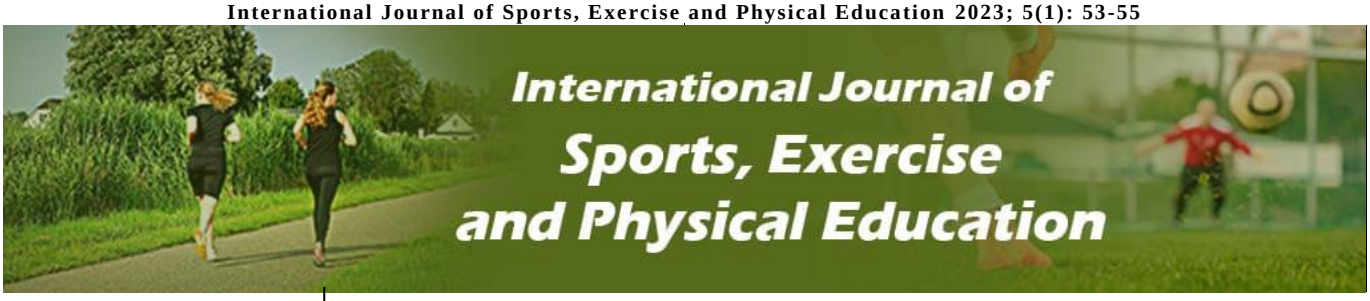

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Comparative analysis of psychomotor abilities in basketball and football players

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Abstract
Study Aim: This study aims to compare the psychomotor abilities, specifically kinesthetic perception, and speed of movement, among basketball and football players.
Materials and Methods: The study involved a sample of 80 male players (40 basketball and 40 football players) selected through purposive sampling. Psychomotor abilities were assessed using standardized tests.
Statistical Techniques: Data analysis was conducted using independent t-tests to compare the means of psychomotor abilities between the two groups.
Results: No significant differences were found in kinesthetic perception and speed of movement between basketball and football players.
Conclusion: The findings indicate that psychomotor abilities such as kinesthetic perception and speed of movement are comparable between basketball and football players, suggesting that these abilities may not be sport-specific.

Keywords: Psychomotor abilities, kinesthetics perception, speed of movement, basketball, football

Introduction

Psychomotor abilities, encompassing skills such as kinesthetic perception and speed of movement, are crucial components of athletic performance. These abilities allow athletes to execute precise movements, respond swiftly to external stimuli, and adapt to dynamic game situations. The investigation of psychomotor abilities among athletes in various sports has been an area of interest for sports scientists, given its implications for skill acquisition, training, and performance enhancement (Singh *et al*., 2021) [7]. Basketball and football, as dynamic team sports, place significant demands on players' psychomotor capabilities. Basketball requires swift hand-eye coordination and spatial awareness for dribbling, passing, and shooting, while football demands exceptional foot-eye coordination and the ability to maneuver in complex scenarios (Chen *et al*., 2019) [2]. Despite these distinctions, some studies suggest that foundational psychomotor abilities, such as kinesthetic perception and reaction speed, may not differ substantially between athletes in these sports (Ahmed & Kumar, 2020) [1]. Kinesthetic perception, the ability to sense body movement and position, is essential for accurate and controlled actions in sports (Gupta & Singh, 2018) [3]. In basketball, this ability is crucial for maintaining balance during rapid directional changes, whereas in football, it aids in ball control under pressure (Jones *et al*., 2020) [4]. Similarly, speed of movement, characterized by rapid response and execution of actions, is critical for both sports, whether in intercepting passes or executing fast breaks (Sharma *et al*., 2021) [7]. The comparative analysis of psychomotor abilities across sports can offer valuable insights into the specificity of training programs and the transferability of skills. Previous research has yielded mixed findings, with some studies highlighting sport-specific differences and others suggesting a common psychomotor foundation among athletes (Kumar *et al*., 2019; Lee *et al*., 2022) [6]. These discrepancies underscore the need for further research using standardized assessments and well-defined populations.

The present study aims to contribute to this body of knowledge by comparing kinesthetic perception and speed of movement among basketball and football players. By employing standardized tests and robust statistical analyses, this study seeks to determine whether these psychomotor abilities differ significantly between the two groups, thereby providing insights into their sport-specific demands and training implications.

Selection of subjects
A total of 80 male athletes were selected for the study, comprising 40 basketball players and 40 football players. The participants were aged between 18 and 25 years and were actively engaged in competitive sports at the university level.

Procedures for selecting the sample
G*Power version 3.1.9.7 was used to analyse the statistical power and determine the appropriate sample size with graphical options. This ensured that the sample size was adequate for reliable comparisons.

Selection of variables
The selection of variables was based on a feasibility assessment that considered tool availability, subject adequacy, time constraints, and research objectives. Expert consultation was sought to finalize the psychomotor abilities for investigation:

- Kinesthetic Perception
- Speed of Movement

Criterion measures
Psychomotor Abilities

Variables	Test	Criterion Measure
Kinesthetic Perception	Horizontal Space Test	Recorded to the nearest Centimeters
Speed of Movement	Nelson Speed of Movement Test	Recorded to the nearest Centimeters

Kinesthetic Perception (Horizontal Space Test)

- **Purpose:** To measure the ability to determine specific positions along a horizontal line.
- **Equipment Required:** Yardstick, blindfold, and chair.
- **Procedure:** The subject, seated and blindfolded, was instructed to point to a marked position on a yardstick after an initial visual orientation. Three trials were conducted.
- **Scoring:** The deviation from the desired mark was measured in centimetres, and the total deviation across three trials was recorded.

Speed of Movement (Nelson Speed of Movement Test)

- **Purpose:** To measure the reaction time and movement speed of the hands and arms.
- **Equipment Required:** Wooden meter scale, table, chair, measuring tape, chalk/marker, ruler, and pad.
- **Procedure:** The subject attempted to catch a dropped meter scale as quickly as possible using horizontal hand movements. Twenty trials were conducted.
- **Scoring:** The five slowest and fastest trials were discarded, and the average of the remaining ten trials was recorded as the score.

Sampling technique
Purposive sampling was employed to select participants who met the inclusion criteria and were actively involved in competitive basketball or football.

Statistical techniques
Independent t-tests were applied to compare the mean scores of kinesthetic perception and speed of movement between basketball and football players. A significance level of 0.05 was used

Results

Table 1: T-test summary for Kinesthetic Perception

Statistic	Basketball	Football
Mean	19.525	19.125
Variance	2.2494	5.3594
Stand. Dev.	1.4998	2.315
n	40	40
t	0.9171	
d.o. f	78	
critical value	1.99	
t < criticall value		no sig. diff.

The t-value is 0.9056. The p-value is .183969. The result is not significant at $p < .05$.

Table 2: t-test summary for Speed of Movement

Statistic	Basketball	Football
Mean	5.775	5.875
Variance	2.6244	2.6594
Stand. Dev.	1.62	1.6308
n	40	40
t	-0.2751	
d.o. f	78	
critical value	1.99	
| t | < criticall value		no sig. diff.

The t-value is -0.27168. The p-value is .393292. The result is not significant at p <.05.

Conclusion
The results reveal no significant differences in kinesthetic perception or speed of movement between basketball and football players. This suggests that these psychomotor abilities are not distinctly influenced by the type of sport. Further research could explore additional variables or incorporate larger and more diverse samples

Conflict of Interest
The authors declare that there is no conflict of interests.

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