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Reaction Ability and Response Variability Among Foil, Epee and Sabre Players

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Abstract

Objective: This study aimed to compare the hand and foot reaction abilities among foil, epee, and sabre fencers at the national level in Manipur.

Method: Thirty male fencers (10 from each weapon category) aged 18–24 years were selected from the Khongman Fencing Academy, Imphal East District. The Nelson Hand and Foot Reaction Test was used to assess reaction ability. Data were analyzed using one-way ANOVA with a significance level set at 0.05.

Results: The mean ± SD of hand reaction times for foil, epee, and sabre were 8.65 ± 3.13, 7.90 ± 3.93, and 7.75 ± 2.65, respectively. The F-value (2, 27) = 0.216, p = 0.807, indicated no significant difference. For foot reaction, the means ± SD were 14.90 ± 4.12, 15.30 ± 2.95, and 15.45 ± 3.62, respectively, with F(2, 27) = 0.063, p = 0.939, also showing no significant difference.

Conclusion: The study concluded that there were no significant differences in hand or foot reaction abilities among foil, epee, and sabre fencers. These findings suggest that reaction ability may be influenced more by individual training factors than by weapon specialization.

Keywords: *Fencing, Reaction time, Foil, Epee, Sabre, Performance analysis*

INTRODUCTION

Fencing is an open-skill sport where two players battle each other using one of the three weapons: epee, foil, or sabre (Chtara et al., 2020). Two competitors fight with identical swords in the combat sport of fencing. It is a swordplay that involves sword combat. Among the most popular sports in Manipur, fencing is one of them. It is suitable for Manipur players since it imitates the Thang-ta state's mode of activity. Two players use similar swords in the combat sport of fencing. In Manipur, fencing is among the most played

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games. Because it has a comparable kind of combat action to Thang-Ta in the state, it is suitable for Manipur players.

Fencing players require lunge, change direction, and recover to en garde as soon as possible (Turner et al., 2017). With the differences in weapon playing styles, rules, strategies, and techniques, the game is different. Fencing calls for strength, intelligence, and the ability to respond quickly and decisively while anticipating the opponent's next move. During the tournament, the fencer must sustain defensive and offensive motions, so it is necessary that the performance in fencing is at a high level. Dynamic movements, such as jumping and stepping back and forth, as well as actions that involve touching the opponent, are closely correlated with an athlete's muscle strength and reaction time. Typically, these performance metrics can change based on the fencers' body types and sizes, but they can all compete successfully (Turna, 2020, p. 127).

The entire fencing performance is significantly influenced by quick reaction, which is strongly linked to the processing of tactile or visual stimulus, muscle synchronisation during movement, technical and tactical skills, or an ideal mental state (Balko et al., 2016).

OBJECTIVES OF THE STUDY

1. To compare the reaction ability (hand) among foil, epee and sabre players.
2. To compare the reaction ability (foot) among foil, epee and sabre players.

HYPOTHESIS OF THE STUDY

1. It was hypothesized that there would be no significant difference in the reaction ability (hand) among foil, epee and sabre players.
2. It was hypothesized that there would be no significant difference in the reaction ability (foot) among foil, epee and sabre players.

SELECTION OF THE SUBJECTS

For the purpose of the study, 30 male fencers, 10 from each of the three disciplines, were selected randomly from the Khongman Fencing Academy, Imphal East District of Manipur. The age ranged between 18 and 24 years.

SELECTION OF THE VARIABLES

The following variables were selected for the purpose of reaction ability and response variability:

1. Hand Reaction Ability
2. Foot Reaction Ability

DATA COLLECTION

For each test, the researcher collected data on separate sheets for foil, epee, and sabre players. The score of each trial was recorded, and the best was considered as individual score. Necessary instructions were provided to the subjects before administering the test. The researcher had demonstrated and explained how to perform the test to the subjects.

CRITERION MEASURES

Variables	Criterion Measures	Unit Of Measurements
Hand Reaction Ability	Nelson Hand Reaction Test	Cm
Foot Reaction Ability	Nelson Foot Reaction Test	Cm

ADMINISTRATION OF TEST

1. **Neslson Hand Reaction Test:** To measure the reaction time of hand movement in response to a visual stimulus of the subject, the Nelson hand reaction test was used and recorded in the nearest centimetres.
2. **Nelson Foot Reaction Test:** To measure the reaction time of foot movement in response to a visual stimulus of the subject, the Nelson foot reaction test was used and recorded in the nearest centimetres.

STATISTICAL PROCEDURE

1. The statistical technique of the study used ANOVA to find out the significant difference.
2. The level of significance was 0.05 in all cases.

RESULTS

Table - 1

Mean And Standard Deviation for the Hand Reaction Ability Test of Foil, Epee and Sabre Players

Variables	N	Mean	Std. Deviation
Foil Hand Reaction	10	8.65	3.13
Epee Hand Reaction	10	7.90	3.93
Sabre Hand Reaction	10	7.75	2.65
Total	30	8.10	3.20

Table 1 shows the mean and standard deviation of the hand reaction test among fencers. The mean and standard deviation for foil, epee, and sabre are 8.65±3.13, 7.90±3.93 and 7.75±2.65, respectively.

Table-2

ANOVA for Hand Reaction among Fencers

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	4.65	2	2.325	0.216	0.807	3.354
Within Groups	290.55	27	10.761			
Total	295.2	29				

Table 2 shows the ANOVA among fencers on the hand reaction test. The F-value with degrees of freedom 2 and 27 is 0.216, and p is .807. The critical F-value at a 0.05 significance level is 3.354. Comparing the obtained F-value and the critical F-value shows that the obtained F-value is less than the critical F-value, and the p-value is greater than 0.05. This shows that no significant difference was observed in hand reaction among Fencers.

Fig. 1: Graphical presentation showing the mean of fencers ' hand reaction ability.

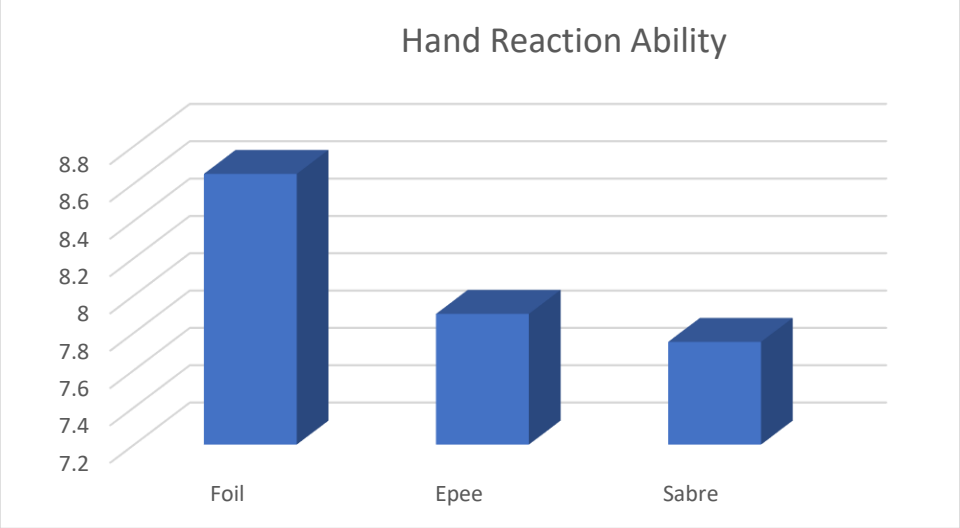


Table 3

Mean And Standard Deviation for the Foot Reaction Ability Test of Foil, Epee and Sabre Players

Variables	N	Mean	Std. Deviation
Foil Foot Reaction	10	14.90	4.12
Epee Foot Reaction	10	15.30	2.95
Sabre Foot Reaction	10	15.45	3.62
Total	30	15.22	3.61

Table 3 shows the mean and standard deviation of the foot reaction test among fencers. The mean and standard deviation for foil, epee, sabre are 14.90±4.12, 15.30±2.95

and 15.45±3.62respectively.

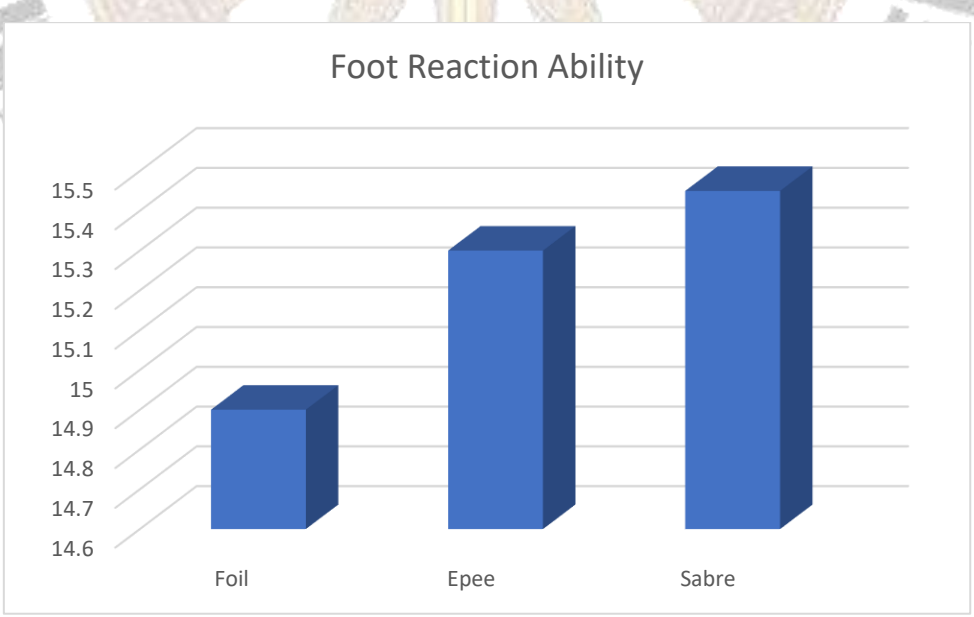
Table- 4

ANOVA for Foot Reaction among Fencers

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1.617	2	0.808	0.063	0.939	3.354
Within Groups	347.225	27	12.860			
Total	348.842	29				

Table 4 shows the ANOVA among fencers on the foot reaction test. The F-value with degrees of freedom 2 and 27 is 0.063, and p is .939. The critical F-value at a 0.05 significance level is 3.354. Comparing the obtained F-value and the critical F-value shows that the obtained F-value is less than the critical F-value, and the p-value is greater than 0.05. This shows that no significant difference was observed in foot reaction among Fencers.

Fig. 2: Graphical presentation showing the mean of fencers ' foot reaction ability.



DISCUSSION OF FINDINGS

The primary purpose of the present study was to compare the reaction ability and response of the hand and foot among foil, epee and sabre of national-level fencing players.

For the study, thirty national-level fencing players (N = 30), ten from each of the foil, epee, and sabre disciplines, were assigned as subjects. The players were selected from Khongman Fencing Academy. ANOVA was used for the analysis and interpretation of the data.

For the hand reaction test, the F-value with degrees of freedom 2 and 27 is 0.216, and p is .807. The critical F-value at a 0.05 significance level is 3.354. Comparing the obtained F-value and the critical F-value shows that the obtained F-value is less than the critical F-value, and the p-value is greater than 0.05. This shows that no significant difference was observed in hand reaction among Fencers.

For the foot reaction test, the F-value with degrees of freedom 2 and 27 is 0.063, and p is .939. The critical F-value at a 0.05 significance level is 3.354. Comparing the obtained F-value and the critical F-value shows that the obtained F-value is less than the critical F-value, and the p-value is greater than 0.05. This shows that no significant difference was observed in foot reaction among Fencers.

Thus, the statistical analysis of the data shows that there is no significant difference in the reaction ability of hands and feet among national-level fencers in the three disciplines: foil, epee, and sabre.

CONCLUSION

According to the above study, no significant difference was found in reaction abilities among fencing players (foil, epee, and sabre). The findings among the fencers may be due to the similarity of the training aspects and factors. All three weapons, foil, epee, and sabre, are characterised by time, distance, and the quickness of response. The training similarity might contribute to the current research findings. The only difference among the three disciplines is the target area for scoring and playing speed. Hence, no significant difference was found among foil, epee, and sabre fencing players in terms of hand reaction ability and foot reaction ability tests.

RECOMMENDATION

Based on the results obtained from the study, the following recommendations, which may be helpful for future research work, are made:

1. Fencing coaches must implement reaction time drills uniformly among all three groups, as no specific weapon category outperformed the others in terms of reaction time performance.
2. Although the study found no significant difference, some individuals had faster reaction times. Therefore, it is recommended to conduct individual performance assessments to train according to the athletes' specific requirements.
3. A similar study could be carried out by selecting subjects at different levels, such as the international level, rather than the level used in the present study.
4. Encourage the adoption of technological tools such as video analysis or reaction time sensors for more precise monitoring and feedback during training.
5. Future research should focus on whether changes in reaction time occur over time due to experience, age, or specific training regimens.
6. It is recommended that future studies be performed by increasing sample sizes and including athletes from different regions or training backgrounds.

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