Original Article

A Questionnaire Study On Knowledge and Awareness of Radiotherapy Among Dental Students

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ABSTRACT

Background: Radiotherapy is crucial in managing head and neck cancers, impacting oral health. Dental students must understand its implications for effective patient care.

Objective: This study aimed to assess the awareness of radiotherapy among dental students, identify knowledge gaps, and emphasize the need for improved educational interventions.

Methods: A cross-sectional study was conducted over three months, surveying 105 dental students from a private college using a 10-question questionnaire distributed via Google Forms.

Results: Findings indicated that 75% of participants understood radiotherapy, while 78.1% recognized its side effects. Notably, 64.8% acknowledged the risk of osteoradionecrosis, and 86.7% identified salivary gland effects. Awareness of radiation units was adequate, with 68.6% identifying Curie and 61.9% recognizing Gray (Gy).

Conclusion: While dental students demonstrated reasonable awareness of radiotherapy, curriculum enhancements are essential to address knowledge gaps, ensuring comprehensive patient care for those undergoing cancer treatment.

Keywords: Radiotherapy; Dental Students; Oral Health; Head and Neck Neoplasms; Osteoradionecrosis.

INTRODUCTION

Radiotherapy plays a critical role in the management of various cancers, particularly those affecting the head and neck region.[1] As dental professionals often encounter patients who have undergone or are currently undergoing radiotherapy, it is imperative for dental students to have a comprehensive understanding of its implications on oral health. This awareness is crucial for effective patient management, as radiotherapy can lead to a range of oral complications, including mucositis, xerostomia, and osteoradionecrosis.[2] Radiotherapy for head and neck cancers commonly leads to several complications, including mucositis, which manifests as confluent inflammation, pain, and ulceration around the third week of treatment, hindering swallowing and speech.[3] Salivary gland dysfunction occurs due to decreased salivary flow (xerostomia) and altered composition, resulting in oral dryness and increased susceptibility to infections and dental caries.[4] Additionally, radiation-induced changes in saliva contribute to rapid decalcification of dental enamel, known as radiation caries, characterized by widespread superficial lesions. In pediatric patients, craniofacial disturbances such as microdontia and malocclusion may arise, necessitating orthodontic interventions. One of the most severe complications, osteoradionecrosis, results from irreversible damage to bone and microvasculature, leading to necrosis, particularly in the mandible, with clinical manifestations including pain, exposed necrotic bone, and pathologic fractures, typically developing within a year of therapy.[5] Awareness about radiotherapy among dental students is crucial, given the significant oral health implications for patients undergoing treatment for head and neck cancers.[6] Research indicates that while dental students possess a good understanding of oral cancer, their knowledge about the specific effects of radiotherapy is less comprehensive.[7] Despite the importance of this knowledge, research indicates that the curriculum for dental education may not adequately cover the intricacies of radiotherapy, resulting in knowledge gaps among future practitioners. As a result, dental students may struggle to provide optimal care for patients affected by the side effects of radiotherapy.[8] This study aims to assess the level of awareness regarding radiotherapy among dental students, identify potential knowledge gaps, and highlight the need for enhanced educational interventions.

METHODS AND MATERIALS

This study employed a cross-sectional design to assess the awareness of radiotherapy among dental students. Conducted over three months from June to August 2024, the research encompassed data collection, analysis, and report preparation. The focus was on dental students from a private dental college, with the study receiving approval

from the Department of Oral Medicine and Radiology, as well as ethical clearance from the Institutional Review Board. A sample of 105 participants was chosen through simple random sampling, and demographic details were recorded. A questionnaire consisting of 10 questions was distributed via Google Forms across various social media platforms, predominantly WhatsApp. Informed consent was obtained to ensure confidentiality and privacy, and participants were briefed about the questions, encouraging accurate responses. Data collected through the Google Forms was analyzed using MS Excel to generate the report.

RESULTS

A total of 105 dental students participated in the study aimed at assessing their awareness of radiotherapy. The demographic analysis revealed that a significant majority, 72.4%, were above 20 years of age, while 23.8% fell within the 18–20-year age range, with the remainder being below 18 years. In terms of their year of study, 36.2% were house surgeons, 22.9% were final year students, 31.4% were in their third year, 9.5% were second year students, and the remaining were first-year students. Regarding radiotherapy awareness, 75% of the participants demonstrated an understanding of what radiotherapy entails. Furthermore, 78.1% were able to correctly identify the side effects associated with radiotherapy, including radiation caries. Specifically, 64.8% believed that radiotherapy could lead to osteoradionecrosis, while 86.7% thought that it affects the salivary glands. In terms of preventive measures, 27.6% of the students stated that the extraction of infected teeth is unnecessary. Knowledge of radiation units was also assessed, with 68.6% correctly identifying the unit of radioactivity as Curie and 61.9% recognizing the unit of absorbed dose of radiation as Gray (Gy). Additionally, 66.7% understood the concept of radiation caries and its features, such as dark pigmentation, amputation caries, and superficial white spot caries. When it came to types of radiotherapy, 61% correctly identified external beam radiotherapy and brachytherapy. To minimize radiation exposure, 74.3% of the students suggested methods such as intensity-modulated radiotherapy, fractionation, and shielding techniques.

DISCUSSION

According to a report by Jham BC et al., 90% of patients undergoing radiotherapy may experience xerostomia, while approximately 60% may develop mucositis. Additionally, 40% are affected by candidiasis, over 50% may experience caries following radiotherapy, and 15% of patients might suffer from osteoradionecrosis.[9] In a study by Hafeez, it was found that 57% of participants had below-average knowledge regarding the complications of radiotherapy. In contrast[10], our study revealed that 64.8% of students recognize that radiotherapy can result in osteoradionecrosis, indicating a notable awareness of serious long-term complications affecting dental health. Additionally, a significant 86.7% of respondents acknowledged the impact of radiotherapy on salivary glands, which is crucial, as dry mouth can greatly influence a patient's quality of life and oral health. G. Özkan found that many dentists and dental students tend to underestimate the actual radiation doses associated with dental imaging techniques. In our study, awareness of radiation units was relatively good[11], with 68.6% identifying Curie and 61.9% recognizing Gray (Gy) as appropriate measurement units. This foundational understanding is crucial for dental students, enabling them to communicate effectively with their peers and make informed decisions in clinical environments. In a study conducted by Afnan A. Nassar, 71.3% of participants disagreed that osteoradionecrosis of the jaw (ORNJ) is not a potentially severe risk for patients undergoing radiotherapy. In contrast, our study found that 64.8% of students believe that radiotherapy can lead to osteoradionecrosis. Afnan A. Nassar reported that 78.8% of participants identified radiation caries as one of the significant oral problems associated with radiotherapy, emphasizing the importance of discussing this issue with head and neck cancer (HNC) patients prior to treatment.[12] In our study, it is encouraging to note that 66.7% of students understand radiation caries and its features. This recognition of specific manifestations of radiation-induced dental issues is vital for enabling early detection and effective management, ultimately helping to maintain the oral health of patients undergoing radiotherapy.[13] The identification of external beam radiotherapy and brachytherapy by 61% of participants signifies a reasonable familiarity with different treatment modalities. However, this also indicates a potential area for further education, as knowledge about various types of radiotherapy is essential for effective patient management and interdisciplinary communication.[14] The study highlights that 74.3% of students suggested methods to minimize radiation exposure, such as intensity-modulated radiotherapy, fractionation, and shielding techniques. This awareness reflects an understanding of radiation safety principles, which are vital for protecting both patients and healthcare providers during treatment.[15]

CONCLUSION

In Conclusion, while the study indicates a good level of awareness regarding radiotherapy among dental students, it also highlights areas where educational improvements can be made. Enhancing the curriculum to address knowledge gaps—particularly in preventive measures and the implications of radiotherapy on dental practice—can better equip future dental professionals. By fostering a deeper understanding of radiotherapy and its complications, dental students will be more capable of providing comprehensive care for patients undergoing cancer treatment, ultimately improving patient outcomes in this vulnerable population.

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