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A CROSS-SECTIONAL STUDY ON THE KNOWLEDGE AND AWARENESS OF LUNG CANCER AMONG THE GENERAL POPULATION OF DISTRICT KARAK AND KOHAT KHYBER PAKHTUNKHWA

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ABSTRACT

Lung cancer is not only a significant source of morbidity and cancer deaths in various populations and health care systems, but it is likely to have a critical impact on them. This study aims to determine the extent of knowledge and awareness about lung cancer among the populations in the two southern districts of Khyber Pakhtunkhwa and inform about gaps that can impede the prevention and timely occurrence of lung cancer. A cross-sectional observational study was conducted in the district of Karak and Kohat in Pakistan between July 2025 and July 2025. The collection of data involved will be conducted in the form of a self-administered questionnaire, which will be designed after an intensive review of relevant literature and consultation with proficient professors in the domain. The results advance a complicated topography of knowledge gaps, non-symmetry of knowledge among demographic groups, with a definite impact on the formulation of the public health policy and focus of intervention that shows a marked disparity. The findings revealed valuable knowledge gaps within the early symptoms, the risk factors of lung cancer, and early medical consultation. The government and health officials must prioritize lung cancer in their management plans towards reducing non-communicable diseases (NCD) by allocating

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finances towards the establishment of awareness, screening, and treatment centers in these areas.

Keyword: Lung Cancer Awareness, Smoking, Environmental Exposure, Genetic Predisposition, Health Education

INTRODUCTION

Lung cancer is a malignant tumor that begins in the respiratory system, usually in the trachea, bronchi, and the pulmonary tissue. As specified by the World Health Organization (2023), there are two major histology types of lung cancer: non-small cell lung cancer (NSCLC), which comprises 85% of cases, and small cell lung cancer (SCLC), whose prevalence constitutes 15% of the cases (World Health Organization, 2023). Epithelial cells, which line the airways and the alveoli, are mostly the target of the disease, though they are differentiated and have a different metastatic potential in the different subtypes. The lung cancer classification goes beyond the primary classification of NSCLC or SCLC. SCLC has a variety of subtypes, including adenocarcinoma that occurs mainly in smokers, squamous cell carcinoma that is closely linked to smoking, and large cell carcinoma (Barta, Powell, & Wisnivesky, 2019). Subtypes exhibit specific molecular features, growth patterns, and responses to treatment, which affect prognosis and change the way they are treated. Lung carcinogenesis is an interaction between environmental agents, genetic predisposition, and cellular interactions. The consistent effects associated with exposure to tobacco smoke include genetic modification over a gradual process, tumor suppressor gene destabilization, and oncogene activation, culminating in malignant conversion (Oudkerk et al., 2021).

Lung cancer was the most often diagnosed cancer in males, with 7,571 newly diagnosed cases, and comprised 8.6 per cent of all new cancer diagnoses in males. Regarding mortality, lung cancer ranked second as a cause of cancer mortality in Pakistan in 2022 after the lip and oral cavity malignancies (WHO, 2022). Lung cancer is the most commonly diagnosed cancer and the leading cause of mortality because there were more than 2.48 million new cases of the disease and nearly 1.82 million deaths in 2022 across the world (WHO, 2022). Persistent cough, Hemoptysis, chest pain, dyspnoea, cervical or supraclavicular lymphadenopathies, weight loss, metastatic pain, fatigue, and fever (although they do not represent the most widespread symptoms in the literature, they do vary depending on the study in question) are the most common symptoms enumerated (Hu et al., 2023; Singh, 2020). There was no significant difference in the existence of symptoms among smokers. Never smokers, ex-smokers and current smokers had cough as the most common symptom, which was 31.7%, 34.5%, and 34.5%, respectively, followed by pain and dyspnoea. Hemoptysis occurred more than two times in ever smokers as compared to anyone who never smoked, 12% vs 6%, respectively (Ruano-Raviqa et al., 2020). The upsurge in LC outlook will depend on the advancement of LC awareness, awareness of the symptoms, early detection, and access to proper treatment (Smith et al., 2018). In a study of the Malaysian population, it was shown that both smokers and non-smokers would be willing to undergo LC screening when they knew that they would be at risk (Loh & Tan, 2018). Conversely, 92.8 per cent of USA veterans were keen to be screened under LC irrespective of their smoking statuses (Schluger & Koppaka,

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2014).

The use of cigarettes and tobacco products has been cited as one of the many factors resulting in the prevalence of lung cancer, which is increasing (Global Adult Tobacco Survey Pakistan, 2019). Prevention and early identification significantly increase the outcome of patients. However, these are strategies that are carefully affected by the level of awareness and knowledge of lung cancer among the population. The objective of the study will involve evaluating knowledge and awareness about lung cancer in the populations of the two southern districts of Khyber Pakhtunkhwa and determining gaps that could contribute to inhibiting prevention and early detection. Understanding these gaps will be crucial for developing effective educational and health strategies, ultimately promoting positive health behaviors. Lung, Bronchus, and Tracheal (TBL) cancer is a significant cause of both morbidity and cancer-related mortality in different populations and health care systems (Sadiq et al., 2012). TBL cancer has caused 2 million deaths and new cases worldwide in 2019 alone, so it has posed a considerable healthcare system burden, which has strained available resources and infrastructure. The development of lung cancer is in itself complex, but the socioeconomic, cultural and educational variables can influence the prevention measures and the success of treatment.

The Age Standardized Incidence Rates (ASIR) were 4.0 in girls and 6.1 in boys among children 0-14 years old, and hematologic malignancies were more common; in adolescents 15-19 years old, the ASIR was 7.7 in females and 9.4 in males in Khyber Pakhtunkhwa in particular (Tasneem Shaikh, 2008), showing age-specific frequencies of cancer occurrence in the area. The lung cancer risk factor profile in Pakistan is found to have similarities and differences when compared to global trends. The determinants of lung cancer in Pakistan include smoking, pesticide exposure, diesel exhaust, and meat consumption as the most significant. Indeed, the risk of lung cancer can be minimized by the consumption of vegetables, fruits, milk, and juices, as in other countries (Uzair et al., 2024). This observation shows how lung cancer is a multivariate factor in Pakistan, given that tobacco is not the only cause. However, occupational and environmental factors should also be taken into consideration. Khyber Pakhtunkhwa is a rural province and has many agricultural activities, therefore posing risks in different ways. The situation could be related to a high level of pesticide exposure in the farming communities, which is accompanied by a lack of awareness about the available protective behaviors that reduce the risk of lung cancer. Also, the form of cooking modalities of the region, as well as the combustion of biomass in the form of heating, might augment the exposure to air pollution, especially in women (Zubair et al., 2024). The distribution of lung cancer risks in Khyber Pakhtunkhwa is also socioeconomically determined. Lack of robust healthcare infrastructure, access to preventive measures, and lesser educational levels are some of the contributory factors. The cultural background, such as traditional approaches to gender relations and health-seeking behavior, may also contribute to the way diseases are manifested and how medications are used.

Lung cancer burden in Pakistan is a complex issue in terms of the health care system, not only touching on the clinical aspects of the disease, treatment, and cure, but also in terms of prevention, early detection, and community awareness. Even though lung cancer is the most common type of cancer in the nation, and the second leading cause

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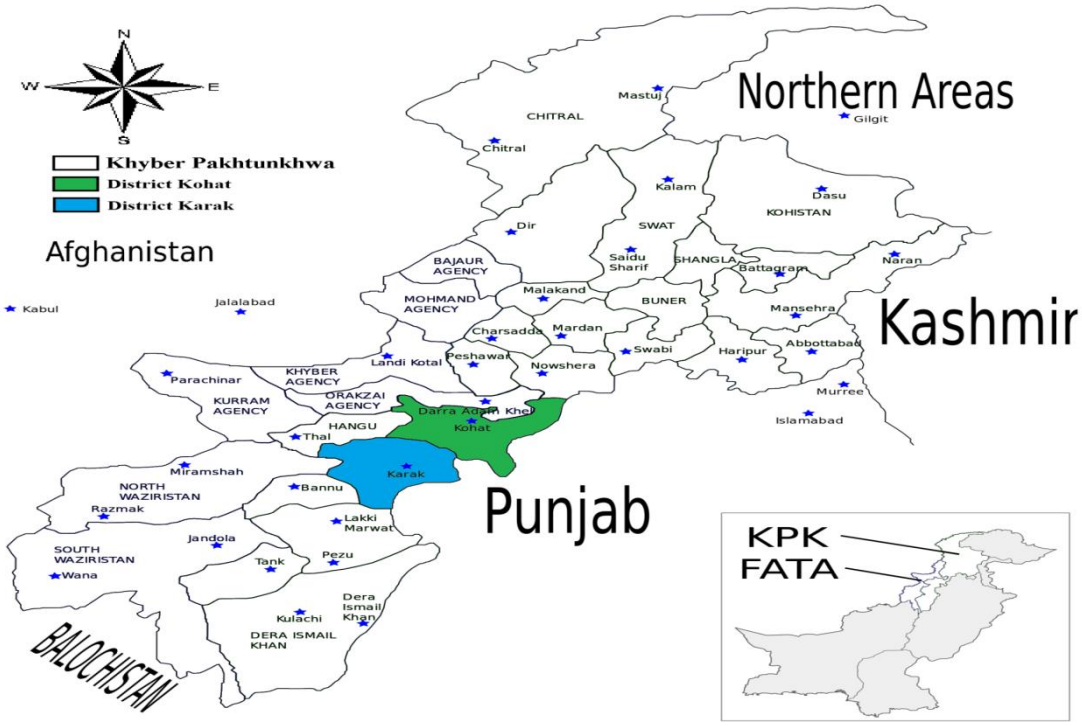
of cancer mortality, the base level knowledge, along with awareness regarding lung cancer, has been ill perceived at the population level, particularly in the rural and semi-urban areas of the Khyber Pakhtunkhwa province. Karak and Kohat districts in Khyber Pakhtunkhwa are also significant regional settings in which it is highly desirable to gain awareness about lung cancer. The cultural, linguistic, and socioeconomic peculiarities defined in these neighborhoods might have specific gaps and misunderstandings that prevent the successful implementation of cancer prevention and early detection programs. The lack of baseline information in terms of knowledge and awareness of lung cancer in these two districts is a significant gap that prevents the formulation of specific intervention plans as well as health facility promotional plans.

The problem is also further aggravated by the lack of culturally appropriate materials and linguistically accessible health education materials. Effective health communication necessitates the need to learn the local knowledge patterns, beliefs, and misconceptions in an effort to build on messages that will be appealing to the target populations. The health education programs underway cannot be expected to provide the most efficient impact without having a complete assessment of what the population already knows (and what the awareness levels are), as there is a high risk that health education programs will not fill the most significant gaps but rather solidify the existing misunderstanding.

MATERIALS AND METHODS

Study design, setting and participants

The present study is a cross-sectional observational study conducted across the district of Karak and Kohat, Khyber Pakhtunkhwa, in the period between February and July



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Figure 1: Map of Study Area

2025. District Karak is situated in Kohat division within the Khyber Pakhtunkhwa province, and it is found to the South of district Kohat and the North of Bannu and Lakki Marwat districts. It is situated at 33 N 71 E (Liaqat, Zulfiqar, & Jamal, 2025). According to the 2023 census, the population of District Karak is approximately 0.81 million. District Kohat, also part of the Kohat division in Khyber Pakhtunkhwa, has a population of about 1.23 million, as reported in the same census (Pakistan Bureau of statistic 2023). The Kohat District spans from the latitude of 33° N and a longitude of 33.58° E and 71.43° E, respectively (Liaqat, Zulfiqar, & Jamal, 2025). In conducting this research, the methodological approach outlined by Madkhali, M. A., et al. (2023) was utilized as a reference, with appropriate adaptations implemented to ensure relevance to the current study's population and regional context.

Sample size and sampling method

The sample size was determined using the Raosoft sample size calculator, with participants selected through a simple random sampling technique from the populations of the Karak and Kohat districts.

Data collection

The information was collected via a self-completed questionnaire that was designed after reviewing most of the available literature and discussing the issue with some professors who have expertise in the topic. The questionnaire was prepared in English and simultaneously be produced in native forms (Pashto, Urdu, and native Hindko, etc.). Prior to the second research, a pilot study of 21 respondents was completed to test the data gathering instrument. The key reliability indices to assess the questionnaire through the Cronbach's Alpha test. After the pilot, specific improvements and rearrangement of some questions was carried out, leading to required modifications in the data collection instrument to make it more practical.

Variables

The study involved different variables to correspond to its objectives and profoundly explore the factors that affect knowledge and awareness of lung cancer. Too much of the correlation involving the relationship between the demographic characteristics and the outcomes in terms of awareness could be understood not only through a descriptive analysis but also using inferential analysis due to the variable structure. Dependent variables included lung cancer knowledge level and awareness, which were measured using composite scores following answers relating to symptoms, risk factors, prevention, screening, and treatment. Environmental awareness was assessed by awareness of lung cancer as a health problem. Independent variables included demographic variables, which were based on age, gender, level of education, occupation, and area of residence. The variables that moderated were the health facility availability and media access. The confounding messages, such as the language, timing of data collection, and interviewer-related complications, were tackled in control variables. Operational definitions provided a common thread in both data gathering and data interpretation, where knowledge was defined as knowledge to describe aspects of lung cancer, and awareness was defined as

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knowledge related to the seriousness and avoid ability of lung cancer.

Sampling and Population Procedures

The population under study comprises the adult male (18 years+) population of District Karak and District Kohat within Khyber Pakhtunkhwa in Pakistan, totaling about 2.04 million people. The participants were selected with the help of simple random sampling due to the equal probabilities of selection, which contributed to the widening of the outcomes to the rest of the population. Raosoft Sample size calculator stated an estimated Sample size of 544 using a confidence level of 95 per cent and a 5 per cent margin of error. The distribution was given 327 samples of Kohat and 217 samples of Karak. This was achieved by stratified sampling in consideration of important demographic parameters such as age, gender, education, and rural/urban status. The permanent residency, 1 year and older, language understanding, and informed consent willingness are the inclusion criteria. Avoidance of bias was ensured by excluding temporary residents and people suffering from intense cognitive impairments, as well as the medical staff of oncology organizations.

Statistical analysis

Obtained data were managed in MS Excel and analyzed through appropriate statistical tests using the latest version 30 of SPSS.

RESULTS

The study participants numbered 544. The subsequent sections provide a detailed analysis of the gathered data, exploring socio-demographic factors, smoking patterns and characteristics, assessment of knowledge related to lung cancer and screening, and factors affecting lung cancer knowledge.

Table 1: Socio-Demographic Profile of the Participants (n = 544)

Variables	**N**	**%**
Age		
18–35 years	400	73.53
36–45 years	82	15.07
46–60 years	53	9.74
61 years and older	9	1.65
Gender		
Male	209	38.42
Female	335	61.58
Nationality		
Pakistani	529	97.24
Non-Pakistani	15	2.76
Marital Status		
Single	346	63.60
Married	185	34.01

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Divorced	10	1.84
Widowed	3	0.55
Place of residency		
Urban area	319	58.64
Rural area	225	41.36
Educational level		
Uneducated	167	30.70
Primary	87	15.99
High school	177	32.54
Bachelor's degree	89	16.36
M Phil/MS	20	3.68
PhD	4	0.74
Occupation		
Teacher	88	16.18
Private Employee	45	8.27
Military	8	1.47
College Student	148	27.21
University Student	173	31.80
Retired from educational sector	19	3.49
Retired from other sectors	11	2.02
Others	52	9.56
Monthly income		
Less than 15,000 PKR	304	55.88
From 15,000–30,000 PKR	96	17.65
From 30,000 to 50,000 PKR	68	12.50
From 50,000 to 100,000 PKR	47	8.64
More than 100,000 PKR	29	5.33

In the given Sample, demographic analysis has shown that most of the respondents (73.53 %) were aged between 18 and 35, when the female to male ratio stood at 61.58 % to 38.42 %. They were almost all Pakistanis (97.24 %), 63.60 % were single, and 34.01 % were married. The residence was mainly urban (58.64 %) with educational achievements between uneducated (30.70 %) and high school graduate (32.54 %). Among students of various occupations, the university students were the most numerous (31.80 %), whereas the students of college stood second (27.21 %). The monthly occupational earnings of the participants were too biased at a lower scale,

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whereby 55.88 % made less than 15,000 PKR.

Table 2: Smoking Profile of Participants (n = 544)

Question	N	%
Are you a smoker?		
Yes	53	9.74
No	472	86.76
Previously	19	3.49
If you are a smoker, do you plan to quit? (n = 53)		
Yes	35	66.04
No	6	11.32
I do not know	12	22.64
Is any of your family members a smoker?		
Yes	384	70.59
No	145	26.65
I do not know	15	2.76
If you have a family member who is a smoker, did you advise them to quit? (n = 384)		
Yes	331	86.20
No	53	13.80

The detailed analysis of the smoking profiles shows that 9.74% of them said that they were current smokers, 86.76% claimed to be non-smokers throughout life, and 3.49% said that they used to be smokers. 66.04% of present-day smokers were motivated to quit. The figures also indicate that 70.59% of them state the presence of a smoking family member; most (86.20 %) have educated family members to abstain from smoking.

Table 3: Participants Knowledge Assessment toward Lung Cancer (n = 544)

Question	N	%
Do you know about lung cancer?		
No	27	5.0
Yes (correct answer)	517	95.0
Did you know that lung cancer is one of the most common cancers?		
No	96	17.65
Yes (correct answer)	362	66.54
I do not know	86	15.81
Did you know that lung cancer is one of the most common causes of death?		

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No	74	13.60
Yes (correct answer)	407	74.82
I do not know	63	11.58
Do you think exercise reduces lung cancer?		
No (correct answer)	84	15.44
Yes	322	59.19
I do not know	138	25.37
Do you think lung cancer is a genetic disease?		
No	320	58.8
Yes (correct answer)	90	16.5
I do not know	134	24.6
Do you think that COPD is associated with lung cancer?		
No	113	20.8
Yes (correct answer)	224	41.2
I do not know	207	38.1
Is smoking a risk factor for lung cancer?		
No	3	0.6
Yes (correct answer)	531	97.6
I do not know	10	1.8
Is shisha a risk factor for lung cancer?		
No	7	1.3
Yes (correct answer)	509	93.6
I do not know	28	5.1
Do you think smoking e-cigarette is a risk factor for lung cancer?		
No	13	2.4
Yes (correct answer)	469	86.2
I do not know	62	11.4
Do you think air pollution is a risk factor for lung cancer?		
No	53	9.7
Yes (correct answer)	395	72.6
I do not know	96	17.6
Do you think passive smoking (indirect) is a risk factor for lung cancer?		
No	45	8.3
Yes (correct answer)	401	73.7
I do not know	98	18.0
Do you think spicy food and fried food are associated with lung		

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cancer?		
No (correct answer)	305	56.1
Yes	42	7.7
I do not know	197	36.2
Do you think alcohol consumption is a risk factor for lung cancer?		
No (correct answer)	86	15.8
Yes	286	52.6
I do not know	172	31.6
Do you think asbestos is a risk factor for lung cancer?		
No	27	5.0
Yes (correct answer)	212	39.0
I do not know	305	56.1
The following symptoms may or may not be considered symptoms of lung cancer. To what extent do you agree that each of them can increase a person's chance of developing lung cancer? (more than one answer can be chosen) (all answers are correct)		
Shortness of breath	413	75.9
Cough with blood	410	75.4
Persistent chest pain	392	72.1
Cough does not go away	381	70.0
Pain when breathing	354	65.1
Painful cough	338	62.1
Persistent chest infection	318	58.5
High-pitched sound when breathing	269	49.4
Fatigue and constant tiredness	251	46.1
Changes in the characteristics of the previous cough	239	43.9
Unexplained weight loss	197	36.2
Loss of appetite	155	28.5
Changes in the shape of the finger (nail)	90	16.5

Knowledge Score (lowest possible score = 0, highest possible score = 27)
Minimum: 2
Maximum: 25
Mean: 14.66
Standard deviation: 4.45

The evidence about overall knowledge on lung cancer during the assessment of participants showed that 95.0 % of respondents gave the correct answer that lung cancer is a widespread disease. Regarding significant risk factors, smoking (97.6 %)

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and shisha use (93.6 %) were well recognized, but the genetic factor was also unrecognized (only 16.5 %). The same results were witnessed about the connection between physical activity and lung cancer prevention (15.4 %), which showed high levels of ignorance in relation to the problem of the etiological factor. Concerning the symptom recognition, the participants correctly identified the most important manifestations, such as shortness of breath (75.9 %), blood-tinged cough (75.4 %), and lasting chest pain (72.1 %). They demonstrated an overall knowledge level of 14.66, 4.45 points out of 27.

Participants Knowledge Levels Toward Lung Cancer

The dispersion of the knowledge levels of the participants about lung cancer is presented:

Low level of knowledge (less than 50 per cent of the total mark): 226 respondents (41.5 per cent)

Moderate level of knowledge (50- 75 per cent of total score): 269 (49.4percent)

High knowledge level (> 75 percent of total score): 49 participants (9.0 percent)

Table 4: Lung Cancer Screening Profile (n = 544)

Question	N	%
Do you think that early detection of lung cancer will contribute to saving people from death or advanced lung cancer?		
Yes	522	95.9
No	9	1.7
I do not know	13	2.4
Did you know that there are screenings for early detection of lung cancer?		
Yes	345	63.4
No	103	18.9
I do not know	96	17.6
If your previous answer is "yes", Do you think there is a benefit from doing these tests?		
Yes	337	97.7
No	3	0.9
I do not know	5	1.4
If you have a risk factor for lung cancer, would you like to proceed to do the test, to ensure your safety from lung cancer?		
Yes	429	78.9
No	61	11.2
I do not know	54	9.9

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A profile screening analysis was carried out to determine levels of awareness of early detection behavior, current screening procedures, and future patronage of such to the participants. The results demonstrate the degree of awareness, that is, 95.9 % of the respondents were aware of the significance of their early detection, compared with 63.4 % of the respondents being aware of the existing screening methods. Both the benefits of these tests were confirmed in 97.7 % of the people in this subgroup. Also, 78.9 per cent of the respondents will be willing to be screened in case they are at risk of developing lung cancer. The findings showed that the knowledge about the early detection is high among the general population and that there is no uncongenial desire to pursue screening based on risk, generally.

Table 5: Factors Associated with Knowledge toward Lung Cancer

Factor	Knowledge Score		P-value
	Mean	SD	
Age			< 0.001*
18–35 years	15.45	4.35	
36–45 years	13.27	3.87	
46–60 years	12.81	4.93	
61 years and older	9.90	4.28	
Gender			0.533
Male	14.77	4.45	
Female	14.59	4.45	
Nationality			0.791
Pakistani	14.71	4.45	
Non-Pakistani	14.89	5.29	
Marital Status			< 0.001*
Single	15.49	4.29	
Married	13.27	4.50	
Divorced	13.00	3.28	
Widowed	13.33	2.52	
Place of residency			0.089
Urban area	14.41	4.50	
Rural area	15.02	4.37	
Educational level			0.169
Uneducated	15.12	4.31	
Primary to High school	14.50	4.50	
Bachelor's degree and above	13.86	4.50	
Occupation			< 0.001*

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Teacher	13.31	4.55	
Private Employee	15.32	4.92	
Military	12.33	4.15	
College Student	16.26	4.11	
University Student	14.01	4.47	
Retired from educational sector	12.39	4.50	
Retired from other sectors	12.93	4.67	
Others	14.58	4.23	
Monthly income			0.139
Less than 15,000 PKR	15.02	4.21	
From 15,000–30,000 PKR	14.23	5.12	
From 30,000 to 50,000 PKR	13.84	4.21	
From 50,000 to 100,000 PKR	14.24	4.47	
More than 100,000 PKR	15.60	4.63	
Are you a smoker?			0.576
Yes	14.88	4.70	
No	14.67	4.39	
Previously	13.71	5.45	

*Note: Significant at level 0.05

In a multivariate analysis of subsets of factors relating to lung cancer knowledge, statistically significant relations have been found with age, marital status, and occupation. The level of knowledge regarding the respondents in the lowest age group (18 35 years) was much higher when compared to other age groups. The single individuals were the respondents who signified a greater knowledge level than the married people. The mean of college students who were in the occupational categories had the highest means (16.26), and the lowest ranks (12.33) belonged to the military personnel. There was no or little relationship between the gained knowledge and sex, nationality, place of residence, academic level, monthly income, and smoking.

Discussion and Analysis

This cross-sectional study provides an observation of the radical evaluation of lung cancer knowledge and awareness among Pakistani individuals through 544 respondents. The findings present a complex topography with knowledge gaps, asymmetric knowledge distribution across demographic groups, and a profound disparity that has a clear impact on the design of the public health policy and targeting of intervention.

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Population Distribution and the Implications

The Sample demography reflects the key aspects of the Pakistani population. The fact that the prevalent number of respondents is between the age group of 18-35 years (73.5 %), as well as the increased number of women (61.6 %), provides us with precious information regarding the awareness pattern of these categories. This young skew is remarkable in the context of an age-related rise in the incidence of lung cancer and reinforces the need to start early on the education-led prevention measures.

Learning Paths and the Consequences on Health Literacy

The educational level of the participants (30.7 % of the participants are uneducated, 32.5 % have a high school education) resembles the educational situation as it is in Pakistan overall and explains the necessity of health literacy programs, which must find their outlet in the population of all educational levels. The high level of students (59 % enrolled in college and university) is of particular importance, as they are the future decision-makers and possibly health promoters.

Accessibility of Programs and Distribution of Income

As supported by the income distribution between the Pakistani population (55.9 % earn below 15,000 PKR in a month), the economic conditions seem to support the necessity to make lung cancer prevention and screening affordable and accessible even to the low earners. This is what counts in the process of designing and implementing outreach programs.

The Issues of Smoking Habits and Health Implications

The prevalence of smoking in the Sample participants (9.7 %) is significantly lower than the global averages and other Pakistani prior research, and this discrepancy can be partly attributed to the younger age group of the Sample, the underreporting from the social desirability bias, or any actual revision in cessation rates. Nevertheless, just 29.4 % of the respondents claimed that they had never smoked, and 70.6% of the respondents cited family members who are smokers, which is an exposure factor that has well-established health implications.

Smoking and Quitting Cessation Motives

The target population of quitting smokers is relatively high (66.0 %), which is an opportunity to focus on specially organized cessation programs. Such results are reflected in global trends where various smokers want to quit, but they usually do not have sufficient support or resources. In addition, 86.2 % of the respondents whose family members are smokers stated that they recommend the affected individual to quit, and therefore, family and peer influence might be utilised constructively in cessation campaigns.

Analysis of Smoking Profile

When put together, the data on smoking shows trends that are not insignificant in terms of lung cancer prevention. The not-so-low current smoking prevalence, combined with the awareness of smoking dangers, to a high level indicates that

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despite all that, the anti-smoking campaigns have done some good. However, the fact that there is a significant level of presence of smoking relatives also hints at the fact that they are not only being affected by the presence of other people who smoke, but also that it is a substantial risk factor that requires well-rounded tobacco control policies.

The current research gives comprehensive evidence of the knowledge gap, demographic inequalities, and environmental mitigating risk factors, which collectively develop awareness of lung cancer in the Pakistani population. The current study finds results with direct policy and intervention implications, which demonstrate the need to have programmes that are harmonious with the demographic, educational, and economic characteristics explained in this study.

CONCLUSIONS

The presented general overview on the overall level of knowledge about lung cancer and screening awareness among the Pakistani adults has indicated that there will be a ground on which a foundational level of disease detection could be established, and the potential of educating the populace is enormous. The situation is favorable to develop the public health intervention, as mixed knowledge levels (54.3 per cent of maximum points that could be gotten) and high positive attitudes to prevention and screening are in place. The disparities in knowledge relating to the demographic factors, to a greater extent, the inverse relation of age on awareness, necessitate specific education plans to address the needs and interests of the different categories of the population. The existing knowledge gaps, namely ignorance about the genetic component, confusion between prevention and rumors, and ignorance of the symptoms, are also apparent areas of attention concerning the content of the educational program. Large numbers of those who are willing to undergo lung cancer screening pose a challenge as well as an opportunity to the healthcare system of Pakistan. Although barriers to motivation are fewer, the implementation of positive attitudes will necessitate huge investments in developing infrastructure and education of healthcare providers to carry out the screening programs. The nature of the study findings justifies the creation of the thorough lung cancer awareness programs that will integrate the population education strategies with the interventions on specific demographic groups with a higher priority. To achieve success in the conditions of lung cancer improvement in Pakistan, efforts have to be coordinated at the levels of personal knowledge and the levels of the healthcare system to provide prevention and early detection services. Both the high prevalence of basic awareness and positive preferences toward prevention and screening indicate that educational interventions with good design could deliver important levels of improvement in the knowledge of lung cancer and, finally, the health outcomes of Pakistani people. The interventions, however, need to be specially designed to take care of the identified gaps in knowledge, misconceptions, and demographic differences as identified in this study.

RECOMMENDATION

Implications of the Early Detection Programs

The results of the research will enable important insights to be generated on how to come up with a lung cancer screening and detection program that fits into the local

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context. Since public recognition was found to be a crucial aspect of the successful screening participation, awareness level comprehension today will make it possible to come up with more effective recruitment and education tactics that will be implemented in future screening efforts.

The symptom recognition focus featured in this study has direct implications for the reduction of diagnostic delays. The recognition of specific gaps in symptom recognition allows healthcare providers to create specific forms of education that encourage people to seek medical advice at an earlier stage and, possibly, have a better chance of survival. The study is relevant to the field of public health, healthcare policy, scholarship, and community health; it influences the prevention and treatment of lung cancer in Pakistan and other places in the world.

DECLARATION

The authors confirm that this study was conducted independently and is free from any conflicts of interest.

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