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Effects of aerobic training on selected coordinative abilities among male students with postural deformities

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Abstract
The purpose of the study was to find out the effects of aerobic training on selected coordinative abilities among male students with postural deformities. To achieve the purpose of the study, thirty postural deformities of male students at bharathiar university were selected randomly 22 to 25 years of age from various departments of Bharathiar University at Coimbatore. The selected subjects were divided into two equal groups namely experimental and control groups of 15 subjects each. The training period was limited to twelve weeks and for three days per week. The aerobic training was selected as independent variables Space Orientation Ability, Complex Reaction Ability, Dynamic Balancing Ability, Kinesthetic Differentiation Upper Extremity and Kinesthetic Differentiation Lower Extremity were selected as dependent variables and it was measured by Numbered Medicine Ball Run Test, Ball Reaction Exercise Test, Long Nose Balance Test, Backward Ball Throw Test and Jump Down Line 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 Space Orientation Ability, Complex Reaction Ability, Dynamic Balancing Ability, Kinesthetic Differentiation Upper Extremity and Kinesthetic Differentiation Lower Extremity of experimental group due to the effects of aerobic training when compared to the control group.

Keywords: Space orientation ability, complex reaction ability, dynamic balancing ability, kinesthetic differentiation upper extremity and kinesthetic differentiation lower extremity

Introduction
Aerobic literally means living in air, (Kenneth, 1997) and refers to the use of oxygen to adequately meet energy demands during exercise via aerobic metabolism (William, 2006). Aerobic capacity describes the functional capacity of the cardio respiratory system which includes heart, lungs, and blood vessels. Aerobic capacity is defined as the maximum amount of oxygen the body can use during a specified period, usually during intense exercise. It is a function both of cardio respiratory performance and the maximum ability to remove and utilize oxygen from circulating blood. Generally, light-to-moderate intensity activities that are sufficiently supported by aerobic metabolism can be performed for extended periods of time (Sharon *et al*., 2007). Any physical exercise that requires additional effort by the heart and lungs to meet the striated muscles' increased demand for oxygen. Aerobic exercise increases the breathing rate and ultimately raises heart and lung efficiency. Prolonged aerobic exercise, at least for 20 minutes, three times a week, is recommended for the maintenance of a healthy cardiovascular system. Examples of aerobic exercise include running, jogging, swimming, and vigorous dancing or cycling, (Mosby's Medical Dictionary, 2009).
General coordination is one's capacity to rationally perform various motor skills, irrespective of one's specialization. All sports persons must possess an average amount of general coordination. Development of general coordination must reach optimum level before the beginning of specialized training. This helps to build a strong base for the development of specific coordination in future. Specific coordination reflects one's ability to perform various movements in the selected sports activity quickly flawlessly with ease and precision.

Thus, specific coordination is closely linked with the specificity of motor skills and helps to prepare a sports person with additional abilities in order to perform efficiently in training and competition. Consequently, a gymnast may be extremely coordinated in his or her event but may not be in playing basketball. Sports achievements are based on optimum level of training to develop conditional and coordinative abilities. Both conditional and coordinative abilities are prerequisites to achieve excellent results in competitions. Since a long time motor abilities namely, strength speed, endurance, flexibility, and agility are considered to be the components of physical fitness. Since recently the word agility has been replaced by the word coordinative ability. Coordinative abilities differ from one another in their directional dynamics and never present in isolation but always as prerequisites for several athletic activities. Coordinative abilities differ from technical skills in that they exist as prerequisites for motor action while technical skills are always only the solution to a single mechanical task.

There are a few classifications of coordinative abilities, formulated by sports scientists from United States, United Kingdom, Poland, Moscow, Kiev and Germany. Later, the scientists considered that too many groups and abilities may make the classification, their definitions, training, and evaluation more complex and complicated while in the process of attaining higher results. 19 Also, it would be very difficult to evaluate the individual abilities, and hence a few of them believed that on the basis of the various characteristics. It could be concluded that seven of them wire considered for training purpose. Each one has specific characteristics and different from one another. They are present among different sports persons and at different levels namely collegiate, university, and state. Coordinative abilities of a particular group of players can be at a higher level than the other groups of players. On the other hand, some groups of sports persons have lower level abilities than the other groups. There are also the differences between men and women player.

Methodology

For the purpose of this study, altogether thirty postural deformities of male students were selected randomly 22 to 25 years of age from various departments of Bharathiar University at Coimbatore. They were divided into two groups of 15 each. The experimental group I would undergo aerobic training. The second group of 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 aerobic training on selected coordinative abilities among male students with postural deformities in scientific methods.

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

Criterion Variables	Test Items	Unit Measurements
Space Orientation Ability	numbered Medicine Ball Run Test	Seconds
complex Reaction Ability	Ball Reaction Exercise Test	Mts
dynamic Balancing Ability	Long Nose Balance Test	Seconds
Kinesthetic Differentiation Upper Extremity	Backward Ball Throw Test	points
kinesthetic Differentiation Lower Extremity	Jump Down Line Test	Centi meters

Training Programme

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

Group	Design of the Training
Experimental Group I	Aerobic 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

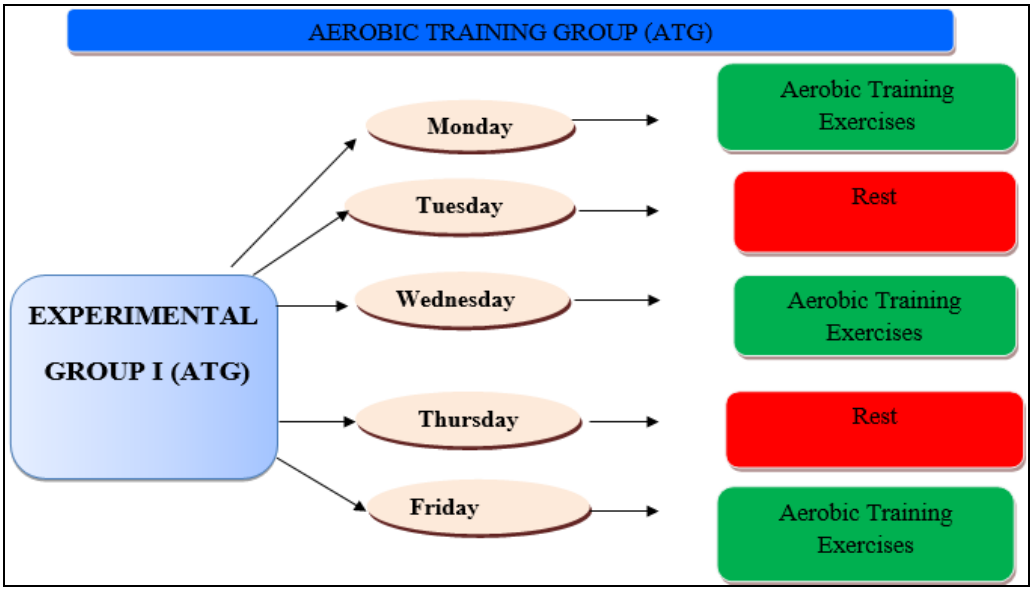

Chart 1: Experimental treatment adopted for experimental group-I

Table 3: Progression of load for experimental Group-I (ATG)

Weeks	Aerobic Training (Monday, Wednesday, Friday)	Duration(10+25+40-+15= 90 min)	Load
I to IV	Warm -up 1000M Walking / Jogging Alternate toe touch Jumping Jack Double leg lift Skipping Leg swing forward Aerobic Dance 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 Alternate leg circle Side ward shuttle run Alternate leg thrust Side skipping Donkey kick Aerobic Dance Warming down	10 minutes 25 minutes 40 minutes 15 minutes	8 to12rep x 3 sets
IX to XII	Warm- up 3000 M Walking /Jogging Double leg circle Hopping shuttle run Zig-zag run Squat thrust Donkey kick Aerobic Dance Warm- down	10 minutes 25 minutes 40 minutes 15 minutes	12 to15 rep x 4 sets

Experimental Design

The experimental group was given aerobic training exercises after taking an initial test. After the initial test selected aerobic exercises were given for twelve weeks in three days. The time of practice was from 6.00AM to 7.30 AM. The control group was not participating in any of the special training programme. However they were allowed to participate in their regular education classes in the college 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 't' – test on the data achieved for Space Orientation Ability, Complex Reaction Ability, Dynamic Balancing Ability, Kinesthetic Differentiation Upper Extremity and Kinesthetic Differentiation Lower Extremity .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 dependant 't' – test for the pre and post tests on space orientation ability, complex reaction ability, dynamic balancing ability, kinesthetic differentiation upper extremity and kinesthetic differentiation lower extremity of experimental group

S. No	Variables	Pre-test Mean± SD	Post-test Mean± SD	Diff	SE	't' –ratio
1.	Space Orientation Ability	9.74 ± 1.03	8.34 ± 1.04	1.40	0.93	6.14*
2.	Complex Reaction Ability	1.61 ± 0.54	1.23 ± 0.21	0.38	0.58	5.79*
3.	Dynamic Balancing Ability	7.08 ± 1.34	6.57 ± 1.38	0.51	0.99	7.50*
4.	Kinesthetic Differentiation Upper Extremity	8.39 ± 1.87	10.65 ± 1.79	2.26	0.63	2.76*
5.	Kinesthetic Differentiation Lower Extremity	5.57 ± 1.24	53.19 ± 1.12	2.38	0.28	5.81*

*Significance at 0.05 level of confidence (2.05).

Table 5: Mean and dependant't' – test for the pre and post tests on space orientation ability, complex reaction ability, dynamic balancing ability, kinesthetic differentiation upper extremity and kinesthetic differentiation lower extremity of control group

S. No	Variables	Pretest Mean±SD	Post test Mean± SD	Diff	SE	't'–ratio
1.	Space Orientation Ability	9.76± 1.21	9.78 ± 1.19	0.02	0.69	1.18
2.	complex Reaction Ability	1.61 ± 0.23	1.59 ± 0.20	0.02	0.43	0.93
3.	dynamic Balancing Ability	7.07 ± 0.43	7.06 ± 0.41	70.01	0.31	1.74
4.	Kinesthetic Differentiation Upper Extremity	8.38 ± 1.34	8.40 ± 1.31	0.02	0.49	1.46
5.	kinesthetic Differentiation Lower Extremity	5.54 ± 0.54	5.51 ± 0.56	0.03	0.63	1.17

*Significance at 0.05 level of confidence (2.05).

The table 4 and 5, shows that, they obtained 't'–ratio between the pre and post-test means of experimental group were 6.14,5.79,7.50,2.76,5.81 and control group were 1.18, 0.93, 1.74, 1.46 and 1.17 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 Space Orientation Ability, Complex Reaction Ability, Dynamic Balancing Ability, Kinesthetic Differentiation Upper Extremity and Kinesthetic Differentiation Lower Extremity were greater than the table value 2.05, it was concluded that the aerobic training had significantly improved Space Orientation Ability, Complex Reaction Ability, Dynamic Balancing Ability, Kinesthetic Differentiation Upper Extremity and Kinesthetic

Differentiation Lower Extremity of experimental group.

The pre and post- test mean value of experimental and control group on Space Orientation Ability, Complex Reaction Ability, Dynamic Balancing Ability, Kinesthetic Differentiation Upper Extremity and Kinesthetic Differentiation Lower Extremity were graphically represented in the figure 1.

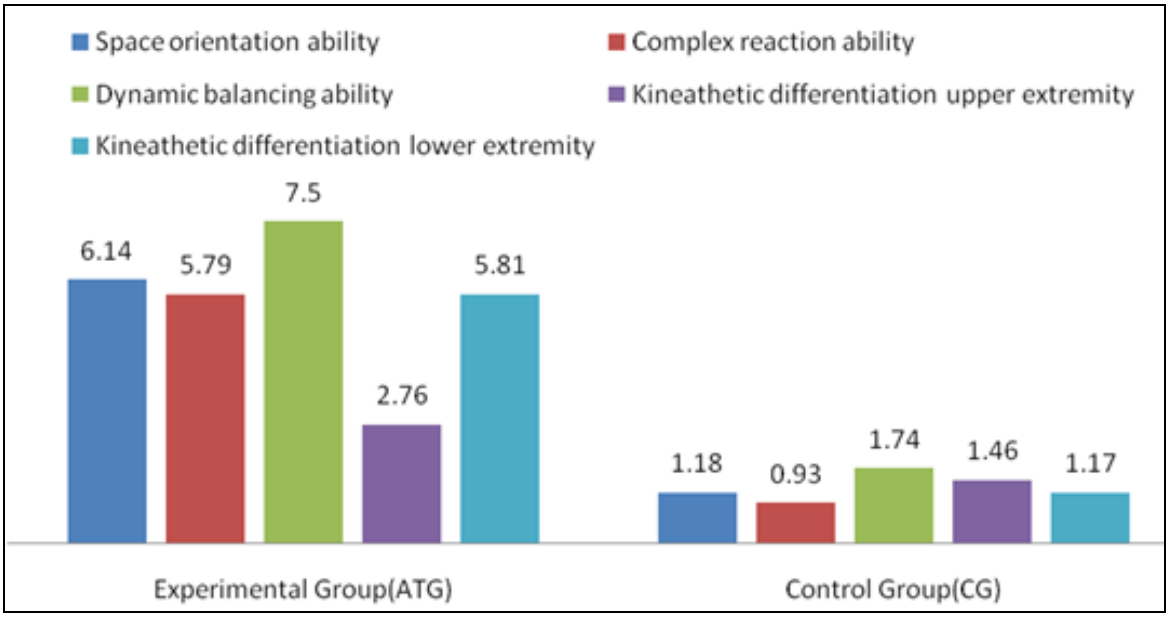

Fig 1: Coordinative Abilites

Discussion on Findings

The finding of the study reveals that the aerobic training group because significant improvement in their coordinative abilities. In the view of control group there was no significant improvement in their coordinative abilities. The findings of the study had close relationship with the results of the previous study conducted by Hirtz, Peter. (1985) [2] Coordinative Abilities of School Sports. Berlin: People Cooperative Printers.

Conclusions

Improvement on Space Orientation Ability, Complex Reaction Ability, Dynamic Balancing Ability, Kinesthetic Differentiation Upper Extremity and Kinesthetic Differentiation Lower Extremity was found significantly on experimental group due to the effects of aerobic training on coordinative abilities when compared to the control group.

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