

# Epidemiological Profile and Clinicopathological Aspects of Patients with Head and Neck Cancer Consulted at a Radiotherapy Center in Pernambuco Countryside

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*Perfil Epidemiológico e Aspectos Clinicopatológicos dos Pacientes com Câncer de Cabeça e Pescoço em um Centro de Radioterapia do Agreste Pernambucano*

*Perfil Epidemiológico y Aspectos Clinicopatológicos de Pacientes con Cáncer de Cabeza y Cuello en un Centro de Radioterapia de la Región Agreste de Pernambuco*

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## ABSTRACT

**Introduction:** Head and neck cancer is a highly prevalent malignancy in Brazil, being the sixth most common type in the world. **Objective:** To highlight the prevalence, sociodemographic and clinicopathological characteristics of patients with head and neck cancer in a radiotherapy service. **Method:** Retrospective cross-sectional study of the medical records of patients with head and neck cancer treated between January 2010 and December 2020 at a radiotherapy center located in the countryside of Pernambuco. Clinical and sociodemographic data and clinical outcomes were collected. The analysis was carried out using Pearson's Chi-square, likelihood ratio and Fisher's exact statistical tests, and significance level of 5%. **Results:** Data were obtained from 908 patients. Males were the most prevalent (71.5%), 48.5% of the patients were in the age range of 50-69 years, 45.2% failed to complete elementary school, 29.3% were illiterate and the majority (91%) was consulted by the National Health System (SUS). The diagnosis of oral cancer was the most frequent (36.5%), the most affected site (21.1%) was the tongue, and the most frequent histological type was squamous cell carcinoma (82%). There was vocal impairment in 14% of the cases, a small proportion was submitted to tracheostomy (6.6%) and 158 patients (17.4%) had previous dental treatment. **Conclusion:** Highlighting the profile of patients with head and neck cancer expands the knowledge about vulnerable groups to facilitate the elaboration of public policies and actions to improve the living conditions of these individuals.

**Key words:** head and neck neoplasms; epidemiology; medical oncology; prevalence.

## RESUMO

**Introdução:** O câncer de cabeça e pescoço é uma neoplasia maligna com alta prevalência no Brasil e o sexto tipo mais comum no mundo. **Objetivo:** Evidenciar a prevalência, características sociodemográficas e clinicopatológicas de pacientes com câncer de cabeça e pescoço em um serviço de radioterapia. **Método:** Estudo transversal retrospectivo dos prontuários de pacientes com câncer de cabeça e pescoço tratados entre janeiro de 2010 e dezembro de 2020 em um centro de radioterapia localizado no Agreste de Pernambuco. Foram coletados os dados clínicos, sociodemográficos e os desfechos clínicos. A análise estatística foi elaborada a partir dos testes qui-quadrado de Pearson, razão de verossimilhança e exato de Fisher, além de ser adotado o nível de significância de 5%. **Resultados:** Foram obtidos dados de 908 pacientes. O sexo masculino foi o mais prevalente (71,5%), 48,5% dos pacientes tinham entre 50 e 69 de idade, 45,2% não concluíram o 1º grau, 29,3% eram analfabetos e 91% foram atendidos pelo Sistema Único de Saúde (SUS). O diagnóstico de câncer de boca foi o mais frequente (36,5%), sendo a língua o sítio mais acometido (21,1%), e o tipo histológico mais comum foi o carcinoma escamocelular (82%). Houve comprometimento vocal em 14% dos casos, uma pequena parcela realizou traqueostomia (6,6%) e 158 pacientes (17,4%) realizaram tratamento odontológico prévio. **Conclusão:** Evidenciar o perfil dos pacientes portadores de câncer de cabeça e pescoço possibilita o conhecimento dos grupos vulneráveis para promoção de políticas públicas e ações para melhorar a condição de vida desses indivíduos.

**Palavras-chave:** neoplasias de cabeça e pescoço; epidemiologia; oncologia; prevalência.

## RESUMEN

**Introducción:** El cáncer de cabeza y cuello es una neoplasia maligna de alta prevalencia en el Brasil, siendo el sexto tipo más común en el mundo. **Objetivo:** Resaltar la prevalencia, características sociodemográficas y clinicopatológicas de los pacientes con cáncer de cabeza y cuello en un servicio de radioterapia. **Método:** Estudio transversal retrospectivo de las historias clínicas de pacientes con cáncer de cabeza y cuello tratados entre enero de 2010 y diciembre de 2020 en un centro de radioterapia ubicado en el interior de Pernambuco. Se recogieron datos clínicos, sociodemográficos y del estadio clínico. El análisis estadístico se realizó mediante ji-cuadrada de Pearson, razón de verosimilitud y pruebas exactas de Fisher, además de adoptar un nivel de significancia del 5%. **Resultados:** Se obtuvieron datos de 908 pacientes. Los hombres fueron los más prevalentes (71,5%), el 48,5% de los pacientes tenía entre 50 y 69 años, el 45,2% tenía educación primaria incompleta, el 29,3% eran analfabetos y 91 fueron atendidos por el Sistema Único de Salud (SUS). El diagnóstico de cáncer bucal fue el más frecuente (36,5%), siendo la lengua el sitio más afectado (21,1%) y el tipo histológico más frecuente fue el carcinoma de células escamosas (82%). Hubo deterioro vocal en el 14% de los casos, una pequeña proporción tuvo traqueotomía (6,6%) y 158 pacientes (17,4%) tenían tratamiento odontológico previo. **Conclusión:** Resaltar el perfil de los pacientes con cáncer de cabeza y cuello posibilita el conocimiento sobre grupos vulnerables para promover políticas públicas y acciones para mejorar las condiciones de vida de estos individuos. **Palabras clave:** neoplasias de cabeza y cuello; epidemiología; oncología médica; prevalencia.

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## INTRODUCTION

The World Health Organization (WHO) classifies the neoplasms of pharynx, larynx, trachea, oral cavity, neck lymphomas, salivary glands, ear, paranasal sinus, skull base in addition to paraganglioma at that region, except thyroid gland as head and neck cancer<sup>1</sup>. The primary sites more frequent in the oral cavity are tongue, palate, gingiva, lip, floor of the mouth and base of the tongue<sup>2</sup>.

Due to the increase of the population life expectancy, neoplasms are becoming one of the main public health problems worldwide<sup>3</sup>. The National Cancer Institute (INCA) estimated 704 thousand new cases of cancer for each year of the triennium 2023-2025 in Brazil<sup>4</sup>.

Head and neck cancers are closely related to lifestyle, alcohol and tobacco use, environmental risk factors, infection by the human papilloma virus (HPV), family history, poor diet and lack of physical activity. Radiotherapy, surgery and chemotherapy are the most utilized treatments and can be combined depending on the stage disease. More advanced tumors usually require multimodal and more aggressive treatments<sup>5,6</sup>.

The management of patients diagnosed with this type of cancer should be based on multidisciplinary approach with active involvement of many experts to maximize survival and quality of life<sup>7,8</sup>.

Most of the patients were diagnosed at a quite advanced stage directly impacting the treatment. As late the diagnosis and beginning of the treatment is, more aggressive will be the therapy and worst prognosis and survival. Unfavorable outcome is the possible result of late diagnosis, leading to tumor progression and considerable increase of mortality<sup>9</sup>.

Knowing the profile of patients affected by head and neck cancer is critical for better follow-up planning, elaboration of prevention strategies and promotion of health. The objective of the present study is to evaluate the epidemiological and clinicopathological profile of patients with head and neck cancer assisted at a reference radiotherapy center in the *Agreste* region of the State of Pernambuco.

## METHOD

The Institutional Review Board (IRB) of “*Associação Caruaruense de Ensino Superior e Técnico (Asces)*” approved the study, report number 5,402,346 (CAAE (submission for ethical review): 58321222.0.0000.5203) in compliance with Directive 466/12 of the National Health Council.

Quantitative, retrospective, cross-sectional study conducted at “*Hospital Santa Águeda*”, a radiotherapy center in Pernambuco’s subregion “*Agreste*”, receiving patients referred by SUS (National Health System) and

mostly from private hospitals. The hospital is part of the State’s Cancer Attention Network, covering a macroregion with a population of 1,992,110 individuals<sup>11</sup>.

The sample was by convenience with charts from patients consulted between 01/01/2010 and 12/31/2020 with confirmatory histopathology of head and neck cancer or secondary metastasis in that location. Charts with missing data and year of diagnosis out of the sample’s schedule were excluded.

Sociodemographics and clinical outcomes were extracted from hard copy charts since the diagnosis up to the last evolution or loss to follow-up. The variables were age, sex, race, education, marital status, occupation, diagnosis, histology, location of the tumor, treatment adopted, previous dental treatment, origin, in addition to cases without evidence of disease, remission, relapse, lymph node metastasis, death, vocal impairment and tracheostomy.

Pearson’s chi-square test, likelihood rate and Fisher’s exact test with level of significance of 5% were adopted to correlate the variables. The results were tabulated in absolute and relative frequencies for descriptive analysis of the sociodemographics and characteristics of the tumors.

## RESULTS

908 charts of patients affected by head and neck cancer were analyzed. Mean age at diagnosis was 60.6 years, with 649 men (71.5%) and 259 women (28.5%). Sociodemographics are shown in Table 1.

Oral cavity cancer was the most prevalent (38.4%) and the predominant type was squamous cell carcinoma in 745 patients (82.0%) (Table 2); only radiotherapy (41.1%) or associated with chemotherapy (33.7%) were the most common therapies. History of previous dental treatment, tracheostomy and vocal cord dysfunction were also collected.

Tongue (21.1%), glottis (9.8%) and oropharynx (7.6%) were the most affected sites (Table 3).

125 patients (13.8%) had no evidence of disease, 324 (35.7%) were in remission, 15, in relapse (1.7%), 162 (17.8%) developed lymph node metastasis, 20 (3.3%) with remote metastasis and 245 (27%) died as main clinical outcomes.

The most vulnerable group with worst clinical outcome and death were men (28.2%) and the most affected age range was older than 70 years or more (37%) (Table 4).

## DISCUSSION

Head and neck cancer is a large group, the most common histologic type is squamous cell carcinoma

**Table 1.** Sociodemographics of patients diagnosed with head and neck cancer (n=908)

Variable	n (%)
<b>Total</b>	<b>908 (100.0)</b>
<b>Age range</b>	
Up to 17	12 (1.3)
18 to 29	29 (3.2)
30 to 49	158 (17.4)
50 to 69	440 (48.5)
70 or more	269 (29.6)
<b>Color</b>	
White	434 (47.8)
Brown	439 (48.3)
Black	23 (2.5)
Yellow	12 (1.3)
<b>Marital Status</b>	
Married	472 (52.0)
Single	248 (27.3)
Widow	131 (14.4)
Divorced	53 (5.8)
Not informed	4 (0.4)
<b>Education</b>	
Illiterate	266 (29.3)
Incomplete elementary	410 (45.2)
Complete elementary	89 (9.8)
Complete high school	76 (8.4)
College	49 (5.4)
Not informed	18 (2.0)

affecting predominantly (90%) the larynx, pharynx, salivary glands, nasal cavity, oral cavity and face sinuses. The incidence of these cancers continues to grow, it is the sixth main cancer group worldwide<sup>12</sup>, consistent with the results herein, accounting for 91.52% of the cases mentioned earlier. According to Dantas et al.<sup>13</sup>, tongue is the primary location found in 192 (21.1%) of the study population.

Males (71.5%) are the main study group affected in the age-range of 50-69 years old (48.5%) and is closely related to lifestyle due to the exposure to several risk factors<sup>14</sup>.

The main deleterious habits that predispose and are determinants for the appearance and increase of head and neck cancer are alcohol and tobacco use<sup>15</sup>. Abuse of alcohol and tobacco, poor feeding, presence of occupational factors as prolonged exposure to sun, chemical substances and asbestos are risk factors clearly described in the literature<sup>16</sup>.

Brown (48.3%) and White (47.8%) individuals were the most affected, the latter are more propense to suffer

**Table 2.** Clinic characteristics of patients with head and neck cancer

Variable	n (%)
<b>Total</b>	<b>908 (100.0)</b>
<b>Diagnosis of Cancer</b>	
Mouth	350 (38.5)
Pharynx	195 (21.5)
Larynx	194 (21.4)
Lymphoma	71 (7.8)
Gland	64 (7.0)
Maxillary sinus	15 (1.7)
Neck	9 (1.0)
Nasal cavity	5 (0.5)
Mandible	2 (0.2)
Trachea	2 (0.2)
Ear	1 (0.1)
<b>Histological type</b>	
Squamous cell carcinoma	745 (82.0%)
Other carcinoma	62 (6.8%)
Hodgkin's Lymphoma	47 (5.2%)
Other histological types	26 (2.9%)
Non-Hodgkin's Lymphoma	21 (2.3%)
Adenocarcinoma	5 (0.5%)
Not informed	2 (0.2%)
<b>Treatment</b>	
Only RT	373 (41.1)
RT + CT	306 (33.7)
Surgery + RT	162 (17.8)
Surgery + RT + CT	38 (4.2)
Discontinued	14 (1.5)
Only surgery	11 (1.2)
Only CT	3 (0.3)
Surgery + CT	1 (0.1)
<b>Previous dental treatment</b>	
No	750 (82.6)
Yes	158 (17.4)
<b>Referral</b>	
SUS	826 (91.0)
Private	82 (9.0)
<b>Vocal impairment</b>	
No	767 (84.5)
Yes	134 (14.8)
Not informed	7 (0.8)
<b>Tracheostomy</b>	
No	841 (92.6)
Yes	60 (6.6)
Not informed	7 (0.8)

**Captions:** CA= cancer; RT= radiotherapy; CT= chemotherapy; SUS = National Health System.

Table 3. Frequency of tumor location

Location of the tumor	n (%)
<b>Total</b>	<b>908 (100.0)</b>
Tongue	192 (21.1)
Glottis	98 (10.8)
Cervical	74 (8.1)
Oropharynx	69 (7.6)
Floor of the mouth	53 (5.8)
Parotid gland	52 (5.7)
Supraglottis	46 (5.1)
Lip	44 (4.8)
Larynx	40 (4.4)
Pharynx	35 (3.9)
Soft palate	32 (3.5)
Nasopharynx	26 (2.9)
Alveolar ridge	23 (2.5)
Jugal mucosa	22 (2.4)
Unspecified palate	18 (2.0)
Maxillary sinus	15 (1.6)
Retromolar triangle	14 (1.5)
Submandibular gland	13 (1.4)
Epiglottis	6 (0.7)
Nasal cavity	6 (0.7)
Subglottic	5 (0.5)
Amygdala	5 (0.5)
Tonsillar region	3 (0.3)
Rinopharynx	3 (0.3)
Pharynx	2 (0.2)
Mandible	2 (0.2)
Hard palate	2 (0.2)
Trachea	2 (0.2)
Uvula	2 (0.2)
Face	1 (0.1)
Sublingual gland	1 (0.1)
Nasopharynx and oropharynx	1 (0.1)
Middle ear	1 (0.1)

the effects of sun exposure (UV rays) increasing the risk of developing cancer<sup>17</sup>.

Low education level is directly associated with risk behavior and lifestyle interfering in self-care and awareness of their long-term repercussions<sup>18</sup> corroborating similar findings in the literature where illiterate patients (29.3%) and incomplete elementary school (45.2%) were the most affected.

Dantas et al.<sup>13</sup> showed that low education has significantly impacted the survival, concluding that

survival was inversely related to the education level, responsible for late diagnosis, discontinuation or lack of treatment leading to worst prognosis; these findings are consistent with the present investigation where most of the deaths occurs in illiterate individuals or who failed to complete elementary school.

Head and neck cancer is highly prevalent in Brazil with significant incidence and mortality rates and impact in the quality-of-life. Quite often, the treatment causes impairment as dysphagia, dysphonia, functional loss, important facial disfiguration negatively affecting the patient's social relationship<sup>14</sup>. Notwithstanding medical advances, this type of cancer has dismal prognosis and 5-year survival rate between 28% and 67%. Early diagnosis can provide best prognosis in 88% of the cases and successful treatment<sup>12</sup>.

The treatments of choice as surgery and radiotherapy and chemotherapy will depend on the clinicopathological characteristics. Surgery is more indicated for lesions at initial stage. Radiotherapy and chemotherapy are therapeutic strategies that ensure extended survival, but high doses of radiotherapy may directly affect the quality-of-life and functionality of mastication, deglutition and even phonation<sup>19,20</sup>. Similar to the present study, where the treatments most utilized were only radiotherapy (41.1%), followed by radiotherapy associated with chemotherapy (33.7%) and previous surgery combined with radiotherapy (17.8%).

Concomitant chemoradiotherapy is the standard for locally advanced head and neck squamous cell carcinoma isolated or post-surgery, supported by two meta-analyses of individual cases<sup>21,22</sup>. Alvarenga et al.<sup>23</sup> corroborated the present findings regarding multimodal treatment because most of the cases were classified as T3 and T4 and were submitted to this modality of treatment<sup>23</sup>.

Radiotherapy-related oral complications may occur during or after the treatment, the most frequent are mucositis, xerostomia, radiation caries, dysgeusia, secondary infections, trismus and osteoradionecrosis<sup>24,25</sup>. Oral mucositis is one of the main motives to discontinue radiotherapy together with other complications as dysphagia, dysgeusia, dermatitis and odinophagia<sup>26</sup>. Dental follow-up of these patients is critical for better quality-of-life, however, only 17.4% of the study patients were referred to the dental-surgeon.

Buccal health interventions can significantly reduce cancer-related complications and the treatment of caries, gingivitis, periodontitis among others improves the quality-of-life<sup>26</sup>. In addition, the guidelines of the National Institute for Health and Clinical Excellence (NICE)<sup>27</sup> recommend the use of low-intensity laser therapy to treat oral mucositis. Morais et al.<sup>28</sup> concluded that buccal

**Table 4.** Evaluation of the outcome according to sociodemographics and origin of the treatment

Variable	Outcome						p
	No evidence of disease	Remission	Relapse	Lymph node metastasis	Remote metastasis	Death	
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	
<b>Sex</b>							
Male	83 (12.8)	231 (35.8)	6 (0.9)	124 (19.2)	20 (3.1)	182 (28.2)	p <sup>(1)</sup> = 0.03*
Female	42 (16.5)	93 (36.5)	9 (3.5)	38 (14.9)	10 (3.9)	63 (24.7)	
<b>Age range</b>							
Up to 17	4 (33.3)	5 (41.7)	0 (0.0)	2 (16.7)	1 (8.3)	0 (0.0)	p <sup>(2)</sup> = 0.002*
18 to 20	5 (17.9)	12 (42.9)	1 (3.6)	2 (7.1)	2 (7.1)	6 (21.4)	
30 to 49	31 (19.6)	55 (34.8)	3 (1.9)	33 (20.9)	4 (2.5)	32 (20.3)	
50 to 69	62 (14.2)	156 (35.6)	6 (1.4)	87 (19.9)	18 (4.1)	109 (24.9)	
70 or more	23 (8.7)	96 (36.2)	5 (1.9)	38 (14.3)	5 (1.9)	98 (37.0)	
<b>Total</b>	<b>125 (13.9)</b>	<b>324 (36.0)</b>	<b>15 (1.7)</b>	<b>162 (18.0)</b>	<b>30 (3.3)</b>	<b>245 (27.2)</b>	
<b>Education</b>							
Illiterate	29 (11.0)	91 (34.5)	3 (1.1)	43 (16.3)	10 (3.8)	88 (33.3)	p <sup>(3)</sup> < 0.001*
Incomplete elementary	52 (12.7)	150 (36.8)	5 (1.2)	85 (20.8)	10 (2.5)	106 (26.0)	
Complete elementary	17 (19.3)	33 (37.5)	3 (3.4)	12 (13.6)	3 (3.4)	20 (22.7)	
Complete high-school	13 (17.3)	30 (40.0)	3 (4.0)	13 (17.3)	1 (1.3)	15 (20.0)	
College	11 (22.9)	15 (31.3)	1 (2.1)	8 (16.7)	5 (10.4)	8 (16.7)	
<b>Total</b>	<b>122 (13.8)</b>	<b>319 (36.1)</b>	<b>15 (1.7)</b>	<b>161 (18.2)</b>	<b>29 (3.3)</b>	<b>237 (26.8)</b>	
<b>Origin</b>							
SUS	108 (13.2)	294 (35.8)	14 (1.7)	151 (18.4)	26 (3.2)	228 (27.8)	p <sup>(1)</sup> = 0.274
Private	17 (21.3)	30 (37.5)	1 (1.3)	11 (13.8)	4 (5.0)	17 (21.3)	
<b>Total</b>	<b>125 (13.9)</b>	<b>324 (36.0)</b>	<b>15 (1.7)</b>	<b>162 (18.0)</b>	<b>30 (3.3)</b>	<b>245 (27.2)</b>	

(\*) Significant association of 5%.

(1) Pearson's chi-square test.

(2) Likelihood test.

(3) Fisher's exact test.

**Captions:** SUS = National Health System.

hygiene preventive protocols and photobiomodulation result in best control of oral complications and less temporary discontinuation of radiotherapy due to mucositis.

Mortality by neoplasms, a clinical outcome, is increasing worldwide<sup>29</sup>. According to WHO<sup>30</sup>, the estimates for 2030 are approximately 27 million new cases and 17 million deaths annually and two thirds will be concentrated in developing countries including Brazil. Constant epidemiological and demographic changes induce this result, as the increase of older population and alteration of the profile of deaths by infectious diseases to deaths by chronic diseases. Ageing, deleterious habits and environmental changes directly impact the incidence

and mortality by cancer, consistent with the current investigation because most of the deaths occurred in 70 years or older groups.

Non-communicable harms and diseases are the main responsible for sickening and death in the world<sup>30</sup>, consistent with the results for the State of Pernambuco<sup>11</sup> because neoplasms are the third more frequent cause of death and oral cavity cancer is ranked fifth in the State's deaths<sup>4</sup>.

The radiotherapy center where the study was conducted is a limitation because diagnosis tends to be late and most of the referrals were at advanced stages treated with radiotherapy and chemotherapy, which justifies the number of cases submitted to surgery.

## CONCLUSION

The clinicopathological profile and sociodemographic factors directly impacted the clinical outcome and prognosis of the patients with head and neck cancer, aligned with evidence-based literature.

Males, older than 50 years of age and illiterate who failed to complete elementary school are the most vulnerable group with dismal prognosis. Although previous dental treatment is essential for head and neck cancers because of the irradiation on that area, this approach was rarely adopted, a continuous concern of health managers because of the high statistics.

It is required the elaboration of public policies to reduce the inequities in more vulnerable groups as prevention and health promotion actions and to support and encourage scientific researches.

## CONTRIBUTIONS

All the authors contributed substantially to the study design, acquisition, analysis and interpretation of the data, wording and/or critical review. They approved the final version to be published.

## DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interest to declare.

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