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Evaluation of the Knowledge of Health Professionals in the Screening of Lung Cancer

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Abstract

Background: Lung cancer screening is one of the most effective early stage disease identification forms, through specific screening criteria. For this, it is necessary to understand how health professionals know how to identify these patients, and thus develop actions that increase adherence to lung cancer screening. The study aims to evaluate the degree of multiprofessional knowledge about lung cancer screening criteria.

Methods: A cross-sectional observational study was conducted with health professionals in Brazil in relation to knowledge about the screening criteria of lung cancer.

Results: 324 health professionals were included in the study, with a mean age of 46.2 years (SD 12.5), with academic training in medicine (f=307; 94.7%). The study involved participants from different regions of the country, predominantly residents of southern Brazil (f=248; 76.5%). In terms of lung cancer screening knowledge, 46.2% of health professionals met all of the screening criteria. In relation to doctors, 47.5% hit the screening criteria, and 62.3% of the respiratory specialty hit the criteria.

Conclusion: Our findings show that only 46.2% of health professionals know the criteria for screening lung cancer, and only 62.3% of physicians working with respiratory specialty have adequate knowledge about the screening lung cancer.

Keywords: Lung cancer • Screening • Knowledge • Health professionals

Introduction

Characterized as one of the main causes of mortality in Brazil, lung cancer represents a significant challenge to public health due to its high malignancy [1]. Because it is a silent disease, without characteristic symptoms, its diagnosis is delayed and usually in an advanced and/or metastatic stage [2]. Lung Cancer Screening (LCS) is an effective way to reduce the impact caused by the disease and aims to identify patients with lung cancer early [3]. By means of low-dose chest tomography (TCBD) examination, it is possible to significantly reduce lung cancer mortality in high-risk patients [4,5], which is considered an effective and cost effective method [6,7]. The United States Preventive and Services recommends performing lung cancer screening in people aged 50 to 80 years old, smokers, and ex-smokers with 20 or more packs-year [6,8,9].

However, the referral rate of high-risk patients for screening remains considerably below the adherence observed in other cancer detection programs, with only 5% of patients being referred [10]. Despite the consensus on the importance of lung cancer screening(9), the persistent lack of knowledge about these recommendations is worrying and contributes to the high rates of diagnosis in advanced stages [11,12]. A study in the USA evaluated the attitudes, beliefs, and knowledge of health professionals about lung cancer screening, highlighting disagreements between primary care physicians and nurses in relation to screening guidelines. It was observed the use of chest x-rays for screening as well as the referral of patients who did not meet the recommended criteria [13,14].

Health professionals play a crucial role in monitoring the entire patient care journey, highlighting its importance from the early identification of risk groups for lung cancer screening, already in the screening phase. However, the scarcity of studies that assess the understanding of health professionals about the recommendations and guidelines of cancer screening programs represents a significant gap in the current literature. Given this need, the present study aims to evaluate the degree of knowledge of several health professionals about lung cancer screening.

Methods

This is a cross-sectional observational study conducted with health professionals in Brazil. The recruitment of the participants was carried out for convenience and the questionnaire sent by e-mail and disclosed on social networks. Some Brazilian societies and councils, such as the Brazilian Society of Gerontology and Geriatrics (SBGG), Rio Grande do Sul Society of Pulmonology and Phthisiology (SPTRS), Brazilian Society of Thoracic Surgery (SBCT) and the Regional Council of Nursing of Rio Grande do Sul (Coren-RS) have helped to disseminate the research. All participants signed the Free and Informed Consent Form (TCLE). The inclusion criteria of the study were: to be a health professional and to meet the general population. Participants who had not completed graduation were excluded.

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The study protocol was approved by the Ethics Committee (CEP) and the data collected from each patient were used only for research purposes. Data collection began in June 2024 and went until April 2024. The research was carried out through a questionnaire built on knowledge in lung cancer screening. The questionnaire was divided into 3 sections totaling 14 questions. Initially, the TCLE, after confirmation, the demographic issues were presented (gender, age, academic background and medical specialty and the region of Brazil that complies with it). In the following section, dichotomous questions about the knowledge of lung cancer screening (Screening Lung and Lung RADS) were presented, after multiple choice questions about screening criteria according to the recommendations of the United States Preventive and Services. Finally, a Likert classification scale of the participant on the degree of knowledge in the screening of lung cancer.

The data were extracted from the form to a database in the software (SPSS), where the analyzes were performed. First, the descriptive and categorical analysis of the data collected for characterization of the sample. After that, the degree of knowledge was analyzed of the population about screening in two groups (physicians and non-physicians), comparing the medical specialties and put an end to the analysis of knowledge of the criteria for screening in the different groups selected.

Results

Sociodemographic characteristics of the sample

A total of 327 subjects agreed to participate in the study, 3 participants were excluded because they did not complete academic training so far. Thus, 324 participants, all health professionals, were included in the study, it was observed that the participants had a mean age of 46.2 years (=SD 12.5). The majority of females (f=168; 51.8%), with academic training in medicine (f=307; 94.7%), the study involved participants from different regions of the country, predominantly residents of southern Brazil (f=248; 76.5%). The details of the other sociodemographic characteristics of the sample are presented in Table 1.

Participants were divided by specialties, respiratory and non-respiratory. Respiratory patients were classified by specialists in the area of thoracic surgery and pulmonology professionals. The non-respiratory specialty was composed of specialists in geriatrics, cardiology, general surgery, urology, family and community medicine, oncology, otorhinolaryngology, pediatrics, medical clinic, gastroenterology, orthopedics and traumatology, pathology, radiology, nursing professionals, pharmacy and psychology. Most participants were non-respiratory specialty (f=207; 63.8%), confidence interval.

Knowledge on criteria for screening lung cancer

Regarding the screening criteria, of the 324 study participants, 91.0% reported having previous knowledge with the screening criteria, 75.6% of the participants agreed the recommended age group for screening. However, only 54.0% of the participants answered correctly the question about the amount of cigarette packets smoked per year for screening, highlighting an area of less knowledge among the health professionals evaluated.

Analysis of association between knowledge of lung cancer screening criteria and sociodemographic characteristics

Regarding the knowledge of the risk group for lung cancer screening, the participants who hit and missed the screening criteria were evaluated. In addition, the comparison analysis used subgroups (age, specialty, academic background and regions of Brazil), according to Table 2. We performed a proportion comparison analysis to examine the association between the hits and errors variables of the screening criteria. Although the general findings of the correct answers and errors did not reveal statistically significant differences, it is essential to highlight that the percentage of hits of only 46.2% among health professionals is extremely relevant. In addition, we can demonstrate that the results of hits in the respiratory specialty group were extremely low (3.1%), as well as in physicians and non-physicians, respectively, 47.5% and 23.5%. This highlights a need to prioritize education and awareness about lung cancer screening within the community of health professionals.

Within the sociodemographic characteristics, we can highlight some points of statistical significance. At the age of the participants it is important to note that participants aged 61 years or older had worse results in the screening criteria than the other participants (CI 7.8854-61.0059, p 0.014). In the respiratory and non-respiratory specialty group, the number of errors in the screening criteria was highlighted in the non-respiratory specialty (CI 11.6317–38.3494, p 0>001). Finally, when comparing the regions of Brazil, due to the high rate of responses in the South and Southeast region, we divided into three groups (South, Southeast and other regions). It can be observed that the South region compared to the others had a significant result, especially when the number of errors of the screening criteria was observed (CI 4.2738–28.7795, p 0.008). In Figure 1, we can highlight the percentage of hits per region of Brazil.

Discussion

The study aimed to evaluate the level of knowledge of health professionals regarding the screening of lung cancer, presenting results of a cohort. It is

Table 1. Sociodemographic characteristics of study participants (n=324).

Categorical Variables		n=324	%
Sex	Male	156	48.1
	Female	168	51.8
Academic Training	Doctor	307	94.7
	Nurse	8	2.4
	Physiotherapy	4	1.2
	Pharmacy	4	1.2
	Psychology	1	0.3
Regions of Brazil	South	248	76.5
	North	6	1.5
	Center-west	12	3.7
	Northeast	12	3.7
	Southeast	47	14.5
Numeric Variables		Mean	IQ
Age		46.2	[22.0-79.0]

Legend: IQ=Interquartile interval

Table 2. Analysis of association and comparison between the hits and errors of criteria for screening lung cancer in sociodemographic characteristics.

Characteristics	Hit the Criteria		Did not Hit the Criteria		Hit X did not Hit	
	n (%)	p Value	n (%)	p Value	CI 95%**	P Value
All participants	150 (46.2%)	-	174 (53.7%)	-	3.3843-18.1365	0.178
Age (≤ 40 years)*	61 (52.1%)	-	56 (47.8%)	-	13.4396-21.6635	0.643
Age (41- 60 years)	75 (46.5%)	0.275	86 (53.4%)	0,042	-8.4124-21.7647	0.383
Age (≥ 61 years)	14 (30.4%)	0.027	32 (69.5%)	0.163	7.8854-61.0059	0.014
Spec. Respiratory*	73 (62.3%)	0.741	44 (37.6%)	<0.001	6.0104-41.0645	0.009
Non-respiratory specialty	77 (37.1%)		130 (62.8%)		11.6317-38.3494	<0.001
Physicians*	146 (47.5%)	<0.001	161 (52.4%)	<0.001	6.2333-15.8633	0.391
Non-physicians	4 (23.5%)		13 (76.4%)		0.0099-77.5120	0.061
Regions of Brazil: South*	103 (41.5%)	-	145 (58.4%)	-	4.2738-28.7795	0.008
Regions of Brazil: Southeast	30 (63.8%)	<0.001	17 (36.1%)	<0.001	-1.6738-51.1083	0.070
Regions of Brazil: Other regions	17 (58.6%)	<0.001	12 (41.3%)	<0.001	17.6126-46.9488	0.367

Source: The authors Notes: *characteristics as reference for comparison; **95% confidence interval, bold values: statistically significant

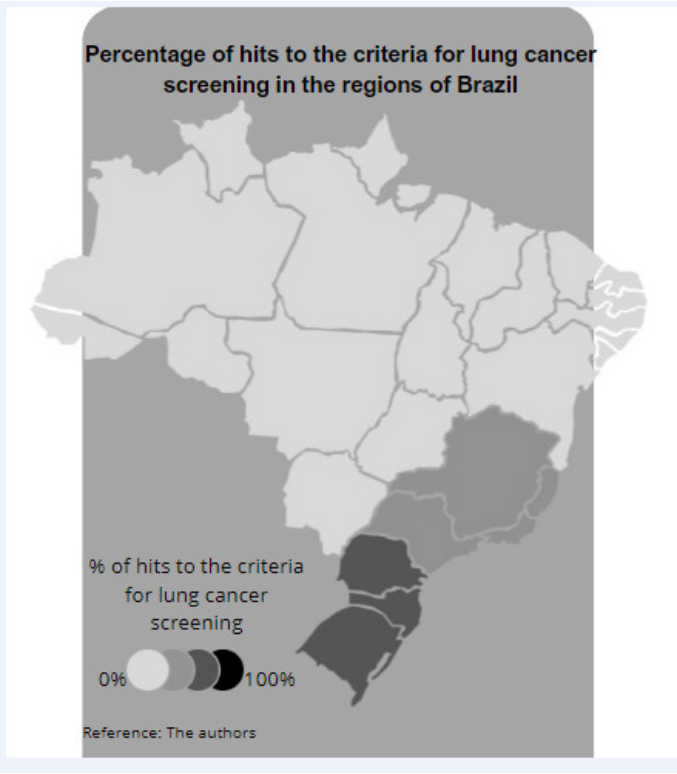

Figure 1. Percentage of hits to the criteria for lung cancer screening in the regions of Brazil.

notable the significant low rate of correct answers of health professionals participating in the study (46.2%) in relation to the criteria, especially that these professionals meet the population eligible for screening. This highlights the importance of prioritizing education and awareness among health professionals in lung cancer screening. In addition, our findings show a disparity in the level of understanding among professionals who have no experience in the respiratory area compared to others. It was also possible to visualize those professionals aged over 61 years presented lower assertiveness in the proposed questionnaire than the younger group (30.4%), reasons for this data may be updating teaching methods or professional practices. The low level of physician knowledge about lung cancer screening criteria represents a significant problem. The lack of understanding among professionals about the profile of at-risk patients who should be screened can result in late diagnoses and consequently unfavorable outcomes for patients. To change this reality, it is essential to raise awareness among healthcare professionals and implement continuing education programs, highlighting the importance of screening, the benefits in patient survival, and emphasizing specific criteria for identifying the population to be screened.

Although most health professionals have stated that they have prior knowledge with the criteria for screening lung cancer (91.3%), only 46.2% correctly answered the two questions about screening criteria (75.6% age group and 54.0% for the history of smoking in packs-year). This discrepancy, gap between believing to have a comprehensive theoretical knowledge about tracking and actually being able to identify specific criteria is concerning, is worrying, especially considering that the group of respiratory and medical specialists also did not present high rates of accuracy in the criteria for lung cancer screening. Although there are established international guidelines and a recently published Brazilian recommendation(9), the effective implementation of lung cancer screening is challenging and requires improving the theoretical knowledge of the professionals who serve the eligible population for lung cancer screening. These findings highlight the critical importance of improving the knowledge and competence of professionals who serve the population eligible for lung cancer screening.

Our results are in line with other studies that highlight the barriers faced by health professionals when referring patients to lung cancer screening. These barriers include a lack of knowledge about screening guidelines, cultural aspects in medical practice and uncertainties about patient benefits [12]. However, it is widely recognized that screening for lung cancer has the potential to reduce mortality [9], but less than 5% of patients eligible for screening are referred [10].

The adherence of health professionals to respond to research is crucial to obtain representative and significant data. This aspect was particularly relevant during the development of the study, given the low initial adherence. Ensuring a high adherence rate of health professionals in studies is fundamental to the quality and relevance of data collected, assisting in clinical practice and patient care. Our study have some limitations, such as the low adherence of non-medical health professionals and the greater representativeness of the South region compared to the others. The presence of a selection bias, in which the participants of the research were those with prior interest in the subject, which may have made it difficult to obtain representative answers of all participants. A strong point of the study is the heterogeneity of the participants in relation to their area of activity. The lack of studies that assess the level of knowledge about lung cancer screening makes it difficult to compare the available data, which in turn hinders the analysis of the understanding of health professionals about this topic.

Conclusion

Our study demonstrates an important limitation of multiprofessional knowledge on lung cancer screening. It is important to highlight the low

number of correct screening criteria by health professionals including doctors working in respiratory specialties. Lung cancer is now one of the most killing types of cancer in the general population, so it is important to think about strategies to promote health and education of the population in the screening of lung cancer.

Contributorshisip

Each author played a fundamental role in the development of this article, contributing at every stage of the drafting process. From the planning of the writing to the drafting of the text, through the contribution and understanding of the topic, to the final revision of the entire manuscript, the collaboration of all authors was indispensable to ensure the quality and integrity of this work.

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Conflict of Interest

The authors have declared that there is no conflict of interest.

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