# 183 - EVALUATION AND ORIENTATION OF ACTIVITIES IN ELDERLY WITH SIGHTS TO THE CONTROL OF THE BALANCE

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## INTRODUCTION

The aging is a natural and irreversible process, and the degeneration is too part of this process (Bodachne, 1998), he is a phenomenon much discussed in recent years. As regards the health of the elderly, their condition, their physical and functional features are the most obvious signs and indicators of the quality of life, and scientific evidence show the beneficial effect of a lifestyle active (NAHAS, 2001).

Care interventions measures and programs for the elderly are aimed at preparing the individual to handle the elderly, among other things, with the falls (Bodachne, 1994), preventing them and helping the elderly to recover confidence in their abilities posture.

In Curitiba city, the CuritibAtiva program emerged in 1998 with the purpose of guiding and educating the population about the importance of Physical Activity (PA) as a tool for improving the life quality. For this, the most varied strategies served as a means of achieving the segments of the population, including printed material (folders, pamphlets, posters and information panels oriented to the practice habits of PA, to care the nutritional, respiratory and strength habits); search with the population of indicators related to living habits (usual PA; heart risk); tests application (BMI, ICQ, sit and reach test for the flexibility, abdominal strength and hand dynamometry) to determine the level of physical fitness of the population; verification of indicators of risk to health through tests (glucose, cholesterol and blood pressure), in conjunction with the City Health Department; organization Protocols for the Evaluation of users of Physics programs developed in Centers for Sports and Leisure. The program has undergone changes and now caters to people of various ages, through various bodily oriented practices, as well as evaluation and prescription of PA using as a tool, specific protocols for each stage of development: child/adolescent, adult and elderly.

The data were entered into a database that can and are being used to determine the profile of the population and, with the results, state shares to be perpetrated with them.

## PURPOSE AND METHODE

For the importance of the issue, and that from functional assessment of elderly people, we can detect disturbs in balance and prescribing PA procedures, with a view to resolving the disturbs, it was developed study to verify the influence degree that they have, whether the length of the muscles muscular rear legs / flexibility, and strength in the balance of non-institutionalized elderly people and, from the results develop program of counseling returned to the PA, this as a intervention strategy in the elderly, non-institutionalized, people with disorders of balance.

To determine and select the sample of this study were used data collected by the program CuritibAtiva in the "Mutirão of Citizenship" events, where several desks pushed shares with the people of the affected region.

The “Mutirão of Citizenship” is an inter-sectoral Public Policy, and is part of the Policy for the Health Promotion, under the management of the City Health Secretariat (CHS), and aims to build strategies involving all sectors municipal government, institutions and community, to encourage participatory management and respond to the demands of the local level. In partnership with CHS, which seeks to identify some risk factors for chronic diseases later (obesity, hypertension, diabetes and sedentary), the Municipal Secretary of Sports and Leisure holds the physical evaluation and guidelines for practice of PA citizens who travel evaluation of the circuit.

The Municipal Department of Sports and Leisure, by the program CuritibAtiva, conducted functional assessments and guidance on physical activity for citizens in "Mutirão", which were addressed to this program. In the years 2006 and 2007, 11 editions of effort have been met, approximately 8 thousand people and their data entered into the database for the program itself, and about 10% of this total, consisting of elderly. This seat 840 chips were selected on the basis of the criteria for inclusion and exclusion related to follow.

**To include**: over 60 years old, be entered in the database program of CuritibAtiva in the years 2006 and 2007, from collection events held in the "Mutirão of Citizenship.

**Of exclusion**: the evaluation sheets that contain deletions and incomplete sheets.

The CuritibAtiva Coordinator would contacted only after approved als research project by the Research Ethics Committee in Human Beings, the Pontifical Catholic University of Parana, culminated with the use of said the database that program. First, picked up the sheets in accordance with the criteria set and preceded to typing in Excel file, the data related to the variables studied.

Sheets of functional assessment, conducted by the Program CuritibAtiva, it was made using data from tests of muscle length, used to check the incidence of muscle shortening, mainly of ischiotibial muscles; the test of strength of lower limbs, which evaluates both the resistance of strength and the test of static equilibrium.

The data collected were processed, statistically, through the mean, standard deviation, the magnitude range and the median, and compared through the test of $^2$, considering a significance level of 5% (0.05).

## RESULTS

The sample of this study is characteristically (Table 1), with a typical morphology for the age group; with body weight moderately above the normal, due to the increase for to age.

It has a Body Mass Index (BMI), concerning, above the reporting of the literature (WHO, 1996), with point values of obesity and morbid obesity; they are in the senescence age (up to 70 years old), with the maximum range (87 years) closer to the big old range (NICOLA, 1986).

Table 1 Sample characteristic

| | Age (years) | Mass Weight (kg) | Height (m) | BMI |
|---|---|---|---|---|
| Mean | 67,40 | 69,20 | 1,57 | 28,10 |
| Sd | 6,03 | 12,62 | 0,09 | 4,52 |
| Medien | 66 | 68,95 | 1,56 | 27,9 |
| Max | 87 | 110,5 | 1,9 | 43,9 |
| Min | 60 | 26 | 1,29 | 13,7 |

Most of the sample (Table 2) was composed of women, perhaps because is the physical activity a great ally in the fight against osteoporosis (NAHAS, 2001; BODACHNE, 1994), and the offer of this type of program (Mutirão of Citizenship) can be encouraging the frequency of female persons for this type of evaluation, or it's them, effectively, concerned about physical activity for the benefits that are allocated to it (physical and emotional well being, in addition to the psycho-social) (RAUCHBACH, 2005 & KRUCHELSKI in RAUCHBACH, 2005). In addition, the women have more longevity that man (Santos, 2004 in Kruchelski and Rauchbach, 2005).

**Table 2 Sample distribuition**

| | (n) | % |
|---|---|---|
| Man | 290 | 34,5% |
| Woman | 550 | 65,5% |
| Total | 840 | 100,0% |

**BALANCE**

It is observed (Table 3) that most of the sample (52.6%) presents rates with good (13.9%), from optimum (37.6%) and 1.1% of excellent. With the classification of Matsudo (2000) there are, however, a fraction (47.4%) of subjects with low rates, particularly the 198 (23.6%) with values considered insufficient.

Already in 1948 apud Bodachne Sheldon (1998) searched the grounds of falls, in very reason that the incidence of falls in the elderly, may be caused by the decrease in the balance (Bodachne, 1994) and that, regardless of the fall be accidental (external reasons such as irregular or slippery floor) or recurrent (due to lack of fitness as intrinsic strength and shortenings). (Perracini, 2002).

**Table 3 Balance rates**

| BALANCE | (n) | % |
|---|---|---|
| Excelent | 9 | 1,1% |
| Very good | 316 | 37,6% |
| Good | 117 | 13,9% |
| Regular | 200 | 23,8% |
| Insufficient | 198 | 23,6% |
| Total | 840 | 100,0% |

**FLEXIBILITY**

Regarding the values of the flexibility (Table 4) has been 53.6% with values between regular and low (27.3 and 26.3% respectively) and, among others, the majority presents values as good (27.5%), with a smaller portion (16.3%) as very good and only 22 subjects (2.6%) with rates as excellent.

Despite the authors refer to loss of flexibility as a result of aging (loss of elasticity, fragmentation, erosion, calcification, among others), the low figures are worrying. The flexibility is largely responsible for muscle end properties (tensile strength of and concerning inextensibilities) (Alter, 1999), factors that influence the strength and balance (NAHAS, 2001).

Table 4 Values of the flexibility

| FLEXIBILITY | (n) | % |
|---|---|---|
| Excelent | 22 | 2,6% |
| Very good | 137 | 16,3% |
| Good | 231 | 27,5% |
| Regular | 229 | 27,3% |
| Insufficient | 221 | 26,3% |
| Total | 840 | 100,0% |

**STRENGTH**

In according to the Matsudo classification (2000), in relation to the strength, the sample has a well suited development, with only 81 subjects categorized as inadequate (Table 5). These data counter it with in a way, to those found in the literature (Hernandez et al., 1993), who claims that the elderly reduce muscle strength with age. On the one hand the level of force may be enough (between good and great) for age, but on the other the loss of strength in relation to what had, when younger, it was measured by not have data on that stage of their lives, nor be the object of this study.

**BALANCE x FLEXIBILITY**

When compares the balance with the test results of muscle length, is a level of significance represented by p = 0.140247, which is higher than 0.05. This shows that for this population, contrary to statements by various authors (Nahas, 2001; Alter, 1999), the muscle length has no influence on the level of balance. This leads us to believe that other factors must have its influence, which can be seen from analysis of other parameters.

**Table 5 Strength values**

| Level | (n) | % |
|---|---|---|
| Very good | 160 | 19,0% |
| Good | 599 | 71,3% |
| Insufficient | 81 | 9,6% |
| Total | 840 | 100,0% |

**FORCE x BALANCE**

When compares the balance with the level of legs strength, is a level of significance represented by p = 0.00000005, lower than 0.05 and highly significant, demonstrating that, for this population, confirming statements from Guccione (2002); Raso et al (1997), the strength of lower limbs influence the level of balance. But despite the large number of people with good rating, the low number of good, with regular and high enough, shows need for therapeutic intervention to reverse the table found in the parameter balance.

**CONCLUSIONS**

The low number of subjects with GOOD classification, with a high number of regular and sufficient, denoting need for therapeutic intervention to reverse the table in parameter balance, although it found itself with large number of subjects rating VERY GOOD.

According to the above, it appears that the sample shows disturbances in the balance, particularly due to deficiency of the range of motion in the lEGS, which are compensated by the level of force displayed.

It is also, that in those in which the level of force is in good or very good level, it may be factor in maintaining the balance. And for many, are inadequate levels of strength and muscle length that causes changes in the balance.

**CONSIDERATIONS**

The length muscle must be developed or maintained through specific program of activity due to the fact that the force is still in some way by industrial activities, if sufficient, as occurs with the muscle length.

The population needs physiotherapy intervention or regular physical activity, targeted directly or by means that would be followed without the need for monitoring, for adequacy of daily activity, with indications of exercises and guidelines in accordance with each case.

Further work should be conducted periodically, with this and other samples for verification of adherence to the proposed change of attitude, and also to investigate its effectiveness against the subjects who adhered to the guidelines.

**KEY WORDS**

Functional assessment, Balance, Elderly

**REFERENCE**

ALTER, M. J. **Ciências da flexibilidade.** 2ª Editora Artmed: Porto Alegre, 1999.

BODACHNE, L. **Princípios básicos de geriatria e gerontologia.** Curitiba: Champagnat, 1998.

_____ **Instabilidade e quedas no idoso.** Revista Brasileira Médica. Vol. 51, n. 3, PP 226 - 234, março, 1994.

ACSM American College of Sport Medicine *in* MAZZEO, R. S.; CAVANAGH, P.; EVANS, W. J.; FIATARONE, M. A.; HABERG, J.; McAULEY, E.; STARTZELL, J. **Exercício e atividade física para pessoas idosas.** Revista Brasileira de Atividade Física e Saúde. 3(1), 48-68. 1998.

GUCCIONE, Andrew A. Fisioterapia geriátrica. Rio de Janeiro: Guanabara Koogan, 2002.

RAUCHBACH, R. *in KRUCHELSKI, S.; RAUCHBACH, R.* ***CuritibAtiva gestão nas cidades voltada à promoção da atividade física, esporte, saúde e lazer:*** *avaliação, prescrição e orientação de atividades físicas e recreativas, na promoção de saúde e hábitos saudáveis da população curitibana. Curitiba: R Rauchbach, 2005. Pp. 78 a 85.*

MATSUDO, S. M. M. **Avaliação do idoso, física e funcional.** São Caetano do Sul: Editora Midiograf, 2000.

MAZO, G. Z.; LOPES, M. A.; BENEDETTI, T. B. **Atividade física e o idoso. Concepção Gerontológica.** Porto Alegre: Sulina, 2001.

NAHAS, M. V. A. **Atividade física, saúde e qualidade de vida: conceitos e sugestões para um estilo de vida ativa.** 2ª edição, Porto Alegre: ArTmed, 2001.

NICOLA, Pietro; Alda Ribeiro. Geriatria. Porto Alegre: D. C. Luzzatto, 1986.

PERRACINI M. R, RAMOS L. R. **Fatores associados a quedas em uma coorte de idosos residentes na comunidade.** Revista de Saúde Pública, 2002; p.709-16.

RASO, V.; MATSUDO, S.; MATSUDO, V.; ANDRADE, E. **Efeito de três protocolos de treinamento na aptidão física de mulheres idosas.** Gerontologia p. 162-170, 1997.

RASO, V.; ANDRADE, E. L.; MATSUDO, S.; MATSUDO, V; KEIHAN, R. **Exercício aeróbio ou de força muscular melhora as variáveis da aptidão física relacionadas à saúde em mulheres idosas?** Revista brasileira de atividade física & saúde v.2, n.3, pág. 36-49, 1997.

RASO, V.; ANDRADE, E. L.; MATSUDO, S. M.; MATSUDO, V. K. R. **Exercícios com pesos para mulheres idosas.** Revista brasileira de atividade física & saúde v.2, n.4, pág. 17-26, 1997.

SANTARÉM, J. M. (2004) *in KRUCHELSKI, S. e RAUCHBACH, R.* ***CuritibAtiva gestão nas cidades voltada à promoção da atividade física, esporte, saúde e lazer:*** *avaliação, prescrição e orientação de atividades físicas e recreativas, na promoção de saúde e hábitos saudáveis da população curitibana. Rauchbach: Curitiba, 2005. Pp. 78 a 85.*

SHELDON. R. S. *In* BODACHNE, L. **Princípios básicos de geriatria e gerontologia.** Curitiba: Champagnat, 1998.

**Web source (Internet)**

OMS, 1996 **The Heidelberg guidelines for promoting physical activity among older persons:** guideline series for healthy ageing I. (*On Line*). Access in 23/03/2007

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**EVALUATION AND ORIENTATION OF ACTIVITIES IN ELDERLY WITH SIGHTS TO THE CONTROL OF THE BALANCE**

Purpose - The balance disturbs affect the social autonomy, reduce the daily activities for the predisposition to the falls, and raise the costs with the health treatment. The objective of this study was to develop a advised program as strategy of intervention in elderly with balance alterations. Methods 840 elderly (550 women and 290 men; 67.4 ± 6,03 years; 69,2 ± 12,62 kg; 1,57 ± 0,09 m) had been analyzed by means of the evaluation of flexibility (test to seat and to reach of Wells), the power and endurance of inferior members by means of the test "to seat and to raise in thirty seconds" and the level of the balance by means of the test "static balance". The data had been compared through test of $^2$ (p 0,05). RESULTS: Through test of $^2$, the power showed a "p" elevated in relation to the balance (0,00000005), and a low "p" (0,140247) among the balance and flexibility. CONCLUSION: for this sample the study shows that flexibility did not have influence in the balance, but the power had the influence elevated in the levels of the balance. The sample that presents these deficiencies may suffer falls and possess greater susceptibility to suffer serious breakings. On the basis of the results, conclude that the sample needs a direct intervention that may be followed with or without permanent accompaniment, with purpose to revert or to minimize the riots of the balance, with indications of exercises and attitudes that favor mobility. Other works with this and other samples are recommended for the verification of the adhesion to the proposal and its effectiveness, mainly because the prevention of the event of the fall is necessary and it is considered a good behavior of practical and a point of service of quality for the elderly.

Key words - Functional Assessment, Balance, Elderly

**L'ÉVALUATION ET L'ORIENTATION DES PERSONNES ÂGÉES DANS LES ACTIVITÉS AVEC LES VUES POUR LE CONTRÔLE DE L'ÉQUILIBRE**

Objectif - L'équilibre est perturbé sur l'autonomie sociale, réduire les activités quotidiennes pour la prédisposition à la tombe, et augmenter les coûts de traitement de le santé. L'objectif de cette étude était de développer un program avec la stratégie d'intervention en personnes âgées avec des modifications de l'équilibre. Méthodes - 840 personnes âgées (550 femmes et 290 hommes; 67,4 ± 6,03 ans; 69,2 ± 12,62 kg; 1,57 ± 0,09 m) a été analysé par l'évaluation de la flexibilité (test de siège et à la portée de Wells), la puissance et l'endurance des membres inférieurs par l'essai "de siège et d'augmenter en trente secondes" et le niveau de l'équilibre par l'essai "équilibre statique". 2 (p 0,05). Les données et les resultants ont été comparées par le test de $^2$ (p 0,05). RÉSULTATS: La puissance et l'equilibre avoir an haute "p" (0,00000005), et un faible "p" (0,140247) entre l'équilibre et la flexibilité. CONCLUSION: pour cet exemple de l'étude montre que la flexibilité ne pas avoir de l'influence dans la balance, mais le pouvoir a élevé l'influence du niveau de l'équilibre. L'échantillon qui présente ces lacunes mai subir des chutes et avoir une plus grande prédisposition à souffrir de graves fractures. Sur la base des résultats, de conclure que l'échantillon a besoin d'une intervention directe de mai que suivre avec ou sans accompagnement permanent, avec effet à revenir ou à réduire au minimum les émeutes de l'équilibre, avec des indications d'exercices et d'attitudes qui favorisent la mobilité. Avec d'autres œuvres et d'autres échantillons sont recommandés pour la vérification de l'adhésion à la proposition et de son efficacité, principalement parce que la prévention de l'événement de l'automne est nécessaire et il est considéré comme une bonne pratique de comportement et d'un point de service de qualité pour les personnes âgées.

Mots-clés - Évaluation fonctionnelle, équilibre, personnes âgées

**LA EVALUACIÓN FUNCIONAL DE LA ORIENTACIÓN Y LAS ACTIVIDADES EN LOS ANCIANOS CON EL FIN DE CONTROLAR EL EQUILIBRIO**

Objetivo - Los disturbios en el equilibrio influyen en la autonomía social, reducen las actividades diarias por la predisposición a las caídas, y elevar el costo del tratamiento de la salud. El objetivo de este estudio fue desarrollar un programa de consejería como una estrategia de intervención en los ancianos con los cambios en el equilibrio. Métodos - 840 ancianos (550 mujeres y 290 hombres, el 67,4 ± 6,03 años; 69,2 ± 12,62 kg, 1,57 ± 0,09 m) se analizaron por medio de la evaluación de la flexibilidad (prueba de siente y alcance de Wells), la fuerza y la resistencia de las extremidades inferiores a través de la prueba "sentarse en treinta segundos" y el nivel de equilibrio a través de la prueba del "equilibrio estático". Los datos se compararon por medio del teste $^2$ (p 0,05). RESULTADOS: A través de la prueba del $^2$, la medida de fuerza puso de manifiesto una "p" de alto en relación con el equilibrio (0.00000005), y bajo "p" (0.140247) entre el equilibrio y la flexibilidad. CONCLUSIÓN: el ejemplo muestra que la flexibilidad no tenía ninguna influencia en el equilibrio, pero la fuerza había altos niveles de equilibrio. La muestra pone de manifiesto que estas deficiencias pueden sufrir caídas y tienen una mayor susceptibilidad a sufrir fracturas graves. Basándose en los resultados, la muestra necesita una intervención directa, seguido con o sin supervisión, a fin de revertir o minimizar la perturbación del equilibrio, con indicaciones de ejercicios y actitudes que mejoren la movilidad. Otros trabajos con esta y otras muestras, se recomienda para la verificación de la adhesión a la propuesta y su eficacia, sobre todo desde el caso de caída de prevención es necesaria y se considera una buena práctica, la conducta y la calidad de la atención a las personas mayores.

Palabras clave - evaluación funcional, equilibrio, ancianos

**AVALIAÇÃO FUNCIONAL E ORIENTAÇÃO DE ATIVIDADES EM IDOSOS COM VISTA AO CONTROLE DO EQUILÍBRIO**

Objetivo - Os distúrbios de equilíbrio afetam o equilíbrio, a autonomia social, reduzem as atividades diárias pela predisposição a quedas, e elevam os custos com o tratamento da saúde. O objetivo deste estudo foi desenvolver um programa de aconselhamento como estratégia de intervenção em idosos com alterações do equilíbrio. Métodos - 840 idosos (550 mulheres e 290 homens; 67,4 ± 6,03 anos; 69,2 ± 12,62 kg, 1,57 ± 0,09 m) foram analisados por meio da avaliação de flexibilidade (teste de sentar e alcançar de Wells), a força e a resistência de membros inferiores por meio do teste "sentar e levantar em trinta segundos" e ao nível do equilíbrio por meio do teste do "equilíbrio estático" . Os dados foram comparados através do teste do $^2$ (p 0,05). RESULTADOS: Por meio do teste $^2$, a medida da força mostrou um "p" elevado em relação ao equilíbrio (0,00000005), e um baixo "p" (0,140247) entre o equilíbrio e a flexibilidade. CONCLUSÃO: a amostra deste estudo mostra que a flexibilidade não teve influência no equilíbrio, mas a força elevada teve nos níveis de equilíbrio. A amostra que apresenta estas deficiências pode sofrer quedas e possuem uma maior suscetibilidade a sofrer graves fraturas. Com base nos resultados, conclui-se que a amostra necessita de intervenção direta, seguida com ou sem acompanhamento permanente, com a finalidade de reverter ou minimizar os distúrbios do equilíbrio, com indicações de exercícios e atitudes que favoreçam a mobilidade. Outros trabalhos com esta e outras amostras são recomendados para a verificação de aderência à proposta e à sua eficácia, principalmente porque a prevenção do evento de queda é necessária e é considerada uma boa prática, e comportamento de atendimento de qualidade para os idosos.

Palavras-chaves - Avaliação funcional, Equilíbrio, Idosos