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Knowledge, practices and regulatory challenges associated with portable handheld dental x-ray devices utilization among Indonesian dentists: A cross-sectional study

[Journal of Dentomaxillofacial Science](#) • Article • 2025 • DOI: 10.15562/jdmfs.v10i3.2015

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Abstract

Objective: This study aimed to assess the knowledge of Indonesian dentists regarding the usage, safety practices, and regulatory frameworks for portable handheld dental X-ray devices. **Material and Method:** A descriptive, cross-sectional study was conducted among dentists in Surabaya, Indonesia, between June and October 2024. A total of 1,770 dentists were invited to participate via an online questionnaire, with 184 completing the survey (10.4% response rate). The validated questionnaire assessed knowledge across 12 fields, each with subpoints. A Likert index percentage formula was used to quantify knowledge, and logistic regression analysis explored correlations between knowledge levels and professional characteristics. **Results:** Dentists' overall knowledge was moderately low (44.9%). Ownership of handheld devices was associated with lower knowledge of

licensing requirements (OR=0.089, p=0.002), radiation protective equipment (OR=0.122, p=0.016), and acrylic shielding plates (OR=0.214, p=0.041). Years of practice positively correlated with interest in purchasing devices (OR=2.230, p=0.020). Conclusion: Despite their benefits, portable handheld dental X-ray devices pose risks without proper training and adherence to regulations. Targeted education, standardized training, and regulatory clarity are essential to ensure safe and compliant use in clinical practice. © 2025 JDMFS. Published by Faculty of Dentistry, Hasanuddin University. All rights reserved.

Author keywords

Dental radiography; Diagnostic; health services; radiation safety; safety regulations; x-rays

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