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## Analysis of skill-related physical fitness elements between female twins

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### Abstract

The purpose of this study was to analyze the skill-related physical fitness between female twins. Female twins served as subjects for this study. Fifteen female twins were selected on an intentional sampling. The scholar selected the twins whose average age was within 12 years (N =30) and they were all female twins in Kottayam District, Kerala. Skill-related physical fitness variables such as Speed, Explosive strength, Agility, and Cardio-vascular endurance were chosen for this study. To analyze the fitness status of female twins, Pearson's Product Movement Correlation was used. Results of the analysis revealed that a degree of correlation was found in Speed, Agility and Cardio Vascular Endurance. There were no significant relationship between the twins in explosive power.

**Keywords:** Female twins, skill-related, physical fitness

### Introduction

Technology has permeated every aspect of modern life, sports is no exception science applied to sport has enabled modern youth to develop physical capacities beyond anything imagined earlier. Sports have become highly competitive and records are broken rapidly.

By nature human beings are competitive and aspire for excellence in all athletic performance. Not only in the present age but even the people of the ancient times were aware of the importance of physical fitness. Ancient people did not have any systematic program to develop physical fitness. Yet they kept themselves fit by participating in activities not only kept them fit but also enabled them to meet the requirements of their daily life. Not only every man, has every nation wanted to show his supremacy by challenging the other nation. Thus this challenge stimulates, inspires and motivates the entire nation to sweat and strain, to run faster, jump higher, throw further and exhibit greater strength, endurance and skill in the competitive world. This is only possible in channelizing them into appropriate game and sports according to their potentialities and scientific, systematic and planned sports training.

NO two organisms are identical, and the unique collection of traits, that define an individual in called "phenotype". Phenotype encompasses both physical and behavioral characteristics. Even identical twins raised together exhibit different phenotypes, even though they share the same genome. Most of the differences between identical twins are the result of difference in their environments.

### Statement of the problem

The purpose of this study was to analyze the skill-related physical fitness between female twins.

### Delimitations

- 1) The study was delimited to the following skill related physical fitness variables.
  - i) Speed
  - ii) Explosive Strength
  - iii) Agility
  - iv) Cardio vascular Endurance.
- 2) The study was delimited to the female twins and their age ranged 10 to 17 years.
- 3) The study was restricted to 15 female twins.

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- 4) Similar studies can be done on children with neurological handicaps or mentally retackled children.
- 5) The result of the study would be having immersed use of coaches, physical tutors and other people to locate the talented people on the field of sports.
- 6) This study will help the teachers to clarify students according to their level of fitness.

## Methodology

### Selection of subject

Female twins served as subject s for this study. Fifteen female twins were selected on an intentional sampling. The scholar selected the twins whose average age was within 12 years (N =30) and they were all female twins.

### Selection of variables

The following skill-related physical fitness variables were chosen for this study keeping the feasibility in mind and the availability of the instruments.

- a) Speed-50mts. dash
- b) Explosive strength–Standing Broad Jump
- c) Agility –Shuttle –Run 4x10mts.
- d) Cardio-vascular endurance –Harvard Step Test

### Tester competency

To ensure uniformity, in the testing process, the tester reliability was established by test and re-test method on the skill –related physical fitness elements. Each test was administered on ten subjects and the data was analyzed by the correlation method as given by Clarke and Clarke1.

**Table 1:** Tester competency and Reliability of Data

S. No.	Variables	Co efficient of correlation
1.	Speed	0.824*
2.	Explosive strength	0.872*
3.	Agility	0.921*
4.	Cardio vascular Endurance	0.934*

Significant at the 0.05 level of confidence with df [N-2]=0.632.

### Test Administration

#### 50 Meter Dash

**Purpose:** To measure speed

**Procedure:** Two lines were marked 50 meter apart as starting line and finish line, on the command go the subject ran as fast as possible across the finish line to cover 50 meter distance. No trials were given.

**Scoring:** The elapsed time was measured to the nearest 1/10 of the seconds.

#### Standing broad jump

**Purpose:** To measure the explosive strength.

**Equipments:** Measuring tape and score sheet, a long jump pit was used.

**Procedure:** The subject stood with toes just behind the take – off lines and jumped when ready. After making a preparatory backward swing with both, arms she swung her arm forward, vigorously springing from both feet simultaneously to jump as forward as possible. After landing the subject were cautioned not to walk back towards the take off line. No trials were given.

**Scoring:** The score was the distance jumped nearest meter.

### Shuttle Run Test

**Purpose:** To measure the general agility of the subjects.

**Equipment:** Two wooden blocks of 2 x 2 x 4 inches, stop watches, score sheet and measuring tape.

**Procedure:** Two parallel lines were marked on the ground 30 feet apart. The wooden block was placed behind the finishing line. The subject took the standing start position behind the starting line. The starter gave the start command “Go”. The subjects ran to the wooden block and picked up the wooden block then returned to the starting line and placed the wooden block, the same procedure was followed to replace the second wooden block to the starting line. No trails were given.

**Scoring:** The time was recorded to the nearest 1/10 second.

### Harvard Step Test

**Purpose:** To measure the cardio – vascular endurance.

**Equipment:** A Stop watch, 18-inch high bench, metronome (optional), stethoscope (optional).

**Test Administration:** The tester demonstrated the stepping up style to be followed by the subjects during the test. With the availability of 18-inch high bench area and pulse count testers, a group of ‘1 to 4’ subjects asked to start the stepping up and down exercise. The stopwatch was started at the signal ‘go’. The subject was given instruction that on the command ‘up’ or on the second command ‘up’, she placed both feet fully on the bench with the body erect straightening the legs and backed immediately after reaching the erect posture, she stepped down one foot at a time as the tester gave the command down-down. The subject was instructed to repeat the stepping up and down exercise in the above manner for three minutes at the pace of 24 steps per minute. The subject was also asked to take off and step-down with the same foot each time. The tester started the stopwatch simultaneously with the first take of by the subjects and stopped the watch after exactly three minutes gave the ‘stop’ signal to the subjects who immediately sat down on the bench. In case, any subject stopped the exercise or slowed down the pace of the exercise due to fatigue or exhaustion, her duration of exercise performed at the correct pace was noted (in seconds ) and was asked to stop and sit down. Exactly one minute after exercise, the tester started counting the pulse rate and recorded the same for the duration from 1 to 1.5, 2 to 2.5 and 3 to 3.5 minutes.

**Scoring:** The score was calculated by the following formula.

$$P.E.I = \frac{\text{Duration of exercise in seconds} \times 100}{2 \times \text{sums of three pulse counts after exercise.}}$$

### Statistical Analysis

The data collected on the scale – related physical fitness elements from the twins Kottayam; Kerala state was statistically analyzed by applying the person’s product movement correlation.

'r' indicates the degree of correlation between The Twins in each of The skill-related physical fitness elements. Test of significant was fixed at 0.05 level of confidence.

### Analysis and interpretation of data

The data collected on the skill related physical fitness elements from the female twins were statistically analyzed by the product-movement correlation 'r' for each of the physical fitness variables.

The object of the study was to determine the degree of correlation 'r' existing between the twin females i.e. relationship between the elder of the twin or the younger of the twin, on speed (100mts dash), agility (4x10mts), explosive power (S.B.J) and cardio-vascular endurance (Harvard step-test).

The obtained correlation 'r' was tested for significance difference at the .05 level of confidence.

**Table 2:** Correlation between the skills-related physical fitness elements on female twins

S. No.	Physical Fitness Variables	Correlation
1.	Speed (50mts dash)	r=0.533*
2.	Agility (Shuttle run)	r=0.686*
3.	Explosive Power (Standing broad jump)	r=0.353*
4.	Cardio-Vascular Endurance (Hard vard step test)	r=0.557*

\*Significant at r.05 with df 28 'r' value for the table was read as 0.361.

### Discussions and Findings

Among the skill related physical fitness elements, Speed, Agility and Cardio Vascular Endurance showed a significant correlation 'r' between the female twins. This may be attributed to the fact that the selected subjects were in the growing stage and hence they were potential in Speed, Agility and Cardio- Vascular Endurance has been well executed. More over the subjects were exposed to a minimum of three periods of Physical Education Training per week, so they were well adapted to the fundamental movements.

However in the case of explosive power (Standing broad jump) there was no significant correlation between the twins. This may be due to the fact, that most of the selected subject s had attained puberty (i.e, 10 to 17 years), so psychologically the subjects did not perform their maximum effort in leg strength. Further, it was also observed that physical education content in the selected schools did not give much importance to the development of individual, Health Related Physical Fitness Program.

It was hypothesized earlier that their will be a high degree of correlation between the twins on the Skill-Related Physical fitness variables. The Null hypothesis has been partially rejected and accepted.

Further, it was noted that 'r' ranged for  $0 \pm 1.00$ . 'r' value of 0.04 indicates that the degree of correlation was below average; 'r' of 0.50 to 0.60 was termed as having an average relationship. When r=.60 to 0.80 the degree of relationship was high and the degree of relationship was described to be very highly correlated, when 'r' value ranged from r=0.80 to r=0.99.

### Summary conclusion and recommendation

The skill related physical fitness variables, such as, Speed (50 mts dash), Agility (4x10 mts), Explosive Power (S.B.J) and Cardio Vascular Endurance (Harvard Step test) tests were

administered. The data collected from the female twins were statistically analyzed by the Product-Movement Correlation 'r'. The obtained 'r' was tested for significance at the .05 of confidence.

### Conclusions

Results of the analysis revealed that a degree of correlation was found in Speed, Agility and Cardio Vascular Endurance. There was no significant relationship between the twins in explosive power. Hence, the Null hypothesis was partially accepted and rejected.

### Recommendations

A similar study may be conducted on a cross sectional basis for school children.

Health related physical fitness variables might be included for future study. A similar study may be conducted with the subject's academic achievements and fitness profiles.

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