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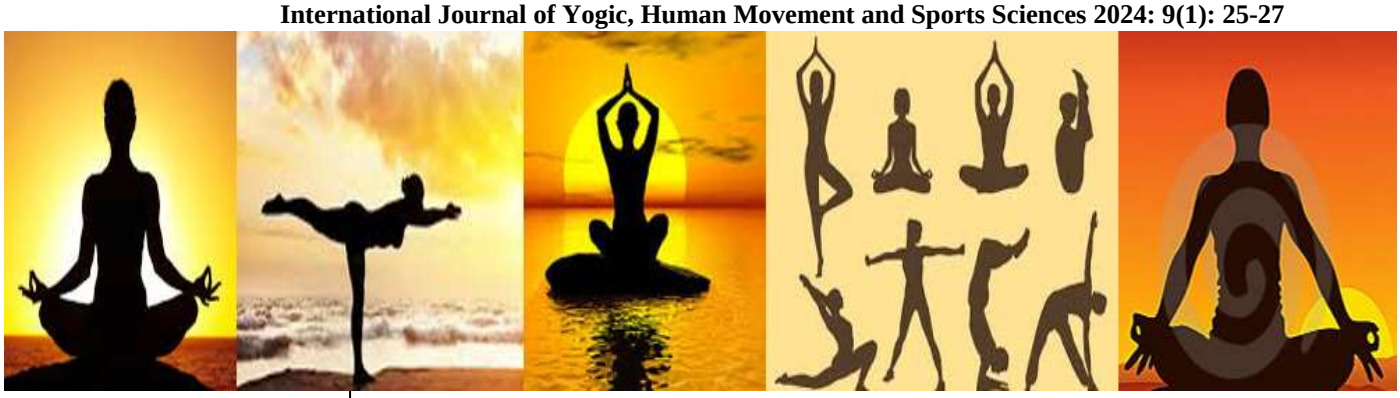

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Effects of a moderate intensity plyometric training on selected physiological variables of college level men ball badminton players

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Abstract
The aim of present study was the effects of a moderate intensity plyometric training on selected physiological variables of college level men ball badminton players were studied. The subjects for this study were confined from SRM Group of Institutions, Tamil Nadu, India. Their age s ranged from 20 to 25 years. 20 players were selected for experiment group and 20 players were selected for control group. The study was conducted only for men players and the physiological variables of resting heart rate, resting systolic blood pressure, and resting diastolic blood pressure were selected for this study. The mean (M) and the standard deviation (SD) of the collected data were computed. To find out the significance of difference between the two means, the 't' ratio was determined. The level of significance was fixed at 0.05 level of confidence. Result of the study indicated that the moderate intensity plyometric training programme have shown positive changes on the subjects. The pre-test and post-test comparisons in respect of all the selected physiological variables were positive and significant at 0.05 level of significance.

Keywords: Moderate intensity plyometric training, resting heart rate, resting systolic blood pressure, resting diastolic blood pressure

Introduction
Ball badminton is a fast reaction and racket game like badminton but the ball is made up of woolen and looks like a tennis ball. The ball badminton players may be required more reaction time, agility, and balancing abilities to become better performers. The moderate intensity exercise is the physical activity that makes heart beat faster and breathing harder. It's defined as any activity that requires to work at 40–59% of our heart rate reserve. The reserve heart rate is, the difference between resting heart rate and maximum heart rate. For moderate-intensity physical activity, the target heart rate should be between 64% and 76% of maximum heart rate. To estimate maximum heart rate based on age. To estimate maximum age related heart rate, subtract the age from 220. (PAGACR 2008) [7]. The main purpose of plyometric training is to increase the rate of force development, the key ingredient of power. It is logical for athletes to seek to increase the rate of force development, because most sporting movements involve fast movements for which forces must be generated quickly. For elite performance, an athlete's rate of force development is often more important than the maximum force he or she is able to generate. Power can be developed by improving strength and speed of the muscle contraction or both. Exercise physiologists, sports scientists, coaches and athletes have searched for an effective method to combine strength and speed using one training technique. Plyometric has been developed as such a technique to meet an end to the searches. Plyometric has been defined as drills or exercises whose purpose is "linking sheer strength and speed of movement to produce an explosive-reactive type of movement" (Chu & Plummer, 1984) [4]. Few studies have investigated the effects of plyometric training. The storage of elastic energy and the stretch reflex mechanisms within the muscles are two major physiological effects of plyometric training. The improvement in muscular force and jumping ability during plyometric are related to such concept of stretch reflex and elastic recoil respectively.

The purpose of the study was to find out the effects of a moderate intensity plyometric training on selected physiological variables of college level men ball badminton players.

Methodology

The study was conducted on 40 numbers college male students. All subjects were fully informed of the risks and discomfort associated with the investigation before accepting their willingness to act as subjects. Subjects were randomly selected into two group of 20 subjects each. Group A, the experimental group participated in moderate intensity plyometric training. Group B, the control group were allowed to perform their regular physical activities but denied for participation in moderate intensity plyometric training. The training stimuli adopted for a six week long included moderate intensity plyometric training exercises as listed below.

Plyometric Training Exercises

1. Exercises for lower extremities (spot jumps, standing jumps, multiple hop jumps, box drill, depth jumps), 2. Exercises for upper extremities (front toss, over-under pass, trunk rotation, overhead throw, rotation in eight figures). The above stated moderate intensity plyometric exercises were performed thrice in a week for one hour in the afternoon under the direct supervision of the investigator. Prior to practicing the exercises the subjects were being asked for getting warmed-up for 10 minutes and to follow the demonstration of each exercise.

Table 1: Type of variables, test and unit of measurements

S. No.	Variables	Test / Equipment	Unit of Measurements
1	Resting Heart Rate	Radial pulse rate	Beats per minute
2	Resting Systolic Blood Pressure	Sphygmomanometer/ Stethoscope	mm Hg
3	Resting Diastolic Blood Pressure	Sphygmomanometer/ Stethoscope	mm Hg

Statistical Analysis

Test scores were subjected to statistical analysis. Indices like means and standard deviations were computed for comparison. The mean and standard deviation values were calculated for the three physiological variables: (a) resting heart rate, (b) resting systolic blood pressure, and (c) resting diastolic blood pressure. To find out significance of the difference or the change that occurred between pre-and-post tests, 't' test was applied.

Results of the Study

Table 2: Mean, SD scores and result of the test of significance ('t') in respect of physiological variables of experimental and control groups

Physiological Variables	Groups	Pre-Test		Post-Test		't'
		Mean	SD	Mean	SD	
Resting Heart Rate	Group A	77.6	6.45	74.6	4.36	4.68*
	Group B	73.5	3.70	73.6	2.71	0.326
Resting Systolic B.P.	Group A	113.5	6.25	116.5	8.38	3.84*
	Group B	116.7	8.92	117.8	8.36	0.37
Resting Diastolic B.P.	Group A	74.1	5.27	77.3	6.9	3.7*
	Group B	75.7	6.07	75.8	5.79	0.32

Table II indicates significant differences between pretest and posttest of the experimental group (Group A) on all the physiological variables namely resting heart rate, resting systolic blood pressure, and resting diastolic blood pressure. Whereas no significant difference are observed between pretest and posttest of the control group (Group B) on all stated physiological variables. The resting heart rate of experimental group (A) the obtained 't' value was 4.68 and found to be greater than the required 't' value 2.09 and significant at 0.05 level of significance with 19 degrees of freedom. The resting systolic blood pressure of experimental group (A) the obtained 't' value was 3.84 and found to be greater than the required 't' value 2.09 and significant at 0.05 level of significance with 19 degrees of freedom and the resting diastolic blood pressure of experimental group (A) the obtained 't' value was 3.7 and found to be greater than the required 't' value 2.09 and significant at 0.05 level of significance with 19 degrees of freedom.

Discussion on findings

An increased heart rate has been observed previously after plyometric training, although at 90 minutes post exercise heart rate was significantly reduced compared with pre-exercise values (Arazi *et al*., 2013) [1]. Regarding systolic blood pressure, and diastolic blood pressure and Resting heart rate, a mean reduction was observed after all plyometric intensities (Except for systolic blood pressure, and diastolic blood pressure, and after low intensities) (Arazi *et al*., 2014) [2]. Hoff (2005) [6] heart's stroke volume is the element in the oxygen chair that mainly improved aerobic endurance performance. The plyometric training programme lead to improvements in 3 km endurance performance (Spurrs *et al*., 2003) [9]. In this present study the results shows that the effects of a moderate intensity plyometric training group shows significant changes on physiological variables of resting heart rate, resting systolic blood pressure and resting diastolic blood pressure college level men ball badminton players compared to control group.

Conclusion

The six week long moderate intensity plyometric training programme on the college level men ball badminton players have proved to be effective on selected physiological variables and significant at 0.05 level of significance.

References

1. Arazi H, *et al*. Post-plyometric exercise hypotension and heart rate in normotensive individuals: Influence of exercise intensity. Asian J Sports Med. 2013;4:235–240.
2. Arazi H, *et al*. Blood pressure responses to resistive exercise in trained female athletes: Influence of velocity of movement. Interv Med Appl Sci. 2014;6:170–174.

3. Bompa TO. Power Training for Sports: Plyometrics for Maximum Power Development. Campaign, Illinois: Human Kinetics Publishers; c1996.
4. Chu DA, Plummer L. The language of plyometrics. Nat Strength Cond Assn J. 1984;6:30-35.
5. Chu A. Jumping into Plyometric. New York: Human Kinetics Publishers; c1998.
6. Hoff J. Training and testing physical capacities for elite soccer players. J Sports Sci. 2005, 23(6).
7. Physical Activity Guidelines Advisory Committee Report. Washington, DC: U.S. Dept of Health and Human Services; c2008.
8. Ramírez-Campillo A, *et al*. Men and women exhibit similar acute hypotensive responses after low, moderate, or high-intensity plyometric training. J Strength Cond Res. 2016;30(1):93-101.
9. Spurrs RW, *et al*. Effect of plyometric training on distance running performance. Eur J Appl Physiol. 2003, 89(1).