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Social participation and barriers to community activities among middle-aged and older Canadians: Differences and similarities according to gender and age

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Aim: This study described and compared participation with community activities and perceived barriers among middle-aged and older Canadians by gender and age group (45–64, 65–74, 75–84, ≥85 years).

Method: Using the cross-sectional 2008–2009 Canadian Community Health Survey – Healthy Aging, we considered the frequency of involvement in eight community activities and the presence of 10 perceived personal and environmental barriers.

Results: Although frequency was globally similar for women and men (15.2 vs. 14.5 activities per month; $P < 0.01$), adults aged 65–74 years had higher participation (16.0 activities per month) than adults aged 45–64, 75–84 and ≥85 years ($P < 0.01$). Barriers showed wider gender and age gaps than participation to community activities. Notably, health condition limitations were the most reported barrier aged ≥65 years, and environmental barriers were generally greater for women than men, particularly transportation problems ($P < 0.01$), except ≥85 years.

Conclusion: The results highlight that further study of social participation and barriers among older adults must consider gender and age differences. The differences are important to consider for designing population interventions aiming at improving social participation among aging Canadians. **Geriatr Gerontol Int 2021; 21: 77–84**.

Keywords: barriers, environment, social activities, social participation, transportation.

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Introduction

Social participation is defined as a person's involvement in activities that provide social interactions within the community or society,[1] and is a determinant of health and well-being for older adults. Social participation can be formal when engaging in volunteering activities in the community, educational courses, sports, clubs, religious or political organizations, or informal, when the relationships fall outside the realm of formal organizations, such as helping a neighbor or going to the restaurant with friends.[2] Social participation is associated with many positive health outcomes in middle-aged adults, such as maintaining cognitive functions,[3] life satisfaction and positive affect,[4] and, in older adults, and lower rates of disability[5] and depressive symptoms.[6] A meta-analysis demonstrated that people having a superior social participation have a 14% increased likelihood of survival, regardless of the age group.[7]

According to the Human Development Model – Disability Creation Process (HDM-DCP),[8] social participation can be explained as the interaction between an individual and their environment. Disability or the lack of neighborhood resources can be respectively relate to personal or environmental barriers to social participation. To increase their opportunities for social participation and contribute to their health and well-being, it is essential to have a better understanding of barriers for older adults, notably by comparing with younger adults. Because social participation is expected to decrease as adults age, particularly past 75 and with health problems,[9] fostering participation at younger age may contribute to maintain health at later ages.

Among the personal domain, Canadian older women are more likely to participate in activities with family and friends, while men are more inclined for physical activities with others.[10] Participation in volunteering activities during middle-age (55–64 years old) was associated with volunteering in later ages.[11] Indeed, more than three of four middle-aged Americans that volunteered preretirement maintained regular or sporadic volunteering postretirement.[12] Almost half (43%) of Western Europeans aged ≥50 that participate formally were more likely, in the following years, to initiate informal social relations with neighbors, friends or colleagues.[2] Developing social relationships is an important aspect, because it was shown to be a mediator to social participation in older Canadians.[10] Age also has been found to be negatively associated with social participation, particularly >75 years old.[13] According to the model of selective optimization with compensation, older adults optimize their resources by selecting the most salient activities in their life, to adjust for becoming exhausted more quickly.[14] Having a driver's license increases mobility and was positively associated with social participation.[15]

The physical and social characteristics of the environment can act as facilitators or barriers to social participation. Environmental facilitators such as safe sidewalks and adequate lighting can support personal capacities such as mobility, beneficial for increasing social participation.[16] The availability of activities and resources may promote walking for transportation, which can both increase opportunities for community activities and lower the needs for transportation. Environmental barriers interacting with personal characteristics can challenge and exceed the capacities of the individual, therefore impeding social participation.[8]

Although several studies have looked at personal and environmental barriers and social participation among older adults, most research targeted a limited number of older adults, sometimes using convenience samples. Moreover, even if social participation at a later age was associated with previous experiences in middle-age,[11] these studies did not explore barriers for adults <65 years old, which may restrict subsequent social participation.[2] In addition, while Canadian studies on social participation[17,18] were interested in barriers, only one examined reasons for not participating,[10] but had not compared gender and age. Comparing social participation and barriers according to gender and age is important for health promotion and preventive action, notably for developing interventions aimed at optimizing the environment for older adults that are more vulnerable. Therefore, this study aimed to describe and compare participation in community activities outside the home and perceived personal and environmental barriers among older Canadians according to gender and age group (45–64, 65–74, 75–84 and ≥85).

Methods

At the time of the study, only one national survey was available to reach our objectives, i.e., the cross-sectional 2008–2009 Canadian Community Health Survey, "Healthy Aging" (CCHS-HA). The CCHS-HA computer-assisted interviews were conducted face-to-face among 30 865 Canadians aged ≥45 living in private dwellings in the 10 Canadian provinces. A stratified random sampling strategy was used to select respondents according to age, gender, province and geography. A weight matrix was applied, enabling population-level inference. Outputs met the confidentiality standards required by the Statistics Act to prevent identification of an individual.

Variables and measures

Sociodemographic characteristics were measured by a series of questions on gender, age, marital status, driver's license, transportation, retirement, dwelling, living area, household income, immigration and education (Table 1). Physical health condition was reported by: (i) chronic conditions (at least one or none); (ii) pain and discomfort (from no pain = 1 to pain preventing most activities = 5); and (iii) mobility (from walking around the neighborhood without difficulty = 1 to being unable to walk alone, even with walking equipment = 4). Loneliness was measured with the three-item loneliness continuous scale (how often respondents feel they lack companionship, left out from others; from not lonely = 3 to very lonely = 9).[19]

Social participation was assessed by measuring reported frequency of participating in eight social and community activities: family or friendship outside the household; church or religious; sports or physical; educational and cultural; service club or fraternal organization; neighborhood, community or professional association; volunteer or charity work; and other recreational (e.g., hobbies, bingo and other games). Based on previous

investigations, responses were converted into monthly frequencies of participation in each activity, i.e., respectively: "at least once a day" = 20; "at least once a week" = 6; "at least once a month" = 2; "at least once a year" = 1; and "never" = 0.[15,20] Frequencies were summed into a continuous estimate of the total number of community activities per month. Internal consistency of the scale was satisfactory ($\alpha = 0.72$).

Respondents were asked if they wanted to participate in more social activities (yes or no) and, in the affirmative, to give the reason(s) that prevented them from participating more, classified by the interviewer from a list of 13 reasons. Responses included personal barriers (health condition limitation, too busy, personal or family responsibilities, and not wanting to go alone), and environmental barriers (time of activities not suitable, cost, activities not available in the area, transportation problems, location too far, concerns about safety, language-related reasons, location not physically accessible, and other [unspecified]). These barriers were classified into the personal and environmental domains following the HDM-DCP.[8]

Analysis

Secondary analyses were conducted using CCHS-HA microdata. Characteristics of respondents were described by means or percentages, and their 95% confidence intervals, according to the type of variable (continuous or categorical, respectively). To identify significant differences according to gender and age group, pairwise comparisons were performed (*z*- and *t*-tests), and Bonferroni adjusted, to limit potential of type I errors. Three barriers had too few observations in combinations of gender and age groups and had to be removed from the results, to avoid the risk of residual disclosure (i.e., concerns about safety, language barriers and physical inaccessibility). To account for the complex design of the CCHS-HA, bootstrap resampling was performed to compute *P*-values. Statistical analyses were carried out using Stata 14.0.

Results

Descriptions of respondents

Consistent with the 2009 population estimates,[21] the majority of CCHS-HA respondents were aged between 45 and 64 (Table 1). Household income dropped aged ≥65 years, particularly for women. Older respondents reported greater mobility limitations, i.e., difficulty in walking around the neighborhood, as well as pain and discomfort that prevent them from doing activities. In general, Canadians reported moderate loneliness. More than seven of 10 Canadians in the 65–74 age group were in a couple, decreasing to about a third in the oldest group (Table 1). Almost two-thirds of Canadians in the older group were widowed, more commonly women than men. Half of Canadians aged 65–74 had a post-secondary education level, a proportion higher than the two older groups, but lower than the 45–64 age group. Across all age groups, men were more likely to have a post-secondary education level than women were. One of five respondents lived in a rural area (Table 1). Home ownership declined from eight of 10 for the youngest group to six of 10 for the oldest group. The great majority of Canadians were fully retired ≥65 years old. Approximately one of four Canadians was immigrant, with the lowest proportion found in the younger age group. The vast majority of Canadians aged ≥45 had a driver's license, but less than half of those aged ≥85 years (Table 1). Fewer women had a driver's license than men for all age groups and the gap increased with age. Driving or being a passenger in a motor vehicle was the most common form of transportation. Alternative modes (public transit, paratransit, walking or cycling) reached a fourth of Canadians aged ≥85 years. Almost a third of women aged ≥85 years reported using alternative forms of transportation (Table 1). More than three of four Canadians aged ≥65 years had at least one chronic condition, reaching more than nine of 10 among Canadians aged ≥85 years.

Participation in social activities

Canadian women and men participated in an average of respectively 15.2 and 14.5 activities per month (Table 2). Canadians aged between 65 and 74 participated the most (16 activities per month). After 75 years old, frequencies of participation decreased with age, reaching 12.5 activities per month for Canadians aged ≥85. The three most frequent social activities for both genders were related to family or friends, physical activity or religion. Involvement in physical activities with others decreased significantly with age, with a steeper decrease for the older groups (Table 2). Women in the 45–64 and 65–74 years age groups had more social activities than men had, but these differences were small.

Barriers to social participation

A third of aging Canadians wanted to participate more, significantly more within the 45–64 years age group than the older groups (Table 3). Women aged between 65 and 74 years were more likely than men to report wanting to participate more. Being too busy was the most frequently reported barrier, particularly for the 45–64 years group, but rapidly decreased with age (Table 3). Unsuitable time of activities was the environmental barrier most reported by the two younger age groups. However, ≥65 years old, health condition limitation became the most prevalent barrier. Personal or family responsibilities were the third most important barrier overall. Not wanting to go alone and transportation problems were reported more frequently by women than men, for both younger age groups. In addition to health limitations, a fourth of all women aged ≥85 years were impeded by transportation problems and over a tenth by the unavailability of the activities.

Discussion

This study aimed to describe and compare social participation and perceived barriers according to gender and age group. Results showed that both genders participated similarly and that they enjoyed roughly the same social activities, which is consistent with previous studies[9] using different questionnaires, such as the Assessment of Life Habits.[22]

In discussing frequencies of participation, similarly to the present research, studies showed that older age is associated with lower social participation ($r = -0.53$; $P < 0.001$).[20] Moreover, in a previous analysis of the CCHS-HA comparing three age groups (65–74, 75–84 and ≥85), adults aged ≥85 years were less likely to participate in social activities than the other groups ($P < 0.05$).[10] A German study found that older adults (≥60 years) participated in fewer activities with friends and family, than middle-aged adults (40–59 years; $P < 0.05$),[4] contradicting the present results. The current age segmentation showed that monthly participation increased in respondents aged ≥65 year old and gradually decreased to reach its lowest frequencies in the ≥85 years age group, as younger retirees have more time for activities they wish to accomplish.[23] However, closer to the end of life, older adults might experience a shift in motivation, prioritizing meaningful social relationships, such as with family members, rather than more superficial social activities.[24] In addition, however, health

Table 1 Sociodemographic and health characteristics of the aging Canadian population by gender and age group

		45–64 years			65–74 years			75–84 years			≥85 years			Total		
		W	M	Total	W	M	Total	W	M	Total	W	M	Total	W	M	Total
		N = 7838	*N* = 6658	*N* = 14 496	*N* = 3721	*N* = 3254	*N* = 6975	*N* = 3317	*N* = 2003	*N* = 5320	*N* = 2692	*N* = 1382	*N* = 4074	*N* = 17 568	*N* = 13 297	*N* = 30 865
		(66.1%)	(70.0%)	(68.0%)	(17.8%)	(17.5%)	(17.7%)	(11.6%)	(9.9%)	(10.8%)	(4.5%)	(2.6%)	(3.6%)	(51.9%)	(48.1%)	(100%)
Continuous variables		Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)
Income ($CAN)		81 252$^{\dagger\dagger **}$ (77 791, 84 713)	89 262†† (85 709, 92 814)	85 424†† (82 730, 88 118)	43 772** (41 229, 46 314)	59 173 (55 709, 62 637)	51 679 (49 226, 54 132)	39 578** (36 736, 42 421)	48 880†† (46 030, 51 731)	44 020†† (41 906,46 134)	34 569$^{\dagger\dagger **}$ (30 746, 38 391)	44 292†† (40 801, 47 783)	38 322†† (35 580, 41 063)	68 823*** (66 236, 71 410)	79 437 (76 694, 82 180)	74 251 (72 157, 76 346)
Mobility limitations (/4)		1.1 (1.1, 1.2)	1.1 (1.0, 1.1)	1.1†† (1.1, 1.2)	1.3 (1.2, 1.4)	1.2 (1.1, 1.2)	1.2 (1.2, 1.3)	1.5† (1.4, 1.7)	1.4‡ (1.3, 1.5)	1.5†† (1.4, 1.6)	2.2†† (2.0, 2.4)	2.0† (1.7, 2.3)	2.2†† (2.0, 2.3)	1.3*** (1.2, 1.3)	1.2 (1.1, 1.2)	1.2 (1.2, 1.2)
Pain and discomfort (/5)		1.6$^{\dagger *}$ (1.5, 1.6)	1.5 (1.4, 1.5)	1.5†† (1.5, 1.6)	1.7** (1.7, 1.8)	1.5 (1.5, 1.6)	1.6 (1.6, 1.7)	1.8** (1.8, 1.9)	1.6 (1.5, 1.7)	1.7† (1.7, 1.8)	2.0†† (1.9, 2.1)	1.7† (1.6, 1.9)	1.9†† (1.8, 2.0)	1.7*** (1.6, 1.7)	1.5 (1.5, 1.5)	1.6 (1.6, 1.6)
Loneliness (/9)		3.9* (3.8, 3.9)	3.7†† (3.6, 3.8)	3.8†† (3.7, 3.8)	3.9** (3.8, 3.9)	3.5 (3.5, 3.6)	3.7 (3.7, 3.7)	3.9 (3.8, 4.0)	3.6 (3.5, 3.6)	3.8 (3.7, 3.8)	4.0* (3.9, 4.1)	3.8†† (3.7, 3.9)	3.9†† (3.9, 4.0)	3.9*** (3.8, 3.9)	3.7 (3.6, 3.7)	3.8 (3.7, 3.8)
Categorical variables		% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Marital status	Married/ common-law	76.5$^{\dagger\dagger ***}$ (74.9, 78.2)	80.7† (79.1, 82.3)	78.6†† (77.4, 79.8)	62.3** (60.1, 64.6)	84.0 (82.4, 85.6)	72.7 (71.2, 74.1)	41.9$^{\dagger\dagger **}$ (39.2, 44.6)	77.5†† (75.3, 79.8)	57.6†† (55.7, 59.5)	18.5$^{\dagger\dagger **}$ (15.4, 21.5)	65.3†† (60.8, 69.9)	35.0†† (32.4, 37.6)	67.4*** (66.2, 68.6)	80.6 (79.3, 81.8)	73.7 (72.8, 74.6)
	Widowed	4.0$^{\dagger\dagger **}$ (3.3, 4.6)	1.3†† (0.8, 1.7)	2.6†† (2.2, 3.0)	21.8** (20.1, 23.5)	4.8 (4.0, 5.5)	13.7 (12.7, 14.6)	47.5$^{\dagger\dagger **}$ (45.0, 50.0)	14.8†† (13.0, 16.6)	33.1†† (31.4, 34.8)	75.8$^{\dagger\dagger **}$ (72.8, 78.9)	31.1†† (26.7, 35.4)	60.1†† (57.6, 62.6)	15.4*** (14.8, 16.0)	4.0 (3.6, 4.4)	9.9 (9.5, 10.3)
	Divorced/ separated	12.4** (11.3, 13.5)	9.8 (8.8, 10.9)	11.2 (10.3, 12.0)	11.3** (10, 12.5)	7.7 (6.5, 8.9)	9.6 (8.7, 10.4)	6.4†† (5.2, 7.5)	4.8†† (3.8, 5.8)	5.7†† (4.9, 6.5)	2.4†† (1.6, 3.1)	1.6†† (1.0, 2.2)	2.1†† (1.5, 2.7)	11.1*** (10.3, 11.9)	8.8 (8.0, 9.5)	10.0 (9.4, 10.6)
	Single	7.1†† (6.1, 8.0)	8.2†† (7.0, 9.4)	7.6†† (6.9, 8.4)	4.6 (3.8, 5.4)	3.6 (2.8, 4.3)	4.1 (3.6, 4.7)	4.2 (3.3, 5.2)	2.9 (2.0, 3.7)	3.6 (3.0, 4.3)	3.4 (2.3, 4.4)	2.0 (1.1, 2.8)	2.9 (2.1, 3.7)	6.1 (5.5, 6.8)	6.7 (5.8, 7.5)	6.4 (5.8, 7.0)
Education	< Secondary school	14.0†† (12.5, 15.4)	13.4†† (12, 14.8)	13.7†† (12.7, 14.7)	37.3* (34.8, 39.8)	32.0 (29.8, 34.3)	34.8 (33.0, 36.6)	49.2†† (46.5, 51.9)	45.4†† (42.2, 48.5)	47.5†† (45.4, 49.7)	57.6†† (54.1, 61.2)	50.2†† (45.2, 55.2)	55.0†† (52.0, 58.1)	24.2*** (22.9, 25.4)	20.9 (19.7, 22)	22.6 (21.7, 23.4)
	Secondary school	25.3$^{\dagger\dagger **}$ (23.4, 27.1)	18.4†† (16.6, 20.2)	21.9 (20.6, 23.2)	17.7* (15.9, 19.6)	14.0 (12.3, 15.7)	15.9 (14.7, 17.2)	15.9 (13.9, 18.0)	14 (11.8, 16.2)	15.1 (13.6, 16.6)	16.1* (13.3, 18.9)	9.8 (6.9, 12.7)	13.9 (11.7, 16.1)	22.4*** (21.1, 23.8)	16.9 (15.6, 18.3)	19.8 (18.8, 20.8)
	Post-secondary	60.7$^{\dagger\dagger **}$ (58.6, 62.9)	68.2†† (66.1, 70.3)	64.4 (62.9, 65.9)	45.0** (42.6, 47.4)	54.0 (51.6, 56.4)	49.3 (47.5, 51.1)	34.9$^{\dagger\dagger *}$ (32.3, 37.4)	40.6†† (37.5, 43.7)	37.4†† (35.3, 39.6)	26.3$^{\dagger\dagger **}$ (23.1, 29.4)	40.0†† (34.9, 45.1)	31.1†† (28.3, 33.9)	53.4*** (51.7, 55)	62.2 (60.6, 63.8)	57.6 (56.4, 58.8)
Rural area		21.7 (19.3, 24.1)	21.7 (19.3, 24.1)	21.7 (19.6, 23.8)	21.7 (18.8, 24.6)	24.6 (21.7, 27.4)	23.1 (20.7, 25.5)	18.8 (15.9, 21.7)	21.3 (18.2, 24.5)	19.9 (17.5, 22.4)	17.0 (14.1, 20.0)	19.9 (15.3, 24.4)	18.0†† (15.2, 20.8)	21.2*** (19.0, 23.3)	22.1 (19.9, 24.3)	21.6 (19.7, 23.6)
Dwelling (own)		82.9†† (81.2, 84.6)	84.5 (82.7, 86.3)	83.7 (82.3, 85.0)	77.2** (75.0, 79.4)	86.1 (84.5, 87.8)	81.5 (80.0, 82.9)	67.1$^{\dagger\dagger **}$ (64.2, 69.9)	82.9 (80.7, 85.0)	74.0†† (72.0, 76.1)	57.3$^{\dagger\dagger **}$ (53.5, 61.0)	74.1†† (70.1, 78.1)	63.3†† (60.3, 66.2)	78.9*** (77.5, 80.3)	84.3 (83.0, 85.7)	81.5 (80.4, 82.6)
Retired		25.3$^{\dagger\dagger **}$ (24.0, 26.6)	18.7†† (17.3, 20.0)	22.0†† (21.0, 23.0)	91.6** (90.1, 93.0)	85.0 (83.0, 87.0)	88.4 (87.2, 89.6)	95.9†† (94.8, 97.1)	96.0†† (94.8, 97.3)	96.0†† (95.4, 96.9)	96.3 (93.0, 99.6)	‡ ‡	97.5†† (95.4, 99.7)	46.7††† (45.7, 47.6)	38.8 (37.8, 39.9)	42.9 (42.1, 43.6)
Immigrant (yes)		23.7† (21.5, 25.9)	24.5† (22.2, 26.9)	24.1†† (22.3, 26.00)	27.8 (25.5, 30.2)	29.3 (26.9, 31.8)	28.6 (26.7, 30.4)	24.5** (22.1, 27.0)	31.3 (28.5, 34.2)	27.5 (25.6, 29.5)	28.6 (25.0, 32.1)	32.5 (28.3, 36.6)	30.0 (27.1, 32.8)	24.8 (23.0, 26.5)	26.3 (24.3, 28.2)	25.5 (23.9, 27.1)
Driver's license (yes)		89.0$^{\dagger\dagger **}$ (87.6, 90.3)	95.5 (94.6, 96.4)	92.2†† (91.3, 93.1)	76.8** (74.8, 78.7)	93.6 (92.3, 94.9)	84.8 (83.6, 86.1)	57.2$^{\dagger\dagger **}$ (54.6, 59.8)	86.3†† (84, 88.5)	70.1†† (68.1, 72.0)	26.3$^{\dagger\dagger **}$ (23.6, 29.1)	66.7†† (62.4, 70.9)	40.7†† (38.4, 43.0)	80.3*** (79.2, 81.4)	93.5 (92.7, 94.3)	86.7 (85.9, 87.4)
Transportation (most common form in the past month)	Motor vehicle (driver or pass)	87.1 (85.4, 88.8)	88.5 (86.4, 90.5)	87.7 (86.3, 89.2)	85.9* (84, 87.9)	90.4 (88.6, 92.3)	87.9 (86.6, 89.3)	78.9$^{\dagger\dagger **}$ (76.4, 81.4)	86.3 (83.7, 88.9)	82.1†† (80.1, 84.1)	67.4$^{\dagger\dagger **}$ (62.7, 72.1)	84.4 (79.6, 89.2)	74.0†† (70.4, 77.5)	85.5** (84.1, 86.9)	88.5 (86.9, 90.1)	86.9 (85.7, 88.1)
	Walking or cycling	4.1 (3.3, 4.9)	4.8 (3.5, 6.2)	4.4 (3.7, 5.2)	4.6 (3.6, 5.6)	4.0 (3.0, 5.1)	4.3 (3.6, 5.1)	6.3 (4.9, 7.7)	4.3 (2.7, 5.8)	5.4 (4.4, 6.5)	8.3 (5.5, 11.0)	3.9 (1.7, 6.0)	6.6 (4.7, 8.4)	4.5 (3.9, 5.1)	4.6 (3.6, 5.6)	4.6 (4.0, 5.2)
	Other (public transit/ paratransit, taxi, wheelchair)	8.8 (7.4, 10.2)	6.7 (5.2, 8.2)	7.9 (6.8, 8.9)	9.5** (7.9, 11.1)	5.5 (4.0, 7.1)	7.7 (6.63, 8.9)	14.8$^{\dagger\dagger **}$ (12.6, 17)	9.4 (7.2, 11.7)	12.5†† (10.8, 14.2)	24.3$^{\dagger\dagger **}$ (19.9, 28.7)	11.8 (7.7, 15.8)	19.5†† (16.3, 22.7)	10.0*** (8.8, 11.2)	6.9 (5.6, 8.1)	8.6 (7.7, 9.5)
Chronic condition (at least one)		74.5$^{\dagger\dagger ***}$ (72.6, 76.4)	68.4†† (66.2, 70.7)	71.5 (70.0, 73.0)	92.0** (90.8, 93.2)	87.3 (85.6, 88.9)	89.7 (88.7, 90.8)	94.5$^{\dagger *}$ (93.3, 95.7)	91.2† (89.5, 92.9)	93.1 (92.0, 94.1)	95.3† (93.9, 96.8)	91.2 (88.1, 94.3)	93.9 (92.4, 95.4)	80.8*** (79.5, 82.1)	74.5 (72.9, 76.2)	77.8 (76.7, 78.9)

W significantly different from M: $^{*}P < 0.01$, $^{**}P < 0.001$; †significantly different from 65–74: $^{\dagger}P < 0.01$, $^{\dagger\dagger}P < 0.001$.

$^{\ddagger}n$ was too small for public release. Column's sample size is indicative only, data were weighted to reflect Canadian population. Percentages between brackets represent the weighted subpopulations proportions.

Table 2 Monthly frequencies of participation in community activity according to gender and age

	45–64 years			65–74 years			75–84 years			≥85 years			Total		
	W	M	Total	W	M	Total	W	M	Total	W	M	Total	W	M	Total
	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)
Family/friends	4.6 (4.5, 4.8)	4.4 (4.2, 4.6)	4.5†† (4.4, 4.6)	5.0 (4.8, 5.19)	4.9 (4.7, 5.1)	4.9 (4.8, 5.1)	4.8 (4.5, 5.0)	4.6 (4.3, 4.9)	4.7 (4.5, 4.9)	4.3†† (4.0, 4.6)	4.7 (4.2, 5.1)	4.4† (4.2, 4.7)	4.7 (4.6, 4.8)	4.5 (4.4, 4.6)	4.6 (4.5, 4.7)
Religious	1.9†† (1.7, 2.0)	1.7†† (1.5, 1.8)	1.8†† (1.7, 1.9)	2.7** (2.5, 2.9)	2.3 (2.1, 2.5)	2.5 (2.4, 2.6)	3.0 (2.8, 3.2)	2.8† (2.6, 3.1)	2.9†† (2.8, 3.0)	2.7 (2.5, 2.9)	2.7 (2.4, 3.1)	2.7 (2.5, 2.9)	2.2** (2.1, 2.3)	1.9 (1.8, 2.0)	2.1 (2.0, 2.1)
Physical	3.1 (2.8, 3.3)	2.9 (2.7, 3.1)	3.0 (2.8, 3.2)	2.7 (2.5, 2.9)	2.7 (2.5, 3.0)	2.7 (2.6, 2.9)	1.8†† (1.6, 2.0)	2.0†† (1.8, 2.3)	1.9†† (1.7, 2.1)	1.1†† (0.8, 1.3)	1.6†† (1.2, 2.1)	1.3†† (1.0, 1.5)	2.8 (2.6, 2.9)	2.8 (2.6, 2.9)	2.8 (2.6, 2.9)
Educational	1.6†**† (1.5, 1.7)	1.4†† (1.3, 1.5)	1.5†† (1.4, 1.6)	1.2 (1.1, 1.3)	1.1 (1.0, 1.2)	1.2 (1.1, 1.2)	1.0 (0.9, 1.1)	0.8†† (0.7, 0.9)	0.9†† (0.8, 1.0)	0.6†† (0.5, 0.7)	0.7†† (0.5, 0.8)	0.6†† (0.6, 0.7)	1.4** (1.4, 1.5)	1.3 (1.2, 1.3)	1.3 (1.3, 1.4)
Clubs	0.4†† (0.4, 0.5)	0.5†† (0.5, 0.6)	0.5†† (0.4, 0.5)	0.8 (0.7, 0.9)	0.8 (0.7, 0.9)	0.8 (0.7, 0.9)	0.9 (0.7, 1.0)	1.1 (0.9, 1.2)	0.9 (0.8, 1.1)	0.5†† (0.4, 0.6)	0.7 (0.6, 0.9)	0.6†† (0.5, 0.7)	0.6 (0.5, 0.6)	0.6 (0.6, 0.7)	0.6 (0.6, 0.6)
Associations	0.8 (0.7, 1.0)	0.8 (0.7, 0.9)	0.8 (0.8, 0.9)	0.9 (0.8, 1.0)	0.9 (0.8, 1.0)	0.9 (0.8, 1.0)	0.9 (0.8, 1.0)	0.9 (0.8, 1.1)	0.9 (0.8, 1.0)	0.7 (0.6, 0.8)	0.7 (0.5, 0.8)	0.7† (0.6, 0.8)	0.9 (0.8, 0.9)	0.9 (0.8, 0.9)	0.9 (0.8, 0.9)
Volunteering	1.4* (1.3, 1.5)	1.2† (1.1, 1.3)	1.3†† (1.2, 1.4)	1.7 (1.5, 1.8)	1.5 (1.3, 1.7)	1.6 (1.5, 1.7)	1.3† (1.1, 1.4)	1.4 (1.2, 1.6)	1.3† (1.2, 1.4)	0.6†† (0.5, 0.8)	0.9†† (0.5, 1.2)	0.7†† (0.6, 0.9)	1.4 (1.3, 1.5)	1.3 (1.2, 1.3)	1.3 (1.3, 1.4)
Other recreational	1.3†† (1.2, 1.4)	1.5 (1.4, 1.6)	1.4 (1.3, 1.5)	1.7 (1.5, 1.8)	1.5 (1.4, 1.6)	1.6 (1.5, 1.7)	1.8 (1.6, 1.9)	1.5 (1.3, 1.7)	1.6 (1.5, 1.8)	1.8 (1.6, 2.0)	1.5 (1.2, 1.9)	1.7 (1.5, 1.9)	1.5 (1.4, 1.5)	1.5 (1.4, 1.6)	1.5 (1.4, 1.5)
Total	15.1†† (14.6, 15.6)	14.3† (13.7, 14.8)	14.7†† (14.3, 15.1)	16.5 (15.9, 17.1)	15.5 (14.9, 16.1)	16.0 (15.6, 16.5)	15.0 (14.1, 15.9)	14.8 (14.0, 15.5)	14.9† (14.3, 15.5)	12.1†† (11.3, 12.9)	13.1† (11.7, 14.5)	12.5†† (11.7, 13.2)	15.2 (14.8, 15.6)	14.5 (14.1, 14.9)	14.9 (14.6, 15.2)

W significantly different from M: *$P < 0.01$, **$P < 0.001$; significantly different from 65–74: †$P < 0.01$, ††$P < 0.001$.

decline could explain the lower participation, without however lowering satisfaction with participation.[13] Indeed, our results showed a decline in social participation for the oldest, while they had the lowest proportions in wanting to participate more. Few gender differences in participation were found, particularly in later ages.

In contrast to the frequencies of social participation, the distribution of barriers according to age and gender revealed significant differences with previous studies. Age wise, the oldest age group had the lowest proportion wanting to participate more, suggesting that they might prioritize some activities (e.g., with friends and family) to counteract the barriers, or not have the motivation to maintain the same level of social participation.[14] Moreover, in a sample of British aged ≥50 years, participation restrictions were found to be more prevalent in women ($P < 0.05$),[25] but did not test for significant differences according to age and gender. The present results showed that women between 65 and 84 years wanted to participate more than men and more women in these age groups were restricted by perceived barriers than men.

In the current study, more than half of the middle-aged Canadians that wanted to participate more reported being too busy or having too many family responsibilities. Additionally, more than one of 10 middle-aged adults suggested that the time of the activities were not suitable for their personal schedule. After the age of 65 years, health limitation became the most prevalent personal barrier to social participation in older adults who could benefit from community interventions. Among these interventions is the personalized citizen assistance for social participation, which paired older adults with volunteers helping them to accomplish activities in the community. This intervention has been shown to improve participation in leisure activities (frequency of activities went from 9.0 [$Q = 3.5$] to 14.0 [$Q = 3.1$] on a maximum of 30; $P < 0.01$).[26] More particularly, transportation problems exposed not only a gender gap, but also a transition from younger to older ages for Canadian women. Effectively, transportation problems were the only barrier reported more often by women than men across all age groups. However, transportation problems were six times more prevalent in women aged ≥85 years than women from the younger group. As one of two Canadian women aged ≥85 years is a car passenger without a driver's license,[27] transportation can become an issue when the spouse loses his driver's license. According to a Californian study, respondents in such a situation were almost six times more likely to report a severely reduced mobility for social and recreational destinations ($P < 0.001$) compared with a household with a driver license.[28] In addition, as a fourth of all women aged ≥85 years used public transit, unsuitable timetables, unavailability of paratransit and transit complexity might contribute to transportation problems.

Lastly, women were living in households with a significantly lower mean income than men, but did not report more frequently that cost was a barrier to social participation than men. Nevertheless, cost factors might be included in other barriers, for example, not owing a car, which can be reported as a transportation problem, but could be the result of having a low income.

The implications of this study were that a low participation was associated with wanting to participate more. Indeed, from the Canadians that wanted to participate more, 25.0% had the lowest frequency of participation (<6 activities per month), against 21.7% with the highest frequency (>18 activities per month; $P < 0.05$).[20] Interventions aimed at lowering the most prevalent barriers found in the current study, notably health condition limitation, not wanting to go alone, transportation problems and unavailability of activities could increase participation for older Canadians that participate the least. Participation barriers for middle-aged adults

Table 3 Barriers to participating more according to age and gender

	45–64 years			65–74 years			75–84 years			≥85 years			Total		
	W	M	Total	W	M	Total	W	M	Total	W	M	Total	W	M	Total
	Prop	Prop	Prop	Prop	Prop	Prop	Prop	Prop	Prop	Prop	Prop	Prop	Prop	Prop	Prop
	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)
Want to participate more	38.2†† (36.3, 40.1)	35.3†† (33.3, 37.4)	36.8†† (35.3, 38.2)	29.9** (27.5, 32.3)	22.0 (19.9, 24.1)	26.1 (24.5, 27.7)	24.0†† (21.9, 26.1)	19.3 (16.8, 21.8)	21.9†† (20.4, 23.5)	19.8†† (17.0, 22.5)	16.8 (13.8, 19.9)	18.7†† (16.7, 20.8)	34.3* (32.9, 35.7)	30.9 (29.4, 32.5)	32.7 (31.6, 33.8)
Personal barriers															
Too busy	51.4†† (48.1, 54.8)	54.8†† (51.3, 58.3)	53.0†† (50.7, 55.3)	20.0** (16.4, 23.6)	34.5 (29.5, 39.4)	25.8 (22.9, 28.7)	11.2†† (8.2, 14.3)	21.1† (14.3, 27.8)	15.0†† (11.7, 18.3)	8.2 (0.0, 16.9)	5.6†† (1.3, 10.0)	7.3†† (1.2, 13.5)	42.3* (39.7, 45.0)	49.5 (46.6, 52.5)	45.6 (43.7, 47.5)
Health condition limitation	14.7†† (12.6, 16.8)	12.2†† (10.0, 14.5)	13.5†† (12.1, 15.0)	27.7 (23.8, 31.5)	24.4 (20.19, 28.7)	26.4 (23.5, 29.2)	42.0†† (37.5, 46.5)	45.2†† (38.1, 52.3)	43.3†† (39.3, 47.2)	56.7†† (48.4, 64.9)	56.3†† (47.0, 65.7)	56.6†† (50.0, 63.1)	19.9 (18.1, 21.6)	16.4 (14.4, 18.3)	18.3 (17.0, 19.6)
Personal or family responsibilities	17.6** (15.0, 20.2)	11.2 (9.1, 13.2)	14.6 (12.8, 16.3)	11.4 (8.1, 14.8)	11.4 (7.1, 15.6)	11.4 (8.7, 14.0)	8.4 (5.8, 11.0)	7.8 (4.7, 10.9)	8.1 (6.2, 10.1)	10.0 (1.2, 18.8)	9.2 (1.7, 16.7)	9.8 (3.3, 16.2)	15.7** (13.7, 17.7)	10.9 (9.2, 12.7)	13.6 (12.2, 15.0)
Not wanting to go alone	12.6** (10.8, 14.5)	6.7 (4.6, 8.8)	9.9 (8.5, 11.2)	16.3** (12.8, 19.8)	7.7 (5.3, 10.2)	12.9 (10.6, 15.2)	16.9 (13.5, 20.3)	9.7 (4.9, 14.4)	14.1 (11.3, 16.8)	19.3 (10.4, 28.3)	17.7 (9.3, 26.1)	18.8 (12.1, 25.5)	13.7** (12.2, 15.2)	7.2 (5.4, 8.9)	10.8 (9.6, 11.9)
Environmental barriers															
Time of activities not suitable	14.8† (12.5, 17.2)	16.0†† (13.6, 18.4)	15.4†† (13.7, 17.1)	9.4 (6.8, 12.0)	7.9 (5.5, 10.3)	8.8 (6.9, 10.7)	5.4 (3.2, 7.6)	5.7 (2.6, 8.7)	5.5 (3.7, 7.3)	9.1 (0.4, 17.7)	0.7†† (0.1, 1.3)	6.4 (0.4, 12.4)	13.1 (11.3, 14.9)	14.1 (12.2, 16.1)	13.6 (12.3, 14.9)
Cost	12.0 (10.0, 14.1)	9.4 (7.2, 11.7)	10.8 (9.3, 12.3)	10.2 (6.9, 13.5)	9.7 (5.6, 13.8)	10.0 (7.4, 12.6)	7.2 (4.7, 9.7)	3.7 (1.1, 6.2)	5.9 (4.1, 7.6)	2.5† (0.0, 5.5)	5.1 (0.0, 10.6)	3.4 (0.0, 6.9)	11.1 (9.5, 12.8)	9.0 (7.1, 10.9)	10.2 (8.9, 11.5)
Activities not available in the area	5.4 (4.2, 6.6)	5.3 (3.6, 7.0)	5.3 (4.3, 6.4)	7.1 (5.1, 9.1)	8.0 (5.6, 10.4)	7.4 (6.0, 8.9)	8.3 (5.8, 10.8)	6.1 (2.7, 9.4)	7.4 (5.5, 9.4)	13.3 (4.7, 21.9)	2.5† (0.5, 4.4)	9.8 (3.8, 15.8)	6.1 (5.1, 7.1)	5.6 (4.2, 7.1)	5.9 (5.0, 6.7)
Transportation problems	4.3†** (3.1., 5.5)	1.5 (0.6, 2.4)	3.0†† (2.2, 3.8)	8.7** (6.5, 11.0)	2.5 (1.1, 4.0)	6.3 (4.7, 7.8)	12.3* (9.2, 15.4)	4.7 (1.5, 7.9)	9.3 (7.1, 11.6)	23.7† (15.0, 32.5)	9.5 (3.6, 15.3)	19.1†† (12.7, 25.5)	6.1** (5.1, 7.1)	1.9 (1.1, 2.7)	4.2 (3.5, 4.9)
Location too far	6.1 (3.2, 5.3)	5.6 (1.9, 4.6)	3.8 (2.9, 4.6)	7.4 (3.4, 7.9)	9.8 (2.3, 6.7)	5.2 (3.6, 6.8)	8.3 (2.3, 5.8)	3.2 (0.1, 6.2	3.7 (2.1, 5.3)	10.4 (1.6, 19.2)	5.9 (0.5, 11.3)	8.9 (2.6, 15.2)	4. 6 (3.7, 5.5)	3.4 (2.3, 4.6)	4.1 (3.3, 4.8)
Other	8.8 (7.4, 10.2)	10.7 (8.5, 12.9)	9.7 (8.4, 11.0)	9.5 (7.1, 11.8)	14.4 (11.0, 17.8)	11.4 (9.4, 13.4)	8.6 (5.5, 11.7)	8.9 (5.7, 12.2)	8.7 (6.4, 11.0)	6.4 (3.9, 8.9)	16.4 (9.2, 23.6)	9.6 (6.6, 12.7)	8.8 (7.7, 9.9)	11.2 (9.3, 13.0)	9.9 (8.8, 10.9)

W significantly different from M: *$P < 0.01$; **significantly different from 65–74: †$P < 0.01$, ††$P < 0.001$.

could also be lowered by offering other time-frames for activities, i.e., considering their work and family responsibilities.[11] Indeed, corporate volunteering can facilitate social participation for middle-aged workers and increase their likelihood to maintain these activities at later ages.[29] Rural environments, where more than a fifth of all aging Canadians lived, should rely on different strategies than in urban areas such as multiple uses of one building and community development initiatives.[30] Improving social participation would require clinicians and managers to explore their community's segmentation by age and gender allowing informed decisions about modifiable characteristics, including transport activities opportunities and cost.

Our study has its strengths and limitations. These secondary analyses of a large Canadian survey improved our understanding of aging Canadians' social participation, and identified the main barriers to social activities, among four age groups. The sampling strategy of this survey, aimed at demographic and geographical representativity, and the bootstrap resampling technique ensured generalization and improved comparisons.

Nevertheless, this study has some limitations. As other cross-sectional surveys, the CCHS-HA does not allow verifying causal associations. Moreover, other studies are needed to identify correlates of social participation and its barriers, notably by considering the respondents' environment, notably the available resources, and the urban/rural environment.

This study described and compared prevalence and patterns of social participation and barriers among older Canadians. The frequency of participation is similar according to gender, but differs for age. Moreover, perceived barriers differ according to gender and age. These differences highlight that further study of social participation frequency and barriers among older adults must consider gender and age differences. Indeed, environmental barriers impeded women's social participation more than men's, most notably transportation. Considering the perceived barriers to social participation, strategies aimed at increasing aging adults' social participation must consider their health conditions and local environment features. Future research should be interested in respondents' environment, considering that it might be beneficial to our understanding of environmental factors of social participation, such as mobility and proximity to resources.

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Disclosure statement

The authors declare no conflict of interest.

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