

Assessing the perception of dental postgraduate students regarding the use of ChatGPT in Dentistry. A multicity survey

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Received: 21-May-2026, Manuscript No. JPAI-2026-0016; **Editor assigned:** 25-May-2026, PreQC No. JPAI-2026-0016 (PQ);

Reviewed: 10-Jun-2026, QC No. JPAI-2026-0016; **Revised:** 24-Jun-2026, Manuscript No. JPAI-2026-0016 (R); **Published:** 01-July-2026

Citation: Kumari, S. (2026). Assessing the perception of dental postgraduate students regarding the use of Chat GPT in Dentistry. A multicity survey. J Prog Artif Intell.

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ABSTRACT

The rapid evolution of Artificial Intelligence (AI) technologies, especially ChatGPT, has begun to influence various fields, including healthcare and dental education. ChatGPT, a large language model developed by OpenAI, offers potential support in academic, clinical, and administrative domains, particularly for dental postgraduates handling rigorous academic and clinical responsibilities. This study aims to assess the Knowledge, Attitude, and Practices (KAP) of dental postgraduate students regarding the use of ChatGPT. A cross-sectional, questionnaire-

based study was conducted among postgraduate dental students from various specialities. A validated 22-item KAP questionnaire was distributed in hard-copy format, comprising sections on knowledge (7 items), attitude and practice (13 items), and 2 concluding questions. A sample size of 850 participants was estimated based on standard prevalence-based calculation methods. Data collection was conducted through Google Forms and WhatsApp groups of postgraduates. Most participants demonstrated awareness of ChatGPT and reported using it for academic tasks such as literature reviews, concept clarification, and case presentations. Positive attitudes

toward its integration in dental education were observed, with students recognizing its potential to enhance self-directed learning and information accessibility. However, concerns were raised about its impact on critical thinking, content accuracy, and ethical use. Dental postgraduate students showed considerable enthusiasm for the use of ChatGPT in education and practice, but a balanced approach is needed to address concerns and ensure responsible use. The integration of AI literacy into dental curricula is recommended to equip future professionals with the skills necessary to effectively and ethically engage with AI-driven tools.

KEYWORDS: Artificial Intelligence, Large Language Model, Generative Pre-Trained Transformer, Dental Education

1. INTRODUCTION

ChatGPT is an AI-based Large Language Model (LLM) created by OpenAI, serving as an advanced conversational AI system ^[1]. It is built on the Generative Pre-trained Transformer (GPT) architecture, specifically GPT-4, and aims to produce responses that resemble human communication ^[2]. AI is increasingly used in healthcare for decision-making, streamlining workflows, improving care quality, patient monitoring, and customising treatments. Its potential extends both the medical and dental sectors. Although AI's use in dentistry remains limited, its development has already influenced areas such as robotic assistance, dental imaging and diagnostics, caries detection, radiography, pathology, and electronic record management ^[2]. In dental education, particularly at the postgraduate level, there is growing interest in integrating AI tools, especially ChatGPT. These tools offer significant support for academic and clinical responsibilities, including literature reviews,

case presentation preparation, quick access to theoretical concepts, and simulated patient interactions. Their potential to foster self-directed learning, provide instant feedback, and enhance problem-solving skills aligns well with the rigorous demands of postgraduate training. Today's postgraduate students increasingly rely on ChatGPT and similar AI tools for quick, convenient, and comprehensive access to information. The ease of use and instant availability of these tools appeal to students who must balance demanding clinical schedules with academic responsibilities. As a result, ChatGPT is often the first port of call for clarifying concepts, generating summaries, and even structuring academic content, reflecting a shift in how information is accessed and used in higher education. Therefore, understanding the Knowledge, Attitudes, and Practices (KAP) of dental postgraduate students regarding ChatGPT is essential. Their perspectives can inform the development of evidence-based guidelines and educational strategies that support the responsible and effective integration of AI tools into dental education and clinical practice ^[3]. This study evaluates dental postgraduate students' awareness, perceptions, and practical use of ChatGPT, and explores their enthusiasm and concerns regarding its application in academic and clinical settings.

2. MATERIALS AND METHODS

2.1 Study design

This study used a cross-sectional, questionnaire-based design to evaluate dental postgraduate students' knowledge, perceptions, and attitudes toward ChatGPT and its potential applications in dentistry. The objective was to assess variations in these parameters across students' postgraduate education levels ^[4].

2.2 Study population

The study population comprised postgraduate dental students enrolled in various specialties at a reputed dental college in Uttar Pradesh. Participants who were currently pursuing postgraduate education in dentistry were included in the study.

2.3 Sample size estimation

An a priori sample size calculation was performed using the point-biserial correlation model (t-test family). Assuming a small effect size ($|\rho| = 0.10$), a one-tailed significance level of 0.05, and 90% statistical power, the required total sample size was calculated to be 850 participants ($df = 848$). The critical t value was 1.646, with a noncentrality parameter (δ) of 2.93, yielding an actual power of 0.90.

2.4 Questionnaire

- A structured Knowledge, Attitude, and Practice (KAP) questionnaire was used as the primary data collection instrument. The questionnaire was adapted from previously validated tools and modified to suit the context of ChatGPT use in dentistry. It consisted of 22 items divided into three sections ^[4].
- Knowledge (7 items) – assessing awareness and understanding of ChatGPT
- Attitude and Practice (13 items) – assessing perceptions and opinions about its incorporation into dental practice and education.
- Conclusive questions (2 items)

2.5 Data collection procedure

The questionnaire was distributed to participants via Google Forms, email, and postgraduate WhatsApp groups. To ensure data integrity, each participant was allowed to submit only one response. Only fully

completed questionnaires were included in the final analysis.

2.6 Statistical evaluation

The data for the present study were entered into Microsoft Excel 2007 and analyzed using SPSS version 23.0. Descriptive statistics were reported as frequencies and percentages. Comparisons between ordinal and nominal variables were performed using the Chi-square test. A p-value of less than 0.05 was considered statistically significant, indicating a significant association between the variables, while a p-value greater than 0.05 was considered statistically non-significant.

3. RESULTS AND DISCUSSION

The knowledge assessment of the study subjects revealed comprehensive awareness and engagement with ChatGPT and related AI technologies in the context of dental education. All participants reported having heard of ChatGPT, with about two-thirds recognizing it as an AI language model developed by OpenAI. A majority had personally used ChatGPT for academic or personal reasons and were aware of its advanced capabilities for understanding and generating human-like text. Most respondents were familiar with ChatGPT or similar conversational AI tools and acknowledged the potential of such technology to enhance dental education. However, despite high general awareness and usage, only about one-third of the participants had received formal discussion or instruction on the use of AI tools like ChatGPT within their dental curriculum (Table- 1, Bar Graph-1). The attitude assessment of ChatGPT among the study subjects revealed a generally positive outlook on its use in dentistry, with varying degrees of

enthusiasm for specific applications. A large majority (87.3%) like the technology such as ChatGPT for dental practice, learning, and research. Similarly, 83.5% believe that ChatGPT has the potential to enhance efficiency and productivity in dentistry. When it came to curriculum integration, nearly half (45.6%) are willing to incorporate ChatGPT into dental education, while 43% are undecided (“May Be”), and only 11.4% are against it. Regarding patient education and communication, 77.2% viewed ChatGPT as a useful tool. However, there was greater scepticism about its role in advancing research-related tasks, with only 11.4% affirming its usefulness and a significant 87.3% responding “No.” The likelihood of integrating ChatGPT into dental practice for operational tasks such as patient education and appointment management showed cautious optimism: 57% were uncertain (“May Be”), 16.5% said “Yes,” and 26.6% said “No.” To stay updated on the latest dental advancements, 78.5% would use ChatGPT, indicating strong support. When it comes to getting quick answers during dental practice, 26.6% would use it, while a majority (55.7%) expressed uncertainty and 17.7% were not inclined. On the broader question of whether ChatGPT could advance dentistry ethically and responsibly, over half (54.4%) answered “May Be,” 32.9% said “Yes,” and 12.7% said “No.” Finally, 53.2% would consider using ChatGPT for dental education, research, or practice tasks, while 43% remain unsure and only a small minority (3.8%) are opposed. A significant share of study participants expressed concerns about the potential negative impacts of relying on Chatgpt. Specifically, about one-third (32.9%) believe that dependence on ChatGPT could hinder the development of critical thinking skills, while a majority (53.2%) are uncertain (“May Be”), and only 13.9% disagree with this concern.

Regarding the risk of plagiarism or copyright infringement when using ChatGPT, few respondents (7.6%) definitively believe it poses such risks, but over half (55.7%) remain unsure, and 36.7% did not see it as a potential issue. Additionally, about a quarter (25.3%) of participants had reservations about ChatGPT’s ability to provide accurate information, indicating some skepticism about its reliability. (Table 2; Bar Graphs 2 and 3). The evaluation of participants’ views on ChatGPT’s ability to improve dental education showed mostly positive perceptions. The majority, 77.2%, see ChatGPT as having moderate potential to enhance educational outcomes, reflecting widespread acknowledgement of its usefulness as a learning aid. A notable segment, 15.2%, believes ChatGPT could significantly transform dental education, indicating optimism about its future influence. Only a small fraction, 7.6%, see it as having limited potential, suggesting minimal scepticism within the group (Table-3, Piechart-1).

The survey results indicate that study participants predominantly view ChatGPT as a valuable tool for advancing dentistry, especially in education and research. Half of the respondents (50.6%) believe ChatGPT is most beneficial in dental education, highlighting its perceived role in enhancing learning, teaching methods, and curriculum design. Close behind, 43.0% see significant potential for ChatGPT to aid dental research, suggesting that many recognize its usefulness for academic inquiry, data analysis, and supporting scientific advancements. In contrast, only a small fraction (2.5%) believe ChatGPT’s benefits are mainly in dental practice, indicating limited recognition or application of AI in clinical settings at present. Additionally, a minimal number of participants (3.8%) feel that ChatGPT would not be beneficial in any of these areas (Table 3, Piechart 2).

In which areas do you believe Chat GPT could be most beneficial?

The analysis of knowledge and attitude levels by gender among the study subjects showed no statistically significant differences between females and males. In terms of knowledge, 3.8% of females have low knowledge, 59.6% have moderate knowledge, and 36.5% have high knowledge. Among males, none fall into the low knowledge category, 44.4% fall into the moderate knowledge category, and 55.6% fall into the high knowledge category. However, the p-value of 0.198, being greater than the significance threshold of 0.05, suggests that these

differences are not statistically significant. Similarly, in terms of attitude, 5.8% of females exhibit a low attitude, 28.8% a moderate attitude, and 65.4% a high attitude. Among males, 3.7% show a low attitude, 44.4% a moderate attitude, and 51.9% a high attitude. The p-value of 0.377 further confirms that these differences in attitude levels between genders are also not statistically significant.

Table 1. Knowledge Assessment of Study Subjects

Variable	Value	Percent (%)
Have you heard of ChatGPT previously	Yes	100.0
Are you aware of the AI language model ChatGPT developed by OpenAI?	No	32.9
	Yes	67.1
Have you ever utilized ChatGPT for academic or personal purposes	No	30.4
	Yes	69.6
Have you been informed about the capabilities of ChatGPT in understanding and generating human like text?	No	24.1
	Yes	75.9
Are you familiar with ChatGPT or similar AI-based conversational tools?	No	17.7
	Yes	82.3
Are you aware that ChatGPT could have a role in enhancing education in dentistry?	No	19.0
	Yes	81.0
Have you ever discussed or been instructed on the use of AI tools like ChatGPT in your dental curriculum?	No	64.6
	Yes	35.4

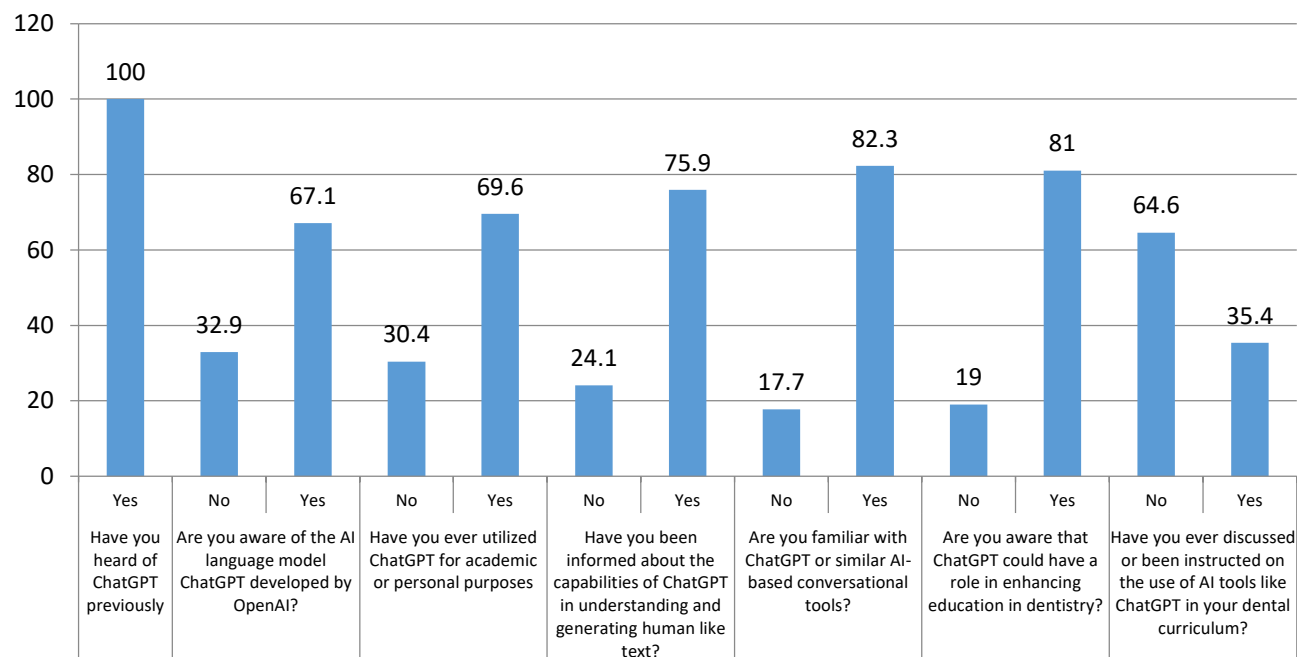


Figure 1. Bar Graph Showing Knowledge Assessment of Participants

Table 2. Attitude and practice Regarding Chat GPT

	Value	Percent (%)
Do you like using technology for dental Practice, learning, and research, like ChatGPT?	No	12.7
	Yes	87.3
Do you think ChatGPT has the potential to enhance efficiency and productivity in dentistry?	No	16.5
	Yes	83.5
Would you consider integrating ChatGPT into the dental education curriculum?	No	11.4
	May Be	43.0
	Yes	45.6
Do you think that ChatGPT could be a useful tool for patient education and communication in dentistry?	No	22.8
	Yes	77.2
Do you believe that ChatGPT could have a role in enhancing research-related tasks in dentistry?	No	87.3
	May Be	1.3
	Yes	11.4
How likely are you to integrate ChatGPT into your dental practice for tasks like patient education and appointment scheduling?	No	26.6
	May Be	57.0
	Yes	16.5
Would you use ChatGPT to stay updated with the latest advancements in dentistry?	No	20.3
	May Be	1.3
	Yes	78.5
How likely are you to use ChatGPT to obtain quick answers or information in your dental practice?	No	17.7
	May Be	55.7
	Yes	26.6
Do you think ChatGPT has the potential to advance dentistry per se if used ethically and responsibly?	No	12.7
	May Be	54.4
	Yes	32.9
Would you consider using ChatGPT for dental education, research, or practice related tasks?	No	3.8
	May Be	43.0
	Yes	53.2
Do you feel that relying on ChatGPT would prevent you from acquiring critical thinking skills?	Yes	32.9
	May Be	53.2
	No	13.9
Do you think that using ChatGPT could lead to plagiarism or copyright infringement accusations?	Yes	7.6
	May Be	55.7
	No	36.7
Do you have reservations about ChatGPT's capacity to offer accurate information?	Yes	25.3
	May Be	63.3
	No	11.4

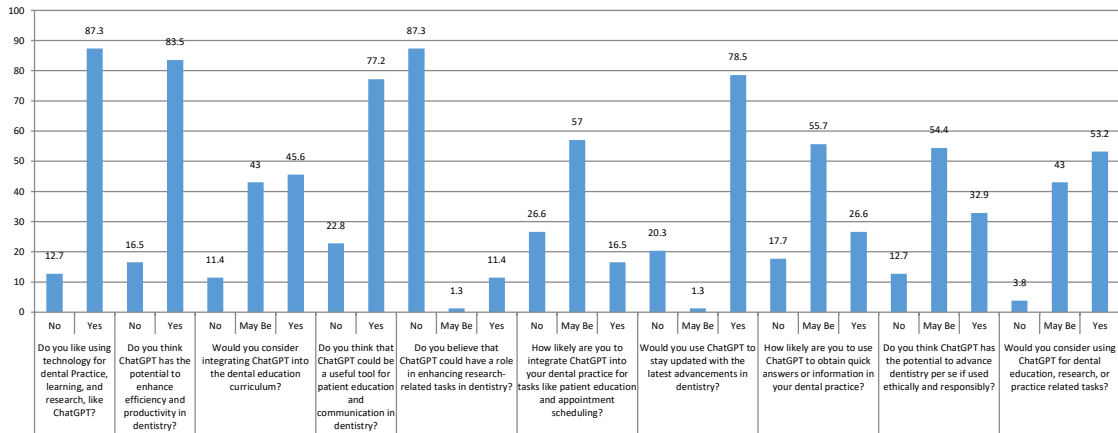


Figure 2. Attitude and Practice Regarding ChatGPT

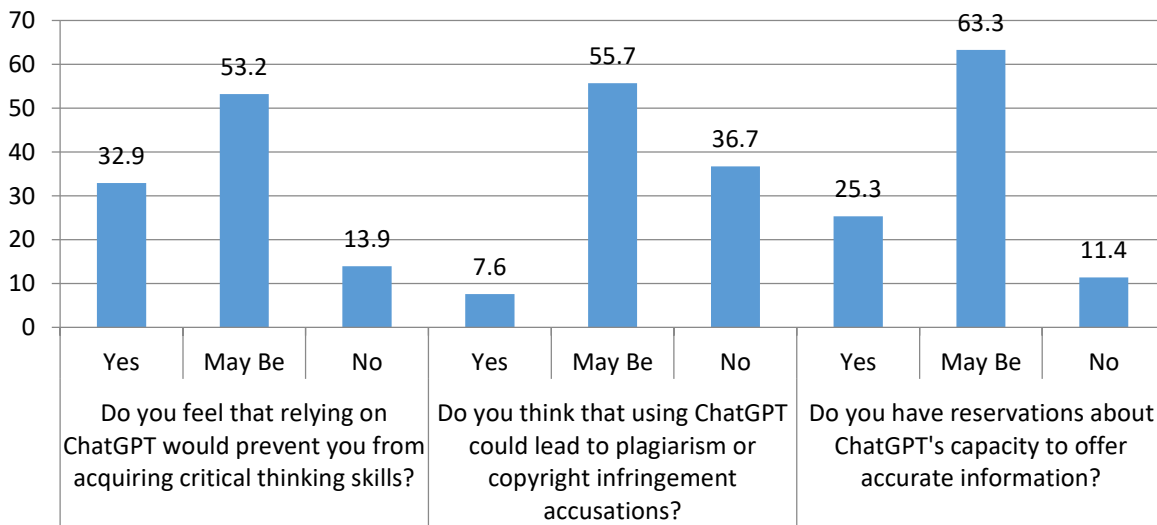


Figure 3. Graphical Representation of Participants' Attitude and Practice (Bar Graphs 2 and 3)

Table 3. Conclusive questions regarding chat GPT

	Value	Percent (%)
Potential of ChatGPT to enhance dental education	Low Potential	7.6
	Moderate Potential	77.2
	High Potential	15.2
In which area(s) do you believe ChatGPT could be most beneficial?	None	3.8

	Dental education	50.6
	Dental research	43.0
	Dental practice	2.5

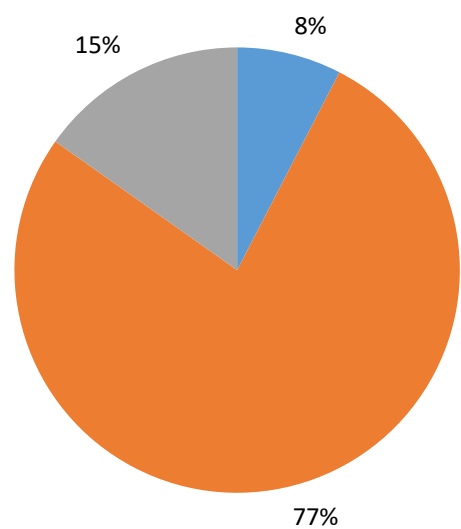


Figure 4. Graphical representation of participants’ perception regarding the potential of ChatGPT to enhance dental education

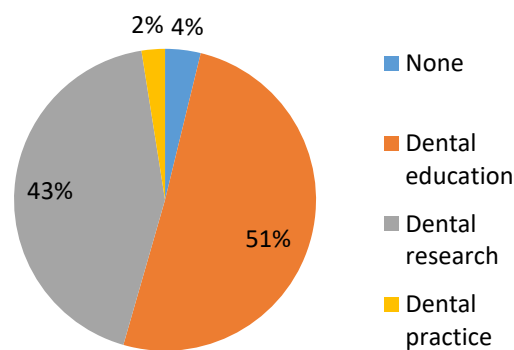


Figure 5. Graphical representation of participants’ perceptions on the areas where ChatGPT could be most beneficial

4. DISCUSSION

The adoption of Generative Artificial Intelligence (GenAI) tools, especially ChatGPT, has greatly changed academic practices by creating new opportunities to improve student learning and engagement. A notable trend emerging from our data is the growing reliance of students on ChatGPT for everyday academic tasks. From completing assignments and preparing presentations to studying for examinations and generating clinical case explanations, students increasingly use ChatGPT as a valuable academic assistant. Its convenience and instant accessibility enable users to obtain information quickly and with minimal effort. However, this ease of access also raises concerns about overdependence. Many students may rely on AI tools without fully understanding the underlying concepts, which can lead to superficial learning and reduced critical engagement. In this study, all participants (100%) were aware of ChatGPT and its dental applications. Conversely, Belaldavar C et al. reported that only 82% of students were aware of ChatGPT [5]. About 70% of respondents used ChatGPT for academic or personal reasons, and 80% found it useful for locating relevant dental literature and scholarly articles. Similarly, Bonsu EM et al. observed that students trusted AI-generated responses and highlighted the importance of

regulating these technologies to address ethical issues such as creativity, misuse, and copyright concerns ^[6]. Furthermore, 75.9% of respondents acknowledged ChatGPT's capacity to understand and produce human-like text. As noted by Biswas S, while ChatGPT generally produces content with a lower risk of plagiarism, human review and editing remain necessary ^[7]. The tool helps researchers draft scientific papers, conduct literature reviews, summarise findings, organise data, suggest titles and citations, and prepare first drafts. In our study, about 69% of participants preferred using ChatGPT for research tasks such as data collection, analysis, literature reviews, and manuscript writing. A key benefit of ChatGPT is its ability to quickly process information and identify connections across datasets, yielding faster insights than traditional methods. These results align with those reported by Belaldavar C et al., in which 89% of participants believed ChatGPT could assist with research activities, literature reviews, and scientific writing ^[5]. About 85% of students in our study considered ChatGPT an essential resource in dental education. Its ability to simplify complex dental concepts and treatment options also makes it a valuable tool for enhancing patient education and communication. In contrast, Roganović et al. (2023) reported that only 7.9% of final-year dental students and practicing dentists in Belgrade, Serbia, were aware of ChatGPT ^[8]. Such variations may be attributed to differences in digital literacy, institutional exposure, access to AI technologies, and cultural perceptions of AI use in education. Our study found that most participants perceived significant potential for ChatGPT to advance dentistry, particularly in education and research. Notably, 45.6% of participants expressed willingness to incorporate ChatGPT into various dental tasks, while 43% supported its

integration into the dental curriculum. By comparison, Belaldavar C et al. reported that more than 90% of participants were willing to incorporate ChatGPT into their curriculum ^[5]. However, integrating ChatGPT into academic settings poses several challenges, particularly regarding academic integrity and the risk of overreliance on the technology ^[9]. The findings revealed frequent use despite limited in-depth understanding, indicating a superficial engagement with the tool. This is especially concerning in healthcare, where ethical issues such as the dissemination of inaccurate information and reliance on non-credible sources may have significant consequences. Another major concern is the protection of patient data, particularly as Large Language Models (LLMs) become increasingly integrated into clinical practice. Ensuring data privacy and upholding ethical standards are essential for the responsible adoption of these technologies in healthcare settings.

4.1 Limitations of the study

- Geographic limitation, restricting the generalizability of the findings.
- Reliance on self-reported responses, which may have introduced response bias.
- Lack of branch-wise speciality categorisation, preventing comparison of ChatGPT utilisation across different dental specialities.
- Future studies should include speciality-based analyses to better understand ChatGPT usage patterns within various branches of dentistry.

5. CONCLUSION

Most participants showed adequate awareness of ChatGPT and its features, with many using it for both academic and personal reasons. The results indicated a

positive view of ChatGPT's ability to improve dental education, research, and patient communication. However, participants also expressed cautious concerns about its effects on critical thinking, data accuracy, and ethical use. These findings highlight the need for responsible AI integration in dental education and practice. Including structured AI literacy and ethics training in dental curricula could help students use AI tools effectively. Such approaches can enhance the educational advantages of AI while reducing potential risks in professional dental work.

AUTHOR CONTRIBUTION

All the authors contributed to this research and also to the further work. Additionally, all the authors reviewed this manuscript.

FUNDING

There is no funding associated to this research.

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