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Research Article

**LUNG FUNCTION EVALUATION THROUGH SPIROMETRY  
IN SMOKERS OF BALOCHISTAN UNIVERSITY STUDENTS****Munir Ahmed, Muhammad Younis, Shafi Muhammad, Tanzeel Ahmed  
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**Abstract:**

**Objectives:** The objective of the research was to evaluate lung feature amongst students who smoke and non-smokers.

**Material and Method:** The exploration was led in the University of Balochistan, Quetta, Pakistan. The self-planned examination form and Spirometer were utilized. The total 100 male student's age amass between 20-45 years who smoking one year or more were chosen. The students were isolated into two gatherings as takes after; (1). Test/Case Group; which comprise of 50 students. (2). Control group; this gathering additionally comprise of 50 students. The meeting was led and Spirometry test was performed for both gatherings' students of University of Balochistan, Quetta, Pakistan. The spirometer considerations; FVC, FEV1, PEFR, FEV1/FVC proportion and FEF25-75% were originated and investigated. The frequency, percent, mean and standard deviation were perceived for smokers and the non-smokers by methods for SPSS 22.

**Result:** The anticipated mean±standard deviation estimation of FVC for smokers was 62.54±17.048 and estimation of FVC for non-smokers was 66.56±12.654. The estimation of FEV1 for smokers was 46.00±13.595 and FEV1 for non-smokers was 74.60±12.638. The estimation of FEV1/FVC proportion for smokers was 74.20±11.433 and FEV1 for non-smokers was 113.58±12.634. The estimation of PEF for smokers was 61.42±19.037 and the estimation of PEF for non-smokers was 87.10±13.368. The estimation of FEF2575 for smokers was 81.16±28.287 and the estimation of FEF2575 for non-smokers was 104.44±23.213.

**Conclusion:** Smoking deleteriously affects the wellbeing, essentially on aspiratory capacities. Consequently, the danger of respirational mortality or dismalness is extraordinary by way of smoking. The investigation inferred that the smoker's students were on more danger of lung illnesses than the non-smokers students and along these lines elevates smoking suspension endeavors to lessen the weight of COPD in the group.

**Keywords:** Spirometry, Lung Function, Smokers, Non-Smokers, Students, University of Balochistan, Pakistan.

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## INTRODUCTION:

The maximum not unusual and vital chance element for decreased lung function is smoking. the terrible effect on lung characteristic because of tobacco smoke is supposed to be the result of an infection as a response to the noxious particles inhaled [1]. The (WHO) World Health Organization pronounced that tobacco smoking executed one thousand million individuals global inside the 20th era and advised that it may assassinate one thousand million individuals round the arena within the twenty first era additionally [2]. Except the straight significances of smoking on people who smoke, submissive smoking with the aid of non-people who smoke, who're uncovered to smoke of tobacco, additionally has exposed a greater than before hazard of respiration and cardio vascular distresses in youngsters [2]. Some other hallmark of the negative impact of tobacco smoke on lung feature is oxidative stress, which is caused by both tobacco smoke and the inflammation and might be both improving and more desirable via the irritation [3]. People who smoke experience a quicker decline of lung characteristic with age in comparison to never people who smoke [4]. Respiration signs associated with smoking are cough and sputum manufacturing. Such signs and symptoms are once in a while, however no longer usually, associated with a measurable lower in lung function [5, 6]. The lung function variable most usually studied when it comes to smoking is compelled expiratory extent in one 2nd, FEV1 [1, 4, 7], which has a bad correlation to respiration signs and symptoms [5, 8]. Now not all smokers increase faster decline of lung function than expected with growing older, and there is nevertheless no fashionable settlement at the opportunity to inform the distinction among a prone and non-prone smoker before the improved lung function decline starts and the presence of respiratory signs will be one such marker [4, 6, 9].

Tobacco has remained as one of the maximum critical predisposing elements liable for such a lot of breathing and cardiovascular illnesses. smoking results in rapid decline in pulmonary characteristic checks (PFTs) [10]. COPD (Chronic Obstructive Pulmonary Diseases) has been identified as unique of the maximum crucial reasons of mortality and morbidity in persistent tobacco people who smoke global [11].

The COPD (Chronic Obstructive Pulmonary Diseases), small airlines are much a smaller amount of diameter i.e. 2mm. Those blockades in airlines always upset the considerations of respiratory feature. e.g. forced vital capacity (FVC) and forced expiratory volume inside

the first 2nd (FEV1) [11]. Pulmonic function trying out is an ordinary method for the evaluation and observing of breathing illnesses [2]. Assessments also are beneficial because they may be a reduced amount of exclusive, non-invasive, reproducible, and reason minimal soreness for the subjects. Spirometric values range in line with age, top, sex, and body length [12, 13].

Therefore, smoking has tremendous possessions on respiration feature, which can be identified by pulmonic feature take a look at. Therefore the intention of this research became to evaluate the respiratory function between university of Balochistan, Pakistan students smokers and non-smokers.

## MATERIAL AND METHOD:

### Study Design:

The design of this study was case-control.

### Research Location:

The study was carried out in the University of Balochistan, Quetta, Pakistan.

### Data Collection Apparatuses:

The self-designed evaluation form and spirometer had been used. The sooner settlement was inspired from the all examine members, students of university of Balochistan, Quetta, Pakistan.

### Study Procedure:

The combination one hundred male student's age organization between 20-45 years who smoking three hundred and one year or more had been selected. The students had been separated into two companies as follows; (1). Experimental/case group; which include 50 students. (2). Control Group; also consist of 50 students. The interview changed into conducted and Spirometry check was completed for both groups' students of university of Balochistan, Quetta, Pakistan. The spirometer parameters; FVC (Forced Vital Capacity), FEV1 (Forced Expiratory Volume in One Second), PEFr (Peak Expiratory Flow Rate), FEV1/FVC ratio and FEF25-75% (Forced Mid Expiratory Flow), found and investigated.

### Arithmetical Analysis:

The amount, percent, mean and standard deviation have been diagnosed for smokers and the non-smoker. Friedman's -way research test changed into affordable and ( $p < 0.05$ ) turned into diagnosed through SPSS 22.

**Ethical Consideration:**

Studies changed into recounted through the studies and ethics committee, Faculty of pharmacy and health sciences, university of Balochistan, Pakistan. The earlier agreement became prompted from the research participants, students of university of Balochistan, Quetta, Pakistan.

**RESULT:**

The total sums of 100 male scholars were designated from the University of Balochistan, Quetta, Pakistan. On view of which 50 were smokers and 50 were non-smokers. The demographic and descriptive statistics considerations of the smokers and the non-smokers are exposed in table 1. In the age group 20-29 years the study accused in smokers were 38 (76.0%) by mean age of  $26.68 \pm 4.62$  and in non-smokers age group 20-29 years the study accused were 39 (78.0%) by mean age of  $25.16 \pm 4.62$ . In the age group 30-39 years the study accused in smokers were 12 (24.0%) and in non-smokers age group 20-29 years the study accused were 11 (22.0%) by mean age of  $25.16 \pm 4.70$ . The qualification of smokers; pharmacy students were 11 (22.0%), M.A English were 04 (8.0%), M.A. Math were 03 (6.0%), MSc. Zoology were 8 (16.0%), MSc. Botany 10 (20.0%), MSc. Chemistry were 9 (18.0%) and MSc. Physics were 5 (10.0%). The qualification of non-smokers; pharmacy students were 4 (8.0%) followed by, Commerce (M.Com) 3 (6.0%), MA. Social work 4 (8.0%), M.A. Education 5 (10.0%), M.A. Balochi 4 (8.0%), M.A. Economics 4 (8.0%), M.A. Gender 5 (10.0%), M.A. History 3

(6.0%), M.A. International Relation 3 (6.0%), M.A. Pak Studies 3 (6.0%), MA. Political Science 3 (6.0%), M.A. Sociology 4 (8.0%) and M.A. Urdu 5 (10.0%). In the smokers group; BMI mean and standard deviation was  $23.68 \pm 2.74$ , Pulse Rate was  $88.12 \pm 15.69$ , Systolic B.P was  $125.92 \pm 14.86$ , Diastolic B.P was  $80.48 \pm 9.25$ , Weight (Kg) was  $64.16 \pm 7.32$  and Height (m) was  $1.65 \pm 0.03$ . In the non-smokers group; BMI mean and standard deviation was  $22.76 \pm 3.53$ , Pulse Rate was  $92.80 \pm 5.05$ , Systolic B.P was  $122.50 \pm 9.27$ , Diastolic B.P was  $81.86 \pm 9.52$ , Weight (Kg) was  $68.08 \pm 11.25$  and Height (m) was  $1.73 \pm 0.06$ .

The association of Spirometry between smokers and non-smokers as exposed in the table no 2 are as follows; the expected mean  $\pm$  standard deviation value of FVC for smokers was  $62.54 \pm 17.048$  with ( $p=0.707$ ) and the expected mean  $\pm$  standard deviation value of FVC for non-smokers was  $66.56 \pm 12.654$  with ( $p=0.230$ ). The value of FEV1 for smokers was  $46.00 \pm 13.595$  with ( $p=0.488$ ) and the value of FEV1 for non-smokers was  $74.60 \pm 12.638$  with ( $p=0.798$ ). The value of FEV1/FVC ratio for smokers was  $74.20 \pm 11.433$  with ( $p=0.259$ ) and the value of FEV1 for non-smokers was  $113.58 \pm 12.634$  with ( $p=0.230$ ). The value of PEF for smokers was  $61.42 \pm 19.037$  with ( $p=0.138$ ) and the value of PEF for non-smokers was  $87.10 \pm 13.368$  with ( $p=0.451$ ). The value of FEF<sub>2575</sub> for smokers was  $81.16 \pm 28.287$  with ( $p=0.870$ ) and the value of FEF<sub>2575</sub> for non-smokers was  $104.44 \pm 23.213$  with ( $p=0.826$ ).

Table No.1: Demographic and Descriptive Statistics

Description	Smokers (N=50)		Non-Smokers (N=50)	
	Frequency	Percent	Frequency	Percent
<b>Age Group</b>				
20-29 years	38	76.0	39	78.0
30-39 years	12	24.0	11	22.0
<b>Qualification</b>				
Pharmacy Students	11	22.0	04	8.0
Commerce ( M.Com)	--	--	03	6.0
MA. Social work	--	--	04	8.0
M.A. Education	--	--	05	10.0
M.A. Balochi	--	--	04	8.0
M.A. Economics	--	--	04	8.0
M.A. English	04	8.0	--	--
M.A. Gender	--	--	05	10.0
M.A. History	--	--	03	6.0
M.A. International Relation	--	--	03	6.0
M.A. Math	03	6.0	--	--
M.A. Pak Studies	--	--	03	6.0
MA. Political Science	--	--	03	06
M.A. Sociology	--	--	04	8.0
M.A. Urdu	--	--	05	10.0
MSc. Zoology	8	16.0	--	--
MSc. Botany	10	20.0	--	--
MSc. Chemistry	09	18.0	--	--
MSc. Physics	05	10.0	--	--
<b>Description</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Mean</b>	<b>Std. Deviation</b>
Age	26.68	4.62	25.16	4.70
BMI (Body Mass Index)	23.68	2.74	22.76	3.53
Pulse Rate	88.12	15.69	92.80	5.05
Systolic B.P (Blood Pressure)	125.92	14.86	122.50	9.27
Diastolic B.P (Blood Pressure)	80.48	9.25	81.86	9.52
Weight (Kg)	64.16	7.32	68.08	11.25
Height (m)	1.65	0.03	1.73	0.06

Table No 2: Association of Spirometry between Smokers and Non-Smokers Students

Description	N	Mean	Standard Deviation	95% Confidence Interval for Mean		Minimum	Maximum	Sig Level (p< 0.05)
				Lower Bound	Upper Bound			
FVC PERCENT Smokers	50	62.54	17.048	57.70	67.38	37	108	0.707
FVC PERCENT Non-Smokers	50	66.56	12.654	62.96	70.16	44	115	0.230
FEV1 PERCENT Smokers	50	46.00	13.595	42.14	49.86	26	86	0.488
FEV1 PERCENT Non-Smokers	50	74.60	12.638	71.01	78.19	35	103	0.798
FEV1/FVC Ratio Smokers	50	74.20	11.433	70.95	77.45	42	99	0.259
FEV1/FVC Ratio Non-Smokers	50	113.58	12.634	109.99	117.17	30	125	0.230
PEFR PERCENT Smokers	50	61.42	19.037	56.01	66.83	22	116	0.138
PEFR PERCENT Non-Smokers	50	87.10	13.368	83.30	90.90	58	125	0.451
FEF2575 PERCENT Smokers	50	81.16	28.287	73.12	89.20	31	206	0.870
FEF2575 PERCENT Non-Smokers	50	104.44	23.213	97.84	111.04	18	145	0.826

\*\*Friedmen's two way analysis of variance by rank\*\*

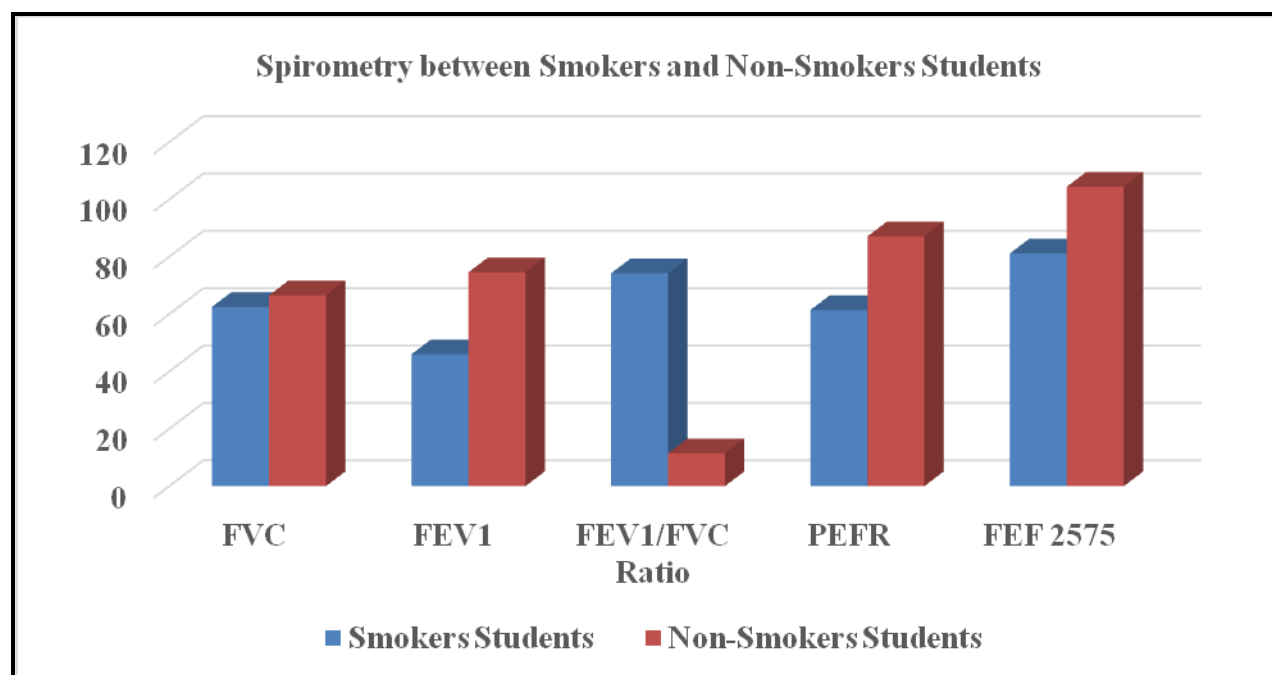


Fig 1: Association of Spirometry between Smokers and Non-Smokers Students

#### DISCUSSION:

Spirometry is an often executed lung characteristic check, and is a crucial tool in clinical surveillance examinations of pulmonary illnesses. Within the gift

take a look at, there's a substantial reduction in FVC, FEV1, FEV1/FVC ratio, PEF and FEF2575 value among the smokers compared to non-smokers.

A take a look at conducted through Harita P Vyas, et al. 2014, full-size discount in FEV1 value a few of the people who smoke in comparison to non-smokers. there has been no statistically extensive alteration inside the FVC and FEV1/FVC percentage between people who smoke and non-people who smoke [2]. But present study have a look at oppose the result or latest take a look at as noted above, decreases in FVC, FEV1, FEV1/FVC ratio, PEF and FEF2575 price some of the people who smoke in comparison to non-people who smoke.

the FEV1 changed into discovered to be expressively condensed in cigarette smoker [2]. similar outcomes had been found by way of Dhand R, Nighute S and Awari A [14]. Present study supported the end result of new studies accomplished via the researcher's as cited above. ciggy smoking has sizable impact on breathing purposes and it's been really associated within the etiology of some of respirational infections [15]. Mahajan et al. and Gupta et al. witnessed no variations for FVC value in cigarette smokers [2]. However, in the extant have a look at reduction in FVC became discovered that's parallel to end result of recent studies.

FEV1/FVC percentage became not originated to be appreciably dissimilar in this observe which isn't according with research performed by Nighute S, Awari A and Nwafleh HA et al [2, 15, 16]. But inside the present study, oppose the end result of new research as stated above because FEV1/FVC ratio changed into found sizable distinction in smokers than non-smokers.

### CONCLUSION:

Smoking deleteriously affects the wellbeing, essentially on aspiratory capacities. Consequently, the danger of respirational mortality or dismalness is extraordinary by way of smoking. The investigation inferred that the smoker's students were on more danger of lung illnesses than the non-smokers students and along these lines elevates smoking suspension endeavors to lessen the weight of COPD in the group.

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