Junior Female Air Pistol Shooters and their Relationship to Selected Anthropometric Measurements

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Abstract

The purpose of the present study was to ascertain the relationship of height, weight, arm length, leg length, waist girth and chest girth to air pistol shooting performance of junior female air pistol shooters (N=30). The age of the subjects ranged between 18 to 21 years. The anthropometric measurements of the subjects were recorded following the appropriate procedures at specific land marks. The air pistol shooting performance of the subjects was evaluated with the help of coaches working at the respective shooting ranges in NCR region following the appropriate procedures. Each subject was given 20 pellets to shoot at the target. Shooting performance was found to be significantly related to weight, arm length, leg e length and chest girth at 0.05 level of confidence whereas relationship of height and shooting performance was not found to be statistically significant.

KEYWORDS: Junior Female Pistol Shooters, Anthropometric Measurements

INTRODUCTION

Over the years the popularity of shooting sport has increased in India and thousands of young males and females have taken to this sport. The Shooting Federation of India is popularizing as well as promoting this sport in different parts of the country and assuring availability of essential facilities to the shooters so that the number of shooters is improved and also their performance is enhanced. This is mainly because of the fact that Indian males and females shooters have performed exceedingly well at the national as well as in the international level competitions. In the Olympic Games also of India's 35 Olympic medals, 4 have come from this sport which includes Gold by Abhinav Bindra in the 2008 Olympics held at Athens. Some of the outstanding Indian shooters who have brought laurels to their country at the international level include Abhinav Bindra,Vijay Kumar, Jitu Rai, Rajyavardhan Singh Rathore, Anjali Bhagwat, Heena Sidhu, Gagan Narang, Apurvi Chandela, Ronjan Sodhi, Manu Bhaker, Shreyasi Singh, Anisa Sayyed, Saurabh Chaudhary and Rahi Sarnobat. In addition in the Paralympics also our male and female shooters have done exceedingly well.

Indian shooting team has been a part of practically all the Olympic Games but shooting contingent of 2012 Olympic Games held at London was larger as compared to the size of shooting contingent of the previous Olympic Games. In all 11 shooters (7males and 4 females) represented India and with his outstanding performance Gagan

Narang achieved a bronze in the 10m Air Rifle event. Abhinav Bindra, with his outstanding performance secured India's first individual gold medal in the same event in the 2008 Beijing Summer Olympics. In the same games Vijay Kumar, an Indian Army soldier won the silver in the 25m rapid fire pistol event after finishing 4th in the qualification rounds. He experienced very tough competition from Chinese shooter Ding Feng who ultimately secured third position. In the same games, performance put up by Joydeep Karmakar who attained 4th position in the 50m rifle prone event was also highly appreciated. Most significant factor to be observed was the emergence a young crop of both male and female shooters and they have performed very well in different shooting competitions held in different parts of the world.

Characteristics of a Good Shooter:

In case a shooter wants to be successful in his or her career as a shooter, it is important that he or she develops the following characteristics:

- Regularity in training: The shooter must practice regularly for the improvement of skill of shooting as well as development of various physical fitness as well as psychological factors. The best way to improve performance under stress is through constant and regular practice.
- Patience: This means that shooter should not come under undue pressure while participating in competition. If the shooter is able to shoot with complete indifference, perhaps he or she should take up another sport.
- Faith: The shooter should have faith in his rifle, coach and also self so that he or she able to shoot accurately with the rifle or the pistol.
- Experience: The shooters should practice very sincerely and follow a good practice regimen practically every day in each training session. It is an accepted fact that correct and regular practice that makes a shooter perfect. One needs to long training sessions in order to become a good shooter.
- Will to do one's best: The will to perform your best in each training session is a basic necessity for becoming a good shooter. In case one wants to become an outstanding shooter it is important that the sports person should have a positive approach to training as well as competitive sessions.

Kin-anthropometry is a science dealing with the study of measurement of body size, shape and form. It has been very effectively used in identification of individuals, at a relative younger age, which could be ideal for specific sports event. For example, individuals with tall stature, long legs and shorter trunks are best suited for events like jumping, hurdling and vaulting. Individual with average stature, short legs and narrow shoulders are most ideal for long distance running, while tall and heavy muscled individual with long legs and broad shoulders in relation to hip breadth are best suited 400 meters running. Similarly tall individual with greater arm reach and longer legs have and added advantages in events like basketball, volleyball, pole vault, long and triple jumps. The high jumpers, on the other hand, are tall individuals with probably the longest legs relative to their trunk, than the other athletes.

Benefits of kin-anthropometry:

1. Helps in evaluating nutritional status (Nutritional anthropometry)
2. Aids in determining pattern of children growth.
3. Individual's physical structure is a significance factor in his motor performance e.g. well proportional physique of boxers and gymnasts, wiriness of champion long distance runners, super structure of top basketball players and massive build of great shot putters and discuss and hammer thrower.
4. Helps in distinguishing one person from another.
5. Helps in finding out growth disorders.
6. Important in sizing the clothing and manufacturing of personal protective equipments.
7. Helps in identification of sports talents.

It is felt that measurements of different body segments as well as height and weight have relevance to shooting performance. Height has direct relevance to balance and those who are short probably have better balance because their center of gravity is closer to the base. Weight is also directly proportional to stability of the body and those shooters who have more weight will probably shoot more accurately because of steadiness of the body. Similarly trunk length and girth of different sites in the body may have relevance to the sport of shooting.

METHODOLOGY

The subjects of the study were 30 female junior level female shooters who were training in different shooting academies of NCR. It was ensured that the selected subjects had state level participation.

Selection of Variables

After gleaning through the available literature and also after having a detailed discussion with the shooting experts the variables to be included in the research study were finalized. In addition to the above, the scholar also kept in mind the feasibility criteria so that only those anthropometric variables were chosen for which equipment and instruments were available for testing. All the latest equipments and instruments were used throughout the study for better reliability and validity of result. Keeping in mind the above factors, the following variables and tests were selected:

S. No.	Anthropometric Measurement	Instrument Used
1.	Height	Stadiometer

2.	Weight	Weighing Machine
3.	Arm Length	Measuring Tape
4.	Leg Length	Measuring Tape
6.	Waist Girth	Measuring Tape
7.	Chest Girth	Measuring Tape

Standardized procedures were adopted for the taking anthropometric measurements. The data was analyzed employing coefficient of correlation.

Procedure of Scoring Shooting Performance

Each shooter used appropriate target as per the requirements of the event. Each subject was given 20 pellets for shooting at the target. As per the rules of the events i.e. 10m air pistol the score of each shooter was calculated and recorded. For computing the final score of the subject help of the coaches working at various shooting ranges was taken.

Findings

The coefficient of correlation in respect of different anthropometric variables and shooting performance is presented in the following table:

Table 1

Coefficient of Correlation Between Criterion Variable (Air Pistol Shooting Score) And Selected Anthropometric Measurements

Criterion Variable (Shooting Performance)	Dependent Variable (Anthropometric Measurement)	Coefficient of Correlation
10m Pistol Shooting Score	Height	0.287*
	Weight	0.419**
	Arm Length	0.374**
	Leg Length	0.420**
	Waist Girth	0.163*
	Chest Girth	0.397**

N=30

** Significant at .05 level of confidence

* Not significant at .05 level of confidence

$r_{.05}(28) = 0.361$

The analysis of data in the above table clearly shows that the values of coefficient of correlation in respect of weight, arm length, leg length and chest girth are statistically significant at 0.05 level of confidence with air pistol shooting performance. The values of coefficient are higher than the table value of 0.361 with 28 degrees of freedom. With respect to height and waist girth the relationship with shooting performance is statistically not significant at 0.05 level of confidence as the values of coefficient of correlation i.e. 0.287 and 0.163 are less than the table value of 0.361 with 28 degrees of freedom.

Discussion of Findings

The positive relationship between body weight and shooting performance in case of junior female 10m pistol shooters can be attributed to the 4th condition of stability mentioned above. Positive relationship between shooting performance and leg strength in the case of junior female shooters could also be justified by the argument that strong legs might help a shooter to maintain proper stance for a considerable period while the shooter is participating in a competition. More chest girth may be an indication of more musculature in the region and that might be of help for a shooter by helping him/her in keeping her arm holding the pistol steady and thus helping the shooter to aim with more accuracy. The reason of significant correlation between body composition and shooting performance could be justified by the fact that higher body composition will lead to more body weight and higher body weight contributes to better stability.

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