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To compare and find relative superiority in breath holding capacity, agility and leg strength between kabaddi players and long jumpers in athletic

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Abstract

Strength may be defined as the capacity of the individual to extract muscle force. This force is revealed by individuals' ability to pull push, lift or squeeze an object or hold the body in a hanging position. Maximum strength is applied in these ways with a singular muscular contraction.

Strength of and itself is not an indicant of capacity; fitness or educability, but is merely the ability to apply power. Although strength as a factor in extricably related to other motor performance factors, it remains an entity in itself and is a salient element of the whole.

Throughout the life, we need some strength to perform normal daily activities in an efficient manner; strength in excess of this amount enables the strength to perform them easily and effectively. This excess over daily demands in needed for two reasons. First, it is need for emergency situation to avoid acute or chronic injury or to survive in crisis. Secondly, after daily normal activities are completed the student should have sufficient strength to live life more fully and completely in leisure time pursuits.

Keywords: Breath holding capacity, agility and leg strength, long jumpers in athletic

1. Introduction

Strength can be developed and measured in several ways. Isotonic or dynamic strength is the maximal weight that can be lifted one time. Isometric or static strength is achieved when a subject exerts maximal force against an immovable object. The Iso-kinetic strength is measured by an electronic or hydrolic apparatus that allow display or force output throughout the full range of motion. There are four basic principles to derive the maximum strength and these are (i) Over load principle (ii) Progressive resistance (load) method (iii) Specificity (iv) Allowing for adequate recovery.

“For Breath is life, says an old Sanskrit proverb and if you breath well you will live long on earth”.

It is intimately concerned with bio-chemical process of obtaining energy from digested food materials. Every cell and tissue of organism's body depends continually for its activity on the energy derived from oxidation of the digested food materials, as this process cannot go on without a continued supply of oxygen to the cell and tissue, almost all forms of life seem to depend very largely on the process of breathing.

This process of breathing may be conveniently divided into two parts-one connected with the external environment and other with the internal environmental.

Taking oxygen from external environment into the body constitute the first part of breathing while making the oxygen available to every cell and tissue is function of what may be called internal breathing. The first part is played by the respiratory system and second part is played by circulatory system.

The first and most important rule for breathing is breath through nose. There are three types of breathing: (a) Upper breathing or shallow breathing (b) Middle breathing or Inter-Costal breathing (c) Abdominal breathing or Diaphragmal breathing.

The complete and perfect yoga breathing contains all the advantage of abdominal middle and upper breathing without any disadvantages. It brings the entire respirator system, every cell and every muscle into action.

The retention of breath over shorter and longer period is called breath holding well-nourished

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individual may survive without difficulty for weeks without food and for days without water. But they can live only a few minutes without oxygen. The boy's ability to store oxygen is extremely limited. The blood may contain upto about 1.0 litter. In the lungs after a normal maximal inspiration it may be about 1.0 litter/A total capacity of 7 litres and a concentration of O₂ of 15 percent = 15/100 x 7 litres) when one holds one's breath at rest a total of about 600 ml. O₂ is available and can be utilized. This is enough to last about 2 minutes. Normal maximal breath holding time is 30 seconds to 60 seconds. The arterial PO₂ then drops to 75 to 50 mm. Hg (10 to 6.6 Kpa) and PcO₂ rises to 45 to 55 mm. Hg (6.0 to 6.6 Kpa). This elevated CO₂ pressure plays a greater role in forcing the individual to discontinue to breath holding than does the reduced O₂ pressure.

The miraculous effect to retain breathing can also be partly explained in the following way. If we watch the Javelin thrower, the discus thrower, we can see how just before the supreme exertion of his decisive moment the athlete hold his breath and often makes a whole series of moments before exhaling, the greater the muscular work or the power he is required to exert, the deeper will be his inhalation preceding it and the longer he will hold his breath. In a hundred meter dash the runner scarcely takes a single breath as he approach the finish. Among the long distance it is a recognized rule that only the one who know how to "save his breath" can hope for success.

In holding his breath a person is forced at least for a time to focus his consciousness in the centre of his SELF and to unite both energies. As a result he achieves a complete equilibrium both mentally and physically.

Keeping these in view, it has been observed that long jumper in athletics and Kabaddi Players holds their breath and often make a whole series of movement before exhaling.

1.1. Purpose of the Study

- (a) To find out the breath holding capacity. Agility and leg strength of Kabaddi players and long jumpers in Athletics.
- (b) To compare and to find relative superiority in breath holding capacity. Agility and leg strength between Kabaddi players and long jumpers in Athletics.

2. Methods and materials

Subjects

Twenty students were taken as subject for the project. Ten students were taken from B.P. Ed. Students (2002-03) who were participants in Kabaddi and other ten students were the athletes from different area of Kalyani Township with long jump specialization. Their age group ranged between 21 to 26 years.

Methods

The subjects were first oriented about the purpose of the project and the procedure that will be followed in conducting tests. Tests were conducted in a single day. Three trails were allowed in each criterion measure and the best performance was recorded.

Tests

Breath holding time, Agility and leg strength were the three variables in this project, which were measured through standard test procedures.

The tests were conducted in the central ground and in the gymnasium hall of Kalyani University.

Procedure

The following tests and measurements were administered into two stages:

1. Measurement of personal data.
2. Measurement of performance of leg strength. Agility and Breath holding capacity.

Personal data

Personal data like age, height and weight were measured by the following method.

A. Age

The age of the subjects was taken from the admit card of the Madhyamik examination and recorded in complete years.

B. Height

The standing height was measured in a standard centimeter scale in the laboratory. The reading of scale was taken in nearest centimeters.

C. Weight

The weight of all the subjects were recorded from a standard weighting machine of the departmental laboratory. During recording weight, the students were in shorts and brief and both feet were equally placed on the top of the scale and students were asked to stand erect. The measurement was taken in Kgs.

Measurement of leg strength, Agility and Breath holding capacity

A. Measurement of leg Strength:

The leg strength was measured by using the standing broad jump test.

Test Description

Purpose: To measure the strength of leg muscle.

Facilities and Equipments: And outdoor jumping pit with a takeoff mark and a measuring tape.

Direction

The subjects assumed the standing position just behind the takeoff mark with his feet several inches apart and parallel. He took a preliminary movement by bending his knees and swimming his arms and jumps out ward as far as possible. Three trails were permitted in succession.

Instruction

The subjects were requested to crouch before the jump and swing their arms downward. As they jump outward, the fore arms should swing forward and upward. Take off from the mark with both feet simultaneously and try not to fall backwards after landing.

Scoring

The measurement was taken from the take of line to the nearest break point where any part of the body touches the ground. Three trails were permitted in succession. Out of three jumps best one is taken as score and it was measured in centimeter.

B. Measurement of Breath Holding Capacity:

The breath holding capacity is measured by an appropriate test of retaining the breath throughout possible longer duration.

Purpose

To measured the breath holding capacity.

Facilities and Equipments

A stopwatch, a nose clip and a chair.

Direction

The subjects are asked to assume sitting position on the chair in relax mood with a nose clip in his hand and mouth is closed. The subjects were asked to retain his breath after a normal inspiration. As soon as he closed his nose with clip after inspiration the timekeeper start the watch and he stop it at that very moment when the subjects open his nose or mouth. In this process the recorded time shows the breath holding time of the particular subjects.

Instruction: The subjects were asked to be calm and quiet to have the normal breathing before retaining the breath and he was also asked to retain his breath after taking a normal inspiration (not a forceful inspiration).

Scoring: Three trails were permitted in succession with a complete rest in between. Out of these three trails, best one, which covers the maximum duration, is taken as score and it was measured in $1/10^{\text{th}}$ of a second.

Measurement of Agility

The Agility is measured by using the shuttle run test.

Purpose

To measure the Agility or quickness in movement.

Facilities and Equipments

An outdoor running track and a stopwatch and a whistle.

Direction

At first two lines were marked 10 yards apart. The student stood behind the starting line. On the signal "start". The subjects ran to the front line and return to the starting line and again move to the front line and come back to the starting line.

Instruction: The subjects were asked to do some conditioning exercise before the shuttle run and were taught how to run the shuttle.

Scoring: The score was the elapsed time recorded in seconds. Three trials were given and the best time was recorded.

3. Results and discussion

The personal data were collected according to the procedure mention earlier and put in a tabular form. In table-I the mean and standard deviation of age, height and weight of Kabaddi players and long jumpers were given and the result of various statistical measures were given in table no. II.

Table 1: Mean S.D. Range at Personal data of the subjects

Personal Data	Group	Mean (Mn.)	SD	Range
Age in year	Kabaddi players	24.2	1.13	22-26
	Long jumpers	24	1.41	21-26
Height in cm.	Kabaddi players	170.1	6.48	161-180
	Long jumpers	172.1	6.17	161-179
Weight in kg.	Kabaddi players	62.1	9.56	50-85
	Long jumpers	57.6	7.44	47-70
S.B.J. in cm	Kabaddi players	243.6	10.75	228-265
	Long jumpers	251.2	17.39	226-279
B.H.C. in second	Kabaddi players	75.4	19.35	42-98
	Long jumpers	60.5	11.76	40-85
Agility in second	Kabaddi players	8.8	0.63	08-10
	Long jumpers	8.8	0.63	08-10

Table 2: Standard Deviation (SD) standard Error of Mean (SED) and "t" ratio of Kabaddi players and Athlete in all criterion measures

	Mean differences	SD	SED	't'	Remarks
Age	0.2	0.57	0.25	0.80	N.S
Height	2.0	2.83	1.24	1.61	N.S
Weight	4.5	3.83	1.68	2.67	*
S.B.J.	7.6	6.46	2.84	2.67	*
B.H.C.	14.9	7.16	3.15	4.73	**
Agility	00	0.28	0.12	0.00	N.S.

N.S. = Not significant, *Significant at .05 level at 18 df. * * = Significant at .01 level at 18 DF.

As per table-I and table-II, mean and standard deviation on age of Kabaddi players (24.2 yrs \pm 1.13) and long jumpers (24 yrs \pm 1.41) were found almost the same. The same was true for height measures of the Kabaddi players (170.1 cm \pm 6.48) and long jumpers (172.1 cm \pm 6.17).

The mean differences in age and height measure were not found to be significant ("t" value being 0.80 and 1.61 respectively).

In the measurement of weight, the mean performance of Kabaddi players and long jumpers were 62.1 kg \pm 9.56 and

57.6 \pm 7.44 respectively. The mean differences were found to be significant ("t" = 2.67) at .05 level of confidence.

In standing broad jump measure the mean and standard deviation of Kabaddi players and long jumpers were 243.6 \pm 10.75 and 251.12 cm \pm 17.39 respectively. Table –II revealed the significant result ("t" = 2.67) at .05 level of confidence.

In breath holding capacity Kabaddi players measured 75.4 sec. \pm 19.35. White long jumpers measured 60.5 \pm 11.76. The mean different as per table-II was significant ("t" = 4.73) at .01 level of confidence. In Agility measure both kabaddi players and long jumpers had identical performance (8.8 sec. \pm 0.63) as can be noticed in table number –I and no significant result was found.

4. Conclusions

Within the limitation of the present study following conclusions could be made.

The long Jumpers athletic group showed significantly better performance in standing broad jump whereas Kabaddi players showed significant performance in breath holding capacity. The Agility performance for both groups were the same.

In weight measure, Kabaddi players weighed significantly

more than the long jumpers.

It can be concluded in a nutshell that

1. Long jumper in Athletics were better in leg strength than Kabaddi players.
2. Kabaddi players have superior breath holding capacity than long jumpers.
3. Kabaddi players are heavier than long jumpers.
4. Both long jumpers & Kabaddi players were the same agile.

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