

Physical Activity Level Analyses and Chronic-Degenerative Disease Risks In Docents At Public Schools In The City of Horizonte, Ceara

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Abstract:- It is of common belief that physical activity can restore damages caused to people's health due to the stressful everyday work routine. The energy expenditure on physical activities is directly related to the frequency, duration and intensity of human movements developed on many tasks. Thus, the main objective of this paper was to evaluate this energy consumption in public school teachers from the city of Horizonte, Ceara, discussing about degenerative chronic disease risks. 30 teachers, 9 men and 21 women within the age of 25 to 59 years old, were evaluated. Their Body Mass Index (BMI) was calculated in order to classify them as normal, overweight and obese. As an instrument, the long version of the International Physical Activity Questionnaire (IPAQ) was used, once it is more recommended to national prevalence studies due to the possibility of international comparison. This instrument contains several questions related to frequency (days per week) and duration (time per day) spent on moderate and vigorous physical activities and walking. The questionnaire also captures the energy expenditure in METs, in order to classify the selected individuals according to intensity: "sedentary" (< 1,5 METs), "low" (1,5 < METs < 3,0), "moderate" (3,9 < METs < 5,9) and "high" (≥ 6,0 METs). These analyses were performed using the Epi Info™ program, which used descriptive statistics. The results showed that the teachers present a good level of physical activity with 46,67% classified as high, 40% as moderate and 13,13% as low. The individuals also presented significant degree of overweight and obesity, 43% and 34% respectively, and only 23% within the acceptable weight range. Therefore, it could be concluded that, among the modifiable risk factors, the physical activity and the body mass control play important roles when it comes to chronic-degenerative disease prevention.

Keywords:- Physical activity, Teachers, Chronic Diseases, BMI, IPAQ.

I. INTRODUCTION

The World Health Organization (WHO) defines health not only as the absence of diseases, but also as a situation of a perfect physical, mental and social welfare. This definition, though it was advanced for the time when it was thought of, is, nowadays, unreal, outdated and unilateral. In the present, health has been defined not only as the absence of diseases. Health is identified as a multiplicity of human behavioral aspects concerning a state of complete physical, mental and social welfare.

Physical activity can be understood as any body movement performed by skeletal muscle contractions which result in significant increase of calorie requirements regarding resting energy expenditure [6], being generally described in four dimensions: (I) frequency (number of physical activity events during certain period of time); (II) duration (time of participation in a single session of physical activity); (III) intensity (physiological effort associated to the participation in a type of physical activity); and (IV) the different types of activity are fundamental to the energy expenditure evaluation [6].

One of the most respected studies concerning physical activity and health was carried out by reference [9], who investigated physical activity and other lifestyle characteristics of 16,936 Harvard students, within the age range from 35 to 74 years old, and their relation to mortality rate indices based on any causes and its association to life expectancy. Besides study [9], [7] also confirms the former results when it concludes that the prevalence of high energy expenditure, *i.e.*, high levels of physical activities, along with healthy habits, contribute to lower obesity indices and to higher life expectancy numbers, if compared to sedentary individuals.

The four chronic diseases with the most worldwide impact (circulatory diseases, diabetes, cancer and chronic respiratory diseases) present four risk factors in common (tobacco smoking, sedentarism, unhealthy nourishment and alcoholism). In terms of attributable deaths, the biggest globally known risk factors are: high blood pressure (responsible for 13% of the deaths in the world), tobacco smoking (9%), high levels of blood sugar (6%), sedentarism (6%) and overweight and obesity (5%) [12].

Nowadays, physical activity recommendations are that, in order to provide more benefits to people's health, a program must include activities to enhance cardiorespiratory resistance, flexibility and neuromotor exercises, as well as everyday chores activities. Therefore, the American College of Sports Medicine (ACSM) recommends at least 150 minutes per week of moderate intensity activities (3 – 5.9 METs) or 75 minutes per week of vigorous activities (6 – 8.7 METs) or an equivalent combination of both moderate and vigorous [4].

Brazilian people's physical activity patterns have recently started being studied. The phone inquiry VIGITEL (Vigilance of Risk Factors and Protection of Chronic Diseases by Phone Inquiry) evaluates physical activities in four domains: in people's free time or leisure activities, during people's displacement to work or school, on work activities and house chores, being the most passive of suffering intervention. Practicing at least thirty minutes of house chores for a minimum of five days a week, among adults from all the capitals in Brazil, increased from 14.8%, in 2006, to 14.9% in 2010. Men, youngsters and higher schooled people are more active. In 2010, 14.2% of the adults were considered inactive and, in 28.2% related to watch the TV for three or more hours a day [1].

There is a trend towards considering that only people who do physical exercises are active and the others who do not are sedentary, but this forgets to include people whose jobs are very intense, such as mailmen, mechanics, masons, who already have a significant caloric waste on their everyday, so they cannot be considered sedentary. Therefore, the same context is applicable to others whose, even though they might not have a regular and planned physical activity routine, job routines require a high and persistent energy expenditure, for instance, those who never take the elevator to go up and down the building, always using the staircase, no matter which floor they are going to or coming from [5].

Teachers form a professional category which is susceptible to great psychosocial risks. Being a docent can be a highly stressful activity, raising, negative repercussion to physical and mental health and to professional performance (REIS *et al.*, 2006). The occurrence of chronic diseases related to the lifestyle has also brought up significant relevance among docents. Some data suggest that, in some professions like teachers, whose work demand is elevated, the activity control is limited, it lacks social support and the main risks to their health are related to degenerative diseases. This fact can be evidenced because of the high prevalence of inadequate habits of nourishment, sedentarism and alcoholism observed in docents [3].

However, it is believed that, among modifiable risk factors (diet, smoking, hypercholesterolemia, high blood pressure, high fasting glycemia levels, overweight, stress and sedentarism), practicing physical activities and controlling body weight have important roles concerning chronic-degenerative diseases prevention. In this way, the present study aims to analyze physical activity levels in public school docents in the city of Horizonte, Ceara, discussing about chronic-degenerative disease risks.

II. METHODOLOGY

This study consists of a descriptive, quantitative and transversal investigation, during which it was necessary to analyze data that helped to describe the physical activity level related to people's health.

The population who participated in this study is formed by docents from public schools in the city of Horizonte, Ceara. The sample composition is 30 docents: 21 women and 9 men. As an inclusion criterion, only teachers who are currently working were part of this sample, so those who were away from work because of any specific problem were excluded, as well as those who did not answer the IPAQ-L questionnaire and those who did not accept the TCLE.

The data collection was performed from July to December, 2015. The indirect instrument used to gather information was the IPAQ (long version), which permits the estimation of the weekly time wasted in walking and in moderate and vigorous physical activities, involving the before mentioned everyday domains, such as: work, transportation, house chores and leisure activities. This also estimates how long one was sitting down during a day of the week and a day on the weekend.

Its long version consists of 27 questions, concerning activities performed for at least 10 minutes non-stop, in a trivial week or during the previous week. For each one of the IPAQ domains, the individual described the frequency (days per week) of the activities he/she has done in different intensities (walking, moderate and vigorous) and its duration per day. The questions are supposed to draw a different scenario and to put the docents in several everyday situations they are used to doing on their lives.

Based on the suggested METs by [2] to each one of the activities, a daily energy expenditure estimation for all the domains was performed, and the total weekly energy expenditure was calculated by summing up those values.

In this way, in order to obtain the daily average energy expenditure, the total weekly value was divided by seven. Regarding the score categorization, the total of the minutes spent on walking and on moderate activities summed with the double of the minutes spent in vigorous activities was calculated. In the sufficiently active group, there were only individuals with scores ≥ 150 minutes/week in every domain; whereas those with

inferior scores were directed to the insufficiently active group, based on the physical activity recommendations [4].

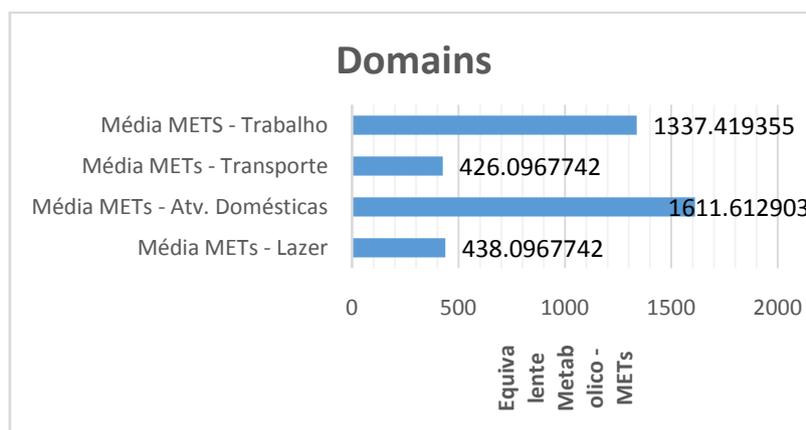
Body weight was also analyzed by using an anthropometric scale, with 0,1 kg intervals. All of the teachers were barefoot and dressed with casual everyday working clothes. Their height, on the other hand, was measured with a physical stadiometer, with 0,1 cm intervals. The body mass index (BMI) was calculated using the following equation: weight / (height²). This value was used to classify the teachers according to the proposed percentages.

In order to analyze the physical activity level data, a consensus carried out between the CELAFISCS and the Center for Disease Control (CDC) in Atlanta, in 2002, was used, considering frequency and duration criteria. The descriptive statistics consisted of simple frequency value calculations, percentage and average of the continuous physical activity level variables, physical activity intensity and simple and percentage domains and frequency. The accepted statistical significance was of $p < 0,05$ for each specific case. The data were analyzed in the Epi Info™ environment for Windows version 7.1.5, and the results were presented in graphics for better visualization.

III. RESULTS AND DISCUSSIONS

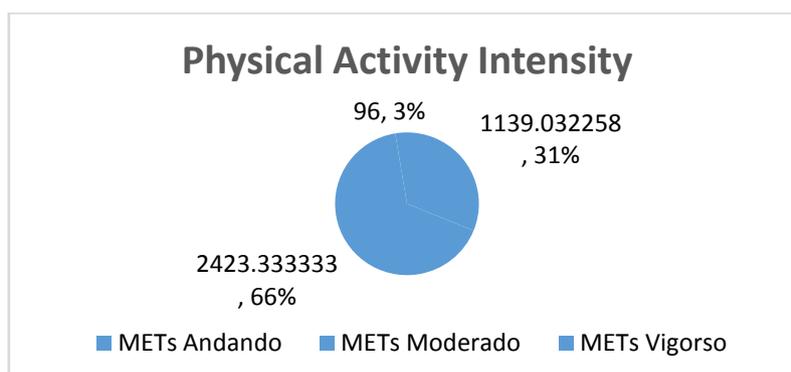
30 docents participated in this study, 21 women and 9 men, from 20 to 59 years old, although most of them were within the range of 32 to 47 years old, *i.e.*, 59.89% of the sample.

The physical activity presents a narrow relationship regarding energy expenditure and health protection factor. Therefore, in this study (Graph 1), the prevalence of total energy expenditure in METs was detected for the house chores domain, followed by work, leisure and transport activities.



Graph 1: Public school teachers' energy expenditure results in four domains: house chores, transport, work and leisure activities. Horizonte, Ceara/2015.

Concerning the entire sample and for both genders, the physical activity intensity in METs presented prevalence in moderate activities, with 66%; followed by walking, with 31%, and vigorous efforts, with 3%. It is believed that this value is related to the fact that most of the sample is formed by women, who are usually used to doing house chores every day, which might have influenced the total intensity of the sample. Nowadays, many people agree that these categories must not only be carefully translated, but also tested in specific cultural contexts.

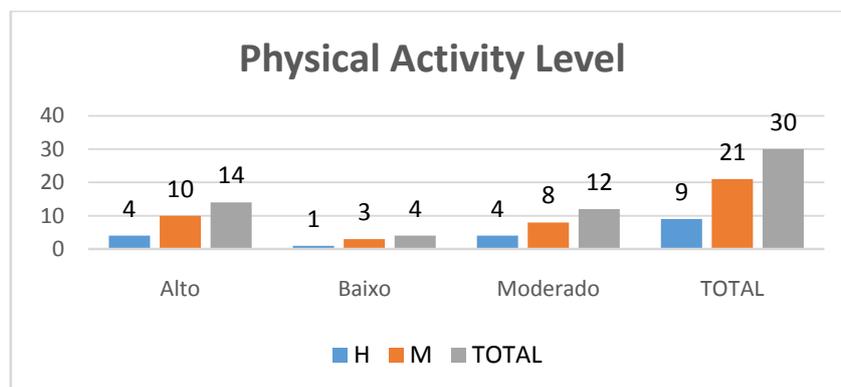


Graph 2: Public school teachers' results of physical activity intensity, in metabolic equivalent of task, classified in walking, moderate and vigorous. Horizonte, Ceara/2015.

Regarding the physical activity level, the results showed that teachers have satisfactory physical activity levels related to both masculine and feminine genders, in which there was a higher prevalence of high levels for women. 10 women and 4 men of the total sample were classified as high level, which consisted in 46.67% of the sample; 8 women and 4 men were classified as moderate level, which consisted in 40% of the sample.

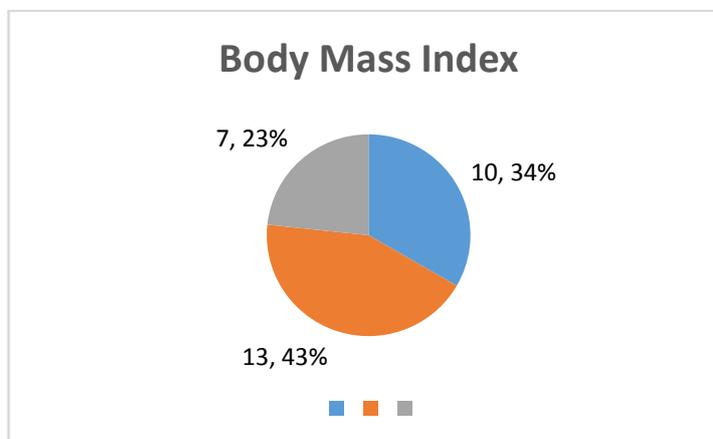
Only 13.13% of the individuals were classified as low physical activity level, *i.e.*, 1 man and 3 women. It is important to mention that none of the participants was classified as sedentary based on the IPAQ-L, which considers sedentary only those individuals who do not practice any physical activity for at least 10 minutes non-stop per week. This goal would already be achieved during teachers' everyday work routine, according to [11], who reported that people's own work place can require certain significant caloric expenditure in dislocation, transportation and body expression, as well as in mental activities, such as speaking and communicating. It is estimated that 15 to 40% of the total energy expenditure, plus 50% of the energy expenditure variation among populations, are associated with physical activities, impacting inactive individuals' houses, who do not fulfill the frequency recommendations: a minimum of 5 days per week and/or the duration of at least 150 minutes per week.

Thus, considering that the trainability of the physical capacities is similar in men and women [8] and that individuals with elevated physical activity levels show high neuromotor profile and functional capability [10] due to the predominance of women in the sample, a slight predominance of physical activities can be found when compared to men, though it is not considered a significant difference.



Graph 3: Public school teachers' physical activity level results related to both masculine and feminine genders. Horizonte, Ceara/2015.

Presently, the BMI is a variable calculated in a simple way, though it is very important in order to detect if the person presents lack of nourishment, if the person is within the normality weight patterns, overweight, obese or morbidly obese. Graph 4 shows a higher BMI incidence between 25 and 29,9, which signifies that 43% of the sample is overweight. The obese population represents 23% of the sample, so only 34% is considered within the acceptable patterns.



Graph 4: Public school teachers' body mass index results. Horizonte, Ceara/2015.

Considering the evidences related in this study, as well as its methodological limitations, such as: a) the transversal characteristics of the data; b) a small sample; c) only a few schools were interviewed, the following conclusions were drawn.

When it comes to public school docents' physical activity levels in the city of Horizonte, Ceara, we can conclude that most of the participants was found in a good physical activity level, and only a few people presented a below average level.

The most representative physical activity category was “moderate” under the house chores domain. It was also observed that the physical activity level under the leisure activities domain presented a low result, so we can conclude that interventions regarding more physical activity incentives are necessary for not only teachers, but also for the entire population, because it would increase the physical activity levels and decrease the inactive time, reducing sedentarism.

The daily physical activity practice for at least 150 minutes per week should be the general recommendation concerning public interventions.

Analyzing the BMI of the sample, the most predominant category was overweight, followed by obesity, which makes us double the attention, because even with high physical activity levels, the sample presents also elevated health risks, so a body weight control thorough a better and healthy nourishment becomes an ally to physical activities in preventing chronic diseases.

Therefore, physical activity is considered as a positive factor regarding chronic-degenerative disease combat, due to its strong relation with these diseases predisposing factors.

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