



## MOTOR FITNESS VARIABLES AMONG THE SELECTED AGE GROUP OF TABLE TENNIS PLAYERS: AN ANALYTICAL STUDY

Mr. Prince Inder Singh<sup>1</sup> and Dr. Somanpreet Singh<sup>2</sup>

<sup>1</sup>Research Scholar, Department of Physical Education and Sports Technology,  
Sri Guru Granth Sahib World University, Fatehgarh Sahib, Punjab.

<sup>2</sup>Asst. Prof. Deptt. of Phy. Edu. and Sports Tech. SGGSW University, Fatehgarh Sahib, Punjab.

### ABSTRACT :

For the purpose of the present study, a total of thirty (N=30), Male subjects of two age groups i.e. U-14 and U-16 years were selected. All the subjects were belongs to the game table tennis only. The minimum training age of the subjects were 2 years, The facts given here shows that which of the variables can be adopted for the research, considering the tools at hand, sufficiency to the subjects and the valid time that could be given to tests and to keep the entire study uniform and integrated was made in discussion with experts.

The following 'Motor Fitness Variables' were selected for the present study with the above criteria in mind: Agility, Balance, Speed, Explosive Strength and Flexibility. The description of each test item is well explained in the main body of the document. To determine the significant differences of motor fitness variables, between the selected age group of table tennis players' unpaired t-test was employed for data analyses. To test the hypothesis, the level of significance was set at 0.05. The analysis highlighted that some sub variable of motor fitness variables of U-14 and U-16 table tennis players differ significantly. It is evident from the results of table- 1 that significant differences were found with regard to motor fitness variables of U-14 and U-16 table tennis players in the sub-variables; speed and explosive strength. However, no significant differences have been observed on the sub-variables; agility, balance and flexibility.



**KEYWORDS :** Motor Fitness Variables: Agility, Balance, Speed, Explosive Strength and Flexibility.

### INTRODUCTION :

In the beginning or initial stage of athletic competitions, people participated for the purpose of enjoyment and to maintain good health. At that time nobody used to adopt wrong ways for the victory. Actually, during that time, the people believed that sports were a source to come closer to different nations and people. The world of training methodology has crossed many milestones, with regard to different types of researches in general and their application to the sports development in particular. In the modern scientific age, athletes are being trained by highly sophisticated means for better achievement in their concerned sports. Cowell and Ismail (1962) indicates that boys who do well in physical ability tests are likely to have leadership potentialities accepted at close personal distance by their association and to be well adjusted socially. Davis (2000) defined that "motor fitness is known as an ability of athletes which helps to perform effectively during sports competitions or other physical activities.

## SELECTION OF SUBJECTS

For the purpose of the present study, a total of thirty (N=30), Male subjects of two age group i.e. U-14 and U-16 years were selected. All the subjects were belongs to the game table tennis only. The minimum training age of the subjects was 2 years. All the subjects were informed about the objective and protocol of the study.

## SELECTION OF VARIABLES

The facts given here show which of the variables can be adopted for the research, considering the tools at hand, sufficiency to the subjects and the valid time that could be given to tests and to keep the entire study uniform and integrated was made in discussion with experts. The following variables were selected for the present study with the above criteria in mind:

### MOTOR FITNESS VARIABLES:

- i Agility
- ii. Balance
- iii. Speed
- iv. Explosive Strength
- v. Flexibility

### Administration of the test items / Description of Tests Items

#### AGILITY

##### Illinois Agility Test

**Purpose:** The purpose of this test is to measure the running agility.

**Equipment Required:** Stopwatch, Paper and Pencil, cones and tape.

**Procedure:** The course length is 10 meters and the distance of path between the start and finish is 5 meters. Four cones are used to mark the start, finish and the two turning points. Another four cones are placed down the centre an equal distance apart. Each cone in the centre is spaced 3.3 meters apart. Subjects should lie on their front (head to the start line) and hands by their shoulders. On the command 'Go', the stopwatch is started and the athlete gets up as quickly as possible and runs around the course in the direction indicated, without knocking the cones over, to the finish line, at which the timing is stopped.

**Scoring:** The time recorded to the nearest 1/10th of a second

#### BALANCE

##### Stork Balance Stand Test

**Purpose:** To examine the capability of the subjects to maintain balance on the ball of the foot.

**Equipment Required:** Paper, pencil, stopwatch and non slippery flat surface.

**Procedure:** Hands should be on the hips, then the non-supporting foot should be positioned against the inside knee of the supporting leg. To practice the balance one minute is given to the subject. The subject has to raise the heel to balance himself on the ball of the foot. As the heel is raised from the floor, the stopwatch is started. If any of the following occurs, the stopwatch is stopped:

- (i) The hands are not on the hips.
- (ii) The supporting foot goes in any other direction.
- (iii) The non-supporting foot completely separates from the knee.
- (iv) The heel of the supporting foot comes in contact with the floor.

**Scoring:** The total time is noted down in seconds. The best of three attempts is the score.

#### SPEED

##### 50 Meter Dash Test

**Purpose:** The test aim is to measured speed and acceleration.

**Equipment Required:** Marked athletic track, measuring tape, stopwatch, cones, clear and flat surface (near about 70 meters).

**Procedure:** A single sprint over 50 meters with the time recorded used to conduct the test. A thorough warm up should be given, including some practice starts and accelerations. Start from a stationary standing position (hands cannot touch the ground), with one foot in front of the other. The front foot must be behind the starting line. Once the subject is ready and motionless, the starter gives the instructions "set" then "go." The tester should provide hints for maximizing speed (such as keeping low, driving hard with the arms and legs) and the participant should be encouraged to not slow down before crossing the finish line.

**Scoring:** The time should be measured to the nearest 1/100th of a second.

## EXPLOSIVE STRENGTH

### Vertical Jump Test

**Purpose:** The aim of this test is to examine the explosive strength of Sprinter, Jumpers and Throwers.

**Equipment required:** Marked wall, chalk for marking wall and jump mat.

**Procedure:** The athlete reaches up with the hand closest to the wall standing side on to a wall. The feet stay flat on the ground and the point of the fingertips is recorded. This is referred to as the standing reach height. The athlete then goes away from the wall, and jumps vertically as high as he can using both arms and legs to support in projecting the body upwards and attempts to contact the wall at the highest point of the leap. The gap in distance between the standing reach height and the leap height is the score. The best of three attempts is the score.

**Scoring:** The jump height is normally measured as a distance score

## FLEXIBILITY

### Sit and Reach Test

**Purpose:** To monitor the progress of the athlete's lower back and hamstring flexibility.

**Equipment Required:** Sit and reach box or on the other hand step or box.

**Procedure:** The subject will place himself on the floor with leg stretched out straight. The soles of the feet are flat against the box. Knees of the subject should be locked and pressed flat to the floor. The tester can help by holding them down. Keeping the palm downward the subject reaches forward along the measuring line as far as possible. The subject has to ensure that the hands remain at the same level. After some practice, the subject reaches out and holds that position for one to two seconds as the distance is recorded. There cannot be any jerky movement.

**Scoring:** The score is noted to the nearest centimeters of half inch.

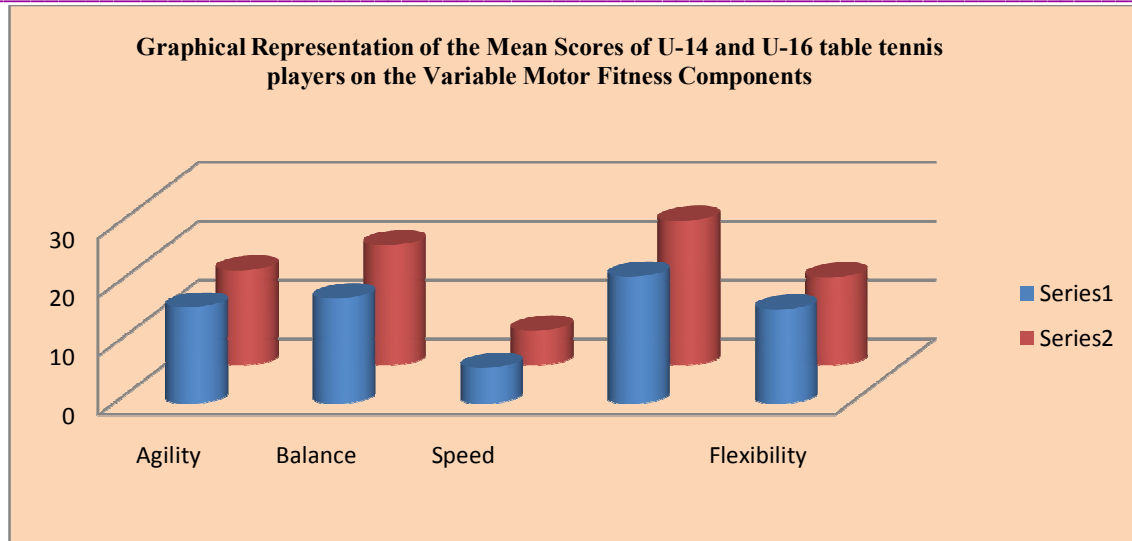
## STATISTICAL TECHNIQUE EMPLOYED

To determine the significant differences of motor fitness components, between the selected age group of table tennis players' unpaired t-test was employed for data analyses. To test the hypothesis, the level of significance was set at 0.05.

**Table-1**  
**Significant Differences in the Mean Scores of U-14 and U-16 table tennis players on the Variable Motor Fitness Components**

Variables	Mean		SD		Mean Difference	t-value	p-value
	U-14	U-16	U-14	U-16			
<b>Agility</b>	16.32	16.10	1.42	2.54	0.32	0.38	0.643
<b>Balance</b>	17.81	20.40	8.56	5.64	2.43	1.34	0.163
<b>Speed</b>	5.99	5.88	0.25	0.13	0.12	2.16*	0.036
<b>Explosive Strength</b>	21.53	24.53	3.65	4.37	3.00	2.92*	0.005
<b>Flexibility</b>	15.93	14.90	4.53	3.76	1.03	0.95	0.341

A glance at table-1 shows the results of U-14 and U-16 table tennis players with regard to motor fitness components agility. The descriptive statistics shows the Mean and SD values of U-14 table tennis players on the variable of agility as 16.32 and 1.42 respectively. However, U-16 Table tennis Players had Mean and SD values as 16.10 and 2.54 respectively. The 't'-value 0.38 as shown in the table above was found statistically insignificant ( $p > 0.05$ ). It has been observed from the above results that insignificant difference was found in the U-14 and U-16 table tennis players with regard to motor fitness components agility. In relation to balance variable, The descriptive statistics shows the Mean and SD values of U-14 table tennis players on the variable balance as 17.81 and 8.56 respectively. However, U-16 table tennis players had Mean and SD values as 20.40 and 5.64 respectively. The 't'-value 1.34 as shown in the table above was found statistically insignificant ( $p > 0.05$ ). The descriptive statistics of Speed shows the Mean and SD values of U-14 table tennis players on the variable of speed as 5.99 and 0.25 respectively. However, U-16 had Mean and SD values as 5.88 and 0.13 respectively. The 't'-value 2.16 as shown in the table above was found statistically significant ( $p < 0.05$ ). Whereas, The descriptive statistics of Explosive Strength shows the Mean and SD values of U-14 table tennis players on the variable of explosive strength as 21.53 and 3.65 respectively. However, U-16 table tennis players had Mean and SD values as 24.53 and 4.37 respectively. The 't'-value 2.90 as shown in the table above was found statistically significant ( $P < 0.05$ ) and The descriptive statistics shows the Mean and SD values of U-14 table tennis players on the variable of flexibility as 15.93 and 4.53 respectively. However, U-16 table tennis player had Mean and SD values as 14.90 and 3.76 respectively. The 't'-value 0.95 as shown in the table above was found statistically insignificant ( $p > 0.05$ ).



**Fig.No.01 Graphical Representation of the Mean Scores of U-14 and U-16 table tennis players on the Variable Motor Fitness Components**

### DISCUSSION OF FINDINGS

The analysis highlighted that some sub variable of motor fitness components of U-14 and U-16 table tennis players differ significantly. It is evident from the results of table- 1 that significant differences were found with regard to motor fitness components of U-14 and U-16 table tennis players in the sub-variables; speed and explosive strength. However, no significant differences have been observed on the sub-variables; agility, balance and flexibility.

Brechue et al. (2010) observed that sprint times and strength per body mass were significantly lower in lineman compared with linebackers-tight ends and backs. Marques, et al. (2009) conducted a study on different positions of Volley ballplayers and concluded that Differences were found in bench press maximal strength among three group's blockers.

Ooi et al. (2009) found that elite players had greater maximum absolute strength in one-repetition maximum bench press ( $P = 0.015$ ) compared with the sub-elite players. There were significant differences in instantaneous lower body power estimated from vertical jump height between the elite and sub-elite groups ( $P < 0.01$ ). Baker and Newton (2008) also found that success in Rugby League seems heavily reliant on players possessing an adequate degree of various physical fitness qualities such as strength, power, speed, agility, and endurance along with the individual skills and team tactical abilities.

Gabbett and Georgieff (2007) found that male players are better in performance than female players because they are taller, heavier, leaner, and have greater standing reach height, speed, agility, muscular power and estimated maximal aerobic power than female players.

Gabbett (2005) analysed that Rugby players according to positional similarities. It was found that the props positional group had lower 20 and 40 m speed, agility, and estimated maximal aerobic power than the hookers and halves and outside backs positional groups.

### REFERENCES:

- Brechue, W.F., Mayhew, J.L., & Piper, F.C. (2010). Characteristics of Sprint Performance in College Football Players. *Journal of Strength and Conditioning Research*, 24(5): 1169 -78.
- Cowell, C.C. & Ismail, A.H. (1962). Relationship between Selected Social and Physical Factor, *Research Quarterly*, 33 (1): 40-43.
- Davis, B. (2000). *Physical Education and Study of Sports*. Harcourt Publishers, Spain, 121-22.

- 
- Fulkerson, J.A., Keel, P.K., Leon, G.R., & Dorr, T. (1999). Eating-Disordered Behaviour and Personality Characteristics of High School Athletes and Non-Athletes. *International Journal of Eating Disorder*, 26, 1:73-79.
- Gab, D. (1968). Comparison of Physical Fitness over a Four Years Period at University of North Dakota, *Research Quarterly*, 10 (9): 15-19.
- Gabbet, T., & Georgieff, B. (2007) Physiological and Anthropometric Characteristics of Austrian Junior National, State and Novice Volleyball Players. *Journal of Strength and Conditioning Research*, 21 (3): 902-08.
- Gabbet, T.J. (2005). A Comparison of Physiological and Anthropometrical Characteristics among Playing Position in Junior Rugby League Players. *British Journal of Sports Medicine*, 39 (9): 675-680.
- Ooi, C. H., Tan, A., Ahmad, A., Kwong, K.W., Sompong, R., Ghazali, K.A., Liew, S.L, Chai, E.J., & Thompson, M.W. (2009). Physiological Characteristics of Elite and Sub-Elite Players. *Journal of Sports science*, 27(14): 151-159