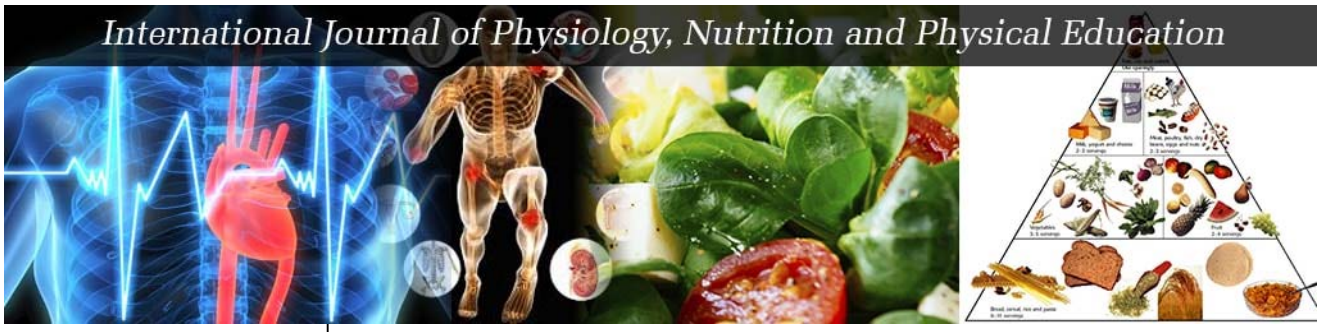

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Poonam
Assistant Professor
Department Of Physical Education Mdu, Rohtak, Haryana, India

Sandeep Sangwan
Assistant Professor
Department Of Physical Education Mdu Rohtak, Haryana, India

Correspondence
Poonam
Assistant Professor
Department Of Physical Education Mdu, Rohtak, Haryana, India

Relationship between endurance and $VO2_{max}$ of basketball players

Poonam and Sandeep Sangwan

Abstract
Objective: The sole purpose of this study was to explore the relationship between endurance and vo2 max of basketball players.
Design of the study: descriptive cum exploratory
Methodology: for accomplish the study a total 50 basketball players were randomly selected as sample. The age of the samples were ranged from 18 to 25. To assess the endurance of subjects Cooper 12 minute walk and run test was administered and score was measure in the units of meters. Vo2 max was measured through the values got via Cooper test and put them in a equation to get the vo2 max. To find out the relationship Pearson Correlation was used and the level of significance was set at 0.01.
Results: A strong positive correlation with the score of .987 was found between the endurance and vo2 max of selected subjects.
Conclusion: endurance is key point in every sports. After the study it has been proved that if a person have a good endurance than his or her vo2 max (maximum oxygen consumption) will also be good.

Keywords: Endurance, vo2 max, Basketball

Introduction
Basketball requires speed, strength, quickness and overall athleticism. Conditioning drills for basketball can help you get in shape to play the game competitively. However, your coaches may push you very hard to get in the best shape possible because they want you to have stamina in the late stages of the game. This is where games are often won and lost; making the effort to build your stamina can have a dramatic impact on your game and your team's win-loss record.
Endurance training in basketball is essential for players looking to maintain stamina throughout an entire game as well as the entire season. Although endurance training can be performed off the basketball court, it is possible for you to increase stamina and endurance during practice through on-court conditioning drills. Endurance training drills range from on-court line sprints to off-court jogging routines.
Endurance training in basketball breaks down into several categories. Speed endurance tests your ability to sustain a certain speed throughout a game or practice. Speed endurance drills often involve sprinting and shuffling for extended periods of time. Strength endurance must be developed in order to stay physical throughout an entire basketball game. Strength endurance is most important for power forwards and centers who need to rebound and box out throughout an entire game. Other endurance training categories include aerobic endurance and anaerobic endurance.

Methodology & procedure
Selection of the subjects: for accomplish the study a total 50 basketball players were randomly selected as sample. The age of the samples were ranged from 18 to 25. The competition level of the subjects was All India Inter-university and data were collected during their university camps.

Selection of the variable: To assess the endurance of subjects Cooper 12 minute walk and run test was administered and score was measure in the units of meters.

Vo2 max was measured through the values got via Cooper test and put them in a equation to get the vo2 max. To find out the relationship Pearson Correlation was used and the level of significance was set at 0.01.

Administration of test

The Cooper 12 minute run is a popular maximal running test of aerobic fitness, in which participants try and cover as much distance as they can in 12 minutes. There are several other variations of running/walking tests, including the Cooper 1.5 mile run test.

- **purpose:** to test aerobic fitness (the ability of the body to use oxygen to power it while running)
- **equipment required:** flat oval or running track, marker cones, recording sheets, stop watch.
- **procedure:** Place markers at set intervals around the track to aid in measuring the completed distance. Participants run for 12 minutes, and the total distance covered is recorded. Walking is allowed, though the participants must be encouraged to push themselves as hard as they can to maximize the distance covered.
- **scoring:** There are Cooper test norm tables for general guidelines for interpreting the results of this test for adults. There are also several equations that can be used to estimate VO_{2max} (in ml/kg/min) from the distance score (a formula for either kms or miles):

VO_{2max} = (35.97 x miles) - 11.29
VO_{2max} = (22.35 x kilometers) - 11.29

- **target population:** This test can be modified to be suitable for most populations. For those who are unfit or unable to run, there are similar walking tests that can be performed.
- **validity:** Cooper (1968) reported a correlation of 0.90 between VO_{2max} and the distance covered in a 12 min walk/run.
- **reliability:** the reliability of this test would depend on practice, pacing strategies and motivation level. There should be good reliability if these issues are addressed.
- **advantages:** large groups can be tested at once, and it is a very cheap and simple test to perform.
- **disadvantages:** practice and pacing is required, and performance on this test can be affected greatly by motivation.
- **comments:** the world record for 5000m is held by Kenenisa Bekele in 12:37.35. Based on that time, he would complete 4752m or 11.88 laps in 12 min.
- **variations / modifications:** The test can also be conducted by running on a treadmill for 12 minutes, set to level 1 (1 percent) incline to mimic outdoor running. There are also many variations of the walk / run test. A very similar test is the Balke 15 minute run. Testing is generally easier to administer when the distance is fixed and the finishing time measured, so the alternative Cooper 1.5 mile (2.4km) run test was developed.

Results

Table 1: Descriptive statistics

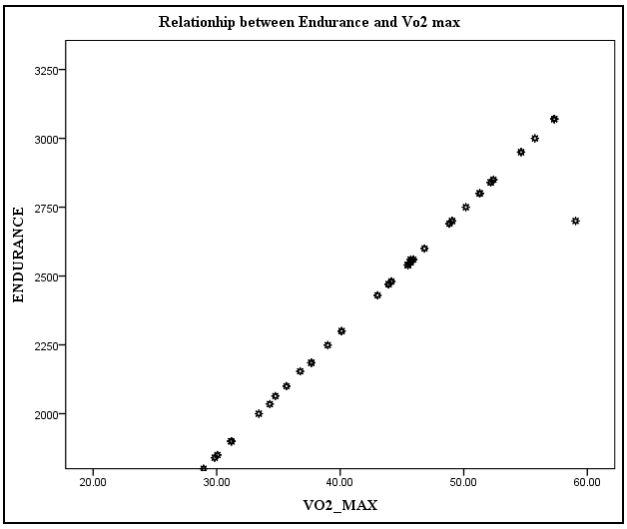
Variables	N	Mean	SD
Endurance	50	2463.34	385.688
$Vo2_{max}$	50	43.9658	8.85057

The table no 1 explore the descriptive statistics of the selected subjects. The mean and SD of endurance was 2463.34±385.688 and mean and SD of $vo2_{max}$ was 43.9658±8.85057 respectively.

Table 2: Correlation between Endurance and $Vo2_{max}$

		Endurance	VO2_Max
Endurance	Pearson Correlation	1	.987**
	Sig. (2-tailed)		.000
	N	50	50
VO2_Max	Pearson Correlation	.987**	1
	Sig. (2-tailed)	.000	
	N	50	50
**. Correlation is significant at the 0.01 level (2-tailed).			

Table. 2 shows the obtained results of correlation between endurance and vo2 max of basketball players. The obtained value of the correlation is .987 which is highly significant at 0.01 level of significance. A perfect positive relationship was found between endurance and vo2 max of basketball players. Figure.1



Conclusion

Almost every sport which need vigor's physical demands endurance play an important role and maximal oxygen consumption is also a key factor in sports performance. After the study it has been proved that if a person have a good endurance than his or her vo2 max (maximum oxygen consumption) will also be good.

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