ASSESSMENT OF THE QUALITY OF LIFE AND RELATED FACTORS IN HEAD AND NECK CANCER PATIENTS UNDERGOING RADIOTHERAPY AT THE ONCOLOGY CENTER, MILITARY HOSPITAL 103

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Abstract

Objectives: To assess the quality of life (QoL) in head and neck cancer (HNC) patients undergoing radiotherapy and to identify factors influencing their QoL during treatment at the Oncology Center, Military Hospital 103. ***Methods:*** A prospective longitudinal study was conducted on 52 HNC patients undergoing radiotherapy from September 2022 to September 2025. The EORTC QLQ-C30 and QLQ-H&N35 questionnaires were administered at three timepoints: Before, during (mid-treatment), and at the end of treatment. Data were analyzed using the Friedman test. ***Results:*** Before treatment, the mean global QoL score was 77.5. Emotional functioning (78.3), insomnia (31.3), and sexual functioning (26.4) were the most affected domains. During treatment, functional scales (physical, role, social) declined significantly ($p < 0.05$) with no subsequent improvement. Symptom scores for pain, swallowing, social eating, dry mouth, sticky saliva, and coughing progressively worsened at both mid-treatment and end-of-treatment timepoints ($p < 0.05$). Patients with earlier disease stage (I - II vs. III - IV), better performance status (PS 0 vs. 1), and those receiving radiotherapy alone (vs. combined chemoradiotherapy) reported significantly better QoL throughout the treatment course ($p < 0.05$). ***Conclusion:*** Radiotherapy significantly impairs the QoL of HNC patients, affecting multiple functional and symptom domains. Poorer QoL is associated with advanced disease, lower performance status, and combined chemoradiotherapy. These findings underscore the need for integrated psychological support and proactive symptom management to improve patient outcomes.

Keywords: Quality of life; Head and neck cancer; Radiotherapy; EORTC QLQ-C30; EORTC QLQ-H&N35.

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INTRODUCTION

Head and neck cancer represents a significant global health burden, with approximately 900,000 new cases and 400,000 deaths annually worldwide [1]. In Vietnam, HNC accounted for 11,552 new cases and 7,610 deaths in 2020 [2]. These malignancies and their treatments profoundly affect vital functions such as speech, swallowing, and respiration, leading to a severe decline in QoL [3]. QoL, a multidimensional concept encompassing physical, psychological, and social well-being, is now recognized as a critical outcome measure in oncology, complementing traditional endpoints like survival.

Radiotherapy is a cornerstone of HNC treatment, used either as a primary modality or in conjunction with surgery and chemotherapy. However, treatment-related toxicities, such as mucositis, xerostomia, and dysphagia, significantly degrade patients' QoL. Evaluating the trajectory of QoL changes during treatment is essential for clinicians to implement timely supportive care interventions and optimize therapeutic strategies.

Therefore, this study was undertaken to: *Prospectively assess the QoL in patients with HNC throughout their course of radiotherapy and to identify clinical and demographic factors associated with QoL changes.*

MATERIALS AND METHODS

1. Subjects

Including 52 patients with histopathologically confirmed HNC scheduled to receive radiotherapy.

** Inclusion criteria:* Indication for radiotherapy; completion of the full treatment course; the ability to provide informed consent.

** Exclusion criteria:* Patients with a second primary malignancy or those who did not adhere to the treatment protocol.

** Time and location:* At the Oncology Center, Military Hospital 103, from September 2022 to September 2025

2. Methods

** Study design:* A prospective longitudinal study.

** Sampling method:* Participants were enrolled using a convenience sampling method.

** Data collection:*

Patients' QoL was assessed using the Vietnamese-validated versions of the European Organisation for Research and Treatment of Cancer (EORTC) QLQ-C30 and the HNC-specific module, the QLQ-H&N35. The questionnaires were administered through direct interviews at three timepoints: Before the start of radiotherapy (baseline), mid-treatment, and at the completion of treatment. Demographic and clinical data, including age, gender, tumor site, disease stage (AJCC 8th edition), performance status (ECOG), and treatment modality, were collected from patient records. Treatment modality (radiotherapy alone vs. concurrent chemoradiotherapy) was considered a clinical factor potentially influencing QoL outcomes. External beam radiotherapy

was delivered using 3D conformal radiotherapy (3D-CRT) or intensity-modulated radiotherapy (IMRT), according to clinical indications and institutional protocols.

** QoL scoring:*

Scores were calculated according to the EORTC QLQ-C30 Scoring Manual [4]. All raw scores were linearly transformed to a 0 - 100 scale. For functional scales, a higher score indicates better functioning. For symptom scales, a higher score indicates a greater symptom burden.

** Statistical analysis:*

Data were analyzed using SPSS software, version 20.0. Descriptive statistics were used to summarize patient characteristics. The Friedman test was used to compare QoL scores across three timepoints. Subgroup comparisons were performed using appropriate non-parametric tests. A p-value of < 0.05 was considered statistically significant.

3. Ethics

The study was approved by the Ethical Committee of Military Hospital 103 (No.181/CNChT-HĐĐĐ) on 10th August 2021. The use and publication of study data were approved by Military Hospital 103 in accordance with institutional regulations. The authors declare to have no conflicts of interest related to this study.

RESULTS

1. Patient characteristics

Table 1. Patient characteristics.

Variables	Number of patients (n)	Percentage (%)
Age		
≥ 50	38	73.1
< 50	14	26.9
Gender		
Male	48	92.3
Female	4	7.7
Risk factors		
With risk factors (smoking/alcohol)	37	71.2
Without risk factors	15	28.8
Tumor site		
Oral cavity	6	11.5
Oropharynx	13	25.0
Hypopharynx	19	36.6
Larynx	14	26.9

Variables	Number of patients (n)	Percentage (%)
Stage		
I - II	19	36.5
III - IV	33	63.5
Performance status		
0	36	69.2
1	16	30.8
Treatment modality		
Radiotherapy only	12	23.1
Surgery + radiotherapy	11	21.1
Chemoradiotherapy	29	55.8

The cohort of 52 patients had a mean age of 53.5 years, and was predominantly male (92.3%). The most common primary tumor sites were the hypopharynx (36.6%), larynx (26.9%), and oropharynx (25.0%). A majority of patients presented with advanced disease (stage III - IV: 63.5%) and a good performance status (PS 0: 69.2%). Concurrent chemoradiotherapy was the most common treatment modality (55.8%).

2. Longitudinal changes in QoL (EORTC QLQ-C30)

Table 2. QoL scores over time (EORTC QLQ-C30).

Index	Pre-treatment	Mid-treatment	End of treatment
Global QoL	77.5	62.3*	60.7
Physical functioning	95.8	78.6*	76.8
Role functioning	97.2	63.5*	63.9
Emotional functioning	78.3	70.6	72.2
Cognitive functioning	95.4	87.5	89.9
Social functioning	94.7	79.9	83.6
Fatigue	6.3	28.5*	30.7
Nausea/Vomiting	4.4	6.5	5.7
Pain	14.9	25.6*	28.7
Dyspnea	13.8	14.3	12.2
Insomnia	31.3	38.7*	56.6**
Appetite loss	9.8	30.7*	50.4**
Constipation	15.7	14.6	15.5
Diarrhea	1.1	1.8	1.6
Financial difficulties	10.5	26.8*	48.7**

*(Scores are based on EORTC QLQ-C30; for Global QoL and functional scales, a higher score is better; for symptom scales, a higher score is worse; *p < 0.05 compared to pre-treatment values; **p < 0.05 compared to mid-treatment values (Friedman test))*

As shown in table 2, the global health status/QoL score significantly decreased from a baseline of 77.5 to 62.3 at mid-treatment ($p < 0.05$) and remained low at the end of treatment (60.7). Significant deterioration was also observed in physical, role, and social functioning at mid-treatment, with no significant recovery by the end of treatment, and these scores remained well below baseline levels. Symptom scores for fatigue, pain, insomnia, appetite loss, and financial difficulties significantly increased during treatment ($p < 0.05$). Notably, insomnia, appetite loss, and financial difficulties continued to worsen between the mid-point and the end of treatment ($p < 0.05$).

3. Longitudinal changes in QoL (EORTC QLQ-H&N35)

Table 3. QoL scores over time (QLQ-H&N35).

Symptoms	Pre-treatment	Mid-treatment	End of treatment
Pain (oral-pharyngeal)	4.3	22.6*	32.1**
Swallowing difficulties	6.5	24.5*	28.7**
Taste/smell changes	4.2	5.3	6.9
Speech problems	12.5	14.7	16.0
Eating restrictions	2.7	26.3*	38.1**
Social contact issues	11.2	10.4	10.7
Sexual dysfunction	26.4	24.7	24.6
Dental issues	18.6	18.3	16.9
Trismus	2.3	2.4	3.2
Dry mouth	11.4	32.8*	40.6**
Sticky saliva	7.8	26.6*	45.3**
Cough	15.6	29.8*	48.5**
Feeling ill	6.2	20.7*	26.8

*(Scores are derived from EORTC QLQ-H&N35; higher values reflect more severe symptoms; *p < 0.05 compared to pre-treatment values; **p < 0.05 compared to mid-treatment values (Friedman test))*

HNC-specific symptoms worsened considerably during radiotherapy (*Table 3*). Scores for oral/pharyngeal pain, swallowing difficulties, trouble with social eating, dry mouth, sticky saliva, and coughing all increased significantly from baseline to mid-treatment ($p < 0.05$). These symptoms, particularly pain, dry mouth, sticky saliva, and coughing, showed further significant deterioration by the end of treatment ($p < 0.05$).

4. Factors influencing QoL

Table 4. Comparison of global QoL and subscale scores by patient subgroups.

Comparison	Global QoL	Function (QLQ-C30)	Symptoms (QLQ-C30)	Symptoms (QLQ-H&N35)
Age ≥ 50 vs. < 50	59 vs. 63	69 vs. 73	22 vs. 23	23 vs. 26
Male vs. Female	62 vs. 60	72 vs. 68	21 vs. 24	23 vs. 24
With risk factors vs. Without risk factors	64 vs. 61	70 vs. 71	20 vs. 22	25 vs. 24
Stage I - II vs. III - IV	67 vs. 56*	75 vs. 63*	19 vs. 28*	20 vs. 31*
PS = 0 vs. PS = 1	69 vs. 54*	76 vs. 67*	17 vs. 27*	19 vs. 33*
Radiotherapy vs. Combined therapy	70 vs. 55*	73 vs. 62*	19 vs. 26*	22 vs. 31*

*(Scores shown are from the end-of-treatment time point; *: $p < 0.05$ indicates statistically significant differences between groups, determined by the Mann-Whitney U test)*

Subgroup analysis at the mid-treatment and end-of-treatment timepoints revealed that patients with stage I - II disease, a performance status of 0, and those treated with radiotherapy alone maintained significantly better QoL scores across global, functional, and symptom domains compared to patients with stage III - IV disease, a performance status of 1, or those receiving combined modality treatment ($p < 0.05$ for all comparisons).

DISCUSSION

This study provides a prospective evaluation of the QoL trajectory for Vietnamese patients with HNC undergoing radiotherapy. Our primary finding is that patients experience a significant and multidimensional decline in QoL, which begins early and persists throughout the course of treatment. This deterioration is evident not only in HNC-specific symptoms but also across broader functional domains, underscoring the profound burden of this treatment modality. Of particular interest are the pre-treatment findings. Even before radiotherapy commenced, patients reported impaired emotional functioning and high levels of insomnia and sexual concerns. This suggests a significant psychological burden stemming from the cancer diagnosis itself, a phenomenon often termed "pre-treatment morbidity".

These findings identify a critical and often overlooked opportunity for early psychosocial intervention, which may enhance patients' resilience and coping capacity during treatment.

As treatment progressed, the decline in QoL became more pronounced. The significant deterioration in functional scales, including physical, role, and social functioning, reflects the systemic impact of radiotherapy. Treatment-related fatigue, general malaise, and the time commitment required for daily therapy sessions inevitably disrupt patients' daily routines, work, and social engagement. This finding is consistent with longitudinal studies by Iwanaga et al. and others, which also report a sharp drop in functional QoL during the active treatment phase [6, 7].

The most severe impact, however, was observed in the HNC-specific symptoms detailed in the QLQ-H&N35 questionnaire. The dramatic increase in scores for oral pain, dysphagia, xerostomia, and sticky saliva directly reflects the unavoidable collateral damage to the oral mucosa and salivary glands from ionizing radiation. These are not merely uncomfortable symptoms; they have cascading consequences, leading to malnutrition (evidenced by worsening "social eating" scores), weight loss, and social isolation. The progressive nature of these symptoms, which continued to worsen between mid-treatment and the end of treatment, underscores the cumulative effect of radiation toxicity.

Our findings align with a large body of international literature. For instance, the specific symptom clusters of pain, swallowing difficulty, and dry mouth have been consistently identified as the primary drivers of QoL decline in HNC patients undergoing radiotherapy across diverse populations [8, 9]. Furthermore, our subgroup analysis revealed that patients with more advanced disease (stage III - IV), a poorer performance status (PS 1), and those receiving combined-modality treatment (particularly chemoradiotherapy) experienced a significantly greater QoL decline. This observation, while clinically intuitive, is also corroborated by local data from Tran Bao Ngoc et al. [10]. Their research similarly identified that Vietnamese patients with advanced HNC experienced a more pronounced deterioration in QoL following combined-modality treatments like chemoradiotherapy. It strongly suggests that these patient groups represent a high-risk population requiring more intensive monitoring and proactive supportive care, including early nutritional intervention, aggressive pain management, and specialized oral care, from the very beginning of their treatment.

A notable and critical finding in our cohort was the significant increase in

"financial difficulties" throughout the treatment. This issue of "financial toxicity" is an increasingly recognized comorbidity of cancer care, particularly in low- and middle-income countries. The financial burden can be a major source of psychological distress for patients and their families, potentially impacting treatment adherence and negating the benefits of medical care. This highlights the need for systemic solutions, including improved health insurance policies and social support programs, to alleviate this burden.

However, the present study has several limitations that should be considered. Firstly, this was a single-center study conducted at a military hospital, utilizing a relatively small sample size (n = 52) and a convenience sampling method. This may limit the representativeness of the sample and the generalizability of our findings. Secondly, the follow-up period was limited to the completion of radiotherapy. Consequently, this study did not capture the late toxicities and the long-term trajectory of QoL recovery (e.g., at 6 months or 1 year). Finally, other potential confounding variables such as patient comorbidities, level of social support, or educational status were not systematically analyzed. Future research involving larger, multi-center cohorts with extended follow-up is warranted to confirm and expand upon these findings.

CONCLUSION

This study demonstrates that radiotherapy imposes a significant and progressive burden on the QoL of patients with HNC. Several key findings emerged:

Even before treatment initiation, patients exhibited notable psychological distress and reduced QoL.

Throughout the course of radiotherapy, patients experienced steep declines in physical, role, and social functioning, with no sign of recovery by treatment completion.

Treatment-related symptoms - particularly oral pain, dysphagia, and xerostomia - worsened cumulatively, becoming major contributors to patient morbidity.

Advanced disease stage, poor performance status, and combined-modality treatment were strong predictors of greater QoL deterioration, thus identifying a high-risk patient subgroup.

Taken together, these findings highlight the urgent need for a proactive, multidisciplinary approach to patient care. Interventions should include early psychological screening and supportive care from the time of diagnosis, aggressive management of treatment-related toxicities, and tailored supportive measures for these vulnerable patient populations to improve overall outcomes.

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