

ABSTRACT
Physical Function Of Aged Population Is Predicted By Motor Competence And Physical Fitness

Fitness and cognitive status on aging has been widely studied and well reported on literature. Independence and functioning are decisive in elders life quality. Motor competence has been associated to children physical activity levels and healthy weight status. Whether or not Motor Competence has additional value in promoting physical function on aging is not well stablished. **PURPOSE:** to investigate the relationship and influence of motor competence, physical fitness and cognitive status on physical functioning, in aged population. **METHODS:** institutionalized participants were recruited as a convenience sample in three day-care centers (N=283, women N=184, mean age = 82.05±7.70 years). Physical functioning was assessed through self-report using a composite physical function scale. Physical fitness was evaluated with the Senior Fitness Test. Motor competence was evaluated as the proficiency in overarm throw a tennis ball, measuring the ball velocity, and standing long jump. Cognitive performance was assessed with Mini-Mental State Examination test. T test was used to test the difference between women and men in all variables. Pearson correlation between physical functioning, physical fitness and motor competence was performed. Stepwise regression was used to identify the predictor variables of physical functioning. Significance was set at p < 0.05. **RESULTS:** Men had significant better motor competence and physical fitness results than women. In women, the highest correlation were found between physical functioning and Chair stand (r=0.25), standing long jump (r=0.19) and 2-min step (r=0.19). In men, the highest correlation were found on 2-min step (r=0.30) and overarm throw (r=0.27). Stepwise regression retained the following variables: 2.44 m up-&-Go, standing long jump, and sex (F(3; 212) = 33.73; p < 0.001, R2 = 0.32). Men has an estimate of more 2.162 points in physical functioning than women. Physical functioning is estimate to increased 1 point for every -0.151 s in 2.44 m Up-&-Go, and 1 point for every 0.051 cm in standing long jump. **CONCLUSION:** Despite having found significant moderate to low correlations in both men and women, it seems that both Motor Competence and Fitness status has important influence on physical functioning.

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INTRODUCTION

Advancing in age indicates a decline in sensorimotor control and functioning. The declines in fine motor control, gait and balance affect the ability to perform activities of daily life and independence. Physical fitness assessment focuses on conditioning not on qualitative or coordinative parts, that is, on motor competence (MC). MC is considered a cornerstone related to health, in children, youth and young adults. Little is known about MC in aged population. Whether or not MC has additional value in promoting health-related fitness on aging is not well established. A new insight may be provided for assessment of MC in such population and its relationship with functional independence. The aim was to investigate the relationship between functional independence and physical fitness, cognitive performance and MC, in older adults.

METHODS

283 older adults of both sexes (women N=184) with ages >65 years (mean age = 82.05±7.70; within the interval of 65.2—99.3 years of age), were recruited from local population.

Materials and respective measure outcome are reported below:

- **Functional Independence:**
Self-report using a composite physical function scale containing 12 items that assesses abilities associated with basic activities of daily living, instrumental or intermediates activities, and advanced activities (Gross, Jones, & Inouye, 2015)
- **Cognitive assessment:**
Mini-Mental State Examination Test (Folstein, Folstein, & McHugh, 1975)
- **Physical fitness tests:**
Senior Fitness Test (Rikli & Jones, 2013)

Multiple linear regression analyses with stepwise variable selection method, was used to identify the explanatory variables of functional independence.

RESULTS

Table 1 – comparison between women and mean

	Women (n=184)		Men (n=99)		
	M	SD	M	SD	
Age (years)	82.1	7.4	81.7	8.1	
BMI (kg/m2)	28.9	4.6	28.5	3.2	
Functional independence (pts)	15.7	7.3	18.9	6.3	*
MMSE score (pts)	20.9	5.4	23.7	5.3	*
Overarm throw (m/s)	5.05	2.23	6.91	3.09	*
Standing long jump (cm)	17.2	29.1	39.0	48.0	*
Chair stand (# reps)	9.2	4.6	10.9	6.3	*
Arm curl (# reps)	13.2	6.4	16.6	6.9	*
2-min step (# reps)	50.9	26.2	64.6	37.2	*
Chair sit-&-reach (cm)	-5.0	13.9	-8.8	13.6	*
2.44 m Up-&-Go (s)	17.5	10.1	16.2	11.9	
Back scratch (cm)	-20.3	29.3	-15.2	34.1	
Walk 6-min (m)	230.2	124.7	272.6	145.4	*

* = significant differences between women and men

REFERENCES

Gross, A. L., Jones, R. N., & Inouye, S. K. (2015b). Development of an Expanded Measure of Physical Functioning for Older Persons in Epidemiologic Research. Research on Aging, 37(7), 671-694. doi: 10.1177/0164027514550834

Table 2 –Pearson correlation between functional independence and all independent variables by sex

Variables	Women	Men
Age (years)	0.05	0.04
BMI (kg/m2)	-0.06	-0.26**
Standing long jump (cm)	0.19*	0.05
Overarm throw (m/s)	0.16*	0.27*
MMSE score (points)	0.06	-0.04
Chair stand (# reps)	0.25**	0.23*
Arm curl (# reps)	0.12	-0.07
2-min step (# reps)	0.19*	0.30**
Chair sit-&-reach (cm)	0.09	-0.04
2.44 m Up-&-Go (s)	-0.16*	0.08
Back scratch (cm)	0.03	-0.21*
Walk 6-min (m)	0.18*	0.12

*p<0.05; **p<0.01

Table 3 –Multiple regression results to predict functional independence

Predictors	B	SE	b	p	Fit	
Constant	15.314	0.427				
Sex	2.162	0.765	0.168	0.005		
2.44 m Up-&-Go (s)	-0.151	0.041	-0.245	< 0.001		
Standing long jump (cm)	0.051	0.011	0.326	< 0.001		
					R ²	0.32
					F (3; 212)	33.73 (p<0.001)

Notes: B = regression coefficient; SE = standard error for regression coefficient b = standardized regression coefficient; p = significance level for regression coefficient

CONCLUSIONS

Functional independence shown low association with physical fitness status and motor competence, and very low association with cognitive status. The functional independence explanatory variables were one physical fitness item and one motor competence item.