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Effects of Swiss ball training on selected physical fitness components among the postural deformities of school Children

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Abstract
The purpose of the study was to find out the effects of swissball training on selected physical fitness components among the postural deformities of school children. To achieve the purpose of the study, forty postural deformities of school children were selected randomly 9 to 14 years of age from different government and private school at Coimbatore. The selected subjects were divided into two equal groups namely experimental and control groups of 20 subjects each. The training period was limited to twelve weeks and for three days per week. The swissball training was selected as independent variables and Speed, Strength, Flexibility, Agility and Balance were selected as dependent variables and it was measured by 50 meters dash, 1RM test, sit and reach, Shuttle run(6X10) and flamingo balance test respectively. All the subjects were tested two days before and immediately after the experimental period on the selected dependent variables. The obtained data from the experimental group and control group before and after the experimental period were statistically analyzed with dependent 't'-test to find out significant improvements. The level of significance was fixed at 0.05 level confidences for all the cases. Significant improvement was found on speed, strength, flexibility, agility and balance of experimental group due to the effects of swissball training when compared to the control group.

Keywords: Speed, strength, flexibility, agility and balance

Introduction
Interest in core steadiness coaching and the use of Swiss balls has improved dramatically in current times. Historically, the Greek logician Galen wrote that workout with a ball "is capable to provide the most extreme exercising and the gentlest relaxation (Sweet., 1987). Since the late 1980s, education programs outlining the advantages of Swiss ball training have seemed in both the therapeutic and athletic conditioning sectors (Fuller., 2002). Proponents of Swiss ball training argue that such training enhances neuromuscular pathways, leading to greater strength, proprioception, and balance (Check., 1999). Hence, Swiss balls are commonly used in both athletic therapy and conditioning settings (Bartonietz., 1998). Suggest adaptations from Swiss ball training are likely to result in better coordination of synergistic and stabilizer muscles. However, while anecdotal evidence from training journals and the popular press suggests Swiss ball training is effective, there is little empirical data available to support the efficacy of Swiss ball training (Rutherford and Jones 1986).
While a Swiss ball routine may have both aerobic and anaerobic benefits, depending on the intensity, duration, and the frequency with which the exercises are performed, Swiss ball training is not a substitute for either type of exercise. The Swiss ball is an ideal supplement to an existing training program, such as yoga or Pilates, which promote greater strength and flexibility in a safe and controlled physical setting.
Physical fitness is a systematic process extending over a long period. For 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 sport. The physical fitness on condition is the namely, speed, strength, agility, explosive power, flexibility, cardio respiratory endurance and coordinate abilities.

These all motor abilities and their complex forms are the basic requirement for human motor actions. Therefore, the sports performance in all sports depends to a great extent on these abilities. The improvement and maintenance of physical fitness of condition is perhaps the most important aim of physical training.

Posture

Posture is the correct alignment of all the body segments (Shyam Anand) it is difficult to define posture in absolute terms because it varies from person to person. The concept of posture varies with an actor, an artist and sportsmen. In a multi segmented and most complicated structure like the human body we cannot conceive of only one single posture in performing different activities, with different purposes in different body positions. In sitting, lying, standing, walking, running, throwing, jumping, climbing etc. the alignment of various parts of the body is different so are the postures resulting from movement mechanics. In other words, different require the body to adopt different posture most suitable to the performance of related skills in the respective movements. In simple words, posture signifies movement defines posture however posture is usually defined as a relative arrangement body parts or segments or as accustomed position which enable the body to function effectively (M.L. Kamlesh) a posture indicates the right body position so assumed while performing an action or otherwise that there is economy of effort and optimal gain in efficiency.

There are sitting, lying, standing(static posture) and walking running (dynamic posture) all this have bearing on our activities and they have a great impact on our total body and wellbeing to a great extent in these positions as in others, we require to alter our body alignment when we get tired of keeping ourselves in a single position for a prolong period we can't sit crossed legged or on a chair keep reclining on the left or right side or standing at attention all the time we change our position or shift our body weight from one side to the other so that we are not tired and stress is not occurred. Walking is the only movement in a single skill or activity.

Methodology

For the purpose of this study, altogether forty postural deformities of school children were selected randomly 9 to 14 years of age from different government and private school at Coimbatore. Their age group ranges from 9 to14 years. They were divided into two groups of 20 each. The Experimental group I would undergo swissball training. The second group Control group did not undergo any training program. Pre – test and post –test would be conducted. Treatment would be given for twelve weeks. It would be find out finally the effects of swissball training on selected physical fitness components among the postural deformities of school children in scientific methods.

Table 1: The selected tests were measured by following units for testing

Criterion Variables	Test Items	Unit Measurements
Speed	50 meters dash	Seconds
Strength	1RM test	Kg
Flexibility	Sit and Reach	Centi Meters
Agility	Shuttle run(6X10)	Seconds
Balance	flamingo balance test	Seconds

Training Programme

Table 2: The following schedule of training was given for the Swiss ball training group.

Group	Design of the Training
Experimental Group I	Swissball Training
Control Group II	Did not do any Specific Training
Training Duration	90 Minutes
Training Session	3 Days a week
Total Length of Training	Twelve weeks

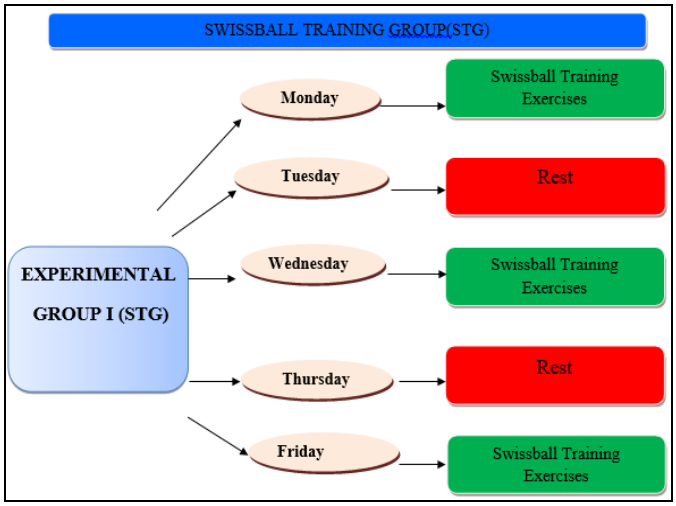

Chart 1: Experimental treatment adopted for experimental group-I

Table 3: Progression of load for experimental group-I (STG)

Weeks	Swissball Training (Monday, Wednesday, Friday)	Duration(10+25+40-+15= 90 min)	Load
I to IV	Warm -up 1000M Walking / Jogging Balance push-up Overhead ball squat Back extension Knee tuck V-sit with ball Warm- down	10 minutes 25 minutes 40 minutes 15 minutes	4 to 8rep x 2 sets
V to VIII	Warm- up 2000 M Walking /Jogging Swiss ball Scissors Swiss ball dead bug Swiss ball incline plank Swiss ball jackknife Swiss ball hamstring curl Warming down	10 minutes 25 minutes 40 minutes 15 minutes	8 to12rep x 3 sets
IX to	Warm- up 3000 M Walking /Jogging	10 minutes 25 minutes	12 to15 rep x 4 sets

XII	Swiss ball jackknife Balance push-up Overhead ball squat Back extension Swiss ball hamstring curl Warm- down	40 minutes 15 minutes	

Experimental Design

The experimental group was given swissball training exercises after taking an initial test. After the initial test selected swissball exercises were given for twelve weeks in three days. The time of practice was from 6.00AM to 7.30 AM. The control groups were not participating in any of the special training programme. However they were allowed to participate in their regular education classes in the school as per their curriculum.

Statistical Technique: The dated were statistically evaluated with dependent t-test to discovery obtainable significant development. The level of significance was secure at 0.05 level of confidence for all the cases.

Results and Discussions

The effect of independent variables on each criterion variables was considered by dependent's' – test on the data achieved for speed, strength, flexibility, agility and balance. The pretest and post- test means of experimental group and control group have been analyzed and existing in Table 4 & 5.

Table 4: Mean and Dependent 't' – ratio for the pre and post tests on speed, strength, flexibility, agility and balance of experimental group

S. No	Variables	Pre-test Mean±SD	Post-test Mean± SD	Diff	SE	't' –ratio
1.	Speed	08.20 ± 2.16	07.76 ±1.88	0.44	0.61	4.86*
2.	Strength	29.14 ± 2.28	30.12 ±2.32	0.98	0.13	5.76*
3.	Flexibility	8.46 ± 2.47	10.33 ± 3.23	1.87	0.24	7.80*
4.	Agility	8.07+1.04	7.12 +1.12	.95	.05	8.10*
5.	Balance	13.15+1.69	15.70 ±1.49	24	.34	7.58*

*Significance at 0.05 level of confidence (2.09).

Table 5: Mean and Dependant 't' – ratio for the pre and post tests on speed, strength, flexibility, agility and balance of control group

S. No	Variables	Pretest Mean±SD	Post-test Mean± SD	Diff	SE	't'–ratio
1.	Speed	08.26 ± 2.16	08.24 ± 1.88	0.02	0.61	1.16
2.	Strength	29.14 ± 2.28	29.20 ± 2.32	0.06	0.13	1.59
3.	Flexibility	8.53 ± 3.05	8.83 ± 2.13	0.30	0.27	1.08
4.	Agility	8.90+1.114	8.73+1.107	.17	.18	.920
5.	Balance	13.17 +1.73	11.48 + 3.70	.35	23	2.08

*Significance at 0.05 level of Confidence (2.09).

The table 4 and 5, shows that, the obtained 't'–ratio between the pre and post-test means of experimental group were 4.86,5.76,7.80,8.10,7.58 and control group were 1.16,1.59,1.08,.920,2.08 respectively. The table values required for significant difference with df 24 at 0.05 level of confidence. Since the obtained 't' – ratio value of experimental and control group on speed, strength, flexibility, agility and balance were greater than the table value 2.09,it was concluded that the swissball training had significantly improved speed, strength, flexibility, agility and balance of experimental group.

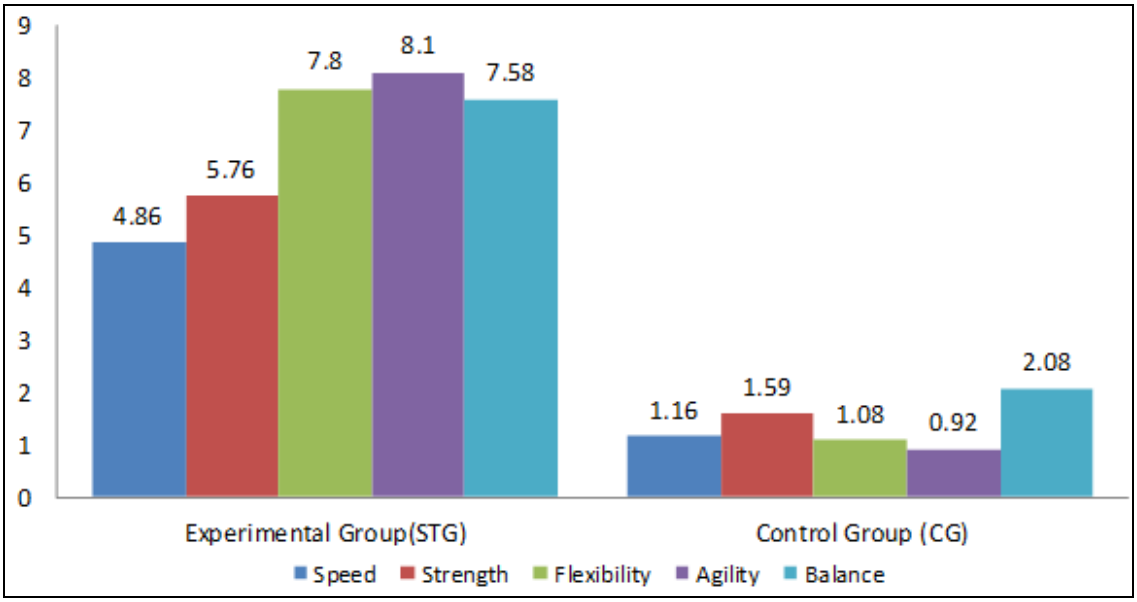

Fig 1: The pre and post- test mean value of experimental and control group on speed, strength, flexibility, agility and balance were graphically represented

Discussion on Findings

The finding of the study reveals that the swissball training group should significant improvement in their physical fitness components. In the view of control group there was no significant improvement in their physical fitness components. The findings of the study had close relationship with the results of the previous study conducted by Yerukala Narendra (2020) effect of swiss ball training on selected physical fitness parameters of tennis players

Conclusions

Improvement on speed, strength, flexibility, agility and balance was found significantly on experimental group due to the effects of swissball training on physical fitness components when compared to the control group.

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