

Evaluation of Selected Motor Fitness Profiles: A Comparative Study of Fencing and Thang-Ta Players

Tapasjit Rajkumar¹, Dr. Amit Dhar², Dr. Satish Kumar³

¹Ph.D Scholar, Department of Physical Education, The ICFAI University, Tripura, Agartala Simna Road, Kamalghat, West Tripura

²Assistant Professor, Department of Physical Education, The ICFAI University Tripura, Agartala Simna Road, Kamalghat, West Tripura

³Assistant Professor, Department of Physical Education, The ICFAI University Tripura, Agartala Simna Road, Kamalghat, West Tripura

Abstract:

To achieve the optimum level of performance in combative sports, motor fitness plays a vital role. The present study aimed to compare between Fencing and Thang-Ta players of Manipur on selected motor fitness component. A total of 60 male players, 30 from each group, age ranging from 15 to 20 years, were selected purposively for this study. The selected variables included flexibility, leg explosive strength, eye-hand coordination, and hand reaction time. Collected data was examined normality by using “Shapiro-Wilk” test. As the flexibility, leg explosive strength and hand reaction time violated the normality assumption, the “Mann-Whitney U” test was used to compare between two group on said variables. While eye-hand coordination was found normally distributed, an independent *t*-test was employed. It was found that there is no significant difference between two group in flexibility ($U = 320$, $p = 0.051$), and eye-hand coordination ($t = -1.89$, $p = 0.064$). However, a significant difference is found in leg explosive strength ($U = 174$, $p < 0.001$) and hand reaction time ($U = 248$, $p = 0.003$), where Thang-Ta players demonstrated higher level of leg explosive strength than Fencing players and Fencing players were found with better in hand reaction time. These finding revealed that both the sports required almost same levels of flexibility and eye hand coordination. They develop specific motor fitness characteristics according to the demands of respective sports.

Keywords: Motor Fitness, Thang-Ta, Fencing, Flexibility, Leg Explosive Strength, Eye-hand Coordination, Hand Reaction Time, Combat Sports.

Introduction

In the present era, the games and sports have grown extremely competitive. The players are trying to achieve peak performance through the vigorous scientific based training methods and by acquiring technical and tactical training. Presently, the games and sports are not bounded into self-satisfaction, but it has got a wide range of importance. Therefore, with physical fitness, motor fitness is very crucial part for every athlete to achieve highest goal in their respective event.

Physical fitness basically comprises four basic fitness components; muscular strength, muscular endurance, cardiovascular endurance, and flexibility. Whereas, motor fitness is a more comprehensive term, which includes four physical fitness components and another five components; explosive strength, speed, agility, balance and reaction time. Motor fitness is the ability of an athlete to perform successfully at their respective sports. It can be defined as:

“A readiness or preparedness for performance with special regard for big muscle activity without undue fatigue. It concerns the capacity to move the body efficiently with force over a reasonable length of time” (Barrow, 1979).

Fencing is one of the sports that having modern Olympic features. It is played on a 14×2 mt. strip called “piste”, with electronic based of scoring system because of its highly pace of competition. There are three primary events in competitive fencing, defined by the types of weapons used. The weapons are Foil, Sabre and Epee. To win a match, fencer need to score 5 hits during the preliminary pool bouts, and in the direct elimination bout, the first fencer reaches 15 hits to be the winner. The duration of the preliminary pools is 5 minutes, whereas, the

elimination bouts are consisting with 3 rounds with 3 minutes each, and between the rounds 1-minute rest is there. In the foil fencing, scoring is restricted to the torso, whereas, the entire body is the target area in the epee, and in sabre hitting above the waist areas are counting (Turner et al., 2014).

In Thang-Ta sports, there are two main events i.e. Phunaba (combat) and individual performance with sword and without sword, called Kanglon Chatpa. There are two categories in Phunaba event i.e. Phunaba Ama (This is performed with Phunachei/Cheibee and Chungoi or shield) and Phunaba Anisuba (This is performed with Phunachei/Cheibee without chungoi, however kicking is allowed in this event). In Kanglon Chatpa or kata event there are Thanglon (Kata with sword), Khonglon-Khutlon (Kata without weapon), Taron (Kata with spear), Thang-Haiba (Dance like movements with two sword). In Phunaba event a competitor has to hit by the Phunachei on anywhere above the waist of opponent's body. In Phunaba Ama, each hit will be awarded one point. The scoring procedure is also same in Phunaba Anishuba, however, there are some additional in scoring procedure, in this event for a successful kick above waist level and hitting by Phunachei (fighting stick) on opponent's kicking leg while executing the kick are awarded two points. The playing area of the Thang-Ta sports is 30 square feet with additional 5 ft area in all side. Both combative events are consisting with 2 round, 3 minutes each and 1 minute rest between the rounds (Rajkumar & Dhar, 2024).

Combat sports require extraordinary levels of motor fitness for the complex interaction of attack and defense movement which are executed at high velocity and precision. Combat sports like fencing demands fast reaction times, balance, explosive leg strength, coordination and trunk flexibility that helps to execute accurate attacks and defensive skills. Likewise, Indian indigenous martial art Thang-Ta, presently growing as a combative sport, demanding high levels of motor fitness.

The present study is initiated to find out, whether, between these two events, are there any significant differences on selected motor fitness or not. The study may help to the coaches, and instructors to construct suitable training protocol for the athletes of respective sports.

Objective of the Study:

- i. To compare the flexibility between national level Fencing and Thang-Ta players of Manipur.
- ii. To compare the leg explosive strength between national level Fencing and Thang-Ta players of Manipur.
- iii. To compare the eye-hand coordination between national level Fencing and Thang-Ta players of Manipur.
- iv. To compare the hand reaction time between national level Fencing and Thang-Ta players of Manipur.

Hypothesis

H₀₁ It is hypothesized that there will be no significant differences in flexibility between national level Fencing and Thang-Ta players of Manipur.

H₀₂ It is hypothesized that there will be no significant differences in leg explosive strength between national level Fencing and Thang-Ta players of Manipur.

H₀₃ It is hypothesized that there will be no significant differences in eye-hand coordination between national level Fencing and Thang-Ta players of Manipur.

H₀₄ It is hypothesized that there will be no significant differences in hand reaction time between national level Fencing and Thang-Ta players of Manipur.

Literature Review:

The reviewed literature reveals that motor fitness is the basic factors of performance in combat sports. However, the existing literature have primarily focused on individual sports and comparisons between closely related disciplines, leaving several important research questions unanswered.

Kanadela et al. (2024) conducted a quantitative descriptive study on biomotor analysis of the physical condition of male fencing athlete from Situbondo Regency. The study was focused on components such as strength, speed,

endurance, explosive strength, flexibility, balance, coordination, agility and accuracy. To collect the data, researcher selected 32 male fencers from Situbondo Regency. The result of the study showed sufficient level of biomotor abilities are there. However, there is lack of lower trunk flexibility, lack of left ankle flexibility and very good upper body flexibility can be observed. The study offers valuable information regarding the motor fitness status of fencer; it is descriptive in nature and does not compare fencers with combative sports athletes.

Gunawan (2021) compared between elite Taekwondo and Karate players on physical fitness level. The study was conducted on 20 elite athletes and to compare the between two group independent sample t-test was employed. It was found that Taekwondo players are showing higher physical fitness than Karate player in speed, endurance of abdominal muscle strength, and strength endurance of thigh muscle, agility, flexibility, leg reaction speed, and cardiovascular endurance, while karate players were demonstrated better in leg muscle strength and breathing than taekwondo players.

Kosova & Koca Kosova (2020) compared on body composition, speed, balance and flexibility level between foil and sabre fencers. In the study 24 (11 female and 13 male) foil fencer and 29 (15 female and 14 male) sabre fencers were took part, who were belong from under 14 and under 17 age categories and participating in the Fencing Fest International Fencing Camp held at Canakkale. It was found that there were no significant differences between two group in body composition, speed and balance. However, the foil fencers were found with better flexibility (sit and reach) than sabre fencers.

Kumar & Chaudhary (2014) undergo a comparison between Judo and Wrestling female players of Rohtak District on motor fitness. They conducted their study on 60 numbers of Inter-University female sports person 30 each. The age range was 18-25 years. To analysed the data, 't' test was employed. It was found that the judo female players have better flexibility and endurance than wrestling player.

De Quel et al. (2008) examined the reaction time of elite Fencing and Karate player. The researcher collected the data from 54 athletes (17 women and 37 men), who were belong from Spanish National Team of Fencing and Karate. For the statistical analysis SPSS 9.0 and 't' test was used. The result revealed that there is no significant difference between girl Spanish national fencer and karate players in reaction time ($t=0.017$; $p>0.05$) nor in efficiency ($t=1.332$; $p>0.05$), whereas the boys national fencer are better than Karate both in reaction time ($t=2.124$; $p<0.05$) and in the efficiency in the test ($t=2.969$; $p<0.05$)

Singer (1968) conducted a study on titled "Speed and Accuracy of Movement as Related to Fencing Success" to investigate the relationship between speed and accuracy of movement and success rate in fencing. For this study, author collected sixty-six college women fencer and analyses correlation between reaction time, response time, movement accuracy, and achievement. It was found no significant correlation among these.

The literature presenting that researcher have broadly examined the motor fitness characteristics among Fencing and other combative sports such as Karate, Taekwondo, Judo and wrestling. It is indicating that each sports develop unique physical and motor fitness characteristics as per the requirement of the particular event for effective and optimum level of execution. The present study may explore the overview of the motor fitness characteristics of Fencing and Thang-Ta player. Which may be useful for cross training method, that will reflect as a positive transfer of training.

Methodology:

For the present study, 30 male Fencer and 30 male Thang-Ta players of Manipur, age ranging from 15 to 20 years old were selected purposively, who participated in state and national level competitions. To measure the "flexibility" "Sit and Reach" test; to measure the "leg explosive strength"- "standing broad jump" test; to measure the "eye-hand coordination"- "alternate-hand wall-toss test" and to measure the "hand reaction time" – "nelson reaction time" test was conducted. Prior to application of the statistical test, data normality was checked by using Shapiro-Wilk test and significance level was set at 0.05.

Result and Discussion:

The result of the Shapiro-Wilk test for Flexibility, $W = 0.958$, $p = 0.040$, Leg Explosive Strength, $W = 0.954$, $p = 0.025$, and Hand Reaction Time, $W = 0.953$, $p = 0.021$, reveals that the p-values are less than 0.05, which

indicating that these variables are violated the normality assumption. Whereas, Eye-Hand Coordination indicating $W = 0.983$, $p = .578$, where p -value is greater than 0.05. It is indicating that the data for Eye-Hand Coordination were normally distributed. Hence, to compare between two group on Flexibility, Leg Explosive Strength and Hand reaction Time, non-parametric statistical test Mann-Whitney U test is employed. For Eye-Hand Coordination, parametric test independent t -test is employed.

Table 1: Result of the Normality (Shapiro-Wilk) Test

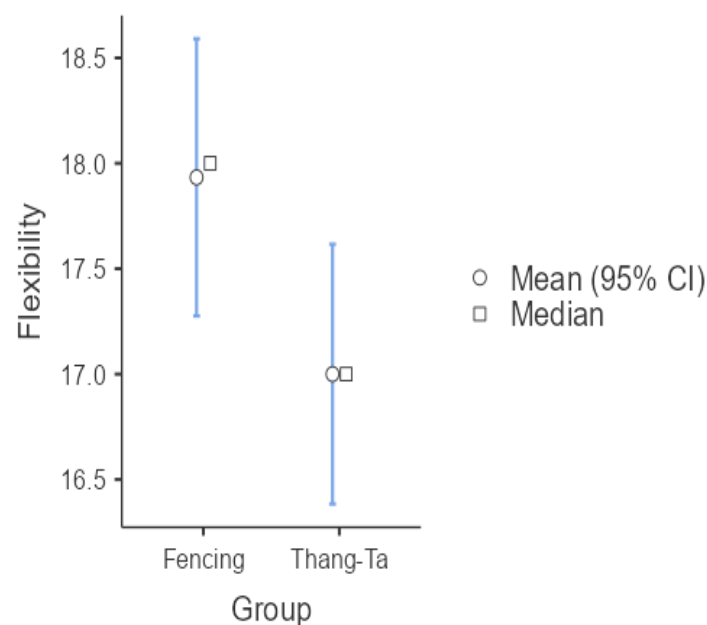
Variable	W	p
Flexibility	0.958	.040
Leg Explosive Strength	0.954	.025
Eye-Hand Coordination	0.983	.578
Reaction Time	0.953	.021

Flexibility: The result of “Mann-Whitney U” test showed statistically no significant difference between Fencing and Thang-Ta player in flexibility ($U = 320$, $p = 0.051$). However, Fencing players were showcased slightly better in flexibility ($17.93, \pm 1.84$) than Thang-Ta player ($17, \pm 1.72$), which indicated marginal difference and did not reach the level of significance 0.05. Hence, it can be concluded that both groups possessed equal levels of flexibility.

Table 2: Result of “Mann Whitney U” Test of Flexibility

Variable	Group	N	Mean	SD	U	p
Flexibility	Fencing	30	17.93	± 1.84	320	0.051
	Thang-Ta	30	17	± 1.72		

Fig. 1: Flexibility



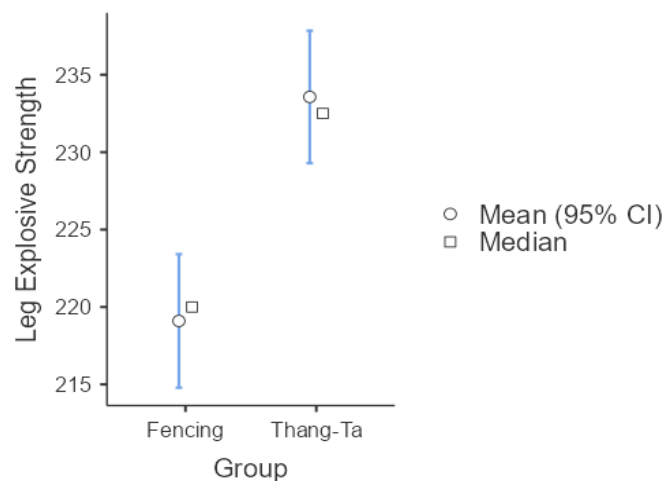
Leg Explosive Strength: In case of Leg Explosive Strength, a highly significant difference can be observed ($U = 174$, $p < 0.001$). The mean value indicating that the Thang-Ta players are better in Leg Explosive Strength

(233.57, ± 11.95) than Fencing players (219.1, ± 12.05). This might be due to the Thang-Ta sport's emphasis on jumping, kicking, and more dynamic lower body movement.

Table 3: Result of “Mann Whitney U” Test of Leg Explosive Strength

Variable	Group	N	Mean	SD	U	p
Leg Explosive Strength	Fencing	30	219.1	± 12.05	174	< 0.001
	Thang-Ta	30	233.57	± 11.95		

Fig. 2: Leg Explosive Strength

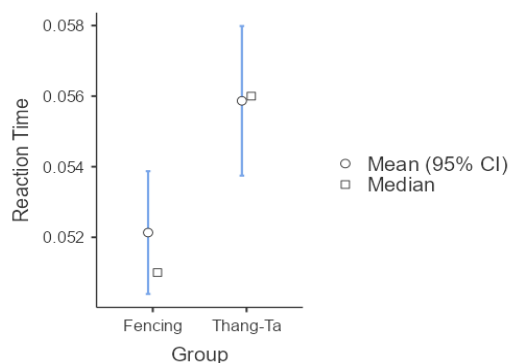


Hand Reaction Time: The result indicated, there is a significant difference between Fencing and Thang-Ta players in Hand Reaction Time ($U = 248$, $p = 0.003$). It can be observed that Fencing players resulted lower score in Hand Reaction Time (0.052 , ± 0.0049) than Thang-Ta players (0.056 , ± 0.0059). As the Fencing players showed lower reaction time, therefore it can be concluded that the Fencing players are better than Thang-Ta player in Hand Reaction Time.

Table 4: Result of “Mann Whitney U” Test of Hand Reaction Time

Variable	Group	N	Mean	SD	U	p
Hand Reaction Time	Fencing	30	0.052	± 0.0049	248	0.003
	Thang-Ta	30	0.056	± 0.0059		

Fig. 4: Hand Reaction Time

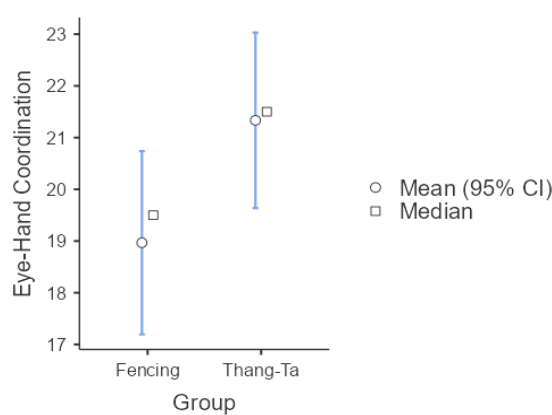


Eye-Hand Coordination: The result showed that, there is no statistically significant difference between Fencing and Thang-Ta players (t -value = - 1.89 at 58 df. $p = 0.064$). As the p -value exceeded the level of significance 0.05, therefore the null hypothesis was accepted. However, Thang-Ta players scored slightly higher mean value (21.3, ± 4.74) than the Fencing player (19, ± 4.95). Hence, it can be concluded that both the groups have equal level of Eye-Hand Coordination.

Table 5: Result of “Independent t -Test” of Eye-Hand Coordination

Variable	Group	N	Mean	SD	t	p
Eye-Hand Coordination	Fencing	30	19	± 4.95	-1.89	0.064
	Thang-Ta	30	21.3	± 4.74		

Fig – 5: Eye-Hand Coordination



Conclusion

The study compared between Fencing and Thang-Ta players of Manipur on flexibility, leg explosive strength, eye-hand coordination and hand reaction time. The result reveals that both sports having distinct motor fitness characteristics, which reflecting specific physical and technical demands in the respective sport.

The result of the statistical analysis showed, the Fencing players having slightly more flexibility than Thang-Ta player. However, between both groups statistically no significant difference was found. Similarly, no significant difference was found in eye-hand coordination, which indicating that players of both the events having comparable levels of eye-hand coordination.

In other hand, a highly significant difference was found in leg explosive strength. It can be observed that Thang-Ta players are possess better in leg explosive strength than fencing player. This might be because of the nature of Thang-Ta sports, where kicking, jumping, quick direction change, and dynamic lower body movements are existed. In contrast, fencing players demonstrated significantly faster hand reaction time than Thang-Ta players. Which indicating that the fencing sport required quick response to an opponent's attack and faster defensive and counter attacking skills.

At last, it can be concluded that, all the sports have their specific fitness requirement according to the nature of sports. The findings of this study can be useful for coaches and athletes to design cross-training programs, which can help to improve the performance in their respective sports.

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