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Survival is Just the Beginning: Quality of Life in Patients (QoL) with Intraoral and Extraoral Squamous Cell Carcinoma (SCC)

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Abstract.

Introduction
Squamous cell carcinoma (SCC) continues to be a health problem worldwide with far reaching effects not only on survival but on patient's quality of life (QoL). Health-related quality of life (HRQoL) assessment sheds lights on overall disease and its treatment impact.

Method
In this cross-sectional study was performed on 53 patients diagnosed with SCC, which included 36 intraoral and 17 extraoral cases. Sociodemographic data was collected and the QoL was assessed by using the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) and short form-36 (SF-36). The data were analyzed using Mann-Whitney U test and Spearman's correlation.

Results
Among 53 SCC patients (36 intraoral, 17 extraoral; mainly middle-aged females of low socioeconomic status), overall Quality of Life (QoL) score did not differ between groups. In summary, the analyses revealed additional differences in QoL determinants as patients with intraoral head and neck Squamous cell carcinoma (SCC) QoL was driven towards functional domains whereas symptom-related determinants were dominated for extraoral SCC patients. There was no statistically significant difference in overall QoL ($p = 0.839$) between groups.

Discussion
This study provides evidence suggesting that QoL impairments associated with intraoral SCC and with extraoral SCC are primarily driven by symptom burden and pain, and that there is no difference between the groups in overall quality of life (QoL). The relationship between QoL and functional limitations was more pronounced for intraoral SCC, whereas symptom severity had a greater impact on mental status for extraoral SCC. These results are consistent with existing evidence that SCC affects multiple dimensions of health irrespective across the sites of the tumor. There are QoL data available for management of various chronic conditions, and they highlight the importance of more comprehensive, patient-centred care that emphasizes early symptom control along with optimal pain management and functional rehabilitation strategies.

Conclusion
Demographics do not affect the quality of life of SCC patients, as clinical variables like symptoms, pain, and limitations impact it more than demographic data. Patients with intraoral SCC also experienced moderate QoL, highlighting opportunities for better symptom control and psychosocial support to improve overall patient health-related QoL.

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Introduction

Amount of oral cancer is 2–4% of all neoplasms and is the sixth most commonly diagnosed malignant disease, with more than 300,000 new cases reported annually along with approximately 145,000 deaths (Rivera,2015). These cases more than 90% are lassified as oral squamous cell carcinoma (OSCC) (Markopoulos, 2012). Diagnosis mainly relies on clinical evaluation and histopathology whilst staging uses the TNM classification. Despite substantial developments in surgery, chemotherapy or radiotherapy, 5-year survival rate is still around 50% and remains soberingly low in advanced stage disease (Rivera, 2015).

Alongside survival, quality of life (QoL) has become a key outcome in cancer care. Quality of life QOL is a biological perception which can be defined as "individual's own personal perception of their place in context to the culture and value systems in which they move and with respect to their goals, expectations, standards and concerns" by World Health Organization. According to previous studies, patients with OSCC have been reported as suffering from an HRQoL reduction that is stronger in dimensions related to emotional and social well-being (Gondivkar et al., 2021).

Squamous cell carcinoma (SCC) is a major global health problem, with significant effects for survival and quality of life (QoL) in patients (Sung et al., 2021). Assessment HRQoL is important information to broader impacts of disease and treatment (Gondivkar et al., 2018). It is therefore clinically important to inform our understanding of this aspect of quality of life (QoL) in those who present with intraoral and/or extraoral SCC.

Assessing health-related quality of life (HRQoL) is useful for gaining a more comprehensive understanding of the burden of disease and treatment (Chernyshov et al., 2019). Meanwhile, understanding QoL of SCC patients based as either specific intraoral or extraoral is essential for appropriate intrinsic treatment and the management of the treatment. The aim of this study was to compare and assess Health-Related Quality of Life (HRQoL) among intraoral and extraoral squamous cell carcinoma.

Method

Study Design and Setting

This was a cross-sectional study conducted at Dr. Moewardi regional general hospital, Surakarta, Indonesia. Data were collected during the study period of June to September 2024 from patients confirmed to have squamous cell carcinoma (SCC).

Participants

A total of 53 patients, including 36 intraoral SCC and 17 extraoral SCC cases with histopathologically documented SCC were included in this study. Eligibility criteria included patients being ≥18 years of age, having a confirmed diagnosis of intraoral or extraoral SCC, and being willing to provide informed consent. Patients with other malignances or comorbidities such as severe systemic cormorbidities i.e. if they had severe cardiovascular and vascular diseases, chronic renal and urological disorders, chronic respiratory diseases, metabolic diseases with complications, neurological, cognitive or psychiatric disorders and other active malignance (cancers) that would affect quality of life assessment were excluded.

Data Collection

Data concerning sociodemographic characteristics like age, sex, educational level and occupation status were obtained from patient interviews and medical records review. Clinical details were validated by hospital records. The quality of life was evaluated using two of the

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validated systems – European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) and SF-36.

The European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire Core 30 (EORTC QLQ-C30) is a cancer-specific measure that includes 30 items assessing functional status and symptom burden both at the global level. SF-36 is a generic quality of life instrument with domains including physical functioning and limitations due to emotional, social and health role; pain; energy or vitality; and general health. Both of those questionnaires have been validated in Indonesian language which was published on Perwitasari et al. [17]. Scores were scaled from 0 to 100 for each domain, and higher scores in the functional and global domains indicated better quality of life while higher scores in the symptom domains represented worse symptom burden.

Statistical Analysis

Descriptive statistics were used to summarize sociodemographic and clinical characteristics. The Mann–Whitney U test was applied to compare quality of life scores between intraoral and extraoral SCC patients. Spearman's rank correlation coefficient was used to evaluate the association between functional, symptom, and SF-36 subscales with overall quality of life. A p-value <0.05 was considered statistically significant. Data analysis was performed using SPSS software.

Ethical Clearance

This study was approved by the Health Research Ethics Committee of Dr. Moewardi Regional General Hospital, Surakarta number 1.942 / IX / HREC / 2025. Written informed consent was obtained from all participants prior to enrollment.

Results

This study included 53 patients diagnosed with squamous cell carcinoma (SCC), consisting of 36 intraoral and 17 extraoral cases. The mean age of patients with intraoral SCC was 52.2 years, while those with extraoral SCC had a mean age of 55.4 years. The majority of participants in both groups were female, with 75% in the intraoral group and 82% in the extraoral group. Most patients had only completed elementary education, and many were either unemployed or worked as housewives, reflecting a relatively low socioeconomic background.

Variable	Intraoral SCC (r)		Extraoral SCC (r)	
	r	p-value	r	p-value
C30_Functional	0.582	0.000*	0.075	0.596
C30_Symptom	-0.732	0.000*	-0.592	0.000*
C30_Average	0.953	0.000*	0.000	0.000*
SF36_General Health	-0.365	0.046*	-0.193	0.167
SF36_Emotional	0.137	0.544	-0.033	0.814
SF36_Pain	-0.539	0.009*	-0.541	0.000*
SF36_Social Function	0.369	0.047*	0.140	0.376
SF36_Energy	-0.002	0.992	0.011	0.914
SF36_Emotional Limit	0.465	0.008*	0.499	0.000*
SF36_Physical Limit	0.469	0.004*	0.273	0.000*

Table 1. Correlation between EORTC QLQ-C30 and SF-36 subscales with overall quality of life in intraoral and extraoral SCC patients

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When assessed using the EORTC QLQ-C30, both groups demonstrated high functional scores, with averages of 86.9 in the intraoral group and 88.7 in the extraoral group. However, global quality of life (QoL) scores were moderate and nearly identical between groups, with values of 64.1 and 65.7, respectively.

The SF-36 results revealed variations across domains. Patients with intraoral SCC reported a greater burden of symptoms and higher pain levels compared to those with extraoral SCC. Conversely, patients with extraoral SCC reported better energy levels and social functioning. Despite these differences, overall physical functioning scores were comparable across groups.

Statistical comparison using the Mann-Whitney U test showed no significant difference in overall QoL between intraoral and extraoral SCC patients ($p = 0.839$).

Correlation analysis highlighted that in intraoral SCC, better functional scores were strongly associated with higher QoL, while symptom burden and pain were negatively correlated. Social functioning and reduced role limitations also showed positive associations.

With QoL. In contrast, for extraoral SCC, symptom burden and pain were the most significant negative predictors of QoL, whereas reduced emotional and physical limitations contributed positively. Other domains of the SF-36 did not demonstrate significant associations.

In summary, both intraoral and extraoral SCC patients reported moderate quality of life, with no significant difference between groups. Clinical symptoms, particularly pain and functional limitations, emerged as the strongest determinants of QoL, underscoring the importance of symptom management and supportive care in improving patient outcomes.

Discussion

This study evaluated the quality of life (QoL) among patients with intraoral and extraoral squamous cell carcinoma (SCC) using two validated instruments: the EORTC QLQ-C30 and the SF-36. Our findings revealed that overall QoL did not differ significantly between intraoral and extraoral SCC patients. However, symptom burden and pain were consistently identified as the strongest negative determinants of QoL across both groups, whereas functional and social domains contributed positively. These results emphasize the multidimensional impact of SCC, where the disease process and treatment outcomes extend far beyond survival alone.

The global epidemiology of oral SCC highlights its substantial burden, accounting for 2–4% of all cancers worldwide and ranking as the sixth most common malignancy (Rivera, 2015). In line with earlier studies, the majority of our participants were from lower socioeconomic backgrounds, with limited education and predominantly unemployed status. Socioeconomic disadvantage is known to worsen health disparities, limit access to care, and negatively affect QoL outcomes (Markopoulos, 2012).

Our study corroborates previous evidence showing that oral SCC patients report poor health-related QoL (HRQoL), particularly in the mental and social domains. Gondivkar et al. (2021) reported that patients receiving multimodal therapies, such as surgery combined with chemoradiotherapy, experienced the greatest decline in HRQoL, especially regarding emotional well-being. Similarly, Stojanović et al. (2024) found that dysphagia and chewing difficulties were among the most critical factors affecting daily functioning and nutrition, further compromising QoL. In our cohort, the strong negative correlations between symptom burden, pain, and QoL reinforce the centrality of symptom management in comprehensive cancer care.

It is also important to consider that intraoral SCC may cause functional impairments such as difficulties in speech, swallowing, and chewing, which directly translate into reduced social functioning and psychosocial distress. Although extraoral SCC may not always lead to

the same functional impairments, the impact on appearance and social interactions can be equally detrimental. This explains the comparable overall QoL scores observed between groups despite site-specific clinical differences.

Instruments such as the EORTC QLQ-C30 and SF-36 have become the gold standard for HRQoL assessment in cancer research (EORTC, 2001; Mols et al., 2018). While the QLQ-C30 provides cancer-specific insights, the SF-36 enables broader comparisons with the general population. The combined use of both instruments in this study allowed us to capture nuanced differences, such as the greater correlation of functional domains with QoL in intraoral SCC versus the prominence of symptom-related determinants in extraoral SCC.

From a clinical perspective, our findings underscore the need for early detection and multimodal interventions not only to improve survival but also to preserve QoL. Surgical and radiotherapeutic advances have improved local control; however, the five-year survival rate for OSCC remains approximately 50% (Chen et al., 2021). Therefore, supportive strategies targeting pain control, nutritional rehabilitation, and psychosocial support are essential components of care. Interventions such as acceptance and commitment therapy (ACT) or structured exercise programs have shown promise in improving QoL among cancer survivors (NCI, 2020; Ramalingam et al., 2023).

Overall, this study highlights that SCC, whether intraoral or extraoral, exerts a profound impact on patients' quality of life. While survival outcomes remain crucial, integrating QoL assessment and supportive interventions into standard care is necessary to achieve truly patient-centered oncology.

Conclusion

This study demonstrates that patients with intraoral and extraoral squamous cell carcinoma (SCC) experience a similarly moderate quality of life, with no significant difference observed between the two groups. Despite comparable global QoL scores, symptom burden—particularly pain—and functional limitations emerged as the strongest determinants of overall well-being across both cohorts. Intraoral SCC tended to show greater associations between functional impairment and QoL, whereas extraoral SCC was more influenced by symptom severity. These findings reinforce that SCC imposes a substantial multidimensional impact extending beyond oncologic outcomes, underscoring the need for comprehensive, patient-centered management. Early detection, optimized symptom control, nutritional and psychosocial support, and rehabilitation-focused interventions are essential to improving quality of life. Integrating structured QoL assessment into routine clinical care is therefore crucial to guide tailored supportive strategies and enhance overall patient outcomes.

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