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A STUDY OF ANTHROPOMETRIC VARIABLES AND KINESTHETIC SENSE BETWEEN BASKETBALL AND HANDBALL PLAYERS

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ABSTRACT

The domain of sports and athletics has evolved significantly over time, achieving numerous milestones due to continuous advancements and their practical applications in the field. Scientific research has played a crucial role in enhancing sports performance, contributing to the development of innovative training methodologies, refined techniques, and strategic execution. These scientific interventions have enabled athletes to push the boundaries of excellence and achieve remarkable success in various sporting disciplines.

The present study aimed to examine the differences in anthropometric measurements and kinesthetic sense among state-level basketball and handball players in Maharashtra. A total of 50 athletes, comprising 25 state-level basketball players and 25 state-level handball players, were selected for the study. The key variables analyzed included arm length, leg length, waist girth, calf girth, and kinesthetic sense.

The findings of the study revealed that there was no statistically significant difference in calf girth between basketball and handball players. However, significant differences were observed in arm length, leg length, waist girth, and kinesthetic sense between the two groups. These results highlight the distinct physical and sensory attributes associated with each sport, emphasizing the impact of sport-specific demands on an athlete's physical development.

Keywords: Arm Length, Leg Length, Waist Girth, Kinesthetic Sense and Calf Girth

1. INTRODUCTION

Achieving excellence in any sport is influenced by a combination of multiple factors, including physiological, psychological, sociological, and scientific training aspects. However, an athlete's performance is also significantly shaped by their physical attributes, such as anthropometry, body composition, endurance, flexibility, reaction time, coordination, agility, speed, strength, and overall body balance. These elements collectively determine an athlete's ability to perform at the highest level.

Anthropometry, the scientific study of body measurements, plays a crucial role in understanding an athlete's physical structure and its impact on performance. It involves the systematic collection of data related to body

dimensions, including height, weight, body mass index, and various limb measurements. By analyzing these parameters, athletes and coaches can optimize body composition and tailor training programs to enhance performance in specific sports.

Equally important is kinesthetic sense, also known as proprioception, which refers to an individual's ability to perceive body position, movement, and muscle tension. This sensory ability is fundamental for athletes, as it enables precise movement control, enhances balance and coordination, and minimizes the risk of injuries by identifying improper movement patterns. Additionally, kinesthetic awareness plays a vital role in rehabilitation, allowing athletes to receive feedback on their movements and muscle engagement, ultimately aiding in recovery and injury prevention.

Recognizing the significance of these factors, the present study aims to explore the relationship between anthropometric measurements and kinesthetic sense among state-level basketball and handball players in Maharashtra. Through this research, an effort has been made to assess the impact of these attributes on athletic performance and to identify sport-specific physical and sensory characteristics that differentiate players of these two dynamic sports.

2. METHODOLOGY

The primary objective of this study was to examine the differences in selected anthropometric measurements and kinesthetic sense among state-level basketball and handball players. To achieve this, a total of 50 athletes—25 state-level basketball players and 25 state-level handball players—were selected from Maharashtra. The participants were within the age range of 18 to 25 years.

Anthropometric measurements were taken using standardized procedures. Arm length and leg length were measured using an anthropometric rod, with readings recorded to the nearest centimeter and millimeter. Waist girth and calf girth were measured using a measuring tape, ensuring accuracy by recording values to the nearest centimeter and millimeter.

Kinesthetic sense was assessed using the distance perception jump test, which evaluates an athlete's ability to perceive spatial distances accurately. The measurements for this test were also recorded to the nearest centimeter.

To analyze the collected data, a Student's *t*-test was applied at a 0.05 level of significance to determine statistical differences between the two groups. This approach provided insights into the variations in anthropometric and kinesthetic attributes among basketball and handball players at the state level.

3. FINDING

Table 1 COMPARISON AMONG BASKETBALL AND HANDBALL PLAYERS IN RELATION WITH THEIR SELECTED VARIABLES

Variable	Mean		Standard Deviation		't' Ratio
	Basketball	Handball	Basketball	Handball	
Arm Length	79.7	67.5	4.99	5.94	5.87*
Leg Length	99.7	97.1	6.38	3.70	5.37*
Waist Girth	74.25	75.2	2.59	2.57	3.89*
Calf Girth	33.1	32.66	2.47	1.59	1.56
Kinesthetic Sense	1.38	2.08	.764	.90	2.60*

The data presented in the table highlights the mean and standard deviation values for state-level basketball and handball players across various anthropometric and kinesthetic parameters. The mean arm length was recorded as 79.7 cm for basketball players and 67.5 cm for handball players. Similarly, the mean leg length was 99.7 cm and 97.1 cm, respectively. The waist girth measurements had mean values of 74.25 cm for basketball players and 75.2 cm for handball players, while the mean calf girth was 33.1 cm and 32.66 cm, respectively. For kinesthetic sense, the mean values were 1.48 for basketball players and 2.18 for handball players.

The computed *t*-values further indicate statistical significance for certain variables. The *t*-value for arm length was found to be 5.87, which exceeds the tabulated value, indicating a significant difference. Similarly, the *t*-value for leg length was 5.37, also surpassing the tabulated value, confirming statistical significance. The *t*-value for waist girth was 3.89, which was significant as well. The kinesthetic sense *t*-value was 2.60, also falling within the significant range. However, the *t*-value for calf girth was 1.56, which did not reach statistical significance, indicating no substantial difference between the two groups for this parameter.

4. DISCUSSION

The findings of this study indicate that there was no significant difference in calf girth between state-level basketball and handball players in Maharashtra in terms of anthropometric variables. However, handball players exhibited a slightly larger calf girth, likely due to the physical demands of their sport, which involves frequent and dynamic lower-body movements.

On the other hand, state-level basketball players were found to have significantly greater leg length and arm length compared to handball players. This difference can be attributed to the nature of basketball, which emphasizes vertical jumping, requiring athletes to engage in specialized training methods such as weight training in various forms and plyometric exercises. In contrast, handball players also undergo strength training but with a primary focus on agility and speed endurance to meet the specific demands of their game.

The study also revealed a significant difference in waist girth between the two groups, with handball players displaying a higher waist girth compared to basketball players. This could be due to the nature of handball, which involves rapid multi-directional movements, requiring greater core stability and strength. Basketball players, in contrast, primarily engage in forward and lateral movements, which influence their waist girth measurements accordingly.

Furthermore, a significant difference was observed in kinesthetic sense between basketball and handball players. This may be due to the similarities between both sports, as they require high levels of cardiovascular endurance. However, research suggests that athletes engaged in small-area sports tend to have a superior kinesthetic sense compared to those participating in large-area sports. Since basketball is played on a relatively smaller court with continuous, high-intensity movements, it places a greater demand on kinesthetic awareness, which is reflected in the results of this study.

Overall, the differences observed in anthropometric measurements and kinesthetic sense between basketball and handball players can be attributed to the distinct physical demands and training regimens associated with each sport. The findings highlight the importance of sport-specific training programs that cater to the unique physiological and movement requirements of each game.

5. CONCLUSION

1) No significant difference was observed in calf girth between state-level basketball and handball players.
2) A significant difference was found in arm length between state-level basketball and handball players.
3) Waist girth showed a significant difference between state-level basketball and handball players.
4) A significant difference was observed in kinesthetic sense between state-level basketball and handball players.

CONFLICT OF INTERESTS

None.

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None.

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