

ABSTRACT

The ability to diagnose malocclusion is a fundamental competency that must be acquired by dental students as a basis for orthodontic treatment planning. Along with technological advancements, artificial intelligence (AI) has begun to be utilized as an assistive tool in the diagnostic process, including through the analysis of intraoral photographs. This study aimed to compare the accuracy of intraoral malocclusion diagnosis between undergraduate students of the Faculty of Dentistry, Universitas Mahasaraswati Denpasar, and AI systems, namely ChatGPT and Gemini. This study was an observational analytical study with a cross-sectional design. The study subjects consisted of 30 seventh-semester undergraduate students of the Faculty of Dentistry, Universitas Mahasaraswati Denpasar, who had completed basic orthodontics courses and were selected using a random sampling technique. The study objects were 10 intraoral malocclusion photographs, including frontal, right and left buccal, and maxillary and mandibular occlusal views, obtained from standardized literature sources. Students were asked to determine the classification of malocclusion based on the photographs through a digital form. The same assessment was conducted by the AI systems ChatGPT and Gemini using standardized procedures and instructions. The diagnoses obtained were then compared with literature-based reference diagnoses and classified into correct and incorrect categories to assess diagnostic accuracy. The results showed a statistically significant difference in the accuracy of intraoral malocclusion diagnosis among students, ChatGPT, and Gemini ($p < 0.05$). The diagnostic accuracy of students and Gemini was comparable, whereas ChatGPT demonstrated a lower level of accuracy. In conclusion, there was a difference in the accuracy of intraoral malocclusion diagnosis between undergraduate students of the Faculty of Dentistry, Universitas Mahasaraswati Denpasar, and AI systems. The use of AI, particularly Gemini, has the potential to serve as a supportive tool in orthodontic education and preliminary diagnostic processes; however, comprehensive clinical judgment by humans remains essential.

Keywords: intraoral malocclusion, diagnostic accuracy, dental students, artificial intelligence, ChatGPT, Gemini.

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ABSTRAK

Kemampuan diagnosis maloklusi merupakan kompetensi dasar yang harus dimiliki oleh mahasiswa kedokteran gigi sebagai dasar perencanaan perawatan ortodonti. Seiring dengan perkembangan teknologi, *artificial intelligence* (AI) mulai dimanfaatkan sebagai alat bantu dalam proses diagnosis, termasuk melalui analisis foto intraoral. Penelitian ini bertujuan untuk membandingkan akurasi diagnosis maloklusi intraoral antara mahasiswa sarjana Fakultas Kedokteran Gigi Universitas Mahasaraswati Denpasar dengan sistem AI ChatGPT dan Gemini. Penelitian ini merupakan penelitian observasional analitik dengan rancangan *cross-sectional*. Subjek penelitian terdiri atas 30 mahasiswa sarjana semester VII Fakultas Kedokteran Gigi Universitas Mahasaraswati Denpasar yang telah menempuh mata kuliah ortodonti dasar dan dipilih menggunakan teknik *random sampling*. Objek penelitian berupa 10 foto maloklusi intraoral yang meliputi tampak frontal, bukal kanan dan kiri, serta oklusal rahang atas dan bawah, yang diperoleh dari sumber literatur terstandarisasi. Mahasiswa diminta untuk menentukan klasifikasi maloklusi berdasarkan foto tersebut melalui formulir digital. Penilaian yang sama dilakukan oleh sistem AI ChatGPT dan Gemini dengan prosedur dan instruksi yang distandarkan. Diagnosis yang dihasilkan kemudian dibandingkan dengan diagnosis rujukan berbasis literatur dan diklasifikasikan ke dalam kategori benar dan salah untuk menilai tingkat akurasi. Hasil penelitian menunjukkan adanya perbedaan tingkat akurasi diagnosis maloklusi intraoral antara mahasiswa, ChatGPT, dan Gemini yang bermakna secara statistik ($p < 0,05$). Mahasiswa dan Gemini menunjukkan tingkat akurasi diagnosis yang setara, sedangkan ChatGPT memiliki tingkat akurasi yang lebih rendah. Kesimpulan penelitian ini adalah terdapat perbedaan akurasi diagnosis foto maloklusi intraoral antara mahasiswa sarjana Fakultas Kedokteran Gigi Universitas Mahasaraswati Denpasar dengan sistem AI. Pemanfaatan AI, khususnya Gemini, berpotensi digunakan sebagai alat bantu pendukung dalam pembelajaran dan diagnosis awal ortodonti, namun tetap memerlukan peran dan penilaian klinis manusia secara menyeluruh.

Kata kunci: maloklusi intraoral, akurasi diagnosis, mahasiswa kedokteran gigi, *artificial intelligence*, ChatGPT, Gemini

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