RELATIONSHIP OF SELECTED PHYSICAL FITNESS PHYSIOLOGICAL ANTHROPOMETRIC AND PSYCHOLOGICAL VARIABLES WITH BASKETBALL PLAYING ABILITY AMONG WOMEN BASKETBALL PLAYERS

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ABSTRACT

The purpose of the study was to analysis on selected physical fitness, physiological, anthropometric and psychological variables with basketball playing ability of basketball players. To achieve this purpose of the study, various basketball teams participated in the South Zone Inter University Basketball Tournament for women and those teams, which entered into the pre-quarter finals stage were contacted and selected. From that one hundred and forty four university female basketball players from twelve universities (n = 12), were selected. The age of the subjects was ranged between 18 and 25 years. The Pearson Product Moment correlation was used to find out the relationship between the selected physical fitness (flexibility, shoulder muscular endurance and muscular strength), physiological (resting pulse rate and breath holding time), anthropometrical variables (standing height, and leg length) and psychological variables (stress and anxiety) and basketball playing ability of various university female basketball players. There is significant relationship between basketball playing ability and flexibility, muscular strength, muscular endurance, height, leg length, resting pulse rate, breath holding time, stress and anxiety of female university basketball players.

Key Words: *Physical fitness, Physiological, Anthropometric and Psychological Variables, Basketball playing ability & Basketball players*

INTRODUCTION

Basketball has gained worldwide popularity and fascinated players and spectators with its dynamic characteristics as a team sport (Hoffman & Maresh, 2000). It is one of the most vigorous games and requires a great variety of athletic traits. In the game of basketball all the movements are involved like passing, throwing, changing the direction quickly, and sudden stop, jumping for rebound, feinting, maneuvering the opponent while going for offensive move and guarding the opponents in the defensive. All these require rapid movements demanding frequent changes in direction. For one to respond to such situation a player should possess good motor fitness and skill qualities.

It is a highly competitive game and it demands high physical qualities, thus making the conditioning of players a complex process. The next step is to investigate methods that produce the integral effects that can be used in the conditioning of basketball players. But, few studies have investigated the training methods that produce the integral effects on various abilities. Within the context of randomized intermittent, dynamic and skilled movement type sports, to which basketball undoubtedly belongs, the integrated effects are wanted. The problem is to decide which type of conditioning should be implemented to improve bio-motor, psycho-motor and skill performance of basketball players.

In Sport, performance is determined by several factors namely skill, technique, tactics, fitness, training, etcetera. In common parlance the term ‘performance’ is equated to ‘playing ability’. To assess the playing ability, there are very many means and methods. Generally it can be assessed by the competition results. Apart from that an individual’s performance can be assessed either by subjective or objective method. One of the goals of scientific research is to identify the key factors, which plays critical role in performance Sports science also plays an influential role in netball performance. In the recent times extensive research works were undertaken in Sports Science namely Sports Training, Sports Physiology, Sports Psychology, Sports Biomechanics, Sports Anthropometry, Sports Medicine, etcetera.

The superior performance of today’s athletes is the result of a complex blend of many factors (MacDougall *et al.*, 1991). These factors include genetic endowment, physiology, biomechanics, training, health status, and experience. Champion athletes, depending on their specific sports, vary considerably in their physiological attributes (Daniels, 1974). It is therefore necessary to gain an understanding of the essential performance characteristics of a specific sport, in order to develop optimal training strategies for the athlete.

To optimize match performance, it is necessary to assess performance variables in order to provide practical feedback to players and coaches, which will guide coach’s decision making and subsequently the coaching process (Bishop, 2008). The sport of basketball requires specific anthropometric, physical, physiological and psychological attributes in high doses.

METHODOLOGY

Subjects

The purpose of the study was to analyze the selected physical, physiological, anthropometrical and psychological variables and basketball playing ability of inter-university female basketball players. To achieve this purpose of the study, one hundred and forty four university female basketball players from twelve universities, such as, Madras University, Chennai, Jain University, Bangalore, Hindustan University, Chennai, SRM University, Chennai, Anna University, Chennai, Calicut University, Calicut, MG University, Kottayam, Kerala University, Kerala, VELS University, Chennai, Bangalore City University, Bangalore, Gitam University, Gitam and Vel Tech University, Chennai, were selected as subjects. The age of the subjects was ranged between 18 and 25 years.

Variables

The selected physical fitness (flexibility, shoulder muscular endurance and muscular strength), physiological (resting pulse rate and breath holding time), anthropometrical variables (standing height, and leg length) and psychological variables (stress and anxiety) and basketball playing ability of various university female basketball players were chosen as subjects.

Experimental Design and Statistical Technique

The Pearson Product Moment correlation was used to find out the relationship between the selected physical fitness (flexibility, shoulder muscular endurance and muscular strength), physiological (resting pulse rate and breath holding time), anthropometrical variables (standing height, and leg length) and psychological variables (stress and anxiety) with basketball playing ability of various university female basketball players.

RESULTS

The result derived by Pearson Product Moment correlation are in table-I.

Table – I: Correlation between Selected Criterion Variables of Female University Basketball Players

	Flexibility	Muscular Strength	Muscular Endurance	Resting Pulse Rate	Breath Holding Time	Height	Leg Length	Stress	Anxiety	Playing Ability
Flexibility	1.00	0.427*	0.448*	-0.488*	0.595*	0.196*	0.189*	0.603*	-463*	0.585*
Muscular Strength	-	1.00	0.256*	-0.317*	0.505*	0.247*	0.298*	0.528*	-0.293*	0.597*
Muscular Endurance	-	-	1.00	-0.302*	0.399*	0.087	0.128	0.303*	-0.180*	0.402*
Resting Pulse Rate	-	-	-	1.00	-0.402*	0.003	0.026	0.048*	0.200*	-0.443*
BHT	-	-	-	-	1.00	0.297*	0.278*	0.786*	-0.545*	0.658*
Height	-	-	-	-		1.00	0.953*	0.369*	-0.408*	0.293*
Leg Length	-	-	-	-		-	1.00	0.329*	-0.394*	0.309*
Stress	-	-	-	-		-	-	1.00	0.646*	-0.709
Anxiety									1.00	-0.478
Playing Ability										1.00

From the scores exhibited in Table – I following inferences were drawn:

1. The correlation between flexibility and muscular endurance was positive and r = 0.427 and it was as much as higher than the 0.001 ($p > 0.01$) and found to be statistically significant.

2. The correlation between flexibility and muscular strength was positive and r = 0.448 and it was as much as higher than the 0.001 ($p > 0.01$) and found to be statistically significant.

3. The correlation between flexibility and resting pulse rate was positive and r = - 0.488 and it was as much as higher than the 0.001 ($p > 0.01$) and found to be statistically significant.

4. The correlation between flexibility and breath holding time was positive and r = 0.595 and it was as much as higher than the 0.001 ($p > 0.01$) and found to be statistically significant.

5. The correlation between flexibility and height was positive and r = 0.196 and it was as much as higher than the 0.019 ($p > 0.01$) and found to be statistically significant.

6. The correlation between flexibility and leg length was positive and r = 0.189 and it was as much as higher than the 0.023 ($p > 0.01$) and found to be statistically significant.

7. The correlation between flexibility and stress was positive and r = - 0.603 and it was as much as higher than the 0.001 ($p > 0.01$) and found to be statistically significant.

8. The correlation between flexibility and anxiety was positive and r = - 0.463 and it was as much as higher than the 0.001 ($p > 0.01$) and found to be statistically significant.

9. The correlation between flexibility and basketball playing ability was positive and r = 0.565 and it was as much as higher than the 0.001 ($p > 0.01$) and found to be statistically significant.

10. The correlation between muscular strength and muscular endurance was positive and r = 0.256 ($p > 0.01$) and it was as much as higher than the 0.001 and found to be statistically significant.

11. The correlation between muscular strength and resting pulse rate was positive and r = - 0.317 and it was as much as higher than the 0.001 ($p > 0.01$) and found to be statistically significant.

12. The correlation between muscular strength and breath holding time was positive and r = 0.505 and it was as much as higher than the 0.001 ($p > 0.01$) and found to be statistically significant

13. The correlation between muscular strength and height was positive and r = 0.247 and it was as much as higher than the 0.003 ($p > 0.01$) and found to be statistically significant.

14. The correlation between muscular strength and leg length was positive and r = 0.298 and it was as much as higher than the 0.001 ($p > 0.01$) and found to be statistically significant.

15. The correlation between muscular strength and stress was positive and r = - 0.528 and it was as much as higher than the 0.001 ($p > 0.01$) and found to be statistically significant.

16. The correlation between muscular strength and anxiety was positive and r = - 0.293 and it was as much as higher than the 0.001 ($p > 0.01$) and found to be statistically significant.

17. The correlation between muscular strength and basketball playing ability was positive and r = 0.597 and it was as much as greater than the 0.001 ($p > 0.01$) and found to be statistically significant.

18. The correlation between muscular endurance and resting pulse rate was positive and r = - 0.302 and it was as much as higher than the 0.001 ($p > 0.01$) and found to be statistically significant.

19. The correlation between muscular endurance and breath holding time was positive and r = 0.399 and it was as much as higher than the 0.001 ($p > 0.01$) and found to be statistically significant.

20. The correlation between muscular endurance and height was negative and r = 0.087 and it was as lesser than the 0.299 ($p < 0.01$) and found to be statistically insignificant.

21. The correlation between muscular endurance and leg length was negative and r = 0.128 and it was as much as lesser than the 0.129 ($p > 0.01$) and found to be statistically insignificant.

22. The correlation between muscular endurance and stress was positive and r = - 0.303 and it was as much as greater than the 0.001 ($p > 0.01$) and found to be statistically significant.

23. The correlation between muscular endurance and anxiety was positive and r = - 0.180 and it was as much as greater than the 0.001 ($p > 0.01$) and found to be statistically significant.

24. The correlation between muscular endurance and basketball playing ability was positive and r = 0.422 ($p > 0.01$) and it was as much as higher than the 0.001 and found to be statistically significant.

25. The correlation between resting pulse rate and breath holding time was positive and r = - 0.297 and it was as much as higher than the 0.001 ($p > 0.01$) and found to be statistically significant.

26. The correlation between muscular endurance and height was negative and r = 0.003 and it was as lesser than the 0.975 ($p > 0.01$) and found to be statistically insignificant.

27. The correlation between muscular endurance and leg length was negative and r = 0.026 and it was as much as lesser than the 0.757 (p > 0.01) and found to be statistically insignificant.

28. The correlation between resting pulse rate and stress was positive and r = 0.448 and it was as much as higher than the 0.001 (p > 0.01) and found to be statistically significant.

29. The correlation between resting pulse rate and anxiety was positive and r = 0.200 and it was as much as higher than the 0.0016 (p > 0.01) and found to be statistically significant.

30. The correlation between resting pulse rate and basketball playing ability was positive and r = - 0.443 and it was as much as higher than the 0.011 (p > 0.01) and found to be statistically significant.

31. The correlation between breath holding time and height was positive and r = - 0.259 and it was as much as higher than the 0.001 (p > 0.01) and found to be statistically significant.

32. The correlation between breath holding time and leg length was positive and r = 0.278 and it was as much as higher than the 0.001 (p > 0.01) and found to be statistically significant.

33. The correlation between breath holding time and stress was positive and r = - 0.786 and it was as much as higher than the 0.001 (p > 0.01) and found to be statistically significant.

34. The correlation between breath holding time and anxiety was positive and r = - 0.545 and it was as much as higher than the 0.001 (p > 0.01) and found to be statistically significant.

35. The correlation between breath holding time and basketball playing ability was positive and r = 0.658 and it was as much as higher than the 0.001 (p > 0.01) and found to be statistically significant.

36. The correlation between height and leg length was positive and r = 0.953 and it was as much as greater than the 0.001 (p > 0.01) and found to be statistically significant.

37. The correlation between height and stress was positive and r = - 0.369 and it was as much as higher than the 0.001 (p > 0.01) and found to be statistically significant.

38. The correlation between height and anxiety was positive and r = - 0.408 and it was as much as higher than the 0.001 (p > 0.01) and found to be statistically significant.

39. The correlation between height and playing ability was positive and r = 0.293 and it was as much as higher than the 0.001 (p > 0.01) and found to be statistically significant.

40. The correlation between leg length and stress was positive and r = - 0.329 and it was as much as higher than the 0.001 (p > 0.01) and found to be statistically significant.

41. The correlation between leg length and anxiety was positive and r = - 0.394 and it was as much as higher than the 0.001 (p > 0.01) and found to be statistically significant.

42. The correlation between leg length and basketball playing ability was positive and r = 0.309 and it was as much as higher than the 0.001 (p > 0.01) and found to be statistically significant.

43. The correlation between stress and anxiety was positive and r = 0.646 and it was as much as higher than the 0.001 (p > 0.01) and found to be statistically significant.

44. The correlation between stress and basketball playing ability was positive and r = - 0.709 and it was as much as higher than the 0.001 (p > 0.01) and found to be statistically significant.

45. The correlation between anxiety and basketball playing ability was positive and r = - 0.478 and it was as much as higher than the 0.001 (p > 0.01) and found to be statistically significant.

Table – II
Pearson Product Moment Correlation between the Selected Variables and Basketball Playing Ability

Dependent Variable	**Variables**	**'r' value**

1. Basketball playing ability	1.	Flexibility	0.565*
	2.	Muscular strength	0.597*
	3.	Muscular endurance	0.422*
	4.	Resting pulse rate	- 0.443*
	5.	Breath holding time	0.658*
	6.	Height	0.293*
	7.	Leg length	0.309*
	8.	Stress	- 0.709*
	9.	Anxiety	- 0.478

* *Significant at 0.05 level of confidence.*

It is evident from the Table - II that there is significant relationship between basketball playing ability and flexibility, muscular strength, muscular endurance, height, leg length, resting pulse rate, breath holding time, stress and anxiety of female university basketball players in each variable separately.

DISCUSSION

Basketball demands repeated high-intensity movements such as sprinting, jumping, changing direction**,** and maintaining balance. Physical fitness components are critically linked to on-court performance. Players who exhibit higher levels of these attributes tend to perform better in both offensive and defensive situations (Drinkwater, Pyne, & McKenna, 2008). Physiological capacities play a fundamental role in sustaining performance during a game. Since basketball is an intermittent high-intensity sport, players must efficiently manage short bursts of exertion and rapid recovery. Studies have shown that higher aerobic and anaerobic capacities are associated with improved stamina, repeated sprint ability, and faster recovery during and after play (Ben Abdelkrim, El Fazaa, & El Ati, 2007).

Anthropometric characteristics contribute to technical skill execution and positional advantage. Taller players with greater reach are naturally suited for rebounding and shot-blocking, while optimal body composition improves mobility and endurance. Research by Hoare (2000) demonstrated that anthropometric profiles could effectively distinguish between higher and lower-level players, emphasizing their predictive value in performance and talent identification. Psychological traits significantly influence performance consistency. Vealey (2007) emphasized that athletes who possess strong psychological attributes perform better in high-pressure game situations and are more resilient to setbacks, contributing to overall playing success. This supports **a** holistic training and assessment model**,** where all these dimensions are considered in player development, selection, and performance monitoring (Reilly, Williams, Nevill, & Franks, 2000).

CONCLUSIONS

There is significant relationship between basketball playing ability and flexibility, muscular strength, muscular endurance, height, leg length, resting pulse rate, breath holding time, stress and anxiety of female university basketball players in each variable separately. This integrated approach is crucial for optimizing the performance of female basketball players.

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