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The effect of swiss ball and wobble board training on coordination of school going boys

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Abstract

This pilot study focused on assessing the impact of Swiss ball training and wobble board training on coordination among a group of schoolboys. The study involved a total of thirty boys aged 13 to 15, enrolled in the 8th and 9th grades at S.G.V.P. International School. These participants were randomly assigned to three groups: ten boys in the Swiss ball training group (Group A), ten boys in the wobble board training group (Group B), and ten boys in the control group (Group C). Coordination was assessed via the 'foot-eye coordination test.' The training program for this pilot study had a duration of 2 weeks, with the experimental groups receiving training sessions 3 days a week. To analyze the gathered data, statistical assessments were conducted using ANCOVA to ascertain significant differences between the pre- and post-training data. The level of significance was 0.05 level. The adjusted mean scores of groups A, B, and C were 9.705, 9.505, and 10.176 for coordination with an F value of 4.651. The gathered data disclosed that significant differences exist between the pre and post-test means of the Swiss ball training group and wobble board training group on coordination.

Keywords: Swiss ball, wobble board, coordination, foot-eye coordination test

Introduction

Physical education plays a pivotal role in preparing students for careers as athletic trainers in a multitude of settings, which may include professional sports, colleges, high schools, and industry. This educational discipline focuses on promoting fitness and well-being, encompassing the physical health of individuals. Students are exposed to a variety of physical activities and participate in training and exercise programs designed to enhance their skills. The specific content and structure of physical education programs can vary internationally, but when delivered effectively, physical education classes can yield positive outcomes for students in terms of their health, behavior, and academic performance.

The application of scientific methods and techniques has resulted in the creation of efficient training methodologies, which are widely adopted by sports coaches worldwide. In order to guarantee the efficacy of training, coaches must possess a thorough comprehension of every facet of the training process, encompassing factors such as the workload and its influence on the particular muscle groups targeted for enhancement.

Swiss balls are big, soft, elastic inflatable balls, typically measuring between 35 to 85 cm in diameter. They go by several names, including Pilates ball, exercise ball, stability ball, and gym ball. In contemporary times, Swiss ball exercises have gained extensive popularity on a global scale, finding application in diverse settings, from professional training establishments to aerobic classes. They are commonly employed in various contexts, including athletic training, exercise programs, and physical therapy sessions.

Wobble boards are specially designed with a less stable drum or ball beneath a flat surface, creating a challenging environment for balance. This instability serves to not only assess our balance but also actively engages both muscles and proprioception as body and mind adjust to the dynamic surface. A notable advantage associated with the use of a wobble board is the enhancement of functional strength since all muscles must collaborate, and no single muscle can operate in isolation.

Coordination refers to the body's capability to perform movements that are both clean and effective. It encompasses the athlete's skill in integrating numerous movements into a seamless, unified motion to accomplish a specific goal. In the context of foot-eye coordination, it involves our feet executing the intended movements in response to our eye's guidance.

Purpose of the study

The objective of this pilot study was to assess alterations in coordination among students using a training regimen that incorporates both Swiss ball and wobble board exercises.

Selection of the subjects

This pilot research study exclusively targeted secondary school students, specifically thirty boys aged between 13 to 15 years old, hailing from the 8th and 9th grades of S.G.V.P. International School. These participants were randomly selected to partake in the pilot research study, subsequently divided into three groups, each comprising ten students. Among these groups, the first two were designated as experimental groups, focusing on Swiss ball training and wobble board training, respectively, while the third group was assigned as the control group.

Criterion of measurement

No	Variable	Tests	Measurement
1	Coordination	Foot-eye coordination test	Seconds

Design of the study

In this pilot study, a total of thirty subjects were randomly selected to participate and subsequently divided into three groups labeled as Group A, Group B, and Group C. The first two groups served as the experimental groups, with Group A undergoing Swiss ball training, Group B receiving wobble board training, and Group C designated as the control group. Each group comprised 10 students. Before commencing the entire training program, all subjects underwent a 2-day adaptation program to familiarize themselves with the Swiss ball and wobble board training routines. The training program spanned a duration of two weeks, with training sessions held three days a week. Prior to each training session, subjects engaged in 20 to 25 minutes of warm-up and stretching exercises, followed by 10 to 15 minutes of cooling down exercises upon completion of each session. Data collection encompassed pre-test and post-test assessments for all three groups, conducted both before and after the two-week training program for the experimental groups. Coordination of the school boys was evaluated by the 'foot-eye coordination test'.

Statistical procedure

Table 1: Analysis of the pre and post test data and 'F' ratio on foot-eye coordination of swiss ball training group, wobble board training group and control group

Test	Group			ANOVA, ANCOVA TABLE			
	A	B	C	SS	df	MSS	F
Pre-test mean	9.950	10.223	10.155	0.404	2	0.202	0.219
				24.903	27	0.922	
Post-test mean	9.560	9.609	10.218	2.687	2	1.344	1.328
				27.328	27	1.012	
Adjusted mean	9.705	9.505	10.176	2.374	2	1.187	4.651*
				6.634	26	0.255	

Significant Level at 0.05 (2, 27) = 3.354 & (2, 26) = 3.369

The pre-test mean scores for Groups A, B, and C were 9.950, 10.223, and 10.155, respectively. The ANOVA revealed that there was no statistically significant difference among the pre-test means, as indicated by a non-significant F value of 0.219 (df = 2, 27; $p > 0.05$). After the intervention, the post-test mean scores for Groups A, B, and C were 9.560, 9.609, and 10.218, respectively. The ANOVA table showed that there was no statistically significant difference among the post-test means, with an F value of 1.328 (df = 2, 27; $p > 0.05$).

However, when the means were adjusted for covariates, the adjusted mean scores for Groups A, B, and C were 9.705, 9.505, and 10.176, respectively. The ANCOVA revealed a statistically significant difference among the adjusted means, with an F value of 4.651 (df = 2, 26; $p < 0.05$).

Table 2: Analysis of the least significant difference

Mean			MD	CD
A	B	C		
9.705	9.505		0.200	0.464
9.705		10.176	0.471*	
	9.505	10.176	0.671*	

Significant level at 0.05

Post hoc tests were conducted using the Least Significant Difference (LSD) method to determine which group(s) differed significantly from each other. The LSD results showed that Group A had a significantly higher adjusted mean score compared to Group C, with a mean difference (MD) of 0.471 and a critical difference (CD) of 0.464. Similarly, Group B had a significantly higher adjusted mean score compared to Group C, with a MD of 0.671 and a CD of 0.464. However, there was no significant difference between Groups A and B, with a mean difference (MD) of 0.200 as the MD and CD values were not statistically significant ($p > 0.05$).

Conclusion

The results of the foot-eye coordination test suggest that there was no significant difference among the groups based on the pre-test and post-test means. However, after adjusting for covariates, there was a statistically significant difference among the groups, with Swiss ball training group and wobble board training group showing higher adjusted mean scores compared to control group. In this pilot study, the two-week Swiss ball training program and wobble board training program resulted in a significant enhancement in coordination among the chosen participants.

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