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Investigation of speed and endurance among volleyball and handball players of C.C.S. University

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Abstract

Speed and Endurance are very important physical ability for performance in Volleyball and Handball. Volleyball is also a team sport in which two teams of six players are separated by a net. Each team tries to score points by grounding a ball on the other team's court under organized rules. In Volleyball, competitive teams master six basic skills: serve, pass, set, attack, block and dig. Each of these skills comprises a number of specific techniques that have been introduced over the years and are now considered standard practice in high-level volleyball. And all these skills demands efficiency in Speed and Endurance. While Handball is a team sport in which two teams of seven players each (six outcourt players and a goalkeeper) pass a ball using their hands with the aim of throwing it into the goal of the other team. A standard match consists of two periods of 30 minutes, and the team that scores more goals wins. Handball is a speed game and a player has to run and jump frequently with speed in order to dominate his opponent by using jumping, dribbling, throwing, running, catching techniques.

Methods: The purpose of the present study to compare the speed and endurance among Volleyball and Handball players. The sample for the present study consists of 40 Male Volleyball and Handball players of Chaudhary Charan Singh University out of which 20 are Volleyball players and 20 are Handball players. The 30 meters run for Speed and 12 Minute Run Cooper Test for endurance is used to assess the results.

Results: This study shows that Handball players are having good speed and Volleyball players are having the good aerobic endurance. Handball players performed very well in 30 Meters Run due to good speed requires in Handball game and Volleyball players are shown good in 12 min run because they are playing the Volleyball game in 2 to 3 sets of 60 to 90 minutes.

Discussion: Volleyball is heavily intermittent meaning its involves physical events expressing maximal exertion short distance, speed, agility, explosive power and endurance. Handball requires high speed, super agility and enormous endurance. Hence Volleyball and Handball requires speed and endurance to perform well.

Keywords: Volleyball, handball, speed, endurance

Introduction

Aerobic Endurance is the amount of oxygen intake during exercise. Aerobic Endurance is the time which you can exercise, without producing lactic acid in your muscles. During aerobic (with oxygen) work, the body is working at a level that the demands for oxygen and fuel can be meet by the body's intake. The only waste products formed are carbon-dioxide and water which are removed by sweating and breathing. Aerobic exercise is physical exercise of relatively low intensity and long duration, which depends primarily on the aerobic energy system. Aerobic means "with oxygen", and refers to the use of oxygen in the body's metabolic or energy – generating process. Many types of exercise are aerobic, and by definition are performed at moderate levels of intensity for extended periods of time.

Aerobic exercise comprises innumerable forms. In general, it is performed at a moderate level of intensity over a relatively long period of time. For example, running a long distance at a moderate pace is an aerobic exercise, but sprinting is not. Playing singles tennis, with near continuous motion, is generally considered aerobic activity, while golf or two person team tennis, with brief bursts of activity punctuated by more frequent breaks, may not be predominantly aerobic. Some sports are thus inherently "aerobic", while other aerobic exercises, such as fartlek training or aerobic dance classes, are designed specifically to improve aerobic capacity and fitness.

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Modern Handball is played on a court of 40 by 20 metres (131 by 66 ft), with a goal in the middle of each end. The goals are surrounded by a 6-meter (20 ft) zone where only the defending goalkeeper is allowed; goals must be scored by throwing the ball from outside the zone or while "diving" into it. The sport is usually played indoors, but outdoor variants exist in the forms of field handball, Czech handball (which were more common in the past) and beach handball. The game is fast and high-scoring: professional teams now typically score between 20 and 35 goals each, though lower scores were not uncommon until a few decades ago. Players may score hat tricks. Body contact is permitted for the defenders trying to stop the attackers from approaching the goal. No protective equipment is mandated, but players may wear soft protective bands, pads and mouth guards.

The game was codified at the end of the 19th century in Denmark. The modern set of rules was published on 29 October 1917 in Berlin, which is seen as the date of birth of the sport, and had several revisions since. The first official handball match was played in the same year in Germany. The first international games were played under these rules for men in 1925 and for women in 1930. Men's handball was first played at the 1936 Summer Olympics in Berlin as outdoors, and the next time at the 1972 Summer Olympics in Munich as indoors, and has been an Olympic sport since. Women's team handball was added at the 1976 Summer Olympics.

The International Handball Federation was formed in 1946 and, as of 2016, has 197 member federations. The sport is most popular in Europe, and European countries have won all medals but one in the men's world championships since 1938. In the women's world championships, only two non-European countries have won the title: South Korea and Brazil. The game also enjoys popularity in East Asia, North Africa and parts of South America.

Playing Court

Handball is played on a court 40 by 20 metres (131 ft 3 in × 65 ft 7 in), with a goal in the centre of each end. The goals are surrounded by a near- semicircular area, called the zone or the crease, defined by a line six meters from the goal. A dashed near- semicircular line nine metres from the goal marks the free-throw line. Each line on the court is part of the area it encompasses. This implies that the middle line belongs to both halves at the same time.

Goals

The goals are two meters high and three meters wide. They must be securely bolted either to the floor or the wall behind. The goal posts and the crossbar must be made out of the same material (e.g., wood or aluminium) and feature a quadratic cross section with sides of 8 cm (3 in). The three sides of the beams visible from the playing court must be painted alternately in two contrasting colors which both have to contrast against the background. The colors on both goals must be the same.

Each goal must feature a net. This must be fastened in such a way that a ball thrown into the goal does not leave or pass the goal under normal circumstances. If necessary, a second net may be clasped to the back of the net on the inside.

Crease

The goals are surrounded by the crease, also called the zone. This area is delineated by two quarter circles with a radius of six metres around the far corners of each goal post and a connecting line parallel to the goal line. Only the defending

goalkeeper is allowed inside this zone. However, court players may catch and touch the ball in the air within it as long as the player starts their jump outside the zone and releases the ball before they land (landing inside the perimeter is allowed in this case as long as the ball has been released).

If a player without the ball contacts the ground inside the goal perimeter, or the line surrounding the perimeter, they must take the most direct path out of it. However, should a player cross the zone in an attempt to gain an advantage (e.g., better position) their team cedes the ball. Similarly, violation of the zone by a defending player is penalized only if they do so in order to gain an advantage in defending.

Substitution area

Outside of one long edge of the court to both sides of the middle line are the substitution areas for each team. Team officials, substitutes, and suspended players must wait within this area. A team's area is the same side as the goal the team is defending; during halftime, substitution areas are swapped. Any player entering or leaving the play must cross the substitution line which is part of the side line and extends 4.5 metres (15 ft) from the middle line to the team's side.

Duration

A standard match has two 30-minute halves with a 10- or 15-minute (major Championships/Olympics) halftime intermission. At half-time, teams switch sides of the court as well as benches. For youths, the length of the halves is reduced—25 minutes at ages 12 to 15, and 20 minutes at ages 8 to 11; though national federations of some countries may differ in their implementation from the official guidelines.

If a decision must be reached in a particular match (e.g., in a tournament) and it ends in a draw after regular time, there are at maximum two overtimes, each consisting of two straight 5-minute periods with a one-minute break in between. Should these not decide the game either, the winning team is determined in a penalty shootout (best-of-five rounds; if still tied, extra rounds are added until one team wins).

The referees may call timeout according to their sole discretion; typical reasons are injuries, suspensions, or court cleaning. Penalty throws should trigger a timeout only for lengthy delays, such as a change of the goalkeeper. Since 2012, teams can call 3 team timeouts per game (up to two per half), which last one minute each. This right may only be invoked by the team in possession of the ball. Team representatives must show a green card marked with a black T on the timekeeper's desk. The timekeeper then immediately interrupts the game by sounding an acoustic signal to stop the clock. Before 2012, teams were allowed only one timeout per half. For the purpose of calling timeouts, overtime and shootouts are extensions of the second half.

Volleyball, game played by two teams, usually of six players on a side, in which the players use their hands to bat a ball back and forth over a high net, trying to make the ball touch the court within the opponents' playing area before it can be returned. To prevent this a player on the opposing team bats the ball up and toward a teammate before it touches the court surface—that teammate may then volley it back across the net or bat it to a third teammate who volleys it across the net. A team is allowed only three touches of the ball before it must be returned over the net.

Volleyball requires a minimum of equipment and space and can be played indoors or outdoors. The game is played on a smooth-surfaced court 9 metres (30 feet) wide by 18 metres (60 feet) long, divided by a centre line into two equal areas,

one of which is selected by or assigned to each of the two competing teams. Players may not step completely beyond the centre line while the ball is in play. A line 3 metres (10 feet) from and parallel to the centre line of each half of the court indicates the point in front of which a back court player may not drive the ball over the net from a position above the top of the net. (This offensive action, called a spike, or kill, is usually performed most effectively and with greatest power near the net by the forward line of players.) A tightly stretched net is placed across the court exactly above the middle of the centre line; official net heights (measured from the top edge of the net to the playing surface—in the middle of the court) are 2.4 metres (8 feet) for men and 2.2 metres (7.4 feet) for women. Further adjustments in net height can be made for young people and others who need a lower net. A vertical tape marker is attached to the net directly above each side boundary line of the court, and, to help game officials judge whether served or volleyed balls are in or out of bounds, a flexible antenna extends 1 metre (3 feet) above the net along the outer edge of each vertical tape marker. The ball used is around 260 to 280 grams (9 to 10 ounces) and is inflated to about 65 cm (25.6 inches) in circumference. A ball must pass over the net entirely between the antennae. A service area, traditionally 3 metres (10 feet) long, is marked outside and behind the right onethird of each court end line. At the 1996 Olympic Games the service area was extended to 9 metres (30 feet). The service must be made from within or behind this area. A space at least 2 metres (6 feet) wide around the entire court is needed to permit freedom of action, eliminate hazards from obstructions, and allow space for net support posts and the officials' stands. A clear area above the court at least 8 metres (26 feet) high is required to permit the ball to be served or received and played without interference. Informally, any number can play volleyball. In competition each team consists of six players, three of whom take the forward positions in a row close to and facing the net, the other three playing the back court. (An exception to this rotation is the libero, a position introduced at the 2000 Olympics; see below.) Play is started when the right back (the person on the right of the second row) of the serving team steps outside his end line into the serving area and bats the ball with a hand, fist, or arm over the net into the opponents' half of the court. The opponents receive the ball and return it across the net in a series of not more than three contacts with the ball. This must be done without any player catching or holding the ball while it is in play and without any player touching the net or entering the opponents' court area. The ball must not touch the floor, and a player may not touch the ball twice in succession. A player continues to serve until his team makes an error, commits a foul, or completes the game. When the service changes, the receiving team becomes the serving team and its players rotate clockwise one position, the right forward shifting to the right back position and then serving from the service area. Either team can score, with points being awarded for successfully hitting the ball onto the opposing side's half of the court, as well as when the opposing side commits errors or fouls, such as hitting the ball out of bounds, failing to return the ball, contacting the ball more than three times before returning it, etc. Only one point at a time is scored for a successful play. A game is won by the team that first scores 25 points, provided the winning team is ahead by 2 or more points, except in the fifth set, when a team needs to score only 15 points and win by 2 points.

The 2000 Olympics introduced significant rule changes to international competition. One change created the libero, a

player on each team who serves as a defensive specialist. The libero wears a different colour from the rest of the team and is not allowed to serve or rotate to the front line. Another important rule change allowed the defensive side to score, whereas formerly only the serving team was awarded points.

Purpose of the study

The purpose of the present study to compare the speed and endurance among Volleyball and Handball players.

Methodology

To find out the Aerobic Endurance and Speed between Male Volleyball and Male Handball players. The sample for present study consists of 20 Male Volleyball players and 20 Male Handball players of Chaudhary Charan Singh University, Meerut, Uttar Pradesh, who has taken part in the C.C.S.U. Inter College sports and games during the year 2017-18.

The 12 Minute Cooper Test is used for collection of Data. The Cooper test is a test of Aerobic Endurance. It was designed by Kenneth H. Cooper in 1968 for US military used in the original form; the point of the test is to run as far as possible within 12 minutes. To undertake this test you will require:

400 meter track, Stop watch, Whistle and Technical Official

This test requires the Volleyball and Handball player to run as far as possible in 12 minutes. The subjects given 10 minutes for warm up. The assistant gives the command "GO", starts the stopwatch and athlete commences the test. The Technical Official keeps the athlete informed of the remaining time at the end of each lap. The Technical Official blows the whistle when the 12 minutes has elapsed and records the distance the athlete covered to the nearest 10 meters

M Run

The objective of this test is to monitor the development of the athlete's ability to effectively and efficiently build up acceleration, from a standing start or from starting blocks, to maximum speed.

To undertake this test you will require:

Flat non-slip surface, Stopwatch, An assistant.

This test requires the athlete to sprint as fast as possible over 30 metres. The athlete warms up for 10 minutes. The assistant marks out a 30 metre straight section with cones. The athlete starts in their own time and sprints as fast as possible over the 30 metres. The assistant starts the stopwatch on the athlete's 1st foot strike after starting and stopping the stopwatch as the athlete's torso crosses the finishing line. The test is conducted 3 times. The assistant uses the fastest recorded time to assess the athlete's performance.

The Volleyball players and Handball players are made to run separately in 12 Min cooper test and 30 M run. The Tests were conducted at Chaudhary Charan Singh University Ground by the qualified Technical Officials.

Results

The results of the study shows that Handball players are having good speed and Volleyball players are having the good aerobic endurance. Handball players performed very well in 30 Meters Run due to good speed requires in Handball game and Volleyball players are shown good in cooper test 12 min run because they are playing the Volleyball game of 60 minutes of 2-3 sets.

Discussion

The Table No. 1 showing the Mean, S.D, Standard Error, t-ratio of Volleyball players and Handball players in 30 M Run

Test.

Table 1: showing the Mean, S.D, Standard Error, t-ratio of Volleyball players and Handball players in 30 M Run Test

Results of 30M Run Test	N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Volleyball players	20	4.87	0.48	0.12	2.25	38.00	0.03
Handball players	20	4.55	0.23	0.06			

The Volleyball players mean performance in 30 M Run is 4.87 and Standard Deviation is 4.87 and Handball players mean performance in 30 M Run is 4.55 and Standard Deviation is 0.23. The Handball players are having the better speed i.e., 4.55 compare the Volleyball players is 4.87 there is a difference 0.32. The t-value is 2.25. The Table No. 2 showing the Mean, S.D, Standard Error, t-ratio of Volleyball players and Handball players in Cooper Test.

Table 2: showing the Mean, S.D, Standard Error, t-ratio of Volleyball players and Handball players in Cooper Test

Results of 12 min Cooper Test	N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Volleyball players	20	3050.00	219.71	49.13	1.69453	38.00	0.10
Handball players	20	2950.00	137.71	30.79			

The Volleyball players mean performance in 12 Min Cooper test is 3050.00 and Standard Deviation is 219.71 and Handball players mean performance in 12 Min Cooper test is 2950.00 and Standard Deviation is 137.71. The Volleyball players are having the better endurance i.e. 3050.00 than Handball players is 2950.00 there is a difference of 0.100 between them.

Conclusion

It is concluded that Handball players are having good speed and Volleyball players are having the good endurance. Both this motor qualities are compulsory for both players to excel in their performance. Hence all the condition programme for improvement of motor qualities are included in the coaching programme of both the players. Similar studies can be conducted on other sports and games.

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