimating a community's age-friendliness when compared with subjective measures (provided by community residents; Menec et al. 2016). Lastly, we had little variability for some of our control variables (e.g., driving status and finances). This is likely a reflection of our sample, where recruitment of individuals already participating in the Candrive study of older drivers ensured our sample was in good health, mostly drivers, and financially secure. Given this study's use of a sub-sample of the Candrive II study and the requirement that participants be licensed and active drivers at the outset of Candrive II, future research examining the perceptions of age-friendliness among older adults who primarily rely on alternative forms of transportation to attain community mobility should be pursued.

Conclusion

Our data show that a community's perceived age-friendliness is associated with quality of life in a select group of older adults, albeit to a small extent. Nonetheless, with an aging population, it is imperative that future research focuses on the needs of all older community members. Furthermore, research to identify specific age-friendly factors that contribute the most to quality of life will assist with designing policies, interventions, and communities that promote successful and healthy aging.

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References

Buffel, T., McGarry, P., Phillipson, C., De Donder, L., Dury, S., De Witte, N., Smetcoren, A.-S., & Verté, D. (2014). Developing age-friendly cities: Case studies from Brussels and Manchester and implications for policy and practice. *Journal of Aging & Social Policy*, *26*(1–2), 52–72. https://doi.org/10.1080/08959420.2014.855043

Choi, M. S., Dabelko-Schoeny, H., & White, K. (2020). Access to employment, volunteer activities, and community events and perceptions of age-friendliness: The role of social connectedness. *Journal of Applied Gerontology: The Official Journal of the Southern Gerontological Society*, *39*(9), 1016–1024. https://doi.org/10.1177/0733464819847588

Eales, J., Keefe, J., & Keating, N. (2008). Age-friendly communities. In N. Keating (Ed.), *Rural aging: A good place to grow old?* (pp. 109–120). Policy Press. https://doi.org/10.1332/policypress/9781861349019.003.0011

Friedman, D., Parikh, N. S., Giunta, N., Fahs, M. C., & Gallo, W. T. (2012). The influence of neighborhood factors on the quality of life of older adults attending New York City senior centers: Results from the Health Indicators Project. *Quality of Life Research*, *21*(1), 123–131. https://doi.org/10.1007/s11136-011-9923-6

Gagnon, S., Marshall, S., Kadulina, Y., Stinchcombe, A., Bédard, M., Gélinas, I., Man-Son-Hing, M., Mazer, B., Naglie, G., Porter, M. M., Rapoport, M., Tuokko, H., & Vrkljan, B. (2016). CIHR candrive cohort comparison with canadian household population holding valid driver's licenses. *Canadian Journal on Aging/La Revue Canadienne Du Vieillissement*, *35*(S1), 99–109. https://doi.org/10.1017/S0714980816000052

Garner, R. E., Feeny, D. H., Thompson, A., Bernier, J., McFarland, B. H., Huguet, N., Kaplan, M. S., Orpana, H., Ross, N. A., & Blanchard, C. (2012). Bodyweight, gender, and quality of life: A population-based longitudinal study. *Quality of Life Research*, *21*(5), 813–825. https://doi.org/10.1007/s11136-011-9989-1

Gibney, S., Zhang, M., & Brennan, C. (2019). Age-friendly environments and psychosocial wellbeing: A study of older urban residents in Ireland. *Aging & Mental Health*, *24*(12), 1–12. https://doi.org/10.1080/13607863.2019.1652246

Gilmour, H. (2012). Social participation and the health and well-being of Canadian seniors. *Health Reports*, *23*(4), 23-32. https://pubmed.ncbi.nlm.nih.gov/23356042.

Jenkinson, C., Wright, L., & Coulter, A. (1994). Criterion validity and reliability of the SF-36 in a population sample. *Quality of Life Research*, *3*(1), 7–12. https://doi.org/10.1007/bf00647843

John, D. H., & Gunter, K. (2016). engAGE in community: Using mixed methods to mobilize older people to elucidate the age-friendly attributes of urban and rural places. *Journal of Applied Gerontology: The Official Journal of the Southern Gerontological Society*, *35*(10), 1095–1120. https://doi.org/10.1177/0733464814566679

Kirchengast, S., & Haslinger, B. (2008). Gender differences in health-related quality of life among healthy aged and old-aged Austrians: Cross-sectional analysis. *Gender Medicine*, *5*(3), 270–278. https://doi.org/10.1016/j.genm.2008.07.001

Lefrancois, R., Leclerc, G., Hamel, S., & Gaulin, P. (2001). Valued activities of everyday life among the very old. *Activities, Adaptation & Aging*, *25*(3–4), 19–34. https://doi.org/10.1300/J016v25n03_02

Lehning, A. J., Smith, R. J., & Dunkle, R. E. (2014). Age-friendly environments and self-rated health: An exploration of Detroit elders. *Research on Aging*, *36*(1), 72–94. https://doi.org/10.1177/0164027512469214

Lui, C.-W., Everingham, J.-A., Warburton, J., Cuthill, M., & Bartlett, H. (2009). What makes a community age-friendly: A review of international literature. *Australasian Journal on Aging*, *28*(3), 116–121. https://doi.org/10.1111/j.1741-6612.2009.00355.x

Marshall, S. C., Man-Son-Hing, M., Charlton, J., Molnar, L. J., Koppel, S., & Eby, D. W. (2013). The Candrive/Ozcandrive prospective older driver study: Methodology and early study findings. *Accident; Analysis and Prevention*, *61*, 233-235. https://doi.org/10.1016/j.aap.2013.07.007.

Menec, V. H., Hutton, L., Newall, N., Nowicki, S., Spina, J., & Veselyuk, D. (2015). How 'age-friendly' are rural communities and what community characteristics are related to age-friendliness? The case of rural Manitoba, Canada. *Aging & Society*, *35*(1), 203–223. https://doi.org/10.1017/S0144686X13000627

Menec, V. H., Means, R., Keating, N., Parkhurst, G., & Eales, J. (2011). Conceptualizing age-friendly communities. *Canadian Journal on Aging = La Revue Canadienne Du Vieillissement*, *30*(3), 479–493. https://doi.org/10.1017/S0714980811000237

Menec, V. H., Newall, N. E. G., & Nowicki, S. (2016). Assessing communities' age-friendliness: How congruent are subjective versus objective assessments? *Journal of Applied Gerontology: The Official Journal of the Southern Gerontological Society*, *35*(5), 549–565. https://doi.org/10.1177/0733464814542612

Menec, V. H., & Nowicki, S. (2014). Examining the relationship between communities' "age-friendliness" and life satisfaction and self-perceived health in rural Manitoba, Canada. *Rural and Remote Health*, *14*(1), 2594. https://doi.org/10.22605/RRH2594.

Miret, M., Caballero, F. F., Chatterji, S., Olaya, B., Tobiasz-Adamczyk, B., Koskinen, S., Leonardi, M., Haro, J. M., & Ayuso-Mateos, J. L. (2014). Health and happiness: Cross-sectional household surveys in Finland, Poland and Spain. *Bulletin of the World Health Organization*, *92*(10), 716–725. https://doi.org/10.2471/BLT.13.129254

Miret, M., Caballero, F. F., Olaya, B., Koskinen, S., Naidoo, N., Tobiasz-Adamczyk, B., Leonardi, M., Haro, J. M., Chatterji, S., & Ayuso-Mateos, J. L. (2017). Association of experienced and evaluative well-being with health in nine countries with different income levels: A cross-sectional study. *Globalization and Health*, *13*(1), 65. https://doi.org/10.1186/s12992-017-0290-0

Mishra, G. D., Gale, C. R., Sayer, A. A., Cooper, C., Dennison, E. M., Whalley, L. J., Craig, L., Kuh, D., & Deary, I. J. (2011). How useful are the SF-36 sub-scales in older people? Mokken scaling of data from the HALCyon programme. *Quality of Life Research*, *20*(7), 1005–1010. https://doi.org/10.1007/s11136-010-9838-7

Nieboer, A. P., & Cramm, J. M. (2018). Age-friendly communities matter for older people's well-being. *Journal of Happiness Studies*, *19*(8), 2405–2420. https://doi.org/10.1007/s10902-017-9923-5

Oxley, J., & Whelan, M. (2008). It cannot be all about safety: The benefits of prolonged mobility. *Traffic Injury Prevention*, *9*(4), 367–378. https://doi.org/10.1080/15389580801895285

Park, S., & Lee, S. (2017). Age-friendly environments and life satisfaction among South Korean elders: Person-environment fit perspective. *Aging & Mental Health*, *21*(7), 693–702. https://doi.org/10.1080/13607863.2016.1154011

Plouffe, L., & Kalache, A. (2010). Towards global age-friendly cities: Determining urban features that promote active aging. *Journal of Urban Health*, *87*(5), 733–739. https://doi.org/10.1007/s11524-010-9466-0

Plouffe, L. A., & Kalache, A. (2011). Making communities age friendly: State and municipal initiatives in Canada and other countries. *Gaceta Sanitaria*, *25*(Suppl 2), 131–137. https://doi.org/10.1016/j.gaceta.2011.11.001

Public Health Agency of Canada (2010). *On the road to age-friendly communities*. Public Health Agency of Canada. http://www.publications.gc.ca/site/eng/9.693959/publication.html

Read, S., Grundy, E., & Foverskov, E. (2016). Socio-economic position and subjective health and well-being among older people in Europe: A systematic narrative review. *Aging & Mental Health*, *20*(5), 529–542. https://doi.org/10.1080/13607863.2015.1023766

Richard, L., Gauvin, L., Gosselin, C., & Laforest, S. (2009). Staying connected: Neighbourhood correlates of social participation among older adults living in an urban environment in Montréal, Quebec. *Health Promotion International*, *24*(1), 46–57. https://doi.org/10.1093/heapro/dan039

Russell, E., Skinner, M. W., & Fowler, K. (2019). Emergent challenges and opportunities to sustaining age-friendly initiatives: Qualitative findings from a canadian age-friendly funding program. *Journal of Aging & Social Policy*, *6*, 1-20. https://doi.org/10.1080/08959420.2019.1636595.

Scharlach, A. E., & Lehning, A. J. (2013). Aging-friendly communities and social inclusion in the United States of America. *Aging & Society*, *33*(1), 110–136. https://doi.org/10.1017/S0144686X12000578

Skevington, S. M., Lotfy, M., & O'Connell, K. A. (2004). The World Health Organization's WHOQOL-BREF quality of life assessment: Psychometric properties and results of the international field trial. A report from the WHOQOL group. *Quality of Life Research*, *13*(2), 299–310. https://doi.org/10.1023/B:QURE.0000018486.91360.00

Smith, R. J., Lehning, A. J., & Dunkle, R. E. (2013). Conceptualizing age-friendly community characteristics in a sample of urban elders: An exploratory factor analysis. *Journal of Gerontological Social Work*, *56*(2), 90–111. https://doi.org/10.1080/01634372.2012.739267

Tang, J. Y. M., Chui, C. H. K., Lou, V. W. Q., Chiu, R. L. H., Kwok, R., Tse, M., Leung, A. Y. M., Chau, P.-H., & Lum, T. Y. S. (2021). The contribution of sense of community to the association between age-friendly built environment and health in a high-density city: A cross-sectional study of middle-aged and older adults in Hong Kong. *Journal of Applied Gerontology*, *40*(12), 1687–1696. https://doi.org/10.1177/0733464821991298

Ware, J. E., Jr., & Sherbourne, C. D. (1992). The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Medical Care*, *30*(6), 473–483. https://doi.org/10.1097/00005650-199206000-00002

Webber, S. C., Porter, M. M., & Menec, V. H. (2010). Mobility in older adults: A comprehensive framework. *The Gerontologist*, *50*(4), 443–450. https://doi.org/10.1093/geront/gnq013

World Health Organization (2004). *The World health organization quality of life (WHOQOL) – BREF*. World Health Organization.

World Health Organization (2007). *Global age-friendly cities: A guide*. World Health Organization.

World Health Organization (2015). *World report on aging and health*. World Health Organization.

Yan, B., Gao, X., & Lyon, M. (2014). Modeling satisfaction amongst the elderly in different Chinese urban neighborhoods. *Social Science & Medicine*, *118*, 127-134. https://doi.org/10.1016/j.socscimed.2014.08.004.