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A COMPARISON OF VO_2 MAX, PEAK INSPIRATORY FLOW RATE AND MAXIMUM TIDAL VOLUME OF FOOTBALL AND HOCKEY PLAYERS OF HIMACHAL PRADESH UNIVERSITY

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Abstract

In this study the researcher attempt to investigate the comparison VO_2 Max, Peak Inspiratory Flow Rate and Maximum Tidal Volume of Football and Hockey players of Himachal Pradesh University. To solve the purpose of the study 128 football players and 128 hockey players of Himachal Pradesh University were taken as the sample. The vo_2 max calculate by the formulae which is taken from the book "Physiological Assessment of Human Fitness" 2nd Edition from page no.25. The editors of this book are Peter J. Maud and Carl Foster. This formula is also used by Jackson ET. al (1990) and Mathews, Hell, Freedson and Pastides (1999) to assess Physical Activity Status (PAS) to estimate and for Peak Inspiratory Flow Rate and Maximum Tidal Volume a Spirometer Model-Helios 401 (company-Recorders & Medicare Systems Pvt Ltd) is used. There will be no significant difference in the variables VO_2 Max, Peak Inspiratory Flow rate and Maximum Tidal Volume among football and Hockey Players of Himachal Pradesh University, hypotheses was formulated for the present study.

Key Words: *VO_2 Max, PIFR, MTV.*

Introduction

In elite athletes, VO_2 max is not a good predictor of performance. The winner of a marathon race for example, cannot be predicted from maximal oxygen uptake. Perhaps more significant than VO_2 max is the speed at which an athlete can run, bike or swim at VO_2 max. Two athletes may have the same level of aerobic power but one may reach their VO_2 max at a running speed of 20 km/hr and the other at 22 km/hr.

While a high VO_2 max may be a prerequisite for performance in endurance events at the highest level, other markers such as lactate threshold are more predictive of performance. Again, the speed at lactate threshold is more significant than the actual value itself.

Vital capacity is the maximum amount of air a person can expel from the lungs after a maximum inspiration. It is equal to the inspiratory reserve volume plus the tidal volume plus the expiratory reserve volume.

According to Food and Fitness Dictionary : The maximal volume of air forcefully expelled from the lungs after a maximal inspiration. It is a measure of the maximum amount of air the lungs can breathe in or out. At rest, values vary from about 3.5-6.0 litres, according to age, sex, and height. Measurements of vital capacity are used as part of a fitness assessment. A person whose vital capacity is less than 75 per cent of the expected value, is generally advised to consult a doctor for further testing before exercising vigorously.

Peak Inspiratory Flow Rate (PEFR) is a person's maximum speed of inspiration, as measured with a peak flow meter, a small, hand-held device used to monitor a person's ability to breathe out air.

Tidal Volume (VT) is defined as; the amount of air that is inspired and expired during normal resting ventilation.

VC is related to size and development of the subject being 2.6 L/m^2 surface area in an adult male and 2.1 L/m^2 in adult female. Exercise increases vital capacity. Besides this, other physiological factors influencing vital capacity are (i) age (ii) sex, (iii) posture (iv) strength of inspiratory muscles (v) Dispensability of lungs (vi) Pregnancy. In the third trimester vital capacity decreases. There are pathological factors effecting this capacity like diseases of inspiratory tract muscles, pleura and lungs, e.g. myasthenia gravis, poliomyelitis, pleural effusion, fibrosis, emphysema, asthma, oxdema of lungs, all can reduce vital capacity.

If vital capacity is timed and recorded on spirometer, 80% of volume of air is expelled in the 1st second and this is known as timed vital capacity or forced expiratory volume in 1st sec (FEV_1). This forms an integral part of lung function test, being a sensitive index in finding out the obstructive and restrictive diseases severity.

Methodology

To complete the purpose of the study 256 players were selected from Himachal Pradesh University inter college football teams and hockey teams players were taken as sample in which 128 football players and 128 hockey players were selected. The vo_2 max calculate by The formulae (VO_2 Max = (0.133 X age) – (0.005 X age^2) + (11.403 X gender) + (1.463 X PA-R score) + (9.17 X height) – (0.254 X body mass) + 34.142) which is taken from the book "Physiological Assessment of Human Fitness" 2nd Edition from page no.25. The editors of this book are Peter J. Maud and Carl Foster. This formula is also used by Jackson ET. al (1990) and Mathews, Hell, Freedson and Pastides (1999) to assess Physical Activity Status (PAS) to estimate and for Peak Inspiratory Flow Rate and Maximum Tidal Volume a Spirometer Model-Helios 401 (company-Recorders & Medicare Systems Pvt Ltd) is used.

Results and Findings

Table No. 1 Comparison Of Vo_2 Max Of Football Players With Hockey Players Of Himachal Pradesh University

Variable	Group	N	Mean	S.D.	SEM	Df	M.D.	"T"
VO_2 Max	Football Players	128	56.75	1.547	.137	254	-.195	-.966
	Hockey Players	128	56.95	1.685	.149			

Table no-1 reveals that the mean value of VO_2 max of Football players is 56.75 and mean value of Hockey players is 56.95 the mean difference is-.195. The obtained "t" value for df 254 is -.966. The obtained "t" value is statistically insignificant at 0.05 level of significance. When compared with table value of "t". The formulated hypothesis for the present study has been accepted on the basis of obtained results.

Table No. 2 Comparison Peak Inspiratory Flow Rate Of Football Players With Hockey Players Of Himachal Pradesh University

Variable	Group	N	Mean	S.D.	SEM	Df	M.D.	"t"
Peak Inspiratory Flow Rate	Football Players	128	7.42	3.050	.270	254	-1.344	-3.453
	Hockey Players	128	8.77	3.176	.281			

Table no-2 reveals that the mean value of Peak Inspiratory Flow Rate of Football players is 7.42 and mean value of Hockey players is 8.77 the mean difference is-1.344. The obtained "t" value for df 254 is -3.453. The obtained "t" value is statistically significant at 0.05 level of

Significance. When compared with table value of "t". The formulated hypothesis for the present study has been rejected on the basis of obtained results. On the basis of results obtained from table no. 4.2 there is significant difference in Peak Inspiratory Flow Rate. The hockey players are found better as compared to the football players in term of Peak Inspiratory Flow Rate. It means they have more speed of inspiration as compare to hockey players. Hockey is the game of speed in which players have to run short sprints and for this the maximum flow of air is required by the lungs. That's why speed of inspiration of hockey players is more than football players.

The mean difference for the variable of Peak Inspiratory Flow Rate -1.344 is further graphically depicted in figure no 1

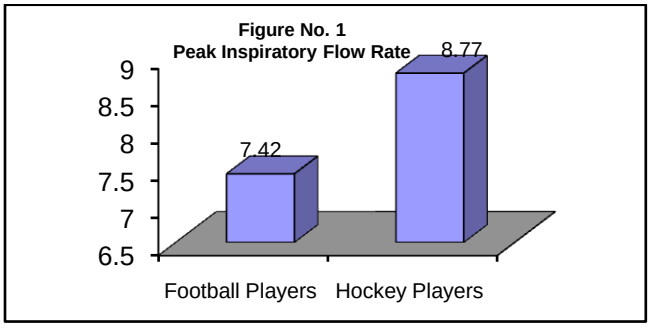
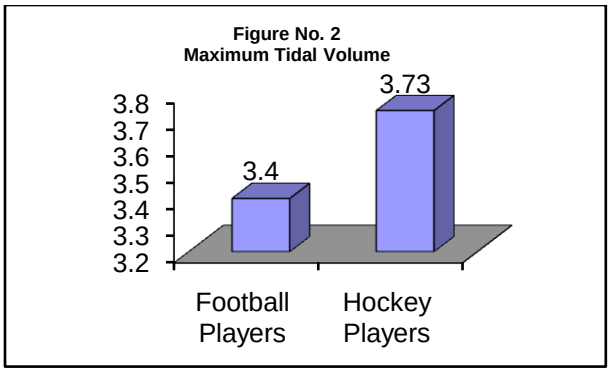


Table No. 3 Comparison Of Maximum Tidal Volume Of Football Players With Hockey Players Of Himachal Pradesh University

Variable	Group	N	Mean	S.D.	SEM	Df	M.D.	"t"
Maximum Tidal Volume	Football Players	128	3.40	1.173	.104	254	-.336	-2.543
	Hockey Players	128	3.73	.926	.082			

Table no-3 reveals that the mean value of Maximum Tidal Volume of Football players is 3.40 and mean value of Hockey players is 3.73 the mean difference is-.336. The obtained "t" value for df 254 is -2.543. The obtained "t" value is statistically significant at 0.05 level of significance. When compared with table value of "t". The formulated hypothesis for the present study has been rejected on the basis of obtained results. On the basis of results obtained there is significant difference in Maximum Tidal Volume. The hockey players are found better as compared to the football players in term of Maximum Tidal Volume. It means Maximum amount of air inhale and exhale during normal resting ventilation is better in hockey players. The reason behind this may be table no. 4.2 reveals that players inhale maximum volume of air due to this inhaling, the player exhale more air from the lungs. This result increases tidal volume. That's why hockey players have more tidal volume as compared to football players.

The mean difference for the variable of Maximum Tidal Volume -.336 is further graphically depicted in figure no 2.



Conclusion The Mean score of VO_2 Max of Hockey and football players of Himachal Pradesh University do not show much difference. Thus we can conclude that there is no significant difference in hockey and football players of Himachal Pradesh university. on the basis of VO_2 Max. The Mean and Standard Deviation score of Peak Inspiratory Flow Rate and Maximum Tidal Volume shows the diffences between Hockey and football players of Himachal Pradesh University Shimla. Hence the hypotheses set that there is no significant difference between football and hockey players in term of VO_2 Max is accepted and in term of PIFR, MTV is rejected. Hockey is the game of speed in which players have to run short sprints and for this the maximum flow of air is required by the lungs. So they are better than football players.

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