

# Cancer Sites Prevalence among Current and Former Cigarettes Smokers: A study of Southern Punjab, Pakistan

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## ABSTRACT

**Objectives:** To see the prevalence of cancer sites among male smokers of the Southern Punjab, Pakistan.

**Methods:** A cross-sectional sample of 211 male cancer patients (aged: 19-80 years), belonging to the Southern Punjab was collected from the Outdoor Ward of Cancer, Oncology Ward of Nishtar Hospital, Multan and Multan Institute of Nuclear and Radiotherapy (MINAR) Hospital. Information about socio-demographic, smoking-related characteristics and medical records of various types of cancers were recorded through self-made questionnaire. Some descriptive analysis i.e., means along with standard deviation (SD) of each quantitative variable and frequency along with their percentage of each categorical variable was calculated. For means age comparison, two sample independent t-test was used in the analysis.

**Results:** Among the cancer patients, 79.1% were current smokers and 20.9% were former smokers. The mean ( $\pm$  SD) age to start cigarette smoking was reported to be 22.46 ( $\pm$ 4.35) while mean age for smoking cessation (quit) was 46.23 ( $\pm$ 12.24) years. Among overall smokers, percentage of lung cancer is highest (28.4%), followed by stomach (19.4%) and esophageal cancer (19.0%). However, cancer of throat and urinary bladder both have equal prevalence (16.6%). The mean ( $\pm$  SD) age affected from cancerous disease was reported to be 47.59 ( $\pm$ 12.68) years.

**Conclusion:** Various cancer sites are dominant among smokers in Southern Punjab, Pakistan. However, the percentage of lung cancer was highest among all stated types.

**Keywords:** Current smokers, Cigarettes smoking, Lungs and Esophagus cancer, Southern Punjab, Pakistan.

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## INTRODUCTION

Cancer or malignancy is an escalating fatal disease around the world. In last few years, its prevalence during fifth to sixth decade of life span is well documented. More than 200 types of cancers are originated that affect humans.<sup>1</sup> According to the World Health Organization (WHO), cancer is the leading cause of death worldwide, with approximately 27 million incident cases, 17 million deaths and 75 million people living with the disease being estimated for the year 2030.<sup>2</sup> Therefore, oncologists now days take some particular interest in this disease as a public health concern.

It is very challenging to say about what certain causes account the risk of cancer. However, some environmental risk factors including certain wounds, radiations, poor nutrition (diet) and fatness, stress, physical inactivity and environmental pollutions etc. are those that contribute to cancer and cancer related deaths.<sup>3</sup> In addition, tobacco consumption in the form of different tobacco products (like cigarette, hookah, cigar smoking etc.) is also another well-established risk factor of cancer, worldwide.<sup>4-8</sup> An international cancer research agency reported that at least 15 different types or subtypes of cancer are casually related to smoking.<sup>9</sup> Another well-designed epidemiological study by Moura et al.<sup>10</sup> also confirms that

tobacco smokers had a 'very high risk' of getting various cancers (i.e. bronchi and lung, larynx, oropharynx and oral cavity) and had 'high and moderate risk' for cancer of the esophagus, bladder and stomach, pancreas, kidney and nasal cavity etc., respectively. Some more studies<sup>11-13</sup> also showed that duration, quantity of smoking per day and time since quit smoking, all are consistently associated with the risk of various developing cancers.

Although in Pakistan, various nation-wide and regional level studies<sup>14-19</sup> have been carried out to see the incidence of various cancer sites. Among these, some researchers<sup>18, 19</sup> in Punjab and its South region also gave the age, sex-specific and rural-urban specific prevalence of different cancers. However, data about cancer sites prevalence among current and former smokers is very scarce in local literature. This motivated use to carry out such kind of study in the wide area of the Southern Punjab, Pakistan. In this study, our focus is to see the prevalence of various cancer sites related to cigarette smoking.

## RESEARCH METHODOLOGY

### Study settings

The present cross-sectional study was conducted in Outdoor Ward of Cancer, Oncology Ward of Nishtar

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Hospital, Multan and Multan Institute of Nuclear and Radiotherapy (MINAR) Hospital, Multan. Mostly of the cancer patients in Southern Punjab visit these two hospitals for their medical check-up of different cancer sites. Punjab is the most populous province of Pakistan and three divisions named as Multan division, D.G Khan Division and Bahawalpur division are situated in its South zone. The climate of this zone is almost hot and polluted. A sample of 211 male subjects as a cancer patient was recruited in this study.

### Data collection

For the present study, data collection activity was performed through an interview of self-administered questionnaire. The questionnaire had two sections. First section of questionnaire comprised of socio-demographic characteristics and tobacco smoking-related characteristics. Socio-demographic characteristics includes age (years) of the subject, marital status (married/un-married) and area of residential division while as, tobacco smoking was addressed through question on smoking status (i.e., current smoker or former smoker). Here, current smokers were defined as those subjects who smoked throughout their follow-up periods and former smokers were those who had to stop tobacco smoking for at least one year before, affecting from the cancer disease. Some more questions were also asked about the starting age (years) of tobacco smoking, type of tobacco product (cigarettes/hookah/cigar etc.) smoked, average consumption of cigarettes/hookah/cigar/pipe per day, duration of smoking and age at cessation (quitting) of tobacco smoking for the former smokers. Second section of the questionnaire consisted of subject's history about the type of cancer who affected and the age (years) at which the subject affected from the cancer, was also asked.

### Inclusion and Exclusion Criteria

The medical records of each subject were checked, if the subject was affected with some cancer and also had some history of smoking were included in the study. As in Pakistan, male had a higher proportion of smoking cigarettes than other tobacco products (hookah, bidi, sheesha smoking etc.)<sup>20</sup> and in our sample also, majority patients were cigarettes smokers. Very few (23) patients smoked other tobacco products; we therefore excluded all those subjects who were not affected from cancer disease and smoked other tobacco products from the study. After explaining objective of the study, verbal consent from each cancer patient was also obtained. Departmental ethics committee of Bahauddin Zakariya University, Multan approved this study.

### Statistical Analysis

Descriptive measures i.e., mean and standard deviation (SD) of each quantitative variable and frequency along with their percentage of each categorical variable were calculated. For means age comparison affected from cancer according to type of smokers (i.e., current or former smokers), two sample independent t-test was used. All statistical analysis was carried out with the software 'statistical package for social sciences' (SPSS) version 21.0. Statistically significance was checked by using  $\alpha=5\%$  in our analysis.

### RESULTS

The detailed information about socio-demographic and smoking-related characteristics of the study subjects were presented in Table 1. A total of 211 (97.2% married and 2.8% unmarried) male subjects aged 19-80 years

were included as a cancer patient in the study. The mean ( $\pm$  SD) age of the total cancerous patients was 50.11 ( $\pm 14.13$ ) years and majority patients 113 (53.6%) were represented the age-group of 41-60 years. Area of residential distribution indicated that 50.2% patients belonged to Multan division whereas, 32.2% and 17.5% patients belonged to D.G Khan and Bahawalpur divisions, respectively. Smoking characteristics of cancer patients revealed that 167 (79.1%) patients were current smokers and 44 (20.9%) were former smokers. The mean ( $\pm$  SD) age to start cigarette smoking was 22.46 ( $\pm 4.35$ ). Majority of the patients 118 (55.9%) were smoked 5 to 10 cigarettes per day and just 14 (6.60%) patients smoke 20 to 30 cigarettes per day. Among the former cigarette-smokers of Southern Punjab, the mean age for smoking cessation (quit) was reported to be 46.23 ( $\pm 12.24$ ) years. Quartile values indicated that 25% smokers quit smoking before the age of 39 while about 50% quit around the age of 46 years and only 25% of the smokers continue to smoke after age of 55 in Southern Punjab.

Table 2 listed the various cancer sites prevalence among overall smokers. Results showed that lung cancer (28.4%) was the most prevalent cancer among the smokers followed by stomach (19.4%) and esophageal cancer (19.0%). However, cancer of throat and urinary bladder both have equal prevalence (16.6%). Compared to former smokers, current smokers had more proportions to get cancer disease. In addition to, the percentage of getting lung cancer was also highest among both current and former smokers as compared to other stated types (Fig. 1).

The figures in Table 3 show that the prevalence of cancer (for all stated types) is alarming among the subjects aged between 41 and 60 years. In our study, the average age affected from cancer disease was 47.59 ( $\pm 12.68$ ) years. Similar results were also seen in Table 2, shows that smokers on average age of 45 or above are more likely to get various cancer sites. Furthermore, current cigarette-smokers affected from said types of cancer in early age than former smokers and the results were also significantly ( $p < 0.05$ ) different (Table 4).

### DISCUSSION

In worldwide, cancer disease is considered as a serious health threat and it has now become the leading cause of death in Asian Pacific countries including Pakistan.<sup>21</sup> According to WHO, smoking is a well-established risk factor for the development of various types of cancer.<sup>22</sup> However; the risk varies between studies according to racial groups and ethnic populations.<sup>23</sup> The main focus of this study was also see the prevalence of various cancer sites among current and former cigarette smokers.

Cancer results in our study shows that cancers of lung, stomach, esophageal, throat and urinary bladder were dominant among smokers. However, lung cancer frequency was the highest (28.4%) among these. A study by Bhurgri et al.<sup>14</sup> about Pakistan-country profile of cancer and cancer control also gave the similar results, explained that various cancer types i.e., lung, oral cavity, urinary bladder, pharynx, esophagus and prostate; are related to tobacco smoking and lung cancer was the leading cancer among male in Karachi South.

Our study findings also exposed that a higher proportion of cancer disease exist among current smokers as compared to former smokers that were align with the previous reported studies<sup>24, 25</sup> showed that lung cancer

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cases among current smokers were larger than former smokers.

In 2009, Coleman et al.<sup>26</sup> explained that a person may affect from cancer disease at any age however, old age is the most significant risk factor for developing cancer. American Cancer Society also reports that 87% of all cancers in the United States are diagnosed after 50 years of age. Similar action level was observed among Pakistani male i.e., the mean age affected from cancer of all sites is 50 years (95% CI: 48.2-52.4).<sup>14</sup> Another local study<sup>16</sup> also reported that more than 55% cancer incidence are in the age range of 46 to 75 years. Results in our study were also comparable, depicted that smokers strike in any malignancy after 45 years-age and highest frequency of cancer disease (for all stated types) was seen among the subjects aged between 41 and 60 years (Table 3).

Among smokers, amount smoked per day and smoking duration both are directly proportionate of contracting cancer disease.<sup>11-13</sup> Such strong evidence was also obtained from present study results, indicated that mostly smokers affected from cancer disease who's smoked 5-10 cigarettes per day and their length of smoking was more than two decades.

The present study has fewer limitations. Firstly, this study did not include the information about passive (second-hand) smoking which is another contributing factor of getting cancer. Secondly, present study just based on the analysis of cross-sectional data and for computing the risks, cancer patients who didn't smoke and control cases were not included in the study.

### CONCLUSION

In conclusion, this study confirms that various cancer types i.e., cancer of lung, stomach, esophageal, throat and urinary bladder were prevalent among Pakistani smokers and percentage of lung cancer disease patients was highest in the said area of Southern Punjab, Pakistan. Overall, the smokers affected from the cancer disease after the age of 45 years. Furthermore, some more studies are needed at national level to see the prevalence of cancer disease among smokers.

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Table 1: Socio-demographic and smoking-related characteristics of all study subjects (n=211)

Characteristics	N (%)
Age (years)	Mean ± SD: 50.11 ± 14.13
Age-groups (years)	
14-30	20 (9.5)
31-40	39 (18.5)
41-60	113 (53.6)
Above 60	39 (18.5)
Marital status	
Married	205 (97.2)
Un-married	06 (2.8)
Area of Residential Division	
Multan Division	106 (50.2)
D G Khan Division	68 (32.2)
Bahawalpur Division	37 (17.5)
Type of Cigarette smoker	
Current smoker	167 (79.1)
Former smoker	44 (20.9)
Age (years) to start cigarette smoking	Mean ± SD: 22.46 ± 4.35
Number of cigarette smoker p/day	
<5 cigarette	20 (9.6)
5-10 cigarette	118 (55.9)
11-20 cigarette	59 (28.0)
21-30 cigarette	14 (6.60)
Duration of cigarette smoking (years)	
01-11	36 (17.1)
12-22	52 (24.6)
23-33	69 (32.7)
34 or above	54 (25.6)
Age (years) for cigarette-smoking cessation	Mean ± SD: 46.23 ± 12.24
Age (years) affected from cancer	Mean ± SD: 47.59 ± 12.68

Table 2: Cancer sites prevalence among overall cigarette smokers (n=211)

Cancer sites	N (%)	Age (years) Mean ± SD
Lungs	60 (28.4)	46.35 ± 11.99
Throat	35 (16.6)	45.89 ± 14.07
Stomach	41 (19.4)	47.66 ± 15.40
Esophagus	40 (19.0)	49.15 ± 11.12
Ur. Bladder	35 (16.6)	49.54 ± 10.57

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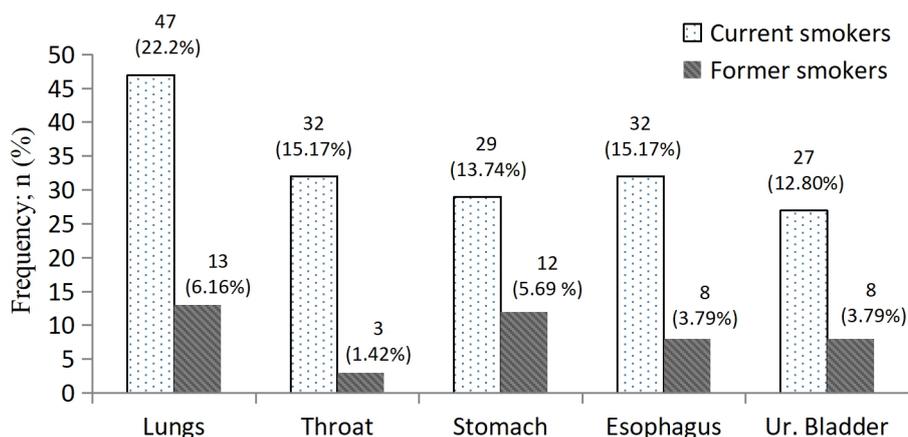


Fig 1: Distribution of different cancer sites among current and former cigarette smokers

Table 3: Distribution of various cancer sites according to age-groups and area of residential division

Category	Cancer types					Total (N=211)
	Lungs (N=60)	Throat (N=35)	Stomach (N=41)	Esophagus (N=40)	Ur. Bladder (N=35)	
<i>Age-groups (years)</i>						
14-30	05 (8.3)	06 (17.1)	07 (17.1)	01 (2.5)	01 (2.9)	20 (9.5)
31-40	09 (15.0)	07 (20.0)	07 (17.1)	10 (25.0)	06 (17.1)	39 (18.5)
41-60	36 (60.0)	17 (48.6)	16 (39.0)	21 (52.5)	23 (65.7)	113 (53.6)
Above 60	10 (16.7)	05 (14.3)	11 (26.8)	08 (20.0)	05 (14.3)	39 (18.5)
<i>Area of Residential Division</i>						
Multan Division	30 (50.0)	18 (51.4)	22 (53.7)	19 (47.5)	17 (48.6)	106 (50.2)
D G Khan Division	18 (30.0)	11 (31.4)	12 (29.3)	17 (42.5)	10 (28.6)	68 (32.2)
Bahawalpur Division	12 (20.0)	06 (17.1)	07 (17.1)	04 (10.0)	08 (22.9)	37 (17.5)
<i>Number of cigarette smoking p/day</i>						
<5 cigarettes	05 (8.3)	05 (14.3)	03 (7.3)	04 (10.0)	03 (8.6)	20 (9.5)
5-10 cigarettes	33 (55.0)	19 (54.3)	20 (48.8)	23 (57.5)	23 (65.7)	118 (55.9)
11-20 cigarettes	16 (26.7)	09 (25.7)	17 (41.5)	11 (27.5)	06 (17.1)	59 (28.0)
21-30 cigarettes	06 (10.0)	02 (5.7)	01 (2.4)	02 (5.0)	03 (8.6)	14 (6.6)
<i>Duration of cigarette smoking (years)</i>						
01-11	08 (13.3)	09 (25.7)	11 (26.8)	05 (12.5)	03 (8.6)	36 (17.1)
12-22	17 (28.3)	07 (20.0)	06 (14.6)	12 (30.0)	10 (28.6)	52 (24.6)
23-33	23 (38.3)	12 (34.3)	11 (26.8)	10 (25.0)	13 (37.1)	69 (32.7)
34 or above	12 (20.0)	07 (20.0)	13 (31.7)	13 (32.5)	09 (25.7)	54 (25.6)

Table 4: Mean comparison for age affected from cancer of the study subjects by smoker's type.

Cancer types	Cigarette smoker's type		P-value
	Current smoker Mean ± SD	Former smoker Mean ± SD	
Lungs	43.34 ± 10.02	57.23 ± 12.59	0.00
Throat	44.75 ± 14.19	58.00 ± 2.65	0.00
Stomach	42.03 ± 13.79	61.25 ± 9.68	0.00
Esophagus	46.63 ± 10.28	59.25 ± 8.65	0.00
Ur. Bladder	46.74 ± 9.58	59.00 ± 8.33	0.00