



# Knowledge and Awareness Of Head and Neck Cancer Among Pulmonologists in Turkey

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## ABSTRACT

**Background :** Head and neck cancers (HNCs) constitute a significant public health burden globally. Pulmonologists often encounter symptoms that overlap with HNC presentations, yet their role in early detection is under-explored. This study aimed to assess the knowledge and awareness of head and neck cancers among pulmonologists in Turkey.

**Methods:** A cross-sectional, questionnaire-based online survey was distributed to practicing pulmonologists across Turkey. The questionnaire consisted of 23 items evaluating knowledge of HNC risk factors, signs and symptoms. Data were analyzed using descriptive statistics and logistic regression to identify factors associated with higher knowledge scores.

**Results:** A total of 136 pulmonologists participated in the study. Of the participants, 64.7% were female, and 62.5% had less than 10 years of professional experience. The mean objective knowledge score was  $16.05 \pm 2.44$  out of a maximum of 23, while the mean self-reported knowledge level was  $2.68 \pm 0.93$  on a 5-point scale. Awareness of classical risk factors such as smoking (98%) and alcohol (55%) was high. However, only 51% of participants correctly identified HPV infection as a risk factor. Key symptoms like neck mass (93%), dysphagia (90%), and hoarseness (89%) were widely recognized, whereas others—such as non-healing ulcer in the oral cavity (63%) and unpleasant taste in the mouth (43%)—were under-recognized. No significant differences in knowledge scores were found across experience levels. Only 27.6 % routinely inform their patients who smoke that they may have HNC.

**Conclusions:** Turkish pulmonologists exhibit moderate awareness of head and neck cancer, with notable deficiencies in recognizing modern risk factors like HPV and less typical symptoms. Structured educational interventions and inclusion of HNC-focused content in pulmonology training and CME programs are warranted to enhance early recognition and referral.

**Keywords:**

Head and neck cancer, pulmonology, awareness, HPV, early diagnosis, Turkey



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## Introduction

Head and neck cancers (HNCs) are a significant cause of cancer-related morbidity and mortality worldwide (1). They are frequently diagnosed at an advanced clinical stage, which usually require combined treatment, often resulting in significant aesthetic and functional consequences. Early detection and appropriate treatment improve the prognosis and lead to better cosmetic and functional outcomes. In addition, patients diagnosed at an advanced stage of HNC have a much lower 5-year survival rate than those diagnosed in early stages of the disease (2).

Tobacco and alcohol use are the most prominent risk factors, though in recent years, the incidence of HPV-related oropharyngeal cancers has been increasing (3,4). Tobacco users have a proven higher risk of lung malignancies as well as non-malignant pulmonary disorders. (5,6) As most of patients seen by pulmonologists are smokers. Therefore, being familiar with the signs and symptoms of HNC is very important for early diagnosis. The symptoms of head and neck cancers often overlap with those of respiratory diseases. Persistent cough, hoarseness, dysphagia, hemoptysis, and neck masses are common presenting complaints in both groups. Consequently, these overlapping symptoms may lead to delayed or missed diagnoses of head and neck cancers, particularly when patients are first evaluated in respiratory or pulmonary clinics.

Pulmonologists play a critical role in the early assessment of such patients. Therefore, their level of awareness and knowledge regarding head and neck cancers is vital for timely diagnosis and appropriate referral. However, data on awareness of HNC among pulmonologists are lacking. This report addresses this gap by presenting the results of a survey evaluating pulmonologists' knowledge about HNC. The findings may also serve as a benchmark for future studies and provide insight into the potential of educational activities to reduce the disease burden of HNC through early diagnosis.

## Methods

A short, web-based questionnaire assessing basic knowledge of HNC among pulmonologists in Turkey was conducted online for 3 months. Demographic information included age, sex, work position (resident, specialist, academician), workplace (university hospital, state hospital, private hospital) and years in profession. The survey was entirely anonymous and designed specifically for the study. We calculated HNC knowledge scores by adding the correct answers to all 23 items in the questionnaire, which covered HNC risk factors, signs and symptoms. (Table 1) Sample questions are provided in Supplementary File 1. To evaluate the effect of demographic factors on mean HNC knowledge scores, we constructed a multivariable model using ordinary least squares regression analysis. The Fisher exact test was used to determine the association between demographic characteristics. All participants completed the survey voluntarily. The study was conducted in full accordance with the Declaration of Helsinki and was approved by the Ethics Committee (Approval number: 2021/36).

## Results

A total of 136 pulmonologists participated in the study. Of the respondents, 64.7% (n = 88) were female and 35.3% (n = 48) were male. Most participants had less

than 10 years of experience in the profession: 31.6% had 0–5 years and 30.9% had 6–10 years. A smaller proportion had 11–15 years (6.6%), 16–20 years (11.0%), or more than 20 years of professional experience (19.9%). The mean total knowledge score out of a maximum of 23 was  $16.05 \pm 2.44$  (Table 2). Self-reported knowledge levels were lower, with a mean of  $2.68 \pm 0.93$  on a 5-point Likert scale. There was a statistically significant, albeit weak, correlation between self-perceived and actual knowledge scores ( $r = 0.23$ ,  $p = 0.0066$ ), suggesting that participants who believed they had better knowledge did tend to score slightly higher, although this perception was not always aligned with performance.

When knowledge scores were compared across experience groups, participants with 0–10 years of experience had slightly higher mean scores (16.28 and 16.33, respectively) compared to those with 11–20 years of experience. However, these differences were not statistically significant (ANOVA  $p = 0.4741$ ) (Table 2).

**Table -1:** Head and Neck Knowledge Questions and Correct Response Rates

| Subject                          | Responses, % |
|----------------------------------|--------------|
| Risk Factors                     |              |
| Smoking                          | 98           |
| Genetics                         | 84           |
| Old age                          | 74           |
| EBV                              | 65           |
| Sex                              | 64           |
| Alcohol                          | 55           |
| HPV                              | 51           |
| Sun exposure                     | 35           |
| Fatty foods                      | 14           |
| Frequent URTI                    | 13           |
| Signs and Symptoms               |              |
| Lump in neck                     | 93           |
| Difficulty swallowing            | 90           |
| Hoarseness/change in voice       | 89           |
| Weight loss                      | 85           |
| Blocked nose on side ± epistaxis | 70           |
| Chronic sore throat              | 66           |
| Non-healing ulcer in oral cavity | 63           |
| Difficulty breathing             | 63           |
| Headache                         | 53           |
| Unpleasant taste in mouth        | 43           |
| Dizziness                        | 37           |
| Loosening of teeth               | 33           |
| Lack of saliva                   | 29           |

Note: correct response. % Percentage answering “yes” to each item.

### Awareness of Risk Factors

Participants demonstrated high awareness of traditional risk factors for HNC. Smoking was correctly identified by 98%, followed by genetics (84%), old age (74%), and EBV (65%). Surprisingly, only 51% of respondents recognized HPV infection as a risk factor, despite its now well-established role as a leading cause of oropharyngeal squamous cell carcinoma. Awareness was considerably lower for less conventional or non-causal factors: sun exposure (35%), fatty foods (14%), and frequent upper respiratory tract infections (URTI) (13%) were incorrectly endorsed as risk factors by a notable number of participants, reflecting potential confusion regarding etiological distinctions (Table 1).

**Table -2:** Mean Knowledge Score by Years of Professional Experience

| Years in Profession | n  | Mean Knowledge Score | SD   |
|---------------------|----|----------------------|------|
| years 5–0           | 43 | 16.28                | 2.48 |
| years 10–6          | 42 | 16.33                | 2.73 |
| years 15–11         | 9  | 15.22                | 1.72 |
| years 20–16         | 15 | 15.27                | 2.09 |
| years 20<           | 27 | 15.96                | 2.28 |

### Awareness of Symptoms

Most participants were able to correctly identify hallmark symptoms of HNC. The most recognized signs included neck mass (93%), dysphagia (90%), and hoarseness or voice changes (89%). Other frequently identified symptoms were weight loss (85%), chronic sore throat (66%), and non-healing oral ulcers (63%). In contrast, several relevant symptoms were under-recognized. Only 43% of respondents marked unpleasant taste in the mouth as a possible warning sign. Additionally, dizziness (37%) and headache (53%), which are generally nonspecific, were incorrectly attributed by some participants as signs of HNC. This highlights a need for better differentiation between core and incidental symptoms in clinical practice (Table 1).

### Referral Preferences and Clinical Practice

When asked about referral preferences for a patient suspected of having HNC, the vast majority selected otolaryngology (ENT) as the preferred specialty. A smaller proportion mentioned medical oncology, plastic reconstructive surgery, or dentistry. Most participants (over 80%) indicated that they would refer the patient immediately, reflecting an appropriate sense of urgency. In daily clinical practice, the majority of participants reported that more than 40% of their patients were active smokers, yet only a minority consistently discussed the risk of head and neck cancer with these individuals. Responses to this question varied, with a notable proportion stating they “rarely” or “sometimes” provide such information.

### Discussion

Head and Neck Cancers (HNC) are a significant clinical challenge due to their diverse histological subtypes, complex anatomical location, and multimodal treatment approaches.(7) The role of pulmonologists in the early recognition and referral of these malignancies is critical—particularly because of the anatomical proximity and symptom overlap between the respiratory system and head and neck region, and the shared risk factors, most notably tobacco use.

This study provides important insights into the knowledge and awareness levels of pulmonologists in Turkey regarding HNC. While the overall knowledge score was moderate (mean 16.05 ± 2.44), and most participants reported encountering high-risk patients—particularly smokers—significant deficiencies were observed in recognizing modern etiological factors, especially HPV infection, and certain less typical clinical symptoms.

Although awareness of traditional risk factors such as smoking (98%) and genetics (84%) was high, only 51% of participants correctly identified HPV infection as a risk factor. This is especially concerning given the global rise of HPV-positive oropharyngeal cancers, which often present in non-smoking, younger individuals outside the classic risk profile. Several studies emphasize the distinct epidemiologic and prognostic behavior of HPV-related HNCs, which, if unrecognized, may lead to delayed diagnoses in atypical patient populations (8,9).

These tumors are typically more responsive to treatment but may be overlooked if clinicians do not maintain a high index of suspicion. To address this, incorporating HPV-focused content into continuous medical education (CME) and training programs could enhance early recognition and referral accuracy, improving outcomes in this distinct subgroup of patients.

Recognition of major symptoms—such as neck mass (93%), dysphagia (90%), and hoarseness (89%)—was high; however, less obvious signs such as non-healing oral ulcers (63%) and taste disturbances (43%) were under-recognized. The overlap of HNC symptoms with those of chronic respiratory conditions—like persistent cough or hemoptysis—can further obscure timely suspicion. Kassirian emphasized that such diagnostic ambiguity contributes to referral delays and advanced-stage presentation at diagnosis (10). Despite most participants reporting that they would refer patients immediately to ENT upon suspicion, only a minority routinely counsel smoking patients about HNC risk. This disconnect between knowledge and preventive practice may hinder early detection efforts. Several studies have shown that delayed referral in patients with glottic or laryngeal symptoms not only shifts presentation toward stage IV disease but is also associated with significantly worse survival outcomes (11,12). Similarly, Schichtel demonstrated that educational interventions targeting pulmon-

ologists led to an increase in timely referrals and early diagnoses (13). Our findings align with previous literature suggesting that pulmonologists often exhibit stronger knowledge of lung cancer than HNC, which may undermine interdisciplinary management of patients presenting with dual or ambiguous symptomatology (14).

However, when appropriately integrated into multidisciplinary care teams, pulmonologists play an indispensable role—particularly in evaluating pulmonary function prior to treatment, managing treatment-related respiratory complications, and identifying coexisting pulmonary diseases among head and neck cancer patients (15). The lack of significant differences in knowledge across years of experience in our study suggests that seniority alone does not compensate for educational gaps.

Meert emphasized the need for integrating structured HNC modules into thoracic oncology training programs to foster familiarity and facilitate collaboration (16). Furthermore, CME activities aimed at non-ENT clinicians, such as primary care physicians, have been demonstrated to improve recognition of potential HNC symptoms and increase urgent referral rates, highlighting their value in facilitating earlier diagnosis and specialist involvement (17).

This study has several limitations. The data were collected via an online survey, which may introduce selection bias, as participants who are more academically inclined or interested in oncology may have been more likely to respond. Furthermore, the study relied on self-reported knowledge, which may not directly reflect clinical practice behavior. Although pulmonologists in Turkey demonstrate a reasonable understanding of classical risk factors and hallmark symptoms associated with HNC, significant knowledge gaps remain—particularly regarding HPV-related oropharyngeal cancer and atypical symptomatology. Moreover, there appears to be a disconnect between clinical knowledge and preventive communication with high-risk patients, particularly smokers. Given the shared risk factors and overlapping symptom profiles between pulmonary and head and neck diseases, pulmonologists are ideally positioned to contribute to early cancer detection.

Enhancing their awareness through targeted educational interventions, updating training curricula, and promoting interdisciplinary collaboration with ENT specialists could help bridge this gap. These strategies may ultimately lead to earlier diagnosis, more timely referrals, and improved patient outcomes.

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**Conflict Of Interest:** The authors declare that there are no conflicts of interest.

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