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Comparative Study of Eye Hand Co-Ordination, Balance and Shooting Efficiency of Female National Pistol Shooters

Sandeep Kaur

M.Phil Research Scholar, Post Graduate Govt. College, Sector-11, Chandigarh (UT) (India)

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***Corresponding Author**
Email: shootersandeepkaur@gmail.com

ABSTRACT

Aim: *To compare the Eye hand co-ordination, Balance and shooting efficiency of female pistol shooters from Badal and Patiala.* ***Material & Methods:*** *The study was conducted on 90 female shooters and their age ranged 18 to 25 years. All subjects, which have been selected for sampling, participated in National or International level competitions and 45 players selected from Dashmesh Rifle club, Badal, District Mukatsar Sahib (Punjab) and 45 players selected from Best shooters academy, Patiala (Punjab). For the statistical purpose, t-test was used to compare both groups and level of significance was chosen at 0.05 level.* ***Result:*** *It is concluded that Eye hand co-ordination had significance difference had found between female national pistol shooters from Badal and Patiala. In case of Balance, there was no significance difference had found in Balance ability of shooting players. It was also observed that female national pistol shooters from Badal and Patiala had shown significance difference in shooting efficiency of match performance and single series.*

1. Introduction

Air Pistol shooting is an individual and team sport, needed accuracy, fitness. Shooting sports Involves Eye hand co-ordination, Balance and self confidence. Shooting sport is a popular activity of people of all ages. It is a physical activity as well as a psychological performing technique. There are various types of shooting events that are enjoyed by individuals- including 10 meter Air Rifle shooting, 25 meter rapid fire pistol shooting, Trap shooting etc. Air Pistol shooting provides participants an opportunity to develop physical fitness, Psychological balance and experience the fun and enjoyment. Shooting is technical ability of an individual to ensure the balance and eye hand co-ordination of the body .The important aspect of shooting sports is to promote body balance which is very much important in physical education activity. Co-ordination of the player is an activity of different skills. The level of co-ordination between different skills is sport specific and depends upon the coaching of sports skills. Co-ordination is the ability of an individual to integrate different muscle movements into an efficient pattern of movement". In sports Co-ordination makes the difference between good performance and poor performance. The accuracy and efficiency of skill patterns depends upon the co-ordination of body parts and balance. Shooting require eye- hand coordination and balance when they exhibit their skills for successful performance. Balance is the ability to maintain the equilibrium, an even distribution of weight enabling someone or something to remain upright and steady (oxford dictionary). There are two types of balance which are in common use in physical education are tests of static balance and tests of dynamic balance. In sports, Efficiency is an ability to do any work successfully and well mannered with accuracy. As there is lack of research available on importance of eye-hand co-ordination and balance in shooting sports. The co-ordination, balance and shooting efficiency of individual's own body systems is a general motor ability which is predominantly one's innate (inherited) quality. On the other hand, it may enhance with coordination of improving training and general practice of basic physical activities involving balance exercises, eye movement exercise and yogic exercises etc. The main purpose of our research work is to show a comparison of the Eye hand co-ordination, balance and Shooting efficiency between national level female pistol shooters of Dashmesh rifle club, Badal and national level female pistol shooters of Best shooters academy, Patiala. Findings of the study will helpful to coaches and physical educationists to enhance performance of shooters.

2. Material & Methods

The female pistol shooters numbering about 90 have been selected as a subject for the conduct of present study. All the female shooters are in the age group of 18-25 years, who have participated at national and international level. Evaluate the Eye hand co-ordination of the shooters, Eye hand co-ordination among the female pistol shooters were investigated by O'Connor Tweezer Dexterity Test Model 32022 is prepared by Lafayette Instrument Company. Static balance between female pistol shooters was investigated by using Stork balance stand test given by Nelson. Shooting Efficiency (single series) of pistol shooting investigated by used 10 bullets hit in the shooting target and shooting efficiency (match performance) investigated by used 40 shots hit on the shooting target. Pistol Shooters (10M) were selected for the sample and data gathered from 45 players selected from Dashmesh Rifle club, Badal, District Mukatsar Sahib (Punjab) and 45 players selected from Best shooters academy, Patiala (Punjab). Following steps have been taken in procedure for tools for measurement of Eye hand co-ordination, Balance and shooting efficiency variables in materials & methodology.

Sr. No.	Variable	Tool used	Developed by
1	Eye Hand Co-Ordination	O'Connor Tweezer Dexterity Test Model 32022	Lafayette Instrument Company
2	Balance	Stork balance stand test	Johnson and Nelson
3	Shooting Efficiency (Match performance)	10 meter air pistol shooting Performance (40 Shots hit on the target)	Criteria Given by National Rifle Association of India (NRAI) in NRAI match book
4	Shooting Efficiency (Single series)	10 meter air pistol shooting Performance (10 shots hit on the target)	Criteria Given by National Rifle Association of India (NRAI) in NRAI match book

In this study, Eye hand co-ordination in shooting was investigated with the help of O'Connor Tweezer Dexterity Test Model 32022 after the competition. The instructions had given before the conducting the test. Three trials conducted for Eye and hand co-ordination, time taken in seconds to fill holes by shooter, counted as score. The subject asked to fill holes within 10 minutes, if shooter took time more than 10 minutes, trial was discontinued. Static balance between female pistol shooters was investigated by using Stork balance stand test given by Nelson. The stork balance stand test requires an individual to stand on one leg for as long as possible. Subject asked to perform screening of health risks and obtain information regarding age, height, body weight, gender. Perform an appropriate warm-up before the test. For the purpose of scoring the total time in seconds is recorded. There were three trials given to the subject and score was the best of three attempts. Efficiency of pistol shooting (single series) evaluated by used 10 bullets hit in the target hitting number (1-10) by the shooter considered as scoring of shooting Efficiency (single series). Efficiency of pistol shooting (Match performance) investigated by used 40 bullets hit in the target hitting number (1-10) by the shooter considered as scoring of shooting Efficiency (Match performance). For the purpose of Statistical analysis t-test was used to compare the eye hand co-ordination, Balance and shooting efficiency of female National pistol shooters from Badal and Patiala.

3. Result and Discussion

The Results of the Study shows that female national pistol shooters from Patiala academy is having more Eye hand co-ordination ability as compare to female National pistol shooters from Badal. In case of Balance, there was equal level of balance ability in national female pistol shooters from Badal and Patiala. It is also concluded that female national pistol shooters from Badal club have more Shooting efficiency (match performance) and shooting efficiency (single series) as compared to shooters of Patiala.

Table-1
Mean S.D and t-value of Eye hand co-ordination, Balance of Female Pistol Shooters from Badal and Patiala

Variables	Group	N	Mean	Standard deviation	t value
Eye hand co-ordination	Badal	45	464.15	35.69	3.36
	Patiala	45	489.93	36.01	
Balance	Badal	45	24.67	1.36	0.13
	Patiala	45	24.70	0.68	

Level of significance=0.05, Tabulated t value=1.99

The above table reveals that Eye hand co-ordination had significance difference had found between female national pistol shooters from Badal and Patiala. The calculated t-value of Eye hand co-ordination value is 3.36 which were more than tabulated value. In analysis part the Mean and SD of Eye hand co-ordination found to be 464.15 and 35.69, whereas in case of Patiala Eye hand co-ordination was found to be 489.93 and 36.01. Moreover, the calculated t-value of Balance is 0.13 which is less than tabulated value. Therefore, there is no significance difference has been found in Balance ability of shooting players among Dashmesh rifle club, Badal and Best shooters shooting academy Patiala. Badal players had mean value and SD was observed to be 24.67 and 1.36 respectively, whereas in case of Patiala, Mean value and Standard deviation of balance is 24.70 and 0.68 respectively.

Table-2
Mean S.D and t-value of shooting Efficiency of Female Pistol Shooters from Badal and Patiala

Variables	Group	N	Mean	Standard deviation	t value
Shooting Efficiency (Match performance)	Badal	45	361.48	4.60	2.77
	Patiala	45	358.91	4.41	
Shooting Efficiency (Single Series)	Badal	45	90.51	2.45	4.83
	Patiala	45	88.86	2.81	

Level of significance=0.05, Tabulated t value=1.99

It was observed that female national pistol shooters from Badal and Patiala had shown significance difference in shooting efficiency of match performance and single series. The calculated t-value of shooting efficiency of match performance is 2.77 which is more than tabulated value. Shooting efficiency (Match performance) of Badal club players the mean and S.D was observed to be 361.48 and 4.60 respectively, whereas in case of Patiala, Mean and Standard

deviation of Shooting efficiency (Match performance) in Shooting is 358.91and 4.41. Further, the calculated t-value of shooting efficiency of single series is 4.83 which is more than tabulated value. Shooting efficiency (Single series) of Badal club players the mean and S.D was observed to be 90.51 and 2.45 respectively, whereas in case of Patiala academy players, Mean and Standard deviation of Shooting efficiency (Single series) in Shooting is 88.86 and 2.81 respectively.

4. Conclusion

It is concluded that female national pistol shooters from Patiala academy is having more Eye hand co-ordination ability as compare to female National pistol shooters from Badal. In case of Balance, there was equal level of balance ability in national female pistol shooters from Badal and Patiala. It is also concluded that female national pistol shooters from Badal club have more Shooting efficiency (match performance) and shooting efficiency (single series) as compared to shooters of Patiala**. Wong et al. (2019)** studies on Balance control, agility, eye–hand coordination, and sport performance of amateur badminton players. Results of the study had shown no significance difference between groups in balance ability. On the other hand there was significance difference found between eye hand co- ordination of players. **Bressel et al. (2007)** Study on static and dynamic balance in female collegiate soccer, basketball, and gymnastics athletes. Results of the study had shown no significance difference among the soccer players.

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