


# Functional physical fitness in elderly: Differences depending on the practice of physical activity

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## ABSTRACT

This study aims to verify the impact of physical activity on the physical fitness of elderly. The sample consisted of 348 elderly individuals aged between 61 and 97 years, divided into 2 groups (254 practitioners of Physical Activity and 94 non-practitioners). From the first group 48 practice hydrogymnastics and 206 practice gymnastics.. Physical fitness was assessed following the test protocol of the Senior Fitness Test battery (Rikli & Jones, 2001). In addition to descriptive statistics, the Kolmogorov Smirnov, Mann-Whitney and Kruskal Wallis statistical tests were used with comparisons by pairs. The results allowed to identify that in each and every one of the tests of functional physical fitness there are statistically differences between practitioners and non-practitioners of PA, with mean averages significantly higher by the practitioners. The practice of any of these activities (Hydrogymnastics and Gymnastics) reveals significant differences with the group of non-practitioners, and the means obtained in any of the physical fitness tests of the two groups of practice much superiors compared to the non-practitioners. There are also significant differences between Hydrogymnastic and Gymnastics practitioners in the test sitting, walking 2.44 m and sitting again, and walking for 6 minutes, where the gymnastic practitioners obtained better results in both tests. **Keywords:** Aging; Physical activity and health; Functional physical fitness.

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Supplementary Issue: Spring Conferences of Sports Science. International Seminar of Physical Education, Leisure and Health, 17-19 June 2019. Castelo Branco, Portugal.

JOURNAL OF HUMAN SPORT & EXERCISE ISSN 1988-5202

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doi:10.14198/jhse.2019.14.Proc4.82

## INTRODUCTION

Physical activity (PA) is determinant for the health and autonomy of the elderly . It has been established as a preventive strategy to mitigate the effects of aging (Strath, Pfeiffer, & Whitt-Glover, 2012). This study aims to verify the impact of physical activity on the physical fitness of the elderly. Its intended to analyse if there are differences between practitioners and non-practitioners of supervised PA and if there are differences between gymnastics and hydrogymnastics practitioners.

## MATERIAL AND METHODS

### *Participants*

A number of 348 elderly individuals aged between 61 and 97 years (mean  $74.48 \pm 7.36$ ) participated in the study. They were divided into 2 groups (254 practitioners and 94 non-practitioners). The group of PA practitioners was divided into 2 subgroups (48 practiced hydrogymnastics and 206 gymnastic). For inclusion criteria the PA practice group had to perform at least 2 weekly sessions.

### *Measures*

For elderly evaluation, the test "Senior Fitness Test" developed by Rikli and Jones (2001) and validated for the Portuguese population by Baptista and Sardinha (2005) was applied.

### *Procedures*

All participants filled an individual informed consent form, and were evaluated under the same conditions, complying with the protocol established by the researchers. All ethical and legal research principles with Human Beings have been considered (Declaration of Helsinki, 2013).

### *Analysis*

Descriptive statistics and the Kolmogorov Smirnov normality test ( $n > 30$ ) was applied for data analysis. The comparison between the practice and non-practice groups of was assessed by the Mann-Whitney test. For each of the functional physical fitness tests, the non-parametric Kruskal-Wallis test for comparison of the three groups (Hydrogymnastics, Gymnastics and non-practitioners) was used for normality verification.

## RESULTS

The functional physical fitness assessment tests used present a psychometric sensitivity because they present a distribution of values between the minimum and the maximum of the scale, with absolute values of asymmetry less than 3 and of kurtosis lower than 7. The analysis of the p-values of table 1 allows to identify, statistical differences between practitioners and non-practitioners. PA practitioners present mean values significantly higher than the non-practitioners. The practice of Hydrogymnastics and Gymnastics reveals significant differences in the comparison between groups, with higher means in the practice group.

Table 1. Comparison between groups and activities

													Pairs comparisons	
	Group	n	Mean	Standard deviation	p-value K-S	p-value M-W	Group	n	Mean	Standard deviation	p-value K-S	p-value K-W	Pair	p-value
Get up and sit on the chair (30s)	Practice	254	15.08	3.481	.000	< 0.001	Hydrogymnastics(1)	48	13.75	2.016	.034	< 0.001	(1)-(3)	< 0.001
	Non-practice	94	8.10	3.534	.008		Gymnastics (2)	206	15.39	3.677	.000		(2)-(3)	< 0.001
							Non-practice (3)	94	8.10	3.534	.008		(1)-(2)	0.098
Forearm flexion (30s)	Practice	254	20.40	6.359	.000	< 0.001	Hydrogymnastics(1)	48	20.33	5.684	.018	< 0.001	(1)-(3)	< 0.001
	Non-practice	94	11.45	5.398	.009		Gymnastics (2)	206	20.42	6.519	.000		(2)-(3)	< 0.001
							Non-practice (3)	94	11.45	5.398	.009		(1)-(2)	1
Seat and reach(cm)	Practice	254	4.31	11.087	.000	< 0.001	Hydrogymnastics(1)	48	.56	11.054	.002	< 0.001	(1)-(3)	< 0.001
	Non-practice	94	-8.80	12.956	.002		Gymnastics (2)	206	5.18	10.938	.000		(2)-(3)	< 0.001
							Non-practice (3)	94	-8.80	12.956	.002		(1)-(2)	0.1
Sit down, walk 2.44 m and sit again	Practice	254	6.5562	2.02338	.000	< 0.001	Hydrogymnastics(1)	48	8.3427	1.97471	.003	< 0.001	(1)-(3)	< 0.001
	Non-practice	94	18.6148	14.28547	.000		Gymnastics (2)	206	6.1400	1.79924	.000		(2)-(3)	< 0.001
							Non-practice (3)	94	18.6148	14.28547	.000		(1)-(2)	0.004
Reach behind back	Practice	254	-11.26	10.671	.016	< 0.001	Hydrogymnastics(1)	48	-14.37	11.094	.177	< 0.001	(1)-(3)	< 0.001
	Non-practice	94	-29.61	14.039	.200		Gymnastics (2)	206	-10.53	10.466	.013		(2)-(3)	< 0.001
							Non-practice (3)	94	-29.61	14.039	.200		(1)-(2)	0.188
Walk 6 min. (m)	Practice	254	543.05	151.448	.000	< 0.001	Hydrogymnastics(1)	48	482.85	62.053	.082	< 0.001	(1)-(3)	< 0.001
	Non-practice	94	237.44	176.564	.008		Gymnastics (2)	206	557.07	162.413	.000		(2)-(3)	< 0.001
							Non-practice (3)	94	237.44	176.564	.008		(1)-(2)	0.007

## DISCUSSION

With aging there is a decline in physical fitness, strength, endurance, agility and flexibility (Milanović et al., 2013). Being sufficiently active is important to maintain or improve functional physical fitness on elderly (Santos et al., 2012). These results have important implications for public health, since the decline in physical fitness has negative consequences on health (Rejeski et al., 2011). Our results are in accordance with the results of Ofei-Dodoo et al. (2016), where PA is associated with greater aerobic endurance, strength and agility / dynamic balance capacity. Similar results were also found in Santos et al. (2012), where PA was shown to be associated with better physical fitness, Nawrocka et al. (2017). Even in advanced ages, the human body is sensitive to stimuli, so maintain a PA programme becomes important in order to improve physical fitness.

## CONCLUSIONS

The elderly group with supervised PA practice presented better results in all components of functional physical fitness, statistically acceptable differences, regardless the type of PA practiced. By the comparison between the two PA activities, there are differences in agility and cardiorespiratory fitness, with gymnastics better performances obtained by the gymnastic practitioners.

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