Revista de Ensino de Ciências e Matemática
ONLINE ISSN 2178-7727

COMPARATIVE STUDY OF HAND REACTION TIME AND EXPLOSIVE STRENGTH BETWEEN BASKETBALL AND HANDBALL PLAYERS

Lambamayum Sadananda Singh
Corresponding Authur: Research Scholar, Department of Physical Education and Sports Science, Manipur University
Dr. Y. Santikumar Singh
Assistant Professor(S-3), Department of Physical Education and Sports Science, Manipur University
Naorem Aken Singh
Yoga Instructor 10-Bedded Ayush Hospital (Yoga & Nature Cure), Mongshangei

Received: 10th July, 2025
Revised &Accepted: 15th November 2025
Published: December, 2025
DOI: https://doie.org/10.65985/AS.2026764127

ABSTRACT

Purpose: The study aimed to investigate the significant difference in hand reaction time and explosive strength between basketball and handball players.

Methods: A total of 30 subjects between 18 to 23 years of ages were selected for the study. 15 players each in basketball and handball who have participated in state level from Manipur were randomly selected. The data collection was carried out for both groups on hand reaction time and explosive strength. The collected data were statistically analyzed by using descriptive statistics, and an independent t-test was used to find out the differences between the two groups. All statistics were carried out by using IBM SPSS, and the level of confidence was set at 0.05.

Results: The mean and standard deviation of hand reaction time were 0.373±0.04 and 0.411±0.03, respectively, and there was significant difference found as calculated t=2.719 was bigger than the table t value 2.048 at the 0.05 level of confidence. The mean and standard deviation found in explosive strength were 2.39±0.30 and 2.45±0.24, respectively. There was insignificant difference found as calculated t=0.623 was much lower than table t=2.048 at 28 degree of freedom and 0.05 level of confidence.

Conclusion: The result of the study concluded that the significant differences found in hand reaction time and insignificant difference found in explosive strength between basketball and handball players.

Keyword: Basketball, Handball, Hand reaction time, Explosive strength

INTRODUCTION

Basketball and Handball are very popular team game in the world. Among team sports, basketball and handball are considered to be the fastest. A high level of physiological, psychological, and physical fitness is necessary for both games in order to provide better results during competition. Basketball is an extremely challenging physical sport (Paiva NA 2005). Reaction ability is the capacity of an individual to react as quickly and effectively as possible to a given signal or event. One aspect of reaction capacity is reaction time, which also includes the period of reaction or response (Singh SK 2011). Playing basketball requires a lot of

ISSN:1517-4492 | **E-ISSN**:2178-7727

jumping, frequent speed changes, and vigorous usage of all muscle groups. For this reason, in order to get the intended effects, instructors must do high-quality work. Explosive power is a vital ability in a variety of sports, like basketball, volleyball, handball, soccer, and athletics. The explosive power in basketball is demonstrated by a variety of jumps, initial acceleration, rapid direction changes, deceleration, sudden halting, and passing. Basketball players of all ages' explosive power is closely tied to the results of training; knowing this helps coaches choose training techniques and streamlines the planning and programming process (Aksović & Berić, 2017). Handball is a contact sport and players require high power and strength to throw the ball (Gorostiaga EM 2005). Jumping is one of the explosives, unilateral movements that define basketball and handball, and it is thought to be essential for good performance in both sports (Fort- Vanmeerhaeghe A 2016).

Objective of the study

To compare the hand reaction time and explosive strength between basketball and handball players.

Statement of the Problem

The purpose of the study was to find out the comparative study of hand reaction time and explosive strength between Basketball and Handball Players.

Hypothesis

It was hypothesized that there would be significant different on Hand Reaction time among Basketball and Handball Players. It was hypothesized that there would be significant different on Explosive strength between Basketball and Handball Players

Delimitation

The study was delimited to 30 Subjects, 15 players each in Basketball and Handball. The subject was delimited to State level participants and ages ranged was 18 to 23 years. The study was delimited to Hand reaction time and Explosive strength.

Limitation

The study was limited to life style of the players, limited to food habits of the players, limited to the climatic condition during the data collection and limited to psychological factors of the players during the training session.

Participants

A total of 30 subjects between 18 to 23 years of ages were selected for the study. 15 players each in basketball and handball players who have participate in state level competition of Manipur were selected by using random sampling method. The players gave their consent to be a part of this study voluntarily after explanation of all the methods and goals of the study.

Variables

Hand Reaction Time and Explosive Strength were selected as the variables of the study.

Criterion Measures

- Hand Reaction Time was measured by using digital visual reaction timer (Takei) and was measured in quickest milliseconds.

ISSN:1517-4492 | **E-ISSN**:2178-7727

- Explosive Strength was measured by using Standing Broad Jump and was measured in longest legal jump in meters.

Data Collection

The data collection was carried out for both groups on Hand Reaction Time and Explosive Strength by using the mentioned instrument/test. The data collection was carried out at the same day in morning time for both groups inside the Dr. Kamal Indoor Stadium of Manipur University.

Statistical Analysis

The collected data were statistically analyzed by using descriptive statistics to understand the characteristics of the groups and independent t-test was used to find out the differences between the two groups. All statistics were carried out by using IBM SPSS and level of confidence was set at 0.05.

Findings

Table1: Descriptive statistics and mean comparison between two groups.

Variable	Group	Mean	SD	SEM	Df	T
Hand Reaction Time	Basketball	0.373	0.04	0.101	28	2.719*
	Handball	0.411	0.03	0.008		
Explosive Strength	Basketball	2.39	0.30	0.077	28	0.623
	Handball	2.45	0.24	0.063		

The findings from table1 indicated that the mean and standard deviation of hand reaction time were 0.373±0.04 and 0.411±0.03 respectively. And there was significant difference found in hand reaction time between basketball and handball as calculated t= 2.719 was bigger than table t value (2.048) at 0.05 level of confidence. The mean and standard deviation of explosive strength of basketball and handball players were 2.39±0.30 and 2.45±0.24 respectively. There was insignificant difference found in explosive strength between basketball and handball players of Manipur as calculated t= 0.623 was much lower than table t= 2.048 at 28 degree of freedom and 0.05 level of confidence.

ISSN:1517-4492 | **E-ISSN**:2178-7727

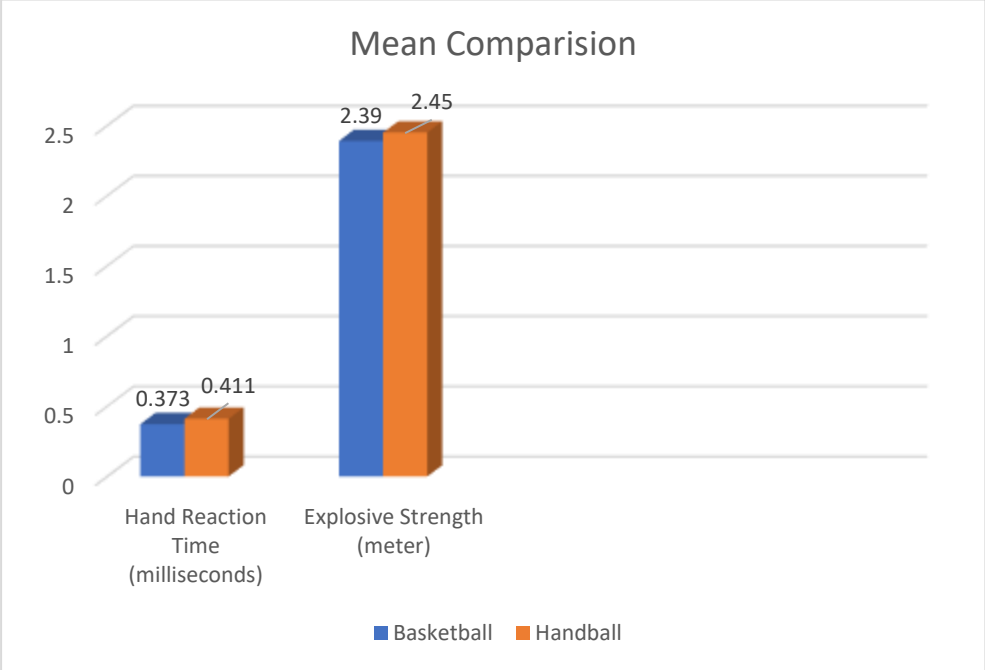

Fig1: Mean comparison of hand reaction time and explosive strength between basketball and handball players.

Discussion of Findings

For the present study, data was carried out for basketball and handball players who were actively participating in state level competitions. The study aimed to determine the hand reaction time and explosive strength between basketball and handball players and subsequently, the differences between them. After finding the result of statistical analyses, the study showed level of hand reaction time for basketball and handball players were 0.373±0.04 and 0.411±0.03 respectively, and explosive strength for basketball and handball players were 2.39±0.30 and 2.45±0.24 respectively.

Further, the result showed significant difference in hand reaction time t=2.719 was bigger than the table t values 2.048 and insignificant difference in explosive strength t=0.623 was much lower than the table t values 2.048 at 28 degree of freedom 0.05 level of confidence between basketball and handball players. It was concluded that there was a significant difference in hand reaction time and there was insignificant found in explosive strength between basketball and handball players. Both games playing styles are quite similar, played by hand, and players use fast break counter strategies, unpredictable direction changes, and powerful hand movements. But jumping performance is different in both basketball and handball in the attacking, shooting and defensive way. There were some studies which support the finding of the study. **Pintu Debnath (2020)** Comparative study of reaction time among football, handball and basketball players and the study revealed that there were significant differences found in reaction time among football, handball and basketball players. In another study **Nikola Aksovic., et. Al., (2022)** Evaluation and comparative analysis of the results of a vertical jump between young basketball and handball players. Result of this study found that there were no significant differences between basketball and handball players.

ISSN:1517-4492 | **E-ISSN**:2178-7727
Vol. 8, No. 1 (2025)

Discussion of Hypothesis

The purpose of this study was to find out the comparative study on hand reaction time and explosive strength between basketball and handball players. There was the hypothesis would be significant difference on reaction time and explosive strength between the basketball players and handball players. Results of the study revealed that there were significant findings on hand reaction time, and the hypothesis was accepted. However, there were no significant differences in explosive strength between basketball and handball players, hence the hypothesis was not accepted in this study.

Conclusion

From the above result showed that there was significant difference in hand reaction time and insignificant difference in explosive strength between basketball and handball players. This article showed new information about hand reaction time and explosive strength between state level basketball and handball male players and this information could be extremely useful for both players, coaches of basketball and handball.

Bibliography

1. Aksović, N., & Berić, D. (2017). Differences in explosive power between basketball players of different age. Physical Culture, 71(1), 36-42.
2. Aksovic, N., Bjelica, B., Milanovic, F., Milanovic, L. Jovanovic, N. (2021). Development of explosive power in basketball players. Turk J Kinesiol, 7(1), 44-52. DOI: 10.31459/turkjkin.861920
3. Dr. Suresh Kumar (2023). "The comparative study of coordinative abilities between handball and basketball national levels players" Journal of Sports Science and Nutrition 4(1): 194-197 DOI: https://doi.org/10.33545/27077012.2023.v4.i1c.205
4. Eduardo J. A. M. Santos and Manuel A. A. S. Janeira (2012). "The Effects of Resistance Training on explosive strength indicators in adolescent basketball players" Journal of Strength and Conditioning Research. 26(10)/2641–2647.
5. Fort-Vanmeerhaeghe A, Gual G, Romero-Rodriguez D, Unnitha V. (2016). "Lower limb neuromuscular asymmetry in volleyball and basketball players". Journal of Human Kinetics, 50(1): 135–143. https://doi.org/10.1515/hukin-2015-0150
6. Gorostiaga EM, Granados C, Ibáñez J, Izquierdo M (2005) Differences in physical fitness and throwing velocity among elite and amateur male handball players. Int J Sports Med 26:225–232.
7. Laishram Thambal Singh1. Thokchom Somorjit Singh1 (2023). "Comparative investigation of hand and foot reaction ability between the basketball and handball players" Sport Sciences for Health https://doi.org/10.1007/s11332-023-01154-9
8. Nikola Aksović, Bojan Bjelica, Filip Milanović, Borislav Cicović, Saša Bubanj, Dejan Nikolić, Iryna Skrypchenko, Victor Rozhechenko, Milan Zelenović, (2022). "Evaluation and comparative analysis of the results of a vertical jump between young basketball and handball players" Pedagogy of physical Culture and Sports doi:10.15561/26649837.2022.0207. pp 126-133
9. Paiva NA, César MC (2005) Body composition assessment in male basketball players in Brazilian national basketball league 2003. Rev Bras Cineantropom Desempenho Hum 7:35–44.

ISSN:1517-4492 | **E-ISSN**:2178-7727

10. Pintu Debnath (2020). “Comparetive study of reaction time among football, handball and basketball players” International Journal of Physiology, Nutrition and Physical Education 5(1): 125-127
11. R. Rajkumar., Dr.K.Divya (2017). “Impact of Specific Training on selected Speed, Explosive Power and Muscular Strength Parameters among School Men Handball players”. Indian Journal of Applied Research. vol-7Issue-9/587-588.
12. Singh SK (2011) Sports training and biomechanics in physical education. Khel Sahitya Kendra (New Delhi), 57
13. Vijay Kumar (2017). “Comparative investigation of selected physical fitness components between handball and basketball players” International Journal of Physiology, Nutrition and Physical Education. 2(2): 980-982.

ISSN:1517-4492 | **E-ISSN**:2178-7727