DOI PREFIX 10.22183
JOURNAL DOI 10.22183/RN
SIF 7.399

RESEARCH NEBULA
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Arts, Commerce, Education & Social Sciences

ISSN 2277-8071

COMPARATIVE ANALYSIS OF POSITIONAL VARIATIONS IN FITNESS AND BODY COMPOSITION AMONG HANDBALL PLAYERS IN YAVATMAL DISTRICT

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Received: 20.05.2024 Reviewed :21.05.2024 Accepted: 26.05.2024

ABSTRACT

This research seeks to examine the differences in physical fitness and body composition among handball players based on their playing positions in the Yavatmal district. A total of 60 participants were included in the study, comprising 20 players each from back, center, and forward positions. All participants had at least one year of handball training experience at various government and private clubs or grounds in Yavatmal (M.S.). The age range of the participants was 18 to 25 years, and the selection process employed random sampling techniques. The study hypothesizes that significant differences exist in physical fitness and body composition among players occupying different positions. To test this hypothesis, an independent samples t-test will be used to compare the physical fitness and body composition scores across forward, center, and back position players. This analysis aims to uncover any positional variations, which can provide valuable insights to optimize training strategies and enhance player development in the sport of handball.

KEY WORDS: *handball, physical fitness, body composition, Playing Positions, Comparative Analysis, Yavatmal District.*

INTRODUCTION

Handball is a dynamic team sport requiring a blend of physical fitness and skillful performance. The interplay between physical fitness parameters and body composition in handball players provides critical insights into player performance and overall health. This study aims to investigate the differences in physical fitness and body composition among handball players across various playing positions in Yavatmal district. Previous research on the relationship between physical activity and the prevention of health conditions has predominantly focused on unrelated genetic cohorts. However, evidence indicates that genetic predispositions significantly influence an individual's inclination toward physical activity, as demonstrated by Kaprio et al. (1981), Lauderdale et al. (1997), Kujala et al. (2002), and Stubbe et al. (2006). These genetic factors may confer a protective advantage, potentially reducing morbidity and mortality among individuals with higher physical activity levels.

In athletic training for handball players, coaches and trainers should adopt a progressive and strategic approach to integrate athletes into rigorous workout regimens. This includes prioritizing adequate recovery by incorporating rest intervals

within training sessions. Plyometric training is particularly beneficial for handball players as it emphasizes the development of explosive leg power rather than solely focusing on strength and muscle mass (Komi, 2003). Moreover, tools such as cycle ergometers, which assess work capacity under controlled conditions, can provide valuable insights into players' physical capabilities. However, their effectiveness may be limited for those unaccustomed to cycling, as fatigue in leg muscles can precede full-body exhaustion (McArdle, Katch, & Katch, 2014). This underscores the importance of selecting training methodologies that align with the specific demands of handball.

Among team sports such as football, field hockey, basketball, and handball, the physical demands are exceptionally high. These sports require a combination of intensive physical fitness, physiological work efficiency, psychological consistency, technical and tactical planning, and competitive motor skills (Bompa & Buzzichelli, 2018). Performance in these games relies on aerobic capacity supported by anaerobic bursts throughout gameplay. Consequently, players develop attributes such as speed, muscular strength, power, endurance, cardiovascular fitness, agility, coordination, and balance, which are critical for optimal performance in team sports.

DESIGN OF THE STUDY

The primary objective of this study is to assess and compare physical fitness and Body Mass Index (BMI), representing body composition, across the positional roles of handball players in the Yavatmal district. The research sample comprises 60 participants (N=60), evenly categorized into three positional groups: back players (20), center players (20), and forward players (20). The participants are aged between 18 and 25 years and possess a minimum of one year of experience in handball practice across government and private clubs or grounds located in Yavatmal, Maharashtra.

The study employs a random sampling technique to ensure a representative and unbiased selection of players from the regional handball community. By systematically examining the differences in physical fitness and body composition among players occupying varied positions, this investigation aims to shed light on the specific physiological demands and attributes associated with each role. The findings are anticipated to enhance the understanding of positional requirements in handball, contributing valuable insights to training protocols and player development strategies tailored to the sport's contextual needs.

HYPOTHESIS:

H0: There is no difference in physical fitness and body composition between back position players and centre position players.

H1: There is a difference in physical fitness and body composition between back position players and center position players.

STATISTICAL PROCEDURE:

The statistical analysis for this study will utilize independent samples t-tests to compare the physical fitness and body composition scores among forward, center, and back position players. This analytical approach is designed to identify significant differences, if any, between the positional groups in terms of their physical attributes. By examining these variations, the study aims to provide valuable insights into the positional demands of handball, contributing to a more nuanced understanding of how physical fitness and body composition differ across roles. These findings are expected to inform tailored training regimens and strategic player development programs for optimizing performance in handball.

SELECTION OF VARIABLES

The study was carried out for the description of Variables selected for study was as follows:

1. Body Composition
2. JCR test

STATISTICAL TECHNIQUE

Results were obtained with the help of statistical tools, like descriptive statistics and independent t-test. Graphical representations were made by using bar chart.

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FINDINGS

Table1: Distribution of Body Composition among the Players

	Frequency	Percentage
Underweight 18.5 below	21	35.03
Normal 18.5 to 24.9	22	36.7
Overweight 25 to 29.9	13	21.7
Obese 30 above	4	6.6
TOTAL	60	100

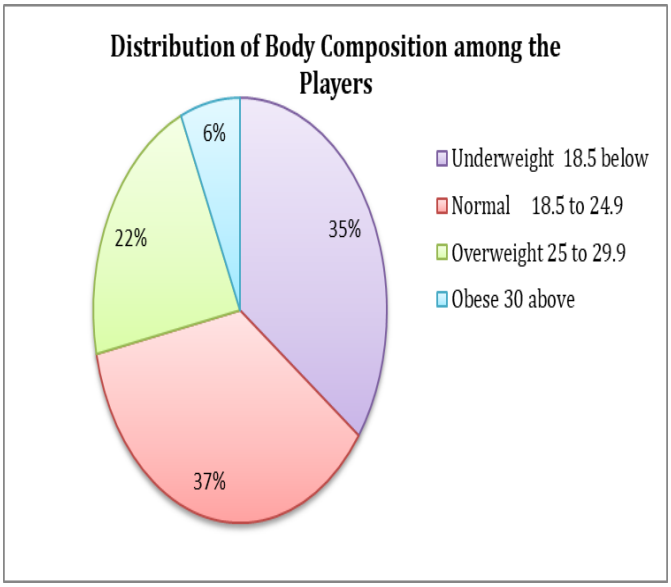


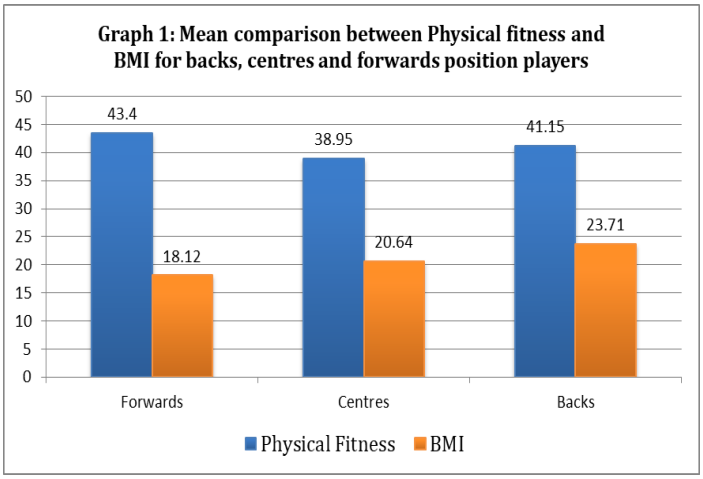
Table2: Mean, SD and t value between Physical fitness and Body Composition for backs, centres and forwards position players.

Position of players	Physical Fitness		Body Composition		Cal t value	Tab. t value
	Mean	SD	Mean	SD		
Forwards	43.40	3.69	18.12	1.29	28.9219	1.6860
Centres	38.95	3.20	20.64	1.34	23.6031	1.6860
Backs	41.15	3.28	23.71	2.40	19.1901	1.6860

df = 38 ; N= 60

** Significant at 0.05 level of significance

The table illustrates a comparative analysis of physical fitness and body composition among handball players in different playing positions: backs, centers, and forwards. For physical fitness, the mean scores are as follows: backs (41.15), centers (38.95), and forwards (43.40). The standard deviations for these groups are backs (3.28), centers (3.20), and forwards (3.69), reflecting the variation in physical fitness within each group. In terms of body composition, the mean scores are backs (23.71), centers (20.64), and forwards (18.12), with corresponding standard deviations of 3.28 for backs, 3.20 for centers, and 3.69 for forwards. These results indicate differences in body composition across the playing positions, with backs displaying the highest mean body composition and forwards the lowest. The calculated t-values for the independent samples t-tests are as follows: backs (19.1901), centers (23.6031), and forwards (28.9219). These t-values are compared against the tabulated (critical) t-value of 1.6860, determined for 38 degrees of freedom at a significance level of 0.05. As the calculated t-values significantly exceed the critical value, the results suggest that the differences in physical fitness and body composition among the three positional groups are statistically significant. This highlights the distinct physiological and fitness demands associated with each playing position in handball.



CONCLUSIONS

The primary aim of this research is to examine the relationship between physical fitness, body composition, and playing positions among

handball players in the Yavatmal district. Utilizing data from 60 participants representing diverse positional roles, the study seeks to identify significant variations in physical fitness levels and body composition measurements across these positions. By uncovering these distinctions, the research aims to provide actionable insights to support the development of tailored training programs and player development strategies specific to handball (Bompa & Buzzichelli, 2018). This investigation is expected to make a meaningful contribution to the existing literature on the physiological demands and positional dynamics of the sport. By enhancing the understanding of these factors, the study aspires to assist in optimizing athletic performance and advancing coaching methodologies in handball (McArdle, Katch, & Katch, 2014).

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