

# COMPARATIVE STUDY OF FUNCTIONAL INDEPENDENCE AND QUALITY OF LIFE AMONG ACTIVE AND SEDENTARY ELDERLY



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## ABSTRACT

**Introduction:** Physical inactivity has been implicated as a risk factor for development of chronic diseases in the elderly. Thus, physical activity has been advocated as a way of preventing these diseases; however, few studies have correlated sedentarism and practice of physical functional independence (FI) and quality of life (QOL) in this population. **Objective:** To compare the FI and QOL between active and sedentary elderly. **Methods:** An analytical, comparative study of cross-temporal character was conducted with a sample of 30 patients of both sexes, divided into two groups. Group 1 was composed of 15 active elderly and group 2 of 15 sedentary elderly individuals. For evaluation of the FI, the measurement of functional independence was used, while for the QOL, the Nottingham Health Profile questionnaire, already adapted and validated in Brazil, was used. Since the data were nonparametric, the Mann-Whitney test was used for comparison between groups and the analysis applied the SPSS software version 14.0 with significance level of  $\alpha = 0.05$ . **Results:** mean age of group 1 was  $68.06 \pm 7.82$  while in group 2 it was  $71.20 \pm 10.26$ , presenting no significant difference  $p = 0.12$ . When FI and QOL were compared, group 1 presented better results than group 2,  $p = 0.001$  and  $p = 0.016$ , respectively. **Conclusion:** This study highlights the importance of physical activity practice for maintenance of good FI and QOL in the elderly.

**Keywords:** physical activity, aging, quality of life.

## INTRODUCTION

Life expectancy of the elderly has significantly increased in the last years, which provided remarkable growth of the geriatric population, which is about to reach approximately 15 million people which represents a total of 9% of the Brazilian population<sup>1</sup>. As chronological age increases, people become less active and their functional Independence decreases; it can be defined as the capacity to perform the dislocation activities, self-care activities, suitable sleep and participation in occupational and recreational activities in an independent way<sup>2</sup>. The alterations derived from aging associated to decrease of functional capacity and inactivity may lead to an impact in the quality of life (QOL) of these elderly subjects. It is understood by quality of life "one's perception on their position in life, within the culture context and values system in which he/she lives, and in relation to their goals, expectations and social standards"<sup>3</sup>.

According to the Brazilian Society of Sports Medicine (SBME) and the Brazilian Society of Geriatrics and Gerontology (SBGG)<sup>4</sup>, regular physical exercise improves quality of life and life expectancy of the elderly, improving him/her many aspects, especially in prevention of incapacities. Moderate and regular practice of physical activity contributes to preserve the organic structures and physical and mental wellness<sup>5</sup>. Thus, it is verified that physical exercise practice can prevent and inhibit a series of factors which affect the life of

the elderly, among which: prophylactic action of diseases and improvement of risk factors for development of many pathologies<sup>6,7</sup>.

In a study carried out by Mota (2006)<sup>7</sup>, which had the aim to compare the level of quality of life among participants and non-participants of physical activity programs, the sample was composed of 88 subjects divided in two groups: experimental group (EG,  $n = 46$ ; men = 34.8%), who were engaged in a physical activity program investigating the impact of regular exercise in the physical aptitude and in the functional capacity and health in individuals of both sexes older than 65 years of age; and the control group (CG,  $n = 42$ ; men = 47%), who were not engaged in any regular physical activity program. In this study statistically significant differences were found between both groups. The EG presented higher performance in all domains of the questionnaire used when compared with the CG. The positive influence physical activity has in crucial factors for the Independence of the elderly was observed.

Another study, carried out by Fernandes et al.<sup>8</sup>, had as aim to investigate the levels of physical activity of adults in advanced age and its influence on the satisfaction with life, self-esteem and personal growth domains. The sample was composed of 168 individuals of both sexes, aged between 60 and 95 years. The results evidenced that about 40% of the sample was physically inactive, while only 31.5% of the elderly was active. The results of the comparative and correlational analyses demonstrated that the active elderly had higher levels of satisfaction with life, self-esteem and personal growth.

The correlation between aging and physical exercises has been object of countless current investigations. Although there are many studies presenting the benefits of physical activity in the prevention of risk factors associated with chronic-degenerative diseases in elderly subjects, there is still a lack of research which presents the impact of sedentarism and practice of physical activities in FI and QOL of this population. The study of the QOL of active and sedentary elderly is necessary to outline the association between physical activity and QOL<sup>9</sup>. Thus, the aim of the present study was to compare the FI and QOL of active and sedentary elderly.

## MATERIAL AND METHODS

This research is characterized as a quantitative, analytical, comparative and transversal study. The inclusion criterion is elderly older than 60 years of age of both sexes, who walk independently. The elderly who have practiced physical activity for at least three months were considered active. The elderly who answered the questionnaire went to a health club in the city of Lauro de Freitas, and the others were from the adjacent community or close to the health club, to decrease the possibility of selection bias. The research adopted the ethical principles presented in the Resolution of the National Health Board (#196/96), which was approved from the ethics committee of an institution of higher education under the law (CEP 01.450-2009). The participants of the sample were informed about their information privacy and that their results would be exposed in scientific investigations. All participants signed the Free and Clarified Consent Form.

The data of the study were obtained through the application of two questionnaires: Nottingham health profile (NHP)<sup>10</sup> and measurement of functional Independence (MFI)<sup>11</sup>, added with collected sociodemographic data (age, sex, education, hypertension (HAS), ethnic group and in case they practiced physical activity, which was the modality).

The NHP quantified the QOL of the interviewed subjects according to pre-set and validated parameters. This instrument was previously adapted and validated for the Brazilian older population<sup>10</sup> and uses a language of easy interpretation, provides a simple measure of physical, social and emotional health of the individual, being considered clinically valid to distinguish patients with different levels of dysfunction and to detect important alterations in the health status of the patient during the time. The Nottingham health profile is a scale which contains 38 items, grouped in six sections: physical skill, energetic level, pain, emotional reactions, quality of sleep and social isolation. The lower the punctuation (one point for each response "yes"), the better the individual's perception about his/her quality of life, being the 0 score an indicator of perfect health<sup>10</sup>.

The measurement of functional independence (MFI) was used for the evaluation of the functional capacity, a scale which has already been adapted and validated for the older population in Brazil<sup>11</sup>. The measurement of functional independence was developed in the 1980's by an American task force, organized by the American Academy of Physical Medicine and Rehabilitation, and its goal was to create an instrument able to measure the level of need of care from other people the patient with disability demands for performance of motor and cognitive tasks. The MFI was validated by many investigations and basically involved the evaluation of

psychometric properties and the comparison with other instruments of functional evaluation. The motor field is composed of 13 items and subdivided in four categories: personal care, sphincter control, mobility/transference, locomotion. The cognitive is composed of five items and in two categories: communication and social cognition. One score is given to each item, which can be: 1 – total assistance; 2 – high assistance; 3 – moderate assistance; 4 – minimum assistance; 5 – supervision; 6 – modified independence; 7 – total independence. The maximum score is 126 points, which indicates total Independence and the minimum is 18 points, an indication of total dependence<sup>11</sup>.

Descriptive statistics was performed for analysis of demographic and clinical data; the data of continuous variables were assessed as measures of central tendency and dispersion and expressed as means and standard deviation; the data of dichotomy or category variables were assessed with frequency measures and expressed as percentage. Data normality was analyzed with the Kolmogorov-Smirnov test. As the data were non-parametrically distributed, the Mann-Whitney test was used for comparison of the variables of the study of functional independence and quality of life between groups. The analysis was performed with the SPSS software (Statistical Package for the Social Sciences) for Windows (version 14.0) and a significance level of  $\alpha = 0.05$  was established.

## RESULTS

30 elderly, with minimum age of 60 years were part of the sample, where 15 were active and 15 were sedentary. In the group of active elderly, age mean in years was of  $68.06 \pm 7.82$  and in the sedentary elderly group, of  $71.20 \pm 10.26$ , with this difference not being statistically significant ( $p = 0.46$ ). 46.6% of the 15 individuals of the active elderly group were male and 53.4% were female; while in the sedentary elderly group, 20% were male, while 80% were female, and this difference was not statistically significant ( $p = 0.12$ ). Regarding hypertension, out of the 15 active elderly, 33% were hypertensive and 67% did not present hypertension; and out of the 15 sedentary elderly, 67% were hypertensive and 33% did not present hypertension.

Table 1 shows the means and standard deviations of the variables in the study comparing the active elderly group and sedentary elderly group. Concerning the measure of functional Independence in the motor tasks (MMFI), in the group of active elderly the mean was of  $89.93 \pm 2.25$  and in the sedentary group the mean was of  $84.10 \pm 11.74$ , where this difference was statistically significant ( $p = 0.01$ ); regarding the measure of functional independence in the cognitive tasks (MCFI), in the group of active elderly the mean was of  $33.66 \pm 2.74$  and in the group of sedentary ones the mean was of  $31.93 \pm 5.03$ , where this difference was not statistically significant ( $p = 0.90$ ); concerning the measure of functional independence, the total result (MTFI) in the group of active elderly, the mean was of  $123.60 \pm 3.29$  and in the group of sedentary the mean was of  $111.53 \pm 17.14$ , where there was not statistically significant difference ( $p = 0.05$ ); concerning the NHP, in the group of active elderly the mean was of  $5.00 \pm 6.50$  and in the group of sedentary the mean was of  $10.33 \pm 6.75$ , where this difference was statistically significant ( $p = 0.01$ ).

**Table 1.** Means and standard deviations of the variables of the study in comparison with the group of active elderly and the group of sedentary elderly subjects.

Group	Age	MMFI	MCFI	MTFI	NHP
Active elderly	Mean ± SD 68,06 ± 7,82	89,93 ± 2,25	33,66 ± 2,74	123,60 ± 3,29	5,00 ± 6,50
Sedentary elderly	Mean ± SD 71,20 ± 10,26	78,26 ± 14,41	31,93 ± 5,03	111,53 ± 17,14	10,33 ± 6,75
P value	0,46	0,001	0,90	0,05	0,016

MMFI = measurement of motor functional independence; MCFI = measurement of cognitive domain functional independence; MTFI = measurement of total score functional independence; NHP = Nottingham health profile; SD = standard deviation.

## DISCUSSION

The results found in this research show that physical activity is associated with good FI of the individual. A positive influence on crucial factors was observed for the independence of elderly individuals. Higher values were obtained concerning the FI in the group of active elderly in different domains such as personal care, sphincter control and locomotion. Concerning cognitive performance, there was no difference between groups.

The results obtained concerning the MMFI indicate that FI of the active elderly was higher, which corroborates other studies which prove that the more active a person is, the fewer physical limitations he/she has<sup>12,13</sup>. The elderly who have the habit of physical activity practice have disacceleration in the occurring alterations, either in his/her structure or functionality of the apparatus and systems which compose his/her body structure<sup>3,14</sup>. The practice of physical activity beneficially act in the alterations derived from the aging process, aiding in the maintenance of the functions<sup>12</sup>, this can contribute to keep and/or improve strength, flexibility, coordination and balance, essential elements of physical fitness for maintenance of functional capacity in the elderly<sup>15</sup>. Besides helping functional capacity, physical exercise promotes improvement in physical fitness<sup>12</sup>.

In a systematic review conducted by Spirduso and Cronin<sup>16</sup>, which determined if a physical activity program influences on the wellness and delay of dependence in the elderly, it was identified from the studies included in the review, that a physical activity program of long term is related to delay of installation of incapacity and higher independence of the elderly in the performance of activities of daily living.

In the present study there was no significance difference in the result of the MCFI between groups. Further studies evidenced specific improvement in memory and capacity to take decisions with exercise or regular physical activity. These authors base their conclusion on the analysis of hormones and body enzymes which would be present in circulation both in the performance of physical activities and in memory use and decision making<sup>17,18</sup>. Moreover, physical exercise leads the individual to greater social participation, resulting in good level of biopsychophysical wellness, factors which contribute to improve their quality of life<sup>18</sup>. Santos and Andrade<sup>15</sup>, in their study, state that elderly with cognitive deficit with attention and memory alteration present five times more chances to suffer a fall, since the posture control and maintenance of balance suffer influence of the cognitive function.

Concerning the QOL, the data obtained through the NHP domains showed us that the group of active elderly presents better QOL than the sedentary elderly group. The higher the difficulty of the elderly in performing activities of daily living (ADL), the worse his/her perception in important QOL domains<sup>3,14</sup>.

The result obtained in this study concerning the QOL assessed by the NHP showed that, in all evaluated domains, the active elderly presented better performance when compared with the sedentary ones, especially in the social interaction domain (SI). Concerning this domain, the results are supported by Rodrigues et al. when they mention elderly who regularly practice a given physical activity present fewer cases of depression, especially when it is performed in a group of individuals with similar ages, in which there is great socialization and new interests and friendships occur<sup>19</sup>.

When developing activities, the elderly compose a new friendship cycle and demonstrate significant improvement in their social networking. Thus, the studies performed by Oliveira<sup>20</sup> and Santarém<sup>21</sup> show that exercise brings a feeling of wellness and emotional balance. Physical wellness is relevant to deal with almost all stressing events, especially the ones which demand great mobilization<sup>22,23</sup>. According to Carvalho and Papaleo<sup>24</sup>, no disease has a more devastating effect on the elderly than loneliness and inactivity. Thus, physical practices are important in the QOL of the elderly, besides boosting their self-esteem, self-confidence and social interaction. These factors may cause better perception of the individuals concerning their health. In the current contemporary society, QOL, satisfaction or psychological wellness are attributed to the called successful aging, and it depends on the balance between one's limitations and potentials, which let them deal with inevitable losses from aging<sup>5,25</sup>.

It is important to highlight that the majority of the active elderly (67%) did not present hypertension. According to Ciolac and Guimarães in <sup>26</sup> and Pollock et al. In <sup>27</sup>, regular practice of physical exercise has demonstrated to prevent increase of blood pressure associated with age, even in individuals with increased risk to develop it<sup>26,27</sup>. Since hypertensive individuals have been traditionally discouraged to perform exercise due to the concern about early cause a cerebrovascular or cardiac event. However, studies which investigated the long-term effect of training with resistance exercise on the rest blood pressure did not report deleterious effects, suggesting that hypertensive individuals should not avoid its practice, since it provides great benefits to quality of life, especially of elderly individuals<sup>27</sup>.

The results of this research let us observe the importance of physical activity practice for the elderly population, where physical exercise should be increasingly practiced in order to avoid deleterious functional consequences of aging, improving their independence and quality of life. Exercise may contribute to healthier aging, with maintenance of autonomy and conservation of functional capacity, being able to delay the onset of complications and contributing to the psychological and social wellness. This study presents some limitations. Firstly, the generalization of results is limited because the sample is small and the temporal characteristic of the study is transversal. This fact reduces the possibility to determine the cause and effect. Secondly, at the moment of

the questionnaires application, a significant number of elderly demonstrated a lot of impatience to answer the questions, which may have somehow influenced on the result. It is worth highlighting that the investigation performed presented as advantage its low cost, due to the centralization of the performed activities. Further studies with larger samples and of longitudinal character are

suggested to report the impact of exercise in the quality of life of sedentary elderly.

Regular practice of physical activity was an important factor for the elderly population, and can bring significant benefits in the functional independence and better perception of these about their QOL.

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