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Relationship of Selected Motor Fitness Components with the Performance of Basketball Player

KEYWORDS: Power, Agility, Speed, Cardio respiratory endurance

Dr. Sentu Mitra	Dr. Sagarika Bandyopadhyay	Mr.Arup Gayen
Assistant Professor, AKPC Mahavidyalaya, Subhasnagar, Bengai, Hooghly, W.B. India	Associate Professor, Deptt. of Physical Education, Visva-Bharati, Santiniketan, Birbhum,W.B. India	Research Scholar, Deptt. of Physical Education, Visva-Bharati, Santiniketan, Birbhum,W.B. India

ABSTRACT *The objective of the study was to find out the relationship of power, agility, Speed and cardiovascular endurance with the performance of basketball player". For the purpose of the study forty male basketball players who had participated in various competitions in basketball at University, national or state level, were selected. Their age ranged from 18-23 years of age. Basketball performance was selected as a Dependent Variable and power, agility, speed and cardio respiratory endurance were considered as Independent Variables. To analysis the relationship between the basketball performance and selected motor fitness components coefficient of correlation was used. The level of significance was set at .05 level. The result revealed that the coefficient of correlation of power (r = 0.581), agility (r = -0.664), speed (r = -0.579) and cardio respiratory endurance (r = 0.371) were found significant with the performance of basketball player at 0.05level of confidence.*

INTRODUCTION:

Basketball is a game played by two (2) teams of five (5) players each. The aim of each team is to score in the opponents' basket and to prevent the other team from scoring. It is one of the spectacular and fastest games in which high level of conditioning and coordinative abilities with technical and tactical potentials are essential to perform every skill at desired or required level. Champion teams have been and always be teams that have mastered the fundamentals of basketball and enjoy the game (Lindeburg F. A., 1967). Basketball game is about 20% aerobic and 80% anaerobic in nature (Brittenham G, 1996). While improving and refining a player's basketball skills crucial for enhancing the quality of play, it is the improvement of the player's athletic skills that allows him to elevate his play to a higher level. Athletic skills include variables such as speed, power, endurance, agility, coordination, balance and reaction time. Improving these athletic skills is critical to the total development of the athlete. The level at which basketball skills are performed is directly related to the level of the athlete's total conditioning (Brittenham G., 1996). Dr James Naismith, the inventor of the game of Basketball stated (1914) that the first principle on which the game was based was that it should demand of, and develop in, the player the highest type of physical and athletic development (Brzycki M. and Brown S., 1993). In basketball, successful performance is dependent upon several fitness components that are anaerobic in nature. These components i.e., speed, agility, and vertical jump height must be performed repeatedly, with minimal reductions in performance for the duration of the contest (Hoffman J.R. et al, 2000).

METHODS

Subjects

40 University/National/ State Level male Basketball Players, aged between 18-23 years, were selected for the purpose of this study.

Testing Procedures

For establishing the relationship of power, agility, speed and cardio respiratory endurance with the performance of Basketball Player following tests were conducted:-

Power was measured by Sergeant Jump in centimeter.

Agility was measured by Illinois Agility Test in seconds.

Speed was measured by 20 meter dash in seconds.

Cardio respiratory endurance was measured by Bleep Test in ml/kg/min.

Basketball performance was recorded by subjective rating test. Three experts were assigned for rating the basketball players during the match situation. Phases of performance that were rated on in the game situation were broken into seven units and rated out of ten points. Average score of the three expert's scores were recorded as the score of the player.

Statistical Analyses

For determining the significant relationship of power, agility, speed and cardio respiratory endurance with the performance of Basketball Player the Pearson's Product Moment Correlation was used for the analysis of data.

Results The findings pertaining to the study are presented in Tables 1 and 2.

TABLE-1

Descriptive Statistics of the selected variables of Basketball Players

	Basketball Performance (Score)	Power (Centimeter)	Agility (Sec)	Speed (Sec)	Cardio respiratory Endurance (ML/Kg/Min)
Mean	45.5	44.85	18.25	3.75	44.24
SD	2.227	3.519	0.836	0.109	4.225
HS	50.333	50	16.58	3.49	54.247
LS	42	36	19.62	3.94	36.564

SD- Standard deviation, HS-Highest Score, LS- Lowest Score

Table-2

Coefficient of Correlation between Motor Fitness Components and Basketball Performance

Playing ability	Power	0.581*
Playing ability	Agility	-0.664*
Playing ability	Speed	-0.579*
Playing ability	Cardio respiratory Endurance	0.371*

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Significant at 0.05 level $r_{0.05\ (38)} = 0.304$

Independent Variables Dependent variables
Table 1 reveals that all the motor fitness components (Power, agility, speed and cardio respiratory endurance) correlates maximum with basketball performance.

The coefficient of correlation of power (r = 0.581), agility(r = -0.664), speed (r = -0.579), and cardio respiratory endurance(r = 0.371) were found to be significant with the performance of Basketball player at 0.05 level of confidence.

Discussion
Power has been found positively significant with the performance of basketball player. Power is the product of speed and strength. It is the ability of a muscular unit or combination of muscular unit to apply maximum force in minimum time. So during playing in basketball a good player has to jump as early as possible for fruitful playing. Therefore power is the performance prerequisite for a good basketball player. It has been found that there is a significant negative relationship between speed, agility and basketball playing ability. Speed is the quickness of movement of a limb and agility is the ability to change the direction of the body in an efficient and effective manner without lose of balance. The efficient basketball player must required these type of movement during play. There was a significant relationship between cardio respiratory endurance and playing ability of basketball player. Cardio respiratory endurance is the ability of the heart, lungs and circulatory system to taken and transport adequate amount of oxygen to the working muscles to perform repetitive contraction over period of time or under condition of fatigue. During game situation one has to perform repetitive contraction of muscles for a longer period of time. A good basketball player need to perform all the skill effectively for longer duration (forty minutes). Therefore Cardio respiratory endurance is the prerequisite for a good basketball player . The study is supported by **Meckel et al (2009) who** worked on Relationship among repeated sprint tests, aerobic fitness, and anaerobic fitness in elite adolescent soccer players. They found that the aerobic system played a significant role in the maintenance of intensity level during a soccer game, which was characterized by short bursts of activities. Anaerobic performance of repeated brief efforts imposed different physiological stress than a single prolonged activity and, thus, might reflect different physiological capabilities. Therefore, anaerobic testing procedures should consist of specific protocols that mimic the athlete's specific sports activity pattern. The study is also supported by **Sihi and Bandyapadhyay (1988) who** studied anthropometric measurements, movements speed and performance ability of forty-six male volleyball players. From the results they concluded that the performance level in volleyball depended on height, limb length, age, movement speed, reaction time, flexibility, strength, speed, agility and coordination.

Conclusions
On the basis of the findings of the study, it may reasonably be concluded that the selected motor fitness components i.e. power, agility, speed and cardio respiratory endurance has significant relation with the playing ability of basketball players.

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