Study Of Physiological Variables Of North And South Indian Hockey Players

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ABSTRACT

Sports and Physical Education have high level and standard in present time. Many dimensions are included behind the growing of standard of sports and physical education like Diet, high level of scientific labs for testing of physiological variables and scientific playing equipment's. Physiological variables play a vital role in improving the sports performance, without physiological testing we cannot think about good performance in games and sports. Therefor the objective of the research is to assess and compare the Physiological Variables of North and South Indian Hockey players. In this study there have 200 subjects as the sample size (100 of North region and 100 of South region) aged 18 to 24 years from different Colleges and Universities students. Vital Capacity, Resting Heart Rate, Maximum Heart Rate, Hemoglobin, LDL, HDL, VLDL, Triglyceride and total Cholesterol physiological variables taken for the study. The data related to Physiological Variables was collected blood sample of the subjects. The statistical analysis was performed by using the "t" test to achieve mean and standard deviation of the collected information. The results of study showed that the north region male hockey players were better in vital capacity, hemoglobin level, total cholesterol, HDL and VLDL. Data also revealed that there was significance difference found between north and south Hockey players whereas LDL was better found in male South Indian hockey players.

Key Words: Vital Capacity, Resting Heart Rate, Maximum Heart Rate, Hemoglobin, LDL, HDL, VLDL, Triglyceride and total Cholesterol

Introduction:
Physiology belongs to the functional study of human as well as animals. We get information about the working condition of human and animals only through physiology. The study of physiology also holds importance in the medical health sciences as it enhances our understanding of disease in medicine and our ability to treat it effectively. In simple language we can say that how do the organs of living beings work? If we talk about physiology in the field of sports, then we can say that physiology is the central point of sports. Because without the knowledge of physiology, it is difficult to increase the performance of the sports person, along with this the sports person also will not be able to do good practice.

In human physiology, the functions of all systems of the human body and their interrelationships are studied. In fact, it is only through human physiology that we come to know that all the parts of our body work in coordinating way with each other. Physiology is very important for both player and coach where with the help of physiology the player will be able to give good performance, choose the right game! At the same time, the trainer will know through physiology how to make a training program, what type of training to give, how to save the player from sports injury, how to provide first aid and rehabilitation and type of chemical changes happen in player's body during training.

Background: Who does not know the name of Major Dhyan Chand Ji, who is known as the magician of Field Hockey. Dhyan Chand was a former legendary Hockey Player and lead Indian as captain more than 10 years. He is counted as one of the best players in India and in the world. Field hockey game is not limited to just the game as it develops qualities like team spirit, personal firmness, social skills and personality development in a person. Field Hockey games being a game of long duration, it is considered a difficult game in which required rigorous physically fit. Along with this, the players should also have technical and tactical sound because when a team plays with another team, the team has to choose its strategy according to the situation in the match so that they can perform efficiently.

The study of Physiology is very important in sports. Physiology is the study of how an organ or cell works. It is about what the function is and what it can do and contribute to the wholeness of the human being. When talking about physiology, one does will always have to deal with anatomy. That is why in many institutions, the subject as named as Anatomy and physiology. Most of the times, the composition or what the organ is made up, anatomy can tell us about the physiology of the organ and vice versa.

Objective: To analyses and compare Physiological Variables of North and South Indian male Hockey Players.

Material and Method:

Data collection: Two hundred male Hockey players (N=200) have been selected in this research work. All the players were from Sports Authority of India (SAI) Schemes. In current research work, the players were minimum level of National level and Inter University.

Sample selection: The current research work is limited to North India (considering four states such as Delhi, Himachal Pradesh, Punjab and Haryana) and South India (involving four states such as Andhra Pradesh, Maharashtra, Kerala and Tamil Naidu). This study considers 200 players as the sample size and using convenience sampling of the both two zones. Out of these 200 players 100 from North region and 100 from South region selected as a Subjects.

Measurement procedure:

Physiological Variables

Vital capacity is the maximum amount of air a person can expel from the lungs after a maximum inhalation. It is equal to the sum of inspiratory reserve volume, tidal volume, and expiratory reserve volume. A person's vital capacity can be measured by a wet or regular spirometer.

Heart rate: "heart rate is the number of heartbeats per unit of time, typically expressed as beats per minute".

Resting heart rate: "Resting Heart Rate (RHR) is how fast your heart beats at rest (i.e. not when exercising)". The faster it beats, the harder your heart is working. RHR is an indicator of heart health because it suggests how efficiently the heart is pumping blood. Resting heart rate will decrease as the walker's heart becomes larger and stronger with training. A low resting heart rate is an indicator of fitness.

Maximum heart rate: "maximum heart rate (MHR) is the fastest rate at which your heart is in one minute". You might wonder why you need to know this number and, unless you use track your heart rate during exercise, you may not have any need to calculate your MHR.

Hemoglobin: hemoglobin and abbreviated Hb or Hgb is the iron containing oxygen-transport metalloproteinase in the red blood cells of all vertebrates. Hemoglobin in the blood carries oxygen from the respiratory organs to the rest of the body i.e. the tissues, where it releases the oxygen to burn nutrients to provide energy to power the functions of the organism, and collects the resultant carbon dioxide to bring it back to the respiratory organs to be dispensed from the organism.

Lipid profile: Lipid profile or lipid panel is a panel of blood tests that serves as an initial broad medical screening tool for abnormalities in lipids, such as cholesterol and triglycerides. The results of this test can identify certain genetic diseases and can determine approximate risks for cardiovascular disease, certain forms of pancreatitis, and other diseases.

Total Cholesterol: "Total cholesterol is a direct cholesterol measurement that measures all cholesterol molecules in the blood, including low density lipoproteins (LDL), high density lipoproteins (HDL), and very low density lipoproteins (VLDL)". A total cholesterol measurement is the most common type of measurement used in a lipid profile, including home cholesterol tests and cholesterol tests performed in a healthcare provider's office.

LDL: Cholesterol isn't bad. It's an essential fat that provides support in the membranes of our bodies' cells. Some cholesterol comes from diet and some is made by the liver.

Cholesterol can't dissolve in blood, so transport proteins carry it where it needs to go. These carriers are called lipoproteins, and LDL (low-density lipoprotein) is one member of the lipoprotein family.

HDL: "HDL cholesterol is the name given to the cholesterol in the bloodstream that is carried by "high density lipoprotein." HDL cholesterol has been called "good cholesterol" because reduced levels of HDL cholesterol have been associated with an increased risk of heart attack and stroke, while high HDL levels are associated with a reduced risk.

VLDL: Very-low-density lipoprotein (VLDL) is a type of lipoprotein made by the liver. LDL is one of the five major groups of lipoproteins i.e. chylomicrons, VLDL, low-density lipoprotein, intermediate-density lipoprotein, and high-density lipoprotein which enable fats and cholesterol to move within the water-based solution of the bloodstream. VLDL is assembled in the liver from triglycerides, cholesterol, and Apo lipoproteins.

Triglycerides: The major form of fat stored by the body. A triglyceride consists of three molecules of fatty acid combined with a molecule of the alcohol glycerol. Triglycerides serve as the backbone of many types of lipids. Triglycerides come from the food we eat as well as from being produced by the body.
The entire above test were measured by Blood Test.

RESULTS:

TABLE-1 COMPARISON OF VITAL CAPACITY BETWEEN NORTH AND SOUTH INDIAN MALE HOCKEY PLAYERS

Groups	Mean	S.D	d.f.	S.E.D.	't'-value
North	4656.20	64.30	98	16.75	8.05*
South	4521.40	99.45			

*Significant at 0.05 levels of significance

Table:1 represented the mean value of north and south Indian Male Hockey players in vital capacity was 4656.20 and 4521.40 respectively and the SD value of north and south Indian Male Hockey players in vital capacity was 64.30 and 99.45 respectively. The standard error difference was also finding out with the reading of 16.75. The 't' was calculated as 8.05, which was significant at .05 level of significance. Which was showed that significant difference in mean values of north and south Indian Male Hockey players in Vital capacity was found and our hypothesis was rejected.

TABLE-2 COMPARISON OF RESTING HEART RATE BETWEEN NORTH AND SOUTH INDIAN MALE HOCKEY PLAYERS

Groups	Mean	S D	d. f.	S.E.D.	't'-value

Groups	Mean	S D	d.f.	S.E.D.	't'-value
North	69.62	2.00	98	0.64	7.41*
South	64.88	4.05			

*Significant at 0.05 levels of significance

Table: 2 represented the mean value of north and south Indian Male Hockey players in Resting Heart rate was 69.62 and 64.88 respectively and the SD value of north and south Indian Male Hockey players in resting heart rate was 2.00 and 4.05 respectively. The standard error difference was also finding out with the reading of 0.64. The 't' was calculated as 7.41, which was significant at .05 level of significance. This was showed that significant difference in mean values of north and south Indian Male Hockey players in Resting heart rate was found and our hypothesis was rejected.

TABLE-3 COMPARISON OF MAXIMUM HEART RATE BETWEEN NORTH AND SOUTH INDIAN MALE HOCKEY PLAYERS

Groups	Mean	S D	d.f.	S.E.D.	't'-value
North	198.34	6.60	98	1.28	3.25*
South	202.52	7.79			

*Significant at 0.05 levels of significance

Table: 3 represented the mean value of north and south Indian Male Hockey players in maximum heart rate was 198.34 and 202.52 respectively and the SD value of north and south Indian Male Hockey players in maximum heart rate was 6.60 and 7.79 respectively. The standard error difference was also finding out with the reading of 1.28. The 't' was calculated as 3.25 which was significant at .05 level of significance. This was showed that significant difference in mean values of north and south Indian Male Hockey players in maximum heart rate was found and our hypothesis was rejected.

TABLE-4 COMPARISON OF HEMOGLOBIN BETWEEN NORTH AND SOUTH INDIAN MALE HOCKEY PLAYERS

Groups	Mean	S D	d. f.	S.E.D.	't'-value
Hockey	15.01	0.97	98	0.20	2.5*
Football	14.49	1.15			

***Significant at 0.05 levels of significance**

Table: 4 represented the mean value of north and south Indian Male Hockey players in hemoglobin was 15.01 and 14.49 respectively and the SD value of north and south Indian Male Hockey players in hemoglobin was 0.97 and 1.15 respectively. which was showed the slightly different between the north and south Indian Male Hockey players in hemoglobin. The standard error difference was also finding out with the reading of 0.20. The 't' was calculated as 2.5, which was no significant at .05 level of significance. This was

showed that significant difference not found in mean values of north and south Indian Male Hockey players in hemoglobin and our hypothesis was accepted.

TABLE-5 COMPARISON OF TOTAL CHOLESTROL BETWEEN NORTH AND SOUTH INDIAN MALE HOCKEY PLAYERS

Groups	Mean	S.D	d.f.	S.E.D.	't'-value
North	175.52	17.02	98	3.37	4.53*
South	160.24	23.15			

*Significant at 0.05 levels of significance

Table: 5 represented the mean value of north and south Indian Male Hockey players in Total Cholesterol 175.52 and 160.24 respectively and the SD value of north and south Indian Male Hockey players in Total Cholesterol was 17.02 and 23.15 respectively. The standard error difference was also finding out with the reading of 3.37. The 't' was calculated as 4.53, which was significant at .05 level of significance. This was showed that significant difference in mean values of north and south Indian Male Hockey players in Total Cholesterol was found and our hypothesis was rejected.

TABLE-6 COMPARISON OF LDL BETWEEN NORTH AND SOUTH INDIAN MALE HOCKEY PLAYERS

Groups	Mean	S D	d.f.	S.E.D.	't'-value
North	93.56	15.20	98	1.86	0.59
South	92.46	10.72			

Not Significant at 0.05 levels

Table: 6 represented the mean value of north and south Indian Male Hockey players in LDL was 93.56 and 92.46 respectively and the SD value of north and south Indian Male Hockey players in LDL was 15.20 and 10.72 respectively. The standard error difference was also finding out with the reading of 1.86. The 't' was calculated as 0.59, which was not significant at .05 level of significance. This was showed that significant difference not found in mean values of north and south Indian Male Hockey players in LDL and our hypothesis was accepted.

TABLE-7 COMPARISON OF HDL BETWEEN NORTH AND SOUTH INDIAN MALE HOCKEY PLAYERS

Groups	Mean	S. D.	d.f.	S.E.D.	't'-value
North	64.82	10.04	98	1.79	6.35*
South	76.24	7.82			

Table: 7 represented the mean value of north and south Indian Male Hockey players in HDL was 64.82 and 76.24 respectively and the SD value of north and south Indian Male Hockey players in HDL was 10.04 and 7.82respectively. The standard error difference was also finding out with the reading of 1.79. The 't' was calculated as 6.35, which was significant at .05 level of significance. This was showed that significant difference in mean values of north and south Indian Male Hockey players in HDL was found and our hypothesis was rejected.

TABLE- 8 COMPARISON OF VLDL BETWEEN NORTH AND SOUTH MALE HOCKEY PLAYERS

Groups	Mean	S. D.	d.f.	S.E.D.	't'-value
North	22.98	3.29	98	0.89	3.49*
South	19.64	2.32			

*Significant at 0.05 levels of significance

Table: 8 represented the mean value of north and south Indian Male Hockey players in VLDL was 22.98 and 19.64 respectively and the SD value of north and south Indian Male Hockey players in VLDL was 3.29 and 2.32 respectively. The standard error difference was also finding out with the reading of 0.09. The 't' was calculated as 3.49, which was significant at .05 level of significance. This was showed that significant difference in mean values of north and south Indian Male Hockey players in VLDL was found and our hypothesis was rejected.

TABLE-9 COMPARISON OF TRIGLYCEROIDS BETWEEN NORTH AND SOUTH MALE HOCKEY PLAYERS

Groups	Mean	S. D.	d.f.	S.E.D.	't'-value
North	147.14	33.10	98	4.93	1.41
South	140.20	12.27			

*Significant at 0.05 levels of significance

Table: 9 represent the mean value of north and south Indian Male Hockey players in Triglyceride was 147.14 and 140.20 respectively and the SD value of north and south Indian Male Hockey players in Triglyceride was 33.10 and 12.27 respectively. The standard error difference was also finding out with the reading of 4.93. The 't' was calculated as 1.41, which was not significant at .05 level of significance. This was showed that significant difference not found in mean values of north and south Indian Male Hockey players in Triglyceride and our hypothesis was accepted.

Conclusions: The researcher analyses of data Physiological variables of south and north, male hockey players. The data related to physiological variables of male hockey players showed that the north region male hockey players was better in vital capacity, hemoglobin level, total cholesterol, HDL and VLDL. Data also revealed that there was significance difference found between north and south Hockey players whereas LDL was better found in male South Indian hockey players and our hypothesis related to the above variables was rejected. The following studies also supported to this study **Mukesh Tiwari (2012)** studded the physiological variables among the Inter District & Inter State Levels of Basketball players. Sixty (60) Male basketball players (30 inter district and 30 interstate) were randomly selected from Uttar Pradesh as a subject. The age of the subjects was ranged from 17-28 years. The physiological variables were resting heart rate measured by manual methods and vital capacity which is measured by Spirometer. The results of the showed that the Physiological variables namely RHR and vital capacity both the group were not differ significantly. Pardeep Kumar (2013) compared the physiological variables of Batsmen's, pace Bowlers, Spin Bowlers, Wicketkeepers and All Rounder's Men Cricketers of India. Total 140 players selected for the study. Resting Heart Rate Resting Blood Pressure, Hb contents Vital Capacity Anaerobic Power and Aerobic Capacity Physiological variables. The results of study showed that Bowlers have good physiological condition that Batsmen's. **Smilee Johncy S 1 , Vivian Samuel T 2 (2010)** Studded as Aerobic power is dependent on the ability of the respiratory and circulatory systems to transport oxygen from the air to the respiring tissues, and the ability of the tissues to use the oxygen to break down metabolic fuels. The present study has therefore been undertaken to investigate the cardiovascular and respiratory responses to submaximal exercise. and aerobic power or VO2max in young healthy untrained South and North Indians. 50 North Indians and 50 South Indians, normal healthy normotensive male subjects in the age group of 18-25 years were selected for the study. In the present study the aerobic power is statistically increased in north Indians compared to the south Indian which may be due regional variation of morphological characteristics, socioeconomic, climatic and genetically variations. **P. Vinoth Kumar, et. al. (2010),** the purpose of this study was to compare the selected physiological variables among university men basketball football and volleyball players. To achieve the purpose each twenty university level basketball, football and volleyball players were selected as subjects from Pondicherry. Data were collected on the selected variables namely resting pulse rate, and breathe holding time. One-way analysis of variance (ANOVA) was used for statistical analysis. The results of the study showed that there was significant difference among players in pulse rate and there was no significant difference in breath holding time.

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