Continuous Scale Physical Functional Performance Test: Appropriateness for Middle-Aged Adults With and Without Parkinson's Disease

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Purpose: Functional measures are needed that are applicable to middle-aged adults with neurological disorders who are on the threshold of disability. One potential measure is the Continuous Scale Physical Functional Performance Test (CS-PFP), which has been normalized and validated to older adults but performance is unknown for adults younger than the age of 65 years with and without neurological disorders. The purposes of this investigation were (1) to compare scores on the CS-PFP of nondisabled adults in three age groups from 35 to 64 years with two groups of individuals older than the age of 65; (2) to determine whether there is a ceiling effect for nondisabled middle-aged adults; and (3) to determine whether performance of individuals in early stages of Parkinson's disease (PD) age 45 to 64 years differ significantly from performance of similarly aged nondisabled adults.

Methods: Data were obtained from three samples: (1) 37 adults with PD (45–54 and 55–64 years; 57% female), (2) 70 nondisabled adults (35–44, 45–54, and 55–64 years; 69% female); (3) 72 nondisabled older adults (65–74 and 75–85 years; 79% female). The CS-PFP was administered in a single test session for each subject. Analysis of variance was performed for group differences with adjustment of sex as a covariate followed by a Student-Newman-Keuls post hoc analysis.

Results: For nondisabled individuals, the CS-PFP total and domain scores were significantly lower in the oldest group (75–85 years) compared to all other age groups and significantly higher in the younger two groups (35–44 and 45–54 years) compared to the older groups. There was no ceiling effect for any domain score or total score for the adults younger than 65 years. For individuals with PD, both age groups had significantly lower scores on the CS-PFP than did the nondisabled counterparts.

Conclusions: Results from the nondisabled middle-aged individuals provide comparison data to be used clinically or in investigations of middle-aged adults with neurological dysfunction. Comparison of middle-aged individuals with PD to middle-aged nondisabled adults illustrates the true extent of functional difficulty experienced by individuals with PD and demonstrates the importance of using age appropriate comparison data. The CS-PFP is particularly applicable to middle-aged adults with compromised functional performance for their age but is too high to be effectively quantified with other assessment measures.

Key words: *Continuous Scale Physical Functional Performance Test, middle-aged adults, Parkinson's disease*

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INTRODUCTION

One of the challenges for physical therapists is to demonstrate changes in function when working with middle-aged individuals who have early and subtle functional limitations resulting from neurological disorders. For adults younger than the age of 65 with progressive conditions such as multiple sclerosis (MS) or Parkinson's disease (PD), it is important to measure meaningful changes in functional performance in the beginning stages of the disorder. Assessing change is particularly problematic when the individual has subtle difficulties with function, but still performs near the ceiling for typical functional measures (eg, Timed Up and Go,[1] Six Minute Walk test[2]).

One functional test, the Continuous Scale Physical Performance Test (CS-PFP), was developed to accurately assess functional limitations of older adults across a broad range of functional ability.[3] The test is reliable, valid, and sensitive to change for older community-dwelling adults with and without overt disability.[3–5] The utility of the CS-PFP has been demonstrated for evaluating older individuals who have preclinical disability, meaning that there are subtle indicators of disability, but the person can still function at a high level. This test has potential for use with middle-aged adults (ie, 35–64 years) who have chronic conditions such as traumatic brain injury and fibromyalgia[6,7] or who are in early stages of degenerative disorders such as MS and PD. The CS-PFP is particularly attractive for use with these middle-aged adults on the threshold of disability because of the high sensitivity to change that has been previously demonstrated for older adults. However, it has not yet been established that the

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CS-PFP can be applied to middle-aged adults. It is known that the normative values determined in the original work of Cress et al[3] may substantially underestimate disability of middle-aged adults with neurological dysfunction. As an example, Schenkman et al[8] reported data on CS-PFP performance of people in early and middle stages of PD (mean [SD] age, 63.7 [11.4]). This sample had a mean (SD) total CS-PFP score of 44.3 (17.6). This total score was compared to the published total score of 52.7 (12.9) for a sample of community-dwelling older adults with mean age of 75.6 (3.6). It is likely that the comparison to older adults substantially underestimated the true degree of difficulty experienced by the middle-aged individuals with PD. Therefore, the overall purpose of this study is to compare performance on the CS-PFP of people who have PD with performance of nondisabled age-appropriate counterparts.

In preparation for undertaking this comparison, it was necessary to confirm that CS-PFP scores differ for middle-aged adults compared to older adults. Hence, the first purpose was to compare scores on the CS-PFP of nondisabled adults in three age groups from 35 to 64 years with two groups of individuals older than the age of 65. We predicted that CS-PFP scores of individuals in the middle-aged participants would differ significantly from those of older adults (ages 65 and older).

Second, it was necessary to determine whether middle-aged adults performance would be limited by a ceiling effect of the CS-PFP. This was an important consideration because the CS-PFP was developed and normalized using a sample of community dwelling older adults ages 65 to 85 years. Because the original sample included individuals across a wide range of functional ability (from near the threshold of disability to elite older athletes), we predicted that the test would adequately score middle-aged adults.

The third purpose was to determine whether middle-aged individuals with PD differed significantly from a comparison group of nondisabled adults of comparable age. We anticipated that there would be significant differences between groups.

METHODS

Subjects

This investigation was approved by the Colorado Multiple Institutional Review Board. Data for 37 middle-aged individuals with PD (ages 45–64; 57% female) were obtained from an ongoing randomized, controlled exercise study. The participants lived independently in the community and were able to able to ambulate without an assistive device. Participants were excluded if they had on-state freezing (ie, freezing while PD medications are working optimally) or uncontrolled hypertension or if exercise was limited by musculoskeletal, neuromuscular (other than PD), or cardiovascular disorders.

Data were obtained from 70 middle-aged men and women without disability (ages 35 to 64 years; 68% female). These middle-aged participants were recruited by posters and e-mail announcements at an academic health science center in a major city. Subjects were excluded who had the following: diagnosed conditions that limit the ability to complete activities of daily living (eg, orthopedic, rheumatoid, cardiovascular, neuromuscular, or other diagnosed conditions) and/or report of pain on day of testing. All subjects who were enrolled completed the test.

Comparison data for 72 older adults (65–85 years; 79% female) were provided from previously published research of Cress et al.[3] Similar inclusion and exclusion criteria were used as for the middle-aged nondisabled adults. Performance on the Short Form (SF)-36 Physical Function subscale established that these participants were within the range for independent living age-matched adults.[3] Mean (SD) scores on the SF-36 physical functional subscale were 84.77 (13.62) and 84.01 (16.70) for participants ages 65 to 74 and 75 to 85 years, respectively.

CS-PFP

The CS-PFP is a standardized test of physical functional ability that was developed and validated on a sample of older adults (n = 148) ranging from those living in assisted-living environments to elite athletes. See Appendix for Web site details.

The CS-PFP measures a person's daily functional performance in that the participant performs real, not simulated, tasks and in a manner consistent with task performance at home.[3] The CS-PFP is composed of 15 tasks performed in a sequential order from easiest to most difficult. The 15 tasks are divided into three levels; there are five low-effort tasks called personal (eg, putting on a jacket), five medium-effort tasks called household (eg, floor sweep), and five hard-effort tasks called mobility (eg, climbing stairs) (Table 1).

The CS-PFP is administered in an environment standardized to set parameters defined by the original laboratory and available on the CS-PFP Web site.[9] The test site occupies a 350-square foot room with a 75-meter hallway for the 6-minute walk and consists of standardized equipment and environmental specifications.

A standard dialogue was used during testing. The dialogue requests the person to perform at his or her preferred capacity such that each task is performed at maximal effort within the person's judgment of comfort and safety. Nondisabled adults completed the test in about 40 minutes, and individuals with PD took between 40 minutes and 1 hour. On completion of the test, participants rated their perceived exertion (RPE)[10] for the entire test.

CS-PFP test results are reported for each task as time, weight carried, distance covered, or some combination of the above. Every subject's height is accounted for in the scoring algorithm. Each individual task has one or more raw scores. For example, the pot carry task has two raw scores (weight and time) from which the total task score is computed. Task raw scores are adjusted to a scale of 0 to 100. Adjustment is accomplished using the following formula: Adjusted score = [(observed score − lower limit)/(upper limit − lower limit)] ∗ 100. The upper and lower limits used are from the test validation research and based on data from older adults ages 65 to 85 years.[3]

Scores for individual tasks also are used to determine the five domain scores, which were established by Cress et al[8]

TABLE 1. Distribution of CS-PFP Measures

Tasks	UBS	UBF	LBS	BALC	END
Personal					
Pan of weight	w			t	t
Pouring	w			t	t
Jacket		t		t	t
Reach ratio (reach height/body height)		d			t
Scarf pick up			t	t	t
Household					t
Floor sweep			t	t	t
Laundry (washer and dryer)	t		t		t
Fire door	t			t	t
Bed making			t	t	t
Vacuum			t	t	t
Mobility					t
Public transportation	w		w	t	t
Groceries	w		w	t	t
Endurance walk					d
Floor sit			t	t	t
Stair climb			t	t	t
Domain scores	A*	B*	C*	D*	E*
Total Score = average of all domain scores (A, B, C, D)					

UBS, upper body strength; UBF, upper body flexibility; LBS, lower body strength; BALC, balance and coordination, END, endurance

Tasks are measured by time (t), weight (w), and/or distance (d). Each domain score is depicted by the types of measures in the tasks that are used to calculate the domain score. .

* Average of the adjusted scores for the tasks listed in table.

(Table 1) using a modified Delphi procedure. The five domains are upper body strength (UBS), lower body strength (LBS), upper body flexibility (UBF), balance and coordination (BALC), and endurance (END). The domain score is the average of the adjusted score for all tasks that contribute to that domain. In order to reach the ceiling of the scoring system, a subject would have to score better than the predetermined range for all the particular tasks that make up each domain score and would be a score of 100. The CS-PFP total score is the average adjusted score for all domain scores and a score of 100 would indicate a ceiling effect as well.

The University of Colorado at Denver and Health Science Center (UCDHSC) laboratory is a registered site with the Aging and Physical Performance Laboratory at the University of Georgia. Before beginning this investigation, interrater reliability was determined for investigators from each site (M.S. and M.E.C.). All other examiners at the UCDHSC then were compared to a trained examiner before data collection. Interclass correlation coefficients between testers ranged from 0.97 to 0.99.

Data Analysis

The first step was to examine performance of nondisabled middle-aged adults on the CS-PFP. Nondisabled subjects were grouped by age as follows: 35 to 44, 45 to 54, 55 to 64, 65 to 74, and 75 to 85 years. After a comparison of male versus female, it was determined that a sex difference existed. Therefore, an analysis of variance (ANOVA) for age group differences was used with adjustment for sex as a covariate. Significance set at $p \leq 0.05$ and post hoc analysis was completed using the Student-Newman-Keuls test.

The second step was to determine whether the nondisabled middle-aged adults demonstrated a ceiling effect on any domain scores or the total score of the CS-PFP. For each participant, each task score was examined to determine whether the middle-aged adults scored better on tasks than the predetermined range. In addition, each participant's data were examined to determine whether any domain score or the total score was 100.

The third step was to compare performance of subjects with PD to nondisabled subjects. As above, it was determined that a sex difference existed in the two groups of adults with PD (45–54 and 55–64 years). The two PD groups were included in the ANOVA to compare their performance to that of all nondisabled subjects.

RESULTS

Characteristics of the nondisabled subjects by age group are shown in Table 2. There were no significant

TABLE 2. Descriptive Data for Nondisabled (ND) Adults

	35–44 ND	45–54 ND	55–64 ND	65–74 ND*	75–85 ND*
No.	26	23	21	33	39
% Females	65	83	57	76	81
Age					
Males	39.2 (2.4)	47.3 (3.9)	58.8 (2.5)	72.5 (1.2)	78.7 (3.1)
Females	38.6 (3.2)	47.7 (2.8)	58.3 (2.8)	69.6 (2.6)	78.3 (2.8)
Height (cm)					
Males	179.8 (6.4)	183.6 (2.5)	175.3 (8.6)	177.8 (6.3)	168.1 (3.0)
Females	165.9 (5.0)	165.1 (6.5)	165.2 (6.3)	161.8 (6.5)	157.0 (6.4)
Weight (kg)					
Males	83.3 (14.2)	92.8 (15.0)	85.2 (9.5)	79.7 (12.2)	74.6 (6.1)
Females	60.4 (7.7)	68.0 (8.1)	70.4 (8.1)	64.9 (7.7)	60.4 (7.2)

Data are mean (SD) unless otherwise indicated.

* Data provided from previously collected data of Cress et al.[3]

differences in height or weight between the groups. There were differences in the percentage of males and females in each group with the 45- to 54-year-old age group having the greatest percentage of females (83%). Overall, females made up 72% of the participants.

The first step was to compare sex adjusted means (SD) of CS-PFP total and domain scores between the age groups (Table 3). Total score for the youngest age group (35–44 years) was 73.9 (11.5) with domain scores ranging from 67.5 (11.9) to 84.8 (7.1). The mean total scores and domain scores demonstrated a downward trend as the age group increased (Fig. 1). The total score and all domain scores differed significantly between the youngest group (35–44 years) and the three older groups (55–64, 65–74, and 75–85 years) but was not significantly different than the 45- to 54-year group, although there was a downward trend. The oldest group (75–85 years) was significantly lower for all scores. The two middle groups (55–64 and 65–75 years) differed significantly for the UBS and UBF domain scores. The age groups 45 to 54 and 55 to 64 years differed significantly for the total score and the UBF, UBS, and LBS domain scores. There were no significant differences in RPE between any age group, nor did this variable show a trend with age. There was a difference in performance between males versus females. As a whole, males scored higher on the total score (males: 66.8 [14.5], females: 59.3 [14.9]) and the domain scores UBS (males: 72.7 [14.5], females: 60.0 [16.3]) and LBS (males: 66.4 [15.5]), females: 56.3 [17.0]).

Next, data were examined for ceiling effects. To this end, total, domain, and task specific scores were examined. As was true in earlier work of Cress et al (unpublished data), some participants reached or exceeded the predetermined range for some tasks, with the greatest proportion being participants in the youngest age group. Although some of the middle-aged adults scored better than the predetermined range, this did not translate into total and domain scores reaching the ceiling as none of the middle-aged adults had a total and/or domain score of 100.

Third, performance of middle-aged subjects with PD was compared to performance of nondisabled subjects. Characteristics of the participants with PD are shown in Table 4. Participants were in stages 2, 2.5, and 3 of Hoehn and Yahr, with Unified Parkinson's Disease Rating Scale scores ranging from 22 to 67.5.[11] Comparisons on the CS-PFP between adults with and without PD are depicted in Table 3, and Figure 2 shows CS-PFP performance between subjects with PD compared to similarly aged nondisabled subjects. The CS-PFP total score and all domain scores (with the exception of BALC) for the PD group ages 45 to 54 years were significantly lower than for nondisabled group ages 45 to 54 years. The total score, LBS, and END for the PD group ages 55 to 64 years were significantly lower than for nondisabled group ages 55 to 64 years (Table 3). There were no differences in RPE for those with PD compared to the nondisabled counterparts.

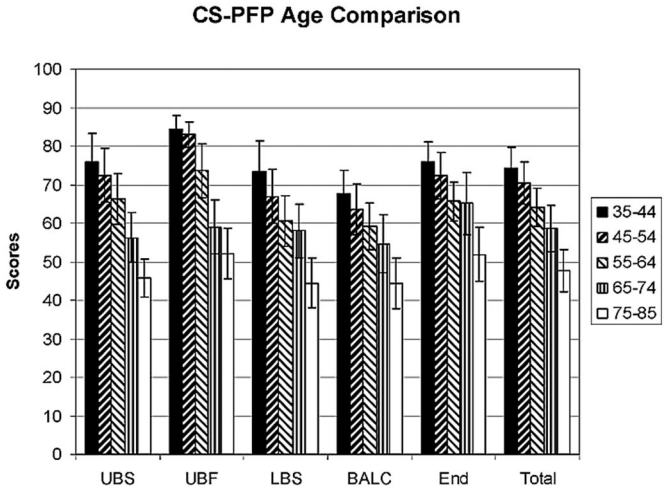

FIGURE 1. CS-PFP total and domain scores for nondisabled adults, comparison of age groups.

When compared to all nondisabled adults, the PD group ages 45 to 55 years scored similar (no significant difference) for total and all domain scores as the nondisabled group ages 55 to 64 years. The PD group ages 55 to 64 years scored similar as the nondisabled group ages 65 to 74 years for total score and UBS, scored lower ($p < 0.05$) in LBS and END and scored higher ($p < 0.05$) in UBF. Figure 3 illustrates total CS-PFP scores for middle-aged adults with PD compared to the same score for all the nondisabled adults of all age groups. As illustrated, performance of middle-aged adults

TABLE 3. CS-PFP Total Score and Domain Scores of ND Adults and Adults with PD

	35–44 ND	45–54 ND	45–54 PD	55–64 ND	55–64 PD	65–74 ND	75–85 ND
No.	26	23	17	21	19	33	39
Total score	73.9 (11.5)	70.9 (11.4)	60.5 (13.9)†	63.2 (10.4)*	56.0 (14.7)†	58.7 (12.5)	48.2 (11.2)*
UBS	74.7 (15.0)	73.6 (14.2)	62.5 (12.5)†	64.0 (13.3)*	59.9 (17.5)	56.5 (13.2)*	46.9 (9.8)*
UBF	84.8 (7.1)	82.7 (6.6)	74.2 (11.5)†	74.1 (14.1)*	69.1 (15.1)	58.9 (14.4)*	51.8 (12.9)*
LBS	72.7 (15.9)	67.6 (13.4)	56.6 (13.8)†	59.2 (13.3)*	51.3 (16.7)†	58.1 (14.2)	45.1 (13.3)*
BALC	67.5 (11.9)	63.8 (12.8)	57.2 (16.1)	58.7 (12.0)	52.0 (14.2)	54.7 (14.9)	44.7 (13.3)*
END	75.7 (10.1)	72.7 (12.3)	62.1 (15.5)†	65.0 (10.5)	57.5 (15.0)†	65.1 (15.7)	52.2 (14.3)*
RPE	10.8 (1.6)	10.5 (1.6)	10.9 (1.4)	11.8 (1.3)	11.9 (1.4)	10.9 (1.8)	11.2 (1.8)

Adjusted for sex differences, mean (SD).
* Significantly different ($p < 0.05$) from the next younger age ND group.
† Significantly different ($p < 0.05$) from ND similar age group.

TABLE 4. Descriptive Data for Middle-Aged Adults With PD, Mean (SD)

	45–54 Yr	55–64 Yr
No.	17	19
% Females	47	52
Age		
Males	49.8 (1.5)	60.8 (2.1)
Females	51.0 (1.8)	60.2 (1.9)
Height (cm)		
Males	180.3 (6.2)	178.5 (5.8)
Females	162.5 (6.2)	162.8 (5.6)
Weight (kg)		
Males	92.5 (16.4)	89.1 (14.2)
Females	72.6 (21.2)	69.9 (12.3)
Years with diagnosis	4.3 (3.5)	4.5 (3.5)
H&Y score	2.1 (0.5)	2.1 (0.2)
UPDRS total score	31.9 (12.3)	31.6 (14.8)

H&Y, the Hoehn and Yahr score for people with PD[9]; UPDRS, total score is the Unified Parkinson's Disease Rating Scale total of the cognitive/emotional, motor, and activities of daily living subscores.[9]

with PD appears more comparable to performance of the older nondisabled age groups.

DISCUSSION

Findings from this investigation illustrate that the CS-PFP performs well for middle-aged individuals. Data from this study provide a basis of comparison for individuals across a wide range of ages. Furthermore, results clearly illustrate the importance of using an age-appropriate comparison group in order to interpret data from individuals with PD who are beginning to lose physical functional capacity.

Our first question was how middle-aged adults would perform on the CS-PFP compared to the older adults in whom this test was validated. Both trends and some group differences were observed. The trend toward higher functional capacity of participants in the middle-aged groups is consistent with data showing a decrease in physiological capacity as

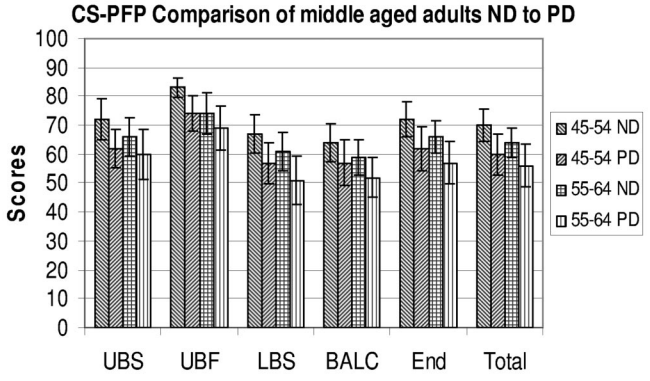

FIGURE 2. CS-PFP total score and domain scores for middle-aged adults with PD versus middle-aged nondisabled adults.

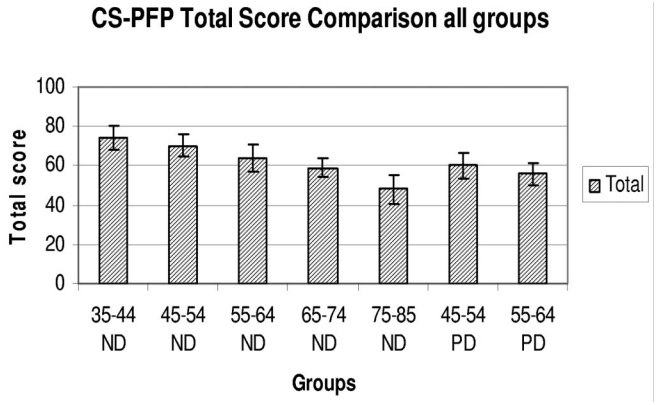

FIGURE 3. CS-PFP total score for all groups with PD and nondisabled adults

age increases.[12] The trend is also consistent with data from single task test performance tests (eg, functional reach).[13] This finding emphasizes the importance of using an age-appropriate comparison group when using the CS-PFP to determine level of functional ability of an individual or a sample of individuals in order to fully appreciate the extent of their functional limitations.

Second, it was important to establish whether scores were within range or whether the test had a ceiling effect for middle-aged participants. Total and domain scores ranged from 67.7 to 84.5 with none of the middle-aged participants scoring 100. Hence, no ceiling effect was observed when the CS-PFP was administered to these nondisabled middle-aged adults. For certain participants, it is noteworthy that task scores exceeded the predetermined range for some of the specific tasks, but this did not translate into a ceiling effect for the total or domain scores. This reflects the robust design of the CS-PFP, which encompasses many components when calculating the total and domain scores, not just a particular task. Furthermore, the CS-PFP was developed using participants ranging from frail to healthy, vigorous older adults.[3] Some vigorous older adults score above the range on selected tasks, while some frail adults cannot do one or two tasks. A participant's raw score on a task that is outside the range (high or low) does not lead to ceiling or floor effects on the overall test (Cress, unpublished data). The absence of ceiling effects for total and domain scores among middle-aged adults indicates that the ranges used to calculate the adjusted scores, established in the validation of the CS-PFP, are appropriate and new ranges are not needed for nondisabled middle-aged adults.

Third, performance of middle-aged adults with PD was compared to performance of nondisabled individuals. Findings illustrate the importance of using age-appropriate data when interpreting degree of loss of functional performance of middle-aged adults with neurological dysfunction. For both groups of participants with PD, physical functional capacity was substantially compromised compared with a similar group of individuals without PD. This compromise was large (CS-PFP total: mean of 60.5 versus 70.9 for the 45- to 54-year-old group; 56.0 versus 63.2 for the 55- to 64-year-old group) and statistically significant. For the younger groups

(45–54 years), this compromise was still above the CS-PFP functional threshold of 57 (range, 48–58 CS-PFP total). In the 55-to 64-year-old group, the subjects with PD were within the confidence intervals of the threshold putting them at increased risk of rapid functional decline.[14] As illustrated in Figure 3, the compromise in functional capacity for these two samples of middle-aged adults with PD would not have been as apparent had their data been interpreted in relation to the available data[3] from older adults. The degree to which functional decline would be underestimated is apparent by the similarity of scores for the people with PD age 45 to 54 years and 55 to 64 years compared to the nondisabled participants in the 55- to 64- and 65- to 74-year-old samples.

Although the scores show a downward trend as age increases, the subjects' overall perception of the difficulty of the test, measured by RPE, did not. There were no differences in the mean RPE among the nondisabled groups (10.5–11.8) or any of those with PD (10.9–11.9). This finding is consistent with the observations of Cress et al,[3] who compared RPE on the CS-PFP test between community-dwelling older adults and older adults living in assisted-living facilities. It has also been shown that when individuals increased their fitness level (measured by increasing the weight carried and decreasing the time on the CS-PFP tasks), they performed 14% better but had the same RPE.[3] Lack of difference in the RPE scores suggests that individuals across age groups tended to work at about the same relative intensity, irrespective of the physiological capacity. Results indicate that middle-aged adults with and without PD simply scaled their intensity up or down (eg, by changing the amount of weight carried or time to complete the task) without changing the overall perceived effort.

The SDs for scores within each group of individuals with and without PD show that functional performance can differ widely, suggesting that performance depends on the specific strategy and level of intensity chosen by the individual. This finding is consistent with data from Cress et al[3] for older adults. The observed variability highlights the importance of allowing individuals to complete the tasks with their own strategy and level of intensity and to measure their perceived level of exertion to truly obtain representative data of the individual's functional performance.

Despite the considerable interindividual variability in CS-PFP scores, the test has been shown to be more sensitive to change than self-report measures.[3,15] Because of this sensitivity to change, it is possible that the CS-PFP can distinguish subtle changes in functional performance of middle-aged individuals on the threshold of functional decline due to neurological disorders. This issue will be examined in the ongoing exercise intervention trial from which data were obtained for middle-aged adults with PD.

A few limitations should be mentioned. First, the number of male participants was relatively low for the nondisabled adults. Mean scores might be slightly different if women and men were more equally represented. Because males scored higher on UBS, LBS, and total scores, a separate analysis comparing sex separately may be beneficial if more male subjects were included in this study. A future investigation with a larger number of males is needed to develop comparison data by age and sex. Second, the proportion of male participants with PD was high. The degree of loss of physical functional capacity might actually be slightly underestimated because the comparison group was heavily female.

Third, data for the older adults were taken from existing databases, obtained at other sites. It is possible that some of the differences between middle-aged and older participants reflect site-related differences in data acquisition. However, a recent study by Cress et al[5] demonstrated reliability of CS-PFP across sites. In this regard, it is important to note that efforts were made to ensure consistency as noted in the Methods section.

Finally, the data compared in this study were from the CS-PFP as opposed to the CS-PFP10.[6] The CS-PFP10, which takes substantially less time for administration, preserves all the information of the CS-PFP. Therefore, we do not expect that the conclusions of this study would be any different using the CS-PFP10.

CONCLUSION

Results from the nondisabled middle-aged individuals provide comparison data that can be used clinically or in investigations of middle-aged adults with neurological dysfunction who have clinical and preclinical disability. Comparison of middle-aged individuals with PD to middle-aged nondisabled adults illustrates the true extent of functional difficulty experienced by individuals with PD and demonstrates the importance of using age-appropriate comparison data. The CS-PFP is particularly applicable to middle-aged adults with functional performance too high to be effectively quantified with other assessment measures.

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APPENDIX

- The test is described in detail at www.coe.uga.edu/CS-PFP.
- The home page includes representative pictures and links.
- "Overview" provides a detailed description of the test.
- Test specifics can be seen on the Web site by clicking on the "CS-PFP Test" link then followed by the "Before Testing" link.
- Scoring is calculated on the Web site on the "Data Reduction for Registered Sites" link, access to which is allowed to registered sites only. The controlled access helps to maintain consistency of test setup and use between sites.