

**COMPARATIVE STUDY BETWEEN TABLE TENNIS, LAWN TENNIS,
AND BADMINTON PLAYERS ON THE SELECTED PHYSIOLOGICAL
VARIABLES AMONG JUNIOR NATIONAL PLAYERS**

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ABSTRACT

The main purpose of this study was to compare the physiological variable between Tennis, Table Tennis and Badminton Junior National players. For this study, 36 boys selected randomly from Tennis, Table Tennis and Badminton Players hail from Andhra Pradesh and divided into three groups i.e. 12 players selected from Tennis, 12 players from table tennis and 12 players from badminton. The age of the subjects is ranging from 14-16 years. These students were first applied pre-test measurement, and post-test measurement was performed with the following application of 25 minutes' continuous endurance in table tennis, tennis and badminton Players. The selected players were subjected to analysis of Blood pressure and Pulse rate by electronic apparatus (Dynamic). The Physiological Variables of blood Pressure and Pulse rate recorded before and after the training session among Table Tennis, Tennis and Badminton players through electronic device of dynamic for blood Pressure Pulse rate scores recorded. Data collected were analysed using Statistical Analysis. One-way ANOVA method was applied for analysing the data obtained from the present study to examine the research hypotheses, paired one-way ANOVA was used for the comparison on physiological variable of blood pressure and pulse rate between table tennis, tennis and badminton junior national junior. All statistical analysis carried out using Significance at 0.05 level of confidence. It is concluded that there was no significant difference in the pre-test in comparison of this three groups and at the post-test there was significant differences were find in the selected groups with regard to (Resting diastolic and systolic blood pressure).

Key Words: Physiological, Junior, Performance, Training

1 Introduction: -

Modern sports are based on physical, technical, tactical and psychological preparations. In Modern era of competition, no, one can afford to neglect any aspect of game/ sports such as mastery of skills, techniques involved, physical fitness components and psychological abilities. All these aspects are to be developed on the scientific lines. Now a day the teams do not participate just for the sake of participation but to win the competition. There are many wonderful sports which provide enjoyment and recreation for mankind. Some sports have become international in character; others have remained confirmed to one country

or state. But undisputedly, Table Tennis, tennis and Badminton stands prominent amongst the sports loving countries of the world for its qualities as a means of entertainment of character building, and even a way of life. In This game involving singles players and doubles players has the capacity to make lakh go destructive for it. Indians are obsessed with this game. That's why during tennis, table tennis and badminton matches India's social schedule, marketing events, traveling plans and even movie release are made keeping in mind these matches. In modern era, much importance has been given to the development of sports in India: Therefore, there is need to analyse all these factors which can helps in developing the better tennis, table tennis and badminton players and we have to change the old concept and have used to the now concept if we have to attain high level of performance. Thus study will render remarkable contribution to the field by searching out physiological potentialities of boy's tennis, table tennis and badminton in different level of competitions. Furthermore, it will be matter of curiosity to dig out the physiological variables of boy's tennis, table tennis and badminton players.

In the modern scientific age in every field of human endeavour, systematic objective and scientific procedures are followed in accordance with principles based upon experience, understanding and application of knowledge of science. The field of games & sports is no exception to this as sports have developed into distinct scientific discipline in itself and every nation is trying to produce top class sports persons to win Laurels in international competitions. Today all over the world physical educators and coaches are facing their greatest challenge in handling problems are in scientific way that is to give their sports persons proper and progressive guidelines based on scientific approach which leads to desired results. Sciences physical, physiological and psychological have been recognized as one of the best means of under lying sportsman's performance and of helping in producing better performance.,

The successful sports persons however, not only possess the apparently ideal physique but also certain physical, physiological and psychological traits developed by the specific events he is competing in different motor abilities, play decisive role in various sports discipline. A performer who wants to excel in sports disciplines, like boy's tennis, table tennis and badminton in different level of competitions has no doubt to pay full attention to the technical aspect but in addition he has to pay much emphasis on developing the desired Physical, physiological and psychological abilities.

The developing tendencies in international sports, especially in individual games are identified as the increase in game 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, physiological qualities. Physiological exercise testing is important in help identify potential talent but also to provide the players, trainers and coaching staff with some profiles for the players and a measure for evaluating training programs.

Testing physiological requirements for boys Table Tennis, Tennis and badminton has become more specific over the past decade with further advances in both sports science technology and general understanding of the physiological requirements for testing Table Tennis, Tennis and badminton. However, despite this progress in testing procedures and knowledge there still appears limited

research regarding the analysis and critical appraisal of tests used specifically for Table Tennis, Tennis and badminton. Many laboratories and field tests for physiological assessment do exist, however to be thorough in reviewing physiological status is important to assess all components of the sport, specifically measuring each energy system. The purpose of the study was comparison of physiological variable of blood pressure and pulse rate between table tennis, tennis and badminton players of national junior players.

Racket sports such as Table tennis, Tennis, Badminton and Squash require a combination of psychological stability, tactical analysis, motor coordination as well as strong physical and physiological attributes. These demands make the sports particularly challenging for athletes at different levels (Ogino, Makita, Satomi & Yoshida, 2007). Sports scientists and coaches are often reluctant over the adoptions of seeding method of placement for players in major competitions due to imminent drop in performance, coupled with non-availabilities of profile that contained database reference for periodic measure of performance and physiological conditioning of athletes (Kawazoe & Yoshinari, 2005).

Cardiovascular system, that combines effective functioning of the heart and blood vessels play a vital role in the maintenance of body homeostasis, which depends on the continuous and controlled movement of blood through the thousands of miles of capillaries that permeate every tissue and reach every cell in the body necessary for all-rounded physiological buildup for the athletes. It was explained that effectiveness of circulatory system rested in the efficiencies of microscopic capillaries that aids blood to perform its ultimate transport function. Nutrients and other essential materials pass from blood capillary into fluids surrounding the cells as waste products are removed (Sanchis, Dorado and Calbet, 2005).

2 PHYSIOLOGICAL ASPECTS

The present study is considered with various physiological variables, so as to compile the physiological characteristics of tennis, table tennis and badminton players, the following physiological variables were taken into consideration: Blood Pressure (Diastolic and systolic) and Pulse Rate.

The physiological aspect of human being is to increase the ability of body to intake the oxygen in sufficient quantities to the muscle cell. It can do in several ways by increasing the rate of breathing, by increasing the depth of breathing, by increasing of rate at which oxygen is taken from the air in the lungs into the blood also increasing the amount of haemoglobin available for oxygen transport and increasing the rate of blood flow with increasing the rate at which oxygen is unloaded from the blood at the muscle cell.

It is always great task for coaches to specify the characteristics of tennis, table tennis and badminton players for learning of fundamentals of tennis, table tennis and badminton games. Singh (2002) has studied the kin anthropometric measurements, aerobic and anaerobic fitness among the badminton players. He has made study on 88 badminton players drawn from the northern states of India with the random sampling device and formed three groups i.e. national and inter-

varsity, state and inter-varsity, district and intercollegiate level players. He has taken 18 kin anthropometric variables and applied 12 minutes run and walk test. With the interpretation of results, he observes that there exists significant difference between aerobic and anaerobic fitness among the three groups of badminton players. Gulshan Lal Khanna and Indranil Manna (July, 2006) studied the morphological, physiological and biochemical characteristics of Indian National boxers as well as to assess the cardiovascular adaptation to graded exercise and actual boxing round. Two different studies were conducted. In the first study [N = 60, (junior boxers below-19 yrs, n = 30), (senior boxers-20-25 yrs, n = 30)] different morphological, physiological and biochemical parameters were measured. In the second study (N = 21, Light Weight category- < 0.05) significantly higher ($p < 0.05$) maximal heart rates and recovery heart rates were observed in the seniors as compared to the juniors. Significantly higher maximum heart rates were noted during actual boxing compared to graded exercise. Blood lactate concentration was found to increase with the increase of workload during both graded exercise and actual boxing round. The senior boxers showed a significantly elevated ($p < 0.05$) levels of haemoglobin, blood urea, uric acid and peak lactate as compared to junior boxers. In the senior boxers significantly lower levels of total cholesterol, triglyceride and LDLC were observed as compared to junior boxers. No significant change has been noted in HDLC between the groups.

Heart rate: The participants' heart rate was measured using the auscultation procedure as described by American College of Sports Medicine, (2000) and demonstrated by Baumgartner and Jackson, (1999). The bell of the stethoscope was put directly on the heart region. Resting heart rate was measured two minutes after standing while the recovery heart rate was measured immediately after the 12-minute run test. Heart rate was recorded in beats per minute (bpm).

Blood pressure: Blood pressure was monitored indirectly (Wingate, 1978) using a mercury sphygmomanometer and stethoscope. Resting orthostatic blood pressure was measured two minutes after standing as directed by Amusa, Igbanugo & Toriola, (1998). The inflatable cuff of a sphygmomanometer was wrapped carefully round the upper arm with the bag over the brachial artery and is connected with the mercury manometer. The bell of the stethoscope was applied over the brachial artery in the cubital fossa and the cuff was inflated to a level well above that which will abolish the korotkov sound. The pressure in the cuff was then allowed to fall slowly and the return of the sound will be taken as the systolic pressure. The point at which the sound became muffled was taken as representing the diastolic pressure.

3. Methodology

3.1 Selection of Subjects

In the present study the investigator used a sampling to collect data on 36 boys lawn Tennis, Table Tennis and Badminton who represented national at the different level i.e. They were randomly divided into three resistance exercise

groups Table Tennis (N=12), Tennis (N=12) and Badminton (N=12) national level belonging to Andhra Pradesh. The age of the subjects is ranging from 14-16 years.

3.2 Selection of variables

The study was taken to pinpoint the Physiological Variables. Therefore, based on literary evidence and scholar's own understanding the following variables were selected for the purpose of this study: 1 Blood pressure and 2 Pulse rate.

3.3 Research Design

The physiological variables of blood pressure and pulse rate were recorded Before training after the training session of Table tennis, Tennis and badminton players through electronic device of Dynamic for BP and Pulse rate.

3.3.1. Pulse Rate

Subjects were rested for 15 minutes before measuring heart rate. Heart rate was measured with the sphygmomanometer (Omron M2) attached to the left arms of the subjects (Günay et al. 2005).

3.3.2 Systolic and Diastolic Pressure

Subjects were rested for 15 minutes before measuring systolic and diastolic pressure. Systolic and diastolic pressure were measured with the sphygmomanometer (Omron M2) attached to the left arms of the subjects (Günay et al. 2005).

3.4 Statistical Technique

Statistical Analysis One-way Anova method was applied for analyzing the data obtained from the present study to examine the research hypotheses, Paired One-way Anova was used comparison on physiological variable of blood pressure and pulse rate between table tennis, tennis and badminton players of national junior players All statistical analysis was carried out using Significance at 0.05 level of confidence.

3.5 Results and Discussion

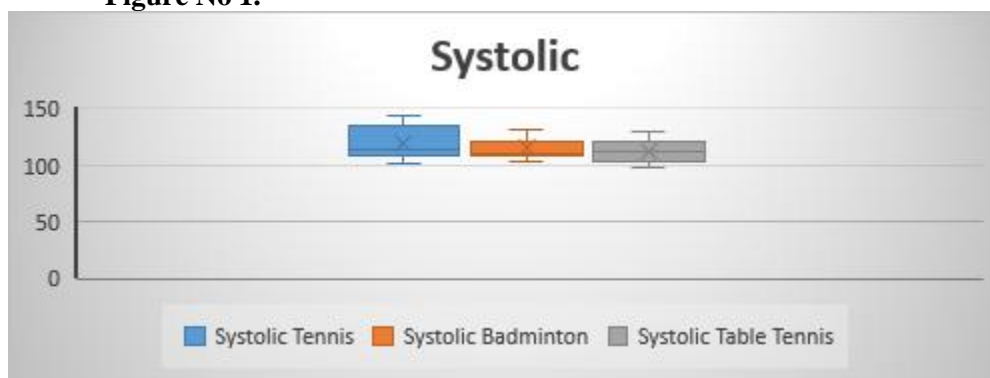
Since the purpose of the study was to analyse the selected Pre Test and post-test Physiological Variables of players of Table Tennis, Tennis and badminton, were explained with the help of different tables.

Table 1: Shows the value of f-ratio for three different Pre Test groups i.e. Table Tennis, Tennis and badminton game players for their physiological variable (Systolic).

ANOVA		Pre Test					
	Source of Variation	Sum of Squares	df	Mean Square	F	P-value	F crit
Systolic	Between Groups	279.167	2	139.5833333	1.050796	0.361067*	3.284918
	Within Groups	4383.58	33	132.8358586			
	Total	4662.75	35				

An analysis of Table -1 reveals that there is no significant difference in Systolic among Table Tennis, Tennis and badminton game players. Because significant value is greater than level of significance which is 0.05 since the calculated significance value is found no significant,

Figure No 1.



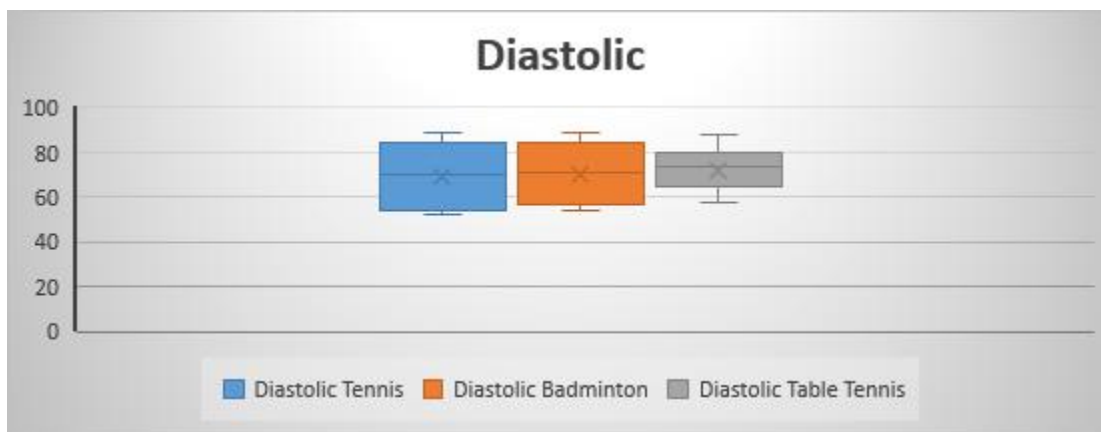
The estimated value of the players Pre Systolic is illustrated below in Figure no 1.

Table 2: Shows the value of f-ratio for three different Pre Test groups i.e. Table Tennis, Tennis and badminton game players for their physiological variable (Diastolic).

ANOVA		Pre Test					
	Source of Variation	Sum of Squares	df	Mean Square	F	P-value	F crit
Diastole	Between Groups	54.8888	2	27.4444	0.163773	0.84962*	3.284918
	Within Groups	5530	33	167.5757			
	Total	5584.888	35				

An analysis of Table -2 reveals that there is no significant difference in Diastole among Table Tennis, Tennis and badminton game players. Because significant value is greater than level of significance which is 0.05 since the calculated significance value is found no significant.

Figure no 2



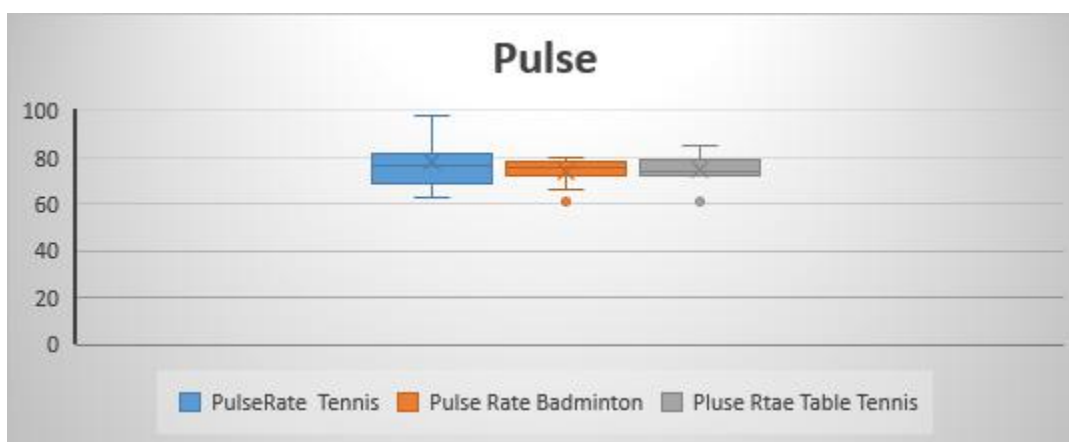
The estimated value of the players Pre Diastolic is illustrated below in Figure no 2.

Table 3: Shows the value of f-ratio for three different Pre Test groups i.e. Table Tennis, Tennis and badminton game players for their physiological variable (Pules rate).

	ANOVA	Pre Test					
	Source of Variation	Sum of Squares	df	Mean Square	F	P-value	F crit
Pulse rate	Between Groups	9.3888	2	4.69444	0.1674	0.84649*	3.28492
	Within Groups	924.916	33	28.0277			
	Total	934.305	35				

An analysis of Table -3 reveals that there is no significant difference in Pulse Rate among Table Tennis, Tennis and badminton game players. Because significant value is greater than level of significance which is 0.05 since the calculated significance value is found no significant,

Figure no 3.



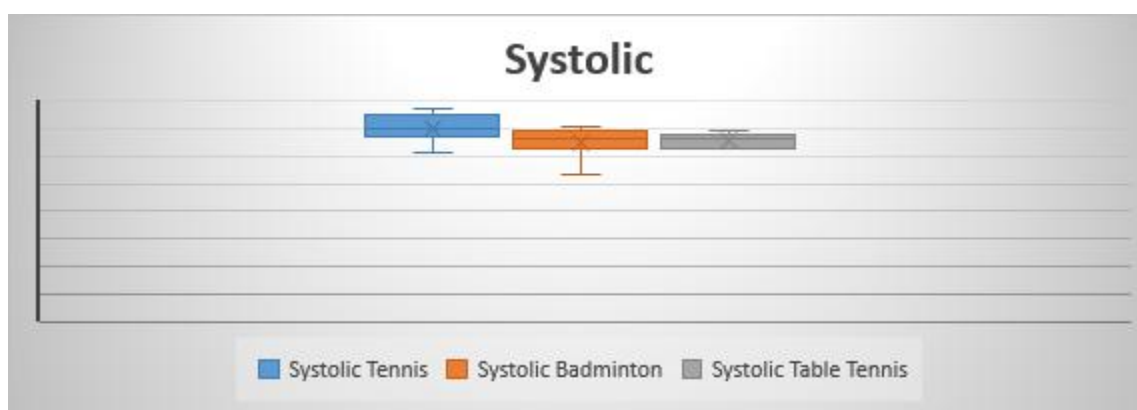
The estimated value of the players Pre Pulse is illustrated below in Figure no 3.

Table 4: Shows the value of f-ratio for three different Post Test groups i.e. Table Tennis, Tennis and badminton game players for their physiological variable (Systolic).

	ANOVA		Post Test				
	Source of Variation	Sum of Squares	df	Mean Square	F	P-value	F crit
Systole	Between Groups	695.1667	2	347.5833	4.40514	0.020152*	3.284918
	Within Groups	2603.833	33	78.90404			
	Total	3299	35				

An analysis of Table -4 reveals that there is a significant difference in Post Systolic among Table Tennis, Tennis and badminton game players. Because significant value is less than level of significance which is 0.05 since the calculated significance value is found significant.

Figure No 4



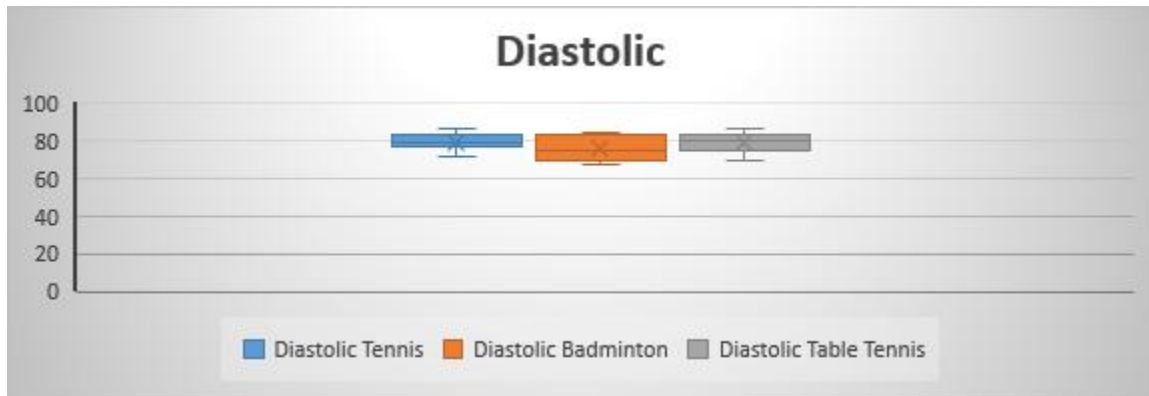
The estimated value of the players Post Systolic is illustrated below in Figure no 4.

Table 5: Shows the value of f-ratio for three different Post Test groups i.e. Table Tennis, Tennis and badminton game players for their physiological variable (Diastolic).

	ANOVA		Post Test				
	Source of Variation	Sum of Squares	df	Mean Square	F	P-value	F crit
Diastolic	Between Groups	161.1667	2	80.583	1.844353	0.174059*	3.284918
	Within Groups	1441.833	33	43.692			
	Total	1603	35				

An analysis of Table -5 reveals that there is a no significant difference in Post Diastole among Table Tennis, Tennis and badminton game players. Because significant value is greater than level of significance which is 0.05 since the calculated significance value is found no significant.

Figure no 5



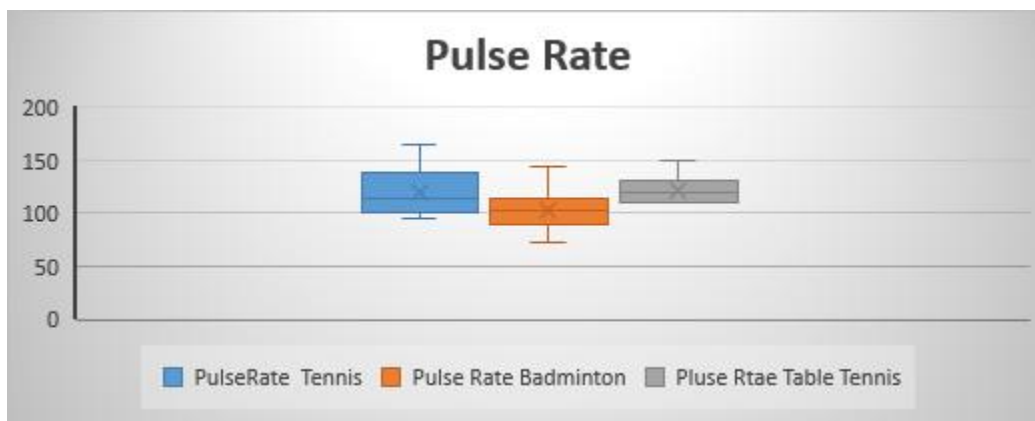
The estimated value of the players Post diastole is illustrated below in Figure no 5

Table 6: Shows the value of f-ratio for three different Post Test groups i.e. Table Tennis, Tennis and badminton game players for their physiological variable (Pules rate).

	ANOVA	Post Test					
	Source of Variation	Sumof Squares	df	Mean Square	F	P-value	F crit
Pulse Rate	Between Groups	2466.166	2	1233.083	3.536004	0.040607*	3.284918
	Within Groups	11507.833	33	348.7222			
	Total	13974	35				

An analysis of Table -6 reveals that there is a significant difference in Post Pulse Rate among Table Tennis, Tennis and badminton game players. Because significant value is less than the level of significance which is 0.05 since the calculated significance value is found significant,

Figure no 6



The estimated value of the players Post Pulse Rate is illustrated below in Figure no 6

4.1 Discussion of the results

A Study of the Findings of the Pre-Physiological Variables of Table Tennis, Tennis and Badminton Players. There was no significant difference in the value of the pre-physiological variables among the table tennis, tennis and badminton game players. Among the post-physiological variables of value obtained were Table Tennis, Tennis and Badminton Game Players. So our study of hypotheses is accepted in this case that there are significant differences in physiological variables such as table tennis, tennis and badminton players. But in post Physiological (Diastoles) variable case no difference found between Table Tennis, Tennis and Badminton Game Players.

The following studies are in agreement with the present study;

5.1 Conclusion

It is concluded that there was no significant difference observed in Pre-test in the selected physiological variables among Table Tennis, Tennis and Badminton junior national players.

It is concluded that the training had shown changes and find significant difference between the groups i.e. Table Tennis, Tennis and Badminton groups with regard to the selected physiological variables i.e. Systolic and Pulse rate. Furthermore, it is also concluded that with regard to physiological variable (diastolic pressure) had shown no significant difference were between Table Tennis, Tennis and Badminton groups.

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