04 - CONSEQUENCES OF A PROGRAM DIRECTED TO HEALTH, APPLIED IN PHYSICAL EDUCATION, ON ANTHROPOMETRIC MEASURES OF STUDENTS

AHÉCIO KLEBER ARAÚJO BRITO[1]
SÉRGIO LUIZ GALAN RIBEIRO[1]
ARIANE KAREY BEZERRA DA SILVA[1]
ALISSON ALVES SILVA[1]
NANCI MARIA DE FRANÇA[2]
1 - Universidade Federal do Piauí - Teresina – Piauí – Brasil
2 - Universidade Católica de Brasília – Brasília – DF – Brasil
ahecio@ig.com.br

INTRODUCTION

Overweight and obesity are risk factors for cardiovascular diseases and when acquired during adolescence tends to persist in adulthood with many consequences, is associated with increased blood pressure, changes in lipid profile and glicidio (SICHIERI; SOUZA 2008).

To assess the nutritional status it becomes necessary the use of efficient methods. Several studies using the anthropometric measures, such as: body mass, stature and the measures of the skin folds are used to evaluate the nutritional status and detect disturbances arising from body composition, in addition, hold great interest in research epimedilogics (Farias; SALVADOR 2005). In this sense, the measures of the skin folds are correlated with the amount of subcutaneous fat, the body that allows us to estimate the percentage of body fat located (CORTEZ; MARTINS 2012) being the most commonly used in epidemiological studies to triceps skinfold thickness (TST) and subscapular skinfold thickness (SST) (BAUER 2009) and subscapular skin fold can be used as an indicator of fat accumulation in the central region of the body (DUQUIA et al. , 2008) while the triceps skin fold indicates peripheral adiposity (CHIARA; SICHIERI; MARTINS 2003).

In Brazil, recent research shows prevalence of overweight and obesity among adults by detecting 48.5% and 15.8 %, respectively, and among adolescents 47% and 14% (BRAZIL, 2010). Given the prevalence of overweight and obesity among children and adolescents in Brazil and the importance of prevention of these diseases, the school, has been much used as a space for the realization of surveys of data about these diseases and to the necessary operations.

The regular practice of physical activity shows an inverse relationship with the risk of non-communicable diseases and has a positive effect on the quality of life of the people, being consensus of several authors that the health and quality of life of man can be preserved and enhanced by the regular practice of physical activities, from the perspective of physical fitness and health (BRITO, 2012). In This way, in the school environment, the classroom Physical Education is one of the most opportune moments to emphasize the relationship between the practices of physical activity with health.

Before the above, the aim of this study was to investigate the effect of a program directed to education in health, developed in physical education at school, on the anthropometric measures of students.

MATERIALS AND MÊTODOS

Characteristic of the study and sample selection

This study was characterized as experimental. The target population of the research relied on 3836 (three thousand, eight hundred and thirty three) students in the age range of 13 to 16 years, of both sexes, enrolled in the 9TH year of elementary school, in public schools urban municipal Teresina /Brazil. For selection of the sample was applied to the technique of probabilistic sampling by conglomerates, where, in the first stage were selected randomly 2 (two) schools of the total of 47 (forty-seven) existing in the city. In the second stage was done scaling the size of the sample with a random selection of components with the participation of all the students of the schools selected using the equations proposed by Barbetta (2006).

At the end of the sample size calculation the sample representative attended with 373 students (184 in school study and 189 in school control). Inclusion criteria were: 1) To be registered in the 9TH year of elementary school, 2) having availability to participate of interventions. Exclusion criteria were: 1) do not submit the free and informed consent form, 2) being pregnant or breastfeeding, 3) be in their plans leave the course or transfer to another school during the intervention, 4) being sick.

Measurement of anthropometric measures

Body mass was measured on a digital scale Plenna ® with maximum load of 150 kg and resolution of 0.01 g. The height was determined by means of a stadiometer of Seca® brand, with a resolution of 0.01 cm. For the purpose of analysis, it was considered as the mean of three measurements. The triceps skinfold thickness (TST) and subscapular thickness (SST) were measured using a caliper skin folds Cescorf skinfold caliper ®. All anthropometric measurements were measured as (PITANGA, 2005).

Implementation of the program in school physical education

In school study group(SG) was running a curricular program for physical education directed to education in health. The contents were organized and developed in two dimensions: a) conceptual: introducing concepts and principles related to health, such as: the concept of health, quality of life, citizenship, lifestyle, physical activity, physical exercise, physical fitness,effects of physical exercise on the body, the relationship of degenerative chronic diseases not with the practice of physical exercises, importance of acclimation control body among others, b) attitudinal: concerning motivation of values and attitudes that aimed to modify habits and behaviors of health negative. The contents were dispensed through theoretical exposure by the researcher using 15 (fifteen) minutes, from a total of 60 (sixty), classes (theoretical-practical), taking care to not modify the pedagogical proposal of the school and the practical content of the discipline (sports, games, different training methods, dances and fights). The intervention occurred in the academic year 2011.

In school control group (CG) the content covered during the classes was: knowledge about the physical fitness and sports, participation in recreational activities, games and sports collective. In this school were not implemented content of health education.

Ethical Care

These data are part of a research project that was previously approved by the Research Ethics Committee of the Universidade Federal do Piauí (CEP/Ophthalmologic Clinic) in 10 05/17/2010, certificate no. 0029.0.045.00 -10 and by the National Committee for Ethics in Research (CONEP) of the Ministry of Health. All responsible for students participating in the research signed the free and informed consent according to the resolution no. 196/96 OF the National Health Council (CNS) which regulates research involving human beings.

Statistical Analysis

To verify the normality of data distribution was used the Kolmogorov Smirnov test . The data are presented using descriptive statistics, using mean ± standard deviation. We used analysis of variance (ANOVA) Split Plot Design2 x 2 (CG x SG; pre-intervention x post-intervention) with post hoc Sheffe to investigate differences among and between the groups on the dependent variables of research. The significance level adopted was of $p \leq 0,05$.data were analyzed by means of the program Statistical Package for the Social Sciences for Windows, version 19.0.

RESULTS AND DISCUSSION

Initially presents the mean and standard deviation of age groups evaluated, it is worth mentioning that the age range of the study ranged from 13 to 16 years. The school study group (SG) points to the pre-test (13,78 ±0.80 years) and in the post-test (13.96 ±0.78 years), the school control group (CG) obtained (10.24 ± 0.99) nopre-test and (14.49 ± 0.77) in the post-test. It was observed that there was no significant difference in mean age at pre-test, as well as in the post-test, between the groups SG and CG, demonstrating homogeneity between groups in age.

Table 1 presents the results of anthropometric measurements body mass and height of the students evaluated before and after the intervention program in school physical education.

Table 1. Values corresponding to the pre-test and post-test control group CG (n= 189) and in the study group SG (n= 184) of body mass (BM) and height (H) of school children from Teresina/Piauí/Brazil.

Variables	Control Group		Study Group	
	Pre Mean±SD	Post Mean±SD	Pre Mean±SD	Post Mean±SD
BM (kg)	51,27±8,79 *	52,56 ±7.71§	51,05 ±10.52#	50,45 ±9.20
H (cm)	160,82 ±7.89	161,40 ±7.92	160,52 ±6.93	161,36 ±6.97

SD: standard deviation; p: level of significance (p< 0.05); * difference significant intra-group (p< 0.001); # significant difference intra group (p< 0.001); § intergroup significant difference (p< 0.001) {post control/post study}.

There was a significant reduction in body mass between the pre-and post-test in the study group, the group that received the intervention, in the control group there was a significant increase in body mass. Result intergroups showed statistically significant difference in the post-test. Others interventions showed a significant reduction of this variable (LOFRANO-PRADO et al. , 2009; MELLO et al. , 2011), however, there are studies that have found similar results (PARENTE; GUAZZELLI; RIBEIRO, 2006; CATTAI et al. , 2008).

The result of our study can is associated with the fact that the program for school physical education, based on information about health, must have modified habits and behaviors that influenced the body mass of students. There was no significant difference in stature, in both groups there was an increase in stature, so that, in this age adolescents are in a growth phase.

Table 2 shows the results of the variables: triceps skinfold thickness (TST) and subscapular skinfold thickness (SST).

Table 2. Values corresponding to the pre-test and post-test in the control group CG (n= 189) and in the study group SG (n= 184) of triceps skinfold thickness (TST) and subscapular skinfold thickness (SST) of schoolchildren from Teresina/Piauí/Brazil.

Variables	Control Group		Study Group	
	Pre Mean±SD	Post Mean±SD	Pre Mean±SD	Post Mean±SD
TST (mm)	11,24±5,10 *	12,21±9.42	12.53±5.89	12.10±5.68
SST (mm)	10.12±4.19#	10,98± 4.01•	10.95±5.40§	9.53±3.86

* significant difference between groups (p< 0.025) {pre control/pre study}; # difference significant intra-group (p< 0.001); § difference significant intra-group (p< 0.001); • intergroup significant difference (p< 0.001) {post control/post study}.

For TST, it was observed that the results of the pre-test of the study group and the control group showed significant differences, however, there was no statistically significant difference intragroup. In SSTobtained significant differences intra-group, in the control group there was an increase in the study group and a reduction between the pre- and post-test and intergroups there was no significant difference in the post-test.

Studies that demonstrate the effects of an intervention program with focus on physical exercise or based on information with emphasis on encouraging the practice of physical exercises and food education about the triceps skin fold (TSF) and subscapular (SST) found significant results (KNEW; SAINTS; RIBEIRO, 2004; OLIVEIRA FILHO; SHIROMOTO 2001), on the other hand, others do not evidenced any amendment (SALLIS et al. , 1993; CABALLERO et al. , 2003).

In this study, the effect of the intervention was positive for SSTand not for TST. We believe that the intervention program has increased the level of physical activity among adolescents who had influence in central adiposity, a time that, second Duquia et al. , (2008) which compared the epidemiology of TST and SST high on demographic characteristics, behavioral and biological of adolescents identified that the low level of physical activity was associated with central adiposity (SSThigh), however, there was no association with the peripheral adiposity (TSThigh).

CONCLUSION

The present study showed results with significant differences between the pre- and post-test with reduction for the study group and increase for the control group in the variables: body mass (MC) and subscapular skin fold (SSF). For triceps skinfold thickness (TST) there was a trend of improvement in the results of the study group the same did not occur in the control group. It can be seen that the intervention program in school physical education, directed education in health, positively influenced on the anthropometric measures of students .

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Rua Dr. Mario Teodomiro Carvalho, 1555 -
Bairro Ininga–Teresina – PI CEP 64049-820
e-mail: ahecio@ig.com.br

CONSEQUENCES OF A PROGRAM DIRECTED TO HEALTH, APPLIED IN PHYSICAL EDUCATION, ON ANTHROPOMETRIC MEASURES OF STUDENTS

ABSTRACT

The objective of this study was to investigate what the consequences of a program directed to education in health, developed in physical education, on anthropometric measures of students. This is an experimental study with students from 13 to 16 years (14.03± 0.93), of both genders, in the city of Teresina/Brazil. The sample was composed of 373 students (184 school study and 189 school control). The measures assessed were: body mass (MC), stature (AND), triceps skinfold (TSF) and subscapular (DCS). The intervention occurred in the study group and consisted in a program for physical education with content organized in a) conceptual dimensions: concepts related to health and b) attitudinal aspects: motivation of attitudes that aimed to modify negative behavior of health. In the control group the contents were addressed on physical fitness and sports. The statistical treatment used the test Split-plot ANOVA with post hoc comparisons Sheffer for intragroup and intergroup. The level of significance was p<0.05. The body mass (MC) presented reduction with statistically significant difference (51,05 /50.45: p< 0.001) intra-group in the study group and in the control group there was a significant increase (51.27/ 52,56; p< 0.001), for triceps skinfold thickness (TSF) there was no significant difference between the pre control intergroups and the pre study (11.24/12.53: p< 0.025), in subscapular skin fold (DCS) there was a significant increase in intra-group control group (10,12/ 10,98; p< 0.001) and significant reduction in the study group (10.95/ 9.53; p< 0.001), there was also a significant difference between the intragroup post control and the post study (10,98/ 9.53; p< 0.001) .It was concluded that the program positively influenced on the anthropometric measures of students.

KEYWORDS: Program of health education, physical education.

CONSEQUENCESD'UN PROGRAMME DE EDUCATION EN SANTE, APPLIQUEEDANS LA CLASSE DE EDUCATION PHYSIQUE,SUR DES MESURES ANTHROPOMETRIQUESDES ÉTUDIANTS

RÉSUMÉ

Le but de cette étude était d'étudier les conséquences d'un programme destiné à l'éducation en santé, développé pendant les cours d'éducation physique, sur des mesures anthropométriques des élèves. Il s'agit d'une étude expérimentale avec des élèves 13-16 ans (14,03 ± 0,93), des deux sexes, de Teresina / Brésil. L'échantillon était composé de 373 élèves (184 école expérimentale et 189 de l'école temoin). Les mesures qui ont été prisessont les suivantes: masse corporelle (MC), la hauteur (H), pli cutané du triceps (PCT) et sous-scapulaire (PCS). L'intervention a eu lieu dans le groupe expérimentale et consistait d'un programme d'éducation physique contenant a) les dimensions conceptuelles: concepts en matière de santé et b)les dimensions comportementales: la motivation et les attitudes qui visent à modifier les comportements néfastes pour la santé. Chez les sujets du groupe témoin, le programme versait sur la condition physique et le sport. Le test statistique utilisé l'analyse de variance Split-plot et poshoc Sheffer pour les comparaisons intra-groupe et inter-groupe. Le niveau de signification

était p<0,05. La masse corporelle (MC) a montré une réduction statistiquement significative (51.29 / 50.45: p <0,001) dans le groupe expérimental, cependant,dans le groupe contrôle il y avait une augmentation significative (51,27 / 52,56, p <0,001) , pour le triceps (PCT) a été importante différence inter-groupe avant l' experimentation (11,24 / 12,53: p <0,025), le pli cutané sous-scapulaire (PCS) a augmentaté significativement dans le groupe de contrôle (10,10/ 12,98, p <0,001) et une réduction significative dans le groupe d'étude (10,95 / 9,53, p <0,001), il y avait aussi importante différence inter-groupe a posteriori l'experimentation (10,98 / 9,53 p <0,001). En conclusion le programme a eu une influence positive sur les mesures anthropométriques des élèves.

MOTS-CLÉS: programme d'éducation en santé, l'éducation physique escolaire.

CONSECUENCIAS DE UN PROGRAMA DIRIGIDO A LA SALUD, APLICADA EN LA EDUCACIÓN FÍSICA EN LAS MEDICIONES ANTROPOMÉTRICAS DE LOS ESTUDIANTES.

RESUMEN

El objetivo de este estudiofue investigar lasconsecuencias de un programa dirigido a laeducación de lasalud, desarrolladoenlaeducación física enlasmediciones antropométricas de losestudiantes. Se trata de unestudio experimental conestudiantes de 13 a 16 años (14,03 ± 0,93), de ambos sexos, de Teresina / Brasil. La muestraestudio conformada por 373 estudiantes (184 escuelas y 189 delestudio de control de laescuela). Se evaluaronlas medidas: de masa corporal (BM), la altura (AND), plieguecutáneo tricipital (TSF) y subescapular (DCS). La intervención se produzioenel grupo de estudio y consistióenun programa de educación física concontenido organizado enlas dimensiones conceptuales): conceptos relativos a lasalud y b) actitudes: motivar actitudes que apuntado a modificar comportamientos negativos para lasalud. Enlossujetosdel grupo de control tratados fueron acerca de laaptitud física y el deporte. El test estadístico utilizóelanálisis de varianza de parcelas divididas conel post Sheffer hoc para comparacionesintragrupales e intergrupales. El nivel de significaciónfue de p <0,05. La masa corporal (BM) mostró una reducciónestatísticamente significativa (51,29 / 50,45: p <0,001) enel grupo de estudio e intra-grupoenel grupo de controlhuboun aumento significativo (51,27 / 52,56, p <0,001) alplieguedel tríceps (TSF) era diferencia intergrupo significativas entre elcontrol y estudio de pre (11,24 / 12,53: p <0,025), elplieguecutáneo subescapular (SSF) produjoun aumento significativo enel interior del grupo grupo de control (10 , 12/10, 98, p <0,001) y una reducción significativa enel grupo de estudio (10,95 / 9,53, p <0,001), tambiénhubo diferencia significativa entre los grupos entre el poste y elestudio de control de poste (10,98 / 9 53, p <0,001). Conclusión de que el programa ha tenido una influencia positiva enlas medidas antropométricas de losestudiantes.

PALABRAS CLAVE: Programa de educación para La salud, La educación física.

CONSEQUÊNCIAS DE UM PROGRAMA DIRECIONADO À SAÚDE, APLICADO NA EDUCAÇÃO FÍSICA, SOBRE MEDIDAS ANTROPOMETRICAS DOS ESTUDANTES

RESUMO

O objetivo deste estudo foi investigar quais as consequências de um programa direcionado à educação em saúde, desenvolvido na educação física, sobre medidas antropométricas dos estudantes. Trata-se de um estudo experimental com estudantes de 13 a 16 anos(14,03±0,93), de ambos os sexos, da cidade de Teresina/Brasil. A amostra foi constituída por 373 estudantes (184 escola estudo e 189 escola controle). As medidas avaliadas foram: massa corporal (MC), estatura (E), dobras cutâneas tricipital (DCT) e subescapular (DCS). A intervenção ocorreu no grupo estudo e consistiu em um programa para a educação física com conteúdos organizados nas dimensões a) conceitual: conceitos relativos à saúde e b) atitudinal: motivação de atitudes que visou modificar comportamentos negativos de saúde. No grupo controle os conteúdos abordados foram sobre aptidão física e esportes. O tratamento estatístico utilizou o teste Split-plot ANOVA com post hoc de Sheffer para comparações intragrupo e intergrupos. O nível de significância adotado foi p<0,05. A massa corporal (MC) apresentou redução com diferença estatisticamente significativa (51,29/50,45: p<0,001) intragrupo no grupo estudo e no grupo controle ocorreu um aumento significativo (51,27/52,56; p<0,001), paradobra cutânea tricipital (DCT) houve diferença significativa intergrupos entre o pré controle e o pré estudo (11,24/12,53: p<0,025), na dobra cutânea subescapular (DCS) ocorreu um aumento significativo intragrupo no grupo controle (10,12/10,98; p<0,001) e redução significativa no grupo estudo (10,95/9,53; p< 0,001), houve também diferença significativa intragrupos entre o pós controle e o pós estudo (10,98/9,53; p<0,001).Concluiu-se que o programa influenciou positivamente sobre as medidas antropométricas dos estudantes.

PALAVRAS-CHAVE: Programa de educação em saúde, educação física escolar.