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RELIABILITY, VALIDITY AND MINIMAL DETECTABLE CHANGE OF 2-MINUTE WALK TEST AND 10-METER WALK TEST IN FRAIL OLDER ADULTS RECEIVING DAY CARE AND RESIDENTIAL CARE

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ABSTRACT

Background: The psychometric properties of the 2-minute walk test (2MWT) and 10-meter walk test (10MeWT) for frail older adults are unclear.

Aims: To determine the test-retest and inter-rater reliability, construct and known-group validity, and minimal detectable change at 95% level of confidence (MDC_{95}) of these walk tests in frail older adults receiving day care and residential care services.

Methods: A cross-sectional study with repeated measures was conducted on frail older adults who could walk independently for at least 15 metres. The participants completed the 2MWT and 10MeWT on three separate occasions over a two-week period under two independent assessors.

Results: Forty-four frail older adults were examined. Excellent test-rest (ICC= 0.95- 0.99) and inter-rater reliability (ICC= 0.95- 0.97) were shown in both walk tests. Good to strong correlations were found between the walk tests and 6-minute walk test (*r*= 0.89- 0.92), Elderly Mobility Scale (*r*= 0.56- 0.57), Berg Balance Scale (*r*= 0.66- 0.66) and Modified Barthel Index (*r*= 0.55- 0.59). The MDC_{95} were 7.7m in the 2MWT and 0.13m/s in the 10MeWT.

Discussion: Although the walking performances of the day care and residential care participants were similar, the validity of the walk tests was different between these two subgroups.

Conclusions: The 2MWT and 10MeWT are reliable and valid measures in evaluating the walking performances of frail older adults. The MDC_{95} of the walk tests has been recommended.

Keywords: Rehabilitation; Exercise Test; Outcome Assessment; Walking; Psychometric Study

INTRODUCTION

Walking is an important determinant of health in older adults. Deteriorated walking performance in older adults indicates poor mobility, increased risk of hospitalization and decreased survival rate [1, 2]. Walk tests, such as the 2-minute walk test (2MWT) [3] and 10-meter walk test (10MeWT) [4], are commonly used to evaluate the walking performance and estimate the health status of older patients in clinical settings.

Despite the frequent use of the 2MWT and 10MeWT in clinical setting, their psychometric properties have not thoroughly tested for older adults, particularly for those who are frail and need prolonged medical care. Past studies have investigated the psychometric properties of these walk tests for community-dwelling individuals with single condition [5, 6] and those receiving acute care [7, 8], but have never investigated separately for frail older adults receiving day care services. There was a study on older adults receiving long-term care but with high drop-out rate (36%) [9]. Hence, the feasibility, reliability and validity of these walk tests for frail older adults receiving residential care services remain uncertain.

The credential of a performance-based outcome measure, such as walk tests, depends on its reliability and validity. Test-retest reliability indicates how consistent an outcome measure is on different testing occasions, and inter-rater reliability refers to how consistent two different assessors conduct an outcome measure [10]. Among different types of validity, construct validity indicates the extent to which the score of a measure reflects the underlying concept of interest to be measured [10]. Known-group validity, one component of construct validity, refers to how two groups of participants differ on the concept of interest to be measured [10]. Minimal detectable change (MDC) represents the smallest difference in the measure to be considered a real change in the performance [11, 12]. MDC can be an absolute value, where the change is considered to exceed the measurement error at the 95% confidence level (MDC_{95}), or a relative value in percentage representing a change over time (MDC_{95}%).

This study aimed at investigating the test-retest and inter-rater reliability, construct and known-group validity, and MDCs of the 2MWT and 10MeWT separately for frail older adults attending day care and residential care centers.

METHODS

Study Design

This study was a cross-sectional, non-experimental psychometric study with repeated measures. Two assessors conducted the 2MWT and 10MeWT on three testing occasions to evaluate the test-retest and inter-rater reliability. The construct validity was evaluated based on the correlations between the walking performances and functional outcomes of the participants. The known-group validity was assessed by comparing the walking performances of the participants using different walking aids and with different ambulatory statuses. The MDCs of the walk tests were determined based on the findings on these walk tests and test-retest reliability [13].

Participants

The study participants were recruited from January to May 2016 from a day care centre and a residential care facility. Both centers provide permanent medical care, social support, personal care and rehabilitation services to older adults with moderate to severe disabilities. Those who are attending the day care center are mainly taken care by their carers at home, while those who are living in the residential care facility are taken care by on-site health and personal care workers. Individuals were included if they were: 1) aged 65 years or above; 2) able to ambulate 15 meters independently with or without walking aid; and 3) scored 3 or above in the Fatigue, Resistance, Ambulation, Illnesses, & Loss of Weight (FRAIL) scale [14]. The FRAIL scale is a frailty screening questionnaire to assess if an individual feel tired in the past 4 weeks (Fatigue), have difficulties in climbing stairs (Resistance), have difficulties in walking 100 meters independently (Ambulation), have more than five diseases (Illnesses) and have lost more than 5% of body weight in last year (Loss of Weight). The total score ranges from 0 to 5 (0 as non-frail, 1 to 2 as pre-frail, and ≥ 3 as frail) [14]. Individuals who had any acute or uncontrolled cardiac, pulmonary or musculoskeletal conditions, a diagnosis of dementia or Alzheimer’s disease, severe hearing or visual impairment, or recent hospitalization in the past 30 days were excluded. The participants were grouped under either day care (DC) or residential care (RC) subgroups based from where they were recruited (Online Resource 1).

Sample Size Calculation

Based on the strong test-retest reliability of the walk tests previously reported on older populations (Intra-class correlation coefficient, ICC $\geq$ 0.82) [5, 6, 8, 9], a sample size of 30 was required to achieve 90% power at a confidence level of 0.05 to detect a strong reliability (ICC $\geq$ 0.90) [15]. Anticipating a 20% of drop-out rate, this study aimed at recruiting 38 participants.

Procedures

The study complied with the Declaration of Helsinki and was approved by the research ethics committees of the Hong Kong Polytechnic University and the participating centres. Informed consent was obtained from all participants.

Demographic data, including age, gender, height, weight, body mass index, past medical history and cognitive function, were retrieved from the medical records of the participants by a physical therapist of the residential care facility (WC, the first author). Functional outcomes, including the 6-minute walk test (6MWT), Berg Balance Scale (BBS), Elderly Mobility Scale (EMS) and Modified Barthel Index (MBI), were assessed by this physical therapist on a separate occasion (Online Resource 1). Based on the Modified Functional Ambulation Classification [16], the participants were categorized into either indoor or outdoor walkers. Indoor walkers can transfer and walk independently on levelled ground but require supervision or physical assistance to ambulate on stairs, inclined or uneven surface. Outdoor walkers are able to ambulate independently on any terrains [16].

Data collection was completed from March to July 2016. Three testing occasions were conducted over a two-week period. Two physical therapists (WC as Assessor A and another on-site physical therapist, CC, as Assessor B) performed the walk tests separately (Online Resource 1). All these testing occasions were at least one day apart so the participants had adequate rest. To prevent recall bias, the sequences of the walk tests on each occasion were randomized for each participant by drawing lots.

Measures

Walk Tests

The walk tests were conducted on a 15-meter levelled corridor located in a spacious hall of the residential care facility. Traffic cones were placed at both ends of the corridor to indicate the turning spots. Markings were placed at 1-meter intervals using colored tapes. The participants were instructed to use their usual walking aids. No vigorous exercise was allowed two hours before the testing occasion. Heart rate, blood pressure and oxygen saturation were monitored using a finger pulse oximetry and a blood pressure monitor, and the rate of perceived exertion were recorded using the modified Borg scale prior to and after each trial of the walk tests [17]. All these vital signs had to return to the baseline before the next trial [17, 18].

1. *2-minute walk test (2MWT)*

The 2MWT was conducted based on the published guideline [18]. The participants were told to "walk at your comfortable, usual pace". The assessor walked half a meter behind the participant to ensure safety. No encouragement or feedback was given during the test. Two practice trials and one final trial for record were performed. The participants were given at least 10 minutes rest between trials. The distance covered in the two minutes was recorded as the 2MWT.

2. *10-meter walk test (10MeWT)*

The 10MeWT was measured simultaneously in the 2MWT. During the first leg of each trial of the 2MWT, the time used to walk for the middle 10 meters of the 15-meter corridor was recorded. The first three meters and the last two meters were reserved for acceleration and deceleration respectively [8, 19]. The 10MeWT was calculated by dividing 10 meters by the time used (i.e. meters/second).

The two walk tests were conducted simultaneously as their testing procedures were very similar. Hence, the amount of repeated walking for the participants was greatly reduced so as to maximize their compliance and reduce unnecessary fatigue.

Functional Outcomes

1. *6-minute walk test (6MWT)*

The 6MWT aims at examining the exercise capacity of older adults [20]. The participants were asked to walk "as far as possible" without jogging or running for six minutes. The distance covered in the six minutes was recorded.

2. Berg Balance Scale (BBS)

The BBS assesses the balance of older adults using 14 functional tasks [21], such as sitting to standing, standing unsupported, chair transfers, standing with eye closed, tandem standing and single leg standing. Each item is rated on a scale of 0 to 4 (0 = incapable to perform the task and 4 = fully capable in completing the task based on the scoring criterion). A higher total score indicates better balance control.

3. Elderly Mobility Scale (EMS)

The EMS evaluates the general mobility, balance and transfers of frail older adults [22]. Seven mobility and functional tasks were examined. Two bed mobility tasks, lying to sitting and sitting to lying, score from 0 to 2. Four tasks, including sitting to standing, standing, gait, six-meter timed walk, score from 0 to 3. The functional reach task scores from 0 to 4. A higher total score indicates better mobility status.

4. Modified Barthel Index (MBI)

The MBI assesses individuals' independence in activities of daily living [23]. It comprises 10 functional activities, including feeding, transfer, personal hygiene, getting on/off toilet, bathing, walking on levelled ground, climbing stairs, dressing, and bowel and bladder control. Each item scores from 0 to 10. A higher total score indicates better functional independence.

Statistical Analyses

The characteristics and functional outcomes between the two subgroups were compared using independent *t* test or chi-square test. The walking performances between the two subgroups were compared using one-way analysis of covariance (ANCOVA).

The test-retest and inter-rater reliability of the walk tests were analyzed using the ICC model 2 ($ICC_{2,1}$) and model 3 ($ICC_{3,2}$) respectively [24]. The correlations between the walk tests and functional outcomes were analyzed using Pearson correlation coefficient (r) for all the participants as a group, and Spearman correlation coefficient (ρ) for each subgroup. Known-group validity was evaluated by comparing the walking performances among the participants using different walking aids (no aid versus stick versus quadripod/frame) and of different ambulatory statuses (indoor walkers versus outdoor walkers) using one-way analysis of variance (ANOVA) and independent *t* test for all the participants as a group, and Kruskal-Wallis test and Mann-Whitney U test for the two subgroups.

The MDC were calculated based on the findings of the walk tests conducted by the same assessor (test-retest reliability by Assessor A). The standard error of measurement (SEM) was calculated using the following formula [13]:

$$\text{SEM} = sd \times \sqrt{(1 - r)}$$

where *sd* is the standard deviation of the measure, and *r* is the reliability coefficient, i.e. the ICC of the test-retest reliability. The absolute MDC at the 95% confidence level (MDC_{95}) was calculated based on the SEM using the following equation [11, 12]:

$$MDC_{95} = SEM \times 1.96 \times \sqrt{2}$$

where 1.96 represents the z-score at the 95% confidence interval from a normal distribution. The squared root of two takes into account the errors made by two repeated measurements.

The relative MDC at the 95% confidence level ($MDC_{95}\%$) was calculated as follows [11]:

$$MDC_{95}\% = (MDC_{95}/\text{mean}) \times 100$$

where “mean” was the average results of the walk tests.

All statistical analyses were performed using the SPSS software (version 22.0). A significance level was set at $p = 0.05$.

RESULTS

Forty-four participants were recruited and completed all the walk tests. No adverse event and drop-out was recorded. The characteristics of the participants are shown in Online Resource 2. The participants had a mean age of 85.0 years. Most participants were female (75%). The average number of chronic conditions was 5.8. Most participants walked unaided (32%) or with a stick (39%). About half of them were outdoor-walkers (52%). The RC subgroup was significantly older (p = .042), with more participants being female (p = .036), having osteoarthritis (p < .001), and having more chronic diseases (p = .046). After controlling these demographic variables, no significant difference was found in the 2MWT and 10MeWT between the DC and RC subgroups (all p > .05).

Both the 2MWT and 10MeWT achieved excellent test-retest (ICC = 0.95- 0.99) and inter-rater reliability (ICC = 0.91- 0.97) as a group and in each subgroup (DC- test-retest: ICC = 0.97- 0.99; inter-rater: ICC = 0.96- 0.98; RC- test-retest: ICC = 0.94- 0.97; inter-rater: ICC = 0.94- 0.97) (Table 1).

The 2MWT and 10MeWT were significantly correlated in the participants as a group (r = 0.98) and in each subgroup (ρ = 0.95 - 0.98) (Table 2). These walk tests were also strongly correlated with the 6MWT (as a group, r= 0.89 - 0.92; in each subgroup, ρ = 0.78 - 0.91). The correlations between the walk tests and the EMS were moderate as a group (r = 0.56 - 0.57) and in the DC subgroup (ρ = 0.38 - 0.46), but strong in the RC subgroup (ρ = 0.60 - 0.62). The correlations between the walk tests and BBS were strong (as a group, r = 0.66 - 0.66; in each subgroup, ρ = 0.67 - 0.77). The correlations between the walk tests and MBI were moderate as a group (r = 0.55- 0.59), strong in the DC subgroup (ρ = 0.74 - 0.81) but weak in the RC subgroup (ρ = 0.28 – 0.33).

The walking performances were significantly different for participants using different walking aids (all $p \leq .027$), except in the 2MWT for the RC subgroup ($p = .070$) (Table 3). Those who ambulated without walking aids walked farther and faster than those using a quadripod or frame (all $p \leq .038$). Stick-users outperformed those using a quadripod or frame in the two walk tests as a group (all $p = 0.01$), and in the 2MWT for the DC subgroup ($p = .030$). The outdoor-walkers performed significantly better in both the walk tests than the indoor-walkers as a group (all $p \leq .001$) and in the DC subgroup (all $p \leq .025$).

The MDC_{95} (MDC_{95}%) of the 2MWT and 10MeWT for the participants as a group were 7.7m (10.7%) and 0.13m/s (18.8%) respectively. For the DC subgroup, the MDC_{95} (MDC_{95}%) of the 2MWT and 10MeWT were 6.1m (8.4%) and 0.13m/s (18.8%) respectively. For the RC subgroup, the MDC_{95} (MDC_{95}%) of the 2MWT and 10MeWT were 8.4m (11.9%) and 0.12m/s (18.0%) respectively.

DISCUSSION

The present study is the first to validate these walk tests for frail older day care attendants. Literature about the walking performances for this population group has been scarce [25, 26]. Previous psychometric studies of the 2MWT and 10MeWT for older populations focused only on community-dwelling individuals [5, 6, 19], those receiving acute care [7, 8] and long-term care [9]. Our findings showed that both 2MWT and 10MeWT were safe, reliable and valid to evaluate the walking performances of frail older day care and residential care attendants.

2MWT

The reliability found in the current study (ICC = 0.97 - 0.99) is consistent with the findings of a study on long-term care attendants (ICC = 0.83 - 0.96) [9], probably because the characteristics of our participants were similar to those in that study. The strong correlation between the 2MWT and 6MWT shown in our findings (r = 0.92) is also similar to this study (r = 0.92) [9], as both 2MWT and 6MWT measure individuals' walking capacities. The strong correlation between the 2MWT and BBS in the present study (r = 0.66) was again similar to this study (r = 0.88) [9]. The correlation between the 2MWT and MBI in the present study (r = 0.59) was different from previous studies on older adults with acute hip fracture (r = 0.35) [7], likely because acute lower limb fracture might have considerably increased the physical dependence of their participants.

Our findings are coherent with previous findings that the 2MWT could distinguish people using different walking aids [7]. This study has further demonstrated that the 2MWT can differentiate frail older indoor walkers from outdoor walkers. The MDC_{95} reported in this study (7.7 m) is lower than the previously published value for healthy adults (42.5 m) [27], likely due to the fact that our participants were more physically restricted.

10MeWT

The excellent reliability shown in the present study is comparable with previous studies on older adults with Parkinson's disease (ICC = 0.92 – 0.96) [5], acute hip fracture (ICC = 0.82) [8] and chronic lung disease (ICC = 0.90- 0.99) [6]. To the author's knowledge, the current study is the first in evaluating the construct and known-group validity of the 10MeWT in older populations. Our findings of the MDC_{95} (0.13 - 0.16 m/s) were lower than those for older adults with Parkinson's disease (0.22- 0.23 m/s) [5] and chronic lung disease (0.40 m/s) [6], probably because our participants were physically weaker than their younger counterparts with single chronic condition. The study on older adults with acute hip fracture reported an extremely small MDC_{95} (0.08 m/s) [8]. The hip fracture at the acute stage might have significantly reduced the walking abilities of their participants, resulting in a very low 10MeWT (0.02 m/s) [8] and consequently a very small MDC.

Our MDCs of the 2MWT and 10MeWT were generally smaller than those previously reported on older populations [5, 6, 9]. This might be attributed to the use of the standardized testing protocols of the walk tests. Our study used the standardized testing protocol of the 2MWT [18]. The number of practice trials, use of verbal encouragement and duration of rest between trials were different (e.g. two versus no practice trials; strictly no verbal versus verbal encouragement; 10 versus 5 minute rest). Similarly, the testing procedures of the 10MeWT varied in many aspects in previous studies, including the length of steady-state walking (6 meters or 10 meters), number of practice trials (0 or 2 practice trials) and instructions ("walk as fast as possible" or "walk at your comfortable speed") [5, 6, 8]. Using standardized testing protocol of the walk tests in the current study might have minimized the variations of the walking performances from our participants, contributing to the smaller MDCs.

It is interesting to find that although the walking performances between the day care and residential care participants were similar (Online Resource 1), there were subtle differences in the validity of the walk tests between these two subgroups. Specifically, these walk tests were more capable to differentiate between those using different walking aids, and between indoor and outdoor walkers among the day care attendants than among the residential care attendants (Table 3). Frail older day care attendants might represent a unique older population group which showed different walking capacity. Future studies should be conducted to verify this speculation.

Study Limitations

Our study consisted of older adults who were relatively old, frail, with multiple chronic diseases and disabilities, and recruited from day care and residential care facilities. Our findings should not be generalized to non-frail, community-dwelling healthy older adults. Although we had reached the targeted sample size, the number of participants remained small, particularly in the post-hoc subgroup analyses. The length of the corridor used in the current study was only 15 meters, which was shorter than the recommendation in the published guidelines (30 meters, or not less than 20 meters) [18]. The walking performances of our participants might be reduced due to the increased number of turns during the tests. Clinicians who are going to use our findings in their settings should be aware of the effects of different environmental set-up. The 10MeWT was measured within the 2MWT and the results might vary if the tests were conducted individually.

CONCLUSION

Excellent test-retest and inter-rater reliability were found in the 2MWT and 10MeWT for frail older day care and residential care attendants. These walk tests were significantly correlated with functional outcomes of exercise capacity, general mobility, balance and functional independence. The two walk tests were able to discriminate frail older adults using different walking aids and of different ambulatory statuses. The MDC_{95} and $MDC_{95}\%$ of the walk tests were suggested for this population group. Frail older day care and residential care attendants presented different patterns of construct and known-group validity of the walk tests.

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Ethical Statements:

i) Compliance with ethical standards: The research complied with the ethical standards as required.

ii) Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

iii) Conflict of interest: The authors declare that they have no conflict of interest.

iv) Ethical approval: This research was approved by the research ethics committees of the Hong Kong Polytechnic University and the participating centres.

v) Informed consent: Written informed consent was collected from all participants

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Table 1. Test-retest and inter-rater reliability results

Walk test	Test-rest reliability		Inter-rater reliability			
			Assessor A Occasion 1 and Assessor B		Assessor A Occasion 2 and Assessor B	
	$ICC_{2,1}$	95% CI	$ICC_{3,2}$	95% CI	$ICC_{3,2}$	95% CI
2MWT						
As a group (n = 44)	0.99	(0.97 - 0.99)	0.97	(0.94 - 0.98)	0.97	(0.95 - 0.98)
DC (n = 20)	0.99	(0.98 - 1.00)	0.98	(0.95 -0.99)	0.98	(0.94 - 0.99)
RC (n = 24)	0.97	(0.93 - 0.99)	0.95	(0.90 - 0.98)	0.97	(0.93 - 0.99)
10MeWT						
As a group (n = 44)	0.95	(0.92 - 0.98)	0.95	(0.91 - 0.97)	0.96	(0.93 - 0.98)
DC (n = 20)	0.97	(0.92 - 0.99)	0.96	(0.89 - 0.98)	0.96	(0.89 - 0.98)
RC (n = 24)	0.94	(0.87 - 0.97)	0.94	(0.86 - 0.97)	0.97	(0.93 - 0.99)

Note: 2MWT- 2-minute walk test; 10MeWT- 10-meter walk test; DC- Day care; ICC- Intra-class correlation coefficient; RC- Residential care.

Table 2. Correlations between the walk tests and functional measures

	2MWT			10MeWT		
	As a group (n = 44)	*DC (n = 20)*	*RC (n = 24)*	*As a group (n = 44)*	*DC (n = 20)*	*RC (n = 24)*
2MWT						
r / ρ*	1.00	1.00	1.00			
p-value						
10MeWT						
r / ρ*	0.98	0.96	0.95	1.00	1.00	1.00
p-value	< .001	< .001	< .001			
6MWT						
r / ρ*	0.92	0.91	0.84	0.89	0.89	0.78
p-value	< .001	< .001	< .001	< .001	< .001	< .001
EMS						
r / ρ*	0.56	0.38	0.60	0.57	0.46	0.62
p-value	< .001	.10	.002	< .001	.041	.001
BBS						

r / ρ*	0.66	0.70	0.71	0.66	0.67	0.77
p-value	< .001	.001	< .001	< .001	.001	< .001
MBI						
r / ρ*	0.59	0.81	0.33	0.55	0.74	0.28
p-value	< .001	< .001	.12	< .001	< .001	.19

The results of the walk tests done by Assessor A on Occasion 1 were used.

* Pearson r correlation was used for all the participants as a group. Spearman ρ correlation was used for the DC and RC subgroups.

Note: 2MWT- 2-minute walk test; 6MWT- 6-minute walk test; 10MeWT- 10-meter walk test; BBS- Berg Balance Scale; DC- Day care; EMS- Elderly Mobility Scale; MBI- Modified Barthel Index; RC-Residential care.

Table 3. Comparisons between subgroups of the participants

Subgroups	2MWT (m), mean (SD)			10MeWT (m/s), mean (SD)		
	As a group (n = 44)	*DC (n = 20)*	*RC (n = 24)*	*As a group (n = 44)*	*DC (n = 20)*	*RC (n = 24)*
Walking aids						
No aid	84.1 ± 15.1	85.8 ± 13.3	82.8 ± 17.1	0.79 ± 0.13	0.80 ± 0.13	0.78 ± 0.14
Stick	75.5 ± 23.1	83.9 ± 24.9	68.0 ± 19.7	0.71 ± 0.22	0.77 ± 0.22	0.65 ± 0.20
Quadripod or frame	53.9 ± 17.4	45.0 ± 18.3	61.6 ± 13.4	0.51 ± 0.16	0.43 ± 0.19	0.57 ± 0.11
p-value^	.001	.006	.070	.001	.023	.027
Pairwise: No aid vs stick	*.66*	*1.00*		*.59*	*1.00*	*.43*
Pairwise: No aid vs quadripod or frame	*.001*	*.009*		*< .001*	*.038*	*.022*
Pairwise: Stick vs quadripod or frame	*.01*	*.030*		*.01*	*.063*	*.54*

Ambulatory status						
Outdoor walker	83.9 ± 19.9	86.4 ± 21.3	80.4 ± 18.5	.77 ± 0.18	0.79 ± 0.20	0.75 ± 0.17
Indoor walker	60.9 ± 18.9	52.8 ± 20.6	65.4 ± 16.9	.58 ± 0.19	0.51 ± 0.21	0.62 ± 0.17
p-value*	< .001	.004	.074	.001	.025	.114

The results of the walk tests done by Assessor A on Occasion 1 were used.

^ One-way ANOVA with Bonferroni adjustment was used for all participants. Kruskal-Wallis with Dunn-Bonferroni adjustment was used for the DC and RC subgroups.

* Independent *t*-test was used for all participants. Mann-Whitney U test was used for the DC and RC subgroups.

Note: 2MWT- 2-minute walk test; 10MeWT- 10-meter walk test; DC- Day care; RC- Residential care.