Mall Walking as a Physical Activity Option: Results of a Pilot Project

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RÉSUMÉ

Le but de la présente étude était d'évaluer la faisabilité et les avantages (forme physique et qualité de vie) d'un programme de marche de 8 semaines dans un centre commercial. Quelque 52 participants ($n = 39$ au post-test) ont pris part au projet pilote (de 46 à 83 ans, âge moyen = 66,4 ans), et ont été présents globalement à 62,4 pour cent. Les participants sélectionnaient eux-mêmes la vitesse de marche, le temps, et la fréquence. Les mesures de la forme physique, le comportement lors de l'activité physique, et la qualité de vie ont fait l'objet d'une évaluation et d'un programme subséquent. Les résultats indiquent une amélioration importante du comportement face à l'activité physique et à la plupart des indices de forme physique. Aucune modification de la qualité de vie n'a été constatée, probablement en raison des valeurs de référence au-dessus de la norme. Globalement, ce projet pilote soutient la faisabilité et les améliorations positives de la santé associées au programme de marche dans un centre commercial. Ces programmes devraient faire partie des programmes de promotion de la santé, et plus particulièrement pour la population vieillissante.

ABSTRACT

The purpose of this study was to assess the feasibility and benefits (fitness and quality of life) of an 8-week mall-walking program. A total of 52 participants ($n = 39$ at post-testing) took part in the pilot project (mean age = 66.4; range 46–83 years), with an overall attendance rate of 62.4 per cent. Participants self-selected pace, time, and frequency. Fitness measures, physical activity behaviour, and quality of life were assessed pre- and post-program. Results indicate a significant improvement in physical activity behaviour and most fitness indices. No quality-of-life changes were found, likely due to the above-norm values at baseline. Overall, this pilot project supports the feasibility of and positive health improvements associated with a mall-walking program. Such programs should be considered as part of health-promotion programs, especially for the aging population.

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Introduction

Current demographic trends indicate a rapidly growing aging population in North America, with the senior population expected to nearly double in both Canada and the United States by 2031 (Administration on Aging, 2006; Statistics Canada, 2005). At present, Canadian seniors comprise 13.1 per cent of the total population, with the majority (6.9%) being 65 to 74 years of age (Statistics Canada, 2006). Coupled with this trend in aging is an increased risk in the population for health conditions and diseases associated with the aging process and, consequently, a significant burden for existing health care systems (International Council on Active Aging [ICAA], 2005). Given this national forecast, prioritizing preventative health care measures for this population is essential not only for prolonging and improving individual lives but also for reducing the direct medical cost of unhealthy, aging seniors.

There is a growing body of evidence to support the physical, psychosocial, and economic benefits of promoting and engaging in an active lifestyle during the aging process. These include the prevention or effective management of chronic diseases and related side-effects, reduced mortality rates, decreased functional decline and disability risk, reduced depression and anxiety, improved mood state, improved health-related quality of life (HRQOL), decreased cognitive impairments, and decreased direct medical costs (Elavsky et al., 2005; ICAA, 2005; Katzmarzyk, Gledhill, & Shephard, 2000; Mazzeo et al., 1998; Penedo & Dahn, 2005). Physical-activity interventions targeting the elderly are an effective means of achieving many of these benefits (Elavsky et al., 2005).

Despite this support, few among the aging population achieve the recommended daily activity levels. The International Council on Active Aging (2005) has identified barriers that may contribute to this high level of inactivity, including fear of injury, social isolation, lack of knowledge, lack of availability and access to physical-activity programs, and a lack of motivation. Thus, there is a need to provide community programs that address these barriers and improve health outcomes.

Walking is one viable form of moderate physical activity that is free, accessible, and appropriate for both the inactive and active populations of any age group. Within the aging population, several studies examining walking as a mode of physical activity have shown a number of positive physical and psychological health benefits. For example, Tully, Cupples, Chan, McGlade, and Young (2005) found that brisk walking for 30 minutes per day, 5 days per week, was sufficient to produce significant increases in functional capacity and decreased blood pressure after a 12-week intervention. Similarly, a 6-week intervention involving walking 30 minutes a day, 5 days per week, found decreased cardiovascular disease risk, altered body fat distribution, reduced anxiety and tension, increased aerobic fitness, and greater confidence for walking (Murphy, Nevill, Neville, Biddle, & Hardman, 2002). Finally, McAuley, Blissmer, Katula, and Duncan (2000) found that both group-walking arms at either intensity (vs. individual maximum-intensity exercise) of their 6-month randomized controlled exercise trial experienced significant increases in positive well-being, enhanced affective response, and increased self-efficacy; whereas those in the individual arm reported a significant decrease in well-being and increased psychological distress.

With urban planning trends reducing walking's usefulness as a mode of transportation within communities, there is a need to utilize and create accessible and safe environments to promote walking as physical activity, especially for the aging population. Community mall-walking programs have the potential to address several physical-activity barriers for the elderly, particularly safety concerns and social support needs. The purpose of the present study was to assess the feasibility of a community mall-walking program and to examine fitness and quality-of-life benefits from an 8-week pilot program.

Methods

Recruitment and Participants

Participants were recruited for an 8-week mall-walking pilot project 2 weeks prior to the pre-testing dates, through posters and food-court tent cards in the host mall of the pilot program. As well, the pilot program was advertised in two community newsletters and through the Calgary Health Region's Living Well program (three presentations offered in the 2 weeks prior to the program start).

A total of 87 potential participants contacted the research assistant over the 2-week recruitment period. All those interested in participating were screened using the PAR-Q (Thomas, Reading, & Shephard, 1992) and received physician approval as required (Thomas et al., 1992). No participants were refused physician approval. A final sample of 52 participated in the mall-walking pilot, which included pre- and post-testing prior to and at the completion of the program. Reasons for non-participation included inability to make pre- and/or post-testing, being away for more than 1 week during the program, and finding the location of the mall a problem.

Design and Procedures

The 8-week mall-walking program was designed as a feasibility study. Participants were encouraged to come as often as they were able, between 8:00 and 10:00 a.m. from Monday to Friday. Participants were provided with pedometers and were instructed to check in with the research assistant prior to and immediately following their walk, to record attendance, steps, time walked, self-reported laps (used for individual tracking purposes only), and rate of perceived exertion (RPE). They were instructed to walk at a self-selected pace for as long as they chose and were encouraged to increase speed and distance over the 8-week program duration. The host mall provided discount cards as an incentive for participants to attend and complete the 8-week program; however, this reward was only made known to the participants upon completion of the program.

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Measures

Pre- and post-testing included basic fitness testing and a brief questionnaire assessing demographics, physical-activity behaviour, and quality of life.

Fitness Measures

Testing and protocols were originally based on an Active Living Community Project from the Calgary Health Region Chronic Disease Management. We were affiliated initially with this program, so the scope of our testing had to be within the domains it laid out. Each participant enrolling in the program, therefore, needed to have a Par Med-X form completed by the physician clearing her/him to join the exercise program. As the majority of the participants had an existing medical condition, we were also limited in our testing by (a) the practicality of testing (i.e., the participants' ability to tolerate more rigorous testing); and (b) ethics, which did not sanction a more rigorous sub-maximal test for this sample.

Fitness assessments were conducted by certified professional fitness and lifestyle consultants. Measures included anthropometric measurements of weight (kg), height (cm), waist (cm), hips (cm), upper arm (cm), and upper-leg girth (cm), and a single skinfold (mm) taken at the triceps location. Body mass index (BMI) and waist-to-hip ratio (WHR) were calculated from these measurements. Resting heart rate and blood pressure were measured prior to a 6-minute walk test (6MWT), and both heart rate and rate of perceived exertion (RPE; 0–10 Borg scale) were measured again at completion (i.e., immediately post–walk test) to assess cardiovascular fitness. The 6MWT followed testing protocols commonly used in clinical populations (Enright, 2003). The primary measure of this test is the distance walked within 6 minutes and this measure is supplemented by self-reported RPE. Finally, grip strength and flexibility (sit-and-reach test) were assessed, as they reflect activities of daily living and might improve with concurrent increases in physical-activity behaviour as a result of this study.

Demographics

Demographics included self-report of marital status, education, income, employment, race, gender, and medical conditions.

Physical-Activity Behaviour

Physical-activity behaviour was assessed using the leisure score index of the Godin Leisure Time Exercise questionnaire (LSI). The LSI contains three questions that assess the frequency and duration of mild, moderate, and strenuous physical activity performed during free time in a typical week within the previous month (Godin & Sheppard, 1985). This measure is reliable and valid in comparison with other self-reports of activity levels (Jacobs, Ainsworth, Hartman, & Leon, 1993).

Quality of Life

QOL was assessed using the Short Form 12 (SF-12). This 12-item survey was derived from the Short Form 36 (SF-36) and has proven to be reliable and valid in a variety of populations, including older adults (e.g., Resnick & Parker, 2001). The physical and mental health scales of the SF-12 have been shown to account for most of the variance in the eight subscales of the SF-36 and to distinguish between samples varying in physical and mental health conditions, age, and self-reported health (Gandek et al., 1998; Jenkinson et al., 1997; Lim & Fisher, 1999; Lundberg, Johannesson, Isacson, & Borgquist, 1999; Sugar et al., 1998; Ware, Kosinski, & Keller, 1996).

Results

A total of 52 participants took part in the pilot project, and 39 completed both pre- and post-testing. The mean age was 66.4 years (range 46 to 83), with the majority being Caucasian (96.2%), female (80.8%), and retired (76.5%). Additionally, the majority ($n = 32$) had at least one known medical condition. See Table 1 for complete demographics.

Attendance

Participants could attend 0–5 days per week over an 8-week program (potential attendance range of 0–40). The overall attendance rate was 62.4 per cent over the 8 weeks, with 64.1 per cent ($n = 25$) participants walking 3 or more days per week. The drop-out rate was 25.0 per cent ($n = 13$). Reasons for drop-out included voluntary withdrawal ($n = 11$), medical issues ($n = 1$), and travel ($n = 1$). Of those who voluntarily withdrew, three did not show up at the program after pre-testing, and the remaining eight only came a total of six times or less within the first week and a half of the walking program. If we exclude those who did not participate in the actual walking program ($n = 3$), the drop-out rate is decreased to 19.2 per cent. Race was the only baseline characteristic that was statistically significant when comparing drop-outs to those who completed post-testing (white, 22.0% drop-outs vs. 78.0% completed; other races, 100.0% drop-outs).

Physical Activity, Fitness, and QOL

Paired-samples t tests were conducted to evaluate the impact of the mall-walking program on

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Table 1: Baseline characteristics of participants[a]

Variable	*N*	%
Gender		
Male	10	19.2
Female	42	80.8
Race		
Caucasian	50	96.2
Other	2	3.8
Marital Status		
Married/Common law	23	44.2
Divorced/Separated	12	23.1
Widowed	8	15.4
Never married	9	17.3
Education		
Some high school	7	13.5
Completed high school	8	15.4
Some university/College	9	17.3
Completed university/College	19	36.5
Some/Completed grad school	9	17.3
Income		
<$20,000	11	25
20,000–39,999	21	47.7
40,000–59,999	6	13.6
60,000–79,999	4	9.1
>80,000	2	4.5
Employment		
Full-time	2	3.9
Homemaker	1	2
Retired	39	76.5
Part-time	6	11.8
Unemployed	1	2
Disability/Sick leave	2	3.9
Medical Condition		
Lung	5	10.2
Arthritis	3	6.1
Heart	3	6.1
Cancer	6	12.2
Other	15	30.6

[a] mean age = 66.38 years (*SD 8.13*)

physical-activity behaviour, fitness indices, and quality of life. See Table 2 for significant *t* test results.

For physical-activity behaviour, there were statistically significant effects for LSI ($p < 0.005$), average daily mall-walk steps ($p < 0.002$), and average daily mall-walk time ($p < 0.002$). Fitness indices showed significant effects for BMI ($p < 0.0005$), WHR ($p < 0.003$), resting heart rate ($p < 0.002$), walk test distance ($p < 0.0005$), walk-test heart rate ($p < 0.004$), post-walk test RPE ($p < 0.0005$), and flexibility ($p < 0.0005$). No significant grip strength or QOL changes were observed, despite increases in physical-activity behaviour.

Discussion

The purposes of this study were, first and primarily, to test the feasibility of a community mall-walking program, and secondly, to assess concurrent changes in fitness and quality-of-life measures. The results demonstrate the feasibility and health benefits of a mall-walking program. First, there was a high attendance rate (62.4%) for a program with self-motivated participation, with the majority (64.1%) attending more than 3 days per week. Additionally, the average age was 66 years, which is reflective of our Canadian senior population and suggests that this population is interested in and motivated to participate in such a community program. In a recent study, shopping malls were the second most popular reported walking site for those 45 years or older, with more women than men likely to use this location (Eyler, Brownson, Bacak, & Housemann, 2003). This was clear in our sample, with the majority (80%) being female. However, the most recent statistics for Canadian seniors (age 65 years and over) indicate that senior men are more active (27%) during their leisure-time activity than women are (17%) (Statistics Canada, 2006). This would suggest that an over-representation of women in a program may be beneficial in that it may encourage more senior women to be active. Furthermore, given the popularity of malls as a potential walking site for women, our results suggest that malls are important facilities to consider in developing community programs for the aging population.

A major advantage of shopping malls is their usual proximity to residential communities. Eighty per cent of Canadian seniors live in urban centres, and their physical and social environments play a major role in determining their health (Masotti, Johnson-Masotti, Fick, & MacLeod, 2006). Of particular importance is the accessibility of services and recreational amenities for this population. Utilizing existing facilities, such as shopping malls, specifically for physical-activity promotion could significantly affect the health of urban-dwelling senior citizens. Furthermore, residents of urban centres with cooler climates would likely benefit from programs being offered in indoor facilities in an effort to address the barriers to physical activity imposed by safety concerns and fear of injury (ICAA, 2005).

The attendance data were supported by concurrent improvements in activity levels and fitness indices. Specifically, there was a significant increase (36.4%) in leisure-time activity levels (LSI score) from pre- to post-testing. This value represents total leisure-time activity, including the mall-walking program. The fact that senior men spend less than an hour per day in physical leisure-time activity and women spend less than a half an hour per day speaks to the significance of this finding (Statistics Canada, 2006). Participants also significantly increased their average daily mall-walk steps and time by 18.1 per cent and 17.5 per cent,

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Table 2: Pre and Post Changes in Physical Activity, Fitness, and Quality of Life

Variable	Pre	Post	*t*	*df*	*p*
	Mean (*SD*)	Mean (*SD*)			
Physical-Activity Behaviour					
LSI	20.6 (10.8)	28.1 (11.9)	3.02	34	0.005
Average daily steps	5,055 (1,374)	5,969 (1,543)	3.33	30	0.002
Average daily time (mins.)	42.9 (10.6)	50.4 (13.5)	3.34	31	0.002
Fitness Measures					
BMI (kg/m^2)	29.1 (4.6)	28.5 (4.4)	4.17	38	<0.0005
WHR	0.89 (0.08)	0.86 (0.09)	3.17	38	0.003
Resting heart rate (bpm)	75.7 (10.6)	70.4 (8.5)	3.33	37	0.002
Walk-test distance (m)	549.9 (78.5)	612.0 (88.1)	5.60	38	<0.0005
Walk-test heart rate (bpm)	116.4 (18.8)	127.3 (22.0)	3.03	38	0.004
Post-test RPE	5.6 (2.0)	6.7 (1.9)	3.84	38	<0.0005
Sit and reach (cm)	26.7 (10.2)	19.7 (8.4)	4.23	38	<0.0005
Quality of Life (SF-12)					
Physical scale	47.8 (6.7)	47.5 (8.0)	0.354	36	0.726
Mental scale	54.1 (6.5)	54.8 (6.7)	0.771	36	0.446

respectively, and increased their distance walked in the 6-minute walk test at post-testing by an average of 62.1m. These findings are similar to those of previous walking studies, where greater increases in aerobic conditioning were supported by increases in walking duration and frequency (Tully et al., 2005; Wong, Wong, Pang, Azizah, & Dass, 2003). Enhanced aerobic capacity has been linked to improved cognitive function in several studies and may be a significant factor in prolonging independent living for the elderly (McAuley & Katula, 1998).

Participants also improved the fitness indices of resting heart rate, flexibility, walk-test heart rate, and RPE. The flexibility increases are supported by previous work in which the walking group increased hip flexibility by 11 per cent, the same improvement found in the pilot project, with only two walking sessions per week for 16 weeks (Simons & Andel, 2006). These behaviour and fitness changes contribute to the literature on physical-activity interventions for the aging and on the benefits of walking as physical activity.

Unique to this pilot study was the significant decrease in both BMI and WHR following the program. Previous studies have not found significant body composition changes, despite improvements in other anthropometric and fitness measures after a walking intervention. The Tully et al. walking study (2005) found no changes in BMI or WHR after 12 weeks. Similarly, Murphy et al.'s (2002) brisk walking trial produced no significant changes in BMI, although there were significant decreases in sum of skinfold thickness and waist and hip circumferences. Both of these studies had smaller sample sizes ($n = 21$) than the current study and may not have had the power to detect significant changes in these measures. Changes in body mass and fat distribution are important, as they correlate highly with many chronic diseases and thus walking may attenuate the risk of these.

No significant quality-of-life changes were observed in this pilot study. This was likely due to the high baseline SF-12 scores, which were above the population norms for both the physical and mental scales. In the United States, the norm for the physical scale is 43.65 for adults age 65 to 74, whereas the pilot sample had an average of 47.78 at baseline. Similarly, the norm for the mental scale is 52.10 for age 65 to 74, and the baseline score was 54.07 for this sample (Ware, Kosinski, Turner-Bowker, & Gandek, 2005, pp. 241–242). These high baseline scores may have created a ceiling effect, making improvements difficult to observe.

Although the pilot study provides support for the feasibility and health benefits of a community mall-walking program, there are limitations. These include a relatively small sample size, short recruitment period, brief program duration, potential selection bias, moderate drop-out rate, and accuracy of the pedometers used in the study. The pedometers were generously donated to the study, but lacked the features necessary to provide the most accurate readings. Future work utilizing more reliable pedometers would corroborate the present step count and distance results. As well, extending the program duration beyond 8 weeks will be important for testing greater fitness changes within the population and may

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provide more insight into adherence to such a program. Although the drop-out rate (19%) is more usual with programs of longer duration, we can speculate that those withdrawing less than 2 weeks into the program may have left before group cohesion and social support was clearly established. This is consistent with recent literature, which indicates that social cohesion is the sole predictor of adherence in adult walking groups (Kwak, Kremers, & Brug, 2006).

Despite these limitations, the pilot project offers significant findings that should be explored in future work. Specifically, future studies may benefit from investigating an enriched program that builds group cohesion and enhances social support and self-efficacy, since the ability of interventions to build social support and self-efficacy may be the key to successful behaviour change in the older adult population (Minkler, Schauffler, & Clements-Nolle, 2001). Although these constructs were not measured specifically in the pilot study, previous research suggests that the group or social environment has a far greater effect on older adults' affective response to exercise than does exercising individually and is a significant determinant of adherence to maintenance physical activity in older adults (McAuley et al., 2000; McAuley, Jerome, Elavsky, Marquez, & Ramsey, 2003). Furthermore, using a two-group design would enable us to determine whether the increase in leisure-time activity is the result of the program itself rather than of potential contamination within the walking group. Finally, greater efforts to recruit older adults within the community and longer periods of recruitment time prior to program initiation may produce higher interest and participation rates. Specifically, recruiting in existing retirement communities, community centres, and through television (i.e., local news) may be beneficial.

Conclusion

In conclusion, the pilot project provides support for mall walking as a viable form of physical activity and an optional health-promotion program within the aging population. There is an urgent need to address the implications of a rapidly growing population, with an emphasis on promoting healthy aging through evidence-based policy and public interventions. Mall walking should be considered as an effective community program for older adults.

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