



## CONSTRUCTION OF PHYSICAL FITNESS TEST ITEMS NORMS OF TAEKWONDO PLAYER OF GURU NANAK DEV UNIVERSITY, AMRITSAR, INDIA

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### **Abstract:**

The purpose of this study was to construct Norms of Physical Fitness Test Items of Taekwondo Player. To obtain data, the investigators had selected Forty (N=40), male Inter-College level Taekwondo Player of Guru Nanak Dev University, Amritsar between the age group of 18-28. The Muscular Strength was measured by Handgrip Strength Test, Muscular Power was measured by Vertical Jump Test, Muscular Endurance was measured by Pull-Up Test, Running Speed was measured by 20-Meter Dash, Running Agility was measured by Illinois Agility Test, Jumping Ability was measured by Standing Long Jump Test, Throwing Ability was measured by Overhead Medicine Ball Throw Test, Flexibility was measured by Sit and Reach Flexibility Test and Balance was measured by Stork Balance Stand Test. The data, which was collected by administering tests, was statistically treated to develop for all the test items. In order to construct the norms, Percentile Scale was used. Further, the scores were classified into five grades i.e., very good, good, average, poor and very poor.

**Keywords:** muscular strength, muscular power, muscular endurance, running speed, running agility, jumping ability, throwing ability, flexibility, balance

### **1. Introduction**

Physical activity is a behavior influenced by many factors. These factors work on four levels: physiological, psychological, sociocultural, and ecological (Lindquist, Reynolds

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& Goran, 1999). Physiological level of physical activity in children is determined by age, gender, and ethnicity (Reynolds et al. 1990 & Hudson, 2008).

Physical activity has positive effects on physical, psychological/social, and cognitive health on school-aged children and youth (Janssen & LeBlanc, 2010). Evidence showed that physical activity improved body composition and the prevention of overweight and obesity, improved skeletal (Gunter, Almstedt & Janz, 2012), metabolic (Janssen & LeBlanc, 2010) and cardiovascular health (Fernhall & Agiovlasitis, 2008). Despite biological benefits on biological health, physical activity also affects psychosocial health, such as reduction of symptoms of depression, stress, anxiety and improvements in self-confidence and self-esteem (Biddle & Asate, 2011).

Taekwondo has been propagated worldwide and is currently a popular sport reaching about 70 million practitioners in 204 countries (World Taekwondo Federation member status, 2013).

Taekwondo is a physically demanding sport that is dominated by kicks and punches with points scored by delivering blows to the opponent (Bueke et al, 2007 & Probst et al, 2007).

## 2. Material and Methods

### 2.1 Participants

Fourty (N=40), male Inter-College level Taekwondo Player of Guru Nanak Dev University, Amritsar between the age group of 18-28 years volunteered to participate in the study. All the subjects were informed about the objective and protocol of the study.

### 2.2 Variables

The following Physical Fitness Test Items were selected for the present study:

- a) Muscular Strength;
- b) Muscular Power;
- c) Muscular Endurance;
- d) Running Speed;
- e) Running Agility;
- f) Jumping Ability;
- g) Throwing Ability;
- h) Flexibility;
- i) Balance.

### 2.3 Procedure

The scores of each Physical Fitness Test Items were recorded by the researcher on the basis of performance in tests. The subjects were given adequate demonstration, practice trial and required instructions for all tests.

**Table 1:** Description of Physical Fitness Test Items and Tests

Sr. No.	Physical Fitness Test Items	Tests
1.	Muscular Strength	Handgrip Strength Test
2.	Muscular Power	Vertical Jump Test
3.	Muscular Endurance	Pull-Up Test
4.	Running Speed	20 Meter Dash
5.	Running Agility	Illinois Agility Test
6.	Jumping Ability	Standing Long Jump Test
7.	Throwing Ability	Overhead Medicine Ball Throw
8.	Flexibility	Sit and Reach Flexibility Test
9.	Balance	Stork Balance Stand Test

### 3. Statistical Technique

The data, which was collected by administering tests, was statistically treated to develop for all the test items. In order to construct the norms, Percentile Scale was used. Further, the scores were classified into five grades i.e., very good, good, average, poor and very poor.

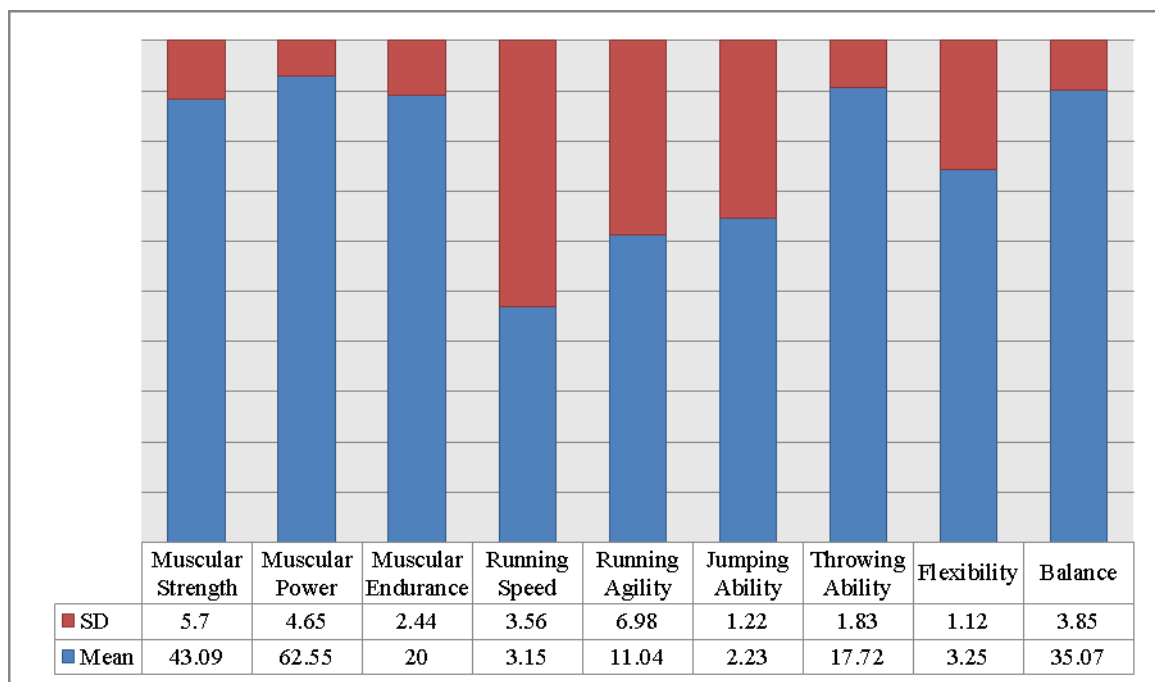
### 4. Results

For each of the chosen variable, the result pertaining to Descriptive Statistics (Mean & Standard Deviation) and Percentile Plot (Hi & Low) of Physical Fitness Test Items of Fourty (N=40), male Taekwondo Player of Guru Nanak Dev University, Amritsar are brought forth in Table 2:

**Table 2:** Descriptive Statistics (Mean & Standard Deviation) and Percentile Plot (Hi & Low) of Physical Fitness Test Items of Taekwondo Players of Guru Nanak Dev University, Amritsar (N=40)

Sr. No.	Test Items	Mean ± Standard Deviation		Hi	Low
		Mean	SD		
1.	Muscular Strength	43.09	5.70	57.5	34.7
		Mean	SD		
2.	Muscular Power	62.55	4.65	70	56
		Mean	S.D		
3.	Muscular Endurance	20	2.44	24	16
		Mean	SD		
4.	Running Speed	3.15	3.56	3.2	3.1
		Mean	SD		
5.	Running Agility	11.04	6.98	12.07	10.02
		Mean	SD		
6.	Jumping Ability	2.23	1.22	2.48	2.10
		Mean	SD		
7.	Throwing Ability	17.72	1.83	20	15
		Mean	SD		
8.	Flexibility	3.25	1.12	5	2
		Mean	SD		
9.	Balance	35.07	3.85	42	30
		Mean	SD		

Table 2 shows that in Muscular Strength, the mean score was 43.09 and standard deviation score was 5.70. In Muscular Power, the mean score was 62.55 and standard deviation score was 4.65. In Muscular Endurance, the mean score was 20 and standard deviation score was 2.44. In Running Speed, the mean score was 3.15 and standard deviation score was 3.56. In Running Agility, the mean score was 11.04 and standard deviation was 6.98. In Jumping Agility, the mean score was 2.23 and standard deviation was 1.22. In Throwing Ability, the mean score was 17.72 and standard deviation score was 1.83. In Flexibility, the mean score was 3.25 and standard deviation score was 1.12. In Balance, the mean score was 35.07 and standard deviation score was 3.85.



**Figure 1:** Descriptive Statistics (Mean & Standard Deviation) and Percentile Plot (Hi & Low) of Physical Fitness Test Items of Taekwondo Players of Guru Nanak Dev University, Amritsar (N=40)

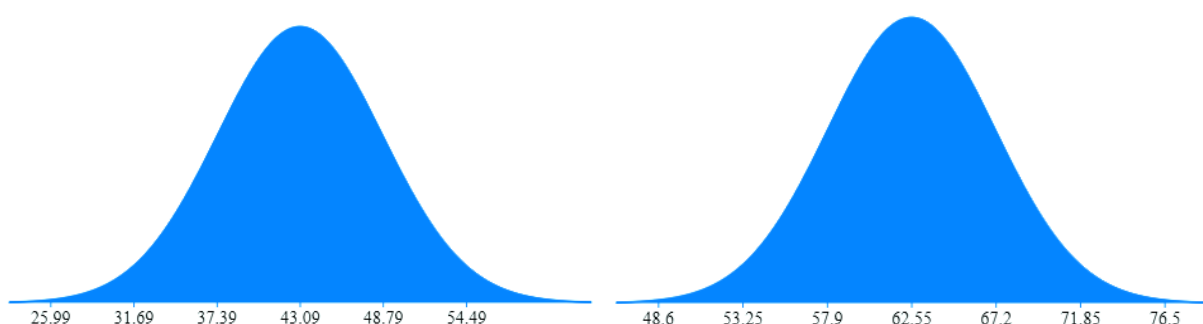
#### 4.1 Grades under Normal Distribution

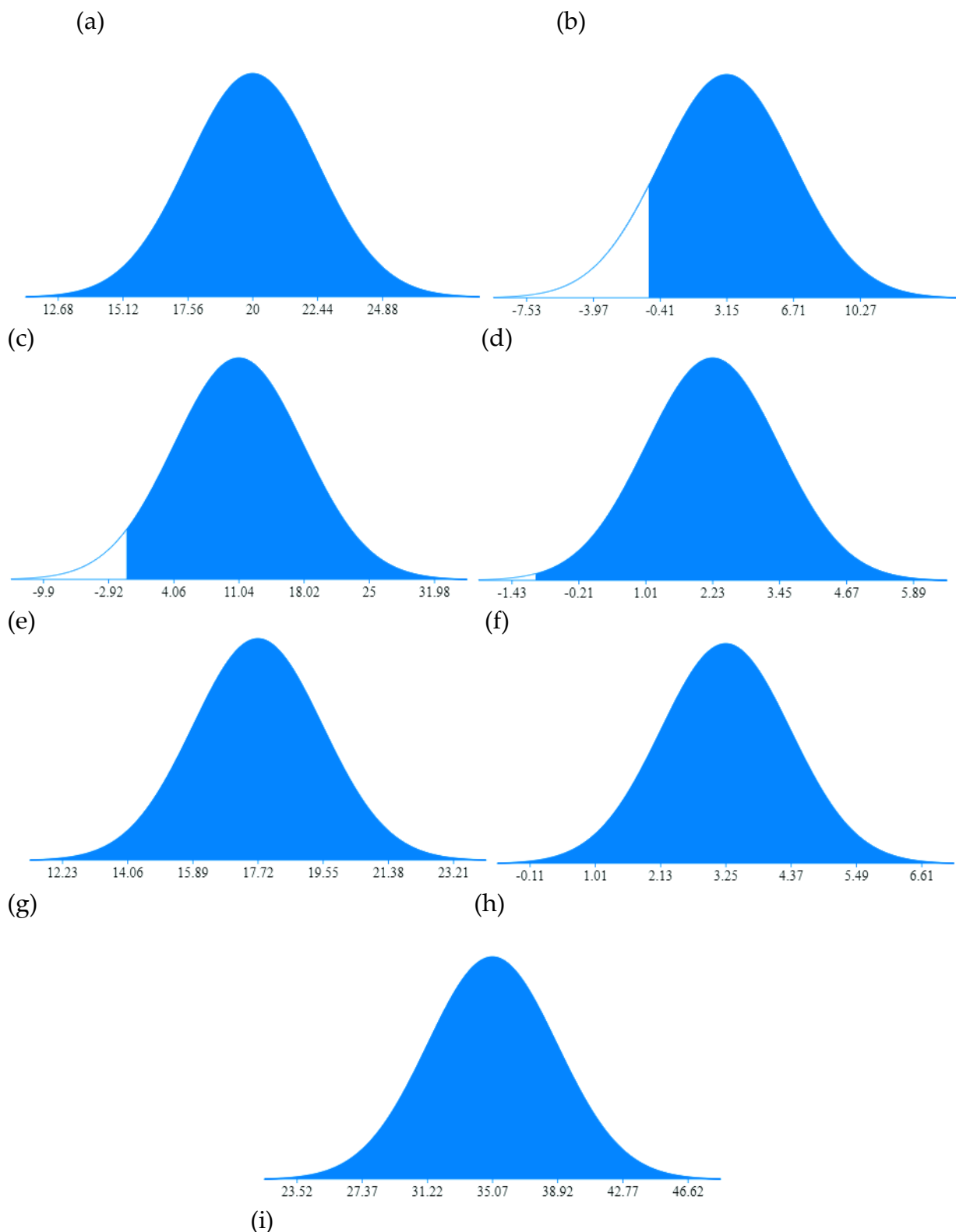
**Table 3:** Descriptive Statistics (Mean & Standard Deviation) and Percentile Plot (Hi & Low) of Physical Fitness Test Items of Taekwondo Players of Guru Nanak Dev University, Amritsar (N=40)

Test Items	Very Poor	Poor	Average	Good	Very Good
Muscular Strength	Less than (<) 31.69	31.69 - 37.39	37.39 - 48.79	48.79 - 54.49	Greater than (>) 54.49
Muscular Power	Less than (<) 53.25	53.25 - 57.90	57.90 - 67.20	67.20 - 71.85	Greater than (>) 71.85
Muscular Endurance	Less than (<) 15.12	15.12 - 17.56	17.56 - 20	20 - 22.44	Greater than (>) 22.44
Running Speed	Greater than (>) 10.27	10.27 - 6.71	6.71 - 0.41	-0.41 - -3.97	Less than (<) -3.97
Running Agility	Greater than (>) 25	25 - 18.02	18.0 - 4.06	4.06 - -2.92	Less than (<) -2.92

Jumping Ability	Less than (<) -0.21	-0.21 - 1.01	1.01 - 3.45	3.45 - 4.67	Greater than (>) 4.67
Throwing Ability	Less than (<) 14.06	14.06 - 15.89	15.89 - 19.55	19.55 - 21.38	Greater than (>) 21.38
Flexibility	Less than (<) 1.01	1.01 - 2.13	2.13 - 4.37	4.37 - 5.49	Greater than (>) 5.49
Balance	Less than (<) 27.37	27.37 - 31.22	31.22 - 38.92	38.92 - 42.77	Greater than (>) 42.77

1. In Muscular Strength, the scores below 31.69 are considered very poor, from about 31.69-37.39 is considered poor, 37.39-48.79 is considered average, 48.79-54.49 is considered good and the scores above 54.49 are considered very good.
2. In Muscular Power, the scores below 53.25 are considered very poor, from about 53.25-57.90 is considered poor, 57.90-67.20 is considered average, 67.20-71.85 is considered good and the scores above 71.85 are considered very good.
3. In Muscular Endurance, the scores below 15.12 are considered very poor, from about 15.12-17.56 is considered poor, 17.56-20 is considered average, 20- 22.44 is considered good and the scores above 22.44 are considered very good.
4. In Running Speed, the scores above 10.27 are considered very poor, from about 10.27- 6.71 is considered poor, 6.71-0.41 is considered average, -0.41- -3.97 is considered good and the scores below -3.97 are considered very good.
5. In Running Agility, the scores above 25 are considered very poor, from about 25-18.02 is considered poor, 18.0-4.06 is considered average, 4.06- -2.92 is considered good and the scores below -2.92 are considered very good.
6. In Jumping Ability, the scores below -0.21 are considered very poor, from about -0.21-1.01 is considered poor, 1.01-3.45 is considered average, 3.45-4.67 is considered good and the scores above 4.67 are considered very good.
7. In Throwing Ability, the scores below 14.06 are considered very poor, from about 14.06-15.89 is considered poor, 15.89-19.55 is considered average, 19.55-21.38 is considered good and the scores above 21.38 are considered very good.
8. In Flexibility, the scores below 1.01 are considered very poor, from about 1.01-2.13 is considered poor, 2.13-4.37 is considered average, 4.37-5.49 is considered good and the scores above 5.49 are considered very good.
9. In Balance, the scores below 27.37 are considered very poor, from about 27.37-31.22 is considered poor, 31.22-38.92 is considered average, 38.92-42.77 is considered good and the scores above 42.77 are considered very good.





**Figure 2:** Normal distribution of Physical Fitness Test Items (i.e., a. Muscular Strength, b. Muscular Power, c. Muscular Endurance, d. Running Speed, e. Running Agility, f. Jumping Ability, g. Throwing Ability, h. Flexibility & i. Balance) of Taekwondo Player of Guru Nanak Dev University, Amritsar (N=40)

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### **Recommendations**

Physical Education teachers, coaches and athletic trainers may utilize the findings of the present study by preparing or modifying the existing training schedules for Taekwondo Player. Normative data regarding Physical Fitness Test Items will help the coaches and trainers to regulate the training programme for elite athletes.

Furthermore, future research could also explore the other variable namely, physical, physiological, anthropometrical and biomedical in addition to the variables chosen in the present study.

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