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COMPARATIVE STUDY OF PHYSICAL AND PHYSIOLOGICAL VARIABLES OF MIDDLE DISTANCE AND LONG DISTANCE RUNNERS OF AMRAVATI CITY

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Abstract:

The main purpose of this study was to compare selected physical fitness and physiological variables of Middle Distance Runners and Long Distance Runners of Amravati city. The necessary data on the selected physical fitness components and physiological variables was collected at different times of day by administering the specific test on the same day. The data of some physiological variables and physical fitness was collected by 40 yard Shuttle run, Goniometry, Peak Flow Meter and Stop watch at the Athletic track. The researcher took the male subjects for the study. The sources of the data were made from the Long Distance Runners and Middle Distance Runners, from Amravati City. Forty (40) subjects were selected for this study. Twenty (20) subjects were taken from Long Distance Runners while the remaining twenty (20) were taken from Middle Distance Runners. It was hypothesized that there would be significant difference in physical fitness and physiological variables of Middle Distance Runners and Long Distance Runners of Amravati city. The 40 subjects were selected by the simple random sampling method.

Keywords: Physical, Physiological Variables of Middle Distance & Long Distance Runners.

Introduction:

Physical fitness is the positive state of well-being allowing you enough strength and energy to participate in a full, active life-style of your choice. Physical fitness is the general capacity to adapt favorably to physical effort. Individuals are physically fit when they are able to meet both the usual and unusual demands of daily life, safely and effectively with undue stress or exhaustion. Physical fitness is the capacity to carry out reasonably well various forms of physical activities without being unduly tired and includes qualities important to the individual's health and well-being. The fit person is one who is free of limiting and debilitating ailments, who has the stamina and skill to do the day's work and who has sufficient reserve of energy not only to meet emergencies but also to participate in leisure time activities. Physical fitness is one phase of total fitness, and it may be used inter-changeably with motor fitness. Other phases of total fitness include social fitness, emotional fitness, mental fitness etc.

Physiology:

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. 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. 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.

Agility:

The speed with which an individual may change his body positions or fastness in changing directions while moving is known as agility.

Flexibility:

It is the range of movements around skeletal joints. It is a measure of the ability of the muscle tendon units to elongate within the physical restrictions of the joints.

Pulse Rate:

The frequency per minute of pressure waves propagated along the superficial, peripheral arteries such as carotid and radial arteries.

Exhale Capacity:

Exhale capacity is the total amounts of air that can be forcibly expire after a complete inspiration has been used frequently as a measure of adequacy of the respiratory system. Although it measures the approximately capacity of the lungs, recent information indicates it is of little use in predicting ability to perform tasks of endurance. Obviously other factors are more important. For example, any limitations of the oxygen delivery system to the cells will reduce the effectiveness of the delivery; regardless of vital capacity is the ability to take in more air per unit of time with fewer, but deeper inspiration, thus prolonging the onset of fatigue in the respiratory muscle. Function of the lungs is the interchange of the gases O2 and CO2 Oxygen is taken in through the nose mouth in breathing, if flows along the trachea and bronchial tubes to the alveoli, where is comes into intimate contact with blood in pulmonary capillaries O2 passes across the cellular – capillary membrane and taken up by the haemoglobin of the R.B.C. cell and 95% HB is saturated. Modern competitive sports also call for immediate attention of the coaches, trainers and sport educators for developing the cardio respiratory of an individual as per requirement. Cardio respiratory endurance is counted upon the factors like vital capacity, cardiac output, breath holding (anaerobic capacity), heart rate blood, pressure and recovery time, differs in proportion from sports to sports and depends upon the nature of activity.

Middle distance running:

In athletes (track and field) races that range in distance from 800metrs (roughly one half miles) to 3,000 meters (almost 2 miles) in international competition, middle distance races include in 800 meters, the 1500 meters metric miles, and the 3000 meters (steeplechase events for men but a regular run for women). In English speaking countries until the second of the 20 century, the 880 yards (half mile) and the mile were run as equivalents of the 800 meters and the 1,500 meters. Middle distance are set apart from the sprint (dash) races of 200 meters (about 650 feet)are less by the pacing required dashes are run at top speed the enter length of the race . Whereas middle distance race require that the athlete a maintain plateau pace that allows for a final sprint of speed, or kick.

An early favorite among middle distance races was the mile, which in the first half of the 20 century was run in times exceeding four minutes, breaking the four minutes barriers was considered unlikely. On May 6, 1954 however, the 25 years old races Bannister of great Brittan set a record of three minutes 59.4 seconds in a dual meet at oxford with increasingly controlled climatic and surface conditions and increasingly accurate timing device, however, the record was scored many times thereafter.

Long-distance running:

In modern human society, long-distance running has multiple purposes: people may engage in it for physical exercise, for recreation, as a means of travel, for economic reasons, or for cultural reasons. Long distance running can also be used as a means to improve cardiovascular health. Running improves your aerobic fitness by increasing the activity of enzymes and hormones that stimulate the muscles and the heart to work more efficiently. Endurance running is often a component of physical military training and has been so historically. Professional running is most commonly found in the field of sports, although in pre-industrial times foot messengers would run to deliver information to distant locations. Long-distance running as a form of tradition or ceremony is known among the Hopi and Tarahumara people, among others. In the sport of athletics, long-distance events are defined as races covering three kilometres (1.86 miles) and above. The three most common types are track running, road running and cross country running, all of which are defined by their terrain – all-weather tracks, roads and natural terrain, respectively. Typical long-distance track races range from 3000 metres to 10,000 metres (6.2 miles), cross country races usually cover 5 to 12 km (3 to 7½ miles), while road races can be significantly longer, reaching 100 kilometres (60 miles) and beyond. In college cross country races, in the United States, males run an 8000 meter race whereas the women run a 6000 meter race. The Summer Olympics features three long-distance running events: the 5000 metres, 10,000 m and marathon (42.195 kilometres, or 26 miles and 385 yards).

Methodology:

Sources of Data:

The researcher took the male subjects for the study. The sources of the data were made from the Long Distance Runners and Middle Distance Runners, from Amravati City during the session of 2014-2015.

Selection of Subjects:

Forty (40) subjects were selected for this study. Twenty (20) subjects were taken from Long Distance Runners while the remaining twenty (20) were taken from Middle Distance Runners.

Sampling Method:

The 40 subjects were selected by the simple random sampling method.

Equipment used for collection of Data:

Agility: It was measured with 40 yard Shuttle run.

Flexibility: It was measured with Goniometer or Flexiometer.
Pulse Rate: Digital Stop watch was used to measure the pulse rate.
Exhale Capacity: It was measured by Peak Flow Meter.

Collection of Data:

The necessary data on the selected physical fitness components and physiological variables were collected at different times of day by administering the specific test on same day at following timings.

The data of some physiological variables and physical fitness was collected by 40 yard Shuttle run, Goniometry, and Peak Flow Meter and Stop watch at the Athletic track and Post Graduate Teaching Department of Physical Education, of Sant Gadge Baba Amravati University, Amravati and then't' test was applied for the statistical treatment in the Microsoft Excel.

Analysis and Interpretation of Data:

The data shall be collected from the subjects by the researcher under the guidance of experts and guide and analysis and interpretation will be carried out on the basis of special statistical techniques viz. mean, standard deviation and't' test.

Level of Significance:

The level of significance will be set at 0.05, for the present study in order to test the hypothesis given by the researcher on the basis of his experience and observation.

Table No-I
Comparisons of Mean Value of Agility of Long Distance and Middle Distance Runners

Group	Mean	S.D.	M.D.	D.F.	O.T.	T.T.
Long Distance Runner	12.41	1.37	0.64	38	1.48	2.02
Middle Distance Runner	11.77	1.37				

Graph No-I
Graphical Representation of Mean Difference of Agility Long Distance and Middle Distance Runners

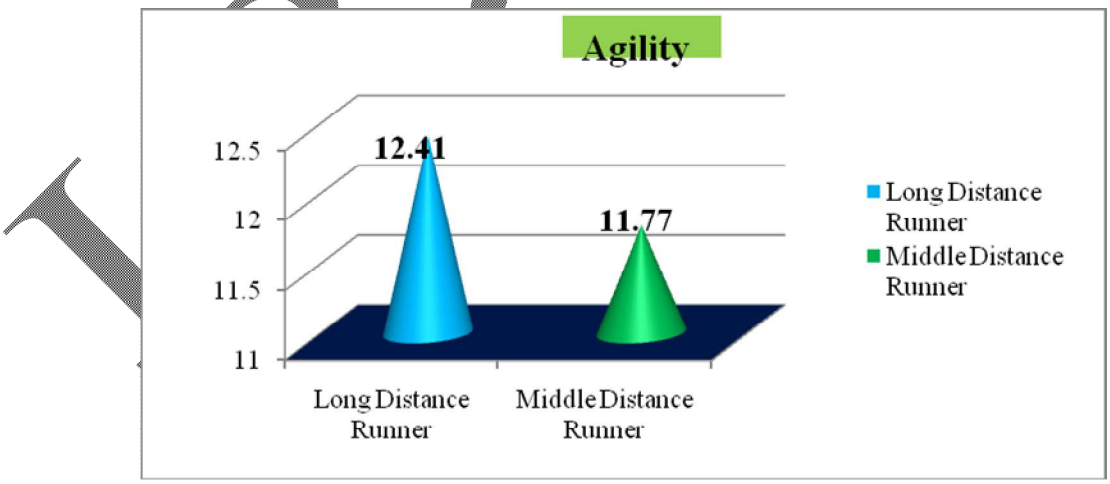


Table No-II
Comparisons of Mean Value of Flexibility of Long Distance and Middle Distance Runners

Group	Mean	S.D.	M.D.	D.F.	O.T.	T.T.
Long Distance Runner	91.7	7.34	1.4	38	0.54	2.02
Middle Distance Runner	90.3	9.02				

Graph No-II
Graphical Representation of Mean Difference of Flexibility Long Distance and Middle Distance Runners

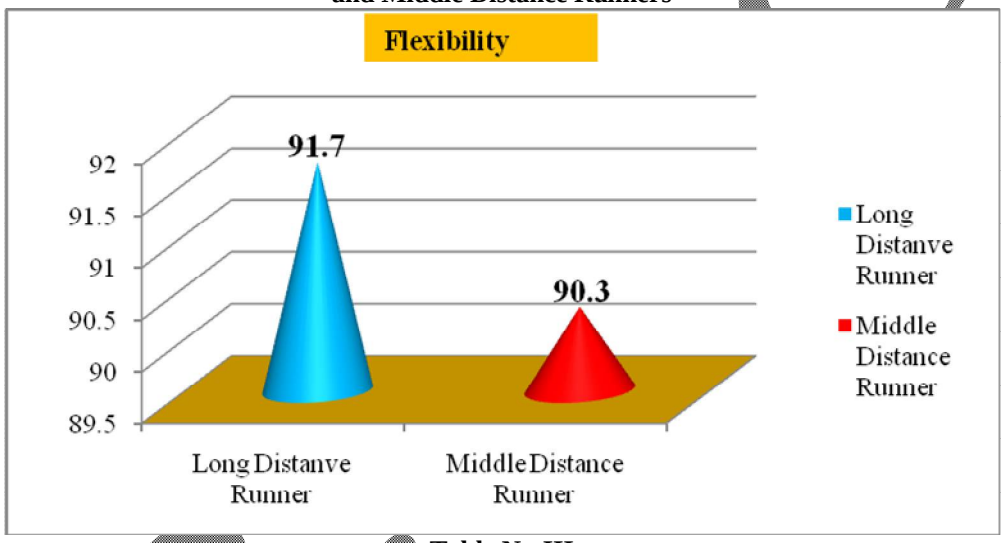


Table No-III
Comparisons of Mean Value of Pulse Rate of Long Distance and Middle Distance Runners

Group	Mean	S.D.	M.D.	D.F.	O.T.	T.T.
Long Distance Runner	61.8	3.61	0.75	38	0.74	2.02
Middle Distance Runner	61.5	2.78				

Graph No-III
Graphical Representation of Mean Difference of Pulse Rate Long Distance and Middle Distance Runners

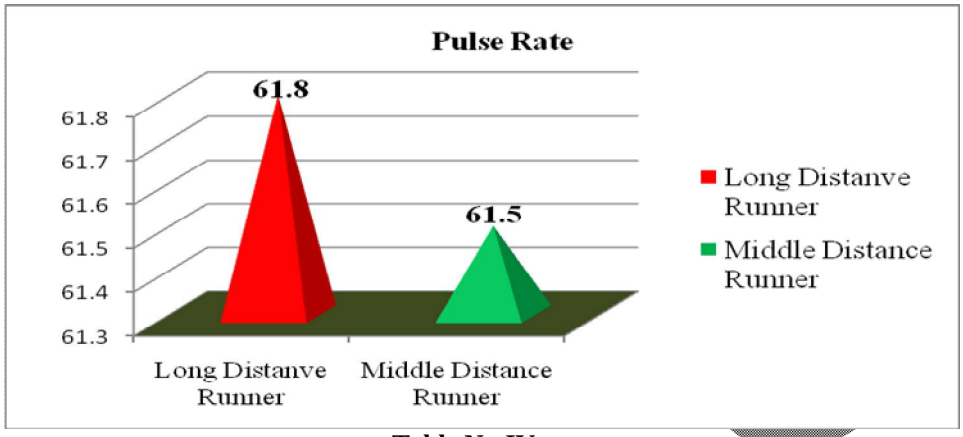
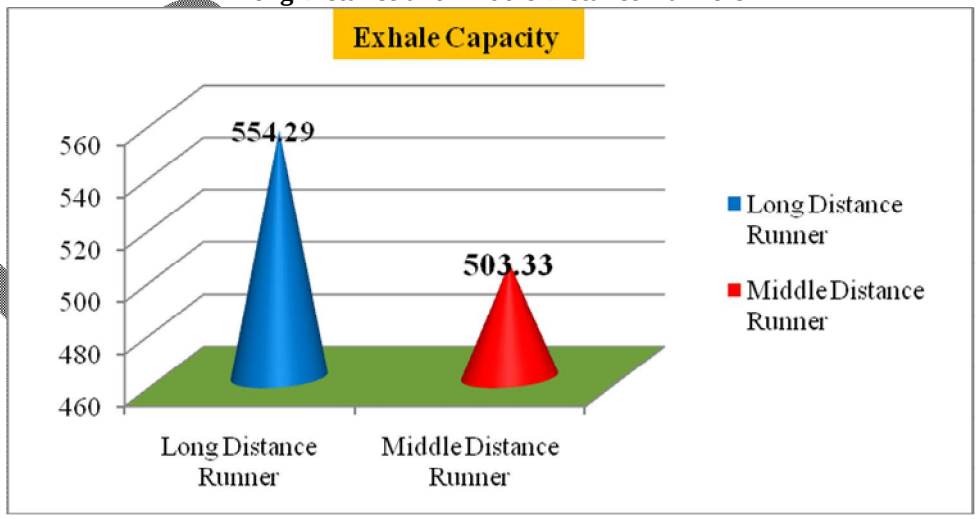


Table No-IV
Comparisons of Mean Value of Exhale Capacity of Long Distance and Middle Distance Runners

Group	Mean	S.D.	M.D.	D.F.	O.T.	T.T.
Long Distance Runner	554.29	24.85	50.95	38	5.13	2.02
Middle Distance Runner	503.33	36.83				

Graph No-IV
Graphical Representation of Mean Difference of Exhale Capacity Long Distance and Middle Distance Runners



Conclusion:

The researcher compared Long Distance and Middle Distance Runners, within the limitations of the present study and on the basis of findings it is concluded that there is significant difference in physical and Physiological Variables between the Agility, Flexibility and Exhale Capacity and insignificant difference between Pulse Rate of Long Distance and Middle Distance players. The researcher compared the particular physical fitness components and physiological variables during the particular Events; it is found that there is also significant result in

Agility and Flexibility, insignificant difference in between Pulse Rate and Exhale Capacity. Hence the researcher's pre assumed hypothesis is partially accepted.

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