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Evaluation of BMI Related to Flexibility and Strength of not Trained for Women

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Abstract
The aim of this study was to examine the BMI comparing the results with a test of strength and flexibility. Established itself as a *methodological proposal* a case study, participated 39 female women (n:39), aged between 18 and 50 years (average de 32.25±8.33), students of Pedagogy College of the City of Santo André - SP, Brazil, not physically active. According to the *results*, the group presents it with normal BMI index value of 24.60 (±5.69), combined with flexibility values of 26.6 cm (±8.18) and strength of manual pressure on 31.18 Kg/f (±5.04). *We conclude* that the reference by BMI, the group showed good results of manual pressure, and were classified as excellent in physical flexibility and there was no correlation between these physical abilities in not trained women.

Keywords: Body Mass Index; Force; Flexibility.

Introduction

Are currently the evaluation of physical capacity levels related to body condition of individuals has been a constant premised on the detection of cardiovascular disease, and in search of a better quality of life and active living standards.

The Body Mass Index (BMI) is an indicator used to suggest the ratio of height (meters) and weight (kg.)[1], and thus enabling us to classify individuals at levels ranging from below the levels of obesity weight.

From the age of 20-increased BMI is greater than 10%, associating it with increasing age, low social level, for women, low level of health perception, and physical inactivity among others[2].

Therefore, it could be said a healthy nourishment is to have better quality of life and ensure control and maintenance of body weight. This and other hypotheses are always questioned and lead the subject to take an active way of life and a balanced diet can complement this framework.

So we must take human in general, to practice physical activity in search of quality of life, and the area of Physical Education presents the possibility of assessment relating aspects relating to physical activity and the population's quality of life, and thus identify the level of physical activity and anthropometric offers us a profile of individuals regarding their situation current front of possible coronary heart disease[3].

Several terms have been used in articles to define people with physical activity levels below current recommendations, such as physical inactivity, low physical activity, physical inactivity, insufficient physical activity[4].

In general, that regular physical activity contributes to health, aiding in maintaining an independent lifestyle, increased functional capacity and improved quality of life[5].

To reverse the inactivity frame, we suggest the implementation of municipal policies, state and national prevention and combating

sedentary lifestyles, emphasizing the dissemination of its benefits and creating devices and public spaces for physical activity in the community[6].

Some risk factors for physical inactivity have been consistently identified as the female and the lowest socioeconomic level[7].

Thus, the aim of this study was to evaluate the BMI, and physical capabilities of flexibility and manual pressing force sedentary women, and correlate the variables with each other.

Method

As methodological approach we adopted the Case Study[8] that we measure the BMI of 39 women aged between 18 and 50 years (n: 39, mean age of 32.25 ±8.33), students of a pedagogy college course of Santo André City – São Paulo, Brazil.

The criteria for choosing the subjects of the research was that the participants should be female and did not practice physical activity for at least six months. To measure BMI use a digital scale and a tape measure attached to the wall and the flexibility test use of the Sit and Reach test protocol, and the strength test of the upper limbs manual pressure protocol[9]. All care research ethics were taken by signing the consent form and clear, making it the subject was voluntary, and had the free will to leave at any time of the study.

Statistical treatment was applied calculating the mean, standard deviation, and average difference between the Mann-Whitney, test "*U",* was used. Correlations were made following the *Spearman* correlation "*s*" $p \leq 0.05$), using SPSS for Windows, version 18.0.

Results and Discussion

The results showed that the study group is at your ideal weight, so despite not practicing physical activity are within the proposed value of the BMI (see Table 01).

Table 01: Average and Standard Deviation Referring to Female Total Data.

Sex	*Age* (Years)	*Weight* (Kg.)	*Height* (Meters)	*BMI* (Kg./m²)	*Flexibility* (cm.)	*Strength* (Kg/f.)
Average	32.25	64.82	1.62	24.6	26.6	31.18
Standard d.	*±8,33*	*±14,24*	*±0,06*	*±5,69*	*±8,18*	*±5,04*

Considering the BMI, we found that this group is less likely to pose risks of diseases related to the cardiovascular context, but still would take other exams as well as raising a family history to assert this hypothesis, and as one limitation of this study we should adopt other data collection sources to assess the percentage of fat

Comparing the results with a study done with thirty women aged between 30 and 60 physically active of the city of Votuporanga, São Paulo, where most of the women studied showed body weight „above the ideal" or „obesity" and with great risk of developing cardiovascular disease[10], the subjects involved in this study are within the weight standards, though not without developing possible health problems such as hypertension and diabetes by the lack of physical activity.

Women's BMI increased until the age of 50 years due to an increase in fat mass, once the lean body mass remained practically unchanged[11].

With the participation of 120 women with a mean age of 41.1 years, BMI was much like our study with a value of 24.70, and concluded that BMI and Waist Hip relationship each other can be considered risk factors for cardiovascular diseases[12].

The flexibility, regarding the data we observe that women are classified as excellent, compared to the results proposed by McArdle et al.[13], that for women aged less than or equal to 35 years of excellent reference is results above 17.9 cm and women ages 36

to 49, excellent are those with higher or equal to 17.4 centimeters, thus correlating the results of BMI and comparing the levels of flexibility can measure the women in this case study show good results, since classification is in excellent.

Establishing the correlation between strength and flexibility, we find that the result was negative, weak and not significant (s= -0.130, p=0.20), i.e. when the physical capacity increases the flexibility decreases the strength, but the hypothesis was refuted (see Figure 01).

Correlating BMI and strength the result was the same (s= -0.258, p=0.113), i.e., weak, negative and not significant, and correlating BMI with The flexibility the result was weak, positive and not significant (s=0.057, p=0.729) so no significant correlation was seen between the data.

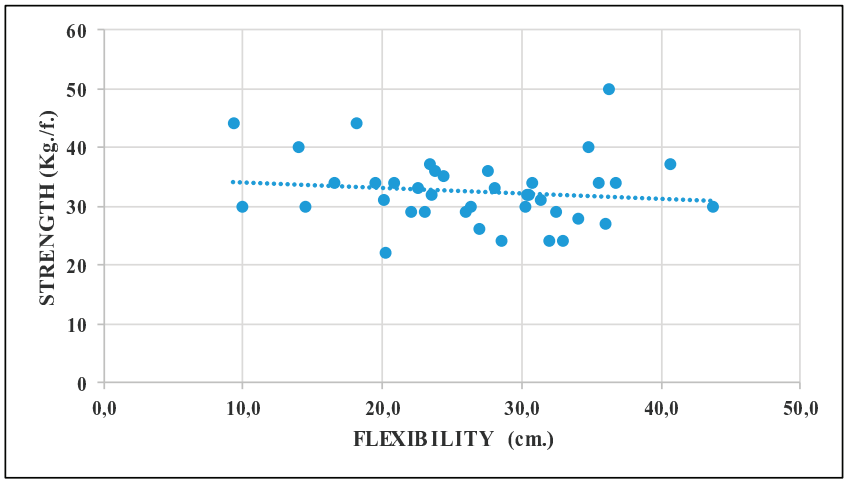

Figure 01: Correlation between Strength and Flexibility

Table 02: Handgrip comparison righties and lefties

Strength	*Right-handed*	*Left-handed*	*Total*	*Teste "U"*
N	35	04	39	
Handgrip (average)	32.86 (Kg/f.)	29.50 (Kg/f.)	31.18 (Kg/f.)	*0.296*
Standard Deviation	*±5,89*	*±4,12*	*±5,04*	

Significance p≤ 0,05

Separating the group in normal weight and overweight according to BMI, there was no significant difference in handgrip strength (p=0.340); the handgrip strength of normal weight was 32.24Kg/f., and the overweight was exactly 33.00Kg/f. In the same way, the comparing the flexibility of overweight women and the ideal weight, the difference was not significant (p=0.416); the flexibility average of overweight was 26.23cm, and the normal weight obtained 26.81cm. A moderate correlation found in this study was between height and handgrip strength (s=0.522, p=0.09, see Figure 02); between flexibility and height the correlation is weak and not significant (s=0.03, p=0.558).

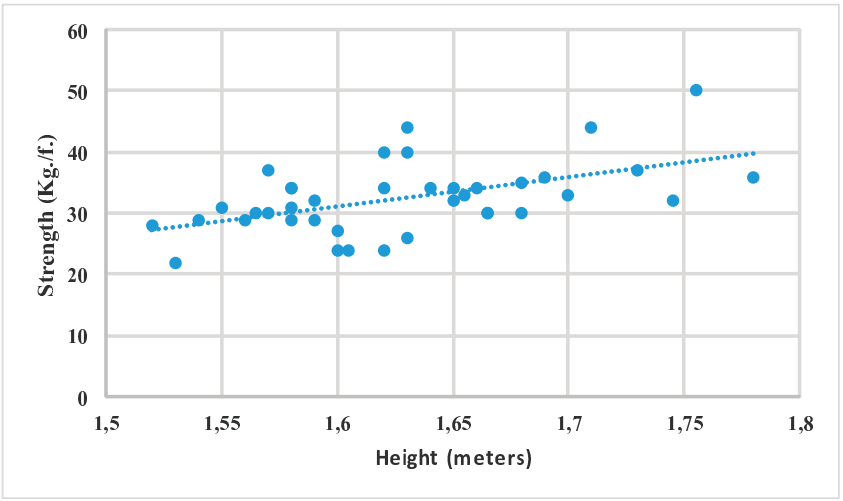

Figure 02: Correlation between Strength and Height

Within the context of handgrip measures we can see that the right dominant member of women are not stronger than the left dominant member, the result shown by Man Whitney test (p=0.296). It would be interesting to get individuals to have an active life and related to this issue Kraemer and Hakkinen[14] emphasize that most of the gains during the early weeks of strength training in untrained men and women is because of the adaptations in the neural pathways enabling and / or inhibitors acting at various levels of the nervous system.

Conclusion

It can be argued that the case study is presented in a group of normal weight, represented with BMI in the ideal, although observing the standard deviation for more we see possible disturbances in BMI and weight.

On the physical capacity of the flexibility, the group presents itself in the excellent result in different age groups, and in the power, capacity also presented results competing at good levels, noting that the study group is sedentary, classified as non-physical activity practitioner in however no correlation between data was observed in physical capacities strength, flexibility and BMI. Concluding that regardless of BMI, women have the same force.

Therefore, it would be recommended that it go to change their lifestyle habits including in the dairy some sort of physical activity and seek an improved quality of life and well-being of women in this group.

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