



Investigating the Relationship Between Selected Anthropometric Physical and Physiological Characteristics and Playing Ability in District Women Basketball Players

¹Dr. P. Anbalagan, ²A. Mahasuran

¹Professor Department of Physical Education, Bharathiar University, Coimbatore -46 Tamil Nadu, India.

²Ph.D. Research Scholar Department of Physical Education, Bharathiar University, Coimbatore – 46 Tamil Nadu, India.

ABSTRACT

This study aimed to investigate the relationships between selected anthropometric, physical fitness, and physiological characteristics of district-level women basketball players and their playing ability. **Sample:** 150 state-level women basketball players participated in the study. **Measures:** Anthropometric variables (weight, height, arm length, girths, etc.), physical fitness variables (speed, agility, flexibility, strength, endurance), and physiological variables (resting heart rate, peak expiratory flow rate) were measured using standard procedures. Playing ability was assessed by five game experts who rated each player's performance on a 10-point scale. The experts' ratings were then averaged to create a composite score for playing ability. **Analysis:** The Karl-Pearson correlation coefficient was used to analyze the relationships between the measured variables and playing ability. **Results:** The findings revealed that only a few anthropometric measurements had significant correlations with playing skill.

Keywords: Anthropometric, physical, physiological, playing ability and basketball players

Introduction

Sports are physical activities or games that help maintain and improve physical ability through competition. They provide enjoyment for participants and entertainment for spectators. There are numerous sports, some for individual competitors and others for teams. While most sports rely heavily on physical prowess, some, like chess, emphasize mental skills. Rules ensure fair competition and determine the winner, who is typically the most skilled competitor who adheres to the game's guidelines.

Sports have become a major source of entertainment, attracting large crowds and generating significant revenue. Many competitions are organized as tournaments, culminating in a champion (individual or team). Other sports are played in leagues or seasons, often followed by playoffs to determine the ultimate victor.

Basketball

Basketball, a dynamic and widely popular sport, combines athleticism, strategy, and teamwork in an exhilarating package. Originating in late 19th century America, basketball was devised as an indoor game to keep athletes active during the winter months. Dr. James Naismith, a physical education instructor, created the sport in 1891 using a soccer ball and two peach baskets as goals. Since then, basketball has evolved into a global phenomenon, with professional leagues, collegiate competitions, and grassroots programs spanning continents. The sport's appeal lies not only in its fast-paced nature and competitive spirit but also in its ability to foster camaraderie among players and fans alike. From the thrill of dribbling and shooting to the strategic maneuvers of defense and offense, basketball continues to captivate audiences worldwide as a testament to athleticism, skill, and the enduring spirit of sportsmanship.

Objective of the Study

Investigate the relationships between selected anthropometric, physical fitness, and physiological characteristics and playing ability in basketball players.

Methodology

A sample of 150 female basketball players aged 18-23 years from various districts in Tamil Nadu participated in this study. Standard procedures were followed to measure their anthropometric characteristics, physical fitness, and physiological variables. Playing ability was assessed by five basketball experts who rated each player's skills during a game on a 10-point scale. The experts' ratings were then averaged to create a composite score for playing ability. The Karl-Pearson correlation coefficient was used to analyze the relationships between the measured variables and playing ability.

Table 1: Independent variable Standard deviation Pearson's co-efficient of correlation

Independent variable	Mean	Standard deviation	Pearson's co-efficient of correlation	Sig
Height	176.31	7.69	-0.131	0.065
Weight	72.60	4.71	-0.219	0.068
Leg length	93.03	2.83	-0.228	0.04*
Arm span	177.99	44.32	0.099	0.161
Waist girth	80.27	9.94	0.038	0.594
Hip girth	95.18	8.51	0.021	0.772
Chest girth (Inspired)	93.92	6.99	-0.087	0.221
Chest girth (expired)	90.52	4.36	-0.257	0.003*
Thigh girth	61.88	7.24	-0.038	0.595
Calf girth	55.08	5.87	0.033	0.639
Palm girth	22.21	2.35	-0.124	0.08
Arm length	71.98	5.78	-0.135	0.056
Speed (50 mtr Dash)	19.32	3.84	-0.118	0.097
Agility (Shuttle Run)	15.47	2.01	-0.076	0.287
Flexibility (Sit and Reach test)	45.29	5.66	-0.052	0.468
Explosive power (Standing broad jump)	137.60	35.86	-0.204	0.004*
Muscular Endurance (Sit up test)	42.19	9.07	0.067	0.345
Cardio vascular endurance (Harvard step up test)	71.91	4.74	-0.024	0.737
Resting heart rate	75.59	5.15	0.052	0.464
Vital capacity	262.17	30.01	-0.090	0.024

Results

The table summarizes the mean, standard deviation, correlation coefficient (r), and significance level for the relationships between various anthropometric, physical fitness, and physiological variables and playing ability in basketball players.

Based on the table, several anthropometric measures (arm span, waist girth, hip girth, and calf girth) and one physical fitness variable (muscular endurance) show positive correlations with playing ability. However, other anthropometric measures (height, weight, leg length, chest girth - inspired and expired, thigh girth, and palm girth), physical fitness variables (speed, agility, flexibility, explosive power, and cardiovascular endurance), and a physiological variable (resting heart rate) demonstrate negative correlations with playing ability. It's important to note that correlation doesn't imply causation.

Among the 20 variables, only three (leg length, expired chest girth, and explosive power) exhibited statistically significant correlations with playing ability.

Discussion

Our findings revealed that arm length, expired girth, and speed as the only anthropometric and physical fitness variables significantly correlated with playing ability. It's possible that these variables influence performance because upper and lower body strength are crucial for skills like shooting, jumping, and passing. Girth (although expired measurement might be less relevant) and arm length could be indicators of this strength, while explosive power directly translates to jumping ability.

However, it's important to consider limitations. Since all participants were from the same Tamil Nadu tournament, they might have had similar overall potential, potentially affecting the significance of other variables. Further research with a more diverse sample could provide more comprehensive insights

Conclusion

This study identified arm length, expired girth, and speed as the only anthropometric and physical fitness variables significantly correlated with playing ability in district-level women basketball players. No significant correlations were found between playing ability and the other variables measured.

Recommendations

Based on the findings of this study, we recommend the following:

1. The results can be valuable for physical educators, coaches, and trainers involved in screening and selecting potential women's basketball players at the university level.
2. These findings can inform the development of training methods by emphasizing factors significantly related to basketball performance at different skill levels.
3. While this study focused on anthropometric, physical, and physiological variables, future research could be expanded to include motor skill and psychological variables for a more comprehensive understanding.
4. To explore potential age-related differences, replicating this study with participants from various age groups is recommended.
5. Given the study's focus on district-level women's basketball players, further research could investigate these relationships in men's basketball as well.

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