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**Mandoli Sapna**

Research Scholar, Department of  
Exercise Physiology, L.N.I.P.E.,  
Gwalior, Madhya Pradesh, India

**Joshi Hem Chandra**

Assistant Professor, Department  
of Sports Biomechanics,  
L.N.I.P.E., NERC, Guwahati,  
Assam, India

## Comparative effect of vital capacity in different levels of table tennis players at khelo India

**Mandoli Sapna and Joshi Hem Chandra**

**Abstract**

The present study seeks to investigate the specific effect of vital capacity on different levels (state, national and Indian) table tennis players. For the meaningful comparison, total thirty [N = 30] state level -10, national level- 10 and India level – 10 were randomly selected as a subject from khelo India tournament. Vital capacity was assessed to check their lung efficiency by the help of spirometer the data were statistically analyzed by using one way ANOVA at 0.05 level of significance. After analyzing the data it was found that there were significant differences between the three groups of table tennis players. Further LSD post hoc test revealed that among the different levels of players chosen for this study, the national and Indian level players showed maximum vital capacity. This might be due to the fact as different training plan, strategy as well as more number of competitions faced by the national and Indian players as compared to state level players.

**Keywords:** Spirometer, vital capacity, table tennis, exercise physiology, performance

**Introduction**

Table tennis is mainstream and amazingly quick indoor game. As we as a whole realize that in games and sports lung efficiency is an exceptionally key significant component in like manner in table tennis lung efficiency is a key unmistakable as a factor for sports execution. Vital capacity is the maximum amount of air a person can expel from the lungs after a maximum inhalation. It is equal to the inspiratory reserve volume plus the tidal volume plus the expiratory reserve volume (Biersteker and Biersteker, 1985) <sup>[1]</sup>. Large number of people dies every year due to pulmonary diseases. These diseases may be mainly due to pollution. To predict an individual's health pulmonary function testing is used. (Hezberg *et al.*, 1985) <sup>[2]</sup>

We can gauge an individual's fundamental limit utilizing an ordinary or wet spirometer. Essential limit is utilized by to do decide how much air the lungs are capable of holding. This is measure by having an individual breathe out, at that point breathe in as much as they can and estimating how much air was breathed in Normal grown-ups have an imperative limit between 3-5L. The imperative limit an individual show will shift dependent on their stature, weight, sex, and age s. A low vital limit is related with a handicap, weight or ceaseless respiratory disease. Vital limit (VC) is the best volume of gas that, following maximum inhalation, can be ousted during a total, slow, constrained exhalation; equivalent to inspiratory limit in addition to expiratory hold volume.

Spirometry is the term given to the essential lung work tests that measure the air that is lapsed and roused. There are three essential related estimations: volume, time and stream. Spirometry is objective, noninvasive, delicate to early change and reproducible. With the accessibility of compact meters it very well may be performed anyplace and, with the correct preparing, it very well may be performed by anyone. It is performed to identify the nearness or nonattendance of lung illness, evaluate lung disability, screen the impacts of work related/ecological exposures and decide the impacts of prescriptions.

**Methodology**

The procedure of this study consist of selection of subjects, selection of variables, criterion measures, testing procedure and the statistical technique employed for analysis of data.

**Corresponding Author:****Mandoli Sapna**

Research Scholar, Department of  
Exercise Physiology, L.N.I.P.E.,  
Gwalior, Madhya Pradesh, India

**Selection of the Subject:** for the purpose of the study, total thirty male [N = 30] Table tennis players of Khelo India were selected on the basis of their specific rankings i.e. state level [N = 10], National level [N = 10] and Indian level [N = 10] and divided in to three separate groups. With age range from 18 to 25 year and was the part of university team was been randomly selected as subjects.

**Procedure:** For the purpose of the present study, the selected subjects [N = 30] (Table tennis players) were assembled and the instructions was delivered by the researcher regarding procedure and administration of test. To identified the lung efficiency of the subjects, the selected parameters i.e. vital capacity was assessed by the dry spirometer and has been expressed in L/min. Proper explanation and demonstration of the test was done by researcher before the administration of the test. The total three trials were given to the subjects. Motivation factor was considered while administer the test to create interest among the subject.

At the end of the administration of test, the proper explanation of the nature and the objective of the study was given to the players who had a curiosity to know for their acknowledgement and invited to ask questions if they wished.



**Fig 1:** data collection and administration of the dry spirometry test

**Statistical technique:** Statistical analysis was done with SPSS (Statistical Package for the Social Sciences, 20.0, USA). Mean and standard deviation was calculated as a descriptive statistics and one way analysis of variance

(ANOVA). Further, LSD post hoc test was employed for means comparison was tested at 0.05 level of significance.

**Results**

The descriptive statistics for the different levels in context to vital capacity used in the present study are presented in Table 1. The mean and standard deviation values of vital capacity for state, national, and Indian players were 2.97 ± 0.62, 3.70 ± 0.91 and 4.28± 0.71, respectively.

**Table 1:** Descriptive Statistics for Vital Capacity

Different Levels	N	Minimum	Maximum	Mean	Std. deviation
State level	10	2.0	4.0	2.97	0.62
National level	10	3.0	5.50	3.70	0.91
India level	10	2.0	5.20	4.28	0.71

The mean estimations of vital capacity of various levels of table tennis players have been compared by means of analysis of variance (ANOVA) portrayed in Table 2.

Table 2 reveals that there was a significant difference between different levels in relation to vital capacity as p value (0.003) less than 0.05, thus there is a difference among these three groups in their mean values.

**Table 2:** Comparative Statistics for Vital Capacity

	Sum of Squares	df	Mean Squares	F	Sig.
Between Group	8.618	2	4.309	7.384	.003
Within Group	15.757	27	.584		
Total	24.375	29			

\*Significant at 0.05 Level Significance

As the differences between the means of vital capacity among different levels i.e., state, National and Indian levels were found significant as shown in Table 2. Therefore, the LSD post-hoc test was employed to compare the groups with each other as shown in Table 3. Looking at the results (p-values), we can see the comparison between state and National players was significant, as the p-value was lower than 0.05. Making the comparison of state players with Indian players, the p-value was again less than 0.05 and, so the value was significant. The comparison of national players with Indian players showed no significant difference as the p-value was greater than 0.05.

**Table 3:** Pair Wise Comparison Among the Groups in Relation to Vital Capacity

(I) group	(J) group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
state level	National Level	-.73000*	.34164	.042	-1.4310	-.0290
	India level	-1.31000*	.34164	.001	-2.0110	-.6090
national level	State level	.73000*	.34164	.042	.0290	1.4310
	India level	-.58000	.34164	.101	-1.2810	.1210
India level	State level	1.31000*	.34164	.001	.6090	2.0110
	National Level	.58000	.34164	.101	-.1210	1.2810

\* Significant at the 0.05 level.

**Discussion of Finding**

Different researchers have gone through a various kind of studies on vital capacity limit in various games. In the current investigation, exertion was made to think about the essential limit of various levels (state, national, Indian table tennis players) with one another. The outcomes examined above obviously demonstrated that all the players had higher estimations of vital capacity, by this implies we can say that

customary exercise upbeat affects the lungs and there volumes. The factual finding of the current examination uncovered that there was a significant difference in mean vital capacity limit of various levels players. Comparative discoveries have been gotten by the examinations done by Kondric *et al.* (2013) [3] Chatterjee *et al.* (2010) [4]; Mehrotra *et al.* (1998) [5], Ghosh *et al.* (1985) [6] and Stanley Miles (1969) [7].

Among all the level of players picked for this investigation, the national just as the India level players indicated the highest value of vital capacities. The purpose behind this better vital capacity limit could be manifold. The reason may be, the training plan of both the level players is higher when compared with state level players and just as the quantity and number of competition they face is more than the state level players, as the round of table tennis is progressively coordinated it requires higher level of developments which requires higher degree of movements and which could likewise influence the conditioning of the lungs and increase the efficiency of the lungs the comparison between Indian players and national players couldn't be found on the vital capacity that might be the national players were the part of the India camp however because of some other reason not able to choose as a player for India team.

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