



AI Chatbots for Periodontitis Patients in Dental Clinics Using the KAP Model

Siripipatthanakul S^{1,2*}

¹Faculty of Public Health, Bangkokthonburi University, Thailand

²School of Business Administration, GlobalNxt University, Malaysia

***Corresponding author:** Supaprawat Siripipatthanakul, DDS., MS. (Oral Medicine), PhD. (Education), DBA, MS. (Management), Faculty of Public Health, Bangkokthonburi University, Thailand.

Research Article

Volume 11 Issue 4

Received Date: September 21, 2026

Published Date: October 06, 2026

DOI: [10.23880/oajds-16000425](https://doi.org/10.23880/oajds-16000425)

Abstract

Introduction and Objective: AI chatbots for periodontitis patients in dental clinics based on the KAP (Knowledge, Attitude, and Practice) model can significantly boost patient education, engagement, and self-care.

Materials and Methods: This chapter employs a systematic review and thematic content analysis.

Results: Findings show that chatbots can provide tailored assistance, help evaluate and address patients' knowledge of periodontitis, promote positive attitudes towards oral health, and encourage effective daily routines.

Conclusions: AI chatbots can answer frequently asked questions, remind patients of appointments and oral hygiene regimens, and offer personalized advice based on individual needs and behavior patterns. The chatbot will incorporate the KAP model to identify gaps in understanding or practice and provide targeted interventions that improve treatment outcomes and patient compliance in a clinical context.

Keywords: Chatbots; Dental Clinic; Ai-Driven; Oral Care; Periodontitis; Patients; Kap; Knowledge; Attitudes; Practices

Introduction

Periodontitis is far more likely in people with poor oral hygiene. Smoking, certain diets, systemic disorders, and societal and commercial forces increase periodontal disease risk. Much research has examined the cost-effectiveness of preventing and treating periodontitis, but techniques and reporting still need refinement. Home care to prevent gingivitis is the most cost-effective strategy for preventing periodontitis. Public health prevention initiatives and intersectoral care approaches that target common risk factors for periodontitis and other non-communicable diseases can help determine the economic burden of periodontitis and the value of alternative measures [1]. Although digital dentistry

has evolved, challenges remain. In severe cases, performance declines, vertical bone-loss datasets are limited, and 3D imaging is needed. Artificial intelligence could transform periodontology. These technologies can match doctors' performance, improve diagnosis, and optimize operations. Modern imaging and large, diverse datasets can improve treatment effectiveness. Artificial intelligence will transform periodontal care by enabling early diagnosis, customized therapy, and better patient results [2]. Patients' reported outcomes (PROs) can inform clinical decision-making, but periodontal research seldom includes them. Patients seeking periodontitis treatment require the correct knowledge, expertise, and motivation. Periodontitis influences patients' lifestyles, motivation and treatment expectations, barriers

to treatment, and therapy effects. Periodontitis has physical and mental effects, and knowledge and awareness gaps exist. For these reasons, dentists must educate patients. We found periodontitis-specific PROs for validated instruments. Knowledge of these PROs can improve patient-centered care by supporting future research that accurately assesses patients' perceptions of disease and treatment [3]. AI tries to teach computers to reason and decide like humans. AI aids diagnosis, treatment planning, and prognosis in oral and maxillofacial surgery, orthodontics, and prosthodontics. Dental AI chatbots have perks and downsides. Chatbots aid patient communication, diagnostics, post-op care, surgery, and administrative workflow. Chatbots boost dental clinic productivity and patient engagement. Most AI chatbots support patient communication, appointment scheduling, diagnostic support, and post-op care. Chatbots increase treatment adherence, engagement, and administrative efficiency. Certain trials showed 88% physician agreement with diagnostic assistance. Limited natural language understanding, data privacy issues, and varying dental facility standards were common barriers. Although AI chatbots have benefits, dental clinics struggle to adopt them. To maximize usage and potential, dental facilities must overcome technical, ethical, and operational constraints [4]. In dental clinics, AI chatbots can provide individualized information, encourage preventive home care, and boost patient participation in periodontitis education. Bad oral hygiene, smoking, and systemic disorders are key periodontitis risk factors. Additionally, periodontitis affects patients financially. Knowledge and home care prevent disease and save money. Chatbots can bridge knowledge gaps, facilitate early diagnosis, and personalize treatment regimens to improve clinical results and patient experiences. Despite challenges, chatbots can increase patient communication, diagnostic support, and administrative efficiency. These issues include limited natural language understanding, data privacy, and a lack of standards. When these concerns are rectified, AI chatbots could provide proactive, patient-centered periodontal care and education.

Literature Review

Periodontitis Patients in Dental Clinics

Billions of individuals worldwide have dental issues. Periodontitis contributes to health disparities and systemic diseases, including diabetes and cardiovascular disease. In locations with a low sociodemographic index (SDI), periodontitis prevalence, incidence, and DALYs are higher than in those with a higher SDI. Low-SDI regions suffer the biggest burden and expect little drop, whereas high-SDI nations have stable, lower rates. Periodontitis reductions worldwide have not eliminated inequities; low-SDI regions have the highest burden and the least progress. If comprehensive public health

policies do not include preventive oral health in disease care, inequalities will remain and harm the whole health system. To guarantee universal access to periodontal treatment and other early interventions, especially in low-resource areas, immediate action is needed [5]. Periodontal doctors estimate chronic and aggressive periodontitis will remain steady until 2025, but implant-related disorders will rise. Implants are becoming more important. Analysts predict an increase in periodontology and implantology postgraduate education. Implant dentistry publications are rising with demand and training. Researchers predict better-informed individuals requesting more routine checkups. Europe will require skilled dentists and periodontists throughout the next decade. Future qualifications will include more experience and study in implant dentistry and periodontology [6]. Clinicians identified four main themes: psychological barriers and dissatisfaction with uncertain treatment outcomes when managing periodontitis; professional barriers related to referral processes and shared care decisions; patient barriers from undervaluing specialist care; and facilitation of participatory care, standardized referral processes, and aligned treatment expectations in primary and tertiary care. Three significant patient themes were: 1) initial interaction with general dentists improved dental care perceptions; 2) recognizing periodontitis' emotional and social impact encouraged dental care; and 3) health care system confusion hampered patients' journeys. Both respondents stated primary care is essential for periodontitis management and awareness. Primary and tertiary care must collaborate for referral and continuity. Empathy and periodontitis awareness at the clinical and governmental levels are essential to address structural and interpersonal care-delivery barriers. Periodontitis therapy requires primary care. Specialists and general dentists must collaborate to provide seamless care. Planning for health care system-level integration requires patient participation. Better public health education is needed to understand the causes and treatments of periodontitis [7]. AI chatbots for periodontitis patients at dental clinics may help reduce oral illness worldwide. Specialized treatment is scarce, and health inequities are worst in countries with low socioeconomic development index (SDI). Chatbots can help with routine follow-ups, patient education, and periodontal screening. This can help patients proactively manage their dental health. These methods can overcome psychological and systemic hurdles by clarifying treatment expectations, providing accessible information, and guiding patients through referral processes. Artificial intelligence chatbots can improve primary-to-tertiary care communication, standardize management pathways, and provide emotional support, especially for people navigating complex health systems. AI-enabled support in routine dental treatment can increase awareness, patient involvement, and equitable, participative, and continuous periodontitis care in clinics.

AI-Chatbots and KAP Model for Periodontitis Patients

AI that can perform human tasks is a major focus of artificial intelligence research. A study examined periodontists' knowledge, views, and concerns about AI in periodontology. Egyptian periodontists understand AI and its possibilities in periodontology. They see AI as revolutionary for disease prediction and find its diagnostic applications fascinating. Dental schools must incorporate, improve, and expand AI instruction. [8]. AI is expected to play a significant role in dentistry, particularly in education and clinical practice. To incorporate technology effectively in both practice and instruction, it is essential to understand dental students' perspectives on dental professors' and students' attitudes toward artificial intelligence [9].

Lee, et al. [10] compared AI-based chatbot and professional periodontist answers to patient periodontology and implantology questions from the Korean Academy of Periodontology (KAP) online Q&A section. The KAP online Q&A received 219 patient periodontics and implant inquiries for this comparative cross-sectional investigation. Ten evaluators—5 periodontists and 5 laypeople—scored the periodontist and AI chatbot responses using standardized scales. We used t-tests and Spearman correlation coefficients to compare response quality, empathy, consistency, and evaluator preferences. According to 10 reviewers, the AI chatbot outperformed the doctor in quality and empathy. Compared to the periodontist, the chatbot had a higher percentage of low-quality responses (28.7% vs. 15.0%; $P < 0.001$) and a higher percentage of empathic responses (62.5% vs. 42.8%; $P < 0.001$). With no substantial differences in consistency or preference, periodontists and lay evaluators had 64.2% answer consistency. AI-powered chatbots can answer periodontist questions more accurately and compassionately than humans, suggesting that their use as consultation aids needs more study. The intraclass correlation coefficient values were strong (0.79–0.93), indicating high agreement among periodontist and lay evaluators and supporting the study's assessment approach's dependability and robustness [10].

Smadi, et al. [11] found that AI has changed numerous industries, including dentistry. They investigated dental students' knowledge, perspectives, and attitudes about AI in dentistry. The survey collected demographic data, knowledge of AI and its applications in dentistry, awareness of AI risks and limitations, opinions on incorporating AI into dental education and practice, and competence in using AI-enabled dental tools with 30 multiple-choice questions. In total, 214 dental students participated, 65.5% in their fourth or fifth year. AI was known by 80.9%, but only 39.2%

grasped its dental applications. Most participants (76.2%) valued AI in dentistry, especially for dental research and development. However, implementation and maintenance costs (67.3%), AI judgment transparency (47.2%), and data privacy and security (44.4%) were major concerns. Most participants (58.9%) agreed that dentistry curricula should contain specific AI training. Targeted educational programs and training initiatives play a significant role in bridging the knowledge gap and preparing future dental professionals with the skills needed to apply AI technology effectively in dentistry. It also examines AI's ethical implications and issues in dentistry [11].

Many health educators use the Knowledge, Attitude, and Practice (KAP) model to assess students' knowledge, attitudes, and behaviors on topics like periodontal health. AI-based chatbots for periodontal patient education could improve the KAP model. AI Chatbots can correct misconceptions, promote oral hygiene, and provide daily dental care suggestions based on each user's expertise. Chatbots can improve periodontal outcomes and empower patients to maintain their oral health by supporting ongoing learning and behavior modification using engaging, accessible technology. By offering accessible, customized, and consistent oral hygiene, disease management, and treatment information, AI chatbots are fast changing how dental clinics teach periodontitis patients. These digital tools can answer frequently asked questions, reinforce consultation points, and allow patient interaction beyond clinic hours to fill knowledge gaps. AI chatbots can also tailor educational information to patients' requirements and literacy levels, encouraging treatment compliance. However, chatbot knowledge must be genuine and evidence-based, and AI-based teaching should be complemented by human professionals when needed.

ChatGPT, Google Gemini for Dental Education in Periodontitis Patients

Large language models (LLMs) can help dentists and patients diagnose, decide, and communicate. LLMs may improve medical practice and patient care. Symptom and data analysis assist medical diagnosis. This systematic review examines LLM literature. The review found English-language literature using LLM keywords in PubMed, Web of Science, Google Scholar, and Scopus. Researchers collected dental LLM applications, evaluation criteria, and results. The most popular LLM was ChatGPT-3.5. ChatGPT answered dental patient queries during or after treatment. LLMs boost dentistry, patient care, and diagnostic efficiency. Although LLMs may provide false or insufficient information, they should support clinical decision-making. Train them on validated, current datasets to increase performance and

dependability [12]. Large Language Models (LLMs) can digest vast amounts of text and generate human-like language, improving healthcare information retrieval. We tested ChatGPT 4.0, Google Gemini, Google Gemini Advanced, and Microsoft Copilot on 10 clinical questions about periodontal furcation insufficiency. LLM performance varied by rating. Google Gemini Advanced achieved the best comprehensiveness and clarity scores, whereas Google Gemini and Microsoft Copilot received lower relevance. LLMs manage clinical furcation defects, but performance varies. LLMs differed in thoroughness, scientific accuracy, clarity, and utility. Dental professionals seeking clinical information should understand LLMs' strengths and weaknesses [13]. Large language models (LLMs) may aid clinical decision-making and dentistry education. Despite growing interest, evidence on LLMs' periodontology competency, especially in clinically oriented, scenario-based examinations, remains limited. We compared multiple LLMs for accuracy in answering periodontology knowledge- and scenario-based MCQs across difficulty levels, using 100 MCQs from reliable academic sources divided into knowledge-based ($n = 50$) and scenario-based ($n = 50$) categories. Experts categorized the questions into simple and hard (25 questions each). We tested four public LLMs—GPT-4o, Gemini 1.5 Flash, DeepSeek-V3, and Microsoft Copilot—with standardized prompts. We assessed model replies using established answer keys. We conducted statistical analysis using Pearson's Chi-square test, with significance set at $p < 0.05$. Gemini had the highest accuracy (71%), followed by GPT (70%), DeepSeek (65%), and Copilot (63%), with no significant differences ($p = 0.80$). Each model performed better on scenario-based MCQs than knowledge-based ones, with significant improvements for GPT ($p < 0.001$), Gemini ($p = 0.014$), and DeepSeek ($p = 0.022$). Gemini and Copilot accuracy decreased with question difficulty ($p = 0.015$ and 0.022 , respectively), whereas GPT and DeepSeek remained stable. LLMs perform well in periodontology and thrive on scenario-based challenges. As tasks get harder, their accuracy fluctuates. Dental education and clinical support may benefit from these models, but they do not yet support clinical decision-making [14].

To achieve this, the Knowledge, Attitude, and Practice (KAP) paradigm; ChatGPT, Google Gemini, and other LLMs provide tailored health education and assistance for periodontal patients. These AI platforms accurately report the causes, symptoms, and prevention of periodontal disease. They also address patient concerns and misconceptions to develop positive attitudes (Attitude) and motivate optimal dental hygiene practices with individualized reminders and strategies. ChatGPT and Google Gemini can help people maintain their dental health and establish sustainable measures to prevent periodontitis. They use patient-specific knowledge and real-time communication.

Large Language Models (LLMs) for Dental Professionals and Dental Students

Instructional and clinical technology have been changing dental education. The rise of artificial intelligence (AI) has opened up new possibilities for its use in education. Recent progress in generative AI has drawn attention to large language models (LLMs) and foundation models for their natural language processing and generation capabilities, as well as their ability to integrate diverse data sources, such as text, images, and audio. A popular example is ChatGPT, which is built on the GPT LLM. LLMs offer potential advantages and disadvantages in dental education, with an emphasis on periodontal charting, and a use case to illustrate their potential. LLMs can help improve the quality of dental education by providing personalized feedback, generating case scenarios, and creating educational content. However, obstacles, limitations, and hazards remain, including bias and inaccuracies in generated content, privacy and security issues, and the potential for overreliance. Incorporating fun, individualized learning experiences can help prepare students for real-life clinical practice through guidance and oversight, and support the successful and ethical integration of LLMs [15]. Large language models (LLMs) are promising for dental clinical treatment and teaching due to their rapid development. Dental education technology has not been extensively reviewed. LLMs are utilized in seven dental education categories, including exams, educational resources, and assignment evaluation. These applications include technical (inaccurate information, inability to analyze photos, inaccessibility, and high cost) and application (ethical concerns, lack of usage rules, potential impairment to students' knowledge and skills, and wary attitudes toward LLMs) difficulties. To tackle these issues, students, instructors, curriculum administrators, and technical developers must interact. Dental education has only recently begun using LLMs. Future studies should increase applications and develop ethical, technological, and standardized LLM integration standards for dentistry education [16]. AI is transforming dentistry into a more precise, efficient, and patient-centered field. Artificial intelligence (AI) can improve diagnostic accuracy, treatment planning, and dental office management by using machine learning, CNNs, and natural language processing. Dental clinics globally use artificial intelligence, which is no longer experimental. They offer benefits, but they also raise ethical and practical challenges that must be considered. This dilemma shapes dentistry's innovative use of AI, including its use in diagnosis and treatment across specializations, operational efficiency, robotics, nanotechnology, insurance, and ethical and practical implementation [17]. AI has transformed digital technology use. AI algorithms and Large Language Models (LLMs) have revolutionized NLP systems

like ChatGPT. This study examines how advanced LLMs, specifically OpenAI's ChatGPT, affect medical diagnosis, with a focus on dentistry. LLMs use publicly available datasets to improve medical specialists' diagnostic abilities, patient-provider communication, and clinical efficiency. Especially in oral surgery, ChatGPT-4 will transform dental clinics. It advises practitioners and innovators on LLMs, a growing topic. It critically examines the broader ramifications and issues across sectors, including academia and healthcare, and addresses AI's potential to change dental diagnostics for better patient care [18]. AI and large language models (LLMs) have grown in popularity, making educators wary about using them in the classroom. LLMs in dentistry and dental hygiene education using current research. The fact that LLMs can pass high-stakes dental exams calls into question current assessment methodologies. LLMs struggle to objectively research the literature while creating novel dentistry and dental hygiene assignments and evaluation systems. Interpretation-based questions help teachers. LLMs evolve quickly as AI improves. Further research is needed to understand how LLMs affect teaching, learning, and evaluation [19]. AI, IoT, DTs, and LLMs are transforming dental technology. These innovations change clinical diagnosis, patient monitoring, therapy planning, and medical education. Security, privacy, ethics, and trust also pose challenges when integrating these technologies. Image analysis, decision support, and health communication were the main uses of AI-based diagnostic systems and LLM-powered patient-assistance apps. Many studies perform well, but they lack evaluation design, sample size, and real-world validation. Few publications addressed ethical and privacy issues, despite their prominence. Integrated intelligent dental solutions need security, ethics, and clinical validation. To accomplish responsible, patient-focused digital dentistry, cross-disciplinary development, transparency, and regulatory alignment are needed [20]. LLMs are revolutionizing dental education and practice by giving dental professionals and students rapid access to vast amounts of current knowledge, clinical guidance, and research publications. Clinicians can use AI to diagnose complex illnesses, create treatment plans, and answer patient questions with evidence-based solutions. LLMs provide dentistry students with individualized learning tools, explanations of tough topics, and practice exam questions. They aid administrative work, patient communication, and continuing education, making LLMs vital to dentistry professionals and students.

AI-Driven Dental Education for Periodontitis Patients

Periodontics treats the periodontium, the investing and supporting tissues of teeth. Chronic periodontitis is a viral condition causing inflammation in tooth-supporting tissues, attachment loss, and bone loss. Complex periodontal disease

makes it difficult for doctors to diagnose and treat patients. It's a global health issue every year. Periodontal disease pathogenesis and diagnosis require more than a basic clinical examination, patient history, and radiographs. Given risk groups and unknown pathophysiology, microbiome and genetic analyses, disease progression, and patient risk and response to periodontal disease and medication are needed. AI could change diagnosis, imaging analysis, treatment planning, predictive analysis, patient engagement, and dentistry education [21].

Common diseases like gingivitis and periodontitis damage dental and systemic health. Periodontal diagnostics rely on subjective clinical evaluations, which can lead to inconsistent treatment. AI improves measurement precision, treatment planning, and personalized care in healthcare. This study tested convolutional neural networks (CNNs) and segmentation methods for diagnostic accuracy. With 90% accuracy, AI can detect periodontal disease better. Radiographic analysis is more precise with advanced models like Multi-Label U-Net. AI-enabled predictive analytics aid illness progression prediction and therapy planning. AI is improving periodontal therapy with precision, customization, and workflow integration. Uniformity and ethics must be addressed for wider acceptability [22]. A major health issue, periodontal diseases affect 50% of adults worldwide. Periodontal therapy requires patient education. Conventional methods are homogeneous and limiting. AI solutions make education more personalized and interactive. AI can help educate periodontal patients and identify research issues and ways to use these technologies in practice. AI-aided visual instructional aids, natural language processing chatbots, and mobile apps with personalized learning algorithms support periodontal patient education. Educational interventions using artificial intelligence can increase patient knowledge retention, treatment adherence, and oral cleanliness. AI can make periodontal patient education personalized, accessible, and evidence-based. Data and studies on AI use in periodontal patient education remain limited [23]. AI has transformed digital technology use. AI algorithms and Large Language Models (LLMs) have revolutionized NLP systems like ChatGPT. Advanced LLMs, including OpenAI's ChatGPT, are affecting dental diagnosis. These models use publicly available datasets to improve medical specialists' diagnostic abilities, patient-provider communication, and clinical efficiency. ChatGPT-4 will transform dental practices. LLM developments offer practitioners and developers valuable information. AI is transforming dental diagnostics to improve patient care. Periodontitis patients may benefit from Large Language Models (LLMs)' personalized treatment and patient education. LLMs can use advanced natural language processing to diagnose periodontitis more effectively, customize treatment, and anticipate disease progression based on risk factors. LLMs can simplify periodontal disease

management, home care, and maintenance medications for patients, boosting adherence and outcomes. LLM-powered chatbots or virtual assistants can also provide rapid advice, answer common queries, and remind patients of appointments and prescriptions, improving oral health and quality of life.

Previous Studies

At least 50% of Chinese individuals lose teeth to periodontitis, according to Jin, et al. [24]. Northeast Chinese patients' periodontitis KAP has been hardly investigated. This study analyzed periodontitis KAP in Northeast China by gender, age, income, education, and location. Using convenience sampling, researchers performed a one-week cross-sectional survey. Researchers collected periodontitis KAP data using a standardized questionnaire. We employed descriptive statistics (means, SDs, frequencies, percentages). A Shapiro-Wilk test determined normality. Researchers examined demographic and interaction effects on periodontal KAP scores using nonparametric Kruskal-Wallis tests and multivariate regression. We set statistical significance at $P < .05$. Of the 619 questionnaires sent, we received 562 valid responses from 242 (43.06%) males and 320 (56.94%) females, with a mean age of 41.27 (95% CI 37.4-45.1) years. With mean KAP scores of 3.88/8, 5.28/7, and 5.19/11, Northeast China exhibited low periodontal disease knowledge. Age and education level were strongly correlated with periodontitis KAP ($P < .05$), but gender correlated only with knowledge ($P < .05$). One variable had a marginal impact ($P = .05$), but most geographical and income differences were significant. Multiple regression showed that age increases knowledge and attitude. Knowledge gain was highest in the 41-50 age group (Nagelkerke $R^2 = 1.58$, 95% CI 0.83-2.33; $P < .01$). The attitude scores increased more consistently with age. Practice scores decreased with age. Young women were more interaction-aware than men, while older groups were similar. Higher income and education highly correlated with awareness. The presence of gingival bleeding significantly increased public awareness of periodontitis, particularly knowledge score (Nagelkerke $R^2 = 1.07$, 95% CI 0.69-1.44; $P < .01$). This report describes periodontitis KAP in Northeast China. The findings inform targeted strategies and highlight the need to improve regional periodontal KAP [24].

Sun, et al. [25] used correlation analysis and structural equation modeling to analyze oral healthcare professionals' endodontic-periodontal lesions (EPLs) therapy KAP and their linkages. This cross-sectional study recruited dental professionals in Hangzhou and Shaoxing, China, from February to June 2024 and collected questionnaire data. A self-administered questionnaire collected demographics and KAP scores. Analysis of 281 verified questionnaires. The study included 185 doctors (70.08%) and 58 academic

conference attendees (59.85%). Knowledge, attitude, and practice scores averaged 10.06 ± 3.31 (0-18), 25.58 ± 2.29 (7-35), and 15.70 ± 3.23 (5-25). The study found that education, professional title, research participation, and patient care directly affected knowledge ($\beta = 0.013$, $p < 0.001$). Attitude was directly influenced by research engagement ($\beta = -0.79$, $P = 0.026$) and knowledge ($\beta = 0.24$, $p < 0.001$) and attitude ($\beta = 0.19$, $p = 0.023$) all affected practice. Attitude was indirectly influenced by education, professional title, research participation, and patient treatment ($\beta = -0.44$, $p = 0.001$), while knowledge and education ($\beta = 0.04$, $p = 0.034$) and practice ($\beta = 0.30$, $p = 0.001$) all affected practice. Dental professionals treated EPLs poorly, with nice attitudes and inactive practices. Focused education and hands-on training should fill knowledge gaps and help positive attitudes translate into more active, effective clinical practices that improve clinical outcomes [25].

Alahmari [26] examined KAP on maternal periodontal health, pregnancy outcomes, and preventive oral care among dentists, gynecologists, and expecting women in southwestern Saudi Arabia. A cross-sectional survey included 499 people. Researchers assessed knowledge (periodontal disease, its implications for pregnancy, and training/literature) and attitudes (relevance of maternal oral health and interest in additional education) using group-specific items. Researchers calculated each group's mean score, divided it by the highest score, converted it to a percentage, and classified it as good ($\geq 75\%$), intermediate (50-74%), or poor ($< 50\%$). We analyzed categorical differences using chi-square tests with Bonferroni-adjusted post-hoc comparisons ($p < 0.05$). Gynecologists had the lowest knowledge, dentists the greatest, and pregnant women the strongest preventive habits. Clinical relevance: Improving gynecologists' oral-systemic understanding and preventative oral care in pregnant women may help diagnose periodontal disease early and prevent preterm birth and low birth weight [26].

Ji, et al. [27] found that AI usage in periodontal diagnosis is understudied despite its growing use in healthcare. We evaluated ChatGPT-4's diagnostic accuracy in applying the 2017 Classification of Periodontal and Peri-Implant Diseases and Conditions to US dental school faculty to evaluate its potential in dental education and clinical decision-making. Researchers compared diagnoses to two board-certified periodontists' norms. Separately, researchers prompted ChatGPT -4 with the same clinical information and tested diagnostic accuracy using McNemar's test and hierarchical binary logistic regression. Two faculty members exceeded ChatGPT-4 for diagnostic accuracy ($p < 0.01$), and one outperformed the model in grading. Dentists and ChatGPT-4 performed similarly across diagnostic categories. Dentists were 75% accurate, while ChatGPT-4 was 63.3%. ChatGPT -4 diagnoses like dentists. Although not domain-specific,

its availability and reasonable accuracy suggest it could be used as a dental educational and clinical support tool [27]. AI chatbots in dental offices could improve patients' knowledge, attitudes, and practices (KAP) about periodontitis. These chatbots provide patients with reliable, convenient, and personalized information. AI-powered chatbots can give ongoing, tailored support to boost periodontal disease awareness, improve preventive and treatment attitudes, and promote better oral health habits. Research suggests that traditional training approaches may create knowledge gaps and inconsistent health practices. Studies have revealed that artificial intelligence models like ChatGPT-4 can match dental professionals' diagnostic accuracy in certain places. These approaches work best as supplements to education and behavior change, not as therapeutic treatments. AI-powered dentistry chatbots empower patients, increase communication, and, most importantly, improve patient-centered periodontal care.

Methodology

This chapter uses a systematic analysis with the modified PRISMA method for data collection and thematic content analysis [28]. This systematic review employed the PRISMA approach, and content analysis was performed on scholarly articles indexed in Google Scholar, Web of Science, and Scopus from 2024 to 2026. The study selected related topics and keywords through purposive sampling. The PRISMA method comprises four steps.

Identification

The study selected scholarly journals through purposive sampling. The identification process begins here. Identifying keywords and subjects in the analyzed articles marks the completion of the selection procedure. Data were collected and examined from a compilation of originally published English-language articles. These papers came from a diverse range of sources; at this stage, 118 scholarly articles on the topic were identified.

Screening

During screening, articles were selected for further review. After screening, 57 academic papers were selected from the initial collection. The keywords used were chatbots, dental clinics, artificial intelligence-driven methods, oral care, periodontitis, patients, knowledge, attitudes, and practices.

Eligibility

When determining eligibility, the researchers excluded publications or copies of papers that were not complete

versions of the originals. 28 academic papers selected during the qualifying round are accessible to the general audience.

Inclusion

This phase included 28 scientific publications. The fourth phase completed the collection of studies for inclusion in the systematic review. The academic content was reviewed to ensure it followed the prescribed chapter order. Before publishing the results, three independent reviewers evaluated the study's quality. An investigation revealed instances of plagiarism and grammatical errors. In addition, the chapter contained instances of plagiarism and computer-generated text. Before submitting the final edition, two English professionals reviewed and approved the material.

Results

The findings show that periodontist patients who need ongoing support are embracing AI-powered chatbots for proactive dental education. These chatbots provide easy-to-access, personalized, and timely information regarding periodontal disease, dental hygiene, treatment options, and follow-up care. This proactive approach has improved oral health care outcomes by educating patients, encouraging preventive measures, and promoting early intervention. Chatbots can answer common patient inquiries, reduce anxiety, and improve patient-dentist communication.

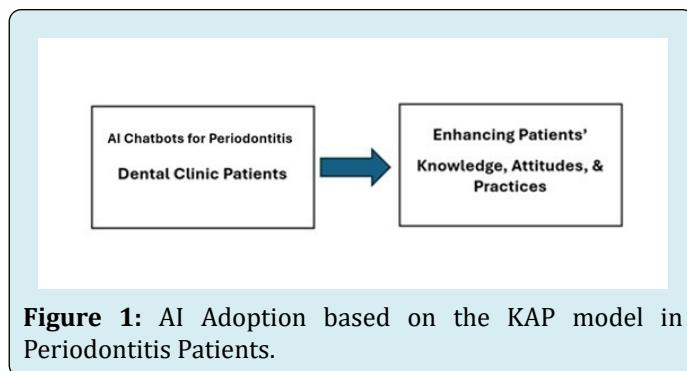


Figure 1: AI Adoption based on the KAP model in Periodontitis Patients.

Figure 1 shows KAP-based AI adoption for periodontitis patients. The Knowledge, Attitude, and Practice (KAP) model can be used to assess periodontitis patients' awareness and comprehension of AI applications in dental care (knowledge), their perceptions and beliefs about the utility and safety of AI-driven tools (attitude), and their willingness or behavior to use AI-based solutions for diagnosis, monitoring, and treatment. Patients' knowledge must be improved through education, their attitudes positively influenced by addressing accuracy and privacy concerns, and they must be motivated to use AI by demonstrating its benefits in improving periodontal health outcomes.

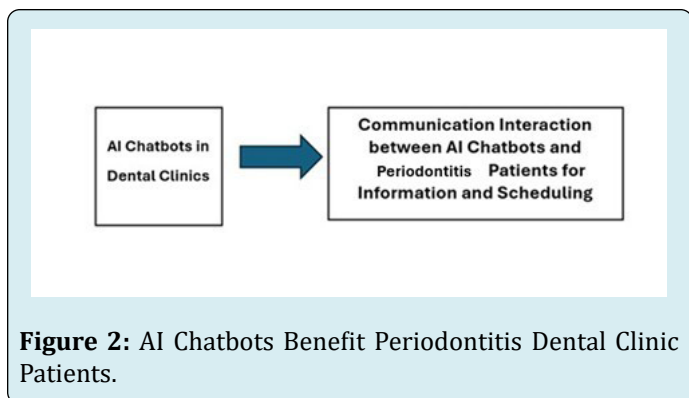


Figure 2 shows how AI chatbots can help periodontitis patients. Chatbots can improve patient engagement and satisfaction in periodontitis dental clinics by providing timely support. These assistants use AI to address periodontitis, treatment, post-procedure, and appointment scheduling concerns. This reduces wait times and improves access to information. Chatbots can help maintain oral health by reminding patients about medication, follow-up appointments, and daily oral hygiene. Chatbots can also enhance patient outcomes by relieving clinical staff of administrative tasks, allowing them to focus on patient care and providing more personalized support.

Discussions

Prevalence and Risk Factors of Periodontitis

Periodontitis is more likely in people with poor dental hygiene and low SDI. Still a huge issue. Food, smoking, systemic diseases including diabetes and cardiovascular disease, and other factors are risk factors. These factors also interact with social and economic forces. The condition exacerbates oral health disparities and systemic health disparities. This is especially true in places with insufficient dental care. Periodontitis prevalence has decreased, but not enough to close the difference between high- and low-resource settings. Periodontitis is a global issue. Therefore, effective public health actions targeting common risk factors are needed to reduce periodontitis and its financial impact.

Opportunities and Challenges of AI Integration in Periodontal Care

Despite breakthroughs in digital technology, dentistry still struggles with difficult issues including severe periodontitis and vertical bone loss. Limited datasets, limited imaging, and poor performance in demanding settings contribute to these constraints. But AI-driven technology is affecting periodontology. AI can replicate clinicians, standardize diagnoses, and streamline processes. To overcome the study's limitations, better imaging techniques

and a larger, more diverse dataset are needed. If these hurdles are resolved, periodontal treatment may change. Artificial intelligence will enhance health outcomes, detect patients earlier, and customize treatment regimens.

Outcomes Reported by the Patient and the Importance of Patient Knowledge

Periodontal therapy research infrequently uses patient-reported outcomes (PROs), despite their importance in therapeutic decision-making. Clinicians should assess patients' awareness of periodontitis, personal experiences, willingness to seek therapy, and barriers to treatment success. Patient education and awareness are lacking, and periodontitis has a severe influence on physical and emotional health. Periodontitis damages gums and tissue. The dentists' role in patient education is crucial. Validated periodontitis-specific PROs can help dentists assess and respond to patients' perspectives and treatment experiences, promoting patient-centered care and research.

AI Chatbots in Dentistry for Periodontitis Patients

Dental AI and chatbots are becoming more popular. This has expanded patient interaction, diagnostic support, administrative chores, and post-operative surgical care. Chatbots can boost efficiency by improving patient interaction, appointment scheduling, and treatment adherence. However, these tools' diagnostic accuracy is inconsistent, and significant issues persist. This article discusses the limits of natural language interpretation, data protection challenges, and inconsistent adoption in practice. To reach their potential, they must overcome technical, ethical, and operational obstacles. Optimized AI chatbots can improve periodontitis patient education. They can provide patient-specific information, emphasize preventive care, and encourage patient participation.

Closing Knowledge Gaps and Promoting Patient-Centered Care

Periodontitis is linked to habits such as good oral hygiene, quitting smoking, and managing systemic health. Knowledge and practices are limited for many patient populations. Age, education level, socioeconomic status, and geographic region significantly affect periodontitis knowledge, attitudes, and practices (KAP). AI chatbots can provide handy, personalized instructional tools, encourage behavior modification, and enhance patient engagement. Chatbots may correct misconceptions, provide specialized information, and promote oral health using the KAP architecture. This will improve periodontal treatment efficiency, effectiveness, knowledge, and equity.

Conclusions

Periodontitis patients often have poor knowledge, attitude, and practice (KAP) across age, education, gender, income, and region. Higher-educated people have improved awareness and attitudes, but their practices may not. To educate all generations, especially children, about bleeding gums. These differences suggest a need for specialized education and support. Artificial intelligence chatbots can address these gaps by providing personalized, easily accessible information to low-KAP patients to improve self-care, illness management, and oral health. Periodontal disease is linked to dental hygiene. For periodontal disease patients, dental plaque management knowledge, attitudes, and practices (KAP) are crucial. Periodontal disease patients need to understand oral hygiene and be encouraged to brush regularly, use an oral irrigator, and utilize an interdental brush. Personalized treatment should consider patient knowledge, attitudes, occupation, and income. AI chatbots for periodontitis patients at dental clinics can benefit both dental professionals and patients when guided by the KAP model. Dental professionals see these chatbots as valuable tools because they can improve patient education, support appointment scheduling, and encourage adherence to oral hygiene practices. As a result, patients achieve better outcomes, and clinic operations become more efficient. Personalized and easily accessible information about periodontitis is made available to patients through the use of AI chatbots. In addition, these chatbots let patients play an active role in their dental health care by answering questions or concerns outside clinic hours. These chatbots can enhance interactions between patients and dentists and support ongoing disease care. They do this by addressing knowledge gaps, fostering good attitudes, and encouraging suitable practices. Dental clinics can use AI-powered chatbots to educate patients, schedule appointments, and give periodontitis patients personalized oral hygiene advice. Drawbacks include limited clinical diagnostic capabilities, limited understanding of minor patient symptoms, data privacy concerns, and reliance on high-quality, varied training data. Computer literacy and linguistic difficulties may hinder patient engagement. Further study is needed to assess chatbots' real-world efficacy in improving therapeutic outcomes, adherence, and patient satisfaction. Additionally, chatbots should integrate with electronic health records, be multilingual, and be protected against data breaches and inclusion issues.

References

1. Pattamatta M, Chapple I, Listl S (2025) The value for money of preventing and managing periodontitis: Opportunities and challenges. *Periodontology* 98(1): 56-64.
2. Spartivento G, Benfante V, Ali M, Yezzi A, Di Raimondo D, et al. (2025) Revolutionizing periodontal care: the role of artificial intelligence in diagnosis, treatment, and prognosis. *Applied Sciences* 15(6): 3295.
3. Furquim CP, Suárez LJ, Tavares R, Retamal-Valdes B, Feres MFN, et al. (2025). Perceptions, attitudes, and needs of periodontitis patients: a qualitative systematic review. *Journal of Clinical Periodontology* 52(1): 80-91.
4. Kumari A, Reddy U, Shetty DMS (2026) The Role of AI Chatbots in Dentistry: A Systematic Review of Applications, Benefits, Challenges, and Future Directions. *International Arab Journal of Dentistry* 17(2): 15.
5. Ghanem AS, Bata R, Kovács N, Nagy AC (2025) Sociodemographic inequalities in the global burden trends and machine learning-based projections of periodontitis from 1990 to 2030 across different development levels. *Frontiers in Oral Health* 6: 1609961.
6. Madianos P, Papaioannou W, Herrera D, Sanz M, Baeumer A, et al. (2016) EFP Delphi study on the trends in Periodontology and Periodontics in Europe for the year 2025. *Journal of Clinical Periodontology* 43(6): 472-481.
7. Tay JRH, Lim YRI, Lee WZ, Nascimento GG, Ng E (2026) Necessity of Collaborative Health Care for Patients with Stage III and IV Periodontitis: Qualitative Study. *JDR Clinical & Translational Research* 11(1): 62-72.
8. Mohd Noh NZ, Wan Ismail WNS, Wan Maznan WNI, Khazin SM, Ardini YD (2026) Knowledge, attitude, practices, awareness, and confidence (KAPAC) among general dental practitioners on basic periodontal examination (BPE). *Dental Journal: Majalah Kedokteran Gigi* 59(1): 33.
9. Yazdi NA, Zamaniahari U, KhadiviMaleki H, Hasanabadi P (2025) Readiness to use artificial intelligence: a comparative study among dental faculty members and students. *BMC Medical Education* 25(1): 1006.
10. Lee JH, Oh SH, Schwendicke F, Chaurasia A, Kim YT (2025) Evaluating the quality and empathy of responses to patient questions on the Korean Academy of Periodontology's online question and answer section: a cross-sectional study comparing periodontists and an AI-powered chatbot. *Journal of Periodontal & Implant Science* 55(6): 485.
11. Smadi L, Sharaireh A, Al-Khateeb O, Odat S, Yusuf D (2025) Assessing Dental Students' Readiness for AI in Dentistry: A Comprehensive Analysis at Jordan

- University. *Journal of International Dental and Medical Research*, 18(1): 374-383.
12. Kaplan TT, Akyol GE (2026) The role of large language models in dental diagnosis, decision-making, and communication: A systematic review. *Japanese Dental Science Review* 62: 57-67.
 13. Chatzopoulos GS, Koidou VP, Tsalikis L, Kaklamanos EG (2025) Evaluation of large language model performance in answering clinical questions on periodontal furcation defect management. *Dentistry Journal*, 13(6): 271.
 14. Khatib HMA (2026) Are Large Language Models Ready for Specialty-Level Periodontology? A Comparative Evaluation Across Question Types and Difficulty Strata.
 15. Claman D, Sezgin E (2024) Artificial intelligence in dental education: opportunities and challenges of large language models and multimodal foundation models. *JMIR Medical Education* 10(1): e52346.
 16. Kong M, Fok EHW, Yiu CKY (2025) A Scoping Review of Large Language Models in Dental Education: Applications, Challenges, and Prospects. *International Dental Journal* 75(6): 103854.
 17. Syed AZ, Duman SB, Ozen DC, Bayrakdar IS, Mupparapu M (2026) Introduction to Large Language Models and the Application of Generative Artificial Intelligence in Dental Education and Clinical Practice. *Dental Clinics* 70(2): 315-329.
 18. Farhadi Nia M, Ahmadi M, Irankhah E (2025) Transforming dental diagnostics with artificial intelligence: advanced integration of ChatGPT and large language models for patient care. *Frontiers in Dental Medicine* 5: 1456208.
 19. Li H, Chen S, Chang B, Wang X, He Y, et al. (2026) Application of artificial intelligence in oral health management: challenges and opportunities. *Frontiers in Medicine* 13: 1700529.
 20. Salvi S, Vu G, Gurupur V, King C (2025) Digital Convergence in Dental Informatics: A Structured Narrative Review of Artificial Intelligence, Internet of Things, Digital Twins, and Large Language Models with Security, Privacy, and Ethical Perspectives. *Electronics* 14(16): 3278.
 21. Mahajan A, Sood R (2025) Application of AI in Periodontics. *Application of Robotics in Dentistry* pp: 305-324.
 22. Sarakbi RM, Varma SR, Muthiah Annamma L, Sivaswamy V (2025) Implications of artificial intelligence in periodontal treatment maintenance: a scoping review. *Frontiers in Oral Health* 6: 1561128.
 23. Akram HM (2026) The Role of Artificial Intelligence in Periodontal Patient Education: A Narrative Review. *Journal of the California Dental Association* 54(1): 2616993.
 24. Jin C, Chi M, Li C, Li Y, Wang W, et al. (2025) Knowledge, attitudes, and practices to periodontal health of the northeast Chinese public: Cross-sectional study. *JMIR Public Health & Surveillance* 11(1): e72069.
 25. Sun F, Hu M, Zhu Q, Wang J, Wang P, et al. (2024) Knowledge, attitudes, and practices toward the treatment of endodontic-periodontal lesions among oral health care providers: a multi-center cross-sectional study. *BMC Oral Health* 24(1): 1513.
 26. Alahmari MM (2026) Periodontal Health and Pregnancy Outcomes: A Knowledge, Attitudes, and Practices Study of Healthcare Providers and Pregnant Women in Southwestern Saudi Arabia. *The Journal of Contemporary Dental Practice* 27(2): 163-169.
 27. Ji EY, George KA, Ahmadi Z, Bender E, Finkelman M, et al. (2026) Integrating Artificial Intelligence in Periodontal Diagnosis: A Comparative Evaluation of ChatGPT-4 and Dental Educators. *Journal of Dental Education*.
 28. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, et al. (2021) The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* pp: 372.

YOUR RESEARCH DESERVES GLOBAL VISIBILITY

• Publish • Discover • Share • Connect

MEDICAL	CLINICAL	LIFESCIENCES	PHARMA
90+ OPEN ACCESS JOURNALS		400+ RESEARCH TOPICS	

SUBMIT YOUR RESEARCH

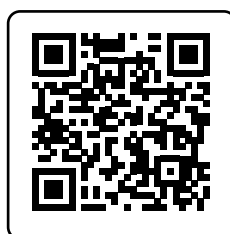
Submit your manuscript through our online submission system.

REPRINTS

If you require a reprint of any article, please contact us.
info@medwinpublishers.com

BECOME A REVIEWER

Share your expertise and contribute to scholarly publishing.



SCAN TO EXPLORE MEDWIN JOURNALS

• Journals • Submit Manuscript • Reviewer Program • Article Tracking

Our Journals indexed in



This article published by **Medwin Publishers**, 28475 Witherspoon Dr, Novi, MI 48377, United States, +1-248-247-6042, WhatsApp +1 (248) 275-1133, info@medwinpublishers.com

© 2026, by the Authors. The articles published from this journal are distributed to the public under “**Creative Commons Attribution License**” (<https://creativecommons.org/licenses/by/4.0/>). Therefore, upon proper citation of the original work, all the articles can be used without any restriction or can be distributed in any medium in any form.