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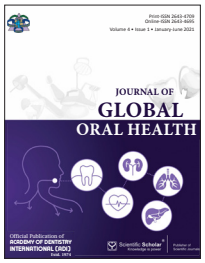

Research Article

Assessment of oral health-related quality of life among head-and-neck cancer patients attending cancer care center at Kanchipuram, Tamil Nadu – A cross-sectional study

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Received : 31 August 2020
Accepted : 28 September 2020
Published : 25 June 2021

DOI
10.25259/JGOH_47_2020

Quick Response Code:

ABSTRACT

Objectives: Oral health is closely related to general health and people's quality of life (QoL), through affecting their oral functions and social interactions. This study aims to assess the oral health-related QoL among head-and-neck cancer (HNC) patients attending cancer care center at Kanchipuram, Tamil Nadu.

Materials and Methods: A cross-sectional questionnaire-based study was conducted among 340 HNC patients between August and October 2019 attending Government Arignar Anna Memorial Cancer Hospital and Research Institute in Kanchipuram District of Tamil Nadu. The questionnaire has two parts. The 1st part consists of demographic characteristics and cancer-related details. The 2nd part was the European Organization of Research and Treatment of Cancer QoL in HNC patients (EORTC QLQ H&N-35) questionnaire.

Results: Among 340 patients, 72.4% were male and 27.6% were female. The majority of them had Stage II cancer. The main factors affecting oral health related QoL (OHRQoL) were taking painkillers, loss of sexual interest, difficulty in social contact, teeth problems, loss of taste, and smell senses. Significant association found between pain ($P = 0.000$), sense ($P = 0.003$), speech ($P = 0.000$), social eating ($P = 0.016$), social contact ($P = 0.005$), teeth problems ($P = 0.031$), dry mouth ($P = 0.000$), sticky saliva ($P = 0.000$), cough (0.002), feeling ill ($P = 0.003$), nutritional supplement ($P = 0.042$), and lost weight ($P = 0.034$) with respect to various treatment modalities. Based on the OHRQoL scores, those who were treated surgically alone had better QoL than others.

Conclusion: We found that surgically treated HNC patients had better OHRQoL than others. Thus, Oral-Health related Quality of Life assessment can be used to analyse the outcome of treatment, patient satisfaction and their sense of self. We need to build a broader care protocol which satisfies/improves the demands arising from the patients.

Keywords: Oral health-related quality of life, EORTC QLQ H&N-35, Head and neck

INTRODUCTION

The head-and-neck cancers (HNCs) are a heterogeneous collection of malignancies that arise from the lips, oral cavity, tongue, nose, tonsil, larynx, nasopharynx, oropharynx, hypopharynx, paranasal sinus, parotids, and thyroid.[1] Worldwide, the HNC accounts for more than 650,000 cases and 330,000 deaths annually. Overall, 57.5% of global HNC occur in Asia, especially in India. HNC in India accounted for 30% of all cancers.[2,3]

Patients with HNC have multiple, unique, and challenging symptoms due to their disease and treatment such as xerostomia, taste disturbances, dietary restrictions, dysphagia, pain, fatigue, distortions of physical appearance, infirmity, weight loss, and permanent disfigurement,. which has a severe impact on the patients quality of life (QoL).[4] Treatment usually consists of surgery, radiotherapy, chemotherapy, or combination. Treatment strategies are, therefore, not only directed at increasing the chances of cure but also at diminishing the impact of treatment on QoL.[5]

Quality of Life is a multidimensional concept which looks at how patients feel about themselves in the context of a medical condition.[6] The subjective evaluation of oral health-related QoL "reflects people's comfort when eating, sleeping, and engaging in social interaction; their self-esteem; and their satisfaction concerning their oral health."[7] An individual's health-related QoL will be affected if the oral health is worsened. No study has been conducted on HNC patients regarding their oral health related QoL (OHRQoL) in South India. Quantifying subjective experience of OHRQoL has been a challenging issue. Hence, a questionnaire-based study was conducted to assess OHRQoL in HNC patients attending cancer care center in Kanchipuram, Tamil Nadu.

MATERIALS AND METHODS

The present study is a cross-sectional study conducted at Government Arignar Anna Memorial Cancer Hospital and Research Institute in Kanchipuram District of Tamil Nadu. The study was conducted from August to October 2019. The study protocol was discussed and permission was obtained from the Directorate of Medical Education, Government of Tamil Nadu. Ethical clearance was then obtained from the Government Arignar Anna Memorial Cancer Hospital and Research Institute's ethical committee. Written consent was also obtained from the patients.

Inclusion and exclusion criteria

Patients diagnosed with HNC aged 18 years and above of both sexes receiving treatment and willing to participate in the study were recruited. Patients with imprecise and incomplete information on clinical and histological data, having cancers other than head and neck, mentally challenged, and speech impaired are excluded from the study. Subjects were selected by purposive sampling technique. The sample size was calculated with the formula $n=4pq/l^2$ with the prevalence of HNC in India 30%.

Data collection procedure

The questionnaire used in the study consists of two parts. The 1st part consists of demographic characteristics and cancer-related details which include the site of cancer, duration of illness, stage of cancer, and type of treatment. The 2nd part was the European Organization of Research and Treatment of Cancer QoL in HNC patients (EORTC QLQ H&N-35) questionnaire.

The EORTC QLQ questionnaire was (1) cancer specific, (2) multidimensional in structure, (3) appropriate for self-administration (i.e., brief and easy to complete), and (4) applicable across a range of cultural settings. The module EORTC QLQ H&N-35 incorporates seven multi-item scales/domains that assess pain, swallowing, senses (taste and smell), speech, social eating, social contact, and sexuality experienced during the past week. There are also 11 single items. The personal information and QLQ questionnaire were completed by the patient and disease characteristics were extracted from the patient's hospital records. In the case where the patient is illiterate, the questions are read by the investigator without guiding them to give a specific answer. The questionnaire was translated into the local language (Tamil). The reliability of the tool was established by administering the QLQ questionnaire to 20 patients with HNC and Cronbach's alpha was calculated as 0.92.

Scoring criteria

Out of 35 questions/items, 30 questions are scored on 4-point Likert scale ("not at all – 1," "a little – 2," "quite a bit – 3," and "very much – 4") and 5 questions have yes/no type (2, 1) response format.

The scores are linear transformed into 0–100 scales with the formula S=(RawScore-1/Range)×100.

A high score for a symptom scale/item scale score represents a higher response level of symptomatology/problems. After obtaining the scores, they were entered into a Microsoft Excel spreadsheet, and a master table was prepared. The data were analyzed using the software Statistical Package for the Social Sciences version 16, Inc., Chicago, IL, USA, with the level of significance kept at $P < 0.05$. Both descriptive and inferential statistics were computed. The descriptive data are presented as frequencies and mean values. ANOVA test was done to assess the association of OHRQoL with site, stage, and treatment modalities of HNC.

RESULTS

[Table 1] shows the demographic variables, habits, and disease-related details of the patients. About 72.4% were male; 50.9% were aged between 41 and 60 years; 36.2% were illiterates; 45% were elementary workers; the majority of them had tobacco habit; buccal mucosa and tongue are the most common site of HNC. The majority of them stopped their tobacco habit after diagnosis (88.5%). We divided the site of cancer into six categories for ease of analysis.

Table 1: The demographic and disease characteristics.

Variable	*n* (%)
Gender	
Male	246 (72.4)
Female	94 (27.6)
Age (in years)	
20–40	67 (19.7)
41–60	173 (50.9)
61–80	100 (29.4)
Level of education	
Illiterate	123 (36.2)
Primary school	102 (30.0)
Middle school	76 (22.4)
High school	27 (7.9)
Diploma/intermediate	6 (1.8)
Graduate	6 (1.8)
Occupation	
Unemployed	31 (9.1)
Elementary occupation	153 (45.0)
Plant, machine operators, and assemblers	15 (4.4)
Craft and related trade workers	24 (7.1)
Skilled agricultural and fishery workers	50 (14.7)
Shop and market sales workers	49 (14.4)
Clerks	3 (0.9)
Technicians and associate professionals	15 (4.4)
Marital status	
Married	326 (95.9)
Unmarried	5 (1.5)
Widowed	6 (1.8)
Divorced	3 (0.9)
Socioeconomic status	
Lower	66 (19.4)
Upper lower	212 (62.5)
Lower middle	56 (16.3)
Upper middle	6 (1.8)
Tobacco habit	
Smoking	114 (33.5)
Smokeless	104 (30.6)
Combined	113 (33.2)
No habit	9 (2.6)
Stopped tobacco habit after diagnosis	
Yes	301 (88.5)
No	30 (8.8)
No habit	9 (2.6
Site of cancer	
Buccal mucosa	69 (20.3)
Tongue	65 (19.1)
Lips	14 (4.1)
Floor of the mouth	6 (1.8)
Palate	6 (1.8)
Alveolus	9 (2.6)
Maxilla	6 (1.8)
Mandible	9 (2.6)
Oropharynx	47 (13.8)
Nasopharynx	8 (2.4)
Hypopharynx	36 (10.6)
Larynx	43 (12.6)
Others	22 (6.5)
Staging of cancer	
Stage I	21 (6.2)
Stage II	144 (42.4)
Stage III	125 (36.8)
Stage IV	50 (14.7)
Duration of illness (months)	
<6	189 (55.6)
6–12	124 (36.5)
>12	27 (7.9)
Treatment modalities	
Only radiotherapy	81 (23.8)
Only surgery	60 (17.6)
Surgery + radiotherapy	52 (15.3)
Radiotherapy + chemotherapy	75 (22.1)
Surgery + radiotherapy + chemotherapy	57 (16.8)
Not yet started	15 (4.4)
Visiting the dentist	
Every 1–5 years	14 (4.1)
Emergency only	243 (71.5)
Never	83 (24.4)

(Contd...)

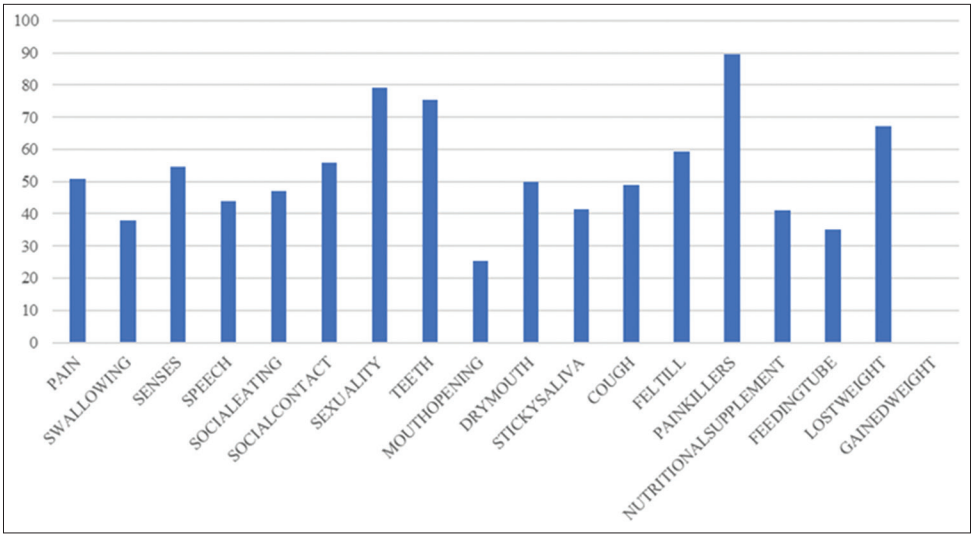
Buccal mucosa, tongue, lips, the floor of the mouth, palate, alveolus, maxilla, and mandible were clubbed into a single category, that is, oral cavity. The remaining categories were oropharynx, nasopharynx, hypopharynx, larynx, and others. The "others" category includes malignancies of the thyroid and salivary glands.

[Graph 1] shows the percentage of all the domains and single items of the OHRQoL H&N-35 questionnaire. Based on the scores calculated, the major factors affecting OHRQoL were taking painkillers, loss of sexuality, teeth problems, feeling ill, weight loss, and social contact. The domains and single items of the QoL questionnaire were compared according to sites of the tumor, stage of cancer, and type of treatment method.

[Table 2] shows a comparison of OHRQoL items with the stage of cancer. Stage IV HNC with high scores illustrates that OHRQoL is impaired severely in comparison with other stages of the disease. After carrying out ANOVA, statistically significant differences were found for pain, swallowing, sense, speech, social eating, social contact, dry mouth, sticky saliva, falling ill, and nutritional supplement.

[Table 3] shows a comparison of OHRQoL domains/items with the site of cancer. Nasopharynx and oropharynx cancer patients have crumbled OHRQoL than other HNC. Statistically significant differences were found for swallowing, sense, social eating, sexuality, teeth, reduced mouth opening, sticky saliva, cough, and falling ill.

[Table 4] shows the comparison of OHRQoL factors with various treatment modalities given for HNC. Patients who were treated surgically had better OHRQoL than other



Graph 1: Percentage distribution of factors affecting OHRQoL.

Table 2: Comparison of factors affecting oral health related QoL with the stage of cancer.

EORTCH&N35	Mean				*P*-value
	Stage I	Stage II	Stage III	Stage IV	
Pain	26.19	41.31	57.39	70.03	0.000*
Swallowing	29.36	33.86	37.43	47.43	0.009*
Sense	53.96	50.11	55.55	64.74	0.044*
Speech	36.41	39.13	45.95	56.0	0.003*
Social eating	40.47	42.08	49.73	56.08	0.011*
Social contact	42.53	49.78	59.84	68.26	0.000*
Sexuality	74.60	80.14	76.45	84.61	0.180
Teeth	73.01	73.75	74.07	83.33	0.081
Reduced mouth opening	26.98	24.82	26.19	23.71	0.942
Dry mouth	52.38	40.42	54.49	64.10	0.000*
Sticky saliva	38.09	34.75	43.65	55.12	0.001*
Cough	42.85	49.64	49.73	48.07	0.858
Felt ill	47.61	56.97	59.52	69.87	0.005*
Painkiller	85.71	85.81	93.65	92.30	0.160
Nutritional supplement	28.57	35.46	42.06	59.61	0.014*
Feeding tube	23.80	33.33	34.12	46.15	0.241
Lost weight	71.42	66.66	64.28	75.0	0.553

*Denotes *P* value <0.05 and statistically significant.

combined treatment modalities. Factors such as pain, sense, speech, social eating, social contact, teeth, dry mouth, sticky saliva, cough, felt ill, nutritional supplement, and weight loss were found to be statistically significant.

DISCUSSION

QoL is the way with which the individual faces the different aspects of his/her life as a whole. It is associated with the individual's degree of satisfaction found in family life, love life, social and environmental life, and the very existential sense. To assess the QoL of the patients affected by HNC, it is important to better understand the impact of the disease and its treatment on the patient's daily routine, and improve the care protocol with more encompassing clinical, social and rehabilitation support measures.[8] de Graeff *et al.* and Alicikus *et al.* found that the male:female ratio was 4:1, in the present study, it was 3:1.[9,10]

Meyer *et al.* found 64% of tobacco users among their studied patients' groups whereas in our study it was 97.3%.[11,12] Most of the subjects belonged to upper lower and lower socioeconomic status and this complied with the results of Khandekar *et al.* who reported that the low SES may be a

Table 3: Comparison of factors affecting oral health related QoL with the sites of head-and-neck cancer.

EORTCH&N35	Mean						*P*-value
	Oral cavity	Oropharynx	Nasopharynx	Hypopharynx	Larynx	Others	
Pain	51.17	52.12	59.37	47.22	47.92	53.03	0.669
Swallowing	35.58	43.97	56.25	40.97	31.63	31.81	0.044*
Sense	59.45	56.73	83.33	40.74	42.17	50.75	0.000*
Speech	42.04	44.91	53.41	53.18	47.62	32.53	0.124
Social eating	51.87	46.27	41.66	43.75	34.18	44.31	0.009*
Social contact	58.22	53.04	66.66	50.37	48.97	63.63	0.131
Sexuality	84.26	76.59	87.50	66.66	76.19	66.66	0.000*
Teeth	76.59	79.43	83.33	83.33	58.50	77.27	0.000*
Reduced mouth opening	31.27	21.27	29.16	14.81	16.32	21.21	0.002*
Dry mouth	50.37	49.64	66.66	42.59	46.25	62.12	0.176
Sticky saliva	43.07	46.09	54.16	22.22	40.13	46.96	0.004*
Cough	44.56	56.02	58.33	69.44	42.17	48.48	0.002*
Felt ill	61.04	56.73	79.16	63.88	48.29	60.60	0.013*
Painkiller	88.20	93.61	100.0	97.22	83.67	90.90	0.280
Nutritional supplement	41.01	57.44	50.00	38.88	28.57	36.36	0.113
Feeding tube	38.20	25.53	50.00	25.00	42.85	22.72	0.168
Lost weight	64.60	74.46	100.00	80.55	57.14	63.63	0.053

*Denotes *P* value <0.05 and statistically significant.

Table 4: Factors affecting oral health related QoL with the treatment modalities.

EORTCH&N35	Mean						*P*-value
	RT alone	Surgery alone	RT+ Chemo	Surgery + RT	Surgery + RT + Chemo	Not yet started	
Pain	41.36	42.89	54.13	57.67	63.33	49.40	0.000*
Swallowing	34.55	32.92	34.61	39.80	45.45	29.16	0.076
Sense	50.00	49.72	50.96	55.48	70.60	48.80	0.003*
Speech	34.91	38.90	38.36	54.37	55.06	42.38	0.000*
Social eating	44.81	39.89	42.62	51.42	57.12	42.26	0.016*
Social contact	47.56	53.00	59.10	56.14	64.66	69.52	0.005*
Sexuality	76.82	75.40	80.12	76.31	87.87	85.71	0.053*
Teeth	76.42	69.39	71.15	76.31	83.63	71.42	0.031*
Reduced mouth opening	26.42	22.40	25.64	25.00	25.45	30.95	0.935
Dry mouth	60.56	10.92	62.82	58.77	66.06	0.00	0.000*
Sticky saliva	48.78	13.66	55.12	40.78	59.39	0.00	0.000*
Cough	50.00	39.89	36.53	58.33	52.72	64.28	0.002*
Felt ill	55.69	53.55	52.56	64.03	69.69	64.28	0.003*
Painkiller	84.14	88.52	92.30	94.03	87.27	100	0.203
Nutritional supplement	32.92	36.06	48.07	42.10	56.36	21.42	0.042*
Feeding tube	25.60	40.98	38.46	35.52	40.00	28.57	0.386
Lost weight	63.41	65.57	51.92	72.36	80.00	78.57	0.034*

*Denotes *P* value <0.05 and statistically significant.

risk factor for poor oral hygiene, and in this way, it further increases the risk for cancer.

In the present study, the common location for the tumor was buccal mucosa and it correlates with the results of Shavi *et al*.[13]

Factors such as painkillers intake, loss of sexual interest, teeth problems, weight loss, the feeling of being ill, and difficulties in maintaining social contact greatly pull down the OHRQoL in our study and it was found to be analogous with the results of Campbell *et al*.[14] Social contact helps to cope with stress, whereas here poor social contact hints that they may be embarrassed by their disabilities or health problems such that they tend to isolate themselves to avoid social interaction out of fear that they would be judged or stigmatized. Sometimes, rather than embarrassment, the disability itself and a person's

lack of a support network can be the cause of social isolation.

Fang *et al*.[15] found that patients presented with the tumor in Stage IV had lower QoL than patients in Stages I, II, and III, and this is consistent with the results of the present study.[15] This proclaims that approaching the physician without neglecting the initial stage of the disease will prevent the spread of the disease to other places, make treatment easier and also the QoL will not be greatly affected.

Dry mouth and sticky saliva are found to be significantly high in patients treated with radiotherapy and chemotherapy. This is due to the damage caused by these treatment modalities on salivary glands. Due to the quantitative and qualitative salivary changes, patients become more prone to dental diseases with important impairment in QoL.[16-18]

Based on the scores, patients treated surgically alone had better OHRQoL than others and it is similar to the findings of Barrios *et al*.[19] The results of various studies reported that combined treatment showed complications including pain, mucositis, mucosal sensitivity, dry mouth, altered or reduced taste, mucosal and bony necrosis, increased risk of dental caries, difficulty with denture function, altered esthetics, reduced mobility of the tongue, lips, and jaw, and limitation of mastication and swallowing.[20-25]

CONCLUSION

The results showed that the patients treated by surgery alone had slightly better OHRQoL compared with others. In recent years, the management of HNC has been more complex with combined-modality programs, as well as the integration of new diagnostic and therapeutic technologies. The head and neck is the most complex organ, so the treatment decision should best support the patient. The assessment of OHRQoL not only provides information about the impact of cancer and its treatment outcome but the information can also be applied to direct patient care, education, and counseling to optimize physical and psychological well-being.

We recommend further research and awareness among health professionals, patient groups, and policy-makers on whether and how the QoL assessment measures and tools can help patients with cancer.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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How to cite this article: Aswini S, Shavi GR, Shankar S, Sanga R, Lalithambigai G, Rahila C, *et al*. Assessment of oral health-related quality of life among head-and-neck cancer patients attending cancer care center at Kanchipuram, Tamil Nadu – A cross-sectional study. J Global Oral Health 2021;4(1):20-6.