23 - THE INFLUENCE OF OXYGEN CLASSES ON THE LEVELS OF FLEXIBILITY AND BALANCE OF OLDER ADULTS

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INTRODUCTION

The aging population is increasing in many countries in a short period of time. In 2025, there will be approximately 30 million people older people in Brazil, which is equivalent to 15% of the population, due to the decrease of fertility rates and mortality rates recorded in recent decades (Silva, 2005).

The aging process is associated to morphological and physiological changes, that lead to functional impairment, such as in flexibility, coordination, muscular strength, mobility, and aerobic and anaerobic endurance, balance and walking abilities, which results in difficulty in performing daily activities. (Spirduso, 2005)

Flexibility and balance are two physical abilities significantly deteriorated with aging and low levels of these variables are associated with increased risk of falling in older adults. Therefore, the current recommendation of physical activity for older people, has suggested the inclusion of exercises that develop balance and flexibility (ACSM / AHA, 2009).

Some companies which work with training programs in the area of gymnastics, such as FIT-PRO and BODY SYSTEMS, have developed gym classes devoted to the development of physical skills, like flexibility and balance. *Oxygen* classes were developed FIT-PRO and its main objective is the improvement of flexibility and balance, facilitating movements of everyday life, reducing the risk of falling and improving the quality of life (FIT-PRO, 2009). Although Oxygen has been developed for this purpose, there are no studies on the effects of this activity in the elderly. Thus, the purpose of this study was to investigate the influence of Oxygen on flexibility and balance in older people.

METHODOLOGY

This research is characterized as pre-trial. The sample consisted of 10 sedentary older adults of both genders, with 60 to 80 years of age. Inclusion criteria were individuals who had no contact with the practice of physical activity in specific classes focused on flexibility and balance.

We assessed anthropometric data, flexibility and balance. Height was measured being the subject in standing position, measured with minimal clothing and barefoot, in the anatomical position, with mass (weight) distributed on both feet. The head was positioned looking ahead on the horizon, on the Frankfurt plan, with the shoulder blades and buttocks in contact with the equipment, free arms down along the body and palms facing the thighs. He/she was asked to inhale deeply, and then the cursor was positioned, touching the top of the head, with a precision of centimeters. Weight was measured with the subject without shoes, his back to the scale, looking at a fixed point on the horizon in the standing position with his/her weight equally distributed on the scale platform, with feet apart and in the anatomical position. The weight was collected in grams accuracy.

The flexibility assessment was performed through the flexitest, developed by Claudio Gil Araújo (specialist in sports medicine) and Roberto Pavel (Physical Education professor), both from Gama Filho University. It is a simple and new method to assess the flexibility. (FERNANDES, 1998)

To assess balance, we used the Berg Balance Scale, with a maximum score of 56, having each item an ordinal scale of five alternatives ranging from 0 to 4 points. It requires only a stopwatch and a ruler as equipment and its execution takes around 15 minutes. (Silva et al., 2008)

Data were presented as mean, standard deviation, minimum and maximum, and the Wilcoxon test was taken for comparison between pre and post-training with Oxygen classes, adopting a significance level of $p \leq 0.05$.

RESULTS AND DISCUSSION

The purpose of this study was to observe the influence of Oxygen classes on flexibility and balance in older people. This study included the participation of 10 subjects having 60% of subjects giving up, thus finishing with 4 subjects. It is believed that this loss may be due to extrinsic factors such as time availability, class schedule, and the difficulty of applying physical activities for this particular population. The percentage of valid and non-valid sample and presented in the graph below.

Graph 1 Percentage of valid and non-valid sample

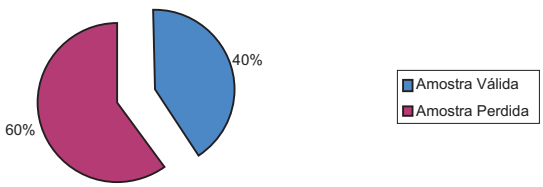

Table 1 presents the mean, standard deviation, minimum and maximum anthropometric profile of the sample.

	Age	MCT	Height	BMI
Mean	66,3	63,5	154,1	27
SD	9,2	9,9	7,2	6,4
Minimun	61	50,8	146	19,1
Maximum	80	73,8	163	34,6

Graph 2 represents the values of flexibility before and after Oxygen classes. There was an increase in the flexibility levels of the elderly (10 to 15 points). However, this increase was not statistically significant (p = 0.06)

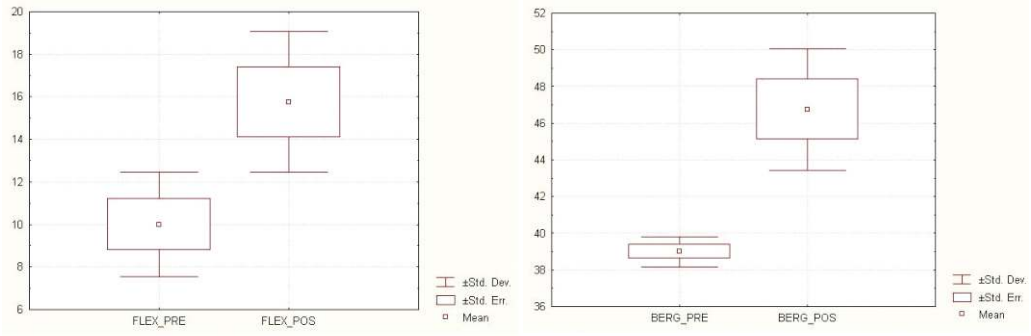

GRÁFICO 1 – Box plot dos valores médios do flexiteste **GRÁFICO 2** – Box plot dos valores médios do equilíbrio

The levels of flexibility have not had a significant improvement, but this result is of great importance to society, since older adults lose more and more independence because of restrictive factors such as low levels of flexibility.(Matsuda et al 2000).

The Oxygen fitness program was created by PRO-FIT FITNESS to improve skills such as flexibility, balance, muscle strength and concentration, which are all related to daily activities, such as lifting an object, sitting, standing from a chair and climbing stairs . A better performance of such daily activities boosts older people's self-esteem and prevent depressions (very common disease in this part of people's lives). The major improvements, through the participation on the training program, were not the ones expected, but of another nature. It was the social contact that improved their high-esteem and encouraged them to perform some physical activity.

Oliveira et al (2001) conducted a study of Tai Chi Chuan, which provides its participants a variety of psychological benefits, through physical improvement in cardiovascular fitness, reducing stress, anxiety and depression. So, this practice is suitable for the elderly, because it is a tiring and non-competitive manner of facilitating their acceptance among the population. This study began with an initial group of 23 ladies, finishing with six, between 52 and 67 years of age, for three months The sit and reach test was used to determine the level of trunk flexibility, and the result of pre-workout and post workout were 29 cm and 30.8 cm, respectively, not presenting a difference statistically significant.

Inácio (2008) speaks of his work that flexibility has a strong importance to the elderly and is responsible for conducting the daily movements, such as tie your shoes, combing hair, among others. Therefore, flexibility can translates a relationship between quality of life and well being of the elderly.

Passos (2008) showed a significant improvement in daily activitis, through water aerobics, which was accomplished in a period of 12 weeks in the study, initially, 36 women aged between 60 and 72 years, sedentary, physically independent. To evaluate the daily activities, the test sitting and rising from a chair was used, climb stairs, rise from the ground, putting on socks and climbing stairs.

These improvements may be related to improvements in overall physical fitness of the practitioners, having flexibility not achieved significant results between the control and experimental. This result may have been affected by the lack of exercises for flexibility, besides the number of sessions and the intensity of the classes that resulted in a negative result for the level of flexibility. These results corroborate this study, which also showed the difficulty in controlling intensity of sessions and classes.

The values of the Berg balance scale before and after training tended to improve with a p = 0.06, but their results were not significant according to the Wilcoxon test for dependent samples with the level of significance of $p \leq 0.05$.

Chart 2 shows the comparison between the averages in the pre and post through the Berg Balance Scale. There was an increase, although not significant in the balance of the elderly. In spite of not being significant, the *Oxygen* induced an increase of 4 points on the Berg balance scale, with an average of 39 points in the pre-training and post training 43 points.

This result may have been affected due to factors such as number of participants, making a study limitation.

Spirduso (2005) portrays in his studies that the balance is a loss of response of 52%, from 60 to 80 years of age, and the improvement is also slower, so you need more time of physical training practice so you can have an improved balance.

The main systems of balance are visual, proprioceptive and vestibular systems, which provide information and patches on the body posture and stability. In addition, other factors such as self confidence and muscle strength, also contribute to the maintenance of balance (Spirduso, 2005).

Along with balance loss, there is neuromuscular loss, resulting in a decreased ability to maintain a static force, thereby generating a reduced ability to hypertrophy, which ends up resulting in a loss of mobility and functional ability of elderly people. Thus, the neural adaptation of elderly is lower, as well as his response to a stimulus (Tribess; VIRTUOSO JR, 2005).

Factors such as confidence and strength are directly related to the practice of Oxygen and may have influenced the results. The subjects were sedentary people who did not practice any physical activity. Therefore, if they have had a longer period of classes, the results would probably have been better.

Another limiting factor in this study is the application of the training, where the instructor was concerned about the safety of participants, and the performance of the movements were optional, making them easier and without risk of falling. A more individualized attention would be necessary, to increase the difficulty and muscle actions of the participants, which is difficult to do in group classes (FIT-PRO FITNESS, 2009).

The teacher learns to select, among pre-defined exercises, the exercises that may be more appropriate for the skill level of each group, achieving the greatest possible participation. However, it is difficult to individually guide each participant of a large group, which makes it harder to potentialize the effects of the training program. Thios might have been a factor that influenced the balance slight increase (FIT-PRO FITNESS, 2009).

Abreu (2008) observed a therapeutic exercise program would affect between walking speed and balance between women and practitioners do not practice regular physical activity. For this, he had a training group with 20 participants and a control group with the same number of participants. To assess the levels of flexibility and balance, he used two tests: the Berg Balance of POMA and compared with the results of gait speed. Thus, it was evident that no positive correlation between walking speed and balance in elderly women studied, whether they are practitioners of therapeutic exercise or not, with results of POMA = 0.25 and Berg test equal to 0.26, with p> 0.05 in both tests. Therefore, there was a significant result.

These results confirm data found in our study, using therapeutic exercise decreasing their difficulty in executing, which is related to the options implemented during the class having the same objective, as I placed the teacher concerned about security has difficulty differentiating the class.

Oliveira et al (2001), through Tai Chi classes, found a positive result in the balance levels in elderly practitioners of the sport. To assess balance levels of each individual, visual control was used, thereby performing a pretest and a posttest, with pretest resulted in 12.6 and 15.4 after training with an increase in the balance of 21.6%, showing a significant increase.

The results obtained by Oliveira (2001) were significant as the improvement of balance in the practitioners of the sport, but the method of assessment is different from the present study, Oliveira used as evaluative test the visual control of balance and could have been a determining factor to find a more significant increase in its results.

In this context, the present study complements the various concepts in relation to aging, aiming to contribute to the literature focused on improving flexibility and balance in older people.

CONCLUSIONS

As noted in this study, training *Oxygen* showed a tendency toward increasing flexibility and balance in older people, but not statistically significant.

The lack of a significant increase in this present study may be related to the small sample size and intensity of exercise reduced.

Although it is not the purpose of this study, the *Oxygen* training program proved itself to be an important activity for the elderly, not just physical, but mental and social, and is, for this reason, recommended for composing a training program for the elderly.

Further studies are recommended, with larger sample and more practice time, with a control group, to verify and quantify the influences of Oxygen. The inclusion of tests to confirm whether or not there is interference of the Oxygen training program on physical, mental and social health of older adults.

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THE INFLUENCE OF OXYGEN CLASSES ON THE LEVELS OF FLEXIBILITY AND BALANCE OF OLDER ADULTS

ABSTRACT

The number of older adults joining in training programs aimed at this population has increased significantly, so the importance of emphasizing the prescription and supervision of activities. The aim of this study was to examine whether the Oxygen physical training program has some influence on flexibility and balance in older people. The sample consisted of 10 individuals of both sexes, 60 to 80 years-old, chosen randomly. First, they had their heights and weights measured, then their flexibility was assess through the flexitest, that measures 8 joints and movements. The balance was assessed through the Berg balance Scale, which consists of 14 questions with maximum score of 56 points. Then, subjects underwent a 8-week- training of Oxygen, three times a week, after which the post-test was conducted to obtain their results. For statistical analysis we used the nonparametric Wilcoxon test, with significance of $p \leq 0.05$. This study had an attrition rate of 60% of the elderly, finishing with only four subjects. As noted in this study, Oxygen training showed a tendency toward increasing flexibility and balance in older people, but not significant.

KEYWORDS: flexibility, balance, gymnastics.

LÍNFLUENCE DE LE PROGRAMME D'EXERCICE OXYGEN DANS LES NIVEAUX D'ÉQUILIBRE ET DE FLEXIBILITÉ DE LES PERSONNES ÂGÉES

RÉSUMÉ

Le nombre de personnes âgées se joindre à des programmes de formation destinés à cette population a augmenté de façon significative l'importance de souligner la prescription et la surveillance des activités. Le but de cette étude était d'examiner si le mode d'oxygène a une certaine influence sur la flexibilité et l'équilibre chez les personnes âgées. L'échantillon était composé de 10 individus des deux sexes, de 60 à 80 ans, choisis au hasard. de départ d'abord, les personnes âgées ont été pesés suivie par la mesure de la hauteur, puis ont été appliquées pour tester la souplesse et l'équilibre spécifiques, flexitest avec cette mesure 8 articulations et les mouvements et de tester l'équilibre de la Berg Balance Scale, qui se compose de 14 questions avec score maximum de 56 points, a ensuite subi un mode de formation de l'oxygène dans les 8 semaines doit avoir lieu trois fois par semaine, après quoi le post-test a été réalisé pour obtenir leurs résultats. Pour l'analyse statistique, nous avons utilisé le test non paramétrique de Wilcoxon, avec de signification de $p \leq 0,05$. Cette étude avait un taux d'attrition de 60% des personnes âgées, de finition avec seulement quatre personnes âgées. Comme indique dans cette éttude, La formation d'oxygéne a montré une tendance à accroite La flexibilité et l'equilibre chez lês personnes âgées, mais non significative.

MOTS-CLÉS: flexibilité, l'équilibre, gymnastique.

LA INFLUENCIA DEL PROGRAMA OXYGEN DE EJERCICIOS EM LOS NIVELES DE FLEXIBILIDAD Y EQUILIBRIO EM LA TERCERA EDAD

RESUMEN

El número de personas mayores incorporarse en los programas de formación dirigidos a esta población ha aumentado considerablemente por lo que la importancia de hacer hincapié en la prescripción y supervisión de las actividades. El objetivo de este estudio fue examinar si el modo de oxígeno tiene alguna influencia en la flexibilidad y el equilibrio en las personas mayores. La muestra consistió de 10 individuos de ambos sexos, de 60 años a 80 años, elegidos al azar. En primer lugar de partida, los ancianos fueron pesados seguida por la medición de la altura a continuación, se aplicaron pruebas específicas de flexibilidad y equilibrio, con Flexiteste que mide 8 articulaciones y los movimientos y poner a prueba el equilibrio de la escala de Berg, que consta de 14 preguntas con La puntuación máxima de 56 puntos, a continuación, se sometieron a un modo de entrenamiento de oxígeno dentro de las 8 semanas después de haber celebrado tres veces a la semana, después de que el post-test se llevó a cabo para obtener sus resultados. Para El análisis estadístico se utilizo la prueba no paramétrica de Wilcoxon, com significación de $p \leq 0,05$.Este estudio tuvo una tasa de deserción de 60% de las personas mayores, terminando con sólo cuatro personas mayores. Como se señala en este estudio, la formación de oxígeno mostró una tendencia a aumentar la flexibilidad y el equilibrio en las personas mayores, pero no significativo.

PALABRAS CLAVES: flexibilidad, equilibrio, gimnasia.

A INFLUÊNCIA DA AULA DE OXYGEN NOS NIVEIS DE FLEXIBILIDADE E EQUILIBRIO EM IDOSOS

RESUMO

O numero de idosos ingressando em programas de treinamento voltados a essa população tem aumentado significativamente por isso a importância de ressaltar a prescrição e orientação de atividades. O objetivo do presente estudo foi verificar se a modalidade oxygen tem alguma influencia na flexibilidade e equilíbrio em idosos. A amostra foi composta por 10 indivíduos de ambos os sexos, de 60 a 80 anos, escolhidos aleatoriamente. Primeiramente os idosos foram submetidos a pesagem seguido da mensuração da estatura em seguida foram aplicados teste específicos de flexibilidade e equilíbrio, iniciando com o flexiteste que mensura 8 movimentos e articulações e para equilíbrio o teste escala de equilíbrio de Berg que é constituído de 14 questões com score máximo de 56 pontos, posteriormente foram submetidos a um treinamento da modalidade oxygen num período de 8 semanas sendo realizado 3 vezes por semana, após esse período foi realizado o pós teste para a obtenção de seus resultados. Para analise estatística utilizou-se o teste não paramétrico de Wilcoxon, com significância de $p \leq 0,05$. Este estudo teve uma perda amostral de 60% dos idosos, finalizando com apenas 4 idosos. Como foi observado no presente estudo, o treinamento Oxygen demonstrou uma tendência à melhora na flexibilidade e equilíbrio em idosos, porém não significativos.

PALAVRAS CHAVES: flexibilidade, equilíbrio, oxygen.