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ANALYSIS OF INFLUENCE OF BACKPACK IN BALANCE IN SCHOOL CHILDREN

[2]Ricardo Santana Braga, [2] Raphaela de Souza Alvarenga, [2]Eric Leal, [3]Flávia Porto, [1]Pedro Paulo Soares, [1,2]Jonas Lírio Gurgel
[1]Stricto Sensu Post Graduation in Cardiovascular Sciences, Medical Science Center, Fluminense Federal University, UFF, Niterói/RJ, Brazil [2]Biomechanics Research Group – GPBIO, Institute of Physical Education, UFF, Niterói/RJ, Brazil [3]Stricto Sensu Post Graduation in Exercise Sciences and Sports, Gama Filho University, UGF, Rio de Janeiro/RJ, Brazil;; email: ricardobraga.edf@gmail.com

SUMMARY

The aim of this study was to evaluate the changes in balance in eutrophic children, overweight and obese through stabilometry, with and without backpacks. The study was conducted with a sample of 11 children, 7 boys and 4 girls with a mean age (years) 9 + 1.01, body mass (kg) 38.9 + 11.17, height (m) 1, 41 + 0.12, BMI (kg / m²) 19.27 + 2.90. Balance assessment was made by stabilometry from a force platform, considered the displacement of the center of pressure (COP) under the influence of assessed implement the backpack with a standard load (2.98 kg), based on average backpack mass of the volunteers.

The results suggest a significant increase in the COP displacements in the medial-lateral axis for eutrophic children when using backpacks and a significant increase for overweight children compared to the maximum displacement in the anterior-posterior axis.

INTRODUCTION

The use of backpacks covers almost all of the children who attend the school. The scope of the use of such material by schoolchildren is by its utility, since the bags are presented as a suitable device for transporting loads in the column next to and symmetric shape while maintaining stability. (VOLL; KLIMT F, 1977).

The habit of using backpacks fit, combined with bad posture habits as the main cause of spinal diseases in children, even if these are considered multifactorial (COTTALORDA et al, 2004), being the excess weight of the backpacks and time exposure to the load frames commonly associated with back pain (Jacobs, 2002; MACKENZIE et al, 2003; RENEMAN et al, 2006). Thus, the use of backpacks can be interpreted as a change in the normal postural control in children and can have varying effects on individuals eutrophic or are obese and with different levels of physical activity due to the change in center of gravity caused by the implement load of the backpack on the back of the body, so that there is a displacement around the base supporting, or the support area of the feet (LANES, Gauron, Spratt, WERNIMONT; FOUND WEINSTEIN, 1995)

METHODS

We evaluated 11 children (7 boys and 4 girls) with age (years), mean 9 + 1.01, body mass (kg) averaged 38.9 + 11.17, height (m) averaged 1.41 + 0, 12, BMI (kg / m²) averaged 19.27 + 2.90. Stabilometric The data were collected using a platform built by the Group of Biomechanics Fluminense Federal University (UFF-GPBIO), as suggested by Alvarenga et. al (no prelo). The design of the data collection was carried out according to a protocol that contained a total of six samples for each individual, three of these being made with the use of the backpack and the other three without the implement. The order in which the data were collected in both conditions was randomized.

The load carried in his backpack during testing was calculated using the average of the values of the mass of the backpack of all children on the test day (2.98 kg) was established that volunteers execute the tests without any footwear that kept upright posture They were also instructed to maintain the highest possible level of stability, keeping his gaze fixed on a point two meters from the established force platform with feet positioned at 30 degrees throughout the test period. The position of the feet was directed by marking made on the surface of the platform as the aid of a protractor.

In the case of this study the protocol adopted considered the duration of the tests in a minute for each collection on the platform, followed by a minute of rest after each repetition. During the resting time the children were instructed to remain standing without support of any other surface.

The data collected through the force platform were analyzed with the aid of the SAD 2 (32-bit) 2.61.07 for Windows mp.

The software used for statistical analysis was SPSS 17.0 for windows, New York, USA. To verify the normal distribution of data was applied the Shapiro-Willk and to compare groups we used the paired t test for non-parametric samples for the amplitude in the x and y axes, the Friedman test for comparison of non-parametric variables and One-Way ANOVA for parametric variables. The value assumed significance for all tests was set at $p < 0.05$.

RESULTS AND DISCUSSION

The results presented in the table 1 show a statistically significant difference for the maximum amplitude values on the x axis (Δx) in the group of eutrophic conditions when compared with and without backpack, was also observed that there was significant difference in the

maximum values found in the x-axis, indicating an increase in the medial-lateral displacement to the eutrophic group for the two conditions, the test applied to variable corresponding to the minimum values of x (MinX) also returned results significant for both groups in both conditions and the minimum values found at the y-axis (MinY) represent a significant increase in COP for posterior displacement of the obese group. The parameters investigated in the study suggested a greater influence implement the backpack in the group of normal individuals.
lay-out.

CONCLUSIONS

The results of this study show that there was variation in static equilibrium between the two conditions, with and without backpack, more significant for the normal-weight group.

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Table 1: ΔX, MaxX, MinX, MinY, MinX (Volts) with (Bp) and without backpack(Wbp)

Groups	**Δx Bp/Wbp**	**MaxX Bp/Wbp**	**MinX Bp/Wbp**	**MinY Bp/Wbp**
Obese / Overweight	5,06± 1,5 / 5,6 ± 3,7	2,97± 1,4/ 2,95 ± 2,0	-6,2 ± 2,0¥/ -7,32 ± 3,5¥	-2,23± 0,9* / -2,65 ± 2,5*
Normal weight	7,26 ± 2,50*/ 8,53 ± 3,0*	3,81 ± 0,8* / 4,58 ± 1,8*	-7,77 ± 1,5 */ -1,08 ± 5,5*	-3,4 ± 0,9/ -4,09 ± 2,3

* Significant difference in normal weight group with and without backpack ($P \leq 0.05$)

¥ Significant difference in Obese / Overweight group with and without backpack ($P \leq 0,05$)