International Journal of Physical Education, Sports and Health 2023; 10(5): 187-190

P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (RJIF): 5.38
IJPESH 2023; 10(5): 187-190

www.kheljournal.com
Received: 25-07-2023
Accepted: 02-09-2023

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Exploring the benchmarks for measuring physical fitness in players of varying types

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Abstract
Lacking adequate physical conditioning, an individual's prowess in athletic performance is markedly compromised. Therefore, it becomes imperative to meticulously scrutinize the relative levels of physical fitness demanded in distinct sports disciplines, namely Volleyball and Basketball. The primary objective of this investigation was to delve into and assess the extent of physical conditioning exhibited by collegiate-level players engaged in both volleyball and basketball.

Keywords: Physical Fitness, Players, Volleyball, Basketball

Introduction
The examination and scrutiny of the anthropometric attributes and physical body composition of athletes have long captivated the attention of coaches, sports scientists, and sports medicine experts. Over an extensive period, a significant number of these professionals have acknowledged that athletes engaged in competitive sports must exhibit distinctive and favorable characteristics that are particularly well-suited for their specific sport. Given the unique demands of each sport, it is imperative that athletes possess specific anthropometric qualities and body composition tailored to their respective disciplines.
Certain sports, such as hand-to-hand combat, necessitate a heightened emphasis on understanding and optimizing these attributes compared to others, owing to their inherent requirements. Nevertheless, this reality does not diminish the importance of scrutinizing the anthropometric features and body composition of athletes engaged in sports like basketball and volleyball. This is because adequate body composition and weight contribute significantly to crucial factors affecting performance and training, such as speed, endurance, power, quality, and readiness.
At the crux of the matter, effective investment in both basketball and volleyball, given their elevated levels of specialization and strategic skills, demands that each competitor possesses essential anthropometric characteristics and body configuration. Furthermore, prior examinations of basketball players and volleyball players have conclusively demonstrated the strong correlation between anthropometric features, body composition, and the specialized tactical requirements of the respective sports.

Parameters for Measuring Physical Fitness
Muscular Strength
Supreme quality manifests as the capacity to surmount obstacles or contend with resistance, as eloquently defined by Hardayal Singh in 1991. The pinnacle of muscular strength is characterized as robust quality, wherein the utmost resistance strength of muscles is appraised. Typically, robust quality is ascertained concerning the cohesive performance of muscles acting in unison, a determination facilitated by dynamometers and tensiometers. These sophisticated instruments measure the exertion of force applied in a singular effort by a specific grouping of muscles.
The meticulous evaluation of hand strength, particularly its robust and opulent analysis, provides a comprehensive benchmark for overall core strength. Power grip, a consequence of dynamic flexion across all finger joints, epitomizes the highest level of unwavering force that an individual can exert under standard biomechanical conditions. The synergistic interplay of

flexor and extensor muscles, coupled with the variance in muscle accumulation, stands as a pivotal factor influencing the quality of grip.
Numerous variables intricately contribute to the intricacies of grip quality, encompassing factors such as muscle integrity, hand dexterity, fatigue, temporal considerations, age, nutritional status, restricted range of motion, and emotional distress. In essence, the nuanced assessment of muscular strength, particularly in the context of grip quality, serves as a multifaceted reflection of an individual's physical prowess and resilience.

Test: Pull Ups for Boys (AAHPER test item)

Purpose: To measure arm and shoulder strength.

Facilities and Equipment's: A metallic bar, approximately 1.5 inches in diameter, is deemed a valuable addition. However, for younger age groups, a doorway workout facility bar can be employed. In various situations, improvisation may be warranted, necessitating the utilization of alternative equipment such as a ball goal support or a tilting chair.

Procedure: Bench is actually transformed based on such growth that the understudy may harmonize devoid of the flooring. The understudy must handle the get rid of along with his hands dealing with much coming from his physical body (overhand deal with). The understudy must at that point rear his body system till the aspect that his mandible mores than bench and also thereafter lower it once more to the starting point setting along with his upper arms fully expanded.

Instructions: Elevating your legs or facilitating the motion through kicking is imperative. The restoration to the equilibrium position mandates the extension of the arms to their full straightened state. It is strictly prohibited to initiate the ascent by opening or thrusting your way upwards.

Scoring: A point is tallied for every instance in which the student successfully executes a maneuver. The individual scores for each element are not aggregated, and only a singular trajectory is permissible unless it becomes evident that the student did not have an adequate opportunity during their initial attempt.

Testing personnel: The examination was undertaken by the researcher, and the proceedings were meticulously documented with the assistance of one collaborator.

Muscular Endurance
The state in which muscular contractions can exert maximal effort is termed as dynamic endurance. Dynamic endurance, contingent upon the nature of the muscle, is further categorized into two types: determination of isometric and isotonic muscular contractions.

Test: Bent knee sit ups.

Purpose: To measure abdominal muscle endurance.

Facilities and Equipment's: Mat was used.
Procedure: The individual assumes a supine position with the hind limbs flexed, and the soles of the feet resting on the floor, positioning the heels approximately one foot from the base. The angle at the knee joint should not be less than 90 degrees. Interlocking the hands and placing them behind the head, with elbows in contact with the floor, the feet are securely held by an assistant. The individual subsequently ascends to a seated position, endeavoring to bring the elbows in contact with the knees. This sequence is repeated as many times as deemed reasonable or necessary.

Instructions:
1. The hands of the subject are to remain securely interlocked, consistently in contact with the posterior aspect of the subject's back.
2. The subject elevates themselves from the initial position, ensuring that their elbows do not lift off the floor during the movement.
3. Upon returning to the starting position, the subject must ensure that their elbows are parallel to the floor or in close proximity without lifting.

Scoring: The state in which muscle groups can exert maximal effort is termed as robust endurance. Robust endurance, contingent upon the classification of muscle type, is further delineated into two distinct varieties: determination of isometric and isotonic muscular contractions.

Testing personnel: The examination was being conducted by the scientist, while an assistant diligently documented the proceedings.

Cardiovascular Endurance
Cardiovascular endurance can be elucidated as the capacity of the heart and respiratory system to efficiently engage and deliver a satisfactory supply of oxygen to the working muscles during exercises that entail substantial mass and are performed over extended durations. Synonymous terms for cardiovascular endurance include cardio-respiratory endurance, circulatory respiratory longevity, cardiopulmonary endurance, and others. The immediate assessment of cardiovascular endurance is gauged by measuring one's aerobic power or maximum oxygen uptake, while in a protracted context, it is estimated through prolonged exercises such as middle to longdistance running, cycling, swimming, and similar activities.

Test: 600 yards run and walk test.

Purpose: To measure cardiovascular endurance.

Facilities and Equipment: A basketball court, four stamp and stopwatch.

Procedure: Understudies always keep managing in party of 6 folks. Understudies might lay to rest room keeping up opportunities of wandering as well as must be actually advised to rate on their own.

Instructions: Run 3 times around the square which had 50 yard arm starting and finishing line is at same point.

Scoring: The score is the elapsed time in minutes and seconds.

Testing Personnel: One starter gave start, six trained testers operate the stopwatch and call out the times and one assistant was recorded all the scores.

Speed

The capacity to execute a sequence of analogous actions swiftly is encapsulated by the term "velocity." Velocity, in this context, can be construed as the celerity with which a series of developments or progressive advancements of a similar nature can be executed by an individual. The swiftness of muscle contraction, constituting an acquired trait, can undergo substantial refinement through diligent training employing legitimate methodologies and the deliberate practice of seamless progression with synchronized precision. Velocity, in a quantitative sense, is evaluated by dividing the distance covered by the time taken during brief sprints or rapid maneuvers.

Test: Speed for 50 -Yard Dash (AAHPER youth fitness test Item).

Purpose: To measure speed.

Facilities and Equipment: A basketball court with same starting line, and finishing line of a 50 yards course and two stopwatches.

Procedures: (i) After a brief heat up time period, the understudy takes a scenario responsible for the starting line. For the greatest result, 2 understudies always keep operating in the meanwhile in a threatening mindset. (ii) The starter uses the purchase, "Are you prepped?" and also "Go!" The final is actually participated in through a coming down stable of the branch as a banner to the time clock. (iii) The understudies always keep tromping completion target. iv) 1 path is actually enabled.

Instructions:

1. Understudy might take any sort of condition responsible for the starting line as they want.
2. On the instructions, "Go!" the understudy can easily always keep dashing as simple as he may to cross completion target.
3. Make an effort certainly not to regulate up till over completion objective. Then understudy might back down constantly.

Scoring: The score was the elapsed time as indicated in stopwatch between the starting signal and the student crosses the finish line.

Testing personnel: One starter and 2 timers are needed to administer this test. One assistant scorer did record the times.

Agility

The term "velocity" is employed to describe the adeptness with which an individual can alter their bodily postures or swiftly transition between movements. Velocity is elucidated as one's disciplined capacity to expeditiously and precisely modify body positions and trajectories, representing a controlled and refined ability to effectuate seamless adjustments in bodily orientation and movement patterns with precision and dexterity.

Test: Shuttle Run. (AAHPER youth fitness test)

Purpose: To measure the agility.

Facilities and Equipment's: 2 pipes 30 shoes split up and also alongside each other are actually bented on the industry. Considering that the understudy should attack each of these pipes, it is vital to possess a handful of shoes a higher volume of area at either edge. 4 squares of hardwood, 2 through 2 through 4 ins as well as stop watch.

Procedure

a) The participant stands poised at the starting line with the two squares positioned on the opposing side.
b) Upon the signal to commence, the participant swiftly advances to the square, retrieves one, and promptly returns to the starting line, placing the acquired square behind that line.
c) Subsequently, the participant proceeds to the second square, or briefly halts at the starting line on the return journey.
d) Two participants engage in this iterative process concurrently, ensuring that two distinct pathways are designated for their continuous sprints.

Instructions: (i) On the banner to "Go!" maintain operating as fast as the understudy may on the contrary collection as well as receive a square. (ii) Trainee needs to return the square throughout the 2nd product line where understudy placed it on the flooring. (iii) Perform certainly not throw it. (iv) Yield for the 2nd square, as well as this time around understudy might always keep tromping the starting line as fast as understudy may without placing the squares on the ground.

Scoring: The score is the elapsed time recorded in seconds, for the better of two trails.

Testing Personnel: One starter starts this. Two trained tester taken time and one assistant record the score.

Power

The ability to expel the highest magnitude of kinetic energy in a perilous manner within the briefest conceivable duration is designated as explosive power, exemplified by actions such as executing a standing broad jump or vertical leap.

Test: Standing Long Jump.

Purpose: To measure power.

Facilities and Equipment: A measuring tape and a mat. Space on the floor or jumping pit.

Procedure: The participant maintains control with a stance, feet positioned a few inches apart. Prior to initiating the jump, the participant flexes at the knees, simultaneously swinging the arms backward. Subsequently, a forward jump is executed by extending the legs and propelling the arms forward in unison. This maneuver allows for three permissible pathways. Evaluation involves measuring the distance from the nearest heel to the transition line.

For an accurate indoor assessment, it is optimal to affix a measuring strip on the floor at the designated point along the transition line. The participant can then execute the jump with the objective of landing on or beyond the line. Measurement precision is achieved by aligning the strip to the precise point of takeoff during the jump.

Instructions: Efficiently propel yourself by lifting both feet

simultaneously, executing a forward jump to the maximum extent feasible, and landing gracefully on both feet. It is crucial to avoid any backward motion upon landing. To enhance stability and control during the jump, consider adopting a preparatory posture by kneeling before the leap and incorporating a synchronized arm movement.

Scoring: The score is the measured distance between the point of takeoff and the nearest spot where any part of the participant's body makes contact with the floor. This measurement is meticulously calculated in feet and inches, down to the nearest fraction of an inch. Only the most favorable outcome along the optimal trajectory is duly recorded.

Results

Findings regarding selected physical fitness components is presented in the following table.

Table 1: Mean of Components of Physical Fitness of Volleyball and Basketball Players

	Pull ups	Sit ups	Shuttle Run	Standing Broad Jump	50 Yard Run	600 Yard Run and Walk
Basketball Player	5.33	39.86	19.32	6.90	6.7	1.85
Volleyball Player	4.87	38.73	19.78	6.78	6.99	1.82

Table 2: *t*-value of Components of Physical Fitness of Volleyball and Basketball Players

	Pull ups	Sit ups	Shuttle Run	Standing Broad Jump	50 Yard Run	600 Yard Run and Walk
t-value	0.8692	0.8309	1.3529	0.5985	2.0878	0.2740

Result and Discussion

Upon investigation, it is discerned that the muscular strength of basketball players, as measured by the frequency of sit-ups (5.33 times/min), surpasses that of their volleyball counterparts (4.87 times/min). Additionally, the muscular endurance of basketball players, reflected in the number of sit-ups performed (39.86 times), exceeds that of volleyball players (38.73 times). The agility of basketball players, measured in terms of maneuvering speed (19.32 sec.), is found to be superior to that of volleyball players (19.78 sec.). Furthermore, the lower limb strength of basketball players (6.90 mts.) surpasses that of volleyball players (6.78 mts.), while the sprint speed of basketball players (6.70 sec.) outpaces that of their counterparts in volleyball (6.99 sec.). Notably, the cardiovascular endurance of basketball players (1.85 minutes) also exceeds that of volleyball players (1.82 minutes). However, it is crucial to highlight that the disparities in agility and speed were statistically significant at the 0.05 significance level. This observed distinction may be attributed to the heightened involvement in physically demanding activities among basketball players compared to their volleyball counterparts.

Conclusion

Based on our observation, it can be deduced that the physical fitness level of the basketball player exceeded that of the volleyball player.

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