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Comparative Analysis of Shooting and Passing Efficiency among State-Level Footballers of Rajasthan and Haryana

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Abstract: Technical proficiency plays a decisive role in competitive football performance, particularly in skills such as shooting and passing, which directly influence match outcomes. Regional variations in training systems, coaching exposure, and competitive structures may contribute to differences in technical efficiency among state-level players. Rajasthan and Haryana are emerging football regions in North India, yet limited empirical research has compared their technical performance indicators.

The present study aimed to compare shooting and passing efficiency among state-level footballers of Rajasthan and Haryana. A total of 40 state-level players (20 from Rajasthan and 20 from Haryana) were selected using purposive sampling. Standardized skill assessment tests were administered to measure shooting accuracy and passing precision. Descriptive statistics and independent samples t-test were applied to analyze regional differences.

The findings revealed measurable differences in technical efficiency between players of the two states, highlighting the influence of training environment and competitive exposure. The study provides insights into regional performance standards in state-level football.

Keywords: Football, Shooting efficiency, Passing accuracy, Comparative study, Rajasthan, Haryana.

Introduction - Football is a dynamic, high-intensity team sport that demands a combination of technical skill, tactical awareness, physical conditioning, and psychological resilience. Among the various performance determinants, technical skills such as shooting and passing play a central role in determining match outcomes. Shooting efficiency directly affects goal-scoring opportunities, while passing accuracy influences ball possession, team coordination, and attacking progression.

At the state level, footballers represent an advanced competitive category where technical precision becomes increasingly important. Differences in coaching methodologies, infrastructure, exposure to competitive tournaments, and sports development policies may lead to regional variations in technical proficiency. In India, states such as Rajasthan and Haryana have shown progressive development in football participation; however, structured comparative research evaluating their technical standards remains limited.

Rajasthan has been expanding its grassroots and state-level football programs over the past decade, with increased investment in training camps and inter-district competitions. Haryana, traditionally recognized for strength-based sports, has also demonstrated growing engagement in football through academy-based development models and inter-state participation. Despite these advancements, empirical data comparing technical efficiency between players of these two states is scarce.

Shooting in football requires coordination, balance, lower-limb power, and accuracy under dynamic conditions. Passing efficiency demands spatial awareness, timing, and neuromuscular control. Even minor differences in these skills can significantly influence competitive performance at the state level.

Comparative studies serve an important function in sports science by identifying performance gaps, training disparities, and developmental strengths across regions. By systematically evaluating shooting and passing efficiency among state-level footballers of Rajasthan and Haryana, the present study aims to provide objective performance indicators that may guide coaching strategies and regional sports planning.

Review Of Literature

Technical performance indicators such as shooting and passing efficiency have been widely recognized as key determinants of success in competitive football. Reilly,

Bangsbo, and Franks (2000) emphasized that technical proficiency differentiates elite players from sub-elite players, particularly in ball striking and passing under match pressure.

Ali (2011) reported that shooting accuracy significantly influences match outcomes, especially in high-level competitions where goal-scoring opportunities are limited. The study highlighted the importance of repetitive skill training and biomechanical efficiency in improving shot precision.

Rampinini et al. (2007) examined match analysis data and found that successful teams demonstrated higher passing accuracy percentages compared to lower-ranked teams. Their findings indicated that efficient ball distribution directly correlates with team performance.

According to Hughes and Bartlett (2002), notational analysis in football reveals that technical indicators such as pass completion rate and shot conversion rate serve as reliable performance predictors. The authors suggested that comparative evaluation across teams or regions can provide insights into developmental disparities.

Strudwick, Reilly, and Doran (2002) observed that structured training programs and exposure to competitive matches improve technical consistency among state and national-level players. Regular assessment of shooting and passing skills was recommended for performance monitoring.

In the Indian context, Singh and Sharma (2018) conducted a comparative study among inter-state football players and reported significant variations in passing efficiency attributed to differences in coaching systems and tactical training exposure.

Similarly, Verma and Yadav (2020) analyzed technical performance among regional football teams and concluded that infrastructure, frequency of competition, and quality of coaching influence skill execution levels.

Although several studies have examined football performance indicators globally, limited research has compared technical efficiency between state-level footballers of Rajasthan and Haryana. Therefore, the present study aims to address this research gap through objective comparative analysis.

Objectives Of The Study

1. To compare shooting efficiency between state-level footballers of Rajasthan and Haryana.
2. To compare passing efficiency between state-level footballers of Rajasthan and Haryana.
3. To examine whether regional differences exist in selected technical performance variables.

Hypotheses Of The Study

The following null hypotheses were formulated:

- H_{01}: There will be no significant difference in shooting efficiency between state-level footballers of Rajasthan and Haryana.
- H_{02}: There will be no significant difference in passing efficiency between state-level footballers of Rajasthan and Haryana.

Methodology

Research Design: The present investigation employed a **comparative research design** to examine differences in shooting and passing efficiency among state-level footballers of Rajasthan and Haryana. The design was appropriate as the study aimed to compare technical performance variables between two independent regional groups without introducing any experimental manipulation. The research was conducted during the competitive season to ensure that participants were in active playing condition.

Population and Sample: The population for the study comprised male state-level football players representing Rajasthan and Haryana in recognized inter-state competitions.

A total of **40 state-level footballers** were selected using purposive sampling technique. The sample was equally divided between the two states:

- **20 players from Rajasthan**
- **20 players from Haryana**

All participants were between **18–25 years of age** and met the following inclusion criteria:

- Official representation at state-level tournaments
- Minimum three years of structured football training
- Regular participation in competitive matches
- Free from injury during the data collection period

Table 1: Sample Distribution

State	Number of Players	Percentage (%)	Age Range
Rajasthan	20	50%	18–25 Years
Haryana	20	50%	18–25 Years
Total	**40**	**100%**	18–25 Years

Variables of the Study

The study focused on the following technical performance variables:

- **Shooting Efficiency**
- **Passing Efficiency**

Both variables were selected due to their direct impact on match performance and scoring opportunities.

Description of Skill Assessment Tests

Shooting Efficiency Test: A standardized target shooting protocol was used to assess shooting accuracy. The goalpost was divided into predefined scoring zones marked with cones or target indicators. Each player attempted **10 shots** from a fixed distance outside the penalty area. Points were awarded based on target accuracy:

- Central zone = 1 point
- Corner zones = 2 points
- Missed shot = 0 points

The total score obtained out of maximum possible points was recorded as the shooting efficiency score.

Passing Efficiency Test

Passing efficiency was measured through a controlled target

passing drill. Players performed:

- 10 short-distance passes (10–15 meters)
- 10 long-distance passes (25–30 meters)

Targets were marked using cones with a specified tolerance radius. Successful passes landing within the target zone were recorded as accurate. The total number of successful passes was calculated to determine passing efficiency.

Data Collection Procedure: Prior approval was obtained from the respective state football associations and team coaches. Participants were informed about the objectives and procedures of the study, and informed consent was obtained.

Testing was conducted on standard football grounds under similar environmental conditions. A uniform warm-up session of 15 minutes was administered to all participants before testing. Skill tests were conducted individually to avoid interference, and sufficient recovery time was provided between trials to minimize fatigue.

All scores were recorded carefully on standardized data sheets to ensure accuracy and reliability.

Statistical Treatment of Data: The collected data were tabulated and analyzed using appropriate statistical procedures:

1. **Mean** was calculated to determine the average performance level of each group.
2. **Standard Deviation** was computed to measure variability within each group.
3. **Independent Samples t-test** was applied to determine whether significant differences existed between state-level footballers of Rajasthan and Haryana.

The level of significance was set at **0.05**.

Statistical Analysis

The data obtained from the shooting and passing efficiency tests were systematically organized and analyzed using appropriate statistical techniques. Descriptive statistics, including mean and standard deviation, were calculated to determine the average performance level and variability of state-level footballers from Rajasthan and Haryana.

To test the formulated null hypotheses regarding differences in shooting and passing efficiency between the two states, an **Independent Samples t-test** was applied. This statistical method was considered suitable as it compares the means of two independent groups to determine whether observed differences are statistically significant.

The level of significance was fixed at **0.05**. The calculated t-values were compared with the critical value to determine whether the null hypotheses could be accepted or rejected. Statistical interpretation was carried out carefully to ensure validity and reliability of the findings.

Results

Table 2: Mean, Standard Deviation and t-value of Shooting and Passing Efficiency

Variable	Rajasthan (Mean ± SD)	Haryana (Mean ± SD)	t-value
Shooting Efficiency	13.40 ± 2.15	15.10 ± 2.30	2.45*
Passing Efficiency	16.75 ± 2.05	18.20 ± 2.10	2.18*

*Significant at 0.05 level

Interpretation of Results: The results indicate that state-level footballers from Haryana demonstrated higher mean scores in both shooting efficiency (15.10) and passing efficiency (18.20) compared to players from Rajasthan. The calculated t-values for both variables were found significant at the 0.05 level, indicating statistically meaningful differences between the two states. These findings suggest that regional variations exist in technical skill execution among state-level footballers.

Discussion: The findings of the present study revealed significant differences in shooting and passing efficiency between state-level footballers of Rajasthan and Haryana. Players from Haryana demonstrated comparatively higher mean scores in both technical variables, indicating better performance consistency in ball striking and distribution.

The superior shooting efficiency observed among Haryana players may be attributed to structured training exposure and greater competitive participation. As noted by Reilly et al. (2000), technical proficiency improves with repetitive practice and match exposure. Differences in coaching methodology and tactical training intensity may also contribute to improved execution under controlled testing conditions.

Similarly, the higher passing efficiency recorded among Haryana players supports the findings of Rampinini et al. (2007), who emphasized that teams with better passing accuracy generally exhibit superior overall performance. Efficient passing reflects neuromuscular coordination, spatial awareness, and decision-making speed, all of which are influenced by systematic training programs.

The results suggest that regional variations in football development structures, competitive exposure, and training frequency may impact technical skill efficiency. While Rajasthan players also demonstrated competent performance levels, the observed gap indicates potential areas for performance enhancement through focused technical drills and structured practice modules.

Overall, the comparative analysis highlights the importance of consistent skill-based training and exposure to competitive match environments in improving technical execution among state-level footballers.

Conclusion:

1. The present study compared shooting and passing efficiency among state-level footballers of Rajasthan and Haryana.
2. The findings revealed significant differences in both technical variables, with Haryana players demonstrating comparatively higher performance levels.

3. The results suggest that structured training exposure and competitive participation may influence technical efficiency at the state level.
4. Shooting accuracy and passing precision remain critical performance determinants in competitive football.
5. The observed regional differences indicate the need for enhanced technical training programs in Rajasthan to bridge the performance gap.
6. Comparative performance evaluation can assist coaches and sports authorities in identifying developmental strengths and areas for improvement.

Recommendations For Further Studies:

1. Future studies may include a larger sample size involving multiple state teams to enhance the generalizability of findings.
2. Longitudinal research can be conducted to examine changes in technical efficiency across a competitive season.
3. Comparative analysis including additional technical variables such as dribbling efficiency, ball control, and crossing accuracy may provide a broader performance profile.
4. Future investigations may explore the influence of coaching methodology and training volume on technical skill development.
5. Match-based performance analysis using notational or video analysis techniques could provide deeper insight into real-game technical execution.
6. Similar comparative studies may be conducted between different competitive categories such as junior, university, and national-level players.

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