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Quality of life in patients treated for oral and laryngeal squamous cell carcinoma in Northeast Iran

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Abstract

Background: Patients with oral and/or laryngeal carcinoma face challenges that can persistently impair their quality of life (QoL) even after treatment. This study aimed to investigate QoL impairment in patients with oral and laryngeal squamous cell carcinoma receiving treatment.

Methods: This descriptive cross-sectional study was conducted on 54 individuals with oral and laryngeal cancer through census sampling in 2022. Patients over 18 years old who had received treatment were included. Individuals experiencing recurrences or relapses and those receiving neoadjuvant therapy were excluded. The list of names and phone numbers of participants was obtained from the database of the Liver and Digestive Research Centre in Golestan Province, Iran. The study utilized the Persian version of the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Head and Neck 35, which the participants completed during phone interviews. Point prevalence (Per 100,000) was reported with 95% confidence intervals, and QoL data were summarized as mean ± standard deviation (SD) and median (Interquartile range, IQR).

Results: The point prevalence of oral and laryngeal squamous cell carcinoma in Golestan Province was 15.15 per 100,000, with significant variation across counties, ranging from 5.80 to 26.01. The mean QoL score for the participants was 68.20 ± 29.58. Overall, 38.9% of the participants reported normal QoL, while 22.2% and 38.9% reported mild and moderate impairment, respectively. Subdomains related to weight loss and feeling ill showed a severe decline in QoL. Meanwhile, issues such as dry mouth, sticky saliva, social contacts, swallowing, pain, taste/smell, social eating, teeth problems, and speech were associated with moderate QoL impairment.

Conclusion: The findings show that the QoL among individuals with a history of oral and laryngeal cancer was below the threshold. Most participants experienced mild to moderate QoL impairments. These results highlight the need for targeted interventions focused on improving QoL for affected individuals based on their symptoms and signs.

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Highlights

What is current knowledge?

Previous studies have shown a wide range of QoL outcomes among oral and laryngeal cancer patients, with some experiencing no changes and others reporting declines.

What is new here?

The QoL of individuals with a history of treated oral and laryngeal cancer was lower than the threshold, and most experienced mild to moderate impairments.

Introduction

Global statistics revealed nearly 20 million new cancer diagnoses and approximately 10 million cancer-related deaths in 2022. Projections indicate that by 2050, demographic shifts could raise the number of new annual cancer cases to 35 million, a 77% increase compared to 2022 figures (1). Cancers of the oral cavity (2) and larynx (3) are among the most common worldwide, with most (94.53%) classified as squamous cell carcinomas (SCC) (3). Researchers and health professionals must therefore focus on the quality of life (QoL) challenges faced by these patients.

Patients with oral and laryngeal cancer often experience numerous challenges that can significantly affect their QoL, with many of these difficulties persisting long after treatment (4). QoL encompasses a holistic view of an individual's or population's well-being, accounting for both positive and negative aspects of their experiences at a specific time (5). Regular QoL assessments should be integrated into ongoing patient evaluations (6). Multidisciplinary healthcare teams need to prioritize patients' QoL while balancing this with their medical needs (5).

Oral and/or laryngeal squamous cell carcinoma often reduces patients' QoL (2). This decline may persist for a long period, even after treatment has ended (4). Various factors contribute to this issue, including fatigue (2), pain, appearance-related concerns, mood problems (7), elevated anxiety, social difficulties (2), speech problems (3), challenges with eating in social settings (8), taste disturbances (7), limited mouth opening, dental issues, impaired chewing ability, trismus (8,9), reduced saliva production (7), dry mouth, thickened saliva (8), swallowing difficulties (7), dysphagia with solid foods (8), and decreased nutritional intake (2). Financial challenges, such as treatment costs and loss of employment during therapy, may also affect compliance (2). Wang et al. reported that four oral cancer-related symptoms, including trouble with social contacts, swallowing problems,

teeth problems, and feeling ill, were significantly associated with greater care needs and lower QoL among oral cancer patients (8). Similarly, a qualitative ethnographic study of laryngeal cancer patients identified four QoL-related subcategories: difficulty eating, giving up some foods, loss of pleasure, and problems preparing food (10). Thus, identifying QoL impairment is an essential goal of healthcare and a significant factor in monitoring treatment and therapeutic outcomes in cancer patients (11).

A systematic review indicated that oral cancer patients experience significantly poorer QoL compared to healthy individuals (12). However, another study found that QoL tends to improve and gradually return to baseline over time after treatment (13). Conversely, a Japanese study reported no improvement in QoL following treatment for oral cancer (14). These findings suggest the need for comprehensive support systems to address and monitor QoL issues among cancer patients.

While several studies have explored QoL in cancer patients, few have specifically focused on oral and laryngeal cancer (15). Onagh et al. (2021) conducted a systematic review in 2022 (16) and analyzed the QoL of cancer patients in general. They found that out of 30 studies conducted in Iran, only one study explicitly focused on head and neck cancers. Given the significance of QoL, the prevalence of oral and laryngeal cancers, and the scarcity of research in this area, further investigation is essential. Therefore, this study aimed to assess the QoL of patients with oral and laryngeal cancer treated in Golestan Province, Iran, in 2022.

Methods

Design and participant

This descriptive cross-sectional study was conducted in 2022 in Golestan Province, Iran, among 54 participants with a history of oral and laryngeal squamous cell carcinoma. All patients over 18 years old registered between 2011 and 2016 in the Liver and Digestive Research Centre registry at Golestan University of Medical Sciences who had undergone treatment were included through non-probability sampling. Individuals with disease recurrence, relapse, or those receiving neoadjuvant therapy, or unwilling to participate, were excluded. Golestan Province, located in northeast Iran, is one of the country's 31 provinces. According to the 2016 census in Iran, it has a population of 1,868,819 and includes 14 counties.

The sample size was determined based on the total number of eligible patients diagnosed with oral and laryngeal SCC who received primary treatment at the tertiary referral center's otorhinolaryngology and head and neck surgery departments. Given the specific inclusion criteria and the relatively low prevalence of these cancers, census sampling was used, yielding 54 patients. This sample size aligns with similar single-center QoL studies in head and neck cancer populations (17) and is sufficient to provide meaningful insights into the QOL landscape of this group. All eligible patients who provided informed consent were enrolled to maximize representativeness.

Data collection

Data were gathered using two instruments: a demographic information form and the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire–Head and Neck 35 (EORTC QLQ-H&N35).

The EORTC QLQ-H&N35, developed in 1999 (18), includes seven subscales: pain (4 items), swallowing (4 items), taste and smell (2 items), speech (3 items), social eating (4 items), sexuality (2 items), and social contacts (5 items), as well as 11 single items addressing issues such as teeth problems, dry mouth, cough, trismus, sticky saliva, weight loss/gain, nutritional supplements, feeding tubes, feeling ill, and painkiller use (19).

Items 1 to 30 are rated on a 4-point Likert scale with "not at all," "a little," "quite a lot," and "very much," scored 1 to 4, respectively. Items 31 to 35 (Painkillers, nutritional supplements, feeding tubes, weight loss, and weight gain) use binary "yes" (2) or "no" (1) responses (19). The questionnaire does not employ reverse scoring, and higher scores indicate lower QoL (20,21). Sipilä et al. (22) reported that the raw score range for this tool is between 35 and 130, with a mean of 82.5 serving as the threshold in this study.

The mean total QoL score, derived from the trance score (0-100) on the numerical rating scale, was categorized as normal (0-25), mild (26-50), moderate (51-75), and severe (76-100) (23). For global health and functional scales, QoL impairment was classified inversely: normal (76-100), mild (51-75), moderate (26-50), and severe (0-25). Since the symptom scale in the original EORTC-QLQ-H&N35 has a reversed scoring system, QoL impairment is categorized as follows: normal (0-25), mild (26-50), moderate (51-75), and severe (76-100).

The questionnaire's psychometric properties were first developed in 1992, later revised to include the H&N35 module, and officially validated in 1999 (18). A recent systematic review reported that studies using the EORTC QLQ-H&N35 were conducted in 28 countries, with the questionnaire validated in 21 languages (24). The Persian version of the EORTC QLQ-H&N has also been validated by its original developer, the European Organization for Research and Treatment of Cancer (25).

The demographic form included age, gender, place of residence, county, cancer site (Mouth or larynx), age at diagnosis, and year of treatment. Contact details were obtained from the Golestan Liver and Digestive Research Centre's database. The researcher (ES) conducted phone interviews, explained the study objectives to the participants, and assured them of confidentiality. The participants were informed of their right to withdraw at any time. Informed consent was obtained from all participants; none were under 16 years old.

Of 283 names registered at the Liver and Digestive Research Centre, 140 individuals answered phone calls, while 143 did not. Of them, five declined participation, and 81 (28.6%) had died. Ultimately, 54 participants were enrolled (Figure 1).

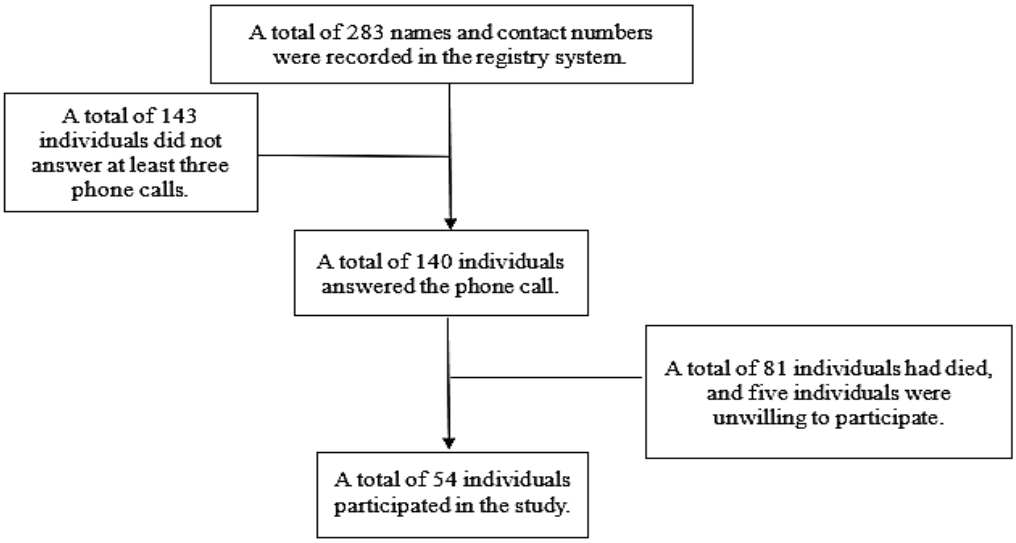

Figure 1. Flowchart of participant inclusion in the study

QoL scores and subdomains were analyzed using means, standard deviations, and frequency distributions in SPSS version 21. The point prevalence of oral and laryngeal squamous cell carcinoma in the 14 counties of Golestan Province was calculated as the number of diagnosed cases per 100,000 people in each county at a specific point in time.

Results

Half of the participants were under 50 years old, with a predominantly male distribution. Laryngeal SCC (55.6%) was more prevalent than oral SCC (44.4%). Participant characteristics are presented in Table 1.

The point prevalence of oral and laryngeal SCC across the 14 counties in Golestan Province was 15.14 per 100,000, ranging from 5.80 to 26.01. Higher rates were observed in Bandargaz (26.01%), Gorgan (22.27%), and Kordkoy (21.04%) counties (Table 2).

The mean and median QoL scores were 68.20 ± 29.58 and 62.50, respectively (Table 3).

Overall, 38.9% of the participants had normal QoL, 22.2% mild impairment, and 38.9% moderate impairment; none had severe impairment (Table 4).

Subdomain analysis of the mean based on trance scores revealed severe impairment in weight loss (85.00 ± 35.00) and feeling ill (77.75 ± 34.00). Moderate impairments were observed in dry mouth (66.25 ± 31.50), sticky saliva (64.00 ± 27.75), social contacts (59.13 ± 25.27), swallowing (57.80 ± 25.13), pain (55.83 ± 28.00), taste/smell (54.67 ± 33.17), social eating (52.47 ± 29.20), teeth problems (51.75 ± 23.25), and speech (51.73 ± 26.00). Mild impairments were found in nutritional supplements (48.00 ± 50.00), cough (47.75 ± 28.00), sexuality (46.40 ± 24.30), and trismus (37.50 ± 21.50). Painkillers (24.00 ± 43.00), feeding tubes (3.00 ± 19.00), and weight gain (0.00 ± 0.00) domains were within normal limits (Table 3).

Table 1. Selected characteristics of individuals with a history of oral and laryngeal squamous cell carcinoma in Golestan Province (n = 54)

Variable	Categories	N (%)
Age (Year)	< 50	27 (50)
	≥ 50	27 (50)
Gender	Male	35 (64.8)
	Female	19 (35.2)
Place of residency	City	25 (46.3)
	Village	29 (53.7)
The area affected by cancer	Mouth	24 (44.4)
	Larynx	30 (55.6)
Age at diagnosis (Year)	≥ 50	25 (46.3)
	< 50	29 (53.7)
Treated year	2011	23 (8.1)
	2012	39 (13.8)
	2013	32 (11.3)
	2013	51 (18.0)
	2014	58 (20.5)
	2015	44 (15.5)
	2016	36 (12.7)

Table 2. The point prevalence of oral and laryngeal squamous cell carcinoma in 14 counties of Golestan province based on Iran's population and the housing census 2022 (n= 283)

City	Population	Frequency of participants	Point prevalence (Per 100,000)	95% CI (Per 100,000)
Gorgan	480,541	107 (37.8)	22.27	18.20 - 26.89
Gonbad	348,744	36 (12.7)	10.32	7.12 - 14.31
AliAbad	140,709	23 (8.1)	16.35	10.23 - 24.56
Aqqala	132,733	23 (8.1)	17.33	10.84 - 26.02
Kalalah	117,319	15 (5.3)	12.79	7.15 - 21.09
Azad Shahr	96,803	12 (4.2)	12.40	6.40 - 21.65
Ramyan	86,210	5 (1.8)	5.80	1.87 - 13.53
Bandar Torkman	79,978	13 (4.6)	16.25	8.64 - 27.79
Minodasht	75,483	5 (1.8)	6.62	2.13 - 15.45
Kordkoy	71,270	15 (5.3)	21.04	11.76 - 34.71
Gomishan	68,773	6 (2.1)	8.72	3.19 - 18.99
Galikesh	63,172	8 (2.8)	12.66	5.46 - 24.93
Maraveh Tappeh	60,953	5 (1.8)	8.20	2.64 - 19.14
Bandargaz	46,130	12 (4.3)	26.01	13.44 - 45.43
Total	**1,868,819**	**283 (100)**	**15.14**	13.43 - 16.99

Table 3. Raw and rescaled scores of the EORTC QLQ-H&N35 scales for patients with a history of oral and laryngeal squamous cell carcinoma (n = 54)

Variables	Raw score		Rescaled score (0-100)	
	Mean ± SD	Median (IQR)	Mean ± SD	Median (IQR)
Weight loss	1.85 ± 0.35	2.00 (0.00)	85.00 ± 35.00	100.00 (0.00)
Feeling ill	3.11 ± 1.36	4.00 (3.00)	77.75 ± 34.00	100.00 (75.00)
Dry mouth	2.65 ± 1.26	3.00 (3.00)	66.25 ± 31.50	75.00 (75.00)
Sticky saliva	2.56 ± 1.11	3.00 (2.00)	64.00 ± 27.75	75.00 (50.00)
Social contacts	8.87 ± 3.79	9.00 (6.00)	59.13 ± 25.27	60.00 (40.00)
Swallowing	8.67 ± 3.77	9.00 (8.00)	57.80 ± 25.13	60.00 (53.33)
Pain	6.70 ± 3.36	5.00 (5.25)	55.83 ± 28.00	41.67 (43.75)
Taste/Smell	3.28 ± 1.99	2.00 (2.00)	54.67 ± 33.17	33.33 (33.33)
Social eating	7.87 ± 4.38	5.00 (9.00)	52.47 ± 29.20	33.33 (60.00)
Teeth problems	2.07 ± 0.93	2.00 (0.25)	51.75 ± 23.25	50.00 (6.25)
Speech	7.76 ± 3.90	8.00 (9.00)	51.73 ± 26.00	53.33 (60.00)
Nutritional supplements	1.48 ± 0.50	1.00 (1.00)	48.00 ± 50.00	0.00 (100.00)
Cough	1.91 ± 1.12	1.50 (1.25)	47.75 ± 28.00	37.50 (31.25)
Sexuality	4.64 ± 2.43	4.00 (6.00)	46.40 ± 24.30	40.00 (60.00)
Trismus	1.50 ± 0.86	1.00 (1.00)	37.50 ± 21.50	25.00 (25.00)
Painkillers	1.24 ± 0.43	1.00 (0.25)	24.00 ± 43.00	0.00 (25.00)
Feeding tubes	1.03 ± 0.19	1.00 (0.00)	3.00 ± 19.00	0.00 (0.00)
Weight gain	1.00 ± 0.00	1.00 (0.00)	0.00 ± 0.00	0.00 (0.00)
Total quality of life	**68.20 ± 29.58**	**62.50 (58.75)**	**68.20 ± 29.58**	**62.50 (58.75)**

For dichotomous variables (Yes/No), such as Painkillers, scoring is typically done as No = 1 and Yes = 2. Therefore, the rescaled score is calculated using the formula: (Raw score - 1) * 100. This results in a "No" score of 0 and a "Yes" score of 100. The median and IQR for these items may appear unusual due to their binary nature (For example, a median of 1 or 2, which, after rescaling, becomes 0 or 100, respectively).

Table 4. The absolute and relative frequency of impaired QOL severity among individuals with a history of oral and laryngeal squamous cell carcinoma (n = 54)

Category	N (%)	Accepted range	Acquired range
Severe impaired QOL	0 (0)	0-25	-
Moderate impaired QOL	21 (38.9)	26-50	27-48
Mild impaired QOL	12 (22.2)	51-75	51-74
Normal QOL	21 (38.9)	76-100	77-99
Total	54 (100.0)	0-100	26-99

Discussion

This study assessed QoL impairment in patients with oral and laryngeal carcinoma treated in Northeast Iran. The mean (68.20 ± 29.58) and median (62.50) QoL scores were below average, with about 60% of the participants experiencing mild to moderate impairment. Weight loss and feeling ill were the most severely affected domains. Eight other subdomains showed a moderate decline in QoL, including issues such as dry mouth, sticky saliva, social contacts, swallowing, pain, taste/smell, social eating, teeth problems, and speech. Additionally, four subdomains showed a mild impact on QoL, including nutritional supplements, cough, sexuality, and trismus.

Several studies have similarly reported significant QoL decline among patients with oral/tongue cancers (2,13). Systematic reviews confirm that oral cancer patients have poorer QoL than healthy individuals (12). Jehn et al. (2022) observed that during the postoperative period, patients with oral cancer may not show substantial changes in QoL over time, indicating a complex recovery process (26).

In a separate study conducted in Japan, it was found that post-treatment QoL among patients with oral cancer showed little to no improvement, emphasizing the ongoing challenges faced by these patients (14). A relatively large-scale cross-sectional study involving Chinese patients aged 18 to 92 years revealed that those with oral cancer consistently reported low QoL (11). Additionally, Breeze et al. identified a significant decline in QoL among oral cancer patients monitored over an 18-month post-treatment period, highlighting the lasting impact of the disease (27). Furthermore, laryngeal cancer also significantly affects QoL; Early-stage tumors (Stage I) were associated with significantly better QoL compared to more advanced tumors (Stages III and IV), both before and after treatment (28).

However, some studies suggest gradual post-treatment improvement (2,13). A comprehensive analysis of cross-sectional surveys conducted over 13 years among patients with oral squamous cell carcinoma indicated that three-quarters of respondents rated their QoL as good, very good, or excellent, particularly within two to ten years post-treatment. While changes between the two- and ten-year marks remained minor, some positive shifts were observed in appearance, chewing, mood, and anxiety, although swallowing abilities tended to decline. Notably, there was considerable variability in individual experiences over time, suggesting that each patient's recovery journey may differ significantly (29).

Previous research indicates that variations in quality of life among patients with oral and laryngeal cancer can be attributed to several factors, including gender differences (19,20), age (16), tumor location (19), cancer stage (19,30), and type of treatment administered (19,31). Additionally, treatment-related side effects (19,20), the diagnostic and treatment technologies used (11), differing care requirements (8), rehabilitation care (32), and the nature and extent of complications encountered (20,26) also play significant roles. In this context, a systematic review conducted in 2022 highlighted considerable differences in research methodologies, patient demographics, tumor sites, treatment approaches, and the timing of assessments. These inconsistencies pose challenges when comparing QoL outcomes across studies (33). Overall, understanding these patterns is essential for improving care strategies and outcomes for patients with oral and laryngeal cancer. Consequently, healthcare providers are encouraged to develop comprehensive support systems that specifically address and monitor these challenges. Such initiatives are crucial for enhancing the overall quality of life for affected individuals.

This study has limitations. It was conducted at a single referral center within Golestan University of Medical Sciences, meaning the results may not be generalizable to the broader Iranian population. The cross-sectional design assessed QoL at a single time point, preventing evaluation of long-term changes. Further research is needed among diverse cancer populations.

Conclusion

The study indicates that QoL among participants with oral and laryngeal SCC was below the threshold. Most reported mild to moderate QoL impairments, including pain, swallowing difficulty, taste and smell issues, speech problems, social and dietary challenges, sexual concerns, dental problems, trismus, dry mouth, sticky saliva, cough, feeling ill, and weight loss. These symptoms substantially reduce QoL. Interventions should focus on symptom management and patient empowerment to help individuals regain a greater sense of control over their challenges and improve overall QoL. Health professionals can use the results of this study to gain a deeper understanding of patients' QoL. The findings provide valuable insights for healthcare workers and policymakers to enhance QoL programs.

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Ethical statement

The Ethics Committee of Golestan University of Medical Sciences (Code: IR.GOUMS.REC.1400.276) approved the study protocol. The study involved minimal risk and no invasive procedures. It was conducted in accordance with the Declaration of Helsinki and the guidelines of the Committee on Publication Ethics. The participants were informed of their right to withdraw at any stage and were assured that the information collected would remain confidential and be used solely for research purposes. In addition, informed consent was obtained from all participants.

Conflicts of interest

The authors declare no conflicts of interest.

Author contributions

E.S., M.GH., AS.B., and GR.R. conceptualized the study design. E.S. and M.GH. conducted the study. A.R.F. entered and cleaned the data. GR.R. and F.M. F.M. analyzed the data. F.M. and A.S.B. interpreted the findings. A.S.B. drafted the manuscript, and A.S.B. and F.M. revised it. All authors read and approved the final version.

Data availability statement

Due to participant consent terms, datasets generated or analyzed during this study are not publicly available but can be requested from the corresponding author.

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