A Comparative Study of Lung Functions of College Boys and Girls

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Abstract

Lung functions of an individual tell his/her cardio respiratory capacity of oxygen intake. It was hypothesized that different level of games/sports participation / non-participation will have sex difference in regard to selected lung function variables. Sample comprises advance sports boys= 22, advance sports girls= 6, inter-mediate sports boys= 37, inter-mediate sports girls= 20, non-sports boys= 37 and non-sports girls= 22. The sample ranged from 17 to 21 years old students.The students were instructed not to eat Foodtwo hours before the test. The lung functions were tested by using MIR Spirodocdevice. Collected data was computed with SD,Mean, 't' test and tested with the hypothesis at 0.05 level of significance. The study concluded: 1) The Respiratory rate found to be statistically significant (different) and vital capacity was found insignificant (not different) in advance sportsperson (between boys and girls). 2) The Vital Capacity found to be statistically significant (different) and respiratory rate was found insignificant in regard to inter-mediate sportsperson (between boys and girls). 3) The Vital Capacityfound to be statistically significant (different) and respiratory rate was found insignificant (not different) in regard to non- sportsperson (between boys and girls). 4) The vital capacity was more in boys and respiratory rate was more in girls which showed that girls have less lung capacity than that of boys. It further indicated that the boys have better lung capacity than that of girls.

KEYWORDS: Vital Capacity Respiratory Rate Lung Functions

INRODUCTION

Lung testing is meant for checkingthe functioning of lungs. The lung function testing determines how well our lungs have exchange oxygen and carbon dioxide.Common lung function testis performed by Spirometer. Spirometer measures the quicknessof an individual's lung to move air in and out. Spirometer tests can measure lung functions like vital capacity and respiratory rate[1].The respiratory rate is the number of breaths a person can take in one minute[2].Vital capacity (VC) is the maximum amount of air exhaled after a maximum inhalation from lungs. Vital Capacity is the sum total of tidal volume,expiratory reserve volume and inspiratory reserve volume[3].

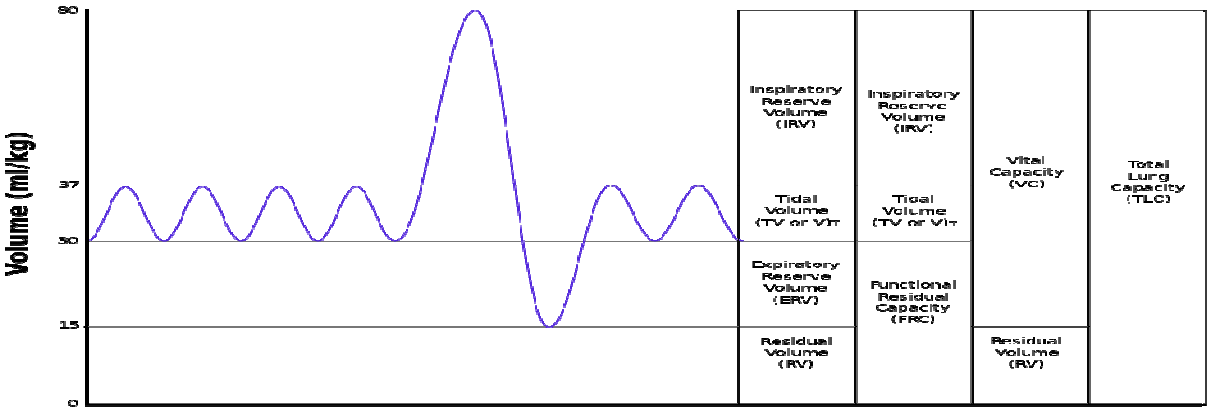


Figure 1- Output of a spirometer[3]

It was hypothesized that different level of games/sports participation / non-participation will have sex difference in regard to selected lung function variables.The University of British Columbia researchers found that men's muscles may have a higher respiration rate than women. It further suggested that women muscles need to work significantly harder to get the same effect as men. The researchers believed that due to this, the females body have to work two fold for blood flow in muscles to get the same effect as muscles in men. Lack of blood flow to large muscles in the body e.g. legs and abdomen caused worst performancein womenthen men[4]. Above evidences motivated the researchers to conduct a research to investigate the differences between the boys and girls lung capacity with special reference to University of Delhi, considering Delhi one of the most polluted capital city of the world.

MATERIALS AND METHODS

Table- 1

Sample Statistics

S.No	Level of Sports	No. of Samples- Boys	No. of Samples- Girls
1	Advance Sportsperson	22	6
2	Inter-mediate Sportsperson	37	20
3	Non-sports Sportsperson	37	22

Note: Advance Sportsperson - who plays games/sports at national level; Inter-mediate Sportsperson - who plays games/sports at inter-college level; Non- Sportsperson- who don't play games/sports at all.

The sample ranged from 17 to 21 years old sports students.The lung functions were tested by using MIR Spirodocdevice. Collected data was computed with SD,Mean,'t' test and tested with the hypothesis at 0.05 level of significancedone on SPSS software.

RESULTS

In the Table-2, variable namely Respiratory rate (t= -2.78) found to be statistically significant (different), whereas, variable namely Vital Capacity (t= 1.74) were found to be statistically insignificant (not different)at .05 level of significance in advance sports boys and girls.

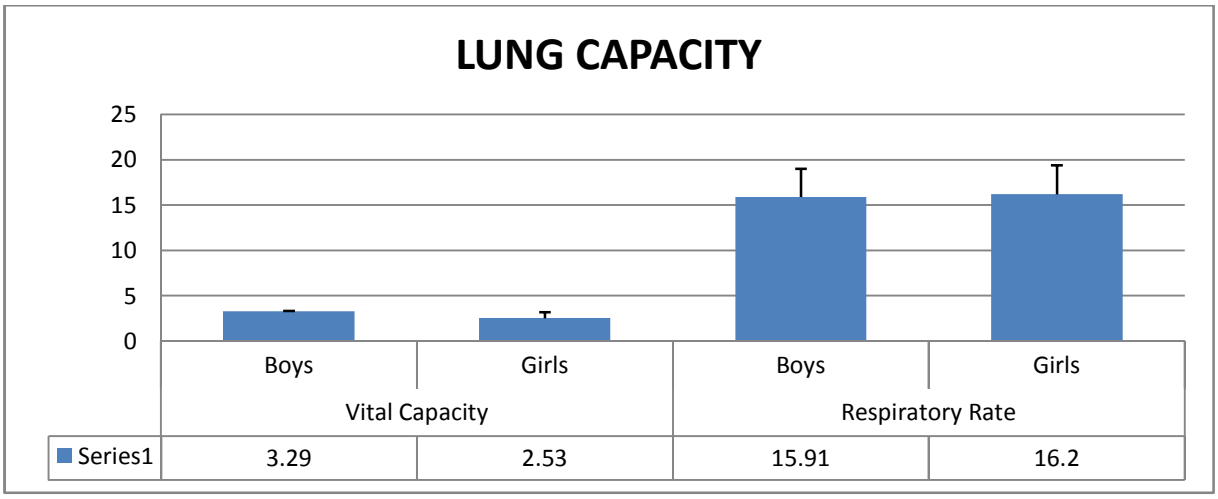
Table- 2

Comparison Between Boys (Advance Sports) and Girls (Advance Sports)in Regard to Lung Function Variables

Variable		M	SD	LTEV		MD	SED	't'	α
				'F'	S				
Vital Capacity	Boys	3.66	0.86	3.32	0.05*	0.41	0.24	1.74(NS)	0.10
	Girls	3.25	0.36						
Respiratory Rate	Boys	13.30	2.90	6.61	0.02*	-2.22	0.80	-2.78*	0.01
	Girls	15.52	1.24						

Note: M= Mean; LTEV= Levene's Test for Equality of Variances; S= Significance;*= significant at .05 level; NS= Not significant; N= 28 (N1= Boys (Advance Sports) + N2= Girls (Advance Sports): N= N1 + N2, N1= 22, N2=6)

Graphical Representation of Comparison Between Boys (Advance Sports) and Girls (Advance Sports)in Regard to Lung Function Variables



According to table-3 the variable namely Vital Capacity (t= 4.01) found to be statistically significant (different), whereas, variable namely Respiratory rate (t= -.67) were found to be statistically insignificant (not different) at .05 level of significance in intermediate sports boys and girls.

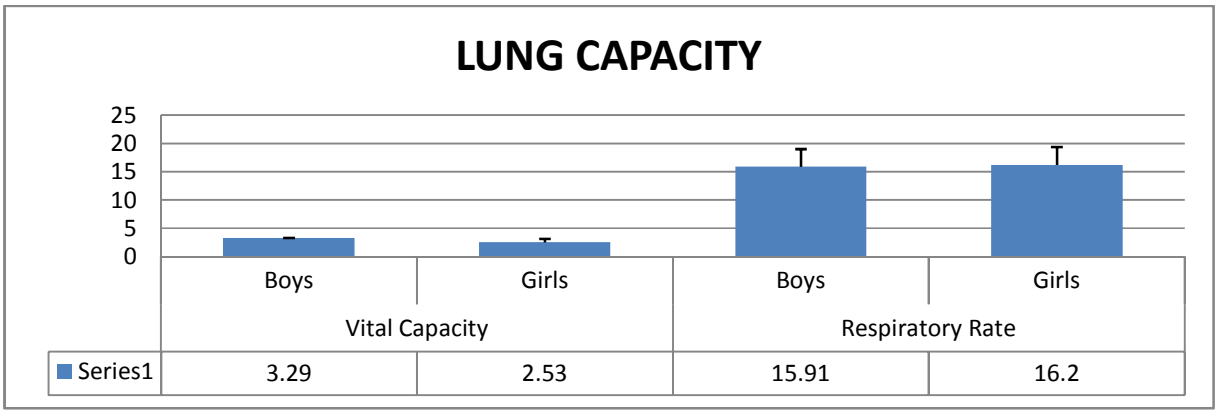
Table- 3

Comparison Between Boys (Inter-mediate Sports) and Girls (Inter-mediate Sports)in Regard to Lung Function Variables

Variable		Mean	SD	LTEV 'F'	LTEV S	MD	SED	't'	A
Vital Capacity	Boys	3.84	0.93	2.20	0.14	1.16	0.29	4.01*	0.00
	Girls	2.69	0.69						
Respiratory Rate	Boys	15.00	2.23	5.78	0.02*	-0.76	1.14	-0.67(NS)	0.51
	Girls	15.77	3.77						

Note: LTEV= Levene's Test for Equality of Variances; S= Significance;*= significant at .05 level; NS= Not significant; N= 57 (N1= Boys (Inter-mediate Sports) + N2= Girls (Inter-mediate Sports): N= N1 + N2, N1= 37, N2=20)

Graphical Representation of Comparison BetweenBoys (Inter-mediate Sports) and Girls (Inter-mediate Sports)in Regard to Lung Function Variables



According to table-4 the variable namely Vital Capacity (t= 4.79) found to be statistically significant (different) whereas, variable namely, Respiratory rate (t= .41) were found to be statistically insignificant (indifferent) at .05 level of significance in advance non- playing sports boys and girls.

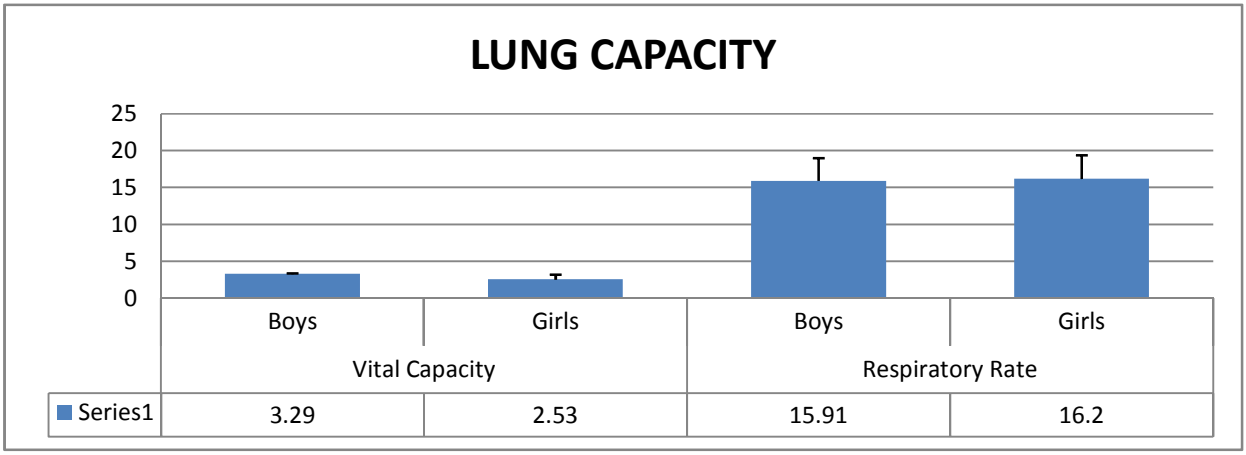
Table- 4

Comparison Between Boys (Non- Sports) and Girls (Non- Sports) in Regard to Lung Function Variables

Variable		M	SD	LTEV 'F'	LTEV SS	MD	SED	't'	A
Vital Capacity	Boys	3.29	.08	.06	0.81	.76	.16	4.79*	0.00
	Girls	2.53	0.67						
Respirator y Rate	Boys	15.91	3.11	1.84	0.18	0.41	1.00	0.41(NS)	0.69
	Girls	16.20	3.19						

Note: M= Mean; LTEV= Levene's Test for Equality of Variances; S= Significance;*= significant at .05 level; NS= Not significant; N= 59 (N1= Boys (Non- Sports) + N2= Girls (Non- Sports): N= N1 + N2, N1= 37, N2=22)

Graphical Representation of Comparison Between Boys (Non-Sports) and Girls (Non- Sports)in Regard to Lung Function Variables



DISCUSSION

There are numerous cross-sectional and longitudinal studies show that regular physical fitness, games and sports have positive relationship with lung function. It has been shown that players doing strenuous exercises (e.g. Swimming and Weight lifting) which involves respiratory muscles have better pulmonary test than players like sprinters[5]. Active men had higher forced expiratory volume in one second and forced vital capacity than inactive[6].Evidences show that regular physical activity causes many desirable physical, physiological and psychological changes in an individual consequently raising his level of fitness[7].Lung functions are also affected by many factors like air pollution, lifestyle, age, size of the body and physical fitness[8-10].Research suggests thatfemale have a greater distribution of blood flow towards the respiratory muscles and a reduced blood flow to the leg muscles during strenuous exercise due to greater oxygen cost of breathing which leads to lower physical performance[11].Our data suggests comparison between boys and girls, and the girls showed significant difference in respiratory functions of the students who were playing advance and intermediate sports as well as those not playing sports at all. The drawn hypothesis with regard to lung functions is proven in our experimental research. From the above evidences and the result of the study it can be said that moderate sports activities have positive effect on lung functions.

CONCLUSIONS

1. TheRespiratory rate was found to be statistically significant (different) in advance sports (between boys and girls) and vital capacity was found insignificant (not different) in advance sportsperson (between boys and girls).

2. The Vital Capacity found to be statistically significant (different) in intermediate sports (between boys and girls) and respiratory rate was found insignificant (indifferent) in regard to inter-mediate sportsperson (between boys and girls).
3. The Vital Capacity found to be statistically significant (different) in non-sportsperson(between boys and girls) and respiratory rate was found insignificant (not different) in regard to non- sportsperson (between boys and girls).
4. The vital capacity was more in boys and respiratory rate was more in girls which showed that girlslung capacity is less than that of boys.

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