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Research Paper

EFFECTIVENESS OF BIOFEEDBACK AND AUTOGENIC TRAINING ON REACTION AND CO-ORDINATION TIME OF VOLLEYBALL AND HANDBALL PLAYER

SPORTS SCIENCE

Keywords: Reaction ability, coordination, Volleyball and Handball

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ABSTRACT

The purpose of this study was to examine the effect of combination of biofeedback and autogenic training for Reaction and co-ordinations time of Volleyball and Handball player. The biofeedback involves the combination of body, mind and apparatus or machine. At the other hand autogenic training is a technique of self-hypnosis which would help in developing relaxation. 40 male players 17 to 24 years of age of Volleyball and Handball Mahadev Desai Sharirik Shikshan Mahavidyalaya, Sadra. Dist. Gandhinagar. Of Gujarat Vidyapeeth were selected as the subject of the study. Audio-visual reaction timer, eye-hand coordination apparatus and GSR biofeedback were used to test reaction ability, and coordination. Paired t-test and applied for analysing pre-test and post test data of training of eight (8) week. It was observed that biofeedback training combined with autogenic training helped to improve reaction ability and coordination whereas reduce of experimental groups of Volleyball and Handball players.

I. INTRODUCTION

The twenty first century is the most rapidly changing century of all time. Rapidity of changes created unusual demands on individuals and on system of education. Today education must not only include the body and knowledge, but also to develop inquiring minds that will enable them to comprehend and accept what is to come tomorrow. As Jacks, the British philosopher, puts it, living becomes an art only, "when work and play, labour and leisure, mind and body, education and recreation, are governed by a single vision of excellence and a continuous passion for achieving it." (Lawrance Pearsall Jacks, London Press, 1932). In sports today best performance can only be achieved through a meticulously planned, executed and controlled training system loosed on the scientific knowledge, theoretical and methodical fundamentals of sport training. The developing tendencies in international sport, especially in team games are identified as the increase in game tempo, tougher body game and greater variability in technique and tactics. An increased performance level can only be achieved by working and training of all major components i.e. technique coordination, tactics, physical fitness and psychological qualities. Apart from these components, one more factor which is now a days known as coordinative abilities also play a greater role. A sportsman can compete effectively only by a certain coordinative mastery of the technique. The word physical refers to the body, and indicates bodily characteristics such as strength, speed, endurance, flexibility, health coordination and performance. It seemingly contrasts the body with mind. The term education when used in conjunction with physical refers to a process of 'education' that develops the human body especially, and the movement skills. Therefore, it transcends all misconceptions and misgivings about physical education as a field of teaching and an ingredient of general education. Human being is an integration of the body and mind. Both components through their combinations make him more successful. The mental process and the physical expression are beautifully interwoven in the mechanism of the whole man and his wholeness in no case should be made to suffer by separating mental and physical aspects (Kamlesh 1988). Man's life is a continuous flow of activity. Every moment he is doing something and his every activity is the result of the joint efforts of the body and mind; more integrated efforts yield more success to the individual. Things in this world, outside ourselves, come via the body (some organs) into our mind and things in our mind reach the world outside through the body (Sushil Chandra Gupta 1983). India is a vast country with a lot of scope in the field of sports. But we find that our players do not fare so well at the international level in spite of the fact that there is a lot of talent with them. Leaving about other factors like the facilities available, researcher feels that this is due to because of the lack of concentration, co-ordination, self-confidence and psychological training for the players / sports persons. There is a need to understand the Psychology & Physiology of the players' viz. the tension, stress and trauma that they feel before the game and to train them to overcome that. In modern age, we have considered the role of sport psychology, within the overall field of sport and exercise science. We will consider sport psychology as a distinct discipline in more detail. It is true that sport psychology is a branch of sport and exercise science that focus on the psychological aspects of sports and exercise, but nowadays limits of sport psychology are not restricted, it has developed and is constructed broadly to include various recreational activities, competitive sports, and health oriented exercise program.

II .METHODOLOGY

The purpose of this study was to find out the effect of the combination of biofeedback and autogenic training on

performance enhancement of Indian sport person. Samples were consisted of 40 sports persons of national level includes 20 Volleyball, 20 Handball players and 40 control group (20 Volleyball, 20 Handball players for control group). They were selected from Inter university camps in their respective games at Mahadev Desai Sharirik Shikshan Mahavidyalay, SADRA in the year 2011-12. For the present investigation researcher has selected them for experimentation of the study. The inclusion and exclusion criteria were framed with the central aim of getting homogeneous, comparable and well defined sample. The subjects were only male and there age was ranging from 17 to 22 years. The Biofeedback and Autogenic training were applied for 8 week. Control group was not provided any biofeedback and autogenic training. The pre and post test was conducted for Reaction time and Coordination by Audio visual reaction timer and eye hand coordination apparatus respectively. Mean & standard deviation of experimental group and control group were calculated. Paired t-test was calculated and applied for the analysis of data. In this program, researcher had provided 2 sessions per day. Each Session was of 40 minutes for 5 days in which Biofeedback along with autogenic training was involved. In morning session heaviness exercise was given and in evening session warmness exercise was given to the subjects. After completed the training programme the Post Testing was done on dependant variables.

III .ANALYSIS OF DATA AND RESULTS

Table 1: The effectiveness of biofeedback and autogenic training on simple visual reaction time with reference to volleyball players

Test	Group	N	Mean	SD	t-value
Pre test	Experimental	20	0.1826	0.02631	0.04227
	Control	20	0.1822	0.02605	
Post test	Experimental	20	0.1586	0.0276	3.33315**
	Control	20	0.1882	0.02856	

* Significant at t.05 level (2, 40) = 1.69

As per Table 1 comparing the means of simple visual reaction time for experimental group and control group of Pre-test, obtained t-value is not significant; it means both the groups were similar in beginning as far as simple visual reaction time is concerned. There is no significant difference between experimental group and control group for pre-test of Volleyball Players. So, before experimentation both the groups were identical. Comparing the means of simple visual reaction time of experimental group and control group for post-test, calculated t-value is 3.33315, which is significant at 0.05 levels.

Table 2: The effectiveness of biofeedback and autogenic training on choice visual reaction time with reference to volleyball players

Test	Group	N	Mean	SD	t-value
Pre test	Experimental	20	0.2449	0.03132	0.84092
	Control	20	0.2366	0.3148	
Post test	Experimental	20	0.2313	0.3288	0.85497
	Control	20	0.2396	0.02835	

* Significant at t.05 level (2, 40) = 1.69

As per Table 2 comparing the means of choice visual reaction time for experimental group and control group of pre-test, obtained t-value is not significant; it means both the groups were similar in beginning as far as choice visual reaction time is concerned. There is no significant difference between experimental group and control group for pre-test of Volleyball Players. So, before experimentation both the groups were identical. Comparing the means of choice visual reaction time of experimental group and control group for post-test, calculated t-value is 0.85497, which is not significant. It means there is no significant difference between the choice visual reaction time of experimental group and control group.

Table 3: The effectiveness of biofeedback and autogenic training on simple audio reaction time with reference to volleyball players

Test	Group	N	Mean	SD	t-value
Pre test	Experimental	20	0.1542	0.1216	6.97794*
	Control	20	0.1901	0.01949	
Post test	Experimental	20	0.1433	0.01054	9.11680**
	Control	20	0.2028	0.02724	

* Significant at t.05 level (2, 40) = 1.69

As per Table 3 comparing the means of simple audio reaction time for experimental group and control group of pre-test, obtained t-value is significant. There is significant difference between experimental group and control group for pre-test of Volleyball Players. Comparing the means of simple audio reaction time of experimental group and control group for post-test, calculated t-value is 9.11680, which is significant at 0.05 levels. It means there is a significant difference between the simple audio reaction time of experimental group and control group after experimentation.

Table 4: The effectiveness of biofeedback and autogenic training on choice audio reaction time with reference to volleyball players

Test	Group	N	Mean	SD	t-value
Pre test	Experimental	20	0.2558	0.01443	7.65561**
	Control	20	0.5014	0.14274	
Post test	Experimental	20	0.2473	0.01462	8.94641**
	Control	20	0.5611	0.15618	

* Significant at t.05 level (2, 40) = 1.69

As per Table 4 comparing the means of choice audio reaction time for experimental group and control group of pre-test, obtained t-value is significant; there is significant difference between experimental group and control group for pre-test of

Volleyball Players. So, before experimentation both the groups were not identical. Comparing the means of choice audio reaction time of experimental group and control group for post-test, calculated t-value is 8.94641, which is significant at 0.05 levels. It means there is a significant difference between the choice audio reaction time of experimental group and control group after experimentation.

Table 5: The effectiveness of biofeedback and autogenic training on eye hand coordination time with reference to volleyball players

Test	Group	N	Mean	SD	t-value
Pre test	Experimental	20	24.9500	5.04167	2.68031*
	Control	20	29.7500	6.22284	
Post test	Experimental	20	17.3500	3.40704	7.11344**
	Control	20	29.4500	6.80151	

* Significant at t.05 level (2, 40) = 1.69

As per Table 5 comparing the means of Eye hand coordination time for experimental group and control group of pre-test, obtained t-value is significant. it means both the groups were not similar in beginning as far as eye hand coordination time is concerned. There is significant difference between experimental group and control group for pre-test of Volleyball Players. Comparing the means of eye hand coordination time of experimental group and control group for post-test, calculated t-value is 7.11344, which is significant at 0.05 level. It means there is a significant difference between the eye hand coordination time of experimental group and control group after experimentation.

Table 6: The effectiveness of biofeedback and autogenic training on simple visual reaction time with reference to handball players

Test	Group	N	Mean	SD	t-value
Pre test	Experimental	20	0.1852	0.00944	1.43595
	Control	20	0.1977	0.03761	
Post test	Experimental	20	0.1627	0.01293	3.97848**
	Control	20	0.2039	0.04441	

* Significant at t.05 level (2, 40) = 1.69

As per Table 6 comparing the means of simple visual reaction time for experimental group and control group of pre-test, obtained t-value is not significant; it means both the groups were similar in beginning as far as simple visual reaction time is concerned. There was no significant difference between experimental group and control group for pre-test of Handball players. So, before experimentation both the groups were identical. Comparing the means of simple visual reaction time of experimental group and control group for post-test, calculated t-value is 3.97848, which is significant at 0.05 level. It means there is a significant difference between the simple visual reaction time of experimental group and control group after experimentation.

Table 7: The effectiveness of biofeedback and autogenic training on choice visual reaction time with reference to handball players

Test	Group	N	Mean	SD	t-value
Pre test	Experimental	20	0.2801	0.01085	0.84092
	Control	20	0.2498	0.05177	
Post test	Experimental	20	0.2594	0.01487	2.56602**
	Control	20	0.2517	0.05167	

* Significant at t.05 level (2, 40) = 1.69

As per Table 7 comparing the means of choice visual reaction time for experimental group and control group of Pre-test, obtained t-value is not significant; it means both the groups were similar in beginning as far as choice visual reaction time is concerned. There was no significant difference between experimental group and control group for pre-test of Handball players. So, before experimentation both the groups were identical. Comparing the means of simple visual reaction time of experimental group and control group for post-test, calculated t-value is 2.56602, which is significant at 0.05 level. It means there is a significant difference between the choice visual reaction time of experimental group and control group after experimentation.

Table 8: The effectiveness of biofeedback and autogenic training on simple audio reaction time with reference to handball players

Test	Group	N	Mean	SD	t-value
Pre test	Experimental	20	0.1607	0.01007	4.32289**
	Control	20	0.2011	0.04051	
Post test	Experimental	20	0.1464	0.01057	5.63128**
	Control	20	0.2037	0.04430	

* Significant at t.05 level (2, 40) = 1.69

As per Table 8 comparing the means of simple audio reaction time for experimental group and control group of pre-test, obtained t-value is significant; it means both the groups were not similar in beginning as far as simple audio reaction time is concerned. There was significant difference between experimental group and control group for pre-test of Handball players. So, before experimentation both the groups were not identical. Comparing the means of simple audio reaction time of experimental group and control group for post-test, calculated t-value is 5.63128, which is significant at 0.05 level. It means and there is a significant difference between the simple audio reaction time of experimental group and control group after experimentation.

Table 9: The effectiveness of biofeedback and autogenic training on choice audio reaction time with reference to handball players

Test	Group	N	Mean	SD	t-value
Pre test	Experimental	20	0.2605	0.01034	8.75372**
	Control	20	0.4826	0.11297	
Post test	Experimental	20	0.2448	0.00861	9.63739**
	Control	20	0.5290	0.13160	

* Significant at t.05 level (2, 40) = 1.69

As per Table 9 comparing the means of choice audio reaction time for experimental group and control group of pre-test, obtained t-value is not significant; it means both the groups were not similar in beginning as far as choice audio reaction time is concerned. There is significant difference between experimental group and control group for pre-test of Handball players. So, before experimentation both the groups were not identical. Comparing the means of choice audio reaction time of experimental group and control group for post-test, calculated t-value is 9.63739, which is significant at 0.05 levels. It means there is a significant difference between the choice audio reaction time of experimental group and control group after experimentation.

Table 10: The effectiveness of biofeedback and autogenic training on eye hand coordination time with reference to handball players

Test	Group	N	Mean	SD	t-value
Pre test	Experimental	20	27.2000	2.98417	3.35168**
	Control	20	30.0000	2.24781	
Post test	Experimental	20	19.3000	4.66905	9.74817**
	Control	20	30.4500	2.08945	

* Significant at t.05 level (2, 40) = 1.69

As per Table 10 comparing the means of Eye hand coordination time for experimental group and control group of Pre-test, obtained t-value is significant; it means both the groups were not similar in beginning as far as Eye hand coordination time is concerned. There is significant difference between experimental group and control group for pre-test of Handball players. So, before experimentation both the groups were not identical. Comparing the means of eye hand coordination time of experimental group and control group for post-test, calculated t-value is 9.74817, which is significant at 0.05 level. It means How is rejected and there is significant difference between the eye hand coordination time of experimental group and control group after experimentation.

IV .FINDINGS & CONCLUSIONS

The independent variable, Biofeedback combined with autogenic training had effect on dependent variables, i.e., simple visual reaction time, choice visual reaction time, simple audio reaction time, and choice audio reaction time. Biofeedback combined with autogenic training has helped Volleyball Players experimental group to improve their Reaction ability, whereas there was no change in Volleyball Players control group which were not given treatment. Biofeedback combined with autogenic training has been effective to improve the Reaction ability of Volleyball Players.

The independent variable, Biofeedback combined with Autogenic training had effect on dependent variables, i.e., eye hand coordination time. The combination of Biofeedback and autogenic training has helped Volleyball Players experimental group to improve Coordination, whereas there was no change in Volleyball Players control group which were not given treatment. Biofeedback combined with autogenic training has been effective to improve the Coordination of the Volleyball Players.The independent variable, Biofeedback combined with Autogenic training had effect on dependent variables, ie, simple visual reaction time, choice visual reaction time, simple audio reaction time, and choice audio reaction time. Biofeedback combined with autogenic training has helped Handball player's experimental group to improve their Reaction ability, whereas there was no change in Handball players control group which were not given treatment. Biofeedback combined with autogenic training has been effective to improve the Reaction ability of Handball players. The independent variable, Biofeedback combined with Autogenic training had effect on dependent variables, i.e., eye hand coordination time, and eye hand coordination error. The combination of Biofeedback and autogenic training has helped Handball players' experimental group to improve Coordination, whereas there was no change in Handball players control group which were not given treatment. Biofeedback combined with autogenic training has been effective to improve the Coordination of the Handball players.

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