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**CHARACTERIZATION OF THE PHYSICAL ACTIVITY LEVEL
IN PORTUGUESE ELDERLY**

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Abstract

The positive impact of physical activity on the elderly is so relevant that WHO (2016) encourages it and sets out global recommendations for its practice. This paper describes a non-experimental study with 202 participants, with a mean age of 81.76 ± 7.47 years, of which 70.3% are female. 20.7% live with a spouse and 5.2% with their sons/daughters. The vast majority of participants (92.1%) has different levels of support from their care givers. Subjective measures were collected through the Baecke Habitual Physical Activity Questionnaire (HPAQ) (2009), and analyzed using the SPSS-24 with the confidence level of 95%. The results show that only 1.5% of the participants engaged in Sports Score (SS) while 44% participated in Leisure Time Score (LTS) activities with mean values of $1,045 \pm 1.05$. The Domestic Activities Score (DAS) involves the largest number of subjects (83.7%) with a mean of $.817 \pm .69$, and the HPAQ average is 1.3 ± 1.31 . Inferential analysis shows that advanced age, non-cohabitation with spouse and institutional support are relevant in the type of Physical Activities engaged in by the elderly. Gender and Body Mass Index (BMI) were not significant. It is, therefore, important to sensitize the providers of elderly care to develop strategies likely to promote, monitor, and follow up such Physical Activities.

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1. Introduction

These days, Physical Activity is so relevant that WHO (2016) highlights it as a determinant factor in the fight against several pathologies (diabetes mellitus, arterial hypertension and even some forms of cancer) as well as the pandemic which obesity has become.

Moreover, of the 8 factors identified by WHO as those with the greatest impact on mortality and morbidity, physical inactivity is indicated as the third in terms of importance, right after tobacco and alcohol intake. The concern expressed by WHO has led to the creation of the Global Recommendations for Physical Activity (WHO, 2010), segmented into three age groups, including one for people over 65. In addition, physical activity has beneficial effects at several levels, namely cardiorespiratory and muscular, weight and body composition, physical autonomy and functionality (Lee et al., 2013).

In Europe, and particularly in Portugal, levels of physical activity are not only low but also widespread. In fact, 80% of the population does not comply with the levels of Physical Activity recommended by the WHO (Direção Geral de Saúde, 2017). According to the Direção Geral de Saúde (2017), inasmuch as the Portuguese population is concerned, among young people over 15 years of age, 42.6% are considered to be sedentary, 30.3% insufficiently active and only 27.1% fit within the active level.

The improvement in living conditions has led to an increase in life expectancy and a greater expressiveness of the elderly in the general population (20.9%), which will tend to worsen by 2050, with Portugal expected to be the country with the third oldest population in the world (WHO, 2015). If this increase is associated with greater inactivity among the elderly (Rosa, 2015) and lower autonomy (Guimarães, Rocha, Gomes, Cader, & Dantas, 2008), as well as overweight (34.8%) and obesity (22.3% - in the elderly the percentage rises to 39.2%) among the Portuguese (Lopes et al., 2017), one understands the decisive importance of the practice of physical activity as a promoter of the autonomy and quality of life of the elderly in the physical, psychological and social dimensions, especially with regard to the relationship between physical activity and brain functioning, namely in the prevention and improvement of dementia diseases, in particular Parkinson's disease (Direção Geral de Saúde, 2017)

In the Portuguese context, and recently, several authors have dealt with this problem. Monteiro, Dias, Corte-Real and Fonseca (2014) using a sample of 76 subjects indicated that 43% were sedentary; this fact clearly having to do with their residential context (rural or urban) and showed lower levels of subjective awareness and of happiness. Using a sample of 215 elderly, practitioners and non-practitioners of physical activity, Teixeira, Nunes, Ribeiro, Arbinaga, and Vasconcelos-Raposo (2016) concluded that the practitioners present high levels of self-esteem and low levels of depression. They also concluded that age and frequency of physical activity practice, as well as the sociodemographic characteristics of the subjects are important variables.

In relation to the elderly, Henriques (2013) proposes a tripartite taxonomy of habitual physical activity levels: Sedentary, Active and Athletes, respectively, with the following cut-off values: SS <2, 2-4 and > 4 points; LTS <4, 4-8 and > 8 points, DAS <1, 1-2 and > 2; HPAQ <9, 9-16, > 16 points. The author's sample of elderly from day centres indicates average values of 0.0 ± 0.0 in SS; LTS values ranging from 0.0-14.8, with a mean score of 3.13 ± 2.7 ; with respect to DAS, the average scores were 1.15 ± 0.52 (scores between 0.4-2.3). Using the taxonomy mentioned above, we found that within DAS 35.4% were

Sedentary, 62.2% Active and 2.4% were Athletes. In terms of the LTS, 67.1% were Sedentary, 30.5% Active and 2.4% Athletes. When considering the usual Physical Activity, we found that 97.6% are Sedentary, 1.2% Active and 2% Athletes.

Ueno (2014), based on a sample of 100 elderly women, randomly selected from the city of Rio Claro, showed mean values of 1.9 ± 0.5 for SS (scores between 0.1-2.9), 1.4 ± 2.9 for LTS (score between 0.0-15) and for DAS 10.6 ± 7.0 (scores between 0,41-32,9). The mean values in the HPAQ are 13.9 ± 8.2 (score between 2.01 - 46.54). Contrary to our study and Henriques' (2013), the most relevant values results are associated to the LTS and not the DAS.

Martins, Fernandes and Mendes (2017) have found mean values of 9 ± 5.17 for SS, 12.16 ± 99.14 for LTS, 2.04 ± 2.58 for DAS and an average value of 12.16 for the HPAQ.

2. Problem Statement

It is now agreed that the practice of physical activity results in physical, physiological, psychological and social benefits for its practitioners, regardless of their personal characteristics. Among the elderly, physical activity is even more relevant, allowing them to lessen the functional limitations arising from aging, which deprive them of the possibility of carrying out day to day activities. However, the conditions in which the elderly live are very different and, in this sense, this study intends to contribute to the knowledge of the physical activity levels of elderly people who, depending on their care needs, are cared for by different elderly assistance institutions, namely Long - Term institutions/homes for the elderly, Home Assistance, Day Centres while there are also those who receive or need no kind of support.

3. Research Questions

In Portugal, several studies have focused on the levels of physical activity among the elderly, but they do not address the problem of the practice of physical activity in the different contexts in which the elderly live their daily life. Thus, the following questions will be addressed:

3.1 What are the usual physical activity practice levels among the elderly Portuguese population?

3.2 What is the impact of contextual variables and socio-demographic factors in terms of physical activity practice levels?

4. Purpose of the Study

The aim of this ex-post fact study is to characterize/contrast the habitual physical activity levels in the elderly, as a function of sociodemographic (age, gender), anthropometric (Body Mass Index - BMI) and contextual variables (Long-Stay institutions, Domiciliary Support, Day Centres and without any support).

5. Research Methods

5.1. Participants

For the development of this non-experimental and ex-post facto study, we relied upon a convenience sample of 202 subjects, aged 65-97, with mean values of 81.76 ± 7.47 . The majority of participants are female (70.3%) versus 29.7% male, from the central region of Portugal.

Only 20.7% of the subjects live with their spouses and 5.2% participants report living with their children. In terms of schooling, 26.2% have not received any formal school education (illiterate), 51% and 17.8% completed, respectively the 1st and 2nd / 3rd cycle of Basic or Secondary Education while only 4% held a bachelor's degree. Of the total sample, 92.1% received support from other people at different levels. Among these, 65.8% live in a Long-Term institution/home for the elderly, 6.9% attend the Day Centre and 16.3% receive home assistance. Community participants (without any support, which is, presumably not necessary) represent 10.9% of the sample. The decision to request the support of third parties came from the elderly themselves in 51.1% of the cases, and from others in the remaining 48.9%. The BMI taxonomy proposed by the WHO (2000) shows that 0.6% are underweight, 38.9% have average weight, 38.9% are pre-obese, while 16.7% are obese.

As a criteria for inclusion in the study, we considered the absence of dementia, as well as the absence of high (or bedridden) walking disability, and, with concern to age, the sample consisted of subjects of at least 65 years of age and above.

5.2. Measures

Habitual Physical Activity Questionnaire (in the Portuguese version of the Baecke Questionnaire modified for Elderly, validated by Azevedo (2009) and a questionnaire for sociodemographic variables. The Baeck Questionnaire includes questions on household activities, sports, and leisure time activities, about a time period of one year. The Baeck Questionnaire scores results classify people as high, moderate, or low in daily physical activity and in the three dimensions (household, sports and leisure activities).

5.3. Procedure

The collection of data conformed to the ethical and deontological principles set forth in the Helsinki Declaration (World Medical Association, 2015) and was accomplished through the assisted completion of the data collection instruments.

5.4. Data Analysis

The data analysis was conducted using SPSS 25, with $p < .05$, and the aspects related to normality and homoscedasticity parameters were evaluated for deciding the inferential analyses that would be performed.

6. Findings

The results indicate that from among the 202 participants involved only 2 (1%) admit they practice a sport of some kind (SS), whereas with concern to Leisure activities (LTS) the number rises to 89 (44%). Nevertheless, domestic activities are the ones that involve the largest number of subjects (83.6%) and, simultaneously, those that contribute in a more relevant way to the score of the Habitual Physical Activity.

The mean values obtained in the subscales are: SS (.816 ± .528), LTS (1.04 ± 1.05), DAS (.817 ± .691) and HPAQ (1.30 ± 1.31). In other words, in addition to a small number of subjects fitting within the first two subscales, they reveal, at the same time, very low values of Physical Activity. Taking into account Henriques' taxonomy (2013), percentages of 100 Sedentary elderly in SS and 99 in LTS were identified. In DAS, 65.1% are Sedentary, 26% Active and 8.9% Athletes.

Gender analysis does not show significant differences in any of the subscales ($p > .05$). These results differ from those that indicate significantly higher values for the female gender in DAS (Martins, Fernandes & Mendes, 2017; Monteiro, 2013; Orbolato et al., 2018). Notthoff, Reisch, and Gerstorf (2017, p. 451) developed a systematic review on the impact of individual characteristics on the practice of Physical Activity and concluded that "across all PA types, men were more active than women in 27 instances and less active in 7; no association between gender and PA level was found in 19 instances". Nevertheless, the peculiar nature of the sample cannot be ignored, as a large majority of participants are living in institutions designed for elderly caretaking.

As regards age, segmented according to the mean, and corroborating work that indicates higher levels of physical activity at lower ages (Souza, 2015), the results are favourable to the younger participants, both in DAS (1.07 ± .79 vs .6 ± .49) $p < .001$, or in global scale (1.63 ± 1.3 vs. 1.04 ± 1.27) $p < .001$. The correlational analysis between these variables shows this same tendency, although more markedly in DAS ($\rho = -.336$, $p = .000$) than in global scale ($\rho = -.206$, $p = .006$). Regarding the LTS, a positive correlation was found, although without statistical significance.

The results obtained in the subscales and in the global scale (Table 1) indicate that for those who live with a spouse there is an increase in terms of DAS ($U = 1092$, $p < .05$) and global activity ($U = 1027$, $p < .05$). In contrast, Notthoff, Reisch, and Gerstorf (2017) point out that most of the studies do not show, with one exception, the existence of significant differences depending on whether or not the subjects that made up the sample lived with a wife or husband. The plausible explanation is that the person living with his partner is still autonomous enough to carry out the activities of domestic life, in contrast to those who live alone and are in elderly care institutions. In fact, from among the 30 subjects who report living with their spouse, only 5 live in a Long-Term elderly institution in contrast to the remaining 25 who, although with some support, still live in their family home and still fulfil domestic activities.

Taking into account the type of support that the subjects receive, it is observed that in the LTS and DAS subscales and global scale the values tend to increase as the support (and eventually functional dependence) is lower, culminating with the higher values on the part of community participants. Nevertheless, in LTS activities the differences are not significant ($p > .05$) among the different groups; by contrast in DAS and HPAQ the differences are highly significant in both ($p < .001$), and only the

comparison between subjects attending the day care centre and those receiving home assistance does not show significant differences.

Table 01. Results of the Anova in the LTS and DAS subscales and in the HPAQ according to the type of support granted to the elderly]

Scale/subscale	Kind of support	M	Sd		SS	MS	F	p
LTS	Long-Term institutions for the elderly	.8464	.86803					
	Day Centres	.9144	.81928					
	Home Assistance	1.3989	1.74454	BG	5.793	1.931		
	Community	1.3890	.96821	WG	91.723	1.07	1.789	.155
	Total	1.0451	1.05268	Total	97.516			
DAS	Long-Term institutions for the elderly	.3930	.30822					
	Day Centres	1.0857	.50514	BG	51.306	17.102		
	Home assistance	1.2758	.57556	WG	29.081	.176	97.033	.000
	Community	1.8909	.52364	Total	80.387			
	Total	.8178	.69173					
HPAQ	Long-Term institutions for the elderly	.7255	.81791					
	Day Centres	1.8041	1.04274	BG	123.767	41.256		
	Home assistance	1.7844	1.42839	WG	182.351	1.048	39.366	.000
	Community	3.1648	1.20864	Total	306.117			
	Total	1.3081	1.31510					

7. Conclusion

The results obtained allow us to conclude that physical activity practice levels among the elderly in the central region of Portugal, measured through the self-report of the Habitual Physical Activity Questionnaire, are quite low. In fact, the mean values of the subscales are: SS (.816 ± .528), LTS (1.04 ± 1.05), DAS (.817 ± .691) and Habitual Physical Activity (1.30 ± 1.31). Among the sociodemographic variables, the one that stood out most was age, with an advantage in terms of LTS, DAS and HPAQ favourable to the younger subjects within the sample. Also in DAS, living together with a spouse is shown to favour the practice of physical activity. Also the type of support seems to be of great importance since it presents significant differences in the LTS, DAS and HPAQ scales among the four levels of this variable, showing the tendency for decrease of physical activity practice among the elderly in this order: that live within the community, then the ones with home assistance, and finally, those who attend the day care centre or live in a Long – term elderly care home/ institution.

It is therefore important to make the elderly, and, in particular, government and social authorities and management staff in charge of different elderly care institutions aware of the importance of the practice of physical activity, to improve elderly people's autonomy and well-being.

Last but not least, inactivity time (sitting or lying down) should also be studied, since its harmful effect to health cannot be neglected at any age and particularly among the elderly. Moreover, the inactivity of the elderly leads to a greater loss of their autonomy with negative consequences for themselves and for the community in which they live. Also, there is an economic benefit for the

government and taxpayers, because healthier people need less assistance (treatment, caregivers, etc.) which would thus, translate into greater savings of taxpayers' contributions.

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