"Assessing Lung Cancer Awareness among Working Professionals Pan India" A Cross Sectional Study

A dissertation submitted in partial fulfilment of the requirements

For the award of

Post-Graduate Diploma in Health and Hospital Management

By:

Dr Vaibhav Sundriyal (PT)

International Institute of Health Management Research

New Delhi -110075

March-May 2023

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The certificate is awarded to

Name - Dr. Vaibhav Sundriyal

in recognition of having successfully completed his internship in the department of

Product Team

and has successfully completed his Project on

Assessing Lung Cancer Awareness Among Working Professionals

Date – 1st March 2023 – 31st May 2023

Organisation - Karkinos Healthcare

He comes across as a committed, sincere & diligent person who has a strong drive & zeal for learning.

We wish him/her all the best for future endeavors.

C. R. K. (Reddy R K P Chittoor, VP- Product)

Training & Development **Zonal Head-Human Resources**

Reddy RKP Chittoor
Vice President – Product
Karkinos Healthcare Pvt Ltd

KARKINOS

Date: 13th June 2023

Internship Completion Certificate

To Whom It May Concern

This is to certify that **Dr. Vaibhav Sundriyal**, (KHPL-0522) has worked as "Intern" with Karkinos Healthcare Private Limited and has successfully completed the internship under the guidance of **Dr. Sandipan De**.

Internship Duration: 01st March 2023 to 31st May 2023.

We wish you all the best.

For Karkinos Healthcare Pvt Ltd

Srikanth Rapaka
Director - Human Resources

To Whom It May Concern

This is to certify that **Dr. Vaibhav Sundriyal** student of PGDM (Hospital & Health Management) from the International Institute of Health Management Research, New Delhi has undergone internship training at Karkinos Healthcare from 1st March to 31st May 2023.

The Candidate has successfully carried out the study designated to him during internship training and his approach to the study has been sincere, scientific, and analytical.
The internship is in fulfillment of the course endeavors.

I wish him all success in all his future endeavors.

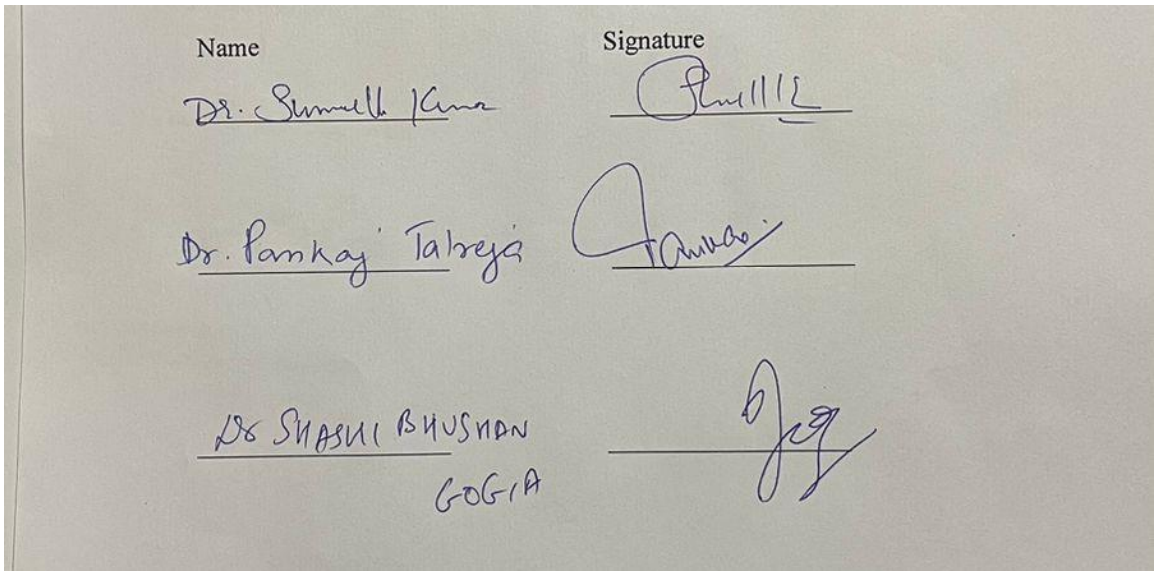
Dr. Sumesh Kumar
Associate Dean, Acedemic and Student Affairs
IIHMR Delhi

Ekta Saroha
Dr. Ekta Saroha
Assistant Professor and Dean
IIHMR Delhi

Certificate of Approval

The following dissertation titled "**Assessing Lung Cancer Awareness among Working Professionals Pan India: A Cross Sectional Study**" is hereby approved as a certified study in management carried out and presented in a manner satisfactory to warrant its acceptance as a prerequisite for the award of **Post- Graduate Diploma in Health and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned does not necessarily endorse or approve any statement made, opinion expressed, or conclusion drawn therein but approves the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation



Certificate from Dissertation Advisory Committee

This is to certify that **Dr. Vaibhav Sundriyal,** a participant in the Post-Graduate **Diploma in Health and Hospital Management**, has worked under our guidance and supervision. He is submitting this dissertation titled **"Assessing Lung Cancer Awareness among Working Professionals Pan India: A Cross Sectional Study"** in partial fulfilment of the requirements for the award of the Post-Graduate **Diploma in Health and Hospital Management**.

This dissertation has the requisite standard and to the best of our knowledge, no part of it has been reproduced from any other dissertation, monograph, report, or book.

Ekta Saroha

Dr. Ekta Saroha

Assistant Professor and Dean

IIHMR (International Institute of Health Management Research)

New Delhi

Date

FEEDBACK FORM

Name of the Student: Dr. Vaibhav Sundriyal

Name of the Organization in Which Dissertation Has Been Completed: Karkinos Healthcare Pvt. Ltd.

Area of Dissertation: "Assessing Lung Cancer Awareness among Working Professionals"
Attendance: 99%

Objectives achieved: Dr. Vaibhav successfully completed a 3-month internship in the Product team at Karkinos Healthcare Pvt. Ltd. He actively participated in the Product Development process and gained valuable experience. Throughout his internship, Dr. Vaibhav diligently completed essential training in tools like Jira, HIS, and Agile Methodology. He conducted a comprehensive study on his project, demonstrating his commitment and dedication to his work.

Deliverables:
1. Demonstrated proficiency in using Jira and applying Agile Methodology.
2. Efficiently contributed to product development, including tasks such as product discovery, user stories, wireframing, and feasibility testing.
3. Played a key role with the team on ongoing implementation of the HIS system in a hospital setting.
4. Collaborated effectively with diverse teams throughout the project.

Overall, Dr. Vaibhav's deliverables encompassed his efficient work in product development, utilization of Jira and Agile Methodology, assistance in HIS system implementation, and collaboration with various teams, all of which significantly contributed to the progress and success of the project.

Strengths:
I. Demonstrated a strong understanding of the healthcare domain, allowing for effective contribution to the project.
2. Displayed a willingness to learn new skills and tools, enhancing the overall team's capabilities.
3. Exhibited quick learning abilities, enabling timely submission of project deliverables.
4. Maintained a proactive and diligent approach to work, ensuring efficient completion of tasks.

Suggestions for Improvement: Can have more research mindset and read related new developments in the field. Should develop skills to write and publish articles related to work.
Suggestions for Institute (course curriculum, industry interaction, placement, alumni): No suggestions

C. R. K. Reddy (Reddy R K P Chitton, VP- Product)

Signature of the Officer-in-Charge/Organization Mentor (Dissertation)

ACKNOWLEDGEMENTS

I would like to express my sincere thanks and gratitude to Karkinos Healthcare Private Limited, Bengaluru for giving me a wonderful opportunity to work along with and at the same time complete my dissertation project titled **"Assessing Lung Cancer Awareness among Working Professionals Pan India: A Cross Sectional Study."**

I thank **Manish Sharma** (Chief Product Officer, KH), **Dr. Sandipan De** (AVP- Product) and **Reddy R K P Chittoor** (AVP- Product) who were kind enough to spare their valuable time and provided the suitable environment and optimum guidance in the interest of my project completion.

Sincere thanks to my colleague **Dr. Shiwani Rawat** and **Prakhya Shastry** for helping and encouraging me at every step.

Last but not least, I want to express my gratitude to my parents for raising me with nothing but love and support. Their unwavering encouragement gave me the willpower to carry on.

Thanks to everyone.

Dr Vaibhav Sundriyal (PT)

PGDHM,
IIHMR, New Delhi

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LIST OF ABBREVIATIONS

S. No	Symbol	Abbreviations
1.	KH	Karkinos Healthcare
2.	AI	Artificial Intelligence
3.	DCCN	Distributed Cancer Care Network
4.	GDP	Gross Domestic Product
5.	APIs	Application Programming Interfaces
6.	ML	Machine Learning
7.	DBFO	Design, Build, Finance, and Operate
8.	IARC	International Agency for Research on Cancer
9.	Globocan	Global Cancer Observatory
10.	NCRP	National Cancer Registry Programme
11.	HBCR	Hospital-based Cancer Registries
12.	PBCR	Population-based Cancer Registries
13.	NCDIR	National Centre for Disease Informatics and Research
14.	ICMR	Indian Council of Medical Research
15.	LC	Lung Cancer
16.	HCPs	Healthcare Professionals
17.	BSE	Breast Self-Examination
18.	LDCT	Low Dose Computed Tomography
19.	KAP	Knowledge, Attitude, and Practice
20.	CT	Computed Tomography
21.	MRI	Magnetic Resonance Imaging
22.	PET	Positron Emission Tomography
23.	X-ray	X-ray Examination
24.	HIV	Human Immunodeficiency Virus
25.	HPV	Human Papillomavirus
26.	CDC	Centers for Disease Control

27.	FDA	Food and Drug Administration
28.	WHO	World Health Organization
29.	PSA	Prostate-Specific Antigen
30.	BMI	Body Mass Index
31.	COPD	Chronic Obstructive Pulmonary Disease
32.	SEER	Surveillance, Epidemiology, and End Results
33.	NIH	National Institutes of Health

LIST OF FIGURES

ORGANIZATION VIEW

KARKINOS HEALTHCARE PVT. LTD, Bengaluru

Karkinos Healthcare (KH) have created and delivered using customised cancer care solutions, acting as a one-stop shop and meeting the essential market demands for this specialised medical treatment. The platform will adapt care to our individual requirements using technology and AI-based continual feedback, and it will scale up its lessons both within India and outside of the country.KH is backed by a diverse founding team with significant backgrounds in technology, healthcare, and finance, as well as a group of esteemed clinical advisers from India and other countries. Access to top-tier suppliers, technological support engineers, pharmaceutical partners, architects, space planners, and vendors, all of whom collaborate to develop the company's USP in the field of cancer care delivery, further strengthens the team's efforts. The KH team has previously been able to design, build, and commission a 700-bed specialist oncology hospital as well as rebuild and modernise an existing hospital, totalling 1 million square feet, in less than a year. Both are now fully operational after being commissioned. In addition, the team played a key role in the planning and creation of a 'Hub

& Spoke' Cancer Care hospital network in Northeast India, which currently consists of 12 facilities. In the Lancet Oncology, KH's Distributed Cancer Care Network model (DCCN) is also mentioned.

The context and the need for Karkinos in cancer care:

Due to widespread underreporting and inadequate diagnosis, cancer has a large burden in India with roughly 1.9 million new cases each year. More than 50% of cancer patients experience their first medical visit when they are in the third or later stages of the disease, necessitating multimodal therapy that lasts for two to three years before they haplessly pass away. Cancer places a heavy financial and emotional strain on the patient as well as their entire family, with out-of-pocket costs reaching up to 70% of the total treatment cost. Along with the patient's lost workdays, there are also losses for the family and a consequent hit to the GDP of the nation. To get ready for closing the demand-supply gap by improving accessibility, availability, and affordability in cancer care, a better evaluation of the need for cancer treatment is required. This is due to the rise in cancer cases across the nation and the lack of adequate infrastructure and medical professionals for cancer care. Given the astonishingly high cigarette consumption and low understanding of the risk factors in the nation, comprehensive early detection and preventive measures are also urgently needed. India's diagnosis and delivery system for cancer care is woefully insufficient. A healthcare infrastructure that is fragmented, unavailable to patients, and caused by multiple entities operating in silos results in an unsatisfying patient experience. There is a considerable shortage of oncology beds, linear accelerators, radiation technicians, oncologists, and other resources needed for basic care, according to publicly available data and market research. The demand/supply imbalance is growing over time due to the rising demand from patients seeking treatment. The untapped opportunity that hovers above us right now is this one. To stimulate the development of participatory systems rather than proprietary systems, the operating model must be reviewed.

Organization Objective:

Vision-

Driven by 4Ds:

- "**D**etection & **D**iagnosis "**D**eliver managed healthcare 2 million+ patient hours saved annually".
- "**D**ata and research

Mission-

"Our mission is to ensure that no person is denied care either due to access or affordability. Since we are diagnosing cancer at an early stage, the cost can be brought down considerably. Almost 60 per cent of the cost associated with cancer is for indirect expenses. We navigate the care for patients with the existing Karkinos centres and help to carry out some of the treatments such as general surgeries, chemotherapy at locations close to the patient's home, and refer them for radiotherapy and complex procedures to super speciality cancer hospitals"

Values-

Social Impact- Reduce travel time from 8-10 to 3-5 hours; 30-40% reduced cost of care Surveillance & early detection. Early detection, Better reach out & care, improved outcomes.

Distributed Care Network- Reversing current focus from treatment to early detection is possible with a Distributed Care Network.

Standardise Care and Experience- Standardised and Patient centric pathways, improve quality in delivery of care and patient outcomes.

Early Detection- Early Detection Enables Stage Shift in Cancer Incidence

Collaboration Action Care Continuum- Patients Centric approach that enables Care Collaboration across the Patient Care Continuum.

Interoperability- Enabling the Flow of Patient Information by adhering to the interoperability standards identified by the NDHM

Plan Centrally Deliver Locally- Command Centre to enable distributed care delivery by a centralized knowledge architecture.

Solve by Accessibility- In a Patient Centric Model, Karkinos enables access to care near the patient's home driven by geo-tagging of care partners.

Affordability- A cancer care network enabling early detection with assured, affordable, and quality focused treatment pathways.

About Karkinos:

Karkinos Healthcare Pvt. Ltd., an oncology platform driven by technology with a purpose, specializes in creating and providing customized cancer care solutions. The organization is on a mission to establish "cancer centres without walls," with the main goal of addressing the

accessibility or affordability gaps in cancer care. It is led by a combination of internationally renowned medical professionals and technology.

Karkinos (’Kark’ means cancer in Hindi and ‘nos’ means elimination) intends to set up 70 community care centers across the State in a year to offer distributed care. It plans to expand throughout the country’s health system using a technology platform.

Through a dispersed cancer care network that is digitally enabled and will bring high-quality care closer to patients, Karkinos is focused on meeting clinical demands. The cornerstone of Karkinos the democratization of cancer care through collaborative efforts with current medical professionals, researchers, and technologists. Karkinos Healthcare is building a medical facility for the treatment of all complex cancers, an open standards-based technology platform that manages the cancer care continuum, and a research facility that employs genomics, synthetic biology, sensors, and AI to process data and advance the creation of cost-effective cancer interventions. The core of the technology platform is an open EHR-based Clinical Data Repository. is hereby acknowledged as management research that has been completed and presented.

The Hub and Spoke and Further Spoke approach

By developing a cutting-edge, data-driven platform with a centralised knowledge architecture and dispersed delivery methods, KH hopes to increase access to cancer care services. The strategy's "hub-and-spoke" hospital architecture, backed by robust technology and clinical decision support systems, enables service delivery to a broad patient catchment. The model is supported by technology that enables anchor referral hospitals that deal with complex cases, surgery, and radiotherapy to be supported by a network of smaller centres for handling diagnosis and ongoing treatment so that the treatment can be decentralised, reducing the load on apex centres for non-complex treatment while enhancing accessibility and reducing lost

productivity. The network is supposed to be "wired" to make it easier for all centres to be connected, to obtain data easily, to do diagnostics, and to consult with patients. This combines a shared training pool for HR staff with a centralised knowledge base and diagnostic tools. Therefore, it is crucial to make investments in physical infrastructure (such as the Karkinos cloud and a clinical workflow orchestration and care coordination engine) to support the "hub and spoke and further spoke" network of cancer care centres. For this, it would be necessary to use tools and apps that assist data gathering from Tier 3–4 medical clinics as well as data aggregation and reporting from Tier 1-2 hospitals. A small number of "core Apps" will be prioritised over the development of the Karkinos backbone infrastructure and open APIs in the design. In order for the developer community to duplicate some of the apps and produce new ones that the service providers in the Karkinos network would require, some of the apps will be released open source. Customers, the existing diagnostic and treatment choices they provide, and the applications' maturity in processing clinical data all have an impact on their priority. With the help of the clinical annotation, the data gathered will be essential to understanding genetic profiles of cancers and will:

A) A technology platform for data mining and diagnosis
B) A training facility with a shared services infrastructure and continuing clinical R&D.

KH is unwavering in his belief that technology will be essential to the decentralisation of professional care. The technology platform is being utilised to develop tools and apps that will safely and easily connect to a Karkinos backbone for use in drug development, diagnostics, and treatment strategies. It has a distributed design. This will promote innovation and new therapy techniques in addition to improving results and acting as a steady source of cash. A clinical data repository, a curated knowledge library, and advanced analytics will all be part of the Karkinos offerings.

Roadmap: - KH will concentrate on laying the groundwork for the following elements during the next 18 months:

- An innovative technology platform specifically selected for oncology
- A knowledge network containing a digital pathology centre, surgical techniques, and medical regimens
- 50 Level 4, 15 Level 3, 5 Level 2, and 1 Level 1 centre, as well.

The majority of the founders' commercial interests will be held in a charitable trust, and the financial gain therefore accrued will be used to enhance patient care, research, education, and other related social purposes. In the State of Kerala, a proof-of-concept for carrying out KH's roadmap has been organised. For nursery and early detection services, MoUs have been struck with Chottanikkara Medical Relief Society and Mar Baselios Medical Mission Hospital. There is still a pipeline of 12 to 15 brownfield properties.

In order to establish a cutting-edge 150 bed multi-specialty cancer institute with complete infrastructure and strong technology support using the DBFO (Design, Build, Finance, and Operate) investment model, an Expression of Interest has been shared with the Manipur government.

Karkinos Healthcare Pvt. Ltd is at the forefront of revolutionizing cancer care through its technology-led oncology platform. With a strong focus on accessibility, affordability, and innovation, the company aims to transform the way cancer care is delivered. By combining medical expertise with innovative technology, Karkinos Healthcare is poised to make a significant impact in the field of oncology, benefiting millions of patients and advancing the fight against cancer.

Project Report

Abstract:

Background: Lung cancer is a widespread and fatal condition, causing a considerable number of cancer-related deaths worldwide. It is the third most common type of cancer in women and the most common type of cancer in males in India. Unfortunately, there is a critical lack of awareness about lung cancer, its risk factors, symptoms, and available preventive measures, particularly among working professionals. This is concerning because these individuals often face heightened exposure to air pollution, tobacco smoke, and other environmental contaminants and occupational hazards. Addressing this knowledge gap and improving awareness among working professionals is essential for early detection, timely intervention, and improved health outcomes. Therefore, this study aims to assess the level of lung cancer awareness among working professionals across India to develop targeted interventions and educational campaigns to combat this disease effectively.

Objective: Objective of this cross-sectional study is to evaluate the awareness of lung cancer among working professionals in India using a Google Forms survey. The study aims to explore their knowledge about lung cancer risk factors, symptoms, diagnostic methods, available treatments, and preventive measures. Additionally, the study seeks to identify demographic and lifestyle factors that may be associated with the level of awareness among this specific population.

Methods: The methodology of the study involves a cross-sectional design to investigate the recruited from various industries and regions across India. Data will be collected using a structured questionnaire distributed through online platforms. The questionnaire will consist of

multiple-choice and open-ended questions to assess participant's level of awareness about lung cancer. Data analysis will be performed using Microsoft Excel.

Results: The results of the survey will give a thorough picture of the existing state of lung cancer awareness among Indian working professionals. Descriptive statistics will present an overview of the distribution of responses, highlighting the most common and least common answers. Cross-tabulations will explore potential relationships between awareness levels and demographic characteristics, such as age, gender, education, occupation, and lifestyle factors.

Conclusion: This study's outcomes will shed light on the knowledge gaps and misconceptions regarding lung cancer among working professionals in India. The findings will contribute to the development of targeted interventions, awareness campaigns, and educational programs aimed at improving early detection, treatment, and prevention of lung cancer. By enhancing lung cancer awareness among working professionals, this study has the potential to reduce the burden of the disease, promote timely medical consultations, and improve health outcomes in this population.

Chapter 1: Introduction

Background – Global Cancer Burden

The word "cancer" comes from the Greek word "Karkinos," which means "crab," and describes a class of non-communicable disorders in which body cells grow out of control, lump up, and spread to other areas of the body. Cellular growth in humans typically consists of multiplying (through a process called cell division) and forming new cells on a regular basis. They die as they age or become damaged, and new ones replace them. The orderly process of cancer is disrupted in diseased states, and cancerous cells grow and multiply when they should not. This results in formation of lumps of cancerous cells/ tissue also called a tumour in various parts of the human body. Tumours can be benign (confined to its original location) in initial stages but if not detected and treated in time, the cells begin to migrate to other body parts (by a process known as metastasis) and result in malignant form of cancer. Although several forms of cancer have been detected in various parts of the human body, the most common sites are breasts, colorectum, prostate, lung, and thyroid.

One in five people will be diagnosed with cancer at some point in their lives, and one in eight men and one in eleven women will pass away from it. In 2020, there will be 19.3 million new instances of cancer globally and 10.3 million cancer deaths, according to data from the International Agency for Research on Cancer (IARC).

These estimates indicate that more than 50 million people are currently dealing with the effects of receiving a cancer diagnosis within the previous five years (figure 1.1). Breast cancer is the most common type of cancer (across the board for both sexes), followed by colorectal cancer (10.4%), and prostate cancer (9.8%), according to Globocan 2020, an online resource for statistics on cancer around the world. The two most prevalent cancers in men in 2020 were

prostate cancer (14.1%) and lung cancer (14.3%), which together accounted for over one-third of all male cancer incidents. At the same time, for women breast cancer alone marked a strong 24.1%, that is one-fourth of all incident's female cancer cases, followed by colorectal cancer (9.4%). Figure 1.2 represents a graphical representation of country wise leading cancer types responsible for the maximum number of deaths among the male population in 2020. The present global burden of breast cancer can be estimated by the fact that out of 185 countries, lung cancer is the leading cause of mortality among males in 93 countries which makes it a massive healthcare concern.[1]

Figure 1 Estimated number of new cases of cancer worldwide (5-year) in 2020 for both sexes and all age groups

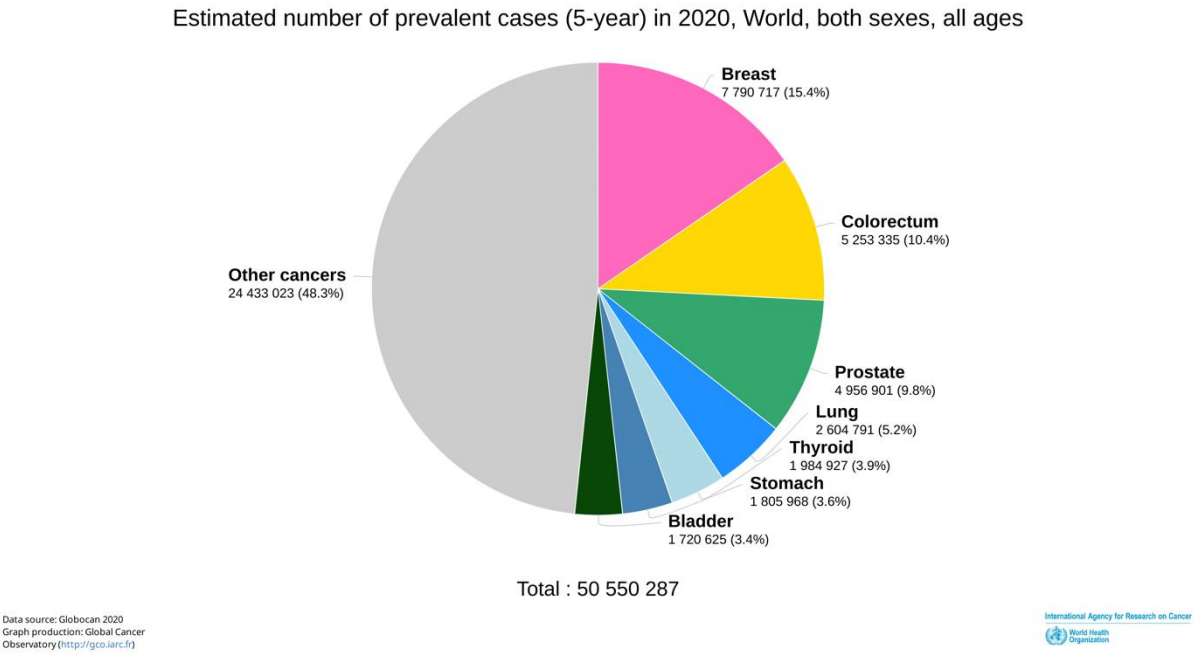
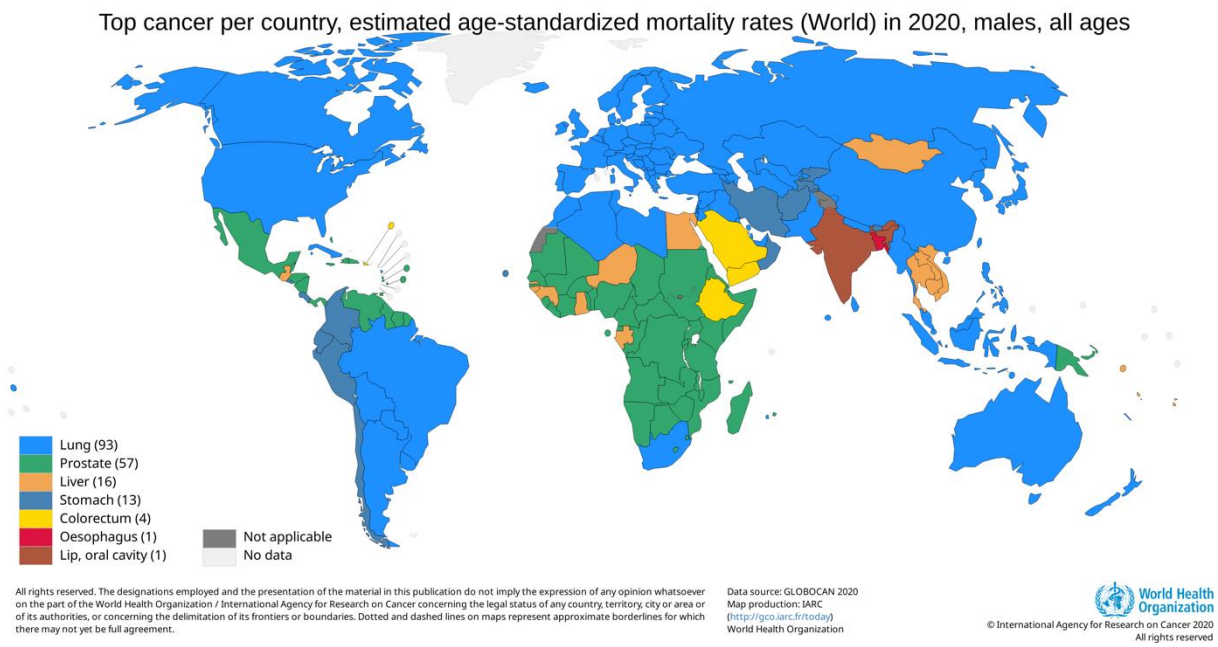


Figure 2 Leading cancer type for maximum number of deaths among males in 2020 around the world

1



Burden of lung cancer in India

Lung cancer is responsible for 8% of malignancies in Indian males. Cancer registries are a main source of cancer incidence data in India and are essential in establishing the National cancer control programme. Since 1982, the National Cancer Registry Programme (NCRP)-National Centre for Disease Informatics and Research (NCDIR) of the Indian Council of Medical Research (ICMR; ICMR-NCDIR-NCRP) in Bengaluru has been collecting cancer data in a systematic manner. These registries are divided into two categories: population-based cancer registries (PBCRs) and hospital-based cancer registries (HBCRs). NCRP has now received registrations for 236 HBCRs and 36 PBCRs.

The expected incidence for cancer patients in India for the year 2020 among males was 679,421 (94.1 per 100,000), and among females was 712,758 (103.6 per 100,000), according to a study based on NCRP data. According to research, the five cancers that will affect males the most frequently in 2020—accounting for approximately 36% of all cancers—are lung, mouth, prostate, tongue, and stomach cancers. While for females' breast, cervix uteri, ovary, corpus uteri, and lung cancers were the top 5 and constituted 53% of all cancers. It was discovered

that 1 in 68 men will have lung cancer, 1 in 29 women will develop breast cancer, and 1 in 9 Indians will develop cancer. Reports also suggest that in the next 20 years, the lung cancer incidence rates will double up with more than 85000 incident cases every year and around 79,000 men dying out of it.[2]

Figure 3 Estimated number of new cancer cases among males in India 2020; Source Globocan 2020

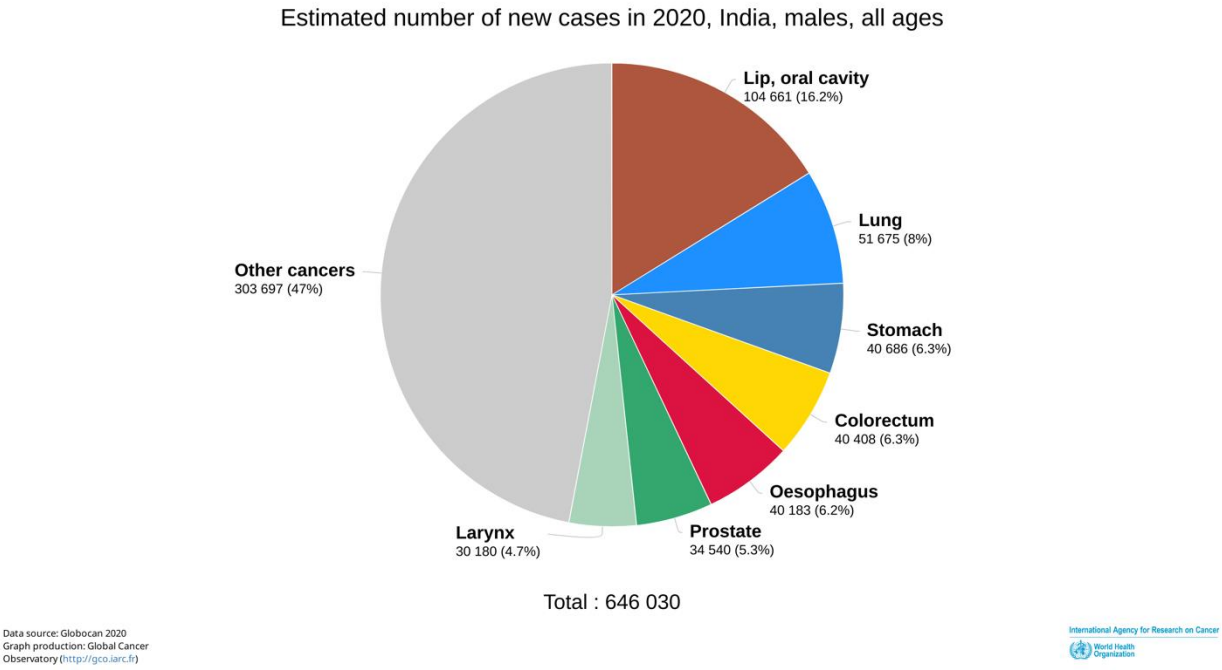
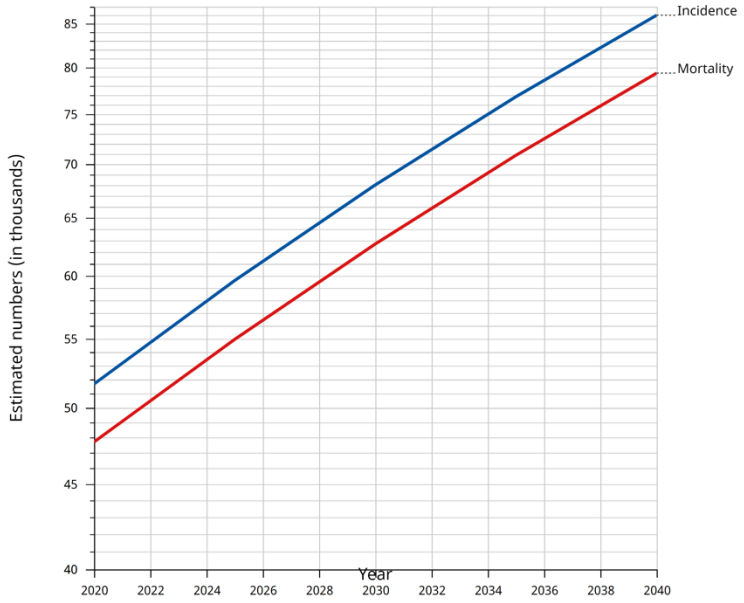


Figure 4 Projected number of lung cancer cases in India among males of all age group in next 20 years (Based on IARC data); Source- Globocan 2020

2

Estimated numbers from 2020 to 2040, Males, age [0-85+]
India

GLOBAL CANCER OBSERVATORY



An comprehensive research was conducted to assess cancer incidence, patterns, trends, and treatment outcomes in India using data from population-based cancer registries (PBCRs) and hospital-based cancer registries (HBCRs). The study encompassed a period of 2012-2016 and included a total of 667,666 patients. The results revealed that Aizawl district had the highest age-adjusted incidence rate among males, while Papumpare district had the highest incidence rate among females. The projected number of cancer patients in India for 2020 was estimated to be 1,392,179, with breast, lung, mouth, cervix uteri, and tongue being the most common sites. Overall, there was an increasing trend in cancer incidence across all sites and genders. Most patients were diagnosed at a locally advanced stage for certain cancer types, while distant metastasis was more prevalent in lung cancer cases. This study provides valuable insights for improving cancer prevention, control strategies, and treatment outcomes to align with national noncommunicable disease targets and sustainable development goals in India.[3]

3

Although lung cancer is a significant public health concern in India, there is a lack of awareness about the disease, its causes, and risk factors, especially among working professionals. This is concerning because working professionals are often exposed to environmental pollutants, such as tobacco smoke, air pollution, and occupational hazards, which can increase the risk of developing lung cancer.

Early detection plays a crucial role in improving lung cancer outcomes. When diagnosed at an early stage, treatment options such as surgery, radiation therapy, chemotherapy, targeted therapies, and immunotherapy can be more effective in reducing tumour size, preventing metastasis, and improving overall survival rates. In high-risk individuals like long-term smokers, routine screenings like low dose computed tomography (LDCT) scans can help detect lung cancer in its early stages.

In addition to early detection, risk reduction strategies are essential in combating lung cancer. Lifestyle modifications, such as smoking cessation, reducing exposure to environmental pollutants, adopting a healthy diet rich in fruits and vegetables, and engaging in regular exercise, can significantly reduce the risk of developing lung cancer. Avoiding or minimizing exposure to occupational hazards and promoting workplace safety measures can also contribute to prevention efforts.[4] [5]

Rationale: -

The rationale for conducting this study on lung cancer awareness among working professionals in India is twofold. Firstly, there is a significant lack of awareness about lung cancer, its risk factors, and symptoms among this population group. Working professionals, due to their occupational exposures and lifestyle factors, are at a higher risk of developing lung cancer. By

[4]

[5]

assessing their level of awareness, we can identify gaps in knowledge and design targeted interventions to improve early detection, prevention, and treatment outcomes.

Secondly, India has a large population of working professionals, and their well-being directly impacts the overall health of the nation. By raising awareness about lung cancer and promoting healthy lifestyle choices, such as smoking cessation and regular health screenings, we can reduce the burden of the disease and improve the overall well-being of this population group. This study aims to provide valuable insights that can inform the development of effective educational campaigns, awareness programs, and policies tailored to the specific needs of working professionals in India.

Problem Statement:

1. Despite the global impact of lung cancer, there is a significant lack of awareness about the disease, its risk factors, and symptoms among working professionals in India.
2. Working professionals in India are frequently exposed to environmental pollutants and occupational hazards, which increase their susceptibility to lung cancer.
3. The lack of awareness and knowledge among working professionals hinders early detection, prevention, and timely treatment of lung cancer.
4. There is a need to assess the level of lung cancer awareness among working professionals across different regions of India to identify knowledge gaps and develop targeted interventions.

Objectives:

The primary objective of this study is to assess the level of lung cancer awareness among working professionals in India. Specifically, the study aims to:

1. Determine the knowledge and understanding of lung cancer, its risk factors, and symptoms among working professionals.

2. Identify the factors associated with the awareness or lack of knowledge among working professionals, including demographic factors, occupational exposures, and lifestyle behaviours.
3. Provide recommendations for the development of effective educational campaigns, awareness programs, and policies targeted at improving early detection, prevention, and treatment outcomes of lung cancer among working professionals in India.

Hypothesis: -

Null Hypothesis (H0):

The awareness of lung cancer among working professionals in various parts of India is not significantly different.

Alternative Hypotheses (H1):

differing parts of India have significantly differing levels of working professionals' awareness about lung cancer.

Scope of the Study:

1. The study aims to assess the level of lung cancer awareness among working professionals in India across different regions.
2. The study will focus on evaluating the knowledge and understanding of lung cancer, its risk factors, and symptoms.
3. The scope of the study will include assessing the utilization of preventive measures such as smoking cessation programs and health screenings among working professionals.
4. The study will explore the factors associated with awareness or lack thereof, including demographic factors, occupational exposures, and lifestyle behaviours.

5. The study will shed light on the existing state of lung cancer awareness among Indian working professionals, highlighting areas in need of further research and potential for focused interventions.

Significance of the Study:

1. This study holds significant importance as it addresses the lack of awareness about lung cancer among working professionals in India, a population group at higher risk due to occupational exposures and lifestyle factors.
2. The findings of the study can contribute to the development of effective educational campaigns, awareness programs, and policies tailored to the specific needs of working professionals.
3. By identifying knowledge gaps and understanding the factors associated with awareness, the study can support efforts to improve early detection, prevention, and treatment outcomes of lung cancer among working professionals in India.
4. The study's outcomes can raise awareness, reduce barriers to early detection, and promote healthy lifestyle choices, reducing the burden of lung cancer in the working population.
5. The study's findings can inform healthcare professionals, policymakers, and public health authorities about the specific challenges and needs of working professionals.

Chapter 2: Review of Literature

1. The study reviewed the existing literature on lung cancer in India, with a specific focus on epidemiological trends, molecular diagnostics, and therapeutic options, particularly in non-small cell lung cancer (NSCLC). The authors conducted a search of electronic databases, including PubMed and Google Scholar, to retrieve relevant studies published within the past five years. The review aimed to address the lack of comprehensive data on lung cancer in India and provided valuable insights into the prevalence of the disease, driver mutations such as EGFR, ALK, and PD-L1, advancements in molecular diagnostics, and the efficacy of various treatment modalities including surgery, radiotherapy, chemotherapy, and targeted therapies. By summarizing and analysing the available literature, this study offers a comprehensive overview of the current landscape of lung cancer in India, highlighting the need for further research and the potential of immunotherapy as a promising avenue for long-term disease control.[6]
2. A systematic review was conducted on Promoting lung cancer awareness which examined interventions aimed at improving awareness, help-seeking, and early detection of lung cancer. Educational sessions and campaigns successfully promoted LC knowledge, while decision aids reduced decision conflicts and increased LC screening uptake. The UK-based 'Be Clear on Cancer' campaign was significant in raising awareness of LC, encouraging help-seeking, and lowering the number of advanced LC diagnosis. To increase awareness, lower barriers to obtaining treatment, and identify LC early, multimodal public health interventions, such as educational programmes, are advised. Future interventions should use resources like counselling

and decision aids, as well as information that is specifically targeted. In general, removing these obstacles can significantly enhance LC results.[7]

3. A study was conducted on the importance of evaluating the expertise of healthcare professionals (HCPs) in relation to tobacco cessation and actions that are connected to it. The study conducted on HCPs at a tertiary care hospital in New Delhi revealed that most of the HCPs had given brief interventions using the 5 A's method. However, the study also indicated that more tobacco cessation training is needed for HCPs to improve their knowledge and skills related to tobacco cessation. Overall, the study emphasizes the need for ongoing education and training programs for HCPs to effectively address the tobacco epidemic. [8]

4. Similar research was done to evaluate Indian women aged 30 and Older's understanding, attitudes, and practice of breast self-examination (BSE). The questionnaire was distributed among 1000 females across India, and the findings demonstrated that, despite the respondents' understanding of the BSE approach, they had a negative attitude towards it and were hesitant to put it into practice. The overall With knowledge, attitude, and practise domain values of 22.0, 36.0, and 13.0, respectively, the KAP score was 70.0 out of a possible 110. The study highlights the need for targeted interventions to improve the attitude and practice of BSE among Indian women.[9]

5. There are increasing incidence of lung cancer in India and the challenges faced in diagnosing the disease at an early stage. It emphasizes the importance of prompt specialist referral and highlights recent therapeutic developments that have improved survival outcomes in patients.[10]

6. A study was conducted to examine the correlation between death from lung cancer and certain demographic factors at a national level. The researchers reviewed information from three surveys: India: Health of the Nation's States, the Global Adult Tobacco Survey 2: India 2016-2017, and the National Family Health Survey 4. Except for Kerala, states in north India had higher lung cancer death rates, according to the research. Smoking, second-hand smoke exposure at home and work, and per capita income were significantly associated with lung cancer deaths. Additionally, the use of clean fuel showed a significant correlation with lung cancer mortality. Based on these findings, the study highlighted the need to focus on tobacco cessation and primary prevention of smoking to address the issue of lung cancer.[11]

Chapter 3: Methodology

Type of Study: Cross-Sectional Study

Study area: Pan India

Duration of study: 3 Months (1st March 2023- 31st May 2023)

Type of data: Primary Data

Sampling Size: 200

Sampling Technique: Convenience sampling

Study Population: Working professional of India

Selection Criteria: -

- **Inclusion Criteria**
    - Individuals who are employed in a full-time capacity in their organization.
- **Exclusion Criteria**
    - Individuals who are employed in a part-time capacity, or not working.

Data Collection Tool: Structured Questionnaire

Variables: -

- **Dependent variable:**

The dependent variable in this research is the level of awareness of lung cancer among working professionals in India. It represents the participants' knowledge, understanding, and familiarity with lung cancer, its risk factors, symptoms, diagnostic methods, available treatments, and preventive measures.

- **Independent variables:**

Demographics: Age, gender, education, and occupation.

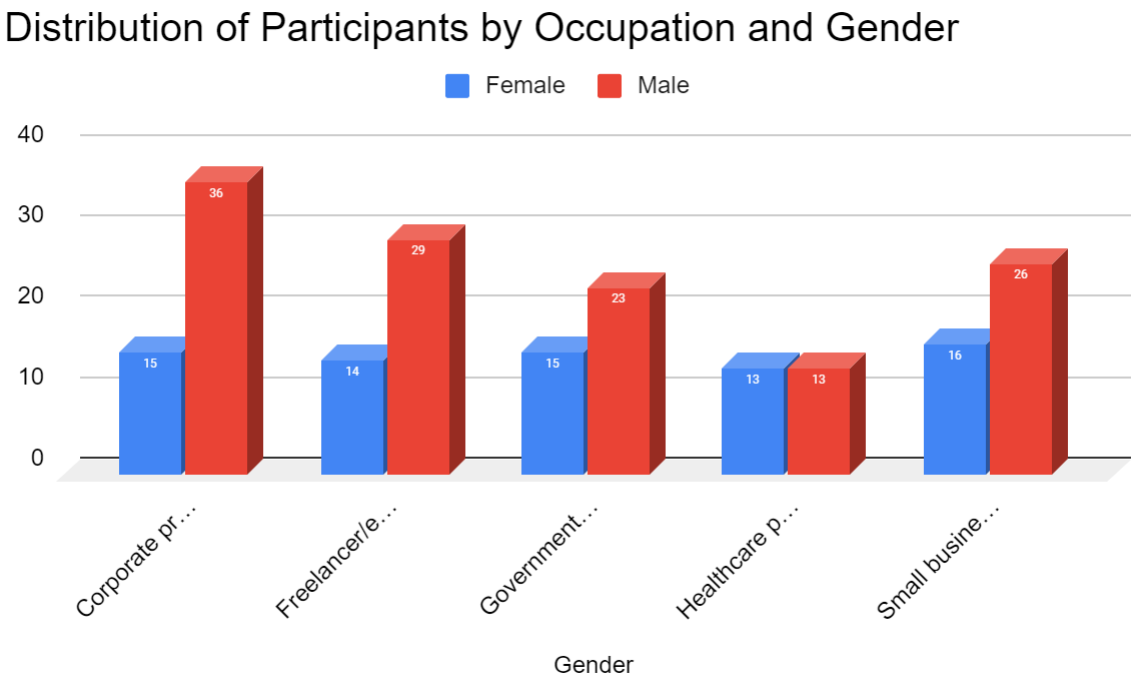
Occupational Exposure: Exposure to occupational hazards related to lung cancer.
Lifestyle Factors: Smoking status, physical activity, dietary habits, and alcohol consumption.
Source of Information: Where participants obtain information about lung cancer.
Previous Medical History: Personal or family history of lung cancer or respiratory conditions.

Data Collection Procedure: Survey Questionnaire Design: Develop a structured questionnaire to collect data on the level of awareness of lung cancer among working professionals. The questionnaire should include sections on demographic information, knowledge of risk factors and symptoms, awareness of preventive measures, and sources of information.

Google Form: It will contain both open-ended and closed-ended questions

Data Analysis: Microsoft Excel

Figure 5 Distribution of Participants by Occupation and Gender

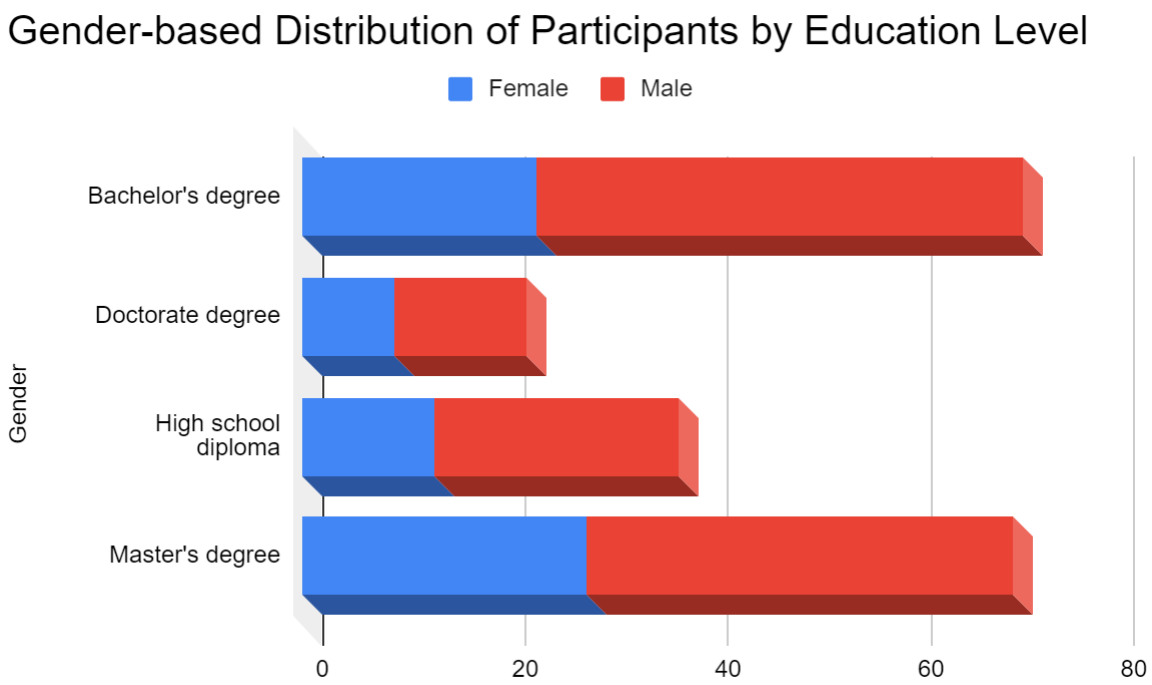


The data provided illustrates the distribution of occupations among respondents based on gender. Among the female participants, it is observed that corporate professionals constitute approximately 20.5% (15 out of 73) of the total, making it the most common occupation for females. Following closely behind are freelancers/entrepreneurs at 19.2% (14 out of 73), government employees at 20.5% (15 out of 73), healthcare professionals at 17.8% (13 out of 73), and small business owners at 21.9% (16 out of 73).

On the other hand, among the male respondents, corporate professionals are the predominant occupation, representing around 28.3% (36 out of 127) of the total. Freelancers/entrepreneurs account for approximately 22.8% (29 out of 127), government employees make up 18.1% (23 out of 127), healthcare professionals constitute approximately 10.2% (13 out of 127), and small business owners represent around 20.5% (26 out of 127).

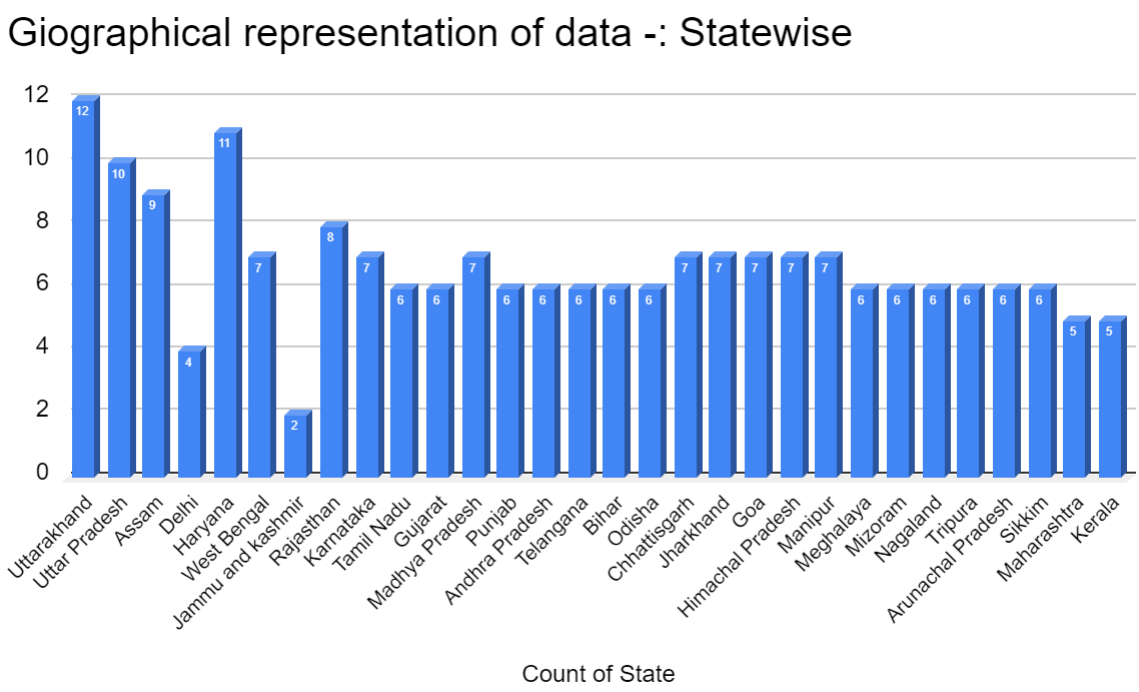
In conclusion, the data reveals that the distribution of occupations varies by gender. Corporate professionals are more prevalent among males, while among females, the distribution is balanced across different occupation types.

Figure 6 Gender-based Distribution of Participants by Education Level



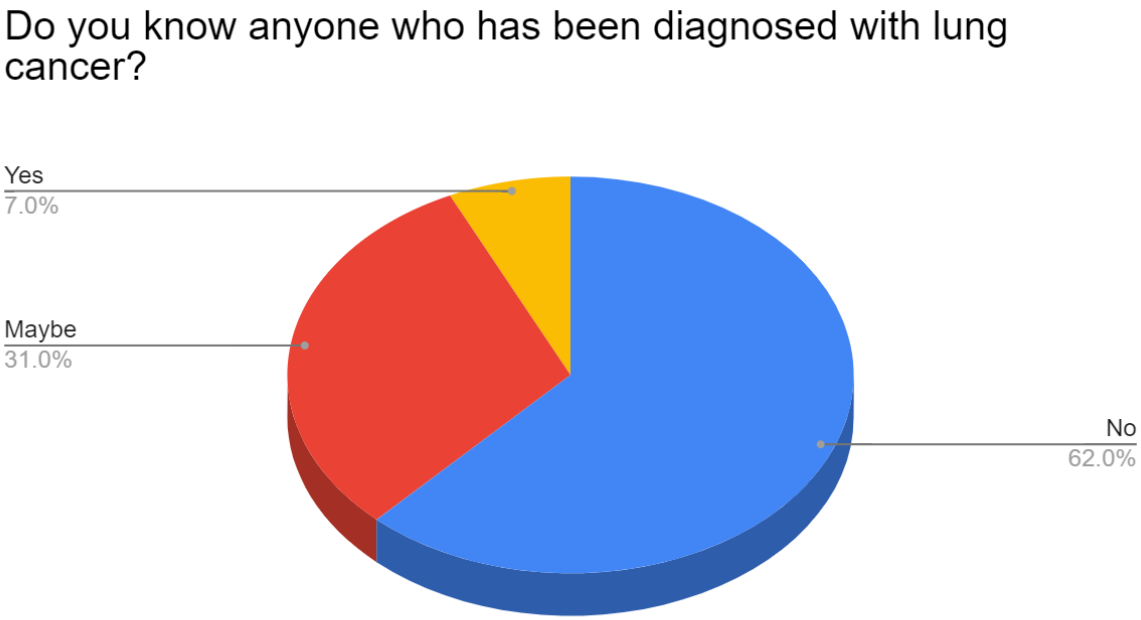
The data shows the educational attainment of the participants based on gender. Among the female participants, a sizeable portion (28%) holds a master's degree, indicating a higher level of education. In contrast, a larger proportion of male participants (48%) have obtained a bachelor's degree, suggesting a higher representation in undergraduate education. The distribution of doctorate degrees is lower for both genders, with 9% for females and 13% for males. Additionally, approximately 13% of both females and males possess a high school diploma. These findings highlight gender differences in educational achievements, with females showing a higher prevalence of master's degrees and males demonstrating a higher prevalence of bachelor's degrees.

Figure 7 Geographic Distribution of Data: State-wise Representation



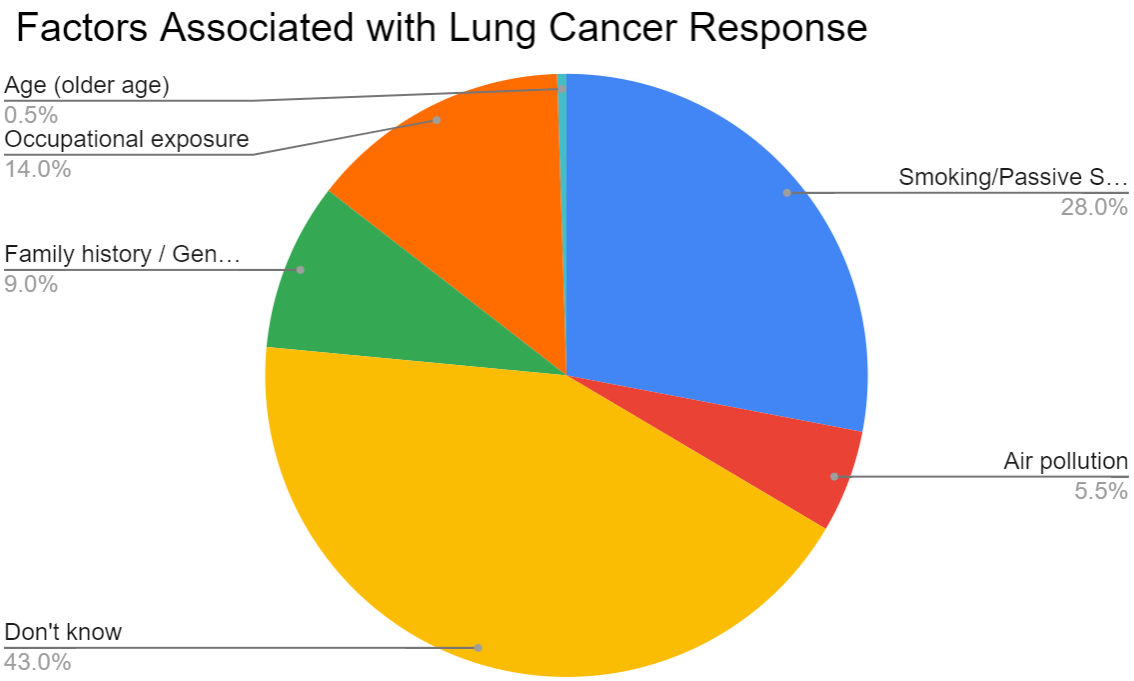
The data represents a diverse range of states, indicating that multiple regions are covered in the dataset. This diversity is beneficial as it ensures representation from various parts of India, including states like Uttar Pradesh, Haryana, Uttarakhand, Assam, Karnataka, and many others. Having data from multiple states increases the potential for capturing regional variations, perspectives, and insights in the analysis. It provides a more comprehensive view and helps in avoiding biases that may arise from focusing on a single region.

Figure 8 Knowledge of Lung Cancer Diagnosis: Personal Connections



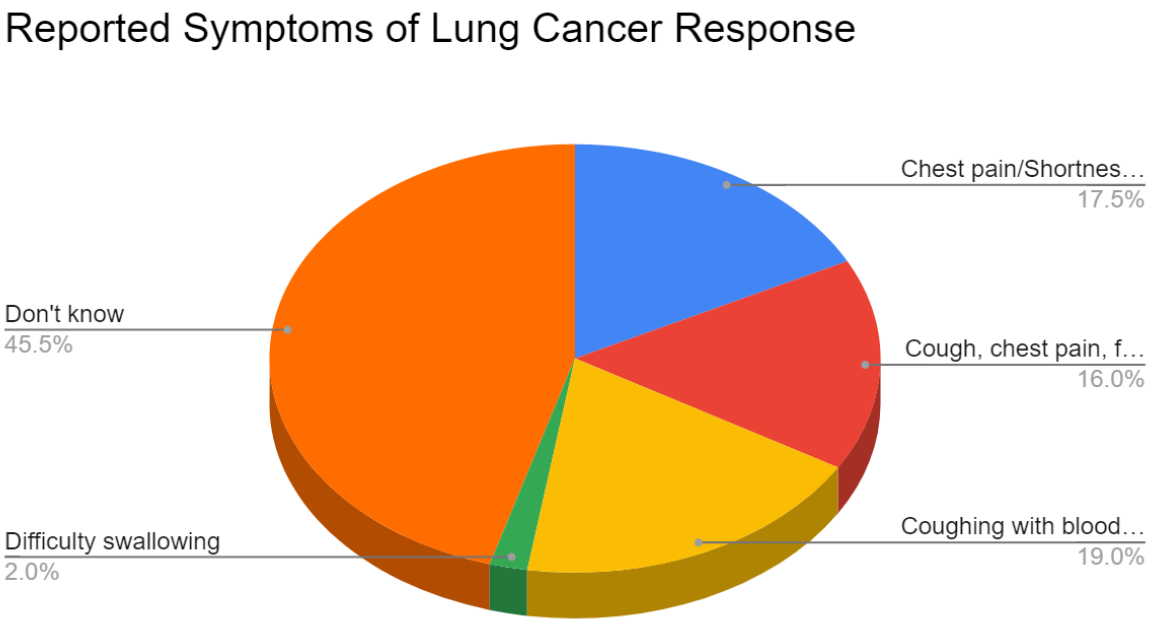
In the provided data, 14 individuals responded "Yes" when asked if they knew someone who has been diagnosed with lung cancer. This indicates that a small percentage of the respondents have personal connections or acquaintances with lung cancer diagnoses. On the other hand, a larger proportion of respondents, accounting for 62 individuals, responded with "Maybe," suggesting that they might have some knowledge of lung cancer cases but are uncertain about specific diagnoses. Most respondents, 124 individuals, responded with "No," indicating that they do not have personal knowledge of anyone diagnosed with lung cancer.

Figure 9 Factors Associated with Lung Cancer



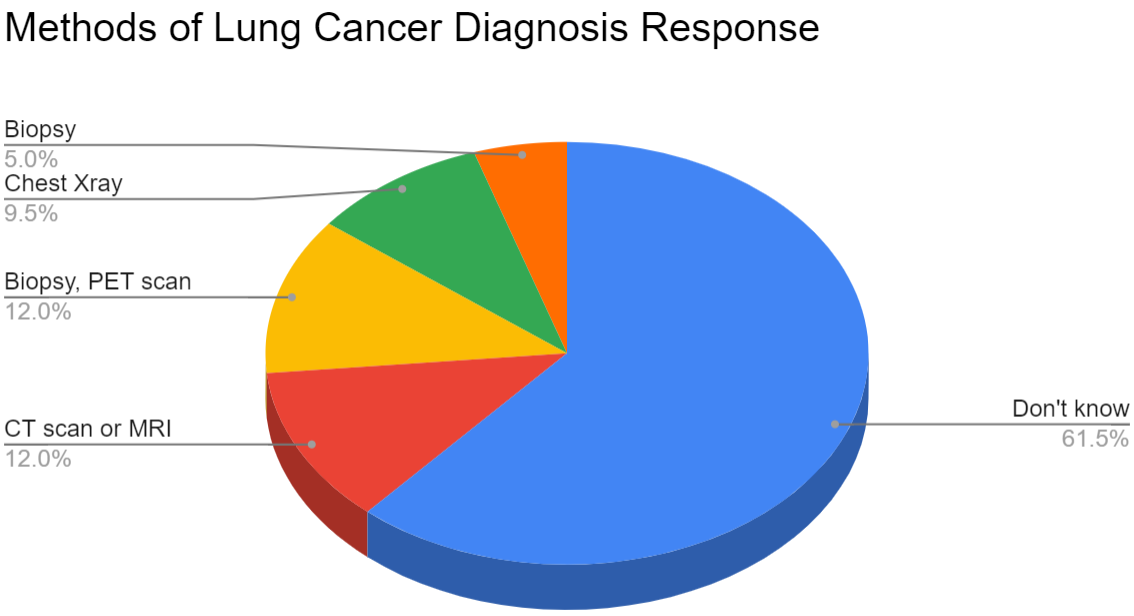
Among the respondents, the data indicates that 56 individuals (28%) identified smoking or passive smoking as a potential factor associated with lung cancer. Occupational exposure was mentioned by 28 respondents (14%), while 18 individuals (9%) cited family history or genetics as a potential risk factor. Air pollution was mentioned by 11 respondents (5.5%). Notably, a considerable proportion of respondents, 86 individuals (43%), answered "Don't know" when asked about the potential factors associated with lung cancer in older age.

Figure 10 Methods of Lung Cancer Diagnosis: Respondent Awareness and Knowledge



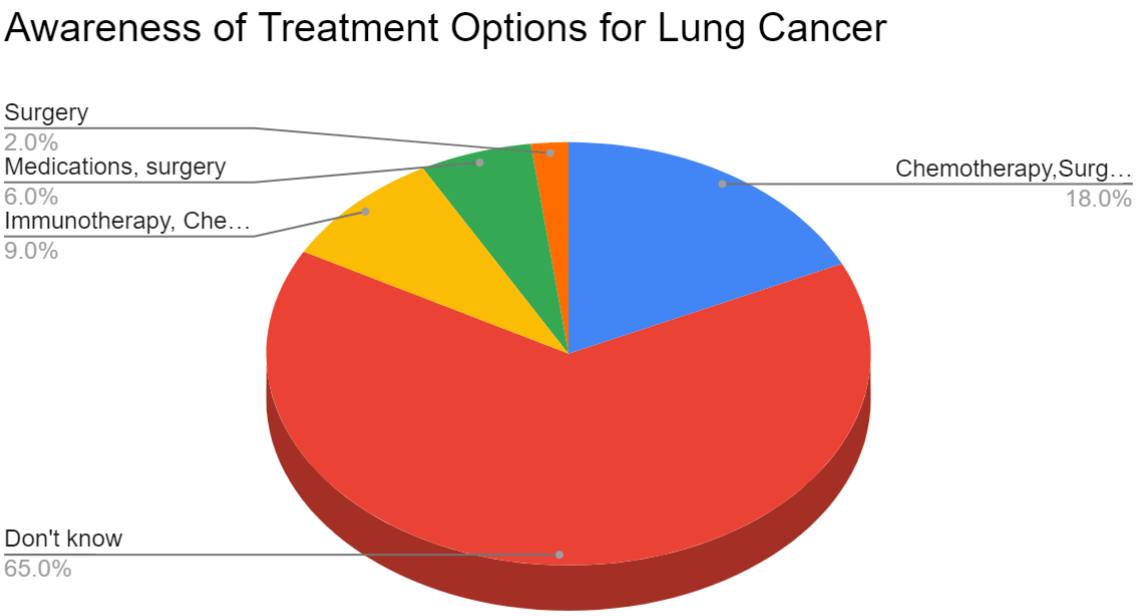
When asked about the reported symptoms of lung cancer, the respondents provided valuable insights. Among the mentioned symptoms, chest pain/shortness of breath/difficulty swallowing was reported by 35 individuals (17.5%). Cough, chest pain, and fatigue were reported by 32 individuals (16%), while coughing with blood and chest pain were mentioned by 38 individuals (19%). A smaller proportion of respondents, 4 individuals (2%), reported difficulty swallowing as a symptom. However, a considerable number of respondents, 91 individuals (45.5%), responded with "Don't know" when asked about the specific symptoms associated with lung cancer.

Figure 11 Methods of Lung Cancer Diagnosis: Respondent Awareness and Knowledge



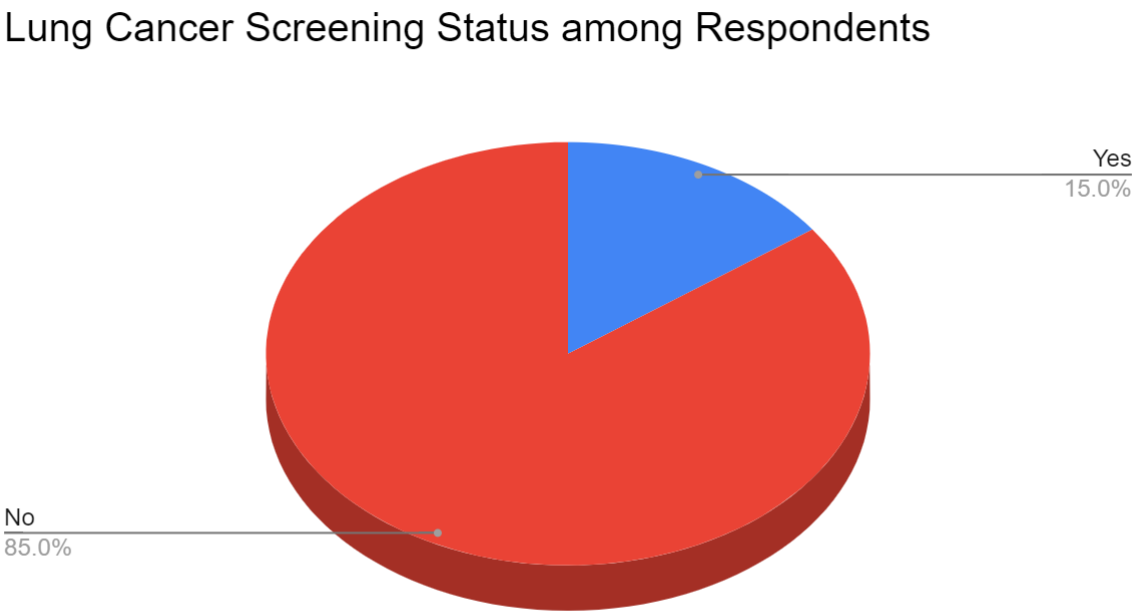
Among the respondents, the data shows that 10 individuals (5%) mentioned biopsy as a method for diagnosing lung cancer. A combination of biopsy and PET scan was cited by 24 respondents (12%). Additionally, 19 individuals (9.5%) mentioned the use of chest X-ray for diagnosis, while 24 respondents (12%) indicated the use of either CT scan or MRI. However, a significant majority of respondents, 123 individuals (61.5%), answered "Don't know" when asked about the diagnostic methods for lung cancer.

Figure 12 Awareness of Treatment Options for Lung Cancer



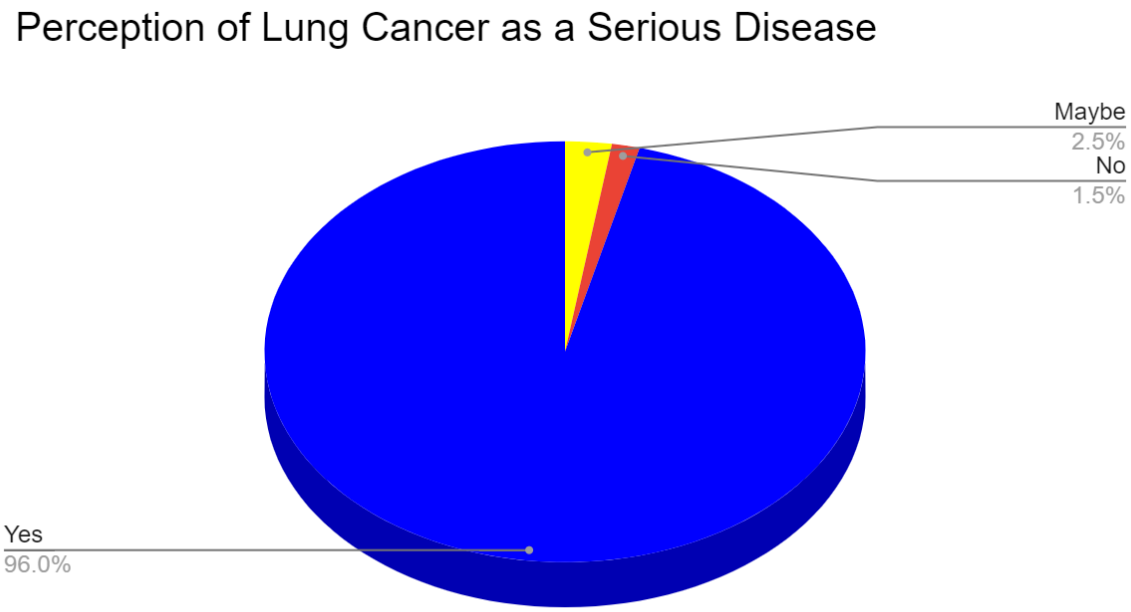
When asked about the treatment options for lung cancer, the respondents provided valuable insights into their knowledge and awareness. Among the mentioned treatment options, chemotherapy, surgery, and radiation therapy were identified by 36 individuals (18%). Immunotherapy combined with chemotherapy was mentioned by 18 individuals (9%), while medications combined with surgery were reported by 12 individuals (6%). A smaller proportion of respondents, 4 individuals (2%), specifically mentioned surgery as a treatment option. However, a considerable number of respondents, 130 individuals (65%), responded with "Don't know" when asked about the available treatment options for lung cancer.

Figure 13 Lung Cancer Screening Status among Respondents



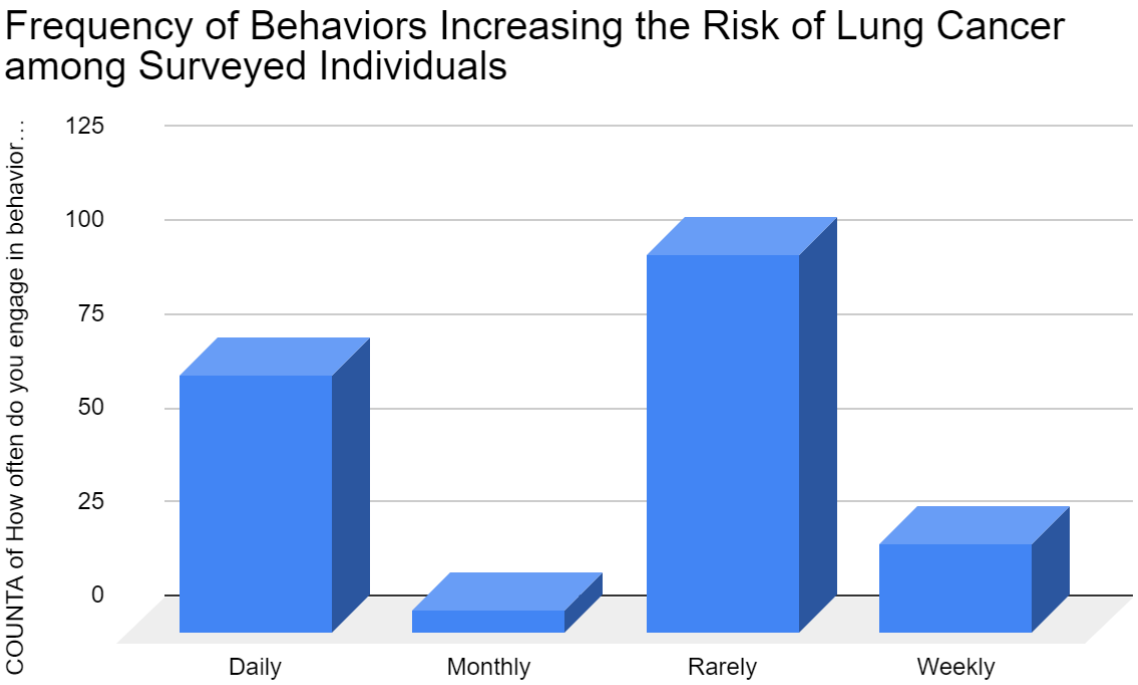
When asked about their lung cancer screening history, only 15% (30 out of 200) of the respondents answered "Yes," indicating that they have undergone screening. The majority, 85% (170 out of 200), responded "No," indicating that they have not been screened for lung cancer.

Figure 14 Lung Cancer Screening Status among Respondents



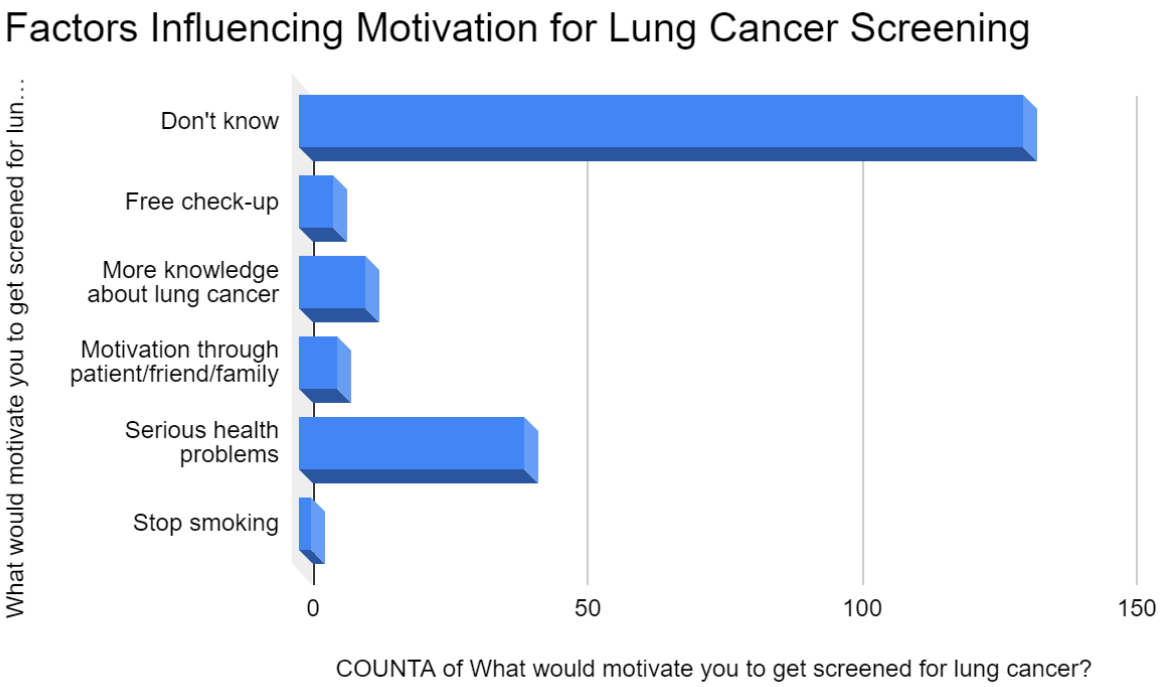
The survey revealed that 96% of the participants consider lung cancer to be a serious disease, indicating a strong awareness of its severity. However, 2.5% responded with uncertainty ("Maybe"), while 1.5% answered negatively ("No").

Figure 15 Frequency of Behaviors Increasing the Risk of Lung Cancer among Surveyed Individuals



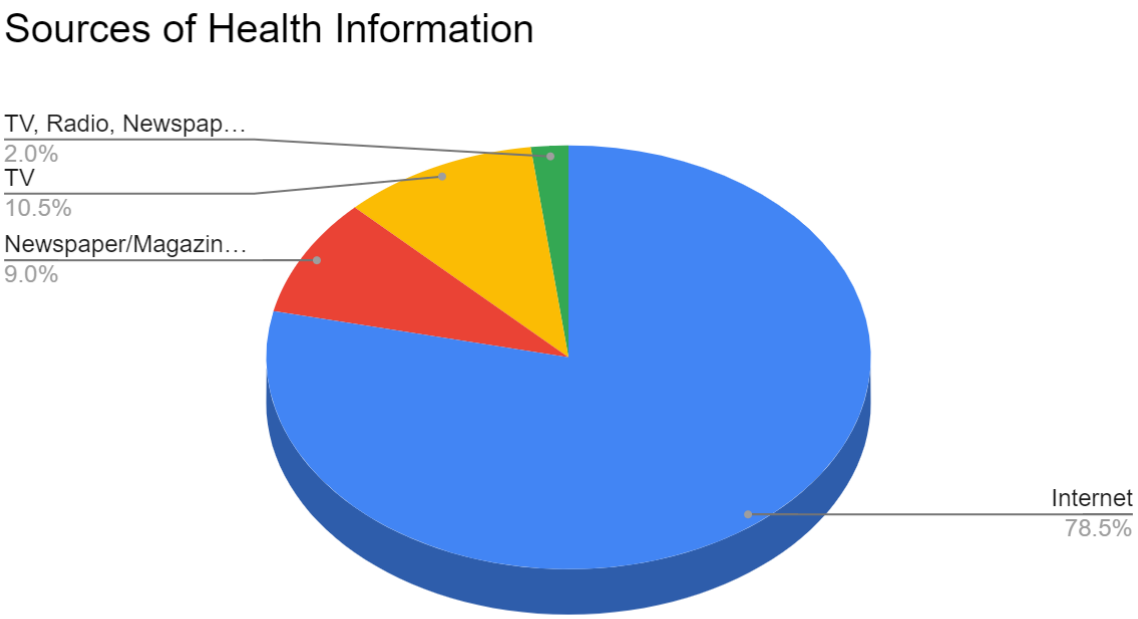
Among the surveyed individuals, 69 reported engaging in these risky behaviors on a daily basis, indicating a consistent and potentially high-risk pattern of behavior. Additionally, 101 individuals reported engaging in these behaviors rarely, suggesting occasional but still potentially harmful exposure. Interestingly, 24 respondents reported engaging in these behaviors weekly, indicating a less frequent but still notable occurrence. Only a minority of individuals, 6 respondents, reported engaging in these behaviors monthly, suggesting a less common occurrence.

Figure 16 Factors Influencing Motivation for Lung Cancer Screening



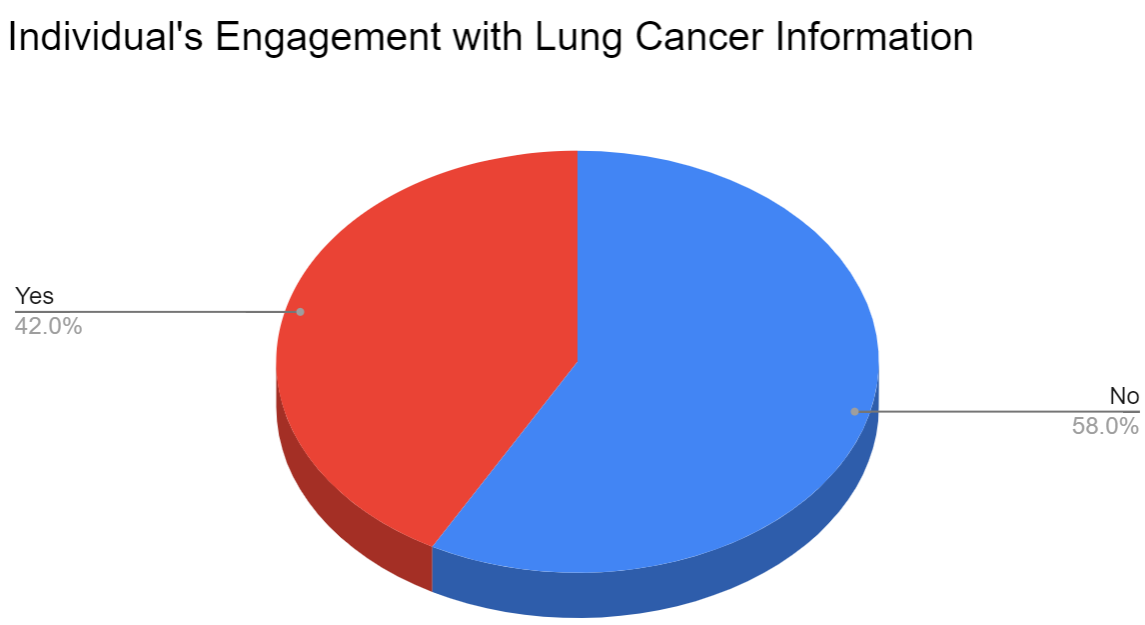
Among the 200 respondents, it was found that 132 individuals (66%) were unsure or did not know what would motivate them to undergo lung cancer screening. This indicates a significant lack of awareness and understanding about the importance of early detection. However, a small proportion of respondents expressed specific motivations for getting screened. Six individuals (3%) mentioned a free check-up as a motivating factor, while 12 respondents (6%) emphasized the need for more knowledge about lung cancer. Seven individuals (3.5%) mentioned being motivated by the experiences of patients, friends, or family members, while 41 respondents (20.5%) cited the presence of serious health problems as a motivating factor. Surprisingly, only two respondents (1%) mentioned that stopping smoking would motivate them to get screened.

Figure 17 Sources of Health Information Responses



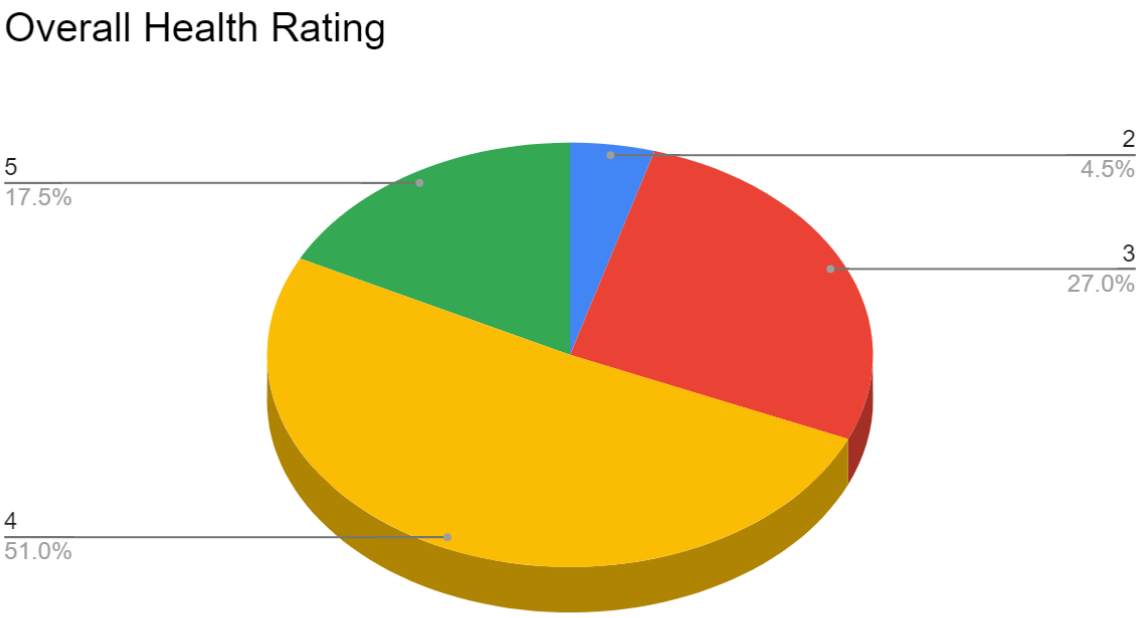
The survey aimed to identify the primary sources from which individuals typically gather information about health issues. The results indicate that the internet is the most relied upon source, with 157 respondents (78.5%) stating that they usually obtain health-related information from online platforms. A smaller proportion of individuals, 18 respondents (9%), reported using a combination of newspaper/magazines and the internet. TV was cited as the primary source by 21 individuals (10.5%), while only 4 respondents (2%) mentioned utilizing multiple sources, including TV, radio, newspaper/magazines, and the internet.

Figure 18 Individuals' Engagement with Lung Cancer Information



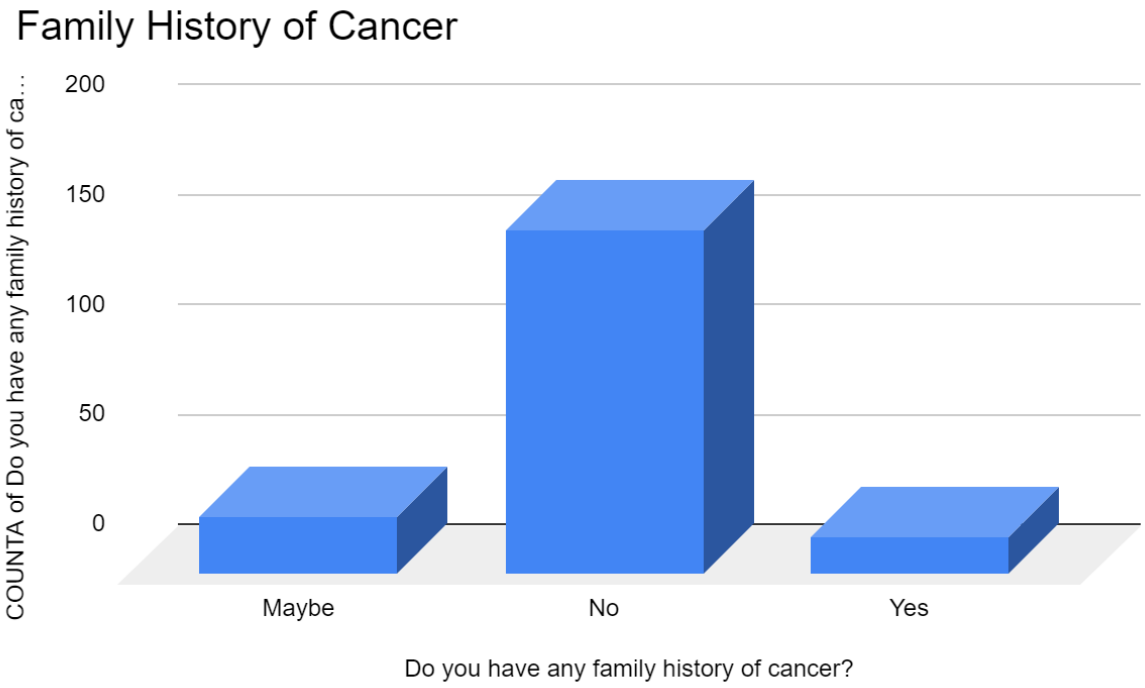
The survey aimed to determine the extent to which individuals have sought information about lung cancer. The results indicate that out of the 200 respondents, 84 individuals (42%) have actively looked for information about lung cancer. On the other hand, 116 respondents (58%) reported not having sought information on this topic.

Figure 19 Overall Health Rating



On a scale of 1 to 5, with 1 denoting the lowest rating and 5 denoting the best rating, participants were asked to rate their general health. Out of the 200 respondents, 9 individuals (4.5%) rated their overall health as 2, 54 individuals (27%) rated it as 3, 102 individuals (51%) rated it as 4, and 35 individuals (17.5%) rated it as 5. Most respondents rated their overall health as 4, indicating a positive perception of their well-being.

Figure 20 Family History of Cancer



When asked about their family history of cancer, 157 participants (78.5%) responded "No," indicating that they do not have any family history of cancer. 17 participants (8.5%) responded "Yes," indicating that they do have a family history of cancer. Additionally, 26 participants (13%) responded "Maybe," suggesting uncertainty or lack of knowledge about their family's cancer history.

Chapter- 4: Results & Findings

1. The data reveals variations in the distribution of occupations among respondents based on gender. Among females, corporate professionals, freelancers/entrepreneurs, government employees, healthcare professionals, and small business owners are evenly represented. In contrast, among males, corporate professionals are the most prevalent occupation, followed by freelancers/entrepreneurs, government employees, small business owners, and healthcare professionals. These findings highlight gender differences in occupational choices and suggest a greater diversity of occupations among females compared to males. No specific recommendations can be drawn from this information.
2. The educational attainment of the participants shows gender differences as well. A considerable proportion of female participants hold master's degrees, while a larger proportion of male participants have obtained bachelor's degrees. The distribution of doctorate degrees is relatively lower for both genders, and a similar percentage of males and females possess a high school diploma. These findings suggest that females have a higher prevalence of master's degrees, while males have a higher prevalence of bachelor's degrees. No specific recommendations can be drawn from this information.
3. The data indicates a diverse representation of states in the survey, ensuring coverage from various parts of India. This diversity is beneficial for capturing regional variations, perspectives, and insights in the analysis. It provides a more comprehensive view and helps avoid biases that may arise from focusing on a single region. No specific recommendations can be drawn from this information.
4. The presence of individuals who know someone diagnosed with lung cancer is limited, with only 14 respondents confirming personal connections. A larger proportion of

respondents indicated uncertainty or lack of specific knowledge regarding lung cancer cases. This highlights the need for increased awareness and education about lung cancer and its impact. It is recommended to provide information and resources to individuals to enhance their understanding of lung cancer.

5. The data suggests that respondents are aware of numerous factors associated with lung cancer, such as smoking, passive smoking, occupational exposure, family history/genetics, and air pollution. However, a considerable proportion of respondents expressed uncertainty or lack of knowledge regarding factors associated with lung cancer in older age. To address this gap, it is recommended to provide targeted education and awareness campaigns focusing on the specific risk factors for lung cancer, particularly in older individuals.
6. The reported symptoms of lung cancer mentioned by respondents include chest pain, shortness of breath, difficulty swallowing, cough, fatigue, and coughing with blood. However, a significant number of respondents expressed uncertainty or lack of knowledge regarding the specific symptoms associated with lung cancer. To enhance awareness and early detection, it is recommended to provide clear and accessible information about the symptoms of lung cancer and encourage individuals to seek medical attention if they experience any concerning signs.
7. The data indicates limited knowledge about diagnostic methods for lung cancer, with a majority of respondents expressing uncertainty or lack of knowledge. Biopsy, PET scan, chest X-ray, and CT scan/MRI were mentioned as potential diagnostic methods, but their awareness was relatively low. To improve knowledge and understanding, it is recommended to provide educational resources about diagnostic methods for lung cancer, highlighting the importance of early detection and the role of different tests in the diagnostic process.

8. The data suggests a lack of awareness regarding treatment options for lung cancer, with a majority of respondents expressing uncertainty or lack of knowledge. Chemotherapy, surgery, radiation therapy, immunotherapy, and medications combined with surgery were mentioned as potential treatment options, but their awareness was relatively low. To address this gap, it is recommended to provide comprehensive information about available treatment options for lung cancer, including the benefits, risks, and potential side effects, to empower individuals to make informed decisions about their healthcare.
9. The survey indicates a low rate of lung cancer screening among respondents, with only 15% reporting that they have undergone screening. The majority of respondents have not been screened for lung cancer. This highlights the need for increased awareness and promotion of lung cancer screening programs to ensure early detection and improved outcomes. It is recommended to implement targeted campaigns to educate individuals about the importance of lung cancer screening and encourage them to discuss screening options with their healthcare providers.
10. The survey reveals a strong awareness of the seriousness of lung cancer among the participants, with a majority considering it a serious disease. However, a small percentage expressed uncertainty or negativism. To further strengthen awareness, it is recommended to continue raising public awareness about the impact of lung cancer and its consequences, emphasizing the importance of prevention, early detection, and treatment.
11. The survey indicates varying levels of engagement in risky behaviors associated with lung cancer, with some individuals reporting daily engagement, while others engage rarely or on a weekly or monthly basis. This suggests the need for targeted interventions to reduce or eliminate these risky behaviors. It is recommended to develop and implement comprehensive tobacco control programs, promote healthy lifestyle choices,

and provide resources for individuals to quit smoking or avoid exposure to secondhand smoke and other environmental hazards.

12. The survey indicates a lack of motivation and awareness regarding lung cancer screening among respondents. Many individuals expressed uncertainty or lack of knowledge about the motivations for undergoing screening. To address this, it is recommended to develop targeted educational campaigns highlighting the benefits of lung cancer screening, addressing common concerns and misconceptions, and providing clear information about the potential motivations, such as free check-ups, knowledge acquisition, subjective experiences, or existing health problems.
13. The survey indicates a strong reliance on the internet as the primary source of health-related information among respondents. This highlights the importance of ensuring the availability of accurate and reliable online resources for individuals seeking information about lung cancer and other health issues. It is recommended to enhance online platforms and provide evidence-based information to empower individuals to make informed decisions about their health.
14. The survey reveals that a considerable proportion of respondents have not actively sought information about lung cancer. This emphasizes the need for increased awareness and education about the importance of seeking information and resources on lung cancer. It is recommended to promote information-seeking behaviors through targeted campaigns, educational materials, and accessible resources.
15. The majority of respondents rated their overall health as 4, indicating a relatively positive perception of their well-being. This suggests a generally good self-assessment of health among the participants. No specific recommendations can be drawn from this information.
16. The data indicates that a significant majority of respondents do not have a family history of cancer. However, a notable proportion responded "Maybe," suggesting uncertainty

or lack of knowledge about their family's cancer history. It is recommended to promote the importance of understanding family medical history and encourage individuals to gather relevant information to inform their healthcare decisions.

Overall, the survey findings highlight the need for increased awareness, education, and targeted interventions to improve knowledge about lung cancer, its risk factors, symptoms, screening, and treatment options. Promoting lung cancer awareness campaigns, enhancing communication between individuals and healthcare providers, and providing accurate and accessible information are key strategies to address the gaps identified in the survey results.

Chapter 5: Discussion

The survey results provide valuable insights into the knowledge, attitudes, and behaviors related to lung cancer among the respondents. It is evident that there are gaps in awareness and understanding of lung cancer, its risk factors, symptoms, and available screening and treatment options. These knowledge gaps pose significant challenges in early detection and prevention efforts.

One notable finding is the limited knowledge about lung cancer symptoms and diagnostic methods. Many respondents expressed uncertainty or lack of knowledge in these areas. This highlights the importance of increasing public awareness and education about the signs and symptoms of lung cancer, as well as the diagnostic tests used for early detection. By providing clear and accessible information, individuals can be empowered to recognize potential symptoms and seek medical attention promptly.

Furthermore, the survey highlights the low rate of lung cancer screening among the respondents. This underscores the need for targeted interventions to promote screening programs and encourage individuals to discuss screening options with their healthcare providers. Increasing awareness about the benefits of lung cancer screening and addressing common concerns or misconceptions can help improve screening rates and enable early detection of the disease.

The survey also sheds light on the limited discussions between respondents and their doctors regarding lung cancer screening. This communication gap hampers the dissemination of valuable information and recommendations. Enhancing healthcare provider education on lung cancer screening and facilitating open discussions with patients can play a crucial role in increasing screening rates and improving patient outcomes.

Additionally, the reliance on the internet as the primary source of health-related information indicates the importance of ensuring the availability of accurate and reliable online resources.

Efforts should be made to enhance online platforms and provide evidence-based information on lung cancer to counter misinformation and support informed decision-making.

Overall, the survey results underscore the need for comprehensive and targeted lung cancer awareness campaigns. These campaigns should address knowledge gaps, promote healthy behaviors, and emphasize the importance of early detection through screening. By increasing awareness, enhancing communication between healthcare providers and patients, and providing accessible and accurate information, we can make significant strides in reducing the burden of lung cancer and improving outcomes for individuals at risk.

Chapter 6: Limitations

While the survey provides valuable insights into lung cancer knowledge and behaviors, there are certain limitations that should be acknowledged. These limitations include:

1. **Sample Representativeness:** The survey sample may not fully represent the broader population, as it is based on a specific group of respondents. The findings may not be generalizable to the entire population or other specific demographics. This limitation affects the external validity of the survey results and should be considered when interpreting the findings.
2. **Self-Reported Data**: The survey relies on self-reported data, which may be subject to recall bias and social desirability bias. Participants may not accurately recall or report their knowledge, behaviors, or attitudes related to lung cancer. Additionally, individuals may provide responses that are socially desirable or conform to perceived societal norms, potentially leading to biased results.
3. **Lack of Detailed Information:** The survey provides a general overview of lung cancer knowledge, attitudes, and behaviors. However, it may lack detailed information about specific factors, such as the duration and frequency of engagement in risky behaviors or the extent of discussions with healthcare providers. Without more specific data, it is challenging to draw precise conclusions or make targeted recommendations.
4. **Limited Response Options:** The survey response options may not capture the full range of possible answers or nuances in participants' responses. For example, the "Don't know" option may be chosen due to lack of knowledge, uncertainty, or other reasons. Providing more comprehensive response options could have yielded more detailed and accurate data.
5. **Potential Bias in Survey Design:** The survey questions and response options may introduce biases or limitations in data collection. The wording of the questions, order of presentation, or response scale could influence participant responses. Additionally,

the survey design may not account for all relevant factors or variables that could impact lung cancer knowledge and behaviors.

6. **Lack of Longitudinal Data:** The survey offers a snapshot of the knowledge and actions of the respondents at a certain period. A more thorough understanding of lung cancer awareness and behaviours, including trends and the efficacy of proposed interventions, would be possible with longitudinal data that records changes over time.
7. **Limited Sample Size:** The survey's sample size may impact the statistical power and generalizability of the findings. With a larger sample size, more robust conclusions could be drawn, and subgroup analyses could be conducted to explore differences across various demographics or characteristics.
8. **Self-Selection Bias:** Participants in the poll who made the decision to reply might have unique qualities or levels of knowledge and awareness as compared to those who did not. This self-selection bias could affect the findings' generalizability and inject biases into the data.

Considering these limitations, it is important to interpret the survey findings with caution and recognize that further research is needed to provide a comprehensive understanding of lung cancer knowledge, behaviors, and interventions. Future studies should address these limitations by employing representative samples, using validated measurement tools, and conducting longitudinal research to capture changes over time.

Chapter 7: Recommendations

Based on the findings and limitations of the survey, the following recommendations can be made:

1. **Increase Public Education and Awareness:** Given the variation in lung cancer knowledge and the considerable number of "Don't know" responses, there is a need for targeted public education campaigns to improve awareness about lung cancer risk factors, symptoms, and screening. These campaigns should utilize multiple channels, including the internet, television, and print media, to reach a wide audience and provide accurate and accessible information.
2. **Encourage Regular Lung Cancer Screening:** With a low percentage of respondents reporting undergoing lung cancer screening, efforts should be made to promote the importance of early detection. Healthcare providers should engage in proactive discussions with patients about the benefits of screening, particularly among individuals with a higher risk, such as smokers or those with a family history of lung cancer.
3. **Enhance Healthcare Provider-Patient Communication:** The survey reveals a gap in discussions about lung cancer screening between doctors and patients. Healthcare providers should actively initiate conversations with their patients about lung cancer screening and provide relevant information to address any misconceptions or concerns. Providing educational materials, hosting seminars or workshops, and utilizing digital platforms for information dissemination can facilitate effective communication.
4. **Tailor Interventions for High-Risk Groups:** The survey findings highlight specific groups, such as individuals engaging in risky behaviors or those with a family history of cancer, who may require targeted interventions. Developing specialized programs that address smoking cessation, occupational safety, and genetic counseling can be

effective in reducing lung cancer risk and improving outcomes in these high-risk populations.

5. **Conduct Longitudinal Studies:** To better understand changes in lung cancer knowledge, attitudes, and behaviors over time, longitudinal studies should be conducted. These studies would provide valuable insights into the effectiveness of awareness campaigns, screening programs, and interventions, allowing for adjustments and improvements in strategies and policies.
6. **Collaboration and Knowledge Exchange:** Collaboration among healthcare professionals, researchers, policymakers, and advocacy organizations is crucial to address the multifaceted aspects of lung cancer. Establishing platforms for knowledge exchange, conferences, and workshops can facilitate collaboration, sharing of best practices, and dissemination of evidence-based interventions.
7. **Further Research on Understudied Areas**: The survey reveals gaps in knowledge and understanding, such as the limited awareness of diagnostic and treatment options for lung cancer. Further research should focus on these understudied areas to provide comprehensive information and address potential misconceptions or barriers that hinder optimal lung cancer care.

By implementing these recommendations, it is possible to enhance lung cancer awareness, promote early detection, and improve the overall understanding of lung cancer prevention and management. These efforts can contribute to reducing the burden of lung cancer and improving outcomes for affected individuals.

Chapter 8: Conclusion

In conclusion, the survey findings indicate a need for increased awareness and education about lung cancer among the surveyed population. There is a variation in knowledge and understanding of lung cancer risk factors, symptoms, and screening methods. The majority of respondents have not undergone lung cancer screening, and there is a lack of communication between healthcare providers and patients regarding screening. To address these challenges, recommendations include implementing targeted education campaigns, promoting regular screening, improving healthcare provider-patient communication, tailoring interventions for high-risk groups, conducting longitudinal studies, fostering collaboration, and further researching understudied areas. By implementing these recommendations, we can work towards improving lung cancer awareness, early detection, and overall outcomes for individuals affected by the disease.

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Google Form Questionnaire

Section 1: Demographics

1. Age: Open-ended response (e.g., 25)
2. Gender: Male/Female/Prefer not to say
3. Occupation: Corporate Professionals/Freelancers, Entrepreneurs/Government Employees/Healthcare Professionals/Small Business Owners
4. Education: High school/bachelor's degree/master's degree/Doctorate Degree
5. Current State: Open-ended response (e.g., Maharashtra)

Section 2: Awareness of Lung Cancer

1. Have you heard of lung cancer before? Yes/No
2. Do you know anyone who has been diagnosed with lung cancer? Yes/No/Prefer not to say
3. What are the risk factors for lung cancer? Open-ended response (e.g., smoking, exposure to air pollution, family history, etc.)
4. What are the common symptoms of lung cancer? Open-ended response (e.g., persistent cough, chest pain, difficulty breathing, etc.)
5. How is lung cancer diagnosed? Open-ended response (e.g., imaging tests, biopsy, etc.)
6. What are the treatment options for lung cancer? Open-ended response (e.g., surgery, radiation therapy, chemotherapy, etc.)
7. Have you ever been screened for lung cancer? Yes/No/Don't know

Section 3: Attitudes and Behaviors

1. Do you think lung cancer is a serious disease? Yes/No/Don't know

2. How often do you engage in behaviors that increase the risk of lung cancer (e.g., smoking, exposure to secondhand smoke, exposure to air pollution, etc.)? Daily/Weekly/Monthly/Rarely/Never
3. What would motivate you to get screened for lung cancer? Open-ended response (e.g., family history, awareness campaigns, etc.)

Section 4: Sources of Information

1. Where do you usually get information about health issues? TV/Radio/Newspaper/Magazines/Internet/Other
2. Have you ever looked for information about lung cancer? Yes/No

Section 5: General Health and Well-being

1. How would you rate your overall health? Excellent/Good/Fair/Poor
2. Do you have any family history of cancer? Yes/No/Don't know

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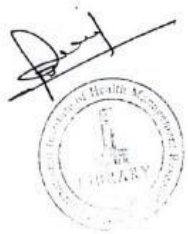

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