26 - EFFECTS OF A SWIMMING PROGRAM, WITH AND WITHOUT FINS, IN THE LEARNING OF THE CRAWL STROKE AND BODY COMPOSITION OF YOUNG DOWN SYNDROME PATIENTS.

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INTRODUCTION

Down Syndrome (DS) is a genetic condition responsible for 15% of the mental delay cases among patients in institutions for children (Rodini & Souza, 2003). People affected by DS have a decreased cognitive and motor development when compared to their non-handicapped counterparts (Augusto, 2003; Wu et Al., 2010; Shields, Taylor and Fernhall, 2010) and are typically sedentary (Mahy, et Al., 2010). Several authors such as Al (2003), Rubin et al, (1998) and Prasher, et al, (1995) report that children with DS show high levels of obesity and the patients with the disease who live with their families have higher incidence of overweight than those who live in institutions or hospital units. Schwartzman, et al (1999) report a tendency among children with DS of being overweight due to reduced motor activity, which added to factors such as inadequate eating habits, excessive caloric intake, decreased physical activity, hypotony and hypothyroidism, tend to aggravate the problem. For this reason, programs to stimulate young people with DS to practice exercises should become increasingly indispensable. According to Andriolo et al. (2010), however, current evidences are not enough to demonstrate positive effects on the physical aptitude of adults with DS resulting from aerobic training. One of the factors that may account for lack of success of programs is the cognitive limitation of this population, Silva (2002) and Schwartzman (1999), describe that DS patients show deficit in language, perception, body scheme, time-space orientation and laterality, as these countless changes in the nervous system have repercussions in learning disorders, which might mean that physical activity programs with this population show limited results due to learning process? Also, if the learning process were experienced with strategies of facilitation during the acquisition of a motor ability (Schmidt and Wrisberg, 2000), would learners be more susceptible to the effects of training?

OBJECTIVE

Analyze the effect of two swimming teaching proposals, with and without fins, on the learning skills and body composition of young DS patients.

MATERIAL AND METHODS

7 young SD patients with age between 15 and 26 years were evaluated, without previous experience in swimming classes. Two groups were randomly formed: the group using fins(GUF) in the learning process was composed of 3 students (one male and two females), with average age of 26 (7.1) years and average height of 1,48m. The group without fins(GNF) in the learning process was comprised of 4 students (three males and one female), with average age of 23.5 (6.7) and average height of 1,56m. The two groups participated in swimming classes during 3 months, with a 3-times weekly frequency, with a total of classes. The meetings were held under the supervision of 2 coaches and 6 assisters. The group with fins used the material manufactured by Aquanaut, made of silicone and featuring flexible fins. Classes with duration of 50 minutes each were divided into 5 sets of 10 minutes, including fluctuation, breath, rhythm, balance and displacement exercises. Training was performed in an indoor swimming pool, with 1,45 meters depth, heated to 30 degrees, with length and width of 25 for 12 meters, respectively.

To evaluate the learning skill a table of aquatic readiness of Langendorfer and Bruya (1995) was used, where the following variables were observed both pre-and post- training: aquatic orientation and adjustments, entrance in the water, respiratory control, fluctuability, position of the body, action of the arm, recovery, action of the leg and checklists of combined movements. For analysis of body composition, the following instruments were used: a Filizola mechanical scale to measure body mass, with 100g resolution, with constant calibration and rested on leveled ground; for determining the height a standard American Medical of Brazil anthropometer was used; for skin fold analysis a scientific Sanny adipometer by the American Medical of Brazil was used; for skin fold measurements the Protocol of Pollock and Wilmore (1993) was used, where the following anatomical spots were evaluated: tricipital, suprailiac area and thigh in females and the abdominal area, chest and thigh in males and the circumferences were measured in the arm, low-arm, abdomen, thigh and calf for both males and females.

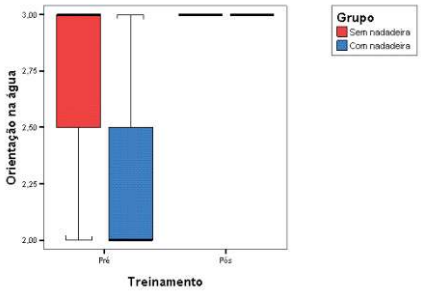
STATISTICAL ANALYSIS

Statistical significance of the training as regards the changes in variables studied was evaluated by the Wilcoxon statistical test, except for the Langendorfer scale, where the test of marginal homogeneity was applied, which is an extension of the McNemar test, commonly used for multinomial variables. For determining the significance of the difference between the groups in each characteristic measured, the statistical test of Mann-Whitney was used. For presentation and summary of the characteristics measured the average was used, for representation of the measure of position, and the first and third quartiles for indicating the dispersion of values. Non-parametric statistics was chosen, given the reduced number of volunteers, as well as the graph of quantiles and box-plot to show deviations from the normal curve. Statistical significance was set at $\alpha \leq 0,05$ for all the statistical tests.

RESULTS

Graphs 1 to 9 show the results for the learning of swimming skills.

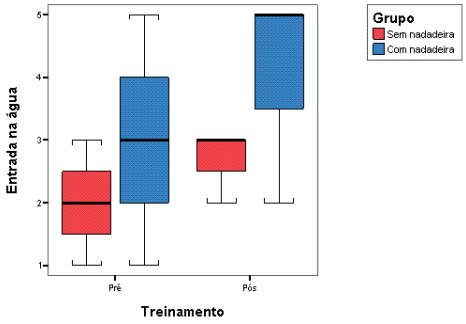
Orientation in water and adjustment component



As seen in graph 1, both groups reached maximum scores in the Post--Test (level 3), however in the Pre-Test the group without fins reached average score in level 3, while the group with fins achieved average score in level 2. Not indicating statistical change in pre- and post- training or between the groups.

GRAPH 1. Comparison of the groups with and without fins in Pre-Training and Post--Training for the aquatic orientation and adjustments variable.

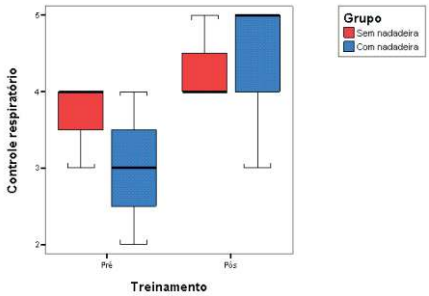
Components of entrance in the wat



As shown in graph 2, the group without fins in the pre-training had average score in level 2 and average score in level 3 in post--training, while the other group in the pre-test reached the level 3 average and level 5 average in post-training. That shows that both groups had statistically significant improvements between pre- and post--training (p=0,034). However no changes have been found in the analysis between groups.

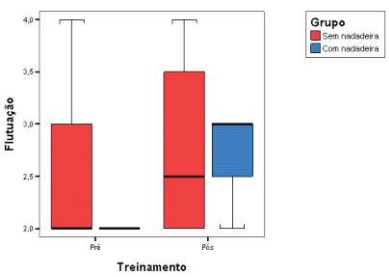
GRAPH 2. Comparison of groups with and without fins in Pre-Training and Post--Training for the entrance in the water variable.

Components of respiratory control



As seen in graph 3, the group with fins maintained average score in level 4 in both pre- and post--training while the other group achieved level 3 average in pre-training and level 5 average in post training. Both groups had statistically significant improvements between pre- and post- training, for p=0,034, but no statistical data have been collected between groups.GRAPH 3. Comparison of the groups with and without fins in Pre-Training and Post-Training for the respiratory control variable.

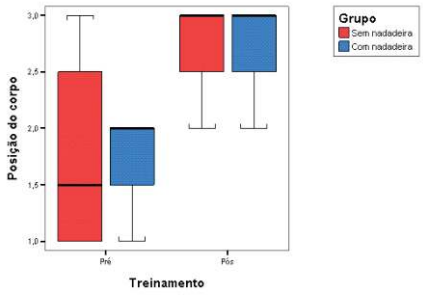
Fluctuability / Fluctuation



As seen in graph 4, the group without fins reached level 2 average in the pre-training and level 2.5 average in post-training, while the group with fins showed level 2 average in pre-training and level 3 average in post-training. Neither groups have shown statistically significant improvements had not improves significant between them.

GRAPH 4. Comparison of the groups with and without fins in Pre-Training and Post-Training for the fluctuation variable.

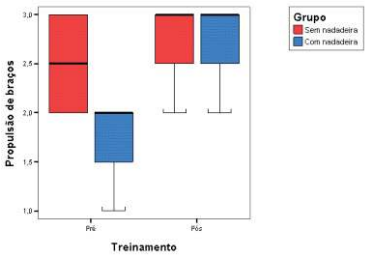
Checklist of the position of the body



In graph 5 we can notice that the group without fins achieved level 1.5 average in pre-training and level 3 average in post-training and the other group achieved level 2 average in pre-training and level 3 average in post- training. A statistically significant difference was detected during pre- and post-training for both groups, (p=0,020). However, no difference have been found between them.

GRAPH 5. Comparison of the groups with and without fins in Pre-Training and Post-Training for the position of the body variable.

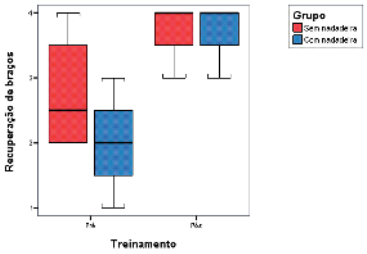
Checklist of the arms propulsion action



In graph 6 it is possible to verify that the group without fins showed level 2.5 average in pre-training and level 3 average in post-training; while the group with fins reached level 2 average in pre-training and level 3 average in post- training. A statistically significant difference have been found for both groups in pre- and post-training (p=0,046). However the same statistically significant difference has not been found between groups.

GRAPH 6. Comparison of the groups with and without fin in Pre-Training and Post-Training for the propulsion of arms variable.

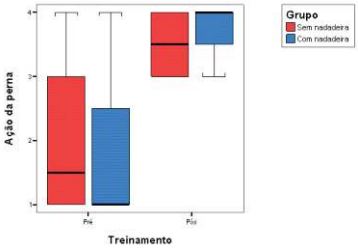
Checkist of arm recovery action



As shown in graph 7, the group without fins reached level 2.5 average in pre-training and level 4 average in post-training while the other group reached level 2 average in pre-training and level 4 average in post-training. Therefore, statistically significant improvements have been found in pre- and post training (p=0,020). But the same change has not been found between groups.

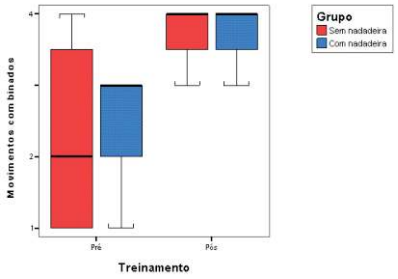
GRAPH 7. Comparison of the groups with and without fins in Pre-Training and Post-Training for the arm recovery variable.

Checklist of leg action



As shown in graph 8, the group without fins presented level 1.5 average in pre-training and level 3.5 average in post-training while the other group achieved level 1 average in pre-training and level 4 average in post-training. A statistically significant difference have been found for both groups between pre- and post-training, (p=0,028), however no statistically significant change have been found between groups. GRAPH 8. Comparison of the groups with and without fins in Pre-Training and Post-Training for the action of the leg variable.

Checklist of movements combined



In graph 9 it is possible to observe that the groups without fins reached level 2 average in pre-training, and level 4 average in post-training while the group with fins presented level 3 average in pre-training and level 4 average in post-training. The statistical difference was significant for both groups in pre- and post-training, (p=0,025). However no statistically significant change has been found between groups.

GRAPH 9. Comparison of the groups with and without fins in Pre-Training and Post-Training for the movements combined variable.

DISCUSSION

For the responses in the Langendorfer scale, statistically significant improvements have been found in the entrance in the water, respiratory control, position of the body, arms propulsion and recovery, action of the leg and movements combined. However, no statistically significant difference has been found between the groups during the training. Descriptively, however, it is possible to observe that the group with fins showed greater evolution than the group without fins for almost all of the variables studied for the learning process. Therefore, it is possible to say that for this study there has been learning of swimming skills.

BODY COMPOSITION

Table 1: Description and comparison of the body mass, abdominal circumference, sum of skin folds, body fat percentage, fat mass and thin mass; in pre- and post-training, the group using fins(GUF) and group without fins(GNF).

	GUF	GNF	Total
Body mass (kg)			
Pre	56 [54,1; 77,4]	54,1 [51,1; 70,8]	56,0 [53,2; 71,8]
Post	57,0 [55,0; 78,0]	55,0 [50,8; 71,5]	56,5 [54,2; 72,8]
Abdominal circumference (cm)			
Pre	83,3 [75,5; 105,4]	83,5 [79,1; 104,5]	83,5 [76,8; 105,4]
Post	84,7 [66,9; 112,0]	87,5 [80,8; 107,6]	87,5 [77,1; 108,4]
Sum of skin folds (mm)			
Pre	57,0 [44,5; 100,0]	80,0 [60,0; 100,0]	69,0 [44,5; 100,0]
Post	60,5 [45,5; 110,0]	96,0 [65,0; 113,5]	75,0; [45,5; 113,5]
Body fat percentage (%)			
Pre	16,4 [12,4; 31,2]	30,4 [20,8; 35,5]	19,7 [12,4; 35,5]
Post	17,5 [12,7; 33,2]	34,9 [22,1; 38,8]	21,3 [12,7; 38,8]
Fat mass (kg)			
Pre	9,2 [6,7; 26,6]	16,4 [10,9; 26,0]	11,1 [6,7; 26,0]
Post	9,9 [7,1; 28,2]	19,2 [11,8; 28,4]	12,06 [7,1; 28,4]
Thin mass (kg)			
Pre	47,4 [45,5; 52,7]	42,8 [40,2; 47,4]	46,0 [43,9; 50,4]
Post	48,4 [45,8; 51,9]	42,3 [39,1; 46,3]	47,1 [43,4; 50,0]

Data are shown in average form [quartile 1and 3].

DISCUSSION

According to the results presented in the table, it is possible to verify that, in spite of small changes found in values of abdominal circumference, sum of skin folds, body fat percentage, fat mass and thin mass, none of these variables have been shown to be statistically significant. In addition, no evidence of differences behave been found between groups in any stage of the training.

FINAL CONSIDERATIONS

The young DS patient is capable of learning the crawl stroke, even in limited time space. In addition, the group that used fins as a strategy of facilitation for learning has not shown difference in performance, when compared to the group that did not use this device. Finally, new studies should be conducted with a higher number of participants, in order to substantiate the results of the variables investigated, as well as programs of concomitant training and eating re-education should be developed for evaluating the effects in the health of this population.

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EFFECTS OF A SWIMMING PROGRAM, WITH AND WITHOUT FINS, IN THE LEARNING OF THE CRAWL STROKE AND BODY COMPOSITION OF YOUNG DOWN SYNDROME PATIENTS.

ABSTRACT

Today, obesity is a pathology that affects several countries, being considered a risk for the health. Young Down Syndrome (DS) patients have higher probability of becoming obese compared to the general population, due to cognitive and physical characteristics, therefore, physical activity programs for this population should be developed and tested to enable a higher daily caloric expense. The objective of this study is to analyze the effects of a swimming program, with and without fins, in the learning of the stroke crawl and body composition of young Down Syndrome patients. The group evaluated was formed by 7 young DS patients, with ages between 15 and 32 years, submitted to a swimming class program during three months, with 3 times weekly frequency, with duration of 50 minutes each and divided in 5 sets of 10 minutes, with the following exercises: fluctuation, breath, rhythm, balance and displacement. Pollock protocol (1985) was used to evaluate the body composition. Langendorfer and Bruya (1995)´s table of aquatic readiness was used for the analysis of the motor learning. Faced with the variables studied, improvements in the motor learning have been found, however, no evolution has been found in body composition with the program proposed.

KEYWORDS: Down Syndrome, Swimming, Learning

EFFETS D'UN PROGRAMME DE NATATION, AVEC ET SANS NAGEOIRES DANS L'APPRENTISSAGE ET LA COMPOSITION CORPORELLE DE JEUNES PATIENTS DU SYNDROME DE DOWN.

RÉSUMÉ

L'obésité est aujourd'hui devenue une maladie qui touche de nombreux pays et est considérée comme un risque pour la santé. Les jeunes, ayant le syndrome de Down (DS), sont plus susceptibles de devenir obèses en rapport à la population générale, en fonction de leurs caractéristiques physiques et cognitives ;donc des programmes d'activité physique auprès de cette population doivent être développés et testés pour offrir une meilleure dépense calorique quotidienne.Ce travail a pour but examiner les effets d'un programme de natation, avec et sans palmes, à l'apprentissage de la nage «crawl» et à la composition corporelle des patients atteints du syndrome de Down. Le groupe composé de sept jeunes patients de (SD), âgés de 15 à 32 ans, ont subi un programme de cours de natation de trois mois, avec une fréquence de trois fois par semaine, durée 50 minutes chaque cours et ont été divisés en 5 séries de 10 minutes, qui étaient composées de: fluctuation, respiration, rythme, équilibre déplacement. Pour l'analyse de la composition corporelle a été utilisé le protocole de Pollock (1993). Pour l'analyse de l'apprentissage motrice, on a appliqué la table de promptitude aquatique de Langendorf et Bruyas (1995). Devant les variables, on a observé des améliorations dans l'apprentissage motrice : toutefois, pour la composition corporelle, aucune évolution n'a été observée avec le programme proposé.

MOTS-CLÉS: Syndrome de down,natation, apprentissage.

EFECTOS DE UN NATACIÓN CON Y SIN ALETAS, ESTILO LIBRE EN EL APRENDIZAJE Y LA COMPOSICIÓN CORPORAL DE PACIENTES JÓVENES DE SINDROME DE DOWN.

RESUMEN

La odesidad es hoy en día una enfermidad que afecta muchos paises, que puede ser considerada un riesgo para la salud. Los jóvenes con Sindrome de Dawn (SD) tienen más posibilidades de convertirse en obesos con respecto à población general de acuerdo a su desarrollo físico y cognitivo, por lo tanto, programas de actividad física en esta población debe ser desarrollado y probado para permitir un mayor gasto calórico diario. El objetivo de este estudio fue examinar los efectos de un programa de natación, con y sin aletas, para aprender a gatear lo crawl y la composición corporal de los jóvenes pacientes con síndrome de Down. El grupo del evaluación consistió en 7 pacientes jóvenes con SD, con edad comprendidas entre los 15 y 32 que se sometieron a un programa de clases de natación con una duración de tres meses con una frecuencia de tres veces por semana, duración de 50 minutos cada y fueron divididos en 5 series de 10 minutos, que fueram compuestos por: flotación, respiración, ritmo, equilibrio y movimiento. Para el análisis de la composición corporal se utilizó el protocolo de Pollock (1985). Para el análisis del aprendizaje motor se aplicó la tabla de disposición acuática del Langendorfer e Bruya (1995). Teniendo en cuenta las variables estudiadas mejoras fueran encontradas en la aprendizaje motor, sin embargo, para la composición corporal ninguna tendencia se encontró para el programa propuesto.

PALABRAS-CLAVE: Sindrome de Down, Natación, Aprendizaje.

EFEITOS DE UM PROGRAMA DE NATAÇAO, COM E SEM NADADEIRAS, NA APRENDIZAGEM DO NADO CRAWL E COMPOSIÇÃO CORPORAL DE JOVENS PORTADORES DA SINDROME DE DOWN.

RESUMO

A obesidade é hoje uma patologia que afeta vários países, sendo considerada um risco para a saúde. Os jovens com Síndrome de Down (SD) têm maiores chances de se tornarem obesos em relação à população geral, em função das suas características físicas e cognitivas, portanto, programas de atividade física com esta população devem ser elaborados e testados para que possibilitem um maior gasto calórico diário. Objetivo deste trabalho foi analisar os efeitos de um programa de natação, com e sem nadadeiras, na aprendizagem do nado crawl e composição corporal de jovens portadores da Síndrome de Down. O grupo avaliado foi formado por 7 jovens portadores da (SD), com idade entre 15 e 32 anos que foi submetido a um programa de aula de natação com duração de três meses, com freqüência de 3 vezes por semana, com duração de 50 minutos cada e eram divididas em 5 séries de 10 minutos, sendo estes compostos por: flutuação, respiração, ritmo, equilíbrio e deslocamento. Para a análise da composição corporal foi utilizado o protocolo de Pollock (1993). Já para a análise da aprendizagem motora aplicou-se a tabela de prontidão aquática de Langendorfer e Bruya (1995). Diante das variáveis estudadas foram observadas melhoras na aprendizagem motora, entretanto, para a composição corporal nenhuma evolução foi verificada com o programa proposto.

PALAVRAS-CHAVE: Síndrome de Down, Natação, Aprendizagem.