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## Relationship of strength and flexibility with skill performance in badminton players

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### Abstract

The purpose of the study was to determine the relationship of strength and flexibility with skill performance in badminton players. The allied objectives are as follows: 1) To find out the strength of badminton players, 2) To find out the flexibility of badminton players, 3) To evaluate the performance of badminton players, 4) To find out the relationship of strength with skill performance of badminton players and 5) To find out the relationship flexibility with skill performance of badminton players. The present research was taken the male subjects for the study. The sources of data would be made from the Badminton Players. Those were participated in their Amravati District tournament. The researcher was selected 40 Badminton Players from District tournament of Amravati City as Subjects. The 40 Subjects would be selected by simple random sampling method. Raw data were by using a statistical technique descriptive statistics and Coefficient of Correlation (r-value) was calculated using Pearson's Product Correlation Method. The level of Significance was considered for the study was only 0.05 level. Results: There was a positive relationship between arm strength, abdominal strength, leg strength, grip strength, flexibility with skill performance of badminton players

**Keywords:** Strength, flexibility, skill performance, badminton players

### Introduction

Physical fitness is probably the most popular and frequently used term in physical education. The most important objective of physical education is to develop physical fitness. According to Nixon and cozens (1964), it was the desire to establish a scientific approach to the development of physical fitness which formed the basis of the first meeting of physical educators in 1885 when the profession of physical education originated. The United States president's Council on physical fitness and sports defined the terms "physical fitness as the ability to carry out daily task with vigor and alertness, without undue fatigue, with ample energy to enjoy leisure time pursuits and to meet unforeseen emergencies" (Clarke, 1971). General fitness implies the ability of a person to live most effectively with his and her potentials, which depend upon the physical, mental, emotional, social and spiritual components of fitness which are highly interrelated. The primary components of physical fitness identified by the president's council on physical fitness and sports were muscular strength, muscular endurance and cardio respiratory endurance. However, later on the president council also included some other motor performance components namely agility, speed, flexibility and balance in physical fitness. But keeping in view the general opinion of the majority of the researchers, the author has not included the components such as speed, agility, power and balance (which are more important for success in specified sports) as essential components of basic physical fitness. However, the author defines physical fitness by group of five components, namely muscular strength, muscular endurance and cardio respiratory endurance, flexibility and body composition<sup>[1]</sup>.

Every game required a considerable amount of physical fitness and mastery of skills. Now the question that arises in the mind of every individual is "What does the term 'physical fitness' deal with? Fitness is very specific to the sports or activity, which a person does. For example, the fitness required to be a 100 mts sprinter is entirely different from that needed by rugby, hockey or squash. Soccer players must have good endurance, good lower and upper body strength, good flexibility, agility and speed<sup>[2]</sup>.

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**Flexibility:** The range of movement around a joint dependent on a number of factors, including the size and shape of the bones, the ability of tendons to stretch, the condition of the ligaments, normal joint mechanics, soft tissue mobility and extensibility of the muscles. Good flexibility is beneficial in sport especially, for example, gymnastics and should be part of a sports-specific training programme and warm-up. However, flexibility training needs to be balanced with strength training to maintain joint stability. Flexibility assessment can be made directly by measuring the angle of joint displacement using a goniometer, but this requires a skilful operator to achieve consistent results. More indirect measurements include the sit-and-reach or standing toe-touch tests [3]. Individual body flexibility level is measured and calculated by performing a sit and reach test, where the result is defined as personal flexibility score [4].

**Muscular strength:** Muscle strength refers to the amount of force a muscle can produce with a single maximal effort. Size of muscle cells and the ability of nerves to activate them are related to muscle strength. Examples Building muscle strength helps with body alignment, makes performing everyday actions easier, increases metabolism, and relieves stress. You don't need to go to the gym to increase your muscle strength. Simple exercises can be done at home without equipment. Check out these workouts and resources to improve your muscle strength and boost your calorie burning potential [5].

### Statement of Problem

#### Relationship of Strength and Flexibility with Skill Performance in Badminton Players

#### Purpose of the Study

The main purpose of the study was to find out the relationship of strength and flexibility with skill performance in Badminton players.

The allied objectives are as follows:

1. To find out the strength of badminton players.
2. The find the out the flexibility of badminton players.
3. To evaluate the performance of badminton players.
4. To find out the relationship of strength with skill performance of badminton players.
5. To find out the relationship flexibility with skill performance of badminton players.

**Table I:** Descriptive statistics on arm strength, abdominal strength, leg strength, grip strength, flexibility and performance variables of the subjects

Variables	Arm strength	Abdominal Strength	Leg Strength	Grip Strength	flexibility	Skill Performance
Mean	11.68	33.83	207.63	33.03	26.30	1.75
S.D.	1.85	3.81	18.52	7.51	2.84	0.74

As can be seen from Table-I the mean values of subjects in arm strength, abdominal strength, leg strength, grip strength, flexibility and performance. The mean values of the subjects arm length was 11.68 with standard deviation of  $\pm 1.85$ , the abdominal strength was 33.83 with standard deviation of  $\pm 3.81$ , the leg strength was 207.63 with standard deviation of  $\pm$

### Methodology

#### Sources of data

The present research was taken the male subjects for the study. The sources of data would be made from the Badminton Players. Those were participated in their Amravati District tournament.

#### Selection of Subject

The researcher was selected 40 Badminton Players from District tournament of Amravati City as Subjects.

#### Sampling Method

The 40 Subjects would be selected by simple random sampling method.

#### Equipments and Test used for Collection of Data

Following equipments and test would be used for collection of data:

Sr. No.	Variable	Test
1)	Arm strength	Pull-Ups
2)	Abdominal Strength	Bent knee Sit-Ups
3)	Leg Strength	Standing Broad Jump
4)	Grip Strength	Grip Dynamometer
5)	Flexibility	Sit and Rich Test
6)	Badminton Performance	Badminton Skill Test
Badminton Skill Test		Badminton shuttle Run Test
		Tennis Ball Throw Test
		Standing Backward Jump

#### Analysis of data

Raw data were by using a statistical technique descriptive statistics and Coefficient of Correlation (r-value) was calculated using Pearson's Product Correlation Method. The level of Significance was considered for the study was only 0.05 level.

#### Computation of descriptive statistics

The descriptive statistics on strength and flexibility variables of subjects are presented in Table -I.

18.52, the grip strength was 33.03 with standard deviation of  $\pm 7.51$ , flexibility was 26.30 with standard deviation of  $\pm 2.84$  and performance was 1.75 with standard deviation of  $\pm 0.74$ . The Pearson's Product Correlation Method analysis tables had been given below.

**Table 2:** Coefficient of correlation of arm strength, abdominal strength, leg strength, grip strength and flexibility with performance in handball players

Variables	Coefficient of Correlation (r)	Relationship
Arm strength	0.875*	High positive
Abdominal Strength	0.691*	Average positive
Leg Strength	0.521*	Low positive
Grip Strength	0.912*	Very High Positive
flexibility	0.414*	Low Positive

\*Significant at .05 level of confidence r. 05 (38) 0.304

An analysis as shown in table-2 indicated that arm strength had significantly positive correlation to performance ( $r=0.875$ ) were statistically significant as the value obtained were much higher than the tabulated value (0.304) required, to be significant at 0.05 level with 38 degree of freedom. Performance had significantly high positive relationship to arm strength.

An analysis as shown in table-2 indicated that Performance had significantly correlation to abdominal strength ( $r=0.691$ ) were statistically significant as the value obtained were much higher than the tabulated value (0.304) required, to be significant at 0.05 level with 38 degree of freedom. Performance had significantly average positive relationship to abdominal strength.

An analysis as shown in table-2 indicated that Performance had significantly correlation to leg strength ( $r=0.521$ ) were statistically significant as the value obtained were much higher than the tabulated value (0.304) required, to be significant at 0.05 level with 38 degree of freedom. Performance had significantly low positive relationship to leg strength.

An analysis as shown in table-2 indicated that Performance had significantly correlation to grip strength ( $r=0.912$ ) were statistically significant as the value obtained were much higher than the tabulated value (0.304) required, to be significant at 0.05 level with 38 degree of freedom. Performance had significantly very high positive relationship to grip strength.

An analysis as shown in table-2 indicated that Performance had significantly correlation to flexibility ( $r=0.414$ ) were statistically significant as the value obtained were much higher than the tabulated value (0.304) required, to be significant at 0.05 level with 38 degree of freedom. Performance had significantly low positive relationship to flexibility.

### Conclusion

On the basis of the result drawn with the mentioned methodology the following conclusions were sougued out:

1. There was a positive relationship between arm strength with performance of badminton players.
2. There was a positive relationship between abdominal strength with performance of badminton players.
3. There was a positive relationship between leg strength with performance of badminton players.
4. There was a positive relationship between grip strength with performance of badminton players.
5. There was a positive relationship between flexibility with performance of badminton players.

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