

Analysis of aerobic endurance of basketball players

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Abstract

The purpose of the study was to find out the analysis of aerobic endurance of basketball players. To achieve this purpose of the study, four hundred and eighty basketball players were selected as subjects who were attend the state championship during the year 2015-2016. The selected subjects were aged between 13 to 45 years and they were examined by a qualified physician and certified that they were medically and physically fit to participate above programme. Based on their age the subjects were divided into four equal groups of 120 each namely Group I- under 14 years boys (120), Group II - under 16 years boys (120), Group III - under 18 years boys (120) and Group IV- senior boys (120). The selected criterion variable such as aerobic endurance was measuring by coopers twelve minutes run /walk test. The analysis of variance (ANOVA) was used to find out the significant differences if any, between the groups on selected criterion variable. The 0.05 level of confidence was fixed to test the significance, which was considered as an appropriate. The result of the present study has revealed that there was a significant difference among the groups on aerobic endurance.

Key words: Aerobic endurance, basketball players, different age categories.

1. Introduction

Sports in the present world have become extremely competitive. It is not the more participation or practice that brings out victory to an individual. Therefore, sports life is affected by various factors, like physiology, Biomechanics. Sports Training, Sports Medicine, and Sociology and Psychology etcetera. All the coaches, trainers, physical education personal and doctors are doing their best to improve the performance of the players of their country. Athletes/players of all the countries are also trying hard to bring laurels/medals for their countries in International competitions. The physical education profession is entering one of the most exciting –dynamic eras in the history. Traditionally the physical education profession has been viewed as providing services within the educational field specifically to the schools within the last 50 years the scope of physical education has expanded tremendously. Performance of players has dramatically progressed over the past few decades. Performance levels unimaginable before are now common and the no of athletes capable of outstanding results are increasing. One among the contribution factors is that athletics is a challenging field, and intense motivation has encouraged long, hard hours of week. Also, coaching has been more sophisticated, partially from the assistance of sports specialists and scientists. Sports Sciences have progressed from descriptive to scientific. A broader base of knowledge about athletes exciting now is reflected in training methodology. Now a day's people are aware of physical fitness and they know the importance of physical education. The physical education is one part of the education process. In the physical fitness it is very important for the youth people know that slogan a "sport for all". It is developed of physical mental, emotional, social and spiritual though the medium of physical activities. The word physical refers to body and indicates bodily characteristics such as strength, speed, endurance, flexibility, agility, explosive power and performance. IT seemingly contrasts the body with the mind. This refers to a process of education that develops the human body especially fitness and movement skills. The word "Aerobic" basically means living or

working with oxygen. Even the dynamics of the idea are more complicated than implied by the definition. Aerobic can be viewed as an intricate system bodily supply and demand. That is body needs energy for any kind of activity and the need is filled by burning off the foods that is eaten. Oxygen is the spark the fuel needs to burn regardless aerobics is the word in general use. The majority medical opinions that aerobic programs strengthen heart muscle increase the efficiency of lungs and offer other wonderful benefits. Aerobic exercise refers to exercise that involves or improves oxygen consumption by the body. Aerobic means "with oxygen" and refers to the use of oxygen in the body's metabolic or energy-generating process.(concise oxford English dictionary). "Aerobics" is a particular form of aerobic exercise. Aerobics classes generally involve rapid stepping patterns, performed music with cues provided by an instructor. This type of aerobic activity became quite popular in the United States after the 1970 publication of *The New Aerobics* by Dr. Kenneth H. Cooper, and went heart rate brief period of intense popularity in the 1980s, when many celebrities (such as Jane Fonda and Richard Simmons) produced videos or created television shows promoting this type of aerobic exercise. Group exercise aerobics can be divided into two major types; freestyle aerobics and pre choreographed aerobics. Many types of exercise are aerobic, and by definition are performed at moderate levels of intensity for extended periods of time. To obtain the best results, an aerobic exercise session involves a warming up period, followed by at least 20 minutes of moderate to intense exercise involving large muscle groups, and a cooling down period at the end. Aerobic exercise is essential to healthy cardio vascular fitness. Aerobic exercises are the activity that can be sustained for an extended period of time without building an oxygen deficiency in the muscle. It is the type of exercises that overloads the heart and lungs and causes them to work harder than that do when person is at rest. Any exercise or activity that elevates the heart rate to one hundred and twenty beats per minute for at least twelve minutes is said to be aerobic. The major benefits of aerobic exercises are stronger and more efficiently operating heart and lungs, more energy, physical flexibility, condition muscles proper use of fats and effective burning of calories. The increased oxygen flow gain heart rate aerobics re-energies by giving' any one more and a "reawakening" of his senses. In other words, as the heart pumps more blood with fewer beats the body systems are in sync, allowing the subject to take in more oxygen. When everything is operating smoothly, your body can efficiently transport and utilize oxygen with no obstructions nucleus of this whole system is the heart. Each heart beat is responsible for propelling the oxyntated blood heart rate the proper blood vessels. Aerobic training will produce an increased capacity for bumping larger volumes of blood to accommodate the need for extra energy and extra oxygen. Aerobic training, results in an increase in the efficiency of oxygen transport within the body by lowering the resting Heart Rate ,and heart rates at sub maximal loads, the heart pumps more blood with every heart beat. This, and other physiological changes, increases the oxygen transport capability when an individual is tested before and after training while performing exercise at the same load, a lower heart rate is shown after training because more blood is delivered in each heart beat. Such heart rate differences during exercise can be used to predict aerobic fitness. Since a fit person shows a lower heart rate than an unfit one when exercising at the same load(same oxygen uptake) and the maximal heart rate for each age group is known, it becomes possible to extrapolate the oxygen uptake-heart rate curve to the maximal where it represents VO₂ max. In sports, endurance ensures optimum speed of motor actions. The ability to maintain pace or tempo of an exercise during a competition is impossible without the requisite level of endurance. Good endurance ensures high quality or skill of movement execution which finds expression in accuracy, precision, rhythm and consistency. Endurance training results in the improvement of the functioning of various organs and systems of human body. This in turn improves the ability to recover quickly from training and competition load. At the same time, endurance activities enable the sportsman to better resist the fatigue.

2. Methodology

In the present study all the students were attend the state championship during the year 2015-2016. A representative sample of four hundred and eighty basketball players was selected as subjects. The selected subjects were aged between 13 to 45 years and they were examined by a qualified physician and certified that they were medically and physically fit to participate above programme.

Based on their age the subjects were divided into four equal groups of 120 each namely Group I- under 14 years boys (120), Group II - under 16 years boys (120), Group III - under 18 years boys (120) and Group IV- senior boys (120). The selected criterion variable such as aerobic endurance was measuring by coopers twelve minutes run /walk test.

The analysis of variance (ANOVA) was used to find out the significant differences if any, between the groups on selected criterion variable.

The “F” ratio found to be significant, the Scheffe’s post hoc test was used to find out the significant difference among the paired means. The 0.05 level of confidence was fixed to test the significance, which was considered as an appropriate.

3. RESULTS

The mean and standard deviation and “F” ratio scores of under 14 years, under 16 years, under 18 years and senior boys on aerobic endurance of basketball players are given in table I.

Table I
Mean, standard deviation and “F” ratio of under 14 years, under 16 years, under 18 years and senior boys on aerobic endurance of Basketball players

Mean and SD				“F” ratio
Group I Under 14 yrs	Group II Under 16 yrs	Group III Under 18 yrs	Group IV Senior Boys	
1614.60 ± 182.12	1912.56 ± 142.32	2254.46 ± 132.57	2342.72 ± 125.24	201.04

Table I shows the mean, standard deviation and ‘F’ ratio of different ages of basketball players on aerobic endurance. The mean values of Group I is 1614.60, Group II is 2012.56, Group III is 2254.46 and Group IV is 2342.72 respectively. The values of standard deviation of Group I is 182.12, Group II is 142.32, Group III is 132.57 and Group IV is 125.24 respectively. The obtained “F” value is 201.04 is greater than the table “F” value of 2.62 with df 3 and 476 required for significance at 0.05 level of confidence. The results of the study indicate that there is a significant difference among the mean of Group I, Group II, Group III and Group IV on aerobic endurance. As the “F” ratio was found significant in case of aerobic endurance the Scheffe’s post hoc test was applied to test the significance of differences between paired means separately among basketball players belonging to different age group which is presented in table II.

Table – II
Significance differences between the paired means of aerobic endurance among Basketball players belonging to different age groups

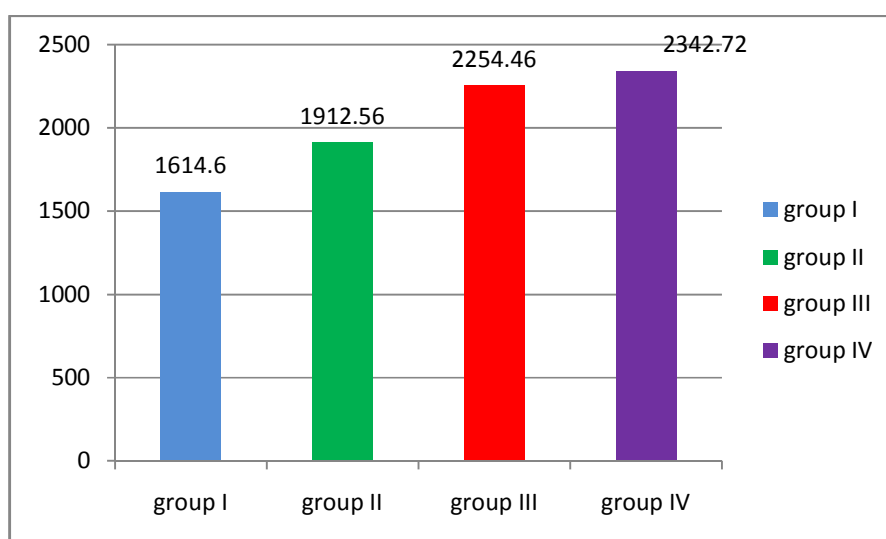
Means				Mean Difference
Group I under 14 years boys	Group II under 16 years boys	Group III under 18 years boys	Group IV senior boys under 35 yrs	
1614.60	1912.56			297.96
1614.60		2254.46		639.86
1614.60			2342.72	728.12
	1912.56	2254.46		341.90
	1912.56		2342.72	430.16
		2254.46	2342.72	88.26

Table II shows that the mean differences on Group I and Group II, Group I and Group III, Group I and Group IV, Group II and Group III, Group II and Group IV, Group III and Group IV are 397.96, 639.86, 728.12, 341.90, 430.16 and 88.26 respectively and the above values are greater than the confidence interval value of 55.42, which shows significance differences at 0.05 level of confidence.

However, the improvement in aerobic endurance was significantly differing from each group and Group IV is higher than the other groups.

The mean values of Group I, Group II, Group III and Group IV on aerobic endurance are graphically represented in the figure I.

Figure I
Mean Values of Group I, Group II, Group III and Group IV On Aerobic Endurance



4. Discussion

Aerobic performance is generally characterized by moderate contractions of large muscle groups for an extended period of time, during which maximum cardio respiratory adjustments are necessary since aerobic performance refers to the ability of the heart, muscular system and lungs to provide oxygen and nutrients to the working tissues and the remove waste products of the metabolism. The result of the study indicates that the group IV has significantly differed from the aerobic endurance, when compared to the group I, group II and group III. It is a known fact that the aerobic endurance is best suited for developing physical fitness and mainly improving the cardio respiratory endurance. The present study also revealed that the above findings of the study was supported by Bente and others (2012), Reidy (2014) and Zaton and Adam (2011).

5. Conclusion

There was a significant difference on aerobic endurance among different age groups of basketball players of under 14 years, under 16 years, under 18 years and senior boys. Further the senior boys is better in aerobic endurance than the other age groups of under 14 years, under 16 years, under 18 years basketball players.

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