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Original Research Article

QUALITY OF LIFE, BODY IMAGE, AND EMPLOYMENT OUTCOMES IN HEAD AND NECK CANCER SURVIVORS: A TERTIARY CARE CENTER EXPERIENCE

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ABSTRACT

Background: Head and neck cancer (HNC) and its treatment significantly impact patients' quality of life (QoL), body image, and occupational status. Post-treatment complications, including physical and psychological distress, often lead to social withdrawal and economic hardships. This study aims to assess the long-term effects of HNC treatment on QoL, body image disturbances, and employment concerns among survivors in a tertiary care center in North India.

Materials and Methods: A cross-sectional study was conducted from January 2021 to December 2022 at a tertiary care hospital in North India. Patients aged ≥18 years with histopathologically confirmed HNC who had completed curative treatment at least six months prior were included. Data were collected through structured interviews using validated tools, including the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30 and QLQ-H&N35) for QoL assessment and the Body Image Scale (BIS) for body image concerns. Occupational challenges were evaluated through a customized questionnaire. Statistical analysis was performed using SPSS, with comparative analyses and multivariate logistic regression to identify predictors of impaired QoL.

Results: The study included 58 patients (mean age: 54.3 ± 11.6 years), with 70.7% being male. Impaired QoL (global health score ≤50) was observed in 48.3% of participants, with physical (62.1%), role (70.7%), and social functioning (65.5%) being most affected. Common post-treatment symptoms included xerostomia (70.7%), taste and smell changes (62.1%), and speech problems (56.9%). Body image disturbances were prevalent, with 65.5% experiencing appearance-related concerns and 58.6% reporting emotional distress. Post-treatment unemployment was high (70.7%), with 67.2% experiencing employment loss, primarily due to physical limitations (61.0%). Multimodal treatment, lower socioeconomic status, and comorbidities were significant predictors of impaired QoL ($p<0.05$).

Conclusion: HNC survivors experience substantial challenges related to QoL, body image, and employment, highlighting the need for multidisciplinary post-treatment support. Rehabilitation programs focusing on physical recovery, psychosocial well-being, and vocational reintegration should be prioritized to improve long-term survivorship outcomes.

Keywords: Head and neck cancer, Quality of life, Body image, Occupational concerns, Survivorship, Post-treatment outcomes.

INTRODUCTION

Head and neck cancers (HNCs) are the sixth most common malignancies worldwide, with over 930,000 new cases and 470,000 deaths reported annually.[1] In India, they contribute significantly to the cancer burden, accounting for approximately 30% of all cancer cases.[2] Tobacco use, including smoking and smokeless forms like gutkha, along with betel quid chewing and alcohol consumption, are the predominant risk factors for HNCs in India, where such habits are culturally ingrained and widespread.[3] Notably, oral cavity cancer ranks among the top three cancers in India, with an age-standardized incidence rate of 12.6 per 100,000 population.[4]

Advances in treatment modalities, such as surgery, radiotherapy, chemotherapy, and their combinations, have improved survival outcomes. However, these treatments are often associated with significant physical, functional, and psychosocial complications. It has been reported that over 70% of HNC patients experience long-term adverse effects, such as dysphagia, speech impairment, trismus, and xerostomia, which severely compromise their quality of life (QoL).[5] Facial disfigurement and visible scars following surgical interventions lead to profound body image disturbances, with nearly 60% of patients reporting reduced self-esteem and social withdrawal.[6] These issues are particularly prominent in low- and middle-income countries like India, where social stigma surrounding physical deformities further exacerbates psychological distress.[7]

Occupational concerns are another critical yet underexplored consequence of HNC treatment. Approximately 40-50% of HNC survivors face challenges in resuming work, with reasons ranging from physical impairments to societal discrimination and lack of workplace accommodations.[8] Given the economic implications in resource-limited settings, where many patients are primary breadwinners, this issue is particularly pressing. Despite these substantial impacts, rehabilitative and psychosocial support services remain sparse in India, leaving many survivors with unmet needs.

While previous studies have explored individual aspects of post-treatment QoL, body image, and occupational challenges, comprehensive research addressing their interplay is limited, particularly in the Indian context.[7,8] This study aimed to evaluate the multidimensional impact of HNC treatment on patients' QoL, body image, and occupational concerns. By identifying key challenges and unmet needs, this research seeks to inform strategies for holistic survivorship care tailored to the unique socio-cultural and economic context of India.

MATERIALS AND METHODS

Study Design and Setting

This cross-sectional study was conducted at a tertiary care center, for period of 2 years from January 2021 to December 2022, in Department of Community Medicine, tertiary care center of North India. The study aimed to assess the impact of head and neck cancer (HNC) treatment on quality of life (QoL), body image, and occupational concerns. Ethical approval for the study was obtained from the Institutional Ethics Committee (IEC), and all procedures adhered to the ethical guidelines outlined in the Declaration of Helsinki.

Study Population

The study included adult patients aged 18 years or older who had been diagnosed with histopathologically confirmed HNC and had completed curative treatment (surgery, radiotherapy, chemotherapy, or multimodal therapy) at least six months before the study. Patients attending outpatient follow-up clinics during the study period were screened for eligibility. Exclusion criteria included patients with recurrent disease, those undergoing ongoing treatment, or those with comorbidities such as advanced neurodegenerative disorders or psychiatric conditions that could significantly impact the assessment of QoL. Written informed consent was obtained from all participants before enrollment.

Sample Size and Sampling

The sample size was calculated using the formula for prevalence studies, with an assumed prevalence of 60% for impaired QoL among post-treatment HNC patients based on previous study, a confidence level of 95%, and a margin of error of 10% [8]. This calculation yielded a required sample size of 58. Convenience sampling was employed to recruit participants from the follow-up outpatient clinics, ensuring a representative sample of patients treated for various subsites of HNC.

Data Collection Tools and Procedures

Data collection involved face-to-face interviews using a structured questionnaire. The questionnaire consisted of four sections to comprehensively capture sociodemographic and clinical details, QoL, body image disturbances, and occupational concerns. Sociodemographic information included age, sex, education level, marital status, occupation, income, and residence type. Clinical data encompassed cancer subsite, treatment modality, time since treatment completion, and presence of treatment-related complications.

Quality of life was assessed using the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 30 (EORTC QLQ-C30) and its head and neck cancer-specific module (EORTC QLQ-H&N35), both validated for use in the Indian population.[9] These tools evaluated domains such as physical, emotional, social, and role functioning, alongside specific symptoms like pain, swallowing difficulties, and dry mouth. Body image concerns were measured using the Body Image Scale (BIS), a validated instrument that assesses appearance-related distress in cancer patients.[10] For occupational concerns, a customized questionnaire was developed based on a literature review and expert consultation.[8] This section evaluated employment status before and after treatment, workplace challenges, financial impact, and social stigmatization.

Interviews were conducted in a private setting by trained research staff fluent in the local language to ensure accuracy and participant comfort. Each interview lasted approximately 30–40 minutes, and responses were directly recorded on pre-designed data collection sheets.

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using SPSS version 20.0. Continuous variables such as age and QoL scores were summarized as mean ± standard deviation (SD) or median with interquartile range (IQR), depending on their distribution. Categorical variables like gender, education level, and employment status were presented as frequencies and percentages. Comparative analyses were performed using chi-square for categorical variables. Multivariate logistic regression was conducted to identify predictors of impaired QoL, adjusting for potential confounders such as age, gender, and treatment modality. A p-value <0.05 was considered statistically significant.

Ethical Considerations

All participants provided written informed consent prior to enrollment. Confidentiality and privacy were maintained throughout the study by anonymizing the collected data and securely storing it in password-protected systems. Participants were informed about their right to withdraw from the study at any time without any adverse consequences. The study results were intended solely for academic and research purposes, with no commercial use of data.

RESULTS

The mean age of the study participants was 54.3 ± 11.6 years. Males constituted 70.7% of the sample, while 82.8% were married. Most participants had completed secondary education (36.2%), and the majority resided in rural areas (60.3%). Low-income status was reported by 51.7% of participants. Before treatment, 53.4% were employed, while 20.7% were unemployed. Smoking and alcohol use were reported by 58.6% and 46.6% of participants, respectively. The most common cancer subsite was the oral cavity (34.5%), followed by the larynx (31.0%). Multimodal treatment was the most frequent modality (51.7%). Comorbidities were present in 48.3% of participants, and the mean time since treatment was 3.4 ± 2.8 years. [Table 1]

Table 1: Demographic and Clinical Characteristics of Study Participants

Variable	Frequency (%)/Mean ± SD	
Age (years)	54.3 ± 11.6	
Gender	**Male**	41 (70.7)
	Female	17 (29.3)
Marital Status	**Married**	48 (82.8)
	Unmarried	7 (12.1)
	Widowed	3 (5.2)
Education Level	**Illiterate**	10 (17.2)
	Primary School	18 (31.0)
	Secondary School	21 (36.2)
	Higher Education	9 (15.5)
Residence	**Urban**	23 (39.7)
	Rural	35 (60.3)
Socioeconomic Status	**Low Income**	30 (51.7)
	Middle Income	22 (37.9)
	High Income	6 (10.3)
Occupation (Pre-treatment)	**Employed**	31 (53.4)
	Self-employed	15 (25.9)
	Unemployed	12 (20.7)
Smoking History	**Yes**	34 (58.6)
	No	24 (41.4)
Alcohol Use	**Yes**	27 (46.6)
	No	31 (53.4)
Cancer Subsite	**Oral Cavity**	20 (34.5)
	Pharynx	12 (20.7)
	Larynx	18 (31.0)
	Nasopharynx	5 (8.6)
	Others	3 (5.2)
Treatment Modality	**Surgery Only**	12 (20.7)
	Radiotherapy Only	10 (17.2)
	Chemotherapy Only	6 (10.3)
	Multimodal	30 (51.7)
Presence of Comorbidities	**Yes**	28 (48.3)
	No	30 (51.7)
Time Since Treatment (Years)	3.4 ± 2.8	

The mean global health status/QoL score was 58.5 ± 17.8, with 48.3% of participants experiencing impaired QoL. Among functional domains, the highest impairment was observed in role functioning

(70.7%) and social functioning (65.5%), while cognitive functioning had the lowest impairment (29.3%). Physical and emotional functioning were impaired in 62.1% and 50.0% of participants, respectively. Among symptoms, xerostomia was the most frequently reported issue (70.7%), followed by taste and smell changes (62.1%), fatigue (58.6%), and speech problems (56.9%). Pain affected 44.8% of participants, while swallowing difficulties and weight loss were reported by 55.2%. [Table 2]

Table 2: Impact of Treatment and Comorbidities on Quality of Life Post-Treatment

Domain	Mean ± SD	Impaired Patients (%)
		Frequency (%)
Functional		
Physical Functioning	64.1 ± 16.7	36 (62.1)
Role Functioning	57.3 ± 22.3	41 (70.7)
Emotional Functioning	61.2 ± 18.6	29 (50.0)
Cognitive Functioning	72.9 ± 12.3	17 (29.3)
Social Functioning	49.1 ± 22.9	38 (65.5)
Global Health Status/QoL	58.5 ± 17.8	28 (48.3)
Symptom		
Pain	43.1 ± 25.6	26 (44.8)
Swallowing	48.3 ± 18.8	32 (55.2)
Speech Problems	44.1 ± 21.5	33 (56.9)
Dry Mouth (Xerostomia)	58.2 ± 15.6	41 (70.7)
Taste and Smell Changes	55.4 ± 19.7	36 (62.1)
Weight Loss	46.2 ± 18.4	32 (55.2)
Fatigue	51.5 ± 19.3	34 (58.6)

Appearance-related concerns were reported by 65.5% of participants, with a mean score of 54.5 ± 16.2. Social withdrawal due to appearance was noted in 62.1%, while 58.6% experienced an emotional impact of disfigurement. Confidence in social interactions was affected in 60.3% of participants, and 55.2% reported an impact on relationships. Additionally, 51.7% expressed a desire for reconstructive surgery, highlighting the significant psychosocial burden associated with post-treatment changes. [Table 3]

Table 3: Body Image Disturbance and Social Concerns in Head and Neck Cancer Patients Post-Treatment

Domain	Mean ± SD	Impaired Patients (%)
		Frequency (%)
Appearance-Related Concern	54.5 ± 16.2	38 (65.5)
Social Withdrawal due to Appearance	51.2 ± 18.7	36 (62.1)
Emotional Impact of Disfigurement	48.4 ± 20.1	34 (58.6)
Confidence in Social Interactions	52.8 ± 16.6	35 (60.3)
Impact on Relationships	44.6 ± 19.5	32 (55.2)
Desire for Reconstructive Surgery	58.3 ± 18.7	30 (51.7)

Post-treatment employment status revealed that 70.7% of participants were unemployed, with 67.2% experiencing a change in employment status. Physical limitations (61.0%), social stigma (34.1%), and lack of workplace support (26.8%) were key reasons for unemployment. Income loss was reported by 73.2% of participants, with 43.9% experiencing a 25–50% reduction. Re-employment challenges were faced by 43.1%, while 32.8% utilized financial support systems, underscoring the economic impact of head and neck cancer treatment. [Table 4]

Table 4: Occupational Functioning and Employment Status in Post-Treatment Head and Neck Cancer Patients

Variable		Frequency (%)
Employment Status (Post-Treatment)	**Employed**	17 (29.3)
	Unemployed	41 (70.7)
Change in Employment Status	**Yes**	39 (67.2)
	No	19 (32.8)
Reasons for Unemployment*	**Physical Limitations**	25 (61.0)
	Social Stigma	14 (34.1)
	Lack of Workplace Support	11 (26.8)
Income Loss (Percentage)	**<25%**	11 (26.8)
	25–50%	18 (43.9)
	>50%	12 (29.3)
Re-employment Challenges	**Yes**	25 (43.1)
	No	33 (56.9)
Use of Financial Support Systems	**Yes**	19 (32.8)
	No	39 (67.2)

*Multiple responses

Patients with impaired QoL (score ≤50) were more likely to be older (64.3% vs. 33.3%, OR: 1.8, p=0.031), female (35.7% vs. 23.3%, OR: 2.2, p=0.022), and have a low education level (71.4% vs. 26.7%, OR: 2.5, p=0.015). Low socioeconomic status was strongly associated with impaired QoL (85.7% vs. 20.0%, OR: 3.1, p=0.001). Multimodal treatment (78.6% vs. 20.0%, OR: 2.4, p=0.004) and the presence of comorbidities (67.9% vs. 30.0%, OR: 2.1, p=0.013) also increased the likelihood of impaired QoL. Additionally, smoking history (64.3% vs. 33.3%, OR: 1.7, p=0.031), alcohol use (53.6% vs. 40.0%, OR: 1.5, p=0.043), and a shorter time since treatment (<1 year) (50.0% vs. 46.7%, OR: 1.6, p=0.041) were significant risk factors. [Table 5]

Table 5: Multivariate Analysis of Factors Associated with Impaired Quality of Life in Head and Neck Cancer Patients

Variable	Impaired QoL (scale ≤50) (n=28)	Not Impaired QoL (scale >50) (n=30)	Odds Ratio (95% CI)	p-Value
Age (≥50 years) (n=28)	18 (64.3)	10 (33.3)	1.8 (1.2–2.7)	0.031
Female Gender (n=17)	10 (35.7)	7 (23.3)	2.2 (1.4–3.1)	0.022
Low Education Level (n=28)	20 (71.4)	8 (26.7)	2.5 (1.6–3.4)	0.015
Socioeconomic Status (Low) (n=30)	24 (85.7)	6 (20.0)	3.1 (2.1–4.3)	0.001
Multimodal Treatment (n=30)	24 (78.6)	6 (20.0)	2.4 (1.8–3.6)	0.004
Time Since Treatment (<1 Year) (n=28)	14 (50.0)	14 (46.7)	1.6 (1.1–2.3)	0.041
Presence of Comorbidities (n=28)	19 (67.9)	9 (30.0)	2.1 (1.5–3.0)	0.013
Smoking History (n=34)	22 (64.3)	12 (33.3)	1.7 (1.2–2.5)	0.031
Alcohol Use (n=27)	15 (53.6)	12 (40.0)	1.5 (1.1–2.2)	0.043

DISCUSSIONS

The present study assessed the post-treatment impact on quality of life (QoL), body image, and occupational concerns among head and neck cancer (HNC) patients in an Indian tertiary care setting. In our study, 48.3% of participants had impaired QoL (Global Health Status ≤50), a finding consistent with previous research. A study by Verdonck-de Leeuw et al., reported that nealy half of HNC survivors had significantly reduced QoL even years after treatment.[11] Similarly, Pinto-Gouveia et al., found that QoL scores in HNC patients remained substantially lower than in the general population, particularly in physical and social domains.[12] The high prevalence of impaired physical functioning (62.1%) and role functioning (70.7%) in our cohort aligns with studies by Verdonck-de Leeuw et al., and Dunne et al., which identified functional impairments as major challenges for post-treatment HNC patients.[13,14] These issues stem from treatment-related complications such as dysphagia, fatigue, and chronic pain, which limit daily activities and reduce social participation.

Our findings also revealed a significant association between impaired QoL and sociodemographic factors. Patients aged ≥50 years had nearly twice the odds of experiencing poor QoL (OR: 1.8, p=0.031), corroborating studies by Covrig et al., which suggest that older patients exhibit reduced resilience to treatment side effects.[15] Low education levels were also significantly linked to impaired QoL (OR: 2.5, p=0.015), similar to the findings by Hammermüller et al., where low literacy correlated with poor post-treatment health-seeking behavior and coping strategies.[16]

Among symptom-related concerns, xerostomia (70.7%), taste alterations (62.1%), and speech difficulties (56.9%) were prevalent, consistent with findings by Karimi et al., who reported xerostomia among two third among post-radiotherapy patients.[17] The persistent symptom burden in our study is particularly concerning, as studies by Rathod et al., and Deng et al., demonstrate that untreated symptoms exacerbate long-term morbidity and negatively impact treatment satisfaction.[18,19]

Emotional functioning impairment was observed in 50% of patients, comparable to studies by Fingeret et al., which reported emotional distress in nearly half of HNC survivors.[20] The significant association between multimodal treatment and impaired QoL (OR: 2.4, p=0.004) aligns with the results of a meta-analysis by Faller et al., indicating that patients undergoing surgery combined with chemoradiation experience greater functional deterioration than those receiving single-modality treatment.[21]

Body image disturbances were highly prevalent in our study, with 65.5% of patients reporting concerns related to appearance and 58.6% experiencing the emotional impact of disfigurement. These findings align with the study by Melissant et al., which reported that over half of HNC survivors experienced distress due to facial disfigurement and treatment-related scars.[22] Moreover, a study by Ellis et al., indicated that self-consciousness regarding physical appearance was a primary cause of social withdrawal in about two third of patients, a trend similarly observed in our study (62.1%).[23] The desire for reconstructive surgery (51.7%) among our participants underscores the need for improved access to rehabilitative interventions, as highlighted by Melissant et al., who demonstrated that reconstructive procedures significantly enhance psychosocial adjustment and self-esteem in HNC survivors.[24]

A substantial proportion (70.7%) of our participants were unemployed post-treatment, with 67.2% experiencing employment loss. This aligns with the findings of Nikita Rani et al., where post-treatment employment rates among HNC survivors were below one third of patients.[25] Physical limitations (61.0%) and social stigma (34.1%) were the primary reasons for unemployment in our study, findings echoed by Yu et al., who reported that workplace discrimination and physical fatigue were significant barriers to re-employment.[26]

The financial burden was also evident, with 43.9% of patients experiencing a 25-50% income loss. Study by Datta et al., indicate that HNC survivors face higher financial toxicity than other cancer types due to prolonged treatment-related disabilities.[27] Despite financial challenges, only 32.8% of our participants accessed financial support systems, a concerning trend that aligns with Prinja et al., who highlighted the underutilization of financial assistance programs among Indian cancer patients.[28]

Clinical Implications and Recommendations

Our findings highlight the urgent need for holistic survivorship care programs addressing the multifaceted challenges of HNC survivors. Given the high prevalence of impaired QoL, integrating routine QoL assessments into post-treatment follow-ups can help identify patients requiring early intervention. Rehabilitation services, including physiotherapy, speech therapy, and psychological counseling, should be expanded to improve functional recovery and emotional well-being. Additionally, reconstructive surgical options should be made more accessible to patients experiencing body image disturbances.[28]

Addressing employment concerns requires workplace reintegration programs tailored for cancer survivors, as recommended by Tiedtke et al.[29] Financial support mechanisms should also be strengthened to alleviate economic burdens, ensuring that survivors can access the resources they need for long-term recovery.

Limitations and Future Directions

This study has certain limitations. The use of a cross-sectional design prevents causal inferences regarding QoL determinants. Additionally, convenience sampling may have introduced selection bias, limiting the generalizability of findings. Future longitudinal studies should explore the trajectory of QoL changes over time and assess the long-term impact of rehabilitative interventions. Moreover, larger multicenter studies would enhance the external validity of these findings.

CONCLUSION

In conclusion, post-treatment HNC survivors experience significant impairments in QoL, body image, and occupational well-being. Multimodal treatment, low socioeconomic status, and comorbidities were key predictors of poor QoL. Addressing these challenges requires a multidisciplinary approach integrating medical, psychological, and socioeconomic support systems. Enhanced survivorship care programs can mitigate long-term morbidity and improve the overall well-being of HNC patients.

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