195 - THE INFLUENCE OF A REGULAR GYMNASTICS PROGRAM IN ELDERLY WOMEN

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Introduction

The ageing process possesses characteristics that are not related to a person's life background, where they encompass the acquired habits. These factors show that the same physical performance does not exist between an active and a sedentary person, because physical inactivity demonstrates that an increasing number of elderly people are living below the limits of physical capability, and that any illness can make them dependant. On the contrary to what was expected, sedentary style in the late years can induce to more wear of the body when compared to a physically active life style (MEIRELLES, 1997).

For BONACHELA (1998), each phase of life has its enchantments, realities, necessities and desires. Thus, maturity also has to have continuity and integration between the past and the present, by aiming at the future.

During the process of ageing there are alterations in the several systems, which vary from individual to individual, and may depend on factors such as life habits and genetic inheritance. However, when thinking about a measure to lessen the ageing process (gain of quality in the natural ageing process), it becomes evident, since genetics is determined through inheritance, that one's life's habit is the variable that may be controlled (EXERCÍCIOS, 2005).

In Brazil people 60 years of age and older are considered elderly, while in more developed countries this group is over 65 (MAZO, LOPES E BENEDETTI, 2004).

For MAZO, LOPES and BENEDETTI (2001), the daily life's activities in society are not providing enough physical work in order to stimulate the body, and thus there is a necessity to regularly do physical activities so as to maintain a functional capability.

The human being requires movement where the results with a minimum of exercise are already evident, mainly when it comes to the elderly. It is possible that the biggest benefit for the health and physical aptitude is the degree of independence that the physical activity can provide to the elderly, and thus reducing the falls and fractures, and also lifting their self-esteem for social contact and pleasure of living.

There are many reasons the elderly might have to do physical activity. The most important one is to find the personal interest and become aware of the need of physical exercise, and that it helps with everyday task performance. Thus, they will be motivated to do physical activity periodically. The motivation will insure that the activity will not be abandoned (DANTAS, 1999).

Gymnastics is a program that presents a great demand of elderly due to its advantages regarding the improvement of health, socializing, integration, and physical and mental well-being. When planning about gymnastics, the interests and the needs of the elderly should be taken into consideration. Ephasizes the preventive aspect, by prioritizing the combat against the illnesses originating from sedentary life styles which, invariably, compromise the anatomical and functional integrity of the human being. It stimulates the body with its bioenergetic and biomechanical components and its relations with the repercussions that come from the exercises and everyday activities (MARQUEZ, 2003).

Before initiating a gymnastics program which satisfies the individual needs, the participating elderly should undergo medical exams in order to evaluate his/her conditions and also undergo an evaluation related to the muscular strength, flexibility, vital capability and anthropometric measures. All of this is important as safety measures and it is from these measures that the exercise is recommended, be it for preventing or improving an existing condition.

It is practically a consensus among the professionals in the area of healthcare that physical activity is a determinant factor to obtain success in the process of ageing. It is believed that physical activity acts as a form of health prevention and rehabilitation for the elderly, thus strengthening the physical aptitude, improving independence and autonomy, and maintaining the execution of daily life activities for more time (KURA, 2004).

The importance of this study is associated to the rapid growth of the elderly who seek the improvement of well being, by investing in the quality of life which is associated to the relations with their families, their disposition and their physical, psychological, social and cognitive well-being. And it is possible that it is within the physical activity that these elderly people find the pleasure to be with happy people who also seek to prevent or delay certain health problems.

Gymnastics is also one of the possibilities to develop and work the awareness of the body by exercising the elderly, but what will the influence be of a 16-week program which contains physical exercise for the elderly, followed by a 12-week recess from those exercises?

Methodology

This research characterizes itself as being quasi-experimental, because the data were collected before and after the experiment without a control group. It is a convenience sample, composed of a group of 12 voluntary elderly women, residing in the city of Marechal Cândido Rondon, with ages varying from 60 to 69 years old. In order to obtain the anthropometric measures a Filizola scale was used for the body mass and an anthropometer for the height. In order to check the Arterial Pressure, a Nawa brand aneroid style sphygmomanometer and a stethoscope were used. In order to do the lumbar flexibility test [the modified sitting and reaching Wells and Dilon test] and a specific box (flexometer) were used.

In order to calculate the IMC (body mass index), a method divulged by NAHAS (2003), also referred to as the Quetelet Index, was used.

The body mass, stature, arterial pressure measures and the flexibility test were all collected in the *Laboratório de Ciências do Movimento Humano* (LACIMH) at UNIOESTE - Marechal Cândido Rondon Campus.

The research was developed with participating subjects from the *Projeto de Extensão da* UNIOESTE named *Projeto Coração de Ouro*. The ladies registered for the project by filling out a clarifying term that authorized some tests.

Before starting the gymnastics program, the participants had to answer an anamnesis form that was later attached to a data collection form. And it was through this anamnesis form that we formulated the classes, by trying to fulfill the needs of each lady.

The classes took place three times a week lasting one hour each, during sixteen weeks. They began August 9th, 2004 and ended December 10th, 2004. For the localized gymnastics the muscular resistance was worked while the aerobics aimed to improve the oxygen consumption (although this was not the objective of the research). During the classes the following

exercises were introduced: flexibility, balance and motor coordination.

In every class we tried to differentiate not only the exercises, as planned, but also the way to do them, by playing German, country and other kinds of songs, and taking walks outside. There were also gatherings with other groups in order to interact. The materials used during the classes were diversified, but always according to the age level of 60 to 69 years.

The recess started in the second week of December, 2004, and ended in the first week of March, 2005, lasting a total of twelve weeks.

The data from the test were collected in August, before the beginning of the classes. Then in December 2004 and March 2005 these data were collected at the same time for the three phases (evening period - 04:00 pm).

The data collection for the research was accomplished after a 5-minute rest, as follows: arterial pressure, weight, height and flexibility.

Descriptive statistics was utilized through the calculation of the average and the standard deviation, and the inferential statistics by using the "t" test of the student, once the comparisons of test 1 and test 2, and test2 and test 3 were accomplished. SPSS 8.0 for Windows, Excel for Windows XP were used and the minimum significance level was established as $p<0.05$.

Results presentation and discussion

The average height for tests 1, 2 and 3 were the same - 158 cm - with a standard deviation of 7.29 cm.

As the years go by, one's height decreases due to the development of cifosis, the decrease of the bone density and also the vertebrae compression and the narrowing of the vertebral discs. The height reduction process is more visible in women due to osteoporosis after the menopause (MATSUDO, 2000). Through the results it could be observed the decrease in body mass, where the average for test 1 was 71.15 Kg, with a standard deviation of 13.44 Kb. For test 2 the average was 69.33 Kb and 13.44 Kg. Between tests 1 and 2 the difference was statistically significant with $p<0.05$. For test 3, taken after a 12-week interruption the average was 70.69 Kg with 13.67 Kg of average deviation.

Through these data we can understand that the body composition tends to pass through several changes with age. It is common for people to gain weight continually until their 5th or 6th decade, and that is probably due to the lack of physical activity and/or the decrease of the basal metabolic index (IMB - in Portuguese), or the energetic expenditure while resting. Even a small decrease in the caloric wear can lead to a continuous weight gain as the years go by.

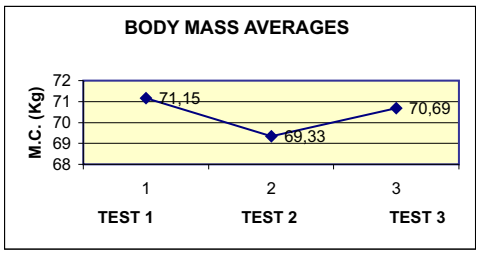


Figure 1: Values related to body mass.

According to box 1, the *body max index*-IMC average for test 1 was 28.6 Kg/m^2 with 4.99 Kg/m^2 of standard deviation. For test 2 there was a reduction and the average was 27.9 km^2 with 4.88 kg/m^2, and after the recess the value increased in relation to the last test - test 3 - with an average of 28.4 Kg/m^2 and 4.94 Kg/m^2 as a standard deviation.

In relation to the collected data about body mass and height, we noticed that, according to the WHO (World Health Organization) table, 1999 (addendum VI), these ladies were overweight, because they had values of between 25 and 29.9 of IMC.

With the alterations in body mass and height, MATSUDO (2000) mentions that the IMC also tends to modify, because the body mass tends to increase due to the several illnesses that appear with age. And, if one practices regular systematic physical activity, the body mass tends do diminish, and that was what happened in the 16-week exercise period for these ladies.

After the 12 (twelve) weeks of interruption, we can observe that the IMC value increased, due to the body mass increase, as it was mentioned previously through the body mass.

The IMC data in figure 2 follows for better visualization.

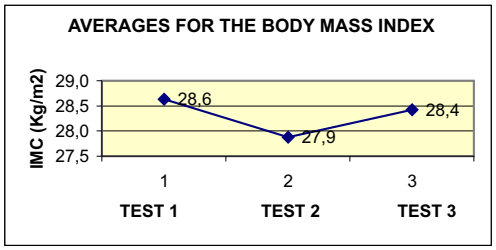


Figure 2: Values related to the body mass index.

The average *systolic arterial pressure*, according to box 1 for test 1 is 124 mmHg and 16.8 mmHg of standard deviation. For test 2 it was 120 mmHg, 20.9 mmHg, and for test 3 the average was 123 mmHg with a standard deviation of 22.6.

Many epidemiologic studies show a strong association between overweight and arterial pressure, more specifically hypertension, and when mass reduction occurs, the arterial pressure also decreases (GUEDES and GUEDES, 1998).

With the results from test 1 and test 2, we can observe that systematic physical activities had a positive influence for the SAP during these 16 weeks. That happens because during physical activity the systolic arterial pressure tends to increase, and because the body needs a greater blood flow. But after the exercise, the pressure starts to decrease and stabilize. With training, the average arterial pressure during the heart's systolic and diastolic cycles suffers a reduction of approximately 14%. If the exercise is done regularly, the SAP value stabilizes, however with a smaller value as compared to the activity program. The diastolic arterial pressure tends to stay the same or diminish, though (KATCH and MCARDLE, 1996).

After the interruption of the exercises, when test 3 took place, we could observe that the SAP increased, and for that to have occurred it was probably due to the sedentary life and the increase in the body mass.

From 25 to 85 years of age, the systolic volume during rest falls about 30% and the myocardium is submitted to a hypertrophy. Older people who do low work load acquire a systolic volume similar to those of younger people, but the increase of

load results in a lower increase of the systolic volume (PATRICK, 1993).

In order to better visualize and understand it, the value for the systolic and diastolic arterial pressures is being presented in the following figures.

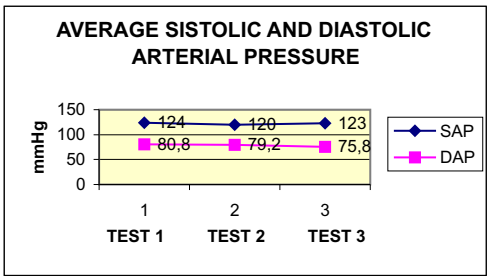


Figure 3: Values related to the SAP and DAP

According to the data from box 1, we can observe that there was a satisfactory increase in the values for *flexibility*, during the period of physical activity. The averages for the tests were: test 1, 25cm with a 5.8 cm of standard deviation, and after 16 (sixteen) weeks going to test 2 with an average of 29.3 cm and 6.5 cm of average deviation. After a 12-week interruption from these activities they still obtained an average of 26.7 cm with a standard deviation of 7.18 cm.

According to LEITE (1990), the elderly presented low indices of flexibility and muscular elasticity. This locomotive function decline reduces the motor aptitude for the elderly, which presents a bigger incidence of fractures, osteoporosis and arthrosis.

By observing the averages for tests 1 and 2, we noticed a positive increase, because they could reach the expected values for that age group.

The flexibility work is essential for the ageing process, because with the passing of the years the connective tissues (cartilage, ligaments and tendons) become less flexible and more rigid, which reduces the flexibility of the joints. Adequate exercises that move the joints in all of their extension may increase the flexibility in men and women of all ages from 20% to 50% (KATCH and MCARDLE, 1996).

After a 12-week interruption of the program, we observed a flexibility value decrease. With that we can infer that the lack of stretching exercise causes a shortening of the muscular fibers, and thus limits the movements and abilities. Figure 4 shows a better visualization of the flexibility average.

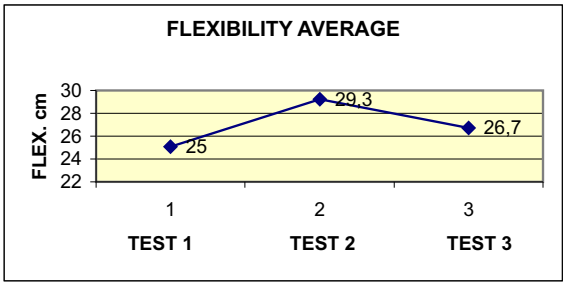


Figure 4: Values related to flexibility.

Final Considerations

After the conclusion of the research, we could observe that the ladies started to give more importance to physical activities related to health, because before they were considered sedentary and by starting with the regular gymnastics program they became more active physically, as well as mentally.

Gymnastics is one of the possibilities to develop physical activities and work the body awareness through physical exercise with the elderly. Joint movements, muscular strengthening, balance and coordination are important points that must be worked.

Collectively working physical activities with the elderly gives them a communication and an exchange of experiences within a cheerful and participative environment, according to the possibilities of the group.

The physical activities, even when initiated in older ages, help with the daily activities. Old age does not arrive suddenly. It is the sequence of the vital process of every human being, and thus, one should exercise daily.

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THE INFLUENCE OF A REGULAR GYMNASTICS PROGRAM IN ELDERLY WOMEN

Abstract: The objective of this study was to analyze the influence of a 16-week gymnastics program over some physical aptitude and health indicators, as well as analyze the behavior of these indicators after a 12-week interruption of this program. The target subjects were made up of 12 volunteer ladies, aged 60 to 69 years old, who resided in the city of Marechal Cândido Rondon. The program lasted 4 months and had 3 weekly classes of 1 hour each. There were 3 tests during this period. The analyzed variables were the body mass index - (IMC, in Portuguese), systolic and diastolic artery pressure and flexibility. The collected data were analyzed by the SPSS for Windows® version 8.0 program. A descriptive statistic was utilized by means of an average calculation and of standard deviation. For the inferential statistics a variance analysis was used. After the analyses of the tests, we noticed that these ladies reduced the values for the IMC. The Arterial Pressure presented a drop in values during the program and it increased again after the interruption of the program. As far as the flexibility is concerned, the increase was also satisfactory because they reached the advisable level of 27 to 34 cm. Based on the results, we concluded that the proposed physical exercises had a positive influence over the Arterial Pressure, IMC and flexibility because the gymnastics favored the performance of the aforementioned items. We also noticed that these ladies started to develop awareness about the importance that physical activity presents in relation to physical aptitude and health.

L'INFLUENCE D'UN PROGRAMME REGULIER DE GYMNASTIQUE SUR LES FEMMES âGEES

Résumé : L'objectif de cette étude a été d'analyser l'influence d'un programme de 16 semaines de gymnastique sur quelques indicateurs d'aptitude physique et de santé, mais aussi d'analyser la variation de ces indicateurs après une interruption de 12 semaines de ce programme. La population ciblée comptait 12 femmes volontaires âgées de 60 à 69 ans, domiciliées à Marechal Cândido Rondon. Le programme s'est développé sur une durée de 4 mois, avec 3 leçons hebdomadaires d'une heure chacune. 3 tests ont été réalisés. Les variables analysées étaient l'indice de masse corporelle (IMC), la pression artérielle systolique et diastolique et la flexibilité. Les données collectées ont été analysées par le programme SPSS pour Windows® - version 8.0. La statistique descriptive a été utilisée pour le calcul de la moyenne et de l'écart-type et la statistique inférentielle pour l'analyse de la variance. Après l'analyse des tests, l'on s'est aperçu que ces femmes âgées réduisaient la valeur de leur IMC. La pression artérielle présentait également une chute de valeur durant le programme et un retour à l'augmentation après son interruption. Concernant la flexibilité, l'augmentation de valeur a été également satisfaisante puisque les femmes réussirent à atteindre la valeur recommandée qui varie de 27 à 34 cm. Sur la base des résultats obtenus, on a conclu que les exercices physiques proposés avaient une influence positive sur la pression artérielle, l'indice de masse corporelle et la flexibilité, puisque la gymnastique a favorisé les performances de chaque indicateur proposé. On a également noté que ces femmes âgées avaient commencé à prendre conscience de l'importance que l'activité physique présentait en relation à l'aptitude physique et à la santé.

Mots-clefs : femmes âgées, gymnastique, aptitude physique.

LA INFLUENCIA DE UM PROGRAMA REGULAR DE GIMNACIA EM MUJERES ADULTAS

Resumen: El objetivo de este estudio fue analizar la influencia de un programa de 16 semanas de gimnasia sobre algunos indicadores de adaptación física y de salud, tal como analizar el comportamiento de estos indicadores, luego de culminar 12 semanas de este programa. El público analizado contó con 12 señoras, voluntarias, con edades entre 60 a 60 años, oriundos de Marechal Cándido Rondon. El programa se desarrolló durante 4 meses, con 3 clases por semana, de 1 hora cada una. Se realizaron 3 testes. Las variables analizadas fueron el índice de masa corporal - IMC, la presión arterial sistólica y diastólica y de flexibilidad. Los datos recolectados fueron analizados por el programa SPSS del Windows - versión 8.0. Se utilizó la estadística descriptiva a través del cálculo de media y del desvío padrón y de la estadística diferencial cuando de recurre al análisis de variación. Luego del análisis de los testes, se percibió que para el IMC, esas señoras reducían sus valores. La PA presentó una caída en los valores durante el programa, volviendo a aumentar luego de la interrupción. En la flexibilidad, el aumento también fue satisfactorio, ya que se consiguió alcanzar lo recomendable que varía de 27 a 34 cm. Basándose en los resultados obtenidos, se concluye que los ejercicios físicos propuestos, tuvieron un influencia positiva para la PA, IMC y flexibilidad, ya que la gimnasia favoreció el desempeño de los ítem propuestos. Se notó también que esas señoras pasaron a tener conciencia de la importancia que la actividad física tiene en relación a la aptitud física y de salud.

Palabras destacadas: mujeres adultas, gimnasia, aptitud física

A INFLUÊNCIA DE UM PROGRAMA REGULAR DE GINÁSTICA EM MULHERES IDOSAS

Resumo: O objetivo desse estudo foi analisar a influência de um programa de 16 semanas de ginástica sobre alguns indicadores da aptidão física e da saúde, bem como analisar o comportamento destes indicadores, após a interrupção de 12 semanas deste programa. O público alvo contou com 12 senhoras, voluntárias, idade de 60 a 69 anos, residentes em Marechal Cândido Rondon. O programa desenvolveu-se durante 4 meses, com 3 aulas semanais, duração de 1 hora/aula. Foram realizados 3 testes. As variáveis analisadas foram o índice de massa corporal - IMC, a pressão arterial sistólica e diastólica e a flexibilidade. Os dados coletados foram analisados pelo programa SPSS for Windows® - versão 8.0. Utilizou-se a estatística descritiva através do cálculo da média e do desvio padrão e da estatística inferencial quando se recorreu à analise de variância. Após a análise dos testes, percebeu-se que para o IMC, essas senhoras reduziram os seus valores. A PA apresentou uma queda nos valores, durante o programa, e voltando a aumentar após a interrupção. E na flexibilidade, o aumento também foi satisfatório, pois conseguiram atingir o recomendável que varia de 27 a 34cm. Com base nos resultados obtidos, conclui-se que os exercícios físicos propostos tiveram uma influencia positiva para a PA, IMC e flexibilidade, pois a ginástica favoreceu para o desempenho dos itens propostos. Notou-se também que essas senhoras passaram a ter consciência da importância que a atividade física apresenta em relação a aptidão física e saúde.

Palavras-chaves: mulheres idosas, ginástica, aptidão física.