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Evaluation Of The Body Composition, Kinematics Of Volleyball Service Of Club And University Players Of Bahawalpur City

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ABSTRACT

This study is the assessment of body composition and volleyball service of club and university volleyball players. Fifteen participants were engaged from the club and (n = 15) from the university volleyball team. The selected variables were age, stature, body mass, the angles of upper and lower limbs joints, 30-meter dash, standing broad jump, vertical jump, agility and flexibility. An independent t-test was used for statistical analysis to compare the club and university volleyball players in the selected variables. The results display significant variances in stature, body mass, in joints angle of the knee, ankle, arm, elbow, shoulder, 30-meter dash, standing broad jump, vertical jump, agility and flexibility. It is concluded university volleyball players are significantly superior in the kinematics of

volleyball service and inferior body compositions than club players. The university players required more attention to improve their physical abilities. Future research is required to investigate the defensive and attacking abilities of volleyball players.

Keywords: Kinematics, body composition, volleyball player, physical fitness

Introduction

Service in volleyball is the first element of attack which signify the game skill of a volleyball player (Wise, 2002). A successful service is an offensive strategy to minimize the attacking opportunity of the opponent team. In contrast, a service mistake leads to a fault and provide an easy point to the opponent team. In the top level of volleyball competitions, obtaining the chance of direct point through service are minute but a good service effect the attacking abilities of the opponent team (Quiroga, García-Manso, Rodríguez-Ruiz, Sarmiento, De Saa, & Moreno, 2010), as a poor defence a reduce the chance of the match win (Patsiaouras, Moustakidis, Charitonidis, &Kokaridas, 2011).

A volleyball server can create greater forces by increasing the range of motion, and ball velocity (Wagle, Garai, Chiang, Monteleone, Kurys, Strohmeyer,...& Bose, 1988). The faster services reduce the flight path of the ball and provide less reaction time to the opponent team (Katsikadelli, 1998). It also reduces the flight path angles than the slower (Wagle et al., 1988). The execution of the faster service may go to the net or out of the volleyball court (Agelonidis, 2004).The faster services increase the margin of error than traditional services, due to a lack of accuracy, however, it is also affected by body composition and fitness (Wagle, et al, 1988). It was verified an attacking good is one of the great predictors of team victory (Zetou, Moustakidis, Tsigilis, & Komninakidou, 2007). On the other hand, the efficiency of blocking depends on the quality of a good service, which help in the defense of the serving team (Papageorgiou & Spitzley, 2003; Drikos, Kountouris, Laios, & Laios, 2009).

It appears that service stops the first return attack of the opponent team (Zetou, Moustakidis, Tsigilis, & Komninakidou, 2007; Fellingham, Hinkle, & Hunter, 2013). The anthropometric traits of volleyball players constitute critical stipulations for in specific given sport (Gualdi-Russo, & Zaccagni, 2001). It may be expected that the anthropometric traits have an effective degree of performance (Carter & Heath, 1990). However, even though research has tested the anthropometric profiles of volleyball players (Duncan, 2006). A few of the distinguished were observed in volleyball players that heightened were better in performance (Ling, 2007). One of the maximum capabilities in volleyball is the leap serve which is very hard to learn (Häyrinen et al., 2012). The performance of service is associated with the rate of serve during practice (Häyrinen et al., 2011).

The previous biomechanics studies of volleyball reported that the rate of service affects the velocity of service (Huang & Hu, 1985; Marquez, Masumura & Ae, 2007). The volleyball service is required to properly evaluation of game capacity via assessment of the

overall performance. It is likewise determined that every one of the competencies of the players couldn't examine via overall performance. The overall performance of the players consists of strategies of the frame moves. Research findings have found that volleyball players' competencies may be circuitously evaluated via overall performance. There is an important distinction of Kinematics measurements among Club and University volleyball.

Method and Material

The example of 30 subjects, which incorporates age 19 to 26 years. The subjects were separated into two groups University versus Club. There is a critical distinction between age club (M=22.24, SD= 2.50) and university (M=23.60 SD=1.90). These participants were chosen from the Club and Islamia University of Bahawalpur. The subjects were surveyed for stature, weight, age, 30-meter run, readiness, adaptability, standing wide leap, vertical leap, greatest arrangements, pushup, and perseverance, in minutes of volleyball players. stature estimations were taken by utilizing the standard anthropometric bar and body mass by weighing machine to the closest 0.5 kg. All information was dissected by utilizing Kinovea software for kinematics analysis of knee, elbow, arm, shoulder, hip joints. The willingness of data collection was obtained by obtaining the consent letter from all the participants. The purpose of data collection was brief to all participants before the start of data collection. The data was compiled inside the premises of the sports ground of the Islamia University of Bahawalpur, Pakistan.

Preceding the organization of the test, the prerequisites of the testing technique were disclosed to them in subtleties, so that there was no vagueness in their brain concerning the endeavors expected of them and the strain that they needed to suffer expansion to their interest in the opposition. Every one of the subjects concurred intentionally to collaborate in the testing method disclosed to them in light of a legitimate concern for logical examination and improving their exhibition. However, no exceptional strategies were utilized to rouse the subject to invest in their best amounts of energy, the subjects were excited and helpful all through the venture.

Instruments and Procedure of Data Collection

The normal score of the three specialists was considered to judge volleyball service. For estimating the stature estimating tape was utilized. The anthropometric measurements were obtained to examine the effects of body size on the performance of volleyball service. All subjects were evaluated for anthropometric measures needed for the computation of body organization factors, utilizing the normalized strategy suggested by the Worldwide Natural Program (IBP) (Marfell-Jones et al., 2006). Stature and weight were estimated in the lab with the subject wearing clothing. Stature was estimated to the closest 0.1 cm utilizing a fixed stadiometer, and weight was estimated to the closest 0.1 kg with a standard scale using a compact equilibrium.

The flexibility test was obtained as the subject was seated on the floor. The position was situated in a fact that the hip-knee is in flexion position inclining to back help of the seat. Lower body furthest points were secured to each other on the femur shaft distal. The length of the arm was set apart on the ulnar styloid level and the player was approached to connect with the front however much as could be expected, for example, shoulder protraction and neck flexion. The length of the ulnar styloid moved was checked on the maximal arriving at point, and the distance in the middle of the first and the subsequent qualities was recorded in cm (Özünlü, & Ergun, 2012). The sit-up tests the player's positions were lying on his back on the mat, knees bowed, bottoms of the feet completely on the mat, hands on each side of the hips and fingers in expansion on the mat. The legs were upheld as to keep the knees bowed. The individual was requested to emerge until the scapula base level, and do however many sit-ups as he could in one minute(Sahlberg et al., 2005).The push-up test was obtained as the member was situated face down on the mat, and the altered push-up adaptation for the females was applied. The force of the furthest point muscles of the subject and the number of aft moves of the chest area was recorded (Ergun, &Baltacı, 2006). The handgrip strength was measured by using the handgrip strength dynamometer. The hand getting a handle and fixed its position to use the maximum force to squeeze it. The performance was obtained in three trials with the interval of one minute. The participants were in light dress in a straight standing position without holding an object to obtain the external force. Before the start of trails the dynamometer, the device was synchronized at zero. The participant was suggested to flex his right elbow at a 90-degree angle and squeeze the handle of the dynamometer by applying his maximum force. On the right hand, the estimation was recorded in kg and a one-minute interval was given to each participant for three trials. The agility test for volleyball players was adopted in the following of (Gabbet et al., 2006). The agility of Volleyball players is required to learn the capacity to move rapidly to situate themselves to get a pass or square a shot from a rival. The running velocity of players was assessed with a 5-and 10-m utilizing stopwatch. Four cones were set 5 m separated looking like an altered T. Players were told to run as fast as conceivable along the dexterity run. Spryness times were estimated to the closest 0.01 second, with the quickest worth got from 2 preliminaries utilized as the deftness score. The target was situated 5 and 10 m from a foreordained beginning stage. Players were told to run as fast as conceivable along with the 10-m separation from a standing beginning. The ntern his position from the left side for a 5-meter run, then right turn for ten meters run, then turn for five meters to approach the central point of the T-test, finally the players turn left to finish in agility test run where he started. The score was recorded in seconds. Players were needed to run to and for along a 20-m track, keeping on schedule with a progression of signs on a reduced circle. The recurrence of the perceptible signs (and subsequently, running rate) was dynamically expanded until subjects arrived at volitional depletion. Maximal high-impact power was assessed utilizing relapse conditions depicted by (Ramsbottom et al., 1988; Haq, Arif, &

Nawaz, 2020). A stopwatch was utilized to quantify the perseverance of players. All the kinematics estimations were taken on the left and right half of the person. The standard method portrayed by (Singh, & Singh, 2017). was followed for estimations. All estimations were recorded closest to feet yet and actual test estimations were recorded to the closest of minutes. Each trail was taken twice.

Three-dimensional marker areas were determined with movement examination programming. Furthest point kinematics were determined as already described (Dillman, Fleisig, Andrews, 1993; Fleisig, Escamilla, Andrews, Matsuo, Satterwhite, Barrentine, 1996; Naveed, Haq, Ahmad, Naz, Haghighi, & Hassan, 2020).Included were the angular estimations of lower limbs and serving shoulder points at adduction, abduction, extension and flexion as describes (Reeser, Fleisig, Bolt, &Ruan,2010).The angular kinematics of serving shoulder and elbow are based on kinematic information, archived body portion boundaries, and reverse elements, as already described (Fleisig et al., 1996). Dynamic qualities were communicated as the determined burdens applied at the joint by the proximal portion onto the distal fragment. The angular kinematics at four phases at preparatory, backswing, ball contact, and follow-through (after ball contact) were determined because the dynamic model did exclude the power produced by ball contact. The spike and the serve share a typical design into 5 stages as approach, departure, arm positioning, arm speed increase, and finish. The angular position of the upper and lower body as the ankle, knee, hip, shoulder, elbow and wrist joint were recorded. Fully expecting to strike the volleyball, the competitor cocks her arm by stealing and remotely pivoting the predominant upper appendage at the shoulder. During the speed increase stageto contact the volleyball at the ideal overhead position. Right now, of ball contact, the speeding up upper appendage ought to be flexed and inside pivoted at the shoulder and stretched out at the elbow. The lower arm is pronated to a lesser or more prominent degree, contingent upon whether the competitor wishes to coordinate the ball corner to corner across the body or straight ahead. The roll shot is utilized in indoor volleyball essentially as a strategic off-speed position shot to surprise the adversary. Therefore, the competitor contacts the volleyball with comparable mechanics yet with significantly less power than if she were playing out a hard spike. To think about our spiking and serving kinematic information, we partitioned every ability into the accompanying stages, arm positioning, arm speed increase, and ball contact. These measurements were obtained on the following of (Reeser, Fleisig, Bolt, &Ruan, 2010).For estimating Kinematics points knee, hip arm, elbow, shoulder points during Kinovea setup.0.8.15 was utilized. For taking recordings and photographs Canon video camera was utilized.

The vital information was gathered by regulating the test for the picked anthropometric factors, actual wellness factors Kinematics factors, and volleyball playing capacity. The whole test was directed during competitions. The subjects were allowed an opportunity to rehearse the recommended test so they may get comfortable with the test and knew precisely what was to be finished. Every one of the tests was direct in the three

days. To safeguard uniform testing conditions the subjects were tried uniquely during the morning and evening meetings. The utilization of the device was disclosed to them before the organization of tests. A colleague was additionally prepared for recording the information, which was knowledgeable with the picked anthropometric estimations. He went with the specialist to all spots regarding the assortment of information. Vital guidance and showings were given to the subjects before the lead of the test. To accomplish the destinations of study the examiner needs to design the whole course of work in the terms of examination configuration fit to the review, in this manner, the plan of the present review is handled deliberately under the after heading. All subjects were guaranteed about their wellbeing status from organizations which was routinely kept up with by their particular establishments and it was tracked down that whole chose subjects were medicinally fit for going through the testing system.

Statistical Analysis

Qualities are introduced as mean and standard deviation. The intra class relationship coefficient for test-retest dependability and normal mistake of estimation for all the physical fitness and kinematics measurements of the volleyball service and reliability was accepted at 0.85 and 2.9%, separately. An independent t-test was utilized to examine the difference among the physical fitness, and kinematics variables fundamentally. Various connections between chosen anthropometric Kinematics and actual wellness factors (autonomous) of playing capacity in volleyball (subordinate) factors were processed to survey the consolidated impacts and actual wellness factors with volleyball playing capacity. Information was broken down utilizing SPSS form 25.

Results

The current section is the examination and translation of information to the following parts. The kinematics factors of the volleyball service and physical fitness of the Islamia University of Bahawalpur and Club volleyball players. Different relationships of chose the kinematics factors and actual physical factors with playing capacity of volleyball players. Results showed the comparison of the elbow, arm, knee angles, stride length, and ball toss in service at different body positions and age, height, the weight of Club and University volleyball players.

Figur 02: Physical Fitness of University and Club volleyball players

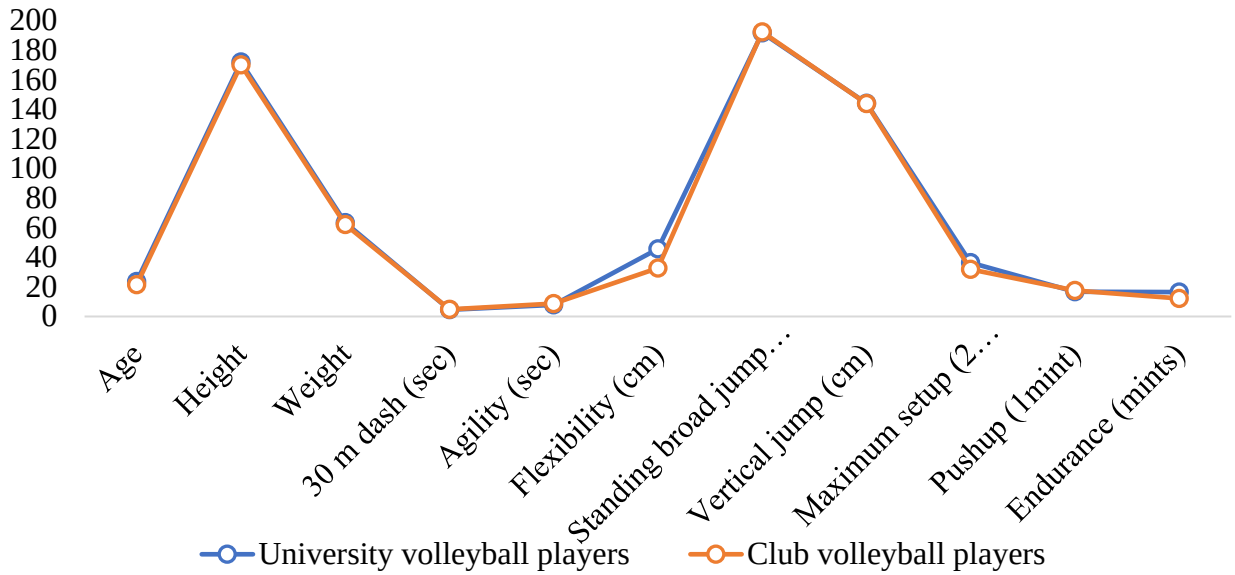

Figure first shows that significant difference between club and university volleyball players inage (t = 2.73), stature (t = 1.26), body mass (t = 0.79), 30 m dash sec (t = -1.301), agility (t = -3.44), flexibility (t = 3.17), standing broad jump (t = 0.27), vertical jump (t = 2.13), maximum set up (t = 1.39), pushups (t = -0.44), endurance capacity (t = 2.95).

Figur 02: Linear Kinematics of University and Club volleyball players

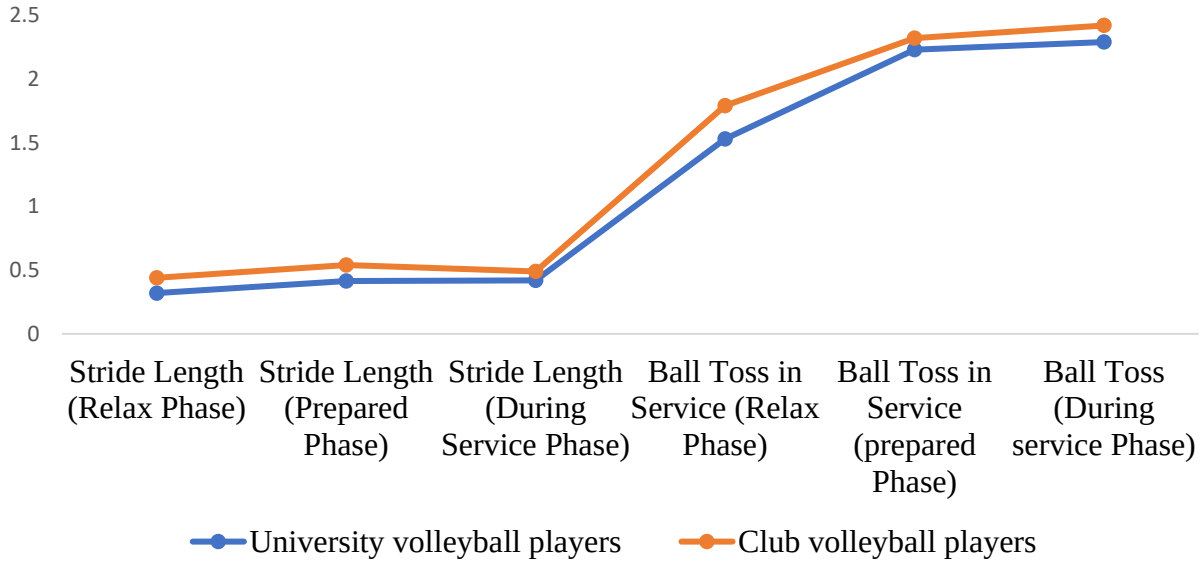

Figure 02 shows there is significant difference among university and club volleyball players in stride length at relax phase(t = -1.46), stride length prepare(t = -2.73), stride length during service (t = -0.85).

Figure 01: Angular Kinematics of University and Club volleyball players

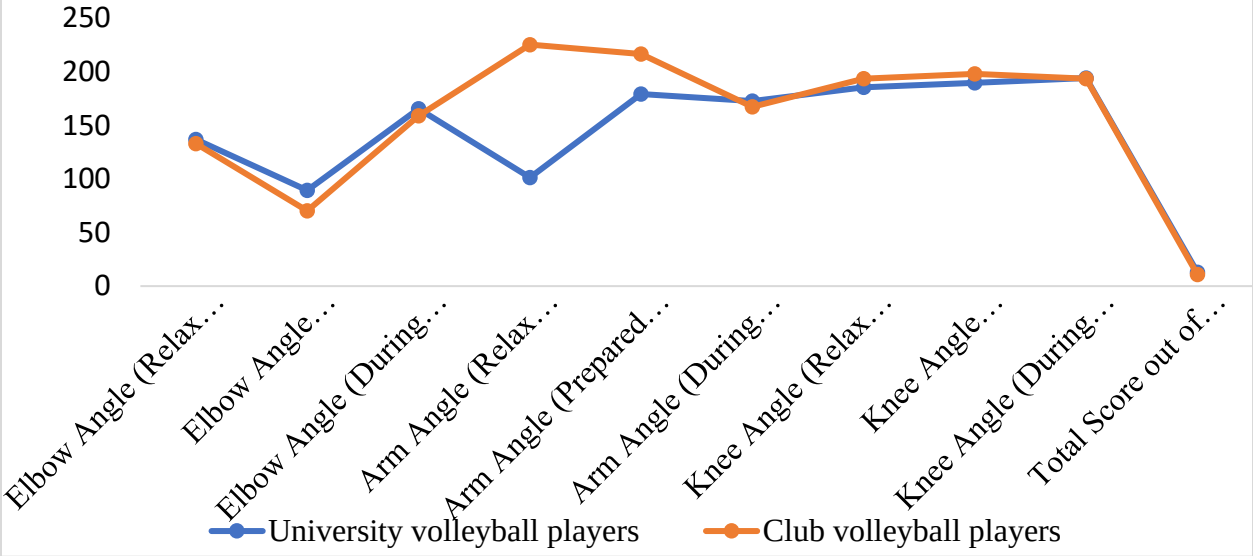

Figure three shows significant difference between university and club volleyball playresin elbow angle relax phase (t = 0.36), elbow angle (t=0.89), elbow angle during service phase (t=0.24), arm angle at relax (t = -2.37), arm angle prepare (t = -1.11), elbow angle during service phase(t = 0.49), knee angle relax phase (t = -2.69), knee angle prepare phase(t = -2.89), knee angle during service phase (t = 0.67).

Discussion and Conclusions

Predication of various relapse conditions for the playing capacity of volleyball players with the chose Kinematics and actual wellness factors. The investigation of information assortment on 30 volleyball players of University and Club level. The connection among Kinematics and actual wellness factors with volleyball execution, the consolidated commitment of chose Kinematics and actual wellness factors with volleyball execution and different statics indicating their connections are introduced in a bunch of each figure. Results show evidence that the physical fitness and the angular kinematics of the volleyball service of university volleyball players were significantly better in few variables than the club volleyball players. height, weight, arm, shoulder, knee, elbow, angles, and physical fitness tests have positive and significant differences with the playing ability of volleyball players. It shows that height and total arm length contribute to the playing ability of volleyball players. Other variables of kinematics have an insignificant correlation with the playing ability of volleyball players. Further out of the physical fitness test measurement

agility test has a significant difference with the playing ability of volleyball players. It shows these agility and flexibility test measurements contribute to the playing ability of volleyball.

Based on the discussion of the results, the following conclusion was made that age and weight have no significant difference with the playing ability of volleyball players. Hence, age, height and weight contribute to the playing performance of volleyball players. The capacity of an agility run among university players was significantly higher than club volleyball players. As well as the vertical jump and flexibility of university volleyball players were significantly higher than club players. These findings indicate that university players having better playing facilities ad coaching assistance than club players. Secondly, the club players belong to Bahawalpur which would be a smaller geographical place for team selection. On the other hand, the university volleyball team was selected from whole university students which belong to various cities of Bahawalpur, Multan and Dera Ghazi khan division. The findings of this study are supported by the finding of (Gabbett, & Georgieff, 2007), that physical fitness assists the volleyball players to perform better service because of the strength of the upper and lower body.

Results showed that the knee angle of club players was significantly higher than university players at the preparatory position. It shows that the club players are less in knee flexion which would be lesser in the vertical jump for service. Therefore, less flexion of the knee reduces the capacity of vertical jump during the volleyball service. So, it can be concluded that the university player's higher vertical jump capacity and higher inflexion signify them from club players. The finding of this study has been supported by the findings of (Fuchs, Fusco, Bell, von Duvillard, Cortis, & Wagner., 2019), that the flexion of the knee increases the vertical jump which increases the force and accuracy of volleyball service (Sarvestan, Svoboda, & Linduška, 2020).

On the other hand, the club players were significantly higher with the playing performance of volleyball players. It shows that the higher toss of the ball reduces the tempo of jump service, which further reduce the ball speed in service along with the ball accuracy. The findings of the present study were supported by the finding of (Gabbett, & Georgieff, 2007), which shows that the ball speed is also associated with the ball toss and vertical jump of athletes.

Recommendations

In the light of the findings of the present study, the following recommendations are made to the coaches, physical educators, sports scientists and players. The results of the study can be used by the coaches, physical education teachers and trainers as an aid in screening and selecting prospective volleyball players. Based on results, coaches and trainers might develop their training program laying more emphasis on the related anthropometric and physical fitness test variables that proved to be important for the performance. It is recommended that a similar study may be conducted by selecting subjects belonging to different age groups and levels of achievements other than those employed in the present

study. Similar studies may be conducted on various other sports and games. It is recommended that a similar study may be conducted on psychological variables and motor fitness variables. To improve the standard of volleyball players a talent hunt scheme should be launched specially for the rural area and players should be selected based on their Kinematics and physical fitness parameters and given training.

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