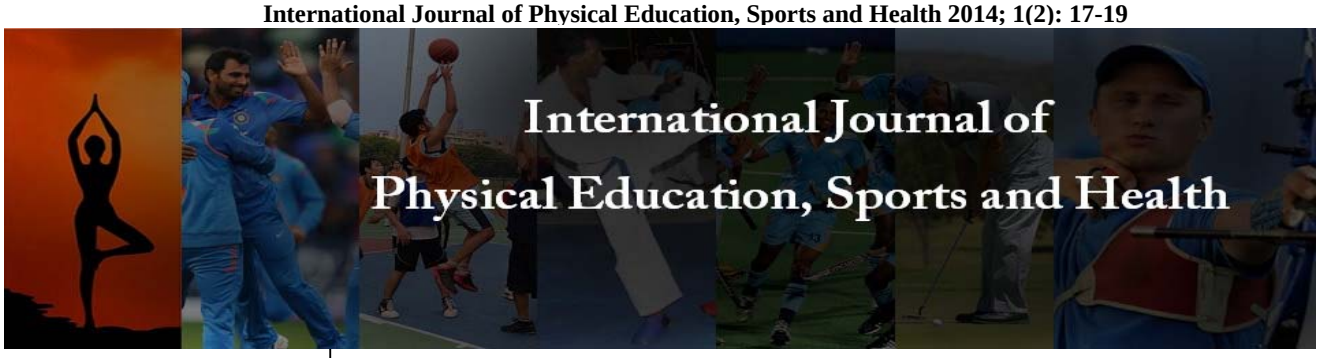

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Comparative study of maximum oxygen consumption of different game players

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Abstract
The demand of oxygen differs from one sport to other sports. It's a common observation that whenever athlete go for anaerobic type of training his/her anaerobic capacity is enhanced but along with this it is also observed that after anaerobic type of training the aerobic capacity of the athlete is also improves. Thus it is very essential to know that which type of training (aerobic/anaerobic) dominates to a particular sport, or whether combination training is needed. The purpose of the study was to investigate whether there were significant differences between different sports and games in relation to maximum oxygen consumption. Fifty-Six subjects were selected from different match practice groups i.e. basketball (18), hockey (12), judo (6), swimming (4), sprinter (10) and cross country runners (6) from Chhatrapati Shahu Ji Maharaj University, Kanpur U.P. for the study. In order to ascertain significant differences among different sports and games in relation to maximum oxygen consumption ANOVA Test was employed. For further analysis Post-Hoc Test (Scheffe's Test) is applied. The Cross Country runners had shown highest Vo2 max (71.43) in comparison to all other games and sports. Further the Basketball players (65.58), Hockey players (62.39) and Sprinters (65.01) had more or less same Vo2 max with a small range of variation. On the other hand Judo players had shown (57.77) lowest Vo2 max., Swimmers also shown a lower Vo2 max (58.91) in comparison to all other sports/games except Judo (57.77).

Keywords: Maximum oxygen consumption, anaerobic, aerobic

1. Introduction
In the modern scientific age, in every field of human endeavor, systematic objective and scientific procedures are followed in accordance with principles based on experience, understanding and application of knowledge of science. The field of games and sports is no exception to this. In advanced countries like U.S.A., Germany, Russia, Australia, Britain and others, the rapid progress in the field of games and sports like athletics, soccer, hockey, etc. has taken place and their international achievements have been possible only due to research, experimentation and application of scientific knowledge [5].

Search and selection of potential athletes in specific field based on scientific knowledge, is a matter of routine in many developed countries. Unfortunately, in India, this aspect has not been given serious consideration; consequently athletes are selected from the 'available pool' mainly on the basis of their performance records in various sports meets. It is often forgotten that such 'talents' have already reached their peak performance with little scope for further spectacular improvement in spite of intense grooming schedules. Therefore, a fresh look towards the need has to be taken to improve upon the methods of selection of Indian athletes. They need to be identified at a very young age [6].

During the last decade in many advanced countries, the "muscle Biopsy" technique, whereby samples from skeletal muscles of healthy people are obtained and have been widely applied "to catch them young" Recently, "histological and histochemical techniques have also been applied to identify different fiber types in the skeletal muscles of man. This is than use to correlate the contractile characteristics of their functions and metabolic potentialities in various athletic events by determining different enzyme activities. It has become popular to determine muscle fiber composition of athletes involved in different types of events. Regarding the relative distribution of ST (slow twitch) and FT (Fast twitch) fibers, the most interesting findings are that long distance runner has a marked predominance of ST (slow twitch) fibers in their leg muscles [7].

The degree to which the cardio-vascular fitness contributes to a particular games or sports depends upon the type and variety of movements involved in them. In sports training much emphasis is laid on those components of physical fitness, which are most fundamental to those sports. For example training of long distance runner, cardio-vascular & muscular endurance are prime importance, while for sprinting, development of strength, speed is given greater importance. Same is true in training of games such as Football, Basketball, Volleyball, Swimming etc. The complex nature of physical fitness includes the muscular strength, muscular endurance, cardio- respiratory endurance and the most important of them is the cardio- respiratory endurance [8].

2. Methodology

The subjects were selected from different match practice group i.e. Basketball (18), Hockey (12), Swimming (4), Judo (6), Cross-Country runners (6) and sprinters (10) from Chhatrapati Shahu Ji Maharaj University, Kanpur U.P. for this study. On random basis sixty percent athletes from each match practice group were selected as the subject for the study. All the subjects were residents of the Kanpur and they had the similar routine of work. The age of the subjects ranged between 20-25 years.

2.1 Statistical Techniques Employed in the Study

To see the significant difference of maximum oxygen consumption among the players belonging to different sports and games the analysis of variance F ratio was applied at 0.05 level of significance. For further analysis Post-Hoc Test (Scheffe's Test) is applied.

3. Results & Discussion

Finding pertaining to maximum oxygen consumption of players belonging to different sports and games which were subjected to analysis of variance and mean difference method has been presented in the following table.

Table 1: Comparison of Maximum Oxygen Consumption of Players Belonging to Different Games

Source of Variation	d.f.	S.S.	M.S.S.	F-ratio
$(SS)_b$	5	29974.46	5994.89	192.70*
$(SS)_w$	50	1555.68	31.11	

*Significant of .05 level of confidence
Cal. F = 192.70*
Tab. F = df .05 (5, 50) = 2.40

The above table-1 indicates that there is a significant difference between different sports and games in relation to maximum oxygen consumption. As F-ratio found to be significant the data further analyzed with Post-Hock test (Scheffe's Test). The results pertaining to this are presented in Table-2.

Table 2: Paired Mean Difference of Maximum Oxygen Consumption of Different Games

Mean						Mean Difference	CD at 5% level
Basketball Players	Hockey Players	Judokas	Swimmers	Sprinters	Cross Country Athletes		
65.58s	62.39					3.19	8.66
65.58		57.77				7.81*	4.24
65.58			58.91			6.67*	4.74
65.58				65.01		0.57	3.35
65.58					71.43	5.85*	4.02
	62.39	57.77				4.62*	4.32
	62.39		58.91			3.48	4.97
	62.39			65.01		2.62	3.66
	62.39				71.43	9.04*	4.32
		57.77	58.91			1.14	5.60
		57.77		65.01		7.24*	4.49
		57.77			71.43	13.66*	5.04
			58.91	65.01		6.1*	5.11
			58.91		71.43	12.52*	5.60
				65.01	71.43	6.42*	4.49

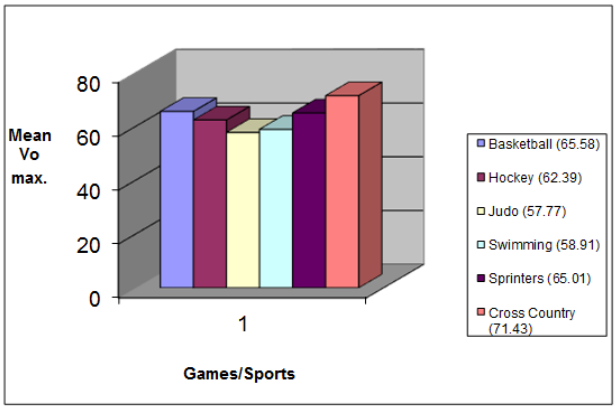

Fig 1: Mean Scores of Different Games in Relation To Vo_2 Max.

From the results of table-2 it is obvious that the Cross Country runners had shown higher Vo_2 max (71.43) in comparison to all other games. The reason could be that they (Cross Country runners) were directly involved in the activity which is primarily aerobic in nature. Further the Basketball players (65.58), Hockey players (62.39) and Sprinters (65.01) had more or less same Vo_2 max with a small range of variation. The reason could be that they were involved in similar kind of training, which is based on strength endurance and explosive strength.

On the other hand Judo players (57.77) have shown the lowest Vo_2 max. This is probably because Judo is primarily an anaerobic base activity where Vo_2 max. is not an essential quality more over the duration of activity is also very shot. Swimmers also have shown lower maximum oxygen consumption (58.91) in comparison to all other sports and

games except Judo (57.77). Normally the swimmers are having high Vo_2 max. for those who are engaged in long distance swimming. But the group chosen here were mostly from those who practiced and participated in the short distance (sprinting) swimming as the size of swimming pool of Chandrashekhar Azad Agriculture University, Kanpur was having the measurement of 12 ½ feet x 25 feet only.

To conclude the discussion of finding it can be stated that subject chosen in this above study were mainly selected from different match practice groups, but the fact stands that even when they were grouped in various games/sports, they were also involved with overall physical education activity programme as academic requirement of each subjects, therefore the impact of other activities could not be nullified and thus above variations in Vo_2 max. of different games and sports groups were observed. But one finding is very clear that on an average the Vo_2 max. of all the subjects irrespective of their games/sports were higher that the Vo_2 max. Values of normal sedentary individuals (between 38-40 ml./kg.)[1]. This might be attributed by the fact that regular participation in physical education programme influenced the overall Vo_2 max.

4. Conclusions

From the results of the study following conclusions may be drawn:

1. The Cross Country runners had shown highest Vo_2 max (71.43) in comparison to all other games and sports.
2. The Basketball Players (65.01), Hockey players (62.39) and Sprinters (65.01) had more or less same Vo_2 max with small range of variation.
3. The Judo players had shown (57.77) the lowest Vo_2 max in comparison to all other sports/games.
4. Swimmers also have shown a lower Vo_2 max. (58.91) in comparison to all other sports and other sports and games except Judo 57.77.

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