



ISSN: 2456-0057

IJPNPE 2019; 4(1): 2331-2333

© 2019 IJPNPE

[www.journalofsports.com](http://www.journalofsports.com)

Received: 05-01-2019

Accepted: 28-01-2019

**Jasbir Singh**

Research Scholar, Department of  
Physical Education, Sant Baba  
Bhag Singh University,  
Jalandhar, Punjab, India

**Dr. Pritam Singh**

Head and Professor, Department  
of Physical Education, Sant  
Baba Bhag Singh University,  
Jalandhar, Punjab, India

## A relationship study of physiological characteristics and basketball playing ability among university level players

**Jasbir Singh and Dr. Pritam Singh**

**DOI:** <https://doi.org/10.22271/journalofsport.2019.v4.i1as.2068>

**Abstract**

The objective of this was to examine the relationship between physiological characteristics and playing ability of male Basketball players of university level. In this Study, a total of 250 male Basketball players were recruited from the various Universities of Northern India. The sampling was done by using the purposive sampling method. The physiological characteristics aerobic fitness ( $vo^2$  max), speed, grip strength, explosive power. Basketball playing ability was tested using the AAHPERD Basketball skill test. It was found that aerobic fitness ( $vo^2$  max), grip strength and explosive power were positively related whereas speed was negatively related to Basketball playing ability. It can be concluded that physiological characteristics play significant role to enhance Basketball playing ability.

**Keywords:** Physiological, ability, dribbling, shooting, passing

**Introduction**

Basketball is a team sport, competitive and sporadic in nature, executed by rapid and quick moves, where shifts of pace and direction are made and where leaps are an important part of the demands of the game. These criteria include strong physiological health, since it is necessary to excel in basketball (Stone *et al.*, 2009) [2]. However, the criteria differ based on the age, rank and sex of the players (Latzel *et al.*, 2018) [5]. For this function, physical activity may be measured by means of different components, like aerobic fitness, speed, handgrip strength and explosive strength which are important for basketball success.

Aerobic fitness is the potential to sustain a sensation for a sustained period of time. This allows the competitor to make changes to the effort (competition or training). After a while, energy intake would be smaller than the same stimulus, and the energy saving mechanism would be achieved. The value of this ability is attributed to the reality that the competitor must rapidly rebound from severe eruptions in a brief amount of time in order to be able to chain a wider number of eruptions during the game.

**Methods**

In this study, a total of 250 male Basketball players were recruited from the various Universities of Northern India. The sampling was done by using the purposive sampling method. The physiological characteristics were tested using their respective validated tests as mentioned in table 1. Basketball playing ability was tested using the AAHPERD Basketball skill test.

**Table 1:** Tools used for data collection

Component	Tests	Unit of measurement
Aerobic Fitness ( $vo^2$ max)	Cooper's 12 minutes run/ walk test	ml/kg/min
Speed	50 meter dash	Seconds
Grip Strength	Hand dynamometer	Kilogram
Explosive Power	Standing vertical jump	Centimeters

**Corresponding Author:****Jasbir Singh**

Research Scholar, Department of  
Physical Education, Sant Baba  
Bhag Singh University,  
Jalandhar, Punjab, India

**Statistical analysis**

Descriptive statistics were described as means and standard deviations. The Pearson’s coefficient of correlation was applied to test the relationship between the physiological characteristics and basketball playing ability. The significance level was 0.05 in all the analyses.

**Table 2:** Descriptive statistics of physiological characteristics and playing ability of basketball players

Characteristics	Mean	SD
Aerobic fitness	37.14	8.63
Speed	7.86	0.82
Right handgrip	38.41	2.52
Left handgrip	37.31	2.75
Explosive power	44.40	3.30
Passing ability	24.66	2.17
Shooting ability	26.60	2.40
Dribbling ability	12.39	2.04
Playing ability	63.66	4.74

Table 2 shows the description of physiological characteristics and playing ability of Basketball players. The mean and standard deviation of aerobic fitness was 37.14 and 8.63 respectively. The mean and standard deviation of speed was 7.86 and 0.82 respectively. The mean and standard deviation of right handgrip was 38.41 and 2.52 respectively. The mean and standard deviation of left handgrip was 37.31 and 2.75 respectively. The mean and standard deviation of explosive power was 44.40 and 3.30 respectively. The mean and standard deviation of passing ability was 24.66 and 2.17 respectively. The mean and standard deviation of shooting ability was 26.6 and 2.40 respectively. The mean and standard deviation of dribbling ability was 12.39 and 2.04 respectively. The mean and standard deviation of overall playing ability was 63.66 and 4.74 respectively.

**Table 3:** Correlation of physiological characteristics with basketball passing ability

Characteristics	R	p-value
Aerobic fitness	0.58	0.001*
Speed	-0.41	0.001*
Right handgrip	0.60	0.001*
Left handgrip	0.58	0.001*
Explosive power	0.38	0.001*

Table 3 depicts the coefficient of correlation between physiological characteristics and passing ability of Basketball players. It was found that a positive and significant correlation was found between the Basketball passing ability and the variables aerobic fitness (r=0.58), right handgrip (r=0.60), left handgrip (r=0.58) and explosive power (r=0.38). However, in the case of speed (r=-0.41), the correlation was significantly negative.

**Table 4:** Correlation of physiological characteristics with basketball shooting ability

Characteristics	R	p-value
Aerobic fitness	0.33	0.001*
Speed	-0.23	0.001*
Right handgrip	0.34	0.001*
Left handgrip	0.35	0.001*
Explosive strength	0.17	0.001*

Table 3 depicts the coefficient of correlation between physiological characteristics and shooting ability of

Basketball players. It was found that a positive and significant correlation was found between the Basketball shooting ability and the variables aerobic fitness (r=0.33), right handgrip (r=0.34), left handgrip (r=0.35) and explosive power (r=0.17). However, speed (r=-0.23) showed significantly negative the correlation with the shooting ability.

**Table 5:** Correlation of physiological characteristics with basketball dribbling ability

Characteristics	R	p-value
Aerobic fitness	0.47	0.001*
Speed	-0.36	0.001*
Right handgrip	0.48	0.001*
Left handgrip	0.47	0.001*
Explosive strength	0.30	0.001*

Table 5 shows the coefficient of correlation between physiological characteristics and dribbling ability of Basketball players. It was found that a positive and significant correlation was found between the Basketball dribbling ability and the variables aerobic fitness (r=0.47), right handgrip (r=0.48), left handgrip (r=0.47), and explosive power (r=0.30). However, speed (r=-0.30) showed significantly negative the correlation with the dribbling ability.

**Table 6:** Correlation of physiological characteristics with basketball playing ability

Characteristics	R	p-value
Aerobic fitness	0.64	0.001*
Speed	-0.47	0.001*
Right handgrip	0.66	0.001*
Left handgrip	0.65	0.001*
Explosive strength	0.39	0.001*

Table 6 shows the coefficient of correlation between physiological characteristics and overall playing ability of Basketball players. It was found that a positive and significant correlation was found between the Basketball dribbling ability and the variables aerobic fitness (r=0.64), right handgrip (r=0.66), left handgrip (r=0.65), and explosive power (r=0.39). However, speed (r=-0.30) showed significantly negative the correlation with the overall playing ability of Basketball players.

**Discussion**

The purpose of this study was to examine the relationship between physiological characteristics and playing ability of male Basketball players of university level. It was found that aerobic fitness, right handgrip, left handgrip, and explosive power were positively related to the passing ability, shooting ability, dribbling ability and overall playing ability. However, speed was negatively related to the playing ability. It can be interpreted from these results that as the score of aerobic fitness, right handgrip, left handgrip, and explosive strength increase the Basketball playing ability also increases. Researchers and coaches are constantly searching for traits that can assist in the growth of talent (Vaeyens *et al.*, 2008) [8]. Basketball is distinguished by high-intensity, sporadic, explosive strength (Ben Abdelkrim *et al.*, 2010; Castagna *et al.*, 2008) [5, 10, 11-13]. There is also a requirement for a range of expertise and physical activity attributes to compete in sport (Montgomery *et al.*, 2010) [9]. Biometric and physical health capacities are currently commonly regarded as the most significant variables determining basketball success (Hoare, 2000; Ziv and Lidor, 2009) [14-16]. As regards game-related

results, there is some literature about how these aspects contribute to winning and losing in men's basketball (Ziv *et al.*, 2010) [14, 15]; however, no research has been performed about game-related success in women's Basketball players.

### Conclusion

It can be concluded from the results that physiological characteristics play significant role in enhancing the playing ability of Basketball players.

### References

- Zarić I, Dopsaj M, Marković M. Match performance in young female basketball players: Relationship with laboratory and field tests, *Int. J Perform anal sport*. 2018; 18:90-103.
- Stone NM, Kilding AE. Aerobic conditioning for team sport athletes *Sports Med*. 2009;39:615-642.
- Singh G, Singh S, Singh H. Physical fitness differentials between boys of government and private schools, *International Journal of physical education, sports and health*. 2017;4(3):468-471.
- Singh H. Exploring the relationship between trait emotional intelligence and physical activity levels in male university students, *European Journal of physical education and sport science*. 2018;4(3):141-148.
- Latzel R, Hoos O, Stier S, Kaufmann S, Fresz V, Eim R, D *et al.* Energetic profile of the basketball exercise simulation test in junior elite players, *Int. J Sports Physiol Perform*. 2018;13:810-815.
- Zupan MF, Arata AW, Dawson LH, Wile AL, Payn TL, Hannon ME. Wingate anaerobic test peak power and anaerobic capacity classifications for men and women intercollegiate athletes, *J strength Cond res*. 2009;23:2598-2604.
- Ibáñez SJ, Reina M, Mancha-Triguero D, García-Rubio J. Evaluación de la capacidad aeróbica y anaeróbica de jugadores de baloncesto en edades de formación. In *Baloncesto Formativo. La Preparación Física II, Camino Hacia El Alto Rendimiento*. Esper Di Cesare PA. Autores de Argentina: Buenos Aires, Argentina, 2019; 365-388.
- Vaeyens R, Lenoir M, Williams AM, Philippaerts RM. Talent identification and development programmes in sport: Current models and future directions *Sport Med*. 2008;38(9):703-14.
- Montgomery PG, Pyne DB, Minahan CL. The physical and physiological demands of basketball training and competition. *Int. J Sports Physiol Perform*. 2010;5(1):75-86.
- Ben Abdelkrim N, Castagna C, El Fazaa S, El Ati J. The effect of players' standard and tactical strategy on game demands in men's basketball, *J Strength Cond Res*. 2010;24:2652-62.
- Ben Abdelkrim N, Castagna C, Jabri I, Battikh T, El Fazaa S, El Ati J. Activity profile and physiological requirements of junior elite basketball players in relation to aerobic-anaerobic fitness, *J Strength Cond Res*. 2010;24:2330-42.
- Ben Abdelkrim N, El Fazaa S, El Ati J. Time-motion analysis and physiological data of elite under-19-year old basketball players during competition, *Br J Sports Med*. 2007;41:69-75.
- Castagna C, Abt G, Manzi V, Annino G, Padua E, D'Ottavio S. Effect of recovery mode on repeated sprint ability in young basketball players, *J Strength Cond Res*. 2008;22:923-9.
- Ziv G, Lidor R, Arnon M. Predicting team rankings in basketball: The questionable use of on-court performance statistics, *Int. J Perform Anal Sport*. 2010;10:103-14.
- Ziv G, Lidor R. Physical attributes, physiological characteristics, on-court performances and nutritional strategies of female and male basketball players *Sport Med*. 2009;39:547-68.
- Hoare DG. Predicting success in junior elite basketball players-the contribution of anthropometric and physiological attributes, *J Sci. Med Sport*. 2000;3(4):391-405.
- Singh H. Relationship between leisure-time physical activity and emotional intelligence in female university students: A correlational study, *European Journal of physical education and sport science*. 2017;3(10):209-216.
- Singh A, Singh T, Singh H. Autogenic training and progressive muscle relaxation interventions: Effects on mental skills of females, *European Journal of physical education and sport science*. 2018;5(1):134-141.
- Singh H, Singh S. Prevalence, patterns and associated factors of physical activity in Indian University students, *European Journal of physical education and sport science*. 2017;3(10):76-87.
- Keshav K, Harmandeep S. Comparative Study of Physical Fitness Variables of male Volleyball Players and Football Players, *Research Journal of Physical Education Sciences*. 2014;2(1):5-7.
- Harmandeep S, Satinder K, Amita R, Anupriya S. Effects of six-week plyometrics on vertical jumping ability of volleyball players. *Research Journal of Physical Education Sciences* 2015;2320:9011.
- Singh H. Relationship between levels of physical activity and health-related quality of life in male university students, *International Journal of Physiology, Nutrition and Physical Education*. 2018;3(1):1391-1394.
- Singh H. Relationship between leisure-time physical activity and emotional intelligence in female university students: A correlational study, *European Journal of Physical Education and Sport Science*. 2017;3(10):209-216.
- Singh A, Singh T, Singh H. Autogenic training and progressive muscle relaxation interventions: Effects on mental skills of females, *European Journal of physical education and sport science*. 2018;5(1):134-141.