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## The effects of wobble board and swiss ball training on the variable of abdominal strength among school students

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### Abstract

The aim of the present study was to investigate the effects of wobble board and swiss ball training on the variable of abdominal strength among school students. A random group design was adopted for the study. Forty-five (N=45) student from seventh and eighth standard were selected as subjects on random basis and their age ranging between 13 to 14 years. The students were selected from the Government Model Senior Secondary School Sector-56, Chandigarh. Pre-test was conducted on the motor fitness variable of abdominal strength. An Experimental Group-I was exposed to wobble board training, where as the other experimental group-II was exposed to swiss ball training, control group was not exposed to do any specific training other than their daily routine activities. The training was given for six days a week for duration of twelve weeks. The Analysis of Covariance (ANCOVA) technique was used to test the adjusted post- test mean difference among school students on the variable of abdominal strength. After the twelve weeks, ANCOVA indicated that there was a positive effect of training on abdominal strength and the P-value (Sig.)00 was found lesser than.05 level of significant ( $P < 0.05$ ). The result revealed that a significant differences have been observed among school students of different groups namely; wobble board, swiss ball and control group on the variable of abdominal strength.

**Keywords:** Abdominal strength, wobble board, swiss ball and control group

### Introduction

Motor fitness is the most often used and well connected with physical fitness by the coaches. It is very important for the students of physical education to understand the prevalent basic difference between the physical fitness and motor fitness. Physical fitness is used to denote only the five basic fitness components *viz.* muscular strength, muscular endurance, cardiovascular endurance, freedom from obesity and flexibility, whereas motor fitness is a more comprehensive term, which includes motor performance components power, speed, agility, balance and reaction time important mainly for the success in sports. In other words, motor fitness refers to the efficiency of basic movements in additional to the physical fitness (Kansal, 1996) [7]. Physical educators, exercise physiologists and physicians have proposed many tests to demonstrate the effect of such programs. Training is a pedagogical process, based on scientific principles, aiming to prepared sportsmen for higher performance in various sports competitions (Singh, 1991) [8]. Training is a systematic process extending over a long period of time. For achieving best results the system of training has to be based and conducted on scientific facts and lines. Where it is not possible to do that, the training has to be based on the results of successful practice which has withstood the test of time. Abdominal muscles are comprised of four muscle groups: the internal and external oblique's running diagonally from the lower ribs to opposite hip, which twist the trunk; the rectus abdominis, running from your pubic bone to your lower ribs, which flexes the spine; and the transverse abdominis, a flat sheath of muscles running across the torso which acts as a muscular girdle to support the contents of the abdomen. Blackburn *et al.* (2000) [3] reported that strength contributes to balance by producing muscle stiffness (resistance to muscle lengthening), which could enhance neuromuscular control by increasing proprioceptor sensitivity to strength and reducing electromechanical delay from the muscle spindle stretch reflex. A better understanding of the factors associated with balance performance in other populations is needed in order to develop training programs for those with balance deficiencies.

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**Methodology**

The study was conducted on forty five (N=45) students from Government Senior Secondary School, Sector-56, Chandigarh aged between 13 to 14 years. A random group design was adopted for the study and all the subjects were randomly divided in to three groups and each group had fifteen (N=15) subjects respectively An Experimental Group-I was exposed to wobble board training, where as the other experimental group-II was exposed to swiss ball training, control group was not exposed to do any specific training other than their daily routine activities. The experimental duration was of 12 weeks and after the experimental treatment, all the subjects were measured on the selected motor fitness parameter. The final test scores formed as Post-test scores of the subjects. Abdominal Strength measurements were taken with Sit-ups test (AAHPER, 1965) [1]. The Analysis of Covariance (ANCOVA) at 0.05 level of significance was applied.

**Results**

The data collected was analyzed by using descriptive statistics and scores of post mean of abdominal strength was presented in table-1

**Table 1:** Descriptive Statistic of Abdominal Strength of Three Different Groups of School Students

Groups	Pre-test		Post-test		Adjusted Mean
	Mean	SD	Mean	SD	
Wobble Board Group	40.00	5.73	49.60	5.67	48.22
Swiss Ball Group	35.93	6.48	44.13	5.13	44.08
Control Group	31.40	6.99	35.26	5.62	36.69

Table 1 revealed Pre-test mean, Pre-test SD, Post-test mean, Post-test SD, and adjusted mean of three different groups namely; wobble board group, swiss ball group and control group. The Pre-test mean & SD of wobble board group was 40.00+5.73, Pre-test mean & SD of swiss ball group was 35.93+6.48 and Pre-test mean & SD of control group was 31.40+6.99. Post-test mean and SD of wobble board group, swiss ball group and control group were 49.60+5.67, 44.13+5.13 and 35.26+5.62 respectively. The adjusted mean of wobble board group was 48.22, adjusted mean of swiss ball group was 44.08 and adjusted mean of control group was 36.69.

**Table 2:** Analysis of Co-Variance in Abdominal Strength Test of Three Different Groups of School Students

	SS	Df	MSS	F value	Sig. (p-value)
Treatment	779.99	2	389.99	14.79*	.00
Error	1080.53	41	26.35		

\*Significant at.05

Table 2 indicated that sit ups test perform for abdominal strength among school students of different groups, namely; wobble board group, swiss ball group and control group was significant because the p-value (Sig.).00 was found lesser than.05 level of significant ( $P < 0.05$ ).

Since the obtained P-value was found significant, therefore, least significant difference (LSD) post hoc test was also employed to find out the significance pair wise difference existed among three groups. The results of LSD Post-hoc test have been presented in table-3.

**Table 3:** Pair Wise Mean Comparison in Abdominal Strength of Three Different Groups of School Students

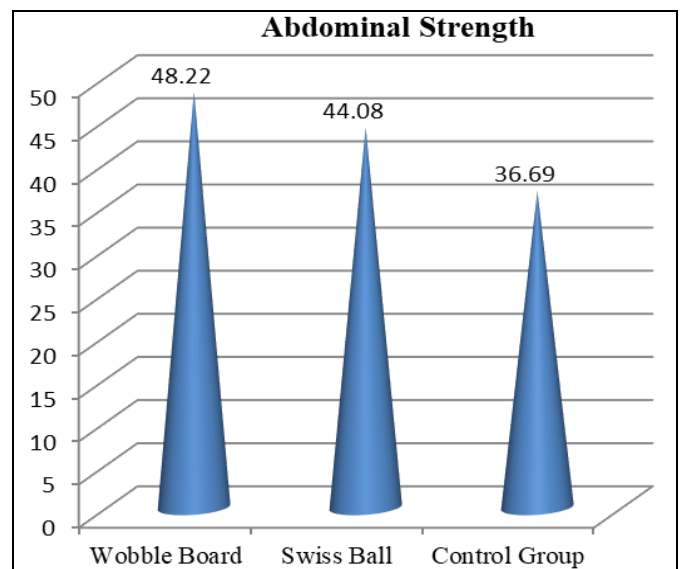
Wobble board	Swiss ball	Control group	Mean difference	P-value
48.22	44.08	-----	4.14	.03*
48.22	-----	36.69	11.53	.00*
-----	44.08	36.69	7.39	.00*

\*Significant at.05

Table-3 shows the mean difference between among wobble board and swiss ball of school students was found.4.14. The P-value (Sig.).03 revealed that wobble board training students had exhibited better abdominal strength demonstrated significantly than swiss ball training after imparting 12 weeks of training.

The mean difference between wobble board and control group school students was found 11.53. The P-value (Sig.).00 revealed that wobble board students had exhibited better improvement in abdominal strength demonstrated significantly than their counterpart control group.

The mean difference between swiss ball and control group school students was found 7.39. The P-value (Sig.).00 revealed that swiss ball students had exhibited better improvement in abdominal strength demonstrated significantly than their counterpart control group.



**Fig 1:** Graphical Representation of Mean Scores With Regard to School Students on the Variable Abdominal Strength

**Discussion**

The pre- and post-test scores of the subjects in the three different groups on abdominal strength were compared to determine if there were any changes between the groups and within each group. This was done in order to determine whether the wobble board training or swiss ball training program had any effect on the subjects' abdominal strength performance. Pre-test for abdominal strength was conducted seven days before the training and Post-test was conducted on the very next day on completion of twelve weeks training program.

It is evident from the above results of table 1 that significant differences have been observed among school students of different groups namely; wobble board, Swiss ball and control

group on the variable abdominal strength. The above results indicate that after giving twelve weeks of wobble board and swiss ball training programme, there is significant improvement in abdominal strength among school students. Chandel (1993) <sup>[4]</sup> reported that tribal students were found to be superior on physical fitness variable as significant mean difference was found in their favour in sit-ups. Hammami *et al.* (2018) <sup>[5]</sup> concluded that biweekly strength training improves key components of performance in junior soccer players relative to standard in-season training. Balaji *et al.* (2016) <sup>[2]</sup> found that there was a significant improvement on leg strength and cardio respiratory endurance due to core stability swiss ball exercises.

### Conclusion

It is concluded from the result that that significant differences have been observed among school students of different groups namely; wobble board, swiss ball and control group on the variable abdominal strength.

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