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## ROLE OF PSYCHOLOGICAL, PHYSIOLOGICAL, AND ANTHROPOMETRIC ASSESSMENT OF TABLE TENNIS PLAYERS

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### ABSTRACT

**Introduction:** Sports and games are the simple tools which fortify and entertain us. They help us achieve our competitive desires and maintain our physical and mental health.

**Aim of the study:** the main aim of the study is role of psychological, physiological, and anthropometric assessment of table tennis players

**Material and method:** The purpose of the study was to find out the relationship of selected variables.

**Conclusion:** The research scholar had gone through the scientific literature pertaining to the analysis of anthropometric measurements, motor fitness, physiological and psychological variables from different sources and also consulted the experts in these areas.

## 1. INTRODUCTION

### 1.1 OVERVIEW

Sports and games are the simple tools which fortify and entertain us. They help us achieve our competitive desires and maintain our physical and mental health. They can be considered as a vital component of human physiology. Sports and games develop personality and confidence in an individual along with maintaining physical and mental health. The sports and games have assumed the status of an industry in the past few decades. The industry not only includes the field of play and players but also the food and souvenirs at the stadium, media rights and sponsorships and many more aspects. It is estimated that the sports industry around the world is worth between €350 billion and €450 billion. Along with other aspects it also incorporates infrastructure construction, sporting goods, licensed products and live sports events. Live sports events in particular offer persuasive proposals to different industry participants i.e. from free-to-air broadcasters seeking viewers and advertising revenues and pay-tv broadcasters looking for loyal subscribers, to sponsors moving away from traditional



media, event organizers, athletes and spectators. It has been assessed that the global sports industry is growing at a much faster rate than national gross domestic product (GDP) rates around the world. And the global sports value chain i.e. its size, makeup and revenues has significant growth prospects for the future. This altered status of sports and games have impacted the overall scenario in which the games are played along with the players. The players are required to play with their utmost potential for their team and sponsors in order to achieve the best outcomes in performance and financial terms.

## 1.2 ROLE OF PSYCHOLOGICAL, PHYSIOLOGICAL AND ANTHROPOMETRIC ASSESSMENT

Most of the sports are based on a complex, multifaceted performance outline which is based on a variety of characteristics such as physical, psychological and physiological etc. All these characteristics play a significant role in the sports performance of individuals or teams. The individual differences in these characteristics greatly influence the performance of the players. The players while playing at various levels experience enormous physical and emotional stress. They are stressed by pressure from coaches, sponsors, teams and by themselves too. In case if this stress is not treated, it can lead to deterioration of the performance of the players which can cause severe mental and physical health issues. Sports psychology is the branch which deals with such issues. They follow a complete approach to improve the mental status and thereby the performance of the players. Various psychological factors which influence the performance of the players are lack of confidence, overstress, unable to manage with opponent's tactics, lack to focus during competition, poor pre-competitive mental preparation, lack of desire to win, problems in following coach's instruction etc.

## 2. LITERATURE REVIEW

**Pradas et al. (2021)** analyzed the differences in anthropometric attributes of 495 table tennis players (288 men, 207 women) according to sex, age, and ranking. Various significant anthropometric variables were considered. Results revealed that table tennis players presented differences in body mass composition, anthropometry, and somatotype according to sex and age category and ranking.

**Picabea et al. (2021)**, analyzed the physical profiles of table tennis players in different age categories (i.e., under U12, U14, U16, U20, Senior and Older). The study also analyzed the correlations among the variables measured by each test. They performed a sprint test, forearm isometric strength test, countermovement vertical test, countermovement horizontal test, change of direction ability (CODA) test and flexibility test. The relation found between forearm isometric strength, vertical jump, horizontal jump, sprint and CODA ability indicates that these capacities are related in table tennis players. Nevertheless, the lack of association



between the sit and reach test with the other capacities is indicative of the fact that flexibility is an independent capacity.

**Pluta et al. (2021)**, studied the impact of chosen anthropometric measurements on the special physical fitness of elite junior table tennis players at different stages of sport training. A total of 87 table tennis players aged  $13.4 \pm 1.74$  years (43.7% girls and 56.3% boys) from two Polish teams were analyzed. The anthropometry measurements included height, sitting height, body weight, arm span, humerus and femur breadths, five skin fold thicknesses, and five girths were assessed. From the findings of the study they concluded that knowledge of the somatic and motor characteristics of young athletes can help coaches in creating a specific training program for improved health and performance, taking into consideration the athletes' biological development, potential, and pre-disposition.

### 3. METHODOLOGY

The purpose of the study was to find out the relationship of selected physical, physiological, psychological and anthropometrical variables with the game performance of college men Table Tennis players.

### 4. ANALYSIS AND INTERPRETATION OF THE DATA

The purpose of the present study was to establish the relationship of Table Tennis game performance with physiological, psychological and anthropometrical variables among Table Tennis players. To achieve the purpose of the study, one hundred thirty men Table Tennis players were selected randomly from various colleges who have represented intercollegiate competition under the V.T.U. jurisdiction. The age of the subjects ranged from 18-25 years.

#### 4.1 PEARSON'S COEFFICIENT OF CORRELATION

The collected data was analyzed by using Pearson's Product Moment Method of Correlation among Table Tennis players on the selected variables and the results were presented as under:

##### 4.1.1 Physical Fitness

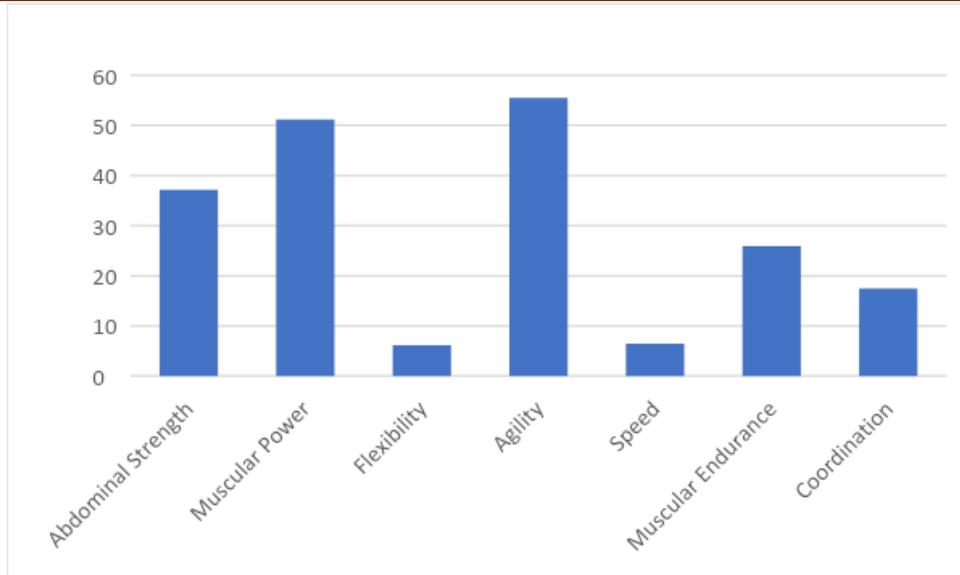
The data on selected physical variables for Table Tennis players were statistically analyzed by using Pearson's Product Moment Method of Correlation and the results were presented in the table-4.1



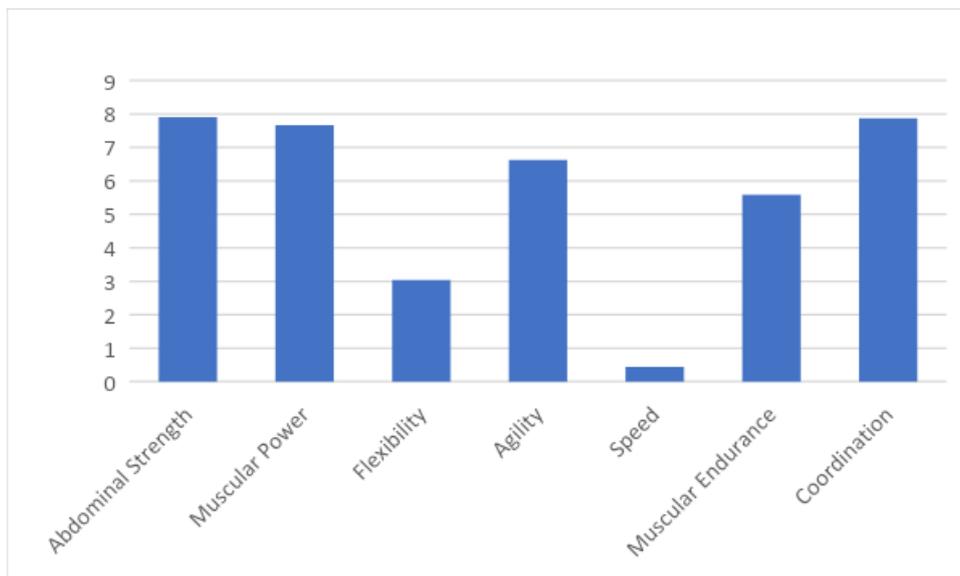
**Table-4.1 Mean, Standard Deviation, Pearson's Product Moment Method of Correlation and Multiple Correlation of selected Physical Fitness and Game Performance among Table Tennis players.**

S.NO	Indepedent Variables	Mean	Standard Deviation	Pearson 'r' value	Multiple Correlation
1	Abdominal Strength	37.153	7.901	0.334*	0.654*
2	Muscular Power	51.161	7.669	0.374*	
3	Flexibility	6.176	3.038	0.270*	
4	Agility	55.507	6.630	0.389*	
5	Speed	6.481	0.445	-0.606*	
6	Muscular Endurance	25.884	5.591	0.273*	
7	Coordination	17.461	7.869	0.666*	

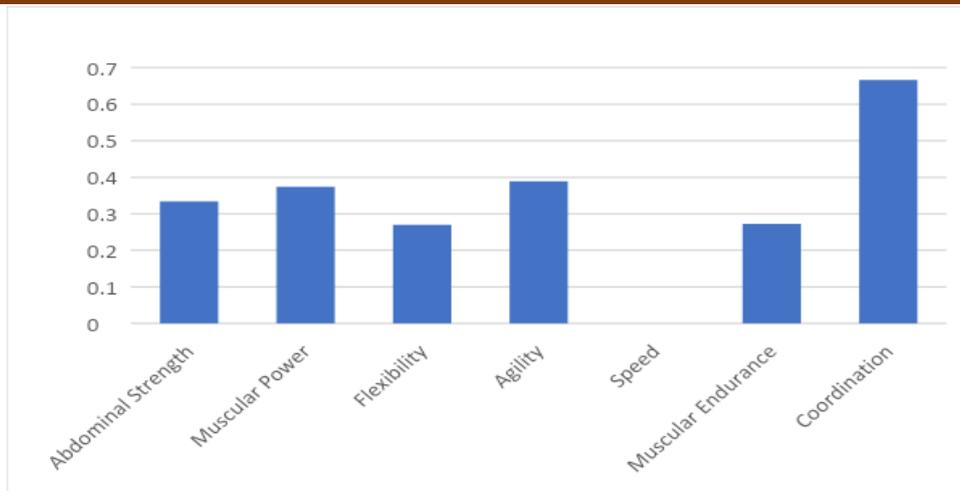
The above table-4.1 shows that the Pearson's coefficient of correlation values between the game performance and physiological variables such as Cardiovascular Endurance (-0.194) and lung capacity of Table Tennis players were greater than the tabulated 'r' value at 0.05 level of confidence. Therefore, it was concluded that there was significant relationship between game performance and physiological variables of Cardiovascular Endurance and Lung Capacity of Table Tennis players in each variable separately. The other variables systolic and diastolic blood pressure variables were less than the tabulated 'r' value at 0.05 level of confidence. Therefore, it was concluded that there was no significant relationship between Game Performance and systolic and diastolic blood pressure of Table Tennis players.



**Fig.4.1 Pearson’s Product Moment Correlation Mean values between the Physical Fitness variables and Game Performance of Table Tennis players**



**Fig.4.2 Pearson’s Product Moment Correlation Standard Deviation values between the Physical Fitness variables and Game Performance of Table Tennis players**



**Fig.4.3 Pearson's Product Moment Correlation 'r' values between the Physical Fitness variables and Game Performance of Table Tennis players**

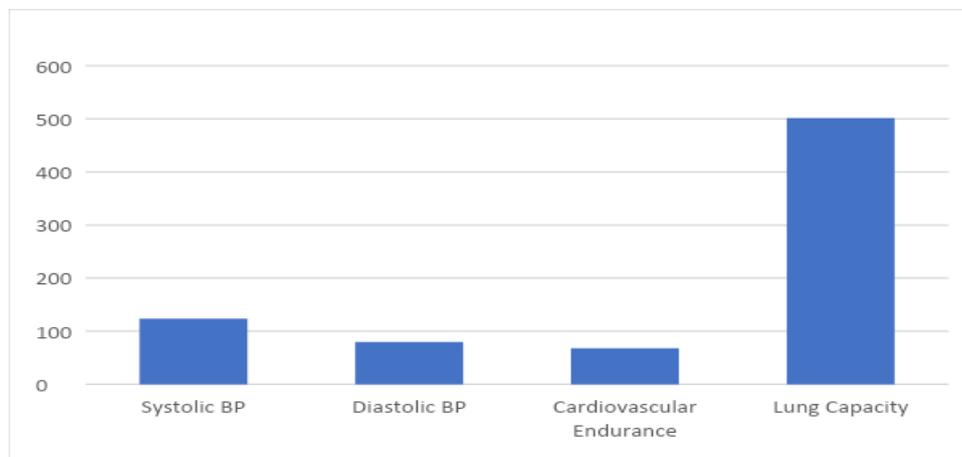
#### 4.1.2 Physiological Variables:

The data on selected Physiological Variables for Table Tennis players were statistically analyzed by using Pearson's Product Moment and the results were presented in the table-4.2

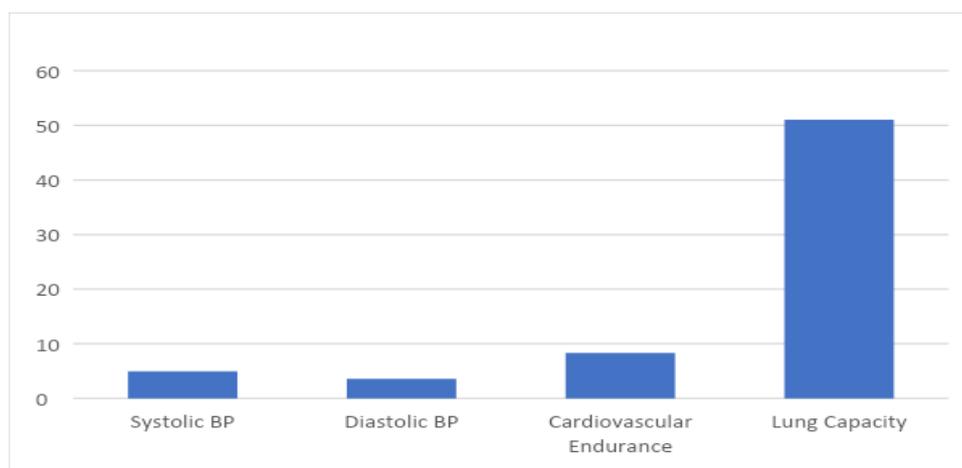
**Table-4.2 Mean, Standard Deviation, Pearson's Product Moment and Multiple Correlation of selected Physiological Variables and Game Performance among Table Tennis players.**

S.NO	Independent Variables	Mean	Standard Deviation	Pearson 'r' value	Multiple Correlation
1.	Systolic BP	123.461	4.935	0.028 <sup>NS</sup>	0.162 <sup>NS</sup>
2.	Diastolic BP	79.462	3.589	0.008 <sup>NS</sup>	
3.	Cardiovascular Endurance	67.882	8.339	-0.192*	
4.	Lung Capacity	501.592	51.021	0.184*	

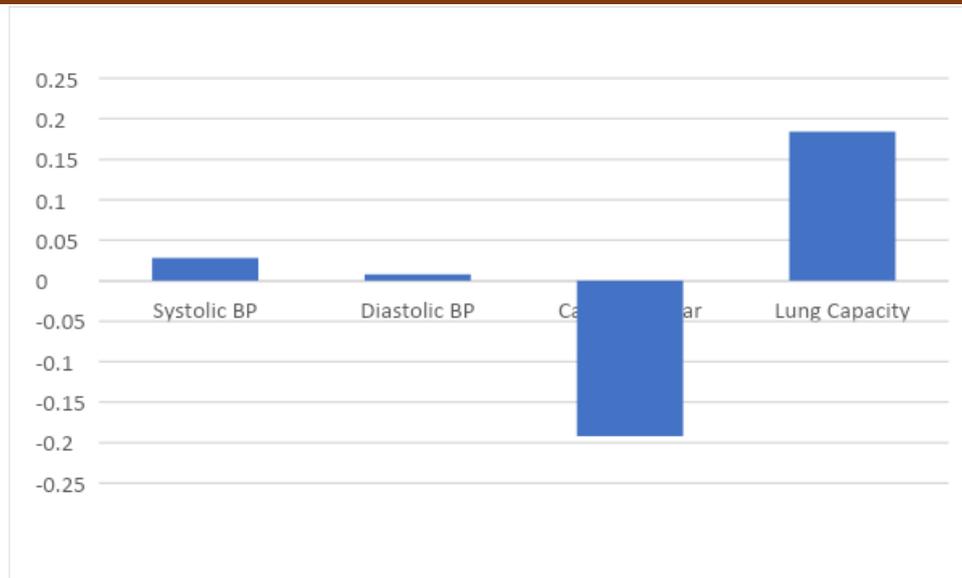
The above table-4.2 shows that the Pearson’s coefficient of correlation values between the game performance and physiological variables such as Cardiovascular Endurance (–0.194) and lung capacity of Table Tennis players were greater than the tabulated ‘r’ value at 0.05 level of confidence. Therefore, it was concluded that there was significant relationship between game performance and physiological variables of Cardiovascular Endurance and Lung Capacity of Table Tennis players in each variable separately. The other variables systolic and diastolic blood pressure variables were less than the tabulated ‘r’ value at 0.05 level of confidence. Therefore it was concluded that there was no significant relationship between Game Performance and systolic and diastolic blood pressure of Table Tennis players.



**Fig.4.4 Pearson’s Product Moment Correlation Mean values between the selected Physiological Variables and Game Performance of Table Tennis players.**



**Fig.4.5 Pearson’s Product Moment Correlation Standard Deviation values between the selected Physiological Variables and Game Performance of Table Tennis players.**



**Fig. 4.6 Pearson's Product Moment Correlation 'r' values between the selected Physiological Variables and Game Performance of Table Tennis players.**

#### 4.1.3 Psychological Variable: Mental Toughness

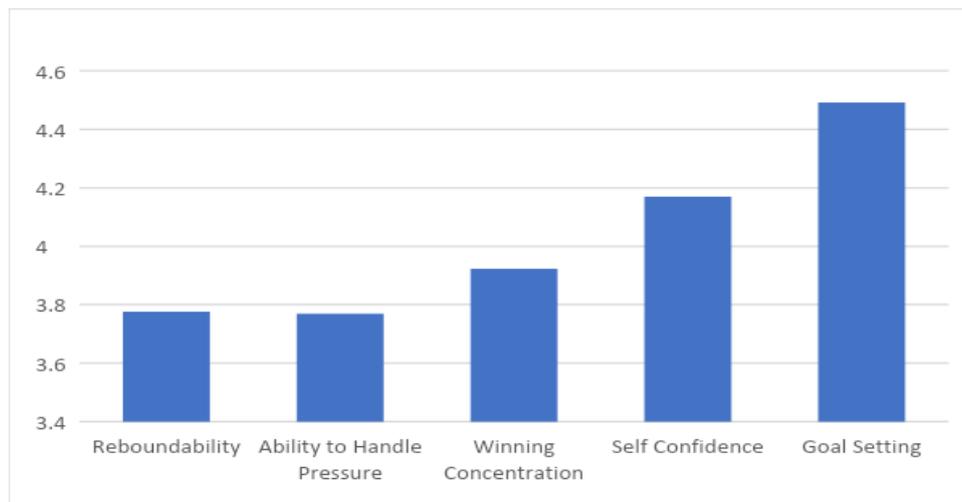
The data on selected physical variables for Table Tennis players were statistically analyzed by using Pearson's Product Moment Method of Correlation and the results were presented in the table-4.3

**Table-4.3 Mean, Standard Deviation, Pearson's Product Moment Method of Correlation and Multiple Correlation of Mental Toughness and Game Performance among Table Tennis players.**

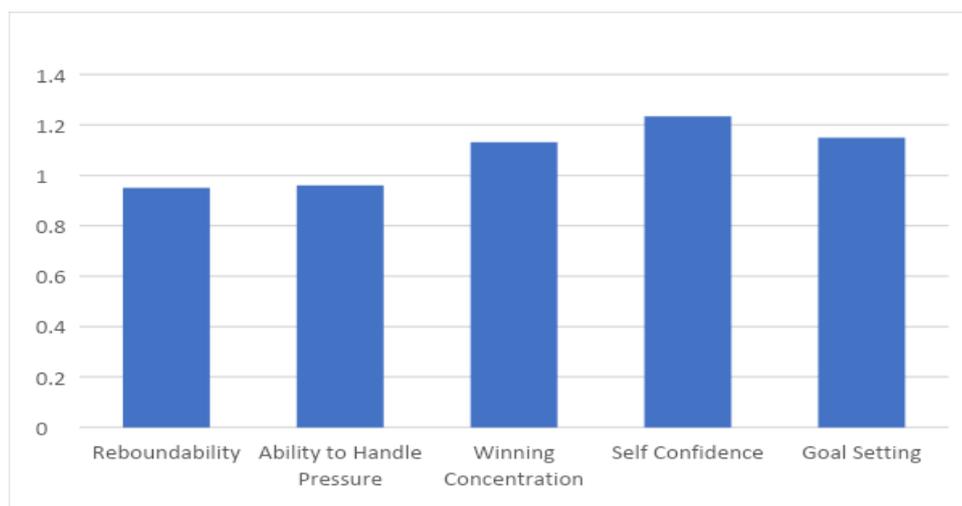
S.No.	Independent Variables	Mean	Standard Deviation	Pearson 'r' value	Multiple Correlation
1.	Reboundability	3.776	0.950	0.392*	0.606*
2.	Ability to Handle Pressure	3.769	0.960	0.401*	
3.	Winning Concentration	3.923	1.131	0.331*	
4.	Self Confidence	4.169	1.233	0.317*	
	Goal Setting	4.492	1.149	0.455*	

\*Significant at 0.05 level with df 128 is 0.174

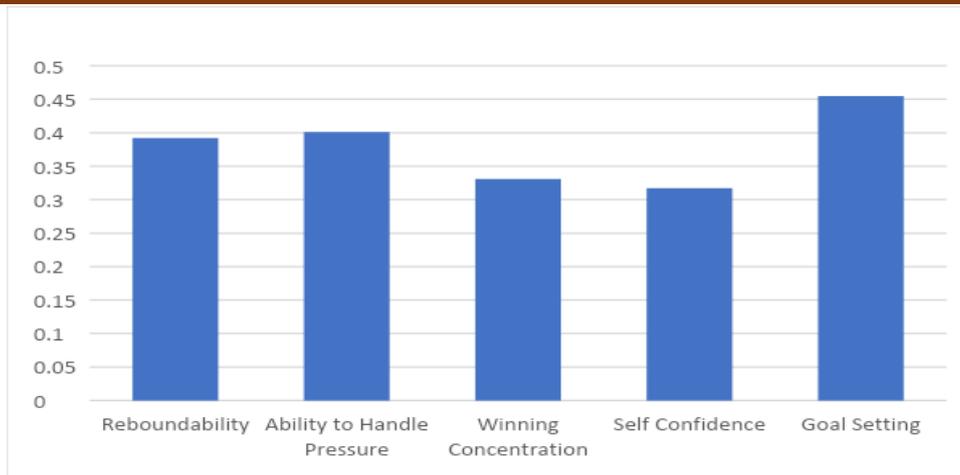
The above table-4.3 shows that the Pearson’s coefficient of correlation values between the game performance and rebound ability (0.392), ability to handle pressure (0.401), winning concentration ability (0.331), self-confidence (0.317) and goal setting (0.455) of Table Tennis players were greater than the tabulated ‘r’ value at 0.05 level of confidence. Therefore, it was concluded that there was significant relationship between game performance and re-bouncability, ability to handle pressure, winning concentration ability, self-confidence and goal setting of Table Tennis players in each variable separately.



**Fig.4.7 Pearson’s Product Moment Method of Correlation Mean values between the Mental Toughness dimensions and Game Performance of Table Tennis players**



**Fig.4.8 Pearson’s Product Moment Method of Correlation Standard Deviation values between the Mental Toughness dimensions and Game Performance of Table Tennis players**



**Fig.4.9 Pearson's Product Moment Method of Correlation 'r' values between the Mental Toughness dimensions and Game Performance of Table Tennis players.**  
**4.1.4 Anthropometrical Variables**

The data on selected Anthropometrical Variables for Table Tennis players were statistically analyzed by using Pearson's Product Moment and the results were presented in the Table-4.4

**Table-4.4 Mean, Standard Deviation, Pearson's Product Moment and Multiple correlation of Anthropometrical Variables and Game Performance among Table Tennis players.**

Sl.No.	Independent Variables	Mean	Standard Deviation	Pearson 'r' value	Multiple Correlation
1.	Standing Height	173.192	9.100	0.633*	0.592*
2.	Body Weight	65.576	7.469	-0.274*	
3.	Arm Length	82.976	4.516	0.562*	
4.	Arm Span	181.561	8.512	0.184*	
5.	Leg Length	102.600	6.756	0.666*	
6.	Arm Girth	24.184	2.216	0.142 <sup>NS</sup>	
7.	Thigh Girth	49.634	3.859	0.305*	
8.	Calf Girth	34.450	3.308	0.492*	
9.	Body Fat %	15.868	0.752	- 0.433	



The above table-4.4 shows that the Pearson's coefficient of correlation values between the game performance and standing height (0.633), body weight (-0.274), arm length (0.562), arm span (0.184), leg length (0.666), thigh girth (0.305), calf girth (0.492) and body fat % (-0.433) of Table Tennis players were greater than the tabulated 'r' value at 0.05 level of confidence. Therefore, it was concluded that there was significant relationship between game performance and standing height, body weight, arm length, arm span, leg length, thigh girth, calf girth and body fat % of Table Tennis players in each variable separately. The other variable arm girth's 'r' value (0.142) is less than the tabulated value @ 0.05 level of confidence. Therefore, it was concluded that there was no significant relationship between game performance and arm girth of Table Tennis players.

## 5. CONCLUSION

The research scholar had gone through the scientific literature pertaining to the analysis of anthropometric measurements, motor fitness, physiological and psychological variables from different sources and also consulted the experts in these areas. Along with the said literature and expert opinion, the administrative feasibility in terms of availability of instruments and expertise for measuring and recording of data was also given due consideration while selecting anthropometric measurements, motor performance, physiological and psychological variables. Anthropometric Variables namely Standing Height, body weight, Chest girth, Upper arm girth, Thigh girth, Outer leg length, Body Fat Percentage, Motor Fitness variables namely Speed (50 M. dash or Run); Agility (4 x 10m. Shuttle run); Movement Time (Circle Run) Strength (Pull ups); Leg Power (Standing Broad Jump); Flexibility (Sit and Reach Test); Physiological variables namely Vital capacity (Wet Spirometry test); Expiratory Flow (Peak Flow meter) and Pulse rate (Resting pulse rate) and Psychological variables namely Sports Competition Anxiety and Sports Achievement Motivation were selected.

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