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Knowledge, Perceptions, and Treatment Beliefs of Oral Tumors Among Patients Attending Specialized Clinics in Western Libya: A Cross-Sectional Study

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Abstract

Background: Oral tumors, including oral squamous cell carcinoma (OSCC) and verrucous carcinoma (VC), represent a significant public health concern due to their high morbidity and mortality rates. Public knowledge and perceptions regarding these tumors play a crucial role in early detection, treatment adherence, and overall prognosis.

Objective: This study aimed to assess patient knowledge, perceptions, and treatment beliefs regarding oral tumors, and to identify factors predicting perceived treatability among patients attending specialized health centers in Libya.

Methods: A descriptive cross-sectional design was employed. The study population included 50 patients (13 males, 37 females) attending the National Cancer Institute in Sabratha, Al-Afrah Center in Al-Ajilat, and Hamda Al-Qarawi Clinic. Data were collected using a structured questionnaire comprising 10 items, validated by a panel of dental specialists. Descriptive statistics summarized demographic characteristics, knowledge, and perceptions, while inferential analyses, including Chi-square tests and binary logistic regression, evaluated associations and predictors of perceived treatability. Statistical significance was set at $p < 0.05$.

Results: The majority of participants were female (60%). Only 16% recognized oral tumors as serious, and 20% believed complete blood count could detect tumors. Misconceptions regarding infectivity were common: 36% considered oral tumors infectious, and 30% believed they could be transmitted orally. Belief in the effectiveness of antibiotics significantly predicted perceived treatability (OR = 3.00; 95% CI: 1.20–7.50; p = 0.02). No significant associations were found between gender and knowledge or perceptions. Weak non-significant relationships were observed between diagnostic methods (CBC, X-ray) and perceived treatability.

Conclusion: The study revealed significant gaps in patient knowledge and misconceptions regarding oral tumors, particularly concerning severity, transmissibility, and treatment. Belief

in antibiotic efficacy strongly influenced perceived treatability, underscoring the need for targeted educational interventions. Findings support the implementation of integrated clinical and public health strategies to improve awareness, early detection, and appropriate management of oral tumors in Libya.

Keywords: Oral tumors, Patient knowledge, Perceptions, Treatability, Oral squamous cell carcinoma, Verrucous carcinoma, Libya.

Introduction:

Cancer arises from uncontrolled cellular growth, leading to the replacement of normal cells and disruption of essential bodily functions (Siegel et al., 2022). Malignant tumors are characterized by their invasive and metastatic potential due to unregulated cell division, whereas benign tumors exhibit localized growth without the ability to invade surrounding tissues, although some may undergo malignant transformation (Boutry et al., 2022). Approximately 5–10% of cancers result from inherited genetic mutations, and diagnosis is based on specific signs, symptoms, and various screening and diagnostic procedures (Loud & Murphy, 2017). Globally, cancer is the second leading cause of death, accounting for an estimated 9.6 million deaths in 2018, representing approximately 13% of all deaths (Vos et al., 2016).

Oral cavity cancer represents a significant global health concern due to its high morbidity and mortality rates. Histopathological studies consistently indicate that squamous cell carcinoma (SCC) is the predominant histologic subtype, comprising over 90% of oral cavity cancers (Zanoni et al., 2019). Major etiological factors include tobacco use and alcohol consumption (Zelefsky et al., 1993), although reductions in smoking prevalence in some countries, such as the United States, have not corresponded to a decline in oral SCC incidence (Ernani & Saba, 2015; Chen et al., 1987). In 2018, approximately 33,950 new cases and 6,800 deaths were projected in the United States (Nishi et al., 2018).

Verrucous carcinoma (VC) is a rare, low-grade variant of SCC, characterized by slow growth, low aggressiveness, and rare metastasis. It primarily arises in the oral cavity and may develop on mucosal surfaces adjacent to leukoplakia. VC is sometimes associated with Proliferative Verrucous Leukoplakia (PVL), a high-risk precancerous lesion (Miranda et al., 2024). PVL was first described by Hansen et al. in 1985 as a multifocal oral verrucous leukoplakia, previously referred to as oral florid papillomatosis (van der Waal & Reichart, 2008).

The World Health Organization (WHO) classifies PVL as a “distinct and aggressive form of Oral Potentially Malignant Disorder (OPMD)” due to its progressive clinical and

histopathological changes, including dysplasia, and its potential transformation into VC or conventional SCC (Cabay et al., 2007). PVL is distinguished from other leukoplakias by its verrucous appearance, high recurrence rate, and elevated risk of malignant transformation, estimated at approximately 50%, often occurring several years after disease onset (Warnakulasuriya et al., 2021; Thompson et al., 2021).

Epidemiological studies indicate that malignant transformation is more common in females (74.3%) with a mean age of 66 years, showing a 1.96-fold increased risk. The gingiva and buccal mucosa are the most frequently affected sites, while tobacco and alcohol show weak associations, as most patients are non-smokers and non-drinkers. Invasive carcinoma is the predominant malignant lesion, with surgery serving as the primary treatment. Recurrence occurs in 55.6% of cases, and cancer-related mortality is reported in 33.8% of patients with available follow-up data (Mohideen et al., 2025).

The precise etiology of PVL remains unclear, with multiple contributing factors, including tobacco use, chronic irritation, viral infections (HPV and EBV), Candida species, specific oncogenes, genetic predispositions, and immunological influences (Cariati et al., 2018). However, viral or fungal infections alone do not fully explain PVL development, and no significant correlation has been observed between tobacco use and lesion onset, differentiating PVL from other leukoplakia types (Staines & Rogers, 2017; van der Waal & Reichart, 2008). These findings suggest a multifactorial origin for the disease (Aguirre-Urizar, 2011).

A comprehensive understanding of PVL pathogenesis and progression is critical to guide clinical management, particularly given the variability in research findings, which underscores the need for systematic reviews to consolidate current knowledge.

Methodology:

Study Design: A descriptive research design was employed due to its suitability for investigating oral tumors comprehensively. This approach allowed for classification of tumor types, identification of clinical manifestations, and evaluation of treatment modalities, while enabling systematic data collection and analysis.

Study Population and Sample: The study population included all patients attending healthcare institutions specialized in oral tumors: the National Cancer Institute in Sabratha, Al-Afrah Center in Al-Ajilat, and Hamda Al-Qarawi Clinic. The total population comprised 50 cases of both genders, representing various age groups.

A census sampling method was applied, including all available cases during the study period. The final sample consisted of 50 patients (13 males and 37 females), ensuring adequate representation.

Data Collection Tool: Data were collected using a structured questionnaire designed based on a review of previous studies on oral tumors. The preliminary version contained 10 items and was reviewed by a panel of dental specialists for clarity, relevance, and comprehensibility. The final questionnaire retained 10 items covering tumor types, symptoms, and treatment methods (see Appendix 1).

Implementation: The questionnaire was distributed to participants over 15 days at the three selected institutions. All responses were successfully collected, ensuring completeness and reliability of the dataset.

Statistical Analysis: Data were entered and analyzed using SPSS version 29. Descriptive statistics summarized demographic characteristics, knowledge, and perceptions regarding oral tumors, including disease severity, diagnostic methods, and treatment approaches. Inferential analysis included Chi-square tests for associations between categorical variables and binary logistic regression to identify predictors of treatment outcomes, with odds ratios and 95% confidence intervals reported. Statistical significance was set at $p < 0.05$.

Results:

Table 1: Demographic Characteristics of Participants and Their Knowledge and Perceptions Regarding Oral Tumors

Variable	Category	Frequency	Percentage (%)
Gender	Male	21	40
	Female	29	60
Do you consider oral tumors to be serious diseases?	Yes	8	16
	No	42	84
Is complete blood count an effective tool for detecting oral tumors?	Yes	10	20
	No	40	80
Are oral tumors infectious diseases?	Yes	18	36
	No	32	64
Can oral tumors be transmitted from one person to another via the mouth?	Yes	15	30
	No	35	70
Can oral tumors lead to death?	Yes	20	40
	No	30	60
Can oral tumors be treated with antibiotics?	Yes	10	20
	No	40	80
Is it possible to be cured from oral tumors?	Yes	25	50
	No	25	50
Can oral tumors be detected by X-ray imaging?	Yes	30	60
	No	20	40
Can oral tumors lead to the removal of jaw bones?	Yes	10	20
	No	40	80
Is it possible to treat oral tumors?	Yes	20	40
	No	30	60

Table 2: Statistical Relationships Between Variables Related to Knowledge and Perceptions of Oral Tumors

Variable 1	Variable 2	P-value	Conclusion
Infectiousness	Tumor Transmission	< 0.01	Significant relationship: Participants who consider tumors infectious tend to believe they are transmissible.
Antibiotic Treatment	Treatability	< 0.05	Significant relationship: Participants who believe in the effectiveness of antibiotics tend to believe that tumors are treatable.
Gender	All other variables	> 0.05	No significant relationship between gender and knowledge or perceptions.
Effectiveness of CBC	Curability	≈ 0.45	No significant relationship.
X-ray Detection	Treatability	≈ 0.1	Weak (non-significant) relationship.

Table 3: Binary Logistic Regression Analysis Identifying Predictors of Oral Tumor Treatability

Independent Variable	Regression Coefficient (B)	Standard Error (SE)	Wald Statistic	P-value	Odds Ratio (OR)	95% Confidence Interval (CI)
Gender	0.25	0.48	0.27	0.60	1.28	0.50 – 3.30
Perception of Oral Tumor Severity	0.12	0.50	0.06	0.81	1.13	0.44 – 2.91
Belief in the Effectiveness of Complete Blood Count (CBC) in Detecting Oral Tumors	0.30	0.52	0.33	0.56	1.35	0.50 – 3.64
Belief that Oral Tumors are Infectious	0.40	0.48	0.69	0.41	1.49	0.58 – 3.85
Belief that Oral Tumors Can Be Transmitted from Person to Person via the Mouth	0.55	0.50	1.21	0.27	1.73	0.65 – 4.60
Belief in the Treatability of Oral Tumors with Antibiotics	1.10	0.48	5.26	0.02*	3.00	1.20 – 7.50
Belief in the Possibility of Recovery from Oral Tumors	0.25	0.49	0.26	0.61	1.28	0.52 – 3.13
Belief in the Detectability of Oral Tumors Using X-ray Imaging	0.45	0.50	0.82	0.36	1.57	0.61 – 4.05
Belief that Oral Tumors May Lead to Jaw Bone Resection	0.30	0.53	0.32	0.57	1.35	0.48 – 3.80

Discussion:

The present study aimed to evaluate patients' knowledge, perceptions, and beliefs regarding oral tumors in Libya, with a particular focus on the awareness of their seriousness, diagnostic

methods, transmissibility, and treatment. Overall, the findings reveal substantial gaps in public understanding, consistent with prior studies highlighting limited awareness of oral cancers and related disorders in both developing and developed contexts (Warnakulasuriya et al., 2021; Mohideen et al., 2025).

Our results indicate that only 16% of participants considered oral tumors to be serious diseases, which contrasts sharply with global epidemiological data showing high morbidity and mortality associated with oral cancers (Zanoni et al., 2019; Ernani & Saba, 2015). This low perception of severity may reflect insufficient public education on the consequences of oral malignancies, as well as cultural beliefs minimizing the health risks of oral lesions. Similar findings were reported in a study by Thompson et al. (2021), which noted that awareness of the potentially fatal nature of oral tumors remains limited in populations outside major urban centers.

Interestingly, 36% of participants believed that oral tumors are infectious, and 30% thought they could be transmitted orally from person to person. The significant association between perceived infectiousness and transmissibility ($p < 0.01$) suggests a common misconception that tumors can spread like communicable diseases. This finding aligns with previous research indicating that patients often confuse cancer with infectious pathologies due to visible lesions or misinterpretation of symptoms (Aguirre-Urizar, 2011). These misconceptions have practical implications for patient behavior and healthcare-seeking patterns, as patients may avoid social interaction or seek inappropriate treatments.

Regarding diagnostic awareness, only 20% believed that complete blood count (CBC) is effective for tumor detection, while 60% recognized X-ray imaging as a diagnostic tool. However, neither perception was significantly associated with beliefs regarding curability or treatability. This result is consistent with clinical evidence showing that CBC has limited utility in cancer detection (Loud & Murphy, 2017), whereas imaging modalities, while useful for staging, cannot alone determine treatment outcomes. The weak, non-significant association between X-ray detection and perceived treatability ($p \approx 0.1$) further emphasizes the need for enhanced patient education on appropriate diagnostic pathways, including biopsy and histopathological confirmation.

Concerning treatment beliefs, 20% of participants erroneously considered antibiotics effective against oral tumors, yet this variable emerged as a significant predictor of perceived treatability in the logistic regression model ($OR = 3.00$; $p = 0.02$). This counterintuitive finding likely reflects a general misconception equating any medical intervention with curative potential,

highlighting gaps in understanding the biological basis of cancer versus infectious diseases. Similar misconceptions have been documented in prior studies assessing public knowledge of oral cancers in low- and middle-income countries (Staines & Rogers, 2017). Importantly, these findings underscore the need for targeted educational interventions clarifying that antibiotics have no role in tumor treatment.

Gender did not significantly influence knowledge or perceptions in this cohort, which contrasts with some epidemiological studies reporting higher oral cancer awareness among women (Mohideen et al., 2025). This discrepancy may be attributed to sample composition (37 females versus 13 males) or regional differences in health education access. Likewise, beliefs regarding the possibility of recovery, severity, and potential jaw bone resection showed no significant predictive value in the regression analysis, suggesting that misconceptions and knowledge gaps are broadly distributed across demographic groups rather than concentrated in specific subpopulations.

The findings also reflect the multifactorial nature of oral tumor awareness. While clinical and histopathological studies, particularly on verrucous carcinoma and Proliferative Verrucous Leukoplakia (PVL), emphasize the importance of early detection, slow progression, and surgical management (Miranda et al., 2024; Mohideen et al., 2025), public understanding remains limited. This disconnect underscores the critical role of community-based educational programs to improve awareness of risk factors, diagnostic procedures, and appropriate treatment strategies.

Study Limitations: This study has several limitations that should be considered when interpreting the findings. First, the sample size was relatively small and geographically restricted, which may limit the generalizability of the results to the wider Libyan population. Second, the study focused specifically on oral tumors, a condition for which patients often seek treatment at major tertiary centers outside the local study area or even abroad. This may have introduced selection bias, as the participants may not fully represent the broader population affected by oral tumors. Third, the cross-sectional design relies on self-reported knowledge, perceptions, and beliefs, which may be subject to recall bias or social desirability bias. Fourth, certain demographic groups were underrepresented, such as males in this cohort, potentially affecting the assessment of gender-related differences. Finally, the study did not include a detailed assessment of participants' prior exposure to health education or previous clinical experiences, which could influence their understanding of oral tumors. Future studies with

larger, more diverse samples and longitudinal designs are needed to confirm and expand upon these findings.

Conclusion: In summary, the study highlights significant deficiencies in public knowledge and perceptions regarding oral tumors in Libya, particularly concerning their seriousness, transmissibility, and treatability. Misconceptions about infectiousness and the use of antibiotics as a treatment modality were particularly notable, with the latter emerging as a significant predictor of perceived treatability. These findings are consistent with global literature emphasizing the complex etiology, slow progression, and management challenges of oral tumors, especially verrucous carcinoma and Proliferative Verrucous Leukoplakia (PVL). Collectively, the results underscore the urgent need for targeted interventions, including culturally sensitive educational campaigns, early screening programs, and integrated clinical and public health strategies, to enhance awareness, promote timely diagnosis, and ensure appropriate treatment.

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