Disparity between Physical Capacity and Participation in Seniors with Chronic Disease

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ABSTRACT

ASHE, M. C., J. J. ENG, W. C. MILLER, and J. A. SOON, Disparity between Physical Capacity and Participation in Seniors with Chronic Disease. Med. Sci. Sports Exerc., Vol. 39, No. 7, pp. 1139–1146, 2007. Consistently low rates of physical activity are reported for older adults, and there is even lower participation if a chronic disease is present. Purpose: To explore the predictors of physical capacity and participation in older community-dwelling individuals living with multiple chronic diseases. Methods: This was a descriptive cross-sectional investigation of physical capacity (physiological potential) and physical activity participation (recorded engagement in physical activity). Multiple regression and odds ratios were used to investigate determinants of physical capacity (6-min walk test) and physical activity participation (Physical Activity Scale for Individuals with Physical Disabilities Questionnaire; pedometer steps per day). Results: Two hundred community-dwelling ambulatory participants living with two or more chronic diseases were assessed. Sixty-five percent (65%) were women, and the mean age was 74 ± 6 yr (range 65–90 yr). Mobility (timed up and go) was a consistent determinant across all three primary outcomes. For the 6-min walk test, determinants included mobility, BMI, grip strength, number of medications, leg strength, balance, and Chronic Disease Management Self-Efficacy Scale (r² = 0.58; P = 0.000). The determinants for the self-reported participation measure (Physical Activity Scale for Individuals with Physical Disabilities Questionnaire) was mobility (r² = 0.04; P = 0.007). For the mean daily pedometer steps, the determinants included mobility, body mass index (BMI), age, and Chronic Disease Management Self-Efficacy Scale (r² = 0.27; P = 0.000). There were higher risks for inactivity associated with impairments compared with the presence of a chronic disease. In addition, more than a third of participants had sufficient physical capacity but did not meet minimal recommendations of physical activity. Conclusion: This study suggests that it is easier to predict an individual’s physical capacity than their actual physical participation. Key Words: OLDER ADULTS, PHYSICAL ACTIVITY, PERFORMANCE, CHRONIC CONDITIONS

There is great potential to enhance the quality of life for individuals with chronic diseases through physical activity, a broad term that encompasses both leisure-time activity (sports, exercise) and activities of daily living (household living tasks, transportation). Although physical activity is an important health determinant, it is often underused despite numerous studies highlighting its benefits in reducing morbidity and in the secondary prevention of chronic diseases (e.g., obesity, depression, fractures, osteoarthritis, and osteoporosis) (21).

Consistently low rates of physical activity are reported for older adults, and there is even lower participation if a chronic disease is present (12,15). There are shared characteristics for not meeting physical activity recommendations that exist for individuals living with different chronic diseases states, including advancing age, female gender, lower educational level and income, low self-esteem, social isolation, depressive symptoms, anxiety, obesity, and osteopenia (8), but most previous research has investigated disease-specific determinants and interventions (8,23,14). Common impairments in multiple domains (e.g., functional balance, aerobic capacity, muscle strength, and self-efficacy) may limit activity participation in a similar way across different chronic diseases (8), but this has not been widely studied.

Functional capacity measures in older adults (e.g., 6-min walk test (6MWT)) (6) can provide an estimate of physical potential and determine what an individual is capable of doing. Participation (engagement in physical activity) in physical activity can be measured either directly or indirectly and consists of three broad areas—direct observation, self-report questionnaires, and portable monitors such as pedometers. These tools can assist in determining how much and which activities an individual actually engages or participates in regularly and can assist in...
understanding the distinction between capacity and participation. Therefore, the primary objectives of this cross-sectional study were to i) determine the predictors of physical capacity and physical activity participation in older community-dwelling individuals living with multiple chronic diseases, and ii) explore the relation between capacity and participation. The secondary objective was to evaluate the risk of inactivity associated with chronic disease and impairments. We hypothesized that there would be common impairments across different chronic diseases.

**METHODS**

**Participants.** We sought to enroll community-dwelling people living with chronic diseases. In this manuscript, we define chronic disease as any medical condition or syndrome that was diagnosed by a health professional and expected to last longer than 6 months. We chose chronic diseases that have the potential to lead to physical conditions with the greatest impact on function. Two hundred community-dwelling ambulatory men and women aged 65 yr and older participated in this study. Participants were recruited from local pharmacies using “shelf-talkers” (described previously (27)). Using this technique, strategically placed recruitment posters were located within community pharmacies. In addition, pharmacists provided study information to participants who presented at the pharmacy counter with multiple prescriptions. This strategy was based on the assumption that potential participants were living in the community and were sufficiently mobile and cognitively intact to purchase their own medications. Inclusion criteria were 1) age 65 yr or older, 2) two or more chronic diseases, 3) living in one’s own home; 4) ambulatory and able to walk for a minimum of 10 m with/without assistive devices, 5) score ≥ 24 on the Folstein Mini Mental Examination (FMME) (9), and 6) able to follow three-step commands in English. Individuals were excluded if they were unable to communicate with the investigator over the phone and/or had an impairment or health concern that prevented the completion of testing. Pharmacists identified 242 potential participants, of whom 173 met inclusion/exclusion criteria when screened by the investigator (72% recruitment success). The remaining 27 participants were enrolled by contacting disease-specific support groups directly, for a total of 200. This study was approved by the local university and hospital ethics review boards, and all eligible participants gave written informed consent to participate in the study.

**Data collection.** We chose select impairment measures to assess key domains known to influence frailty in older adults: balance, strength, respiratory function, mobility, endurance, and psychosocial components (depression, cognition, and self-efficacy) (22). In this study we chose measures to assess body systems (e.g., musculoskeletal, respiratory) as they relate to functional status in older adults. For example, the 6MWT is a walking test of cardiovascular endurance and an efficient way to assess functional capacity in older adults (6,7). Table 1 highlights the outcome measures and normative values.

**Descriptive variables.** The following data were collected: date of birth, gender, marital status, and body weight/height. All participants were asked to self-report chronic diseases he or she had that lasted or that were expected to last 6 months or more and that had been diagnosed by a health professional. Each participant was also asked to self-rate the severity of their disease as mild, moderate, or severe. Participants were asked about mobility aids, current medications, and to rate social support using the Instrumental Support Evaluation List (ISEL) (13). Participants were asked to recall whether they had sustained any falls in the past 12 months.

**Primary outcome variables (dependent variables).** Physical capacity was operationalized as an individual’s ability to perform an action or activity and was assessed using the 6MWT. The two measures of participation (defined as physical activity the individual engages in) were the self-reported Physical Activity Scale for Individuals with Physical Disabilities (PASIPD) and the mean daily pedometer steps. The 6MWT is a walking test of cardiovascular endurance or capacity and an efficient way to assess functional capacity in older adults living with multiple chronic diseases (6,7). Participants were screened before undertaking the 6MWT and were excluded from this test only if there was any chest pain, heart attacks, angioplasty or heart surgery in the previous 3 months, resting heart rate was above 110 bpm or was excluded at the discretion of the tester if musculoskeletal or balance disturbances were safety issues. All participants followed their regular medication regime per the American Thoracic Society guidelines for testing (1).

The PASIPD is a 13-item questionnaire that captures metabolic demands in three domain areas (recreation, household, and occupational activities) (30). The PASIPD captures energy expenditure for both ambulation and/or using a wheelchair or mobility aid. Using the same scale (PASIPD) enabled us to compare across groups of people with similar diseases but different levels of impairment. Respondents were asked to recall the frequency (in days) and amount of time they spent participating in the list of activities during the past 7 d. Kilocalories per week were obtained by multiplying the PASIPD by the mean metabolic equivalent values for each question. Each participant was asked to record daily steps for three consecutive days, using a pedometer (New Lifestyles DigiWalker SW-200, Lee’s Summit, MO), because this amount has been shown to provide sufficient data to estimate weekly physical activity in adults (29).

**Determinant variables (independent variables).** Key impairment variables were the National Institutes of Aging Balance Scale (10), which provided an indication of balance and leg strength in sitting and standing. Upper-extremity isometric muscle strength was tested using a
TABLE 1. Descriptions of outcome variables.

<table>
<thead>
<tr>
<th>List of Measures</th>
<th>Description of Measurement</th>
<th>Available Normative Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Activity Scale for Individuals with Physical Disabilities (PASIPD) (30)</td>
<td>Metabolic demands in three domain areas (recreation, household, and occupational activities) are captured using this tool</td>
<td>Possible score range from 0.0 to 199.5, but no normative data are available</td>
</tr>
<tr>
<td>Pulmonary airflow limitation (spirometry)</td>
<td>Forced expiratory volume/forced vital capacity ratio</td>
<td>Values &lt; 70% suggest obstructive lung disease, although forced expiratory volume/forced vital capacity declines with normal aging (4)</td>
</tr>
<tr>
<td>Self-efficacy for Managing Chronic Disease (17)</td>
<td>Self-efficacy for managing living with a chronic disease</td>
<td>Higher scores indicate a greater level of perceived disease-management self-efficacy; range from 0 to 60</td>
</tr>
<tr>
<td>Six-minute walk test (6MWT) (6,7)</td>
<td>Walking distance (m) completed in 6 min</td>
<td>&lt; 400 m in 6 min associated with higher risk of mortality (19)</td>
</tr>
<tr>
<td>Strength dynamometry</td>
<td>Grip and quadriceps strength for both limbs, determined using the mean of two trials</td>
<td>Grip-strength pooled results for adults aged ≥ 50 yr = 14.7 kg for women and 23.3 kg for men (18)</td>
</tr>
<tr>
<td>Timed up and go test (TUG) (24)</td>
<td>Time taken to stand from sitting, walk 3 m, turn, walk back, and sit</td>
<td>&gt; 15 s identifies participants at higher risk for falling (32)</td>
</tr>
</tbody>
</table>

JAMAR handheld dynamometer (JLW Instruments, Sammons Preston, Bolingbrook, IL), and lower-extremity strength was tested using handheld myometry (Nicholas MMT, Model 01160, Lafayette Instruments, Lafayette, IN). The mean of three trials for bilateral grip and quadriceps muscle strength was used. Leg strength was normalized to body weight. Basic mobility function was assessed using the timed up and go test (TUG) (24). To detect airflow limitation of the pulmonary system (which is associated with many chronic disease states), a portable spirometry system (GPFS/D USB Spirometer; MedGraphics, St. Paul, MN) was used. The ratio of forced expiratory volume to forced vital capacity (FEV1/FVC %) was calculated; values less than 70% were indicative of obstructive lung disease (4).

Falls efficacy or confidence with balance was measured using the Activities-Specific Balance Confidence (ABC) scale (20). The Stanford Self-efficacy for Managing Chronic Disease scale (ESE) was administered; it consisted of six questions and assessed participants’ confidence in coping with the impact of living with a chronic disease (17). The Folstein Mini Mental Examination (FMME) was used to screen for cognition, and depression was measured using the Centre for Epidemiological Studies—Depression scale (CESD) (11).

**Sample size justification.** The sample size (N = 200) for this study was designed to provide sufficient power to address our primary research hypothesis using multiple linear-regression analyses. Up to 17 variables were modeled, for what Cohen (5) defines as a moderate effect size (the proportion of variance in the dependent variable—physical activity—accounted for by the other variables $R^2 = 0.20$) at an alpha of 0.001 (to control for the effects of multiple testing) and power of 0.80.

**Statistical analysis.** Descriptive characteristics of the cohort were assessed using means, standard deviations and frequencies depending on the measurement tool. The PASIPD was used to calculate the proportion of participants who met the recommended amount of weekly leisure-time physical activity (> 1000 kcal-wk$^{-1}$) (15). We used a scatter-plot to create a 2 × 2 figure with quadrants to describe the relation between capacity (6MWT) and participation (pedometer steps) (16), and we compared differences between groups using independent t-tests. For the primary objective, Pearson correlation coefficients were calculated to determine the strength of the associations between continuous variables and to determine entry into the regression model as a significant $P$ value ≤ 0.05. Multiple linear regression was used to ascertain predictive models for capacity (6MWT) and for engaging in physical activity participation (PASIPD and pedometer steps). For the secondary objective to determine the effect of chronic disease and impairment on physical capacity (6MWT) and participation (pedometer steps), logistic regression was used to compute odds ratios (3). Established cutoff points (Table 1) were used, and variables were made dichotomous to establish
RESULTS

Characteristics of the participants. Two hundred (N = 200) eligible people volunteered to participate in this study and met inclusion/exclusion criteria. Means, standard deviations, and ranges are reported in Table 2. Sixty-five (65%) were women, and the mean age was 74.4 ± 5.7 yr (range 65–90 yr). Mean body mass index (BMI) was 26.4 ± 5.3; 2% of participants were overweight (< 18.5), 41% had a normal BMI (18.5–24.9), 39% were overweight (25.0–29.9), and 18% were obese (BMI ≥ 30). The three most frequently reported chronic diseases were high blood pressure (58% of cohort), cataracts (55%), and osteoarthritis (50%). The mean proportion of respondents for self-reported disease-severity categories of mild, moderate and severe across all diseases was 54.3, 32.9, and 12.8%, respectively. The range of disease duration was 6 months to 74 yr, and the median time was 13 yr. Thirty-four percent (34%) of participants reported a fall in the past 12 months.

Number of chronic diseases was significantly correlated with the PASIPD (P = 0.000). Only 163 participants were able to complete the 6MWT; 37 participants were excluded per the American Thoracic Society (ATS) guidelines for relative contraindications of high blood pressure or recent cardiac event (1). This was consistent with previous work that was unable to have all participants complete the 6MWT for health reasons (3). The characteristics of the 163 participants were similar to the total group (Table 2). Data were obtained for 200 participants for the PASIPD self-report questionnaire and 188 responses for the mean pedometer-daily steps (two participants were lost to follow-up and 10 participants could either not use the pedometer or the pedometer malfunctioned).

Only 27.5% of participants met the recommended level of physical activity of 1000 kcal·wk⁻¹ (15). Forty-three percent (43%) of participants were considered sedentary (< 5000 steps per day), 25% were low-active (5000–7499 steps), 15% were somewhat active (7500–9999), and only 17% of participants recorded > 10,000 steps per day (8% active (10,000–11,999 steps) and 9% highly active (> 12,000 steps per day)). Of the participants who completed the 6MWT, 39% were below 400 m, the threshold associated with a higher risk of mortality (19). The mean energy expenditure for reported physical activity was 493.3 ± 644.1 kcal·wk⁻¹ (median 676.4 and range 106.0–4371.7 kcal·wk⁻¹). Figure 1 highlights the relation between capacity (6MWT) and participation. In this descriptive scatterplot, 34% of participants considered to be above the 400-m cutoff did not meet 7500 pedometer steps per day (considered somewhat active or higher). For the group that had sufficient capacity (> 400 m; N = 106), there were statistically significant differences between the two groups (those who reported > 7500 steps and who did not); the group who did not record > 7500 steps were slower on the TUG and had lower confidence with chronic disease management and balance confidence; TUG (9.6 vs 8.2 s; P = 0.013), ESE (45 vs 53/60; P = 0.000) and ABC (87.4 vs 92.3/100; P = 0.000).

Determinants of physical capacity and participation. Table 3 reports associations between primary outcomes and determinant variables to highlight those variables that were used in the regression models. Using multiple linear regression, there was a moderate association for capacity (6MWT), and the determinants were the TUG, left-leg strength normalized to mass, number of medications, ESE, balance, BMI, and grip strength (r² = 0.58; P = 0.000). For the mean number of pedometer steps, a positive low association was found with the TUG, BMI, and age (r² = 0.27; P = 0.000). Only one variable provided a very low determinant for the self-reported PASIPD (TUG (r² = 0.04; P = 0.007) (Table 4); no other variables were significantly correlated with the PASIPD. Using odds ratios, there were greater risks for being inactive associated with impairments and restrictions than for the presence of a chronic disease (Table 5). For the 6MWT, the risk for not achieving 400 m was increased if there was depression,

<table>
<thead>
<tr>
<th>TABLE 2. Descriptive characteristics of participants for entire cohort and for participants (N = 163) who completed the 6-min walk test</th>
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<tbody>
<tr>
<td><strong>Descriptive variables</strong></td>
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<tr>
<td><strong>Frequencies</strong></td>
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<tr>
<td><strong>Gender</strong></td>
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<tr>
<td></td>
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<tr>
<td><strong>Age (yr)</strong></td>
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<tr>
<td><strong>Number of chronic diseases</strong></td>
</tr>
<tr>
<td><strong>Number of medications</strong></td>
</tr>
<tr>
<td><strong>Walking aid (N)</strong></td>
</tr>
<tr>
<td><strong>Height (m)</strong></td>
</tr>
<tr>
<td><strong>Weight (kg)</strong></td>
</tr>
<tr>
<td><strong>Body mass index (kg·m⁻²)</strong></td>
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<tr>
<td><strong>ISEL</strong></td>
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<tr>
<td><strong>Primary outcome variables</strong></td>
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<td></td>
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<tr>
<td><strong>Determinant variables</strong></td>
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ABC scale, Activities–Specific Balance Confidence; BMI, body mass index; CES-depression, Centre for Epidemiological Studies–Depression Scale; FEV/FVC, ratio of forced expiratory volume to forced vital capacity; ISEL, Instrumental Support Evaluation List; management self-efficacy, Stanford Chronic Disease Management Self-Efficacy Scale; NIA balance, National Institutes of Aging Balance Scale; TUG, timed up and go; 6MWT, 6-min walk test; PASIPD, Physical Activity Scale for Individuals with Physical Disabilities.
lower grip strength, balance problems, BMI indicating either overweight or obese, or the presence of arthritis and/or diabetes mellitus. In contrast, for the pedometer, the presence of cataracts, being underweight or obese, having depression or balance challenges increased the risk for not being sufficiently active. Self-efficacy measures provided the highest odds ratios of not being active for both capacity and participation.

DISCUSSION
This study provides novel data highlighting the disparity between physical capacity and physical activity participation in a cohort of people with different chronic diseases. Secondly, these results support the hypothesis that the common impairments across diseases increase risk for inactivity more than the presence of the disease itself.

Our performance measure is consistent with other investigations of older adults, highlighting the importance of physical domains (25); the 6MWT is a measure of endurance but is also considered a means to quantify function in older adults (7). Although 60% of participants were able to complete more than 400 m in the 6MWT (19), only a third of these participants were considered active as measured by the pedometer, and a third were achieving the recommended 1000 kcal wk$^{-1}$ of activity (15). That is, despite the fact that our participants were community dwelling and had sufficient ability, not all achieve recommended physical activity levels. This is an important consideration because if individuals with chronic disease are not using their current abilities to engage in physical activity, they are at risk for developing a reduced tolerance to activity, further sedentary lifestyle, and compromised health.

Interestingly, we found that self-efficacy was an important determinant and was significantly lower in the group who had the capacity but did not meet the recommended activity level. Self-efficacy, based on the work by Bandura (2), describes the relation between the beliefs in one’s ability and achievement. More recently, the self-efficacy


<table>
<thead>
<tr>
<th>Six-Minute Walk Test ($N = 163$)</th>
<th>Pedometer Mean Steps ($N = 188$)</th>
<th>PASIPD ($N = 200$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABC</td>
<td>0.52***</td>
<td>ABC</td>
</tr>
<tr>
<td>Age</td>
<td>−0.19*</td>
<td>Age</td>
</tr>
<tr>
<td>Body mass index</td>
<td>−0.27***</td>
<td>Body mass index</td>
</tr>
<tr>
<td>CES-depression scale</td>
<td>−0.35***</td>
<td>CES-depression scale</td>
</tr>
<tr>
<td>ISEL</td>
<td>0.28***</td>
<td>ISEL</td>
</tr>
<tr>
<td>Management self-efficacy</td>
<td>0.51***</td>
<td>Management self-efficacy</td>
</tr>
<tr>
<td>Left-grip strength</td>
<td>0.43***</td>
<td>Left-grip strength</td>
</tr>
<tr>
<td>Left-leg strength</td>
<td>0.53***</td>
<td>Left-leg strength</td>
</tr>
<tr>
<td>NIA balance test</td>
<td>0.58***</td>
<td>NIA balance test</td>
</tr>
<tr>
<td>Number of medications</td>
<td>−0.39***</td>
<td>Number of medications</td>
</tr>
<tr>
<td>Timed up and go</td>
<td>−0.65***</td>
<td>Timed up and go</td>
</tr>
</tbody>
</table>

These measures were entered into the multiple-regression models for the three primary outcome variables (6MWT, pedometer steps, and PASIPD).

ABC, Activities–Specific Balance Confidence score; CES-D, Centre for Epidemiological Studies–Depression; ISEL, Instrumental Support Evaluation List; NIA, National Institute for Aging balance score; PASIPD, Physical Activity Scale for Individuals with Physical Disabilities.

* Significant at $P \leq 0.05$; ** significant at $P \leq 0.01$; *** significant at $P \leq 0.001$. 
model has been used in health research, in particular to assess a confidence to change negative health behaviors such as smoking and inactivity. Self-efficacy scales are also used to determine one’s balance confidence for a number of environmental situations (Activities of Balance Confidence Scale) (20). Self-efficacy explores an individual’s motivation to start and maintain healthy behaviors despite obvious setbacks. According to Bandura, health promotion activities are dependent on multiple domains (2); as the majority of our measures were performance based, this may explain why only 50% of people who start an exercise program maintain it at 6 months (31), it is therefore prudent to educate individuals on the benefits of regular activity, assist in the development of specific exercise motivators and goals, and assess self-efficacy to sustain a program despite setbacks—including discussing contingency plans in the event of a setback, and, of course, understanding individual impairments and abilities to minimize risk of injury.

These results were able to explain a larger variance for the pedometer record compared with the PASIPD. This may occur for several reasons: first, the PASIPD is a self-report measure that requires the respondent to first remember their actions in the previous 7 d and then make decisions about the effort level, thus creating potential reporting bias. Despite the known limitations, they remain an important tool for capturing activity amount and patterns. There are several limitations noted in this study. First, this was a cross-sectional observational investigation; therefore interpreting any causality of the results needs to be viewed cautiously. With a cross-sectional design we recognize that there may be potential limitations (such as anxiety or lack of experience) to our performance measures which could influence our results. Third, some of the questionnaires used in this study relied on self-report measurements and are therefore subject to recall and respondent bias. We also acknowledge that we only captured the self-reported presence of a disease where the participant sought medical attention. It is possible that participants had mild stages of

### Table 4. Detailed forward multiple-regression models for PASIPD, pedometer, and the 6-min walk test.

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variables in Final Model</th>
<th>Adjusted $r^2$</th>
<th>Standardized Beta</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>PASIPD</td>
<td>Timed up and go</td>
<td>0.04</td>
<td>-0.21</td>
<td>0.907</td>
</tr>
<tr>
<td>Pedometer mean steps</td>
<td>Timed up and go</td>
<td>0.27</td>
<td>-0.35</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Body mass index</td>
<td>-0.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>-0.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of medications</td>
<td>-0.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Management self-efficacy</td>
<td>0.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NIA balance</td>
<td>0.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Management self-efficacy</td>
<td>-0.16</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Grip strength</td>
<td>0.12</td>
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<td></td>
</tr>
<tr>
<td>Six-minute walk test</td>
<td>Timed up and go</td>
<td>0.58</td>
<td>-0.27</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Leg strength</td>
<td>0.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of medications</td>
<td>-0.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Management self-efficacy</td>
<td>0.19</td>
<td></td>
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<tr>
<td></td>
<td>NIA balance</td>
<td>0.21</td>
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<tr>
<td></td>
<td>Body mass index</td>
<td>-0.16</td>
<td></td>
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<tr>
<td></td>
<td>Grip strength</td>
<td>0.12</td>
<td></td>
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</tbody>
</table>

Management self-efficacy, Stanford Chronic Disease Management Self-Efficacy Scale; NIA, National Institutes of Aging Balance Test; PASIPD, Physical Activity Scale for Individuals with Physical Disabilities. Variables excluded: CES–depression scale, NIA balance test, normalized left-leg strength, number of medications, and Stanford Chronic Disease Management Self-Efficacy.

### Table 5. Characteristics of participants for 6-min walk test, > 400 m and > 7500 steps per day, using a pedometer.

<table>
<thead>
<tr>
<th>Pedometer (N = 188)</th>
<th>Six-Minute Walk Test (N = 163)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 7500 Steps per Day</td>
</tr>
<tr>
<td>Chronic conditions</td>
<td></td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>95</td>
</tr>
<tr>
<td>Arthritis</td>
<td>67</td>
</tr>
<tr>
<td>Back problems</td>
<td>49</td>
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<tr>
<td>Cataracts</td>
<td>78</td>
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<tr>
<td>Diabetes mellitus</td>
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<tr>
<td>COPD</td>
<td>10</td>
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<tr>
<td>Stroke</td>
<td>14</td>
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<tr>
<td>Impairments</td>
<td></td>
</tr>
<tr>
<td>ABC</td>
<td>41</td>
</tr>
<tr>
<td>BMI</td>
<td>31</td>
</tr>
<tr>
<td>CES-depression</td>
<td>40</td>
</tr>
<tr>
<td>Management self-efficacy</td>
<td>41</td>
</tr>
<tr>
<td>FEV/FVC %</td>
<td>25</td>
</tr>
<tr>
<td>Grip strength</td>
<td>29</td>
</tr>
<tr>
<td>NIA balance score</td>
<td>32</td>
</tr>
<tr>
<td>Timed up and go</td>
<td>14</td>
</tr>
</tbody>
</table>

ABC, Activities–Specific Balance Confidence Scale; BMI, body mass index; CES-depression, Centre for Epidemiological Studies–Depression Scale; COPD, chronic obstructive lung disease; FEV/FVC, ratio of forced expiratory volume/forced vital capacity; management self-efficacy, Stanford Chronic Disease Management Self-Efficacy; NIA, National Institutes of Aging balance score.
more common diseases (states such as cardiovascular disease and arthritis) not included in this study. These results are only generalizable to people with mild to moderate disease severity, and this is likely a reflection of a sample that are ambulatory, living in the community, and able to visit their community pharmacist. We acknowledge that we were not able to test 18% of people using the 6MWT; however, we believe that those who did complete the 6MWT were still representative of the community.

In conclusion, this novel investigation highlights an important distinction between an individual’s functional capacity and that individual’s participation in physical activity; it also shows that impairments/limitations increase the risk of inactivity more than the presence of the chronic disease itself. Because only one third of older adults achieve recommended physical activity levels, there is the potential for older adults to engage in more physical activity. Further, researchers and clinicians can do more to develop and implement interventions that target the uptake and maintenance of positive health behaviors for older adults who have the potential to engage in more physical activity. Ultimately, this study reinforces that physical activity is a complex entity that requires understanding of many domains and not simply one’s physical capacity.

We thank all the participants who volunteered to be part of the study. We appreciate the contribution of Chihya Hung, Amira Tawashy, Nicole Elfring, Karin McFarlane, Lee Boyer, Alex Koretschenko, Jennifer Cumal, and Miho Asano. We gratefully acknowledge the support of the Canadian Institutes for Health Research (CIHR) Team Development Grant. We also thank CIHR (J.J.E.) and Michael Smith Foundation for Health Research (M.C.A., J.J.E., W.C.M.) for investigator support. Drs. Ashe, Eng, and Miller were involved in all aspects of the research study and manuscript preparation. Dr. Soon was involved in the study concept and design as well as the participant recruitment.

REFERENCES


