



**PHYSICAL PERFORMANCE INDICATORS – A STUDY ON ELITE KHO-KHO PLAYERS OF TELANGANA STATE**

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**ABSTRACT**

The present study mainly focused on to know the significant difference in physical performance indicators, such speed, strength, agility, endurance and flexibility between chasers and runners of elite male Kho-Kho players of Telangana state. A total of sixty male, 30 runners and 30 chasers, were taken as subjects and whose age ranges from 17-23 years. The collected data was analysed using statistical techniques. The results indicate that there is no significant difference between runners and chasers regarding their physical performance indicators, i.e., speed (t=1.707, p>0.05), agility (t=0.280, p>0.05), endurance (t=0.386, p>0.05) and flexibility (t=1.664, p>0.05), except strength (t=3.251, p<0.05).

**Keywords:** Physical performance, Kho-Kho, Runners, Chasers, Telangana.

**1.0 Introduction**

Sports performance is understood as an extent to which a motor task limited by rules of a given sports discipline is accomplished. Sports performance factors are understood as relatively independent parts of sports performance. It can be understood as a process of systematic development of each component in dependence on the duration of preparation which leads to achieving maximum efficiency in selected sports discipline.

Sports scientists are particularly interested in enhancing athletic performance (Popovic et al., 2012)<sup>1</sup>. To achieve optimal sports performance, numerous training protocols are utilized worldwide (American College of Sports Medicine, 2013<sup>2</sup>; Harries and others, 2012<sup>3</sup>). According to Manohar (2015)<sup>4</sup>, different sports require different kinds of bodies to perform at their best. Due to the physically demanding nature of the game, sports performance in Kho-Kho is largely dependent on an individual's musculoskeletal build (Kumar and Arumugam, 2018)<sup>5</sup>.

Kho-kho is a game of speed, stamina, endurance, strength and skill. Dodging and controlled sprinting makes the game exciting. Kho-Kho is a great test of the participants` physical fitness, strength, speed and stamina and dodging ability.

It was believed that the result of the present investigation could be of very high significant for physical education in general and the game of Kho-Kho in special. From this study, it is possible to understand the relative importance of the selective parameters for improvement of Kho-Kho performance.

**Objectives:**

1. To know significant difference in physical performance indicator (speed) between chasers and runners of elite male Kho-Kho players of Telangana state.
2. To know significant difference in physical performance indicator (strength) between chasers and runners of elite male Kho-Kho players of Telangana state.
3. To know significant difference in physical performance indicator (agility) between

chasers and runners of elite male Kho-Kho players of Telangana state.

4. To know significant difference in physical performance indicator (flexibility) between chasers and runners of elite male Kho-Kho players of Telangana state.
5. To know significant difference in physical performance indicator (endurance) between chasers and runners of elite male Kho-Kho players of Telangana state.

**Hypotheses:**

1. There may not be any significant difference in physical performance indicator (speed) between chasers and runners of elite male Kho-Kho players of Telangana state.
2. There may not be any significant difference in physical performance indicator (strength) between chasers and runners of elite male Kho-Kho players of Telangana state.
3. There may not be any significant difference in physical performance indicator (agility) between chasers and runners of elite male Kho-Kho players of Telangana state.
4. There may not be any significant difference in physical performance indicator (flexibility) between chasers and runners of elite male Kho-Kho players of Telangana state.
5. There may not be any significant difference in physical performance indicator (endurance) between chasers and runners of elite male Kho-Kho players of Telangana state.

**2.0 Review of Literature**

Lemdeo B. Nagalwade (2023)<sup>6</sup> concluded that there were significant differences in speed and endurance. The study revealed that the rural Kho-Kho players were significantly higher in speed and endurance than the urban Kho-Kho players of Nagpur district.

In Kho-Kho players, Mahapatra and Abhinandan (2023)<sup>7</sup>examine the relationship between speed and agility and gender. Speed and agility were found to have

a moderate correlation in Kho-Kho players, but there was a weak correlation between boys and girls. This suggests that Kho-Kho players come from both genders, and a particular gender also has a weak to moderate correlation between speed and agility in adolescent Kho-Kho players.

Bhavya and Hanumanthayya (2021)<sup>8</sup> concluded that a significant difference in some selected physical & physiological variables i.e. flexibility, explosive strength & endurance, agility. This type of study need to replicate in variety of players, both male and female or different level of age group, and higher level like national level, taking a large number of subjects.

Ghodke and Robade (2021)<sup>9</sup> study revealed a negative correlation between a player's kho-kho playing ability and his or her agility, speed, reaction ability, speed endurance and ankle flexibility.

Singh and Dubey (2016)<sup>10</sup> concluded that significant difference found between the means of selected physical fitness variables such as speed, agility, endurance and flexibility between Kabaddi and Kho-Kho male players.

Paul and Das (2016)<sup>11</sup> concluded that heart rate, Systolic blood Pressure, Force vital capacity, Diastolic blood Pressure and Vo2 max measurements contribute significantly in Kho-Kho performance.

Senthilkumar (2015)<sup>12</sup> conducted a study find out the relationship between selected motor fitness variables (speed, agility and endurance) and overall playing ability of college men kho-kho players. A significant relationship was found between speed and kho-kho playing ability and agility and kho-kho playing of college men.

Neeraj Sheoran and Suresh Malik (2015)<sup>13</sup> results showed that playing performance has significant relationship with speed, agility, jumping ability and hitting strength whereas no significant relationship was

found with flexibility and endurance among volleyball players.

### 3.0 Methodology

**Population:** The researcher selected all elite national Kho-Kho players of Telangana state as population.

**Subject:** A total of sixty male, 30 runners and 30 chasers, were taken as subjects and whose age ranges from 17-23 years. The players were used to practice regularly under the supervision of qualified coaches.

**Variables:** To find out the physical performance of Kho-Kho players, the variables used are (a) speed, (b) strength, (c) agility, (d) flexibility and (e) endurance.

**Physical performance procedures:** Before the tests, participants were required to do warm-ups of 10 minutes (jogging and running). Every participant was asked to perform the movements properly and only those whose movements met the criteria were admitted to participate in the testing. Each participant was tested twice, and the better testing result was recorded as the result to be used in further analysis. Each participant had about three to five minutes rest before taking the second test. During the testing, two personnel were needed to conduct the measurements and two assistants to record the results. In this study, the researcher applied the tests like, 30 metres run for speed, Illinois agility test for Agility, Sargent vertical jump for Strength, YMCA 3 min Step test for Endurance.

**Data collection procedure:** The subjects were measured with physical performance variables. The data was collected accurately for the total sample selected. The data collection procedure was completed for a duration of six months.

**Statistical techniques used:** The data collected in this study was subjected to statistical analysis with appropriate tools such as mead, standard deviation and t-test.

## 4.0 Data Analysis and Interpretation

### 4.1 Speed

$H_{01}$  = To know significant difference in physical performance indicator (speed) between chasers and runners of elite male Kho-Kho players of Telangana state.

**Table 4.1**

**Showing the Mean, Standard Deviation, degrees of freedom and t-value between physical performance indicator speed of elite male kho-kho players of Telangana State**

Variable (Speed)	N	Mean	SD	Degrees of freedom (df)	t-value	Sig.
Runners	30	4.72	0.31	58	1.707	0.093 (NS)
Chasers	30	4.56	0.40			

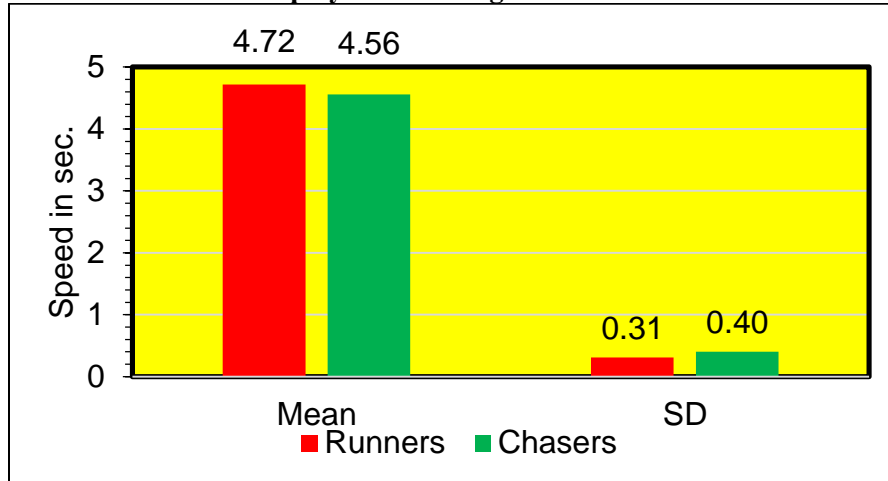
Level of Significance at 0.01 = 2.660 and at 0.05 = 2.000

**Discussion:** Table 4.1 and Fig. 4.1 show the mean, standard deviation values and t-value between runners and chasers of male elite Kho-Kho players of Telangana state in relation to their speed test (30 metres sprint). The mean value speed test of runners is 4.72

standard deviation value is 0.31, correspondingly the mean value of speed test of chasers is 4.56 and standard deviation value is 0.40. The calculated t value (1.707) is less than the table value (2.000) or the standard p value is less than p which is 0.093 at 58 degrees of freedom.

Fig. 4.1

Showing the Mean and Standard Deviation between physical performance indicator speed of elite male kho-kho players of Telangana State



On the basis of this evidence it is concluded that there is no significant difference in the speed of runners and chasers of elite Kho-Kho players. Hence, the null Hypothesis ( $H_{01}$ ) “To know significant difference in

physical performance indicator (speed) between chasers and runners of elite male Kho-Kho players of Telangana state” is accepted.

4.2 Strength

$H_{02}$  = To know significant difference in physical performance indicator (strength) between chasers and runners of elite male Kho-Kho players of Telangana state.

Table 4.2

Showing the Mean, Standard Deviation, degrees of freedom and t-value between physical performance indicator strength of male elite kho-kho players of Telangana State

Variable (Strength)	N	Mean	SD	Degrees of freedom (df)	t-value	Sig.
Runners	30	43.60	5.91	58	3.251**	0.002 (S)
Chasers	30	48.87	6.61			

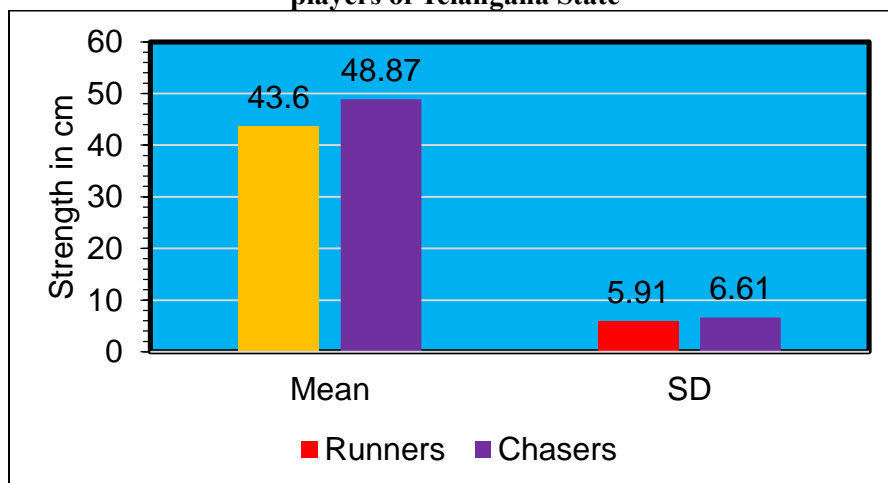
Level of Significance at 0.01 = 2.660 and at 0.05 = 2.000

**Discussion:** Table 4.2 and Fig. 4.2 shows the mean, standard deviation values and t-value between runners and chasers of male elite Kho-Kho players of Telangana state in relation to their strength (vertical jump). The mean value strength of runners is 43.60 standard deviation value is 5.91, correspondingly the mean value of strength of chasers is 48.87 and standard

deviation value is 6.61. The calculated t value (3.251) is higher than the table value (2.660) or the p value is less than standard p which is 0.002 at 58 degrees of freedom. On the basis of this evidence, it is clear from the study that there is a significant difference in the strength of runners and chasers of elite Kho-Kho players.

Fig. 4.2

Showing the Mean and Standard Deviation between physical performance indicator strength of elite men kho-kho players of Telangana State



Hence, the null Hypothesis ( $H_{22}$ ) “To know significant difference in physical performance indicator (strength) between chasers and runners of elite male Kho-Kho players of Telangana state” is rejected.

4.3 Agility

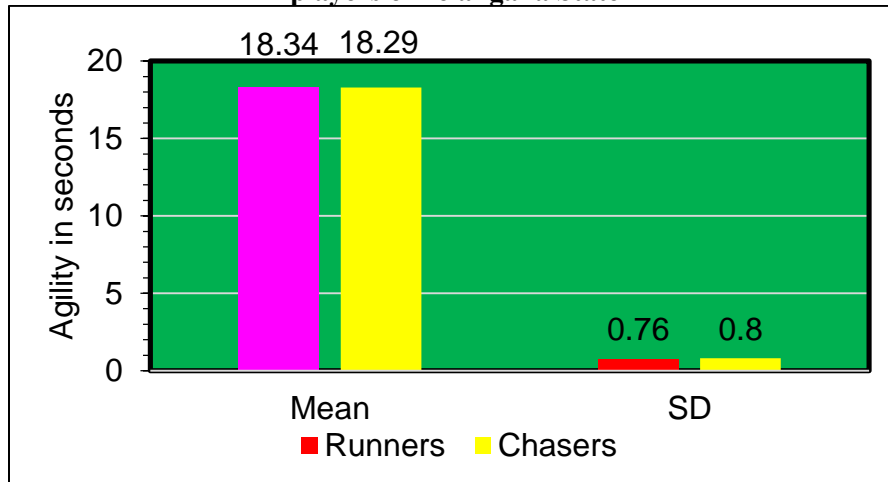
$H_{03}$  = To know significant difference in physical performance indicator (agility) between chasers and runners of elite male Kho-Kho players of Telangana state.

**Table 4.3**  
**Showing the Mean, Standard Deviation, degrees of freedom and t-value between physical performance indicator agility of male elite kho-kho players of Telangana State**

Variable (Agility)	N	Mean	SD	Degrees of freedom (df)	t-value	Sig.
Runners	30	18.34	0.76	58	.280	0.781 (NS)
Chasers	30	18.29	0.80			

Level of Significance at 0.01 = 2.660 and at 0.05 = 2.000

**Fig. 4.3**  
**Showing the Mean and Standard Deviation between physical performance indicator agility of male elite kho-kho players of Telangana State**



**Discussion:** Table 4.3 and Fig. 4.3 shows the mean, standard deviation values and t-value between runners and chasers of male elite Kho-Kho players of Telangana state in relation to their agility (Illinois agility test). The mean value strength of runners is 18.34 standard deviation value is 0.76, correspondingly the mean value of agility of chasers is 18.20 and standard deviation value is 0.80. The calculated t value (0.280) is lower than the table value (2.000) or the p value is higher than standard p which is 0.781 at 58 degrees of freedom. On the basis of this evidence, it is clear from the study that there is no significant difference in the agility of runners

and chasers of elite Kho-Kho players. Hence, the null Hypothesis ( $H_{23}$ ) “To know significant difference in physical performance indicator (agility) between chasers and runners of elite male Kho-Kho players of Telangana state” is accepted.

**4.4 Flexibility**

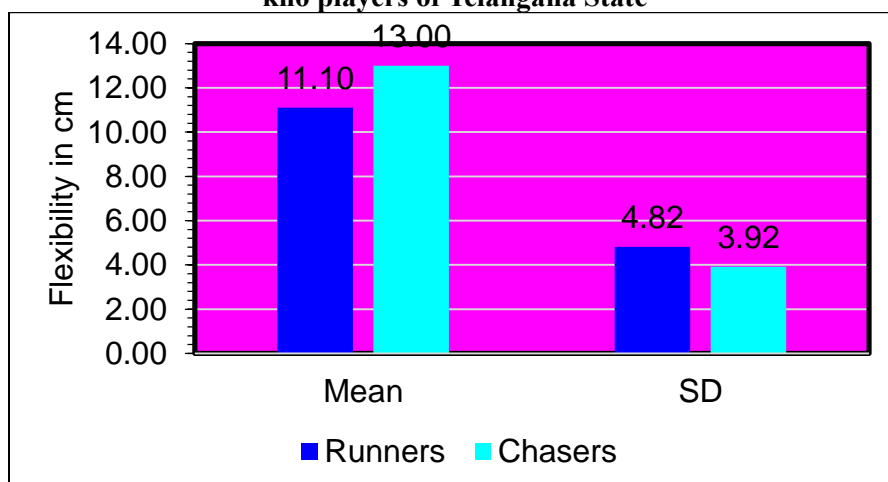
$H_{04}$  = To know significant difference in physical performance indicator (flexibility) between chasers and runners of elite male Kho-Kho players of Telangana state.

**Table 4.4**  
**Showing the Mean, Standard Deviation, degrees of freedom and t-value between physical performance indicator flexibility of male elite kho-kho players of Telangana State**

Variable (Flexibility)	N	Mean	SD	Degrees of freedom (df)	t-value	Sig.
Runners	30	11.10	4.82	58	1.664	0.101 (NS)
Chasers	30	13.00	3.92			

Level of Significance at 0.01 = 2.660 and at 0.05 = 2.000

**Fig. 4.4**  
**Showing the Mean and Standard Deviation between physical performance indicator flexibility of male elite kho-kho players of Telangana State**



**Discussion:** Table 4.4 and Fig. 4.4 shows the mean, standard deviation values and t-value between runners and chasers of elite Kho-Kho players of Telangana state in relation to their flexibility (Sit & Reach Test). The mean flexibility value of runners is 11.10 standard deviation value is 4.82, correspondingly the mean flexibility value of chasers is 13.00 and standard deviation value is 3.92. The calculated t value (1.664) is lower than the table value (2.000) or the p value is higher than standard p which is 0.101 at 58 degrees of freedom. Therefore, it is concluded from the study that there is no significant difference in the

flexibility of runners and chasers of elite Kho-Kho players. Hence, the null Hypothesis ( $H_{24}$ ) “To know significant difference in physical performance indicator (agility) between chasers and runners of elite male Kho-Kho players of Telangana state” is accepted.

**4.5 Endurance**

$H_{05}$  = To know significant difference in physical performance indicator (endurance) between chasers and runners of elite male Kho-Kho players of Telangana state.

**Table 4.5**

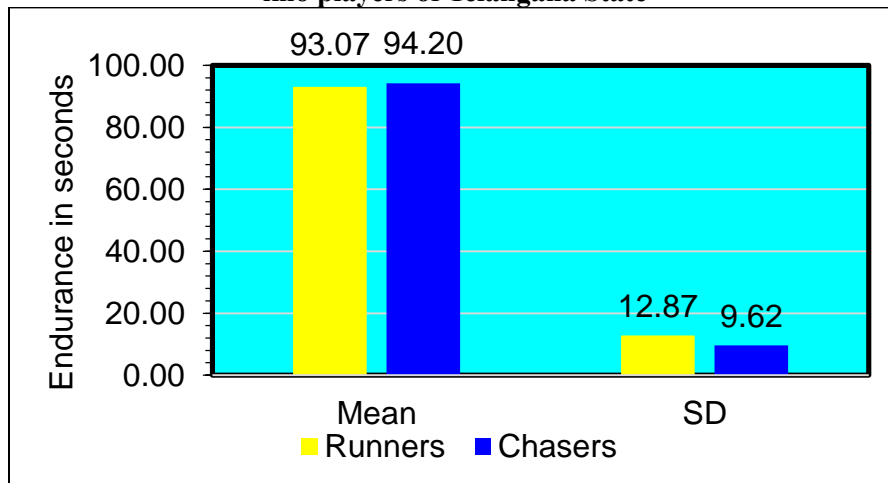
**Showing the Mean, Standard Deviation, degrees of freedom and t-value between physical performance indicator endurance of elite male kho-kho players of Telangana State**

Variable (Endurance)	N	Mean	SD	Degrees of freedom (df)	t-value	Sig.
Runners	30	93.07	12.87	58	0.386	0.701 (NS)
Chasers	30	94.20	9.62			

Level of Significance at 0.01 = 2.660 and at 0.05 = 2.000

**Fig. 4.5**

**Showing the Mean and Standard Deviation between physical performance indicator endurance of elite male kho-kho players of Telangana State**



**Discussion:** Table 4.5 and Fig. 4.5 shows the mean, standard deviation values and t-value between runners and chasers of elite male Kho-Kho players of Telangana state in relation to their endurance (3-minutes step test). The mean endurance value of runners is 93.07 standard deviation value is 12.87, correspondingly the mean flexibility value of chasers is 94.20 and standard deviation value is 9.62. The calculated t value (0.386) is much lower than the table value (2.000) or the p value is higher than standard p which is 0.701 at 58 degrees of freedom. Therefore, it is concluded from the study that there is no significant difference in the endurance of runners and chasers of elite Kho-Kho players. Hence, the null Hypothesis ( $H_{05}$ ) “To know significant difference in physical performance indicator (endurance) between chasers and runners of elite male Kho-Kho players of Telangana state” is accepted.

**5.0 Findings**

- It was found that there is no significant difference in the speed ( $p>0.05$ ) of runners and chasers of elite Kho-Kho players.
- It was found that there is a significant difference in the strength ( $p<0.05$ ) of runners and chasers of elite Kho-Kho players.
- It was found that there is no significant difference in the agility ( $p>0.05$ ) of runners and chasers of elite Kho-Kho players.

- It was found that there is no significant difference in the flexibility ( $p>0.05$ ) of runners and chasers of elite Kho-Kho players.
- It was found that there is no significant difference in the endurance ( $p>0.05$ ) of runners and chasers of elite Kho-Kho players.

**6.0 Conclusion**

The study concluded that the men elite Kho-Kho players of Telangana state should undergo training for speed, agility, flexibility and endurance to improve their performance.

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