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A comparison of selected physiological variables between male athletes and non-athletes

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Abstract
The main purpose of this study was to compare selected physiological variables of athletes and non-athletes. The allied objectives of the study are as follows: 1) To compare the blood pressure of athletes and non-athletes, 2) To compare the pulse rate of athletes and non-athletes, 3) To compare the exhale capacity of athletes and non-athletes, 4) To compare the Vo_2 Max of athletes and non-athletes. For the present study subjects were selected from male athletes and non-athletes of Amravati district. Forty subjects were selected for the collection of data which include 20 subject athletes and 20 from non-athletes of Amravati District. The subjects were selected by simple random sampling method. The various equipments used for collection of data are as under: Blood Pressure: It was measured by Sphygmomanometer, Pulse Rate: Digital Stop watch was used to measure the pulse rate. Exhale Capacity**:** It was measured by Peak Flow Meter Vo_2 Max: It was measured by modified Queens's college step test. 't' test was applied for the statistical treatment in the Microsoft Excel 2007. The statistical analysis and interpretation was done on the basis of data collection. The data was analyzed and interpreted by using 't' test. The level of significance was kept at 0.05, to testing the hypothesis. Result: There was insignificant difference in systolic and diastolic blood pressure between the athletes and non-athletes and there was significant difference in pulse rate exhale capacity and Vo2 Max between the athletes and non-athletes.

Keywords: physiological, athletes and non-athletes

Introduction
Most of us, even infants, have a natural curiosity about how our bodies work. Our bodies are quite miraculous. No machine has been constructed that can take over even a portion of a natural body function as effectively. The world around us contains a staggering number of living organisms with very different appearances and life styles. Despite the diversity of sizes and habits, all living things perform the same basic functions. They respond to changes in their immediate environment. Living things also show adoptability and their internal operations and responses to stimulation can vary from moment to moment. If that takes them from one place to another, we call the process locomotion [1].

Physiology is the study of how body function? Physiology ranges from the various basic units of organism, the cell, to more complex organs and organ systems such as the brain and respiratory organs. In physiology, we study how different parts or organs of an organism work together to achieve a popular function. In our body, e.g. the digestion of food involves the action of hormones and other chemicals produced by the stomach, liver and pancreas. Muscle contraction occurs through the action of chemical messages by nerves that supply the muscles.

Sports physiology is derived from exercise physiology. It applies the concept of exercise physiology to training the athlete and enhancing the athlete's sports performance. As physiology mainly focuses on the functions of structures, we con not discuss physiology without knowing anatomy. Similarly, we cannot understand the anatomy and physiology until unless we know the composition of human body. The human body consists of atoms of chemical elements such as carbon, hydrogen, nitrogen and oxygen. It also contains smaller amounts of many other elements including, calcium, iron, phosphorus, potassium and sodium. Atoms of chemical elements combine and make thin structures called molecules. Water is the most common molecules in our body. A molecule of water consists of two atoms of hydrogen and one atom of oxygen.

About 65 percent of our body and most of the chemical reactions that take places in our body require water. Exercise physiology is the study of the effect of exercise on the body specifically. Exercise physiology concerned with the players responses and adaptation to exercise at the system as well as sub cellular level [2].

As physiology mainly focuses on the functions of structures, we cannot discuss physiology without knowing anatomy. Similarly, we cannot understand the anatomy & physiology until and unless we know the composition of human body. The human body consists of atoms of chemical elements such as carbon, hydrogen, nitrogen and oxygen. It also contains smaller amounts of many other elements including, calcium, iron, phosphorus, potassium and sodium. Atoms of chemical elements combine and make thin structures called molecules. Water is the most common molecule in our body. A molecule of water consists of two atoms of hydrogen and one atom of oxygen. Water about 65 percent of our body and most of the chemical reactions that take places in our body require water [3].

The physiological parameters seems to play a very important role in the modern competitive sports in production of more excellent performance, because competitions are organized more frequently than ever the sum sets at a place at a particular time it may rise at other place, moreover because of physiological parameters and difference in time the athletes the same time at another place. It is well known that the individual performance in any sports activities follows diurnal physiological parameters. Pattern method may be derived to condition the athletes to produce peak performance with change in diurnal physiological parameters.

Unfortunately little research literature is available on these aspects of sports. Therefore, physiological parameters such as cardio-vascular endurance, vital capacity, heart rate and hemoglobin receive a special consideration and it is an important requisite for outstanding performance in any sports activity [4].

Purpose of the Study

The main purpose of this study was to compare selected physiological variables of athletes and non-athletes. The allied objectives of the study are as follows:

1. To compare the blood pressure of athletes and non-athletes.
2. To compare the pulse rate of athletes and non-athletes.
3. To compare the exhale capacity of athletes and non-athletes.
4. To compare the Vo_2 Max of athletes and non-athletes.

Methodology

Source of Data

For the present study subjects were selected from male athletes and non-athletes of Amravati district.

Selection of subject

Forty subjects were selected for the collection of data which include 20 subject athletes and 20 from non-athletes of Amravati District.

Sampling Method

The subjects were selected by simple random sampling method.

Equipment's used for collection of data

The various equipments used for collection of data are as under:

1. **Blood Pressure:** It was measured by Sphygmomanometer.
2. **Pulse Rate:** Digital Stop watch was used to measure the pulse rate.
3. **Exhale Capacity:** It was measured by Peak Flow Meter
4. **Vo_2 Max:** It was measured by modified Queens's college step test.

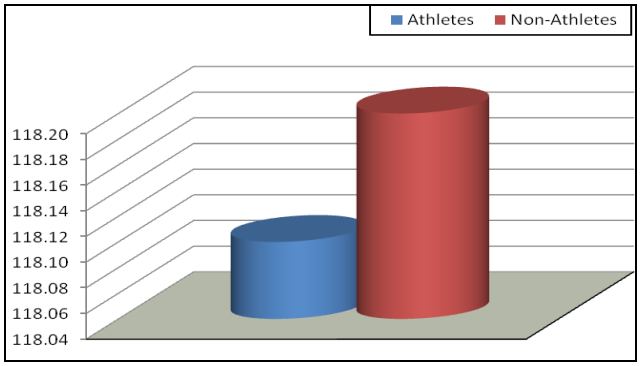
Statistical analysis

The data of some physiological variables of athletes and non athletes of Amravti District was collected by Sphygmomanometer, Digital Stop, Peak Flow Meter and modified queens college step test and then 't' test was applied for the statistical treatment in the Microsoft Excel 2007. The statistical analysis and interpretation was done on the basis of data collection. The data was analyzed and interpreted by using 't' test. The level of significance was kept at 0.05, to testing the hypothesis.

Table 1: Compare the systolic blood pressure between athletes and non- athletes

Group	Mean	SD	SE	MD	OT	DF	TT
Athletes	118.10	2.29	0.756	0.100	0.132	38	2.02
Non-Athletes	118.20	2.48					

Table No.-I reveals that there is difference between means of athletes and non-athletes because mean of athletes is 118.10 which is less than the mean of non-athletes which is 118.20 and calculated value of 't' is found as 0.132, is less than tabulated 't' which is 2.02 at 0.05 level of significance. This shows mean of non-athletes are having more systolic blood pressure than athletes. Hence the hypothesis which was giving by the researcher is rejected. This is presented graphically in graph No.1.

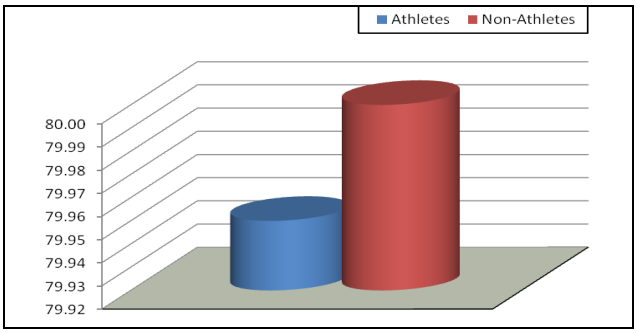


Graph 1: Mean of systolic blood pressure between athletes and non-athletes

Table 2: Compare the diastolic blood pressure between athletes and non- athletes

Group	Mean	SD	SE	MD	OT	DF	TT
Athletes	79.95	1.05	0.266	0.050	0.188	38	2.02
Non-Athletes	80.00	0.56					

Table No.-II reveals that there is difference between means of athletes and non-athletes because mean of athletes is 79.95 which is less than the mean of non-athletes which is 80.00 and calculated value of 't' is found as 0.188, is less than tabulated 't' which is 2.02 at 0.05 level of significance. This shows mean of non-athletes are having more diastolic blood pressure than athletes. Hence the hypothesis which was giving by the researcher is rejected. This is presented graphically in graph No.2.

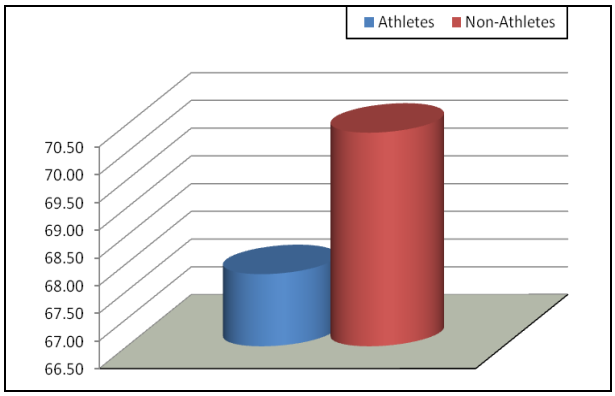


Graph 2: Mean of diastolic blood pressure between athletes and non- athletes

Table 3: Compare the pulse rate between athletes and non- athletes

Group	Mean	SD	SE	MD	OT	DF	TT
Athletes	67.80	2.89	0.725	2.550	3.517*	38	2.02
Non-Athletes	70.35	1.46					

Table No.-III reveals that there is difference between means of athletes and non-athletes because mean of athletes is 67.80 which is less than the mean of non-athletes which is 70.35 and calculated value of 't' is found as 3.517, is greater than tabulated 't' which is 2.02 at 0.05 level of significance. This shows mean of non-athletes are having more pulse rate than athletes. Hence the hypothesis which was giving by the researcher is accepted. This is presented graphically in graph No.3.

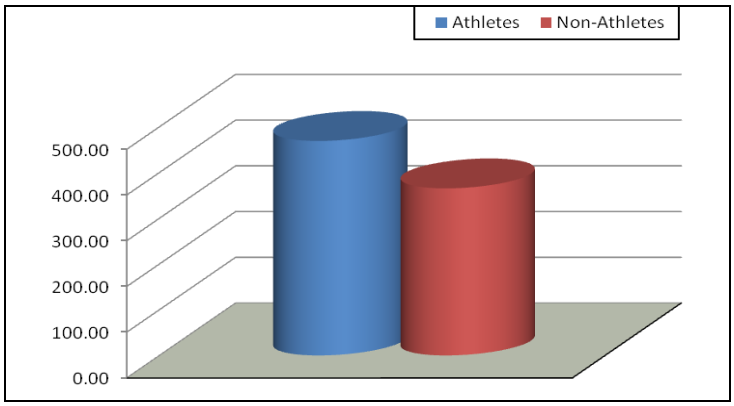


Graph 3: Mean of pulse rate between athletes and non- athletes

Table 4: Compare the exhale capacity between athletes and non-athletes

Group	Mean	SD	SE	MD	OT	DF	TT
Athletes	469.10	52.69	18.845	103.750	5.505*	38	2.02
Non-Athletes	365.35	65.77					

Table No.-IV reveals that there is difference between means of athletes and non-athletes because mean of athletes is 469.10 which is greater than the mean of non-athletes which is 365.35 and calculated value of 't' is found as 5.505, is greater than tabulated 't' which is 2.02 at 0.05 level of significance. This shows mean of athletes are having more exhale capacity than non-athletes. Hence the hypothesis which was giving by the researcher is accepted. This is presented graphically in graph No.4.

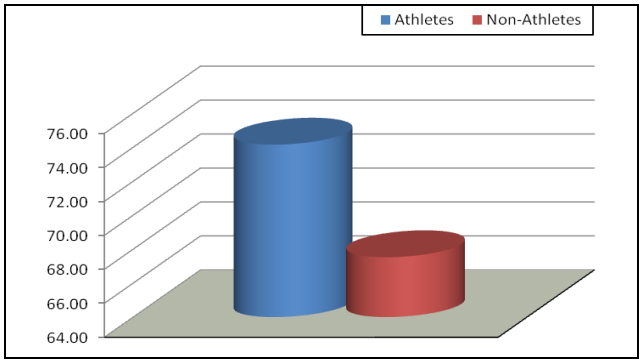


Graph 4: Mean of exhale capacity blood pressure between athletes and non- athletes

Table 5: Compare the Vo2 Max between athletes and non- athletes

Group	Mean	SD	SE	MD	OT	DF	TT
Athletes	74.15	6.68	1.733	6.628	3.825	38	2.02
Non-Athletes	67.52	3.92					

Table No.-V reveals that there is difference between means of athletes and non-athletes because mean of athletes is 74.15 which is greater than the mean of non-athletes which is 67.52 and calculated value of 't' is found as 3.825, is greater than tabulated 't' which is 2.02 at 0.05 level of significance. This shows mean of athletes are having more Vo2 Max than non-athletes. Hence the hypothesis which was giving by the researcher is accepted. This is presented graphically in graph No.5.



Graph 5: Mean of Vo2 Max between athletes and non- athletes

Conclusion

Within the limitations of the study and from statistical analysis the following conclusion was drawn.

1. There was insignificant difference in systolic blood pressure between the athletes and non-athletes.
2. There was insignificant difference in diastolic blood pressure between the athletes and non-athletes.
3. There was significant difference in pulse rate between the athletes and non-athletes.
4. There was significant difference in exhale capacity between the athletes and non-athletes.
5. There was significant difference in Vo2 Max between the athletes and non-athletes.

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