ORIGINAL ARTICLE

A COMPARATIVE STUDY OF FORCED EXPIRATORY VOLUME IN FIRST SECOND AND BODY MASS INDEX IN YOUNG ADULT MALES

Swaroop B. P[1]

HOW TO CITE THIS ARTICLE:
Swaroop B. P. "A Comparative Study of Forced Expiratory Volume in First Second and Body Mass Index in Young Adult Males". Journal of Evidence Based Medicine and Healthcare; Volume 1, Issue 8, October 15, 2014; Page: 1022-1028.

ABSTRACT: Obesity is becoming a serious public health issue and is related to lung dysfunction. This study was planned to assess the correlation between the pulmonary function like FEV_1 and increasing BMI in young adult males. This study was undertaken in normal weight and overweight young adult males of Balagangadaranatha nagara, Mandya. The study and control groups were comprised of 120 male subjects between the age group 18-24 years randomly selected from the population of Balagangadaranatha nagara. Anthropometric measurements and spirometry was performed in all subjects. FEV_1 was used as a measure of lung function. There was a significant difference in FEV_1 in the study group and there was inverse relationship between FEV_1 and increase in BMI.

KEYWORDS: BMI, FEV_1

INTRODUCTION: Overweight and obesity has become global epidemic. In the developing and developed countries it has become a major health related problems nowadays. An increase in the prevalence of obesity is seen around the world.[1] Obesity is a chronic medical condition characterized by an excessive accumulation of body fat on the human body that causes a generalized increase in the body mass.[2] Obesity in children and adults has reached an alarming proportion. The main cause of adolescent obesity is manifold that includes lack of regular exercise, sedentary life style, overconsumption of high caloric foods and genetic, perinatal and early life factors. Obesity can profoundly alter pulmonary function by its adverse effects on the respiratory system. The objective of the study was to record the forced expiratory volume in first second (FEV_1) in normal weight and overweight young adult males and to compare so that the effect of increase in body mass index on the pulmonary function tests is studied.

MATERIALS AND METHODS: The present study included a total of 120 subjects, out of which 60 subjects were normal and 60 subjects were overweight. The subjects were young adult males whose ages were between 18-24 years. These subjects were selected by a simple random sampling method from a general population of Balagangadaranatha nagara, Mandya.

The selected group of subjects were categorized into normal weight and overweight based on the chart provided by WHO for body mass index.

BMI was calculated based on Quetelet's index.[3]
BMI=weight (in kgs) / height^2 (in meters)

BMI SCALE:

BM1 (Kg/m2)	Status
< 18.5	Underweight
18.5-24.99	Normal weight
25-29.99	Overweight
30 and above	Obese

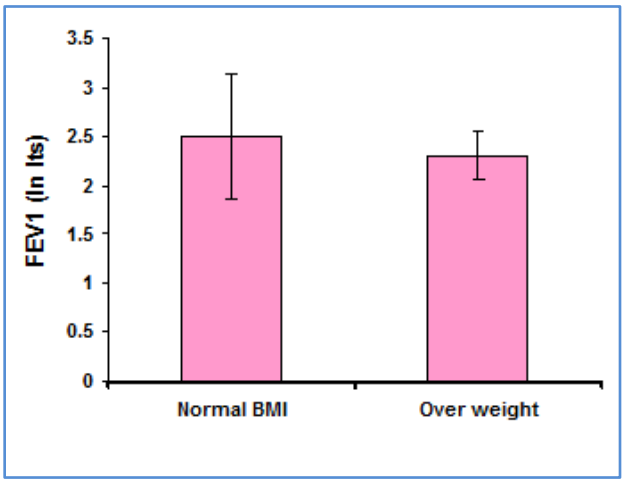
Descriptive and inferential statistical analysis has been carried out in the present study.

Student "t" test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups (inter group analysis) on metric parameters.

The statistical software, SPSS 15.0 is used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc.

RESULTS: Table of Mean and Standard Deviation of Forced Expiratory volume in first second with Normal and Overweight in the subjects

PFT Variables	Normal BMI	Over weight	P value
FEV1 (In lts)	2.50±0.63	2.31±0.24	0.033*



The Mean and SD for FEV_1 in the normal weight group is 2.50±0.63 and it is 2.31±0.24 in the overweight group and it is statistically significant (p=0.033).

DISCUSSION: The present study also showed that the FEV1 has significantly reduced in overweight subjects when compared to the normal weight subjects. The result was consistent with the study done by Dayananda G[4], who found that the BMI and Waist-to-Hip ratio were significantly increased and FEV1 and PEFR were significantly lower in the overweight and obese

subjects when compared to the normal subjects in young males of Siddartha Medical College in the age group of 18-25 years.

He has mentioned that with increasing obesity, fat deposition tend to occur centrally and around the trunk intra-abdominally in men and this pattern of fat distribution was likely to influence the lung function. Further he has stated that abdominal fat deposition may directly impede the descent of diaphragm and fat deposition in the chest wall may diminish rib cage movement and thoracic compliance both leading to restrictive respiration impairment and other probable mechanisms includes the possibility that abdominal fat deposition leads to redistribution of blood flow to thoracic compartment that results in reduced vital capacity.

The result of the present study was also consistent with the other study done by Ahmed H Algadir [5]et al on the Saudi male children between the age groups 6-13 years, who were classified into normal weight, overweight and obese, based on BMI. They have observed in their study that the more fatness the Saudi children had, there is more reduction of ventilatory function. They have observed that the FEV1 in overweight category has statistically declined as compared to the normal weight category children.

CONCLUSION: So the present study showed that FEV_1 is significantly reduced in overweight individuals as compared to their normal weight counterparts.

REFERENCES:

1. LI AM, Chan D, Wong E, Yin J, Nelson EAS, Fok TF. The effects of obesity on pulmonary function. Arch Dis Child 2003; 88: 361-363.
2. Ghobain MA. The effect of obesity on spirometry tests among healthy non-smoking adults. BMC Pulmonary Medicine 2012; 10: 1-5.
3. Park K. Parks textbook of preventive and social medicine. 21st ed. Jabalpur: M/s Banarsidas bhanot publishers; 2011. p.369.
4. Dayananda G. The effects of obesity on lung functions. JPBS 2009; 22 (2): 17-20.
5. Alghadir AH, Aly FA. Effect of obesity on pulmonary functions among Saudi Children. Biomed Res-India 2012 Mar; 23 (4): 605-608.

LIST OF SUBJECTS WHO ARE HAVING NORMAL BMI
(BMI between 18.5-24.99)

Sl. no.	AGE (in years)	SEX	HEIGHT (in cms)	WEIGHT (in kgs)	B M I	FEV1 (in lts)
1	19	M	176	60	19.36	2.905
2	19	M	165	50	18.81	2.748
3	19	M	178	62	19.56	2.853
4	19	M	172	62	20.95	2.853
5	19	M	170	55	19.03	2.031
6	19	M	172	56	18.92	2.053

7	19	M	182	63	19.02	2.774
8	19	M	168	57	20.19	2.064
9	19	M	160	49	19.14	2.026
10	20	M	160	63	24.60	1.972
11	19	M	168	68	24.09	1.039
12	19	M	177	63	20.11	2.892
13	19	M	168	54	19.13	1.709
14	19	M	170	66	22.83	1.919
15	19	M	174	58	19.15	2.342
16	19	M	168	53	18.77	2.603
17	20	M	176	66	21.31	3.55
18	19	M	169	64	22.41	1.078
19	24	M	170	58	20.06	2.289
20	22	M	177	70	22.34	3.405
21	23	M	171	63	21.54	1.525
22	22	M	181	70	21.36	2.182
23	22	M	177	63	20.11	1.67
24	21	M	176	74	23.88	1.893
25	20	M	179	75	23.41	3.103
26	19	M	155	50	20.81	2.274
27	19	M	168	56	19.84	3.51
28	19	M	168	56	19.84	2.276
29	20	M	161	50	19.28	2.695
30	20	M	180	63	19.44	3.589
31	20	M	170	56	19.37	1.89
32	20	M	173	56	18.71	1.801
33	20	M	160	55	21.48	1.762
34	19	M	172	57	19.26	1.91
35	20	M	171	67	22.91	3.181
36	19	M	172	58	19.60	1.13
37	20	M	169	70	24.50	2.56
38	19	M	161	58	22.37	2.642
39	20	M	164	60	22.31	2.564
40	19	M	166	62	22.49	2.656
41	19	M	172	62	20.95	2.025
42	19	M	175	65	21.22	2.458
43	20	M	181	66	20.14	3.681
44	20	M	180	68	20.98	3.812
45	19	M	170	55	19.03	3.247
46	19	M	171	56	19.15	3.273
47	20	M	182	63	19.01	3.142

48	20	M	175	60	19.59	2.761
49	21	M	175	59	19.26	2.84
50	21	M	173	62	20.71	2.984
51	21	M	170	70	24.22	2.787
52	22	M	169	69	19.11	2.498
53	22	M	165	68	24.97	2.59
54	21	M	171	72	24.62	2.905
55	21	M	164	68	24.09	2.695
56	21	M	174	75	24.77	2.682
57	22	M	178	77	24.30	2.958
58	23	M	178	78	24.62	2.064
59	21	M	173	74	24.72	2.195
60	21	M	172	71	23.99	2.656

LIST OF SUBJECTS WHO COME UNDER OVERWEIGHT BMI
(BMI between 25.0-29.99)

Sl. No.	AGE (in years)	SEX	HEIGHT (in cms)	WEIGHT (in kgs)	B M I	FEV1 (in lts)
1	19	M	171	76	25.99	2.261
2	19	M	168	80	28.344	2.644
3	19	M	162	77	29.34	2.353
4	20	M	169	79	27.66	2.564
5	21	M	182	89	26.868	3.523
6	23	M	163	71	26.722	2.135
7	19	M	173	75	25.059	2.117
8	19	M	172	74	25.013	2.051
9	19	M	174	76	25.102	2.261
10	20	M	173	77	25.727	2.314
11	19	M	175	80	26.122	3.339
12	20	M	174	79	26.093	3.044
13	20	M	170	74	25.605	2.21
14	21	M	170	76	26.297	1.776
15	20	M	168	76	26.927	2.092
16	20	M	169	72	25.209	2.695
17	20	M	168	74	26.218	2.419
18	21	M	169	76	26.609	2.577
19	20	M	189	92	25.755	4.224
20	20	M	185	94	27.465	4.049
21	19	M	162	76	28.959	1.867

22	19	M	161	76	29.319	2.064
23	20	M	169	78	27.309	2.761
24	20	M	167	79	28.32	2.748
25	19	M	171	75	25.64	2.027
26	20	M	172	77	26.027	2.079
27	19	M	173	79	26.395	2.066
28	20	M	165	73	26.813	2.524
29	19	M	169	72	25.209	2.098
30	20	M	166	74	26.854	2.721
31	20	M	162	69	26.291	2.734
32	19	M	163	67	25.21	2.34
33	20	M	164	68	25.282	2.09
34	20	M	158	65	26.037	2.432
35	22	M	171	80	27.358	2.695
36	23	M	171	85	29.068	2.353
37	22	M	174	80	26.42	2.314
38	21	M	175	81	26.448	2.235
39	22	M	174	82	27.084	2.287
40	23	M	175	83	27.102	2.445
41	22	M	173	84	28.066	2.721
42	23	M	174	87	28.735	2.721
43	22	M	172	81	27.379	2.787
44	21	M	174	83	27.414	2.09
45	24	M	175	84	27.428	2.524
46	22	M	173	80	26.729	2.04
47	21	M	176	82	26.472	2.695
48	23	M	179	84	26.216	2.656
49	24	M	174	81	26.753	2.051
50	22	M	173	83	27.732	2.34
51	23	M	174	84	27.744	2.682
52	21	M	180	83	25.617	2.498
53	20	M	177	85	27.131	2.629
54	21	M	176	86	27.763	2.366
55	22	M	165	79	29.017	2.432
56	21	M	160	75	29.296	2.066
57	22	M	176	86	27.763	2.537
58	22	M	162	72	27.434	2.379
59	23	M	175	88	28.734	2.209
60	23	M	163	77	28.981	2.327

ORIGINAL ARTICLE

AUTHORS:

1. Swaroop B. P.

PARTICULARS OF CONTRIBUTORS:

1. Tutor, Department of Physiology, Manyda Institute of Medical Sciences, Mandya.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Swaroop B. P,
Tutor, Department of Physiology,
Mandya Institute of Medical Sciences,
Mandya.
E-mail: drswaru77@gmail.com

Date of Submission: 17/09/2014.
Date of Peer Review: 18/09/2014.
Date of Acceptance: 19/09/2014.
Date of Publishing: 10/10/2014.