

Comparison of Knowledge and Attitude Towards Chat GPT In First and Final-Year Dental Students

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Abstract

Objective: This study aimed to examine the knowledge and attitude towards Chat-GPT among first and final-year dental students.

Methods: This was a cross-sectional comparative study conducted at the Rawal Institute of Health Sciences RIHS Islamabad. The duration of the study was 3 months after approval by the Ethical Committee from June 2023 to August 2023. An electronic questionnaire was designed to assess the knowledge and attitude of first-year (G1) and final-year (G2) dental students studying at RIHS. The respondents had to agree or disagree with each statement of the questionnaire. The frequency and percentage for each response were calculated. All the items of the knowledge and attitude questionnaire were assessed for the difference in response between G1 and G2 groups with the help of the Chi-square test.

Results: The knowledge assessment section showed that both first-year and final-year student groups (G1, G2) had inadequate knowledge and discouraging attitudes toward Chat-GPT. 90.6% and 86.7% of G1 and G2 students knew about what Chat-GPT is and this was the only response that showed good knowledge in both groups. 71.1% of first-year students agreed to use Chat-GPT in education as compared to 60% of final-year students. The response of any group could not exceed 70% for any of the attitude questions. The difference in knowledge and attitude response was statistically insignificant between the G1 and G2 groups showing no relationship between the responses of the two groups.

Conclusion: These results highlight that there is a strong need to improve knowledge and a positive attitude towards the use of AI tools like Chat-GPT in dental students.

Keywords: Artificial Intelligence, Chat-GPT, Dental education, Dental students, Knowledge, Attitude.

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Cite this Article: Naureen S, Kiani HG, Naureen N, Shafique M. Comparison Of Knowledge and Attitude Towards Chat GPT In First and Final-Year Dental Students. JRMC. 2024 Mar. 29;28(1). <https://doi.org/10.37939/jrhc.v28i1.2425>.

Received January 19, 2023; accepted July 31, 2023; published online March 15, 2024

1. Introduction

Natural language processing (NLP) models have revolutionized the healthcare industry by providing ease and convenience to access the latest information.¹ Chat-GPT, is a recently developed AI tool that is gaining popularity these days.² It uses a neural network and works like the human brain. It has the capability of recognizing contextual relationships between words and sentences.³ Chat-GPT, a cutting-edge language model developed by Open AI, can generate human-like text responses and has found application in various fields, including healthcare. It is currently used in science and is capable of completely transforming the learning abilities of biomedical science students as well. Chat-GPT can behave like a virtual teaching assistant, updating students with recent information and leading to interactive simulations.^{5,6} After continuous research, Open AI released the latest version of the large-scale language model GPT-4. It can not only receive image and text input, but also has significantly improved reasoning

skills, and the ability to write code.⁷ Critically speaking science gathers new information and interlinks complex ideas together in new ways to create innovation in different fields of learning. This software is not capable of such high-level critical thinking yet.⁸ In dentistry, Chat-GPT is an emerging trend and it can provide numerous services, including better diagnosis, image analysis, and treatment of diseases.⁹ In particular, the use of Chat-GPT offers several benefits for dental students and faculty alike, and they can potentially benefit by integrating Chat-GPT into their educational and clinical environments.¹⁰ Despite all the potential, AI solutions have not yet made many inroads into routine medical and dental practice. In a country like Pakistan, there is an urgent need to study how knowledgeable our students are about Chat-GPT and how frequently they use this AI tool.

The purpose of this study is to examine and compare the knowledge and behaviour of first and final-year dental students towards Chat-GPT. By understanding their perceptions and usage patterns, we aim to

understand the potential impact of this technology on dental education, patient communication, and clinical practice. This research will examine factors such as familiarity with the technology, perceived usefulness, and willingness to incorporate Chat-GPT into their academic and clinical routines. In addition, it will shed light on the future strategy of our educational system to improve the understanding and acceptance of this AI tool among dental students during four years of dental school.

2. Materials & Methods

This was a cross-sectional study in which a questionnaire was used to examine dental students' knowledge and attitude about Chat-GPT. This study was conducted at Rawal Institute of Health Sciences Islamabad, (RIHS) from 2nd June 2023 to 4th August 2023. The duration of the study was three months and the ethical Committee of RIHS approved the study. Only students in the first and final year of BDS took part in the study. Convenience sampling was done and a sample size was calculated using the WHO calculator with a confidence interval of 95% and a population proportion of 50%. The population size was 250 and the margin of error was 5%. A total number of 128 students studying at RIHS were selected consisting of 64 students in each group. All students were briefed about the study and consent was formally taken from each participant.

To ensure the content validity of the questionnaire items had to meet the objectives of this study. The questionnaire items were extracted from a previously validated study and self-designed according to our research.^{21,22} The questionnaire was revised by an academic team consisting of two assistant professors from the Faculty of Orthodontics of RIHS and a computer science student with a background in dental health informatics. In this process, the items were checked for clarity and understanding to eradicate the wording biases. A pilot study was also conducted with randomly selected 10 students to check whether the questionnaire was easily readable or not. Any negative feedback was not reported by the participants. The first year group was designated G1 and the final year group was designated as G2. There were three sections, in the questionnaire namely (1) demographic data, (2) knowledge of Chat-GPT, and (3) attitude towards using Chat-GPT (Annexure-A). The knowledge assessment part consisted of seven questions and the attitude

assessment part consisted of six questions. The students had to agree /disagree with each question. The value was set as 2 for agreement and 1 for disagreement. The questionnaire was developed as a Google form and printed on paper. Data collection was carried out in one session by distributing the questionnaire to all dental students in their respective classrooms. They were not allowed to use the internet or discuss with each other to reduce external bias. After data collection the questionnaire was manually sorted and four final-year questionnaires from the G2 group were rejected due to incomplete answers so the G2 group finally had a sample of 60 students, while the G1 group consisted of 64 students. The percentage of agreement and disagreement with each question was calculated and the standard of evaluation was set as:

70% or above students agreed to the questionnaire = Good knowledge and positive attitude.

Less than 70% of students agreed to the questionnaire = Inadequate knowledge and negative attitudes.

Data was analyzed using the IBM SPSS (version 20.0), with quantitative data summarized as means, frequencies, and standard deviations. The data was also presented in tabular form. To test the difference between the knowledge and attitude of groups G1 and G2, an inferential statistical test called the Chi-square test of Independence was used. The significance value was set at less than 0.05.

3. Results

The average age of our sample was (19.7 years) for first-year G1 and (22.7 years) for the final-year G2 group. In the G1 group, out of 64 students, 4 (6.3%) were male and 60 (93.8%) were females. In the G2 group, the total number of students was 60, of which 8 (13.3%) were males and 52 (86.7%) were females. The sample reflected that the age of RIHS students ranged between 19-23 years with a predominance of females. The results of our study suggest first-year (G1) and final-year students (G2) both showed inadequate knowledge and negative attitudes toward Chat-GPT. In the knowledge questionnaire, only two questions (1 and 4) showed good knowledge of the G1 group. Table I shows the frequencies and percentages of the responses to specific knowledge questions and Table II contains frequencies and percentages for attitude. A greater percentage of students disagreed with the attitude questionnaire in both G1 and G2 groups showing negative attitudes towards the use of Chat-GPT.

Table 1: Frequency and Percentage of Knowledge

Knowledge questions	Group	Response	Frequency	Percentage
Do you know what is chat GPT?	G1	NO	6	9.4%
		YES	58	90.6%
		TOTAL	64	
	G2	NO	8	13.3%
		YES	52	86.7%
		TOTAL	60	
Chat GPT can assist in providing dental health information	G1	DISAGREE	30	46.9%
		AGREE	34	53.1%
		TOTAL	64	
	G2	DISAGREE	34	56.7%
		AGREE	26	43.3%
		TOTAL	60	
Patients can receive personalized responses, from chat GPT	G1	DISAGREE	26	40.6%
		AGREE	38	59.4%
		TOTAL	64	
	G2	DISAGREE	26	43.3%
		AGREE	34	56.7%
		TOTAL	60	
Chat GPT can educate students	G1	DISAGREE	18	28.1%
		AGREE	46	71.9%
		TOTAL	64	
	G2	DISAGREE	24	40%
		AGREE	36	60%
		TOTAL	60	
Chat GPT can help in appointment schedule	G1	DISAGREE	32	50%
		AGREE	32	50%
		TOTAL	64	
	G2	DISAGREE	34	56.7%
		AGREE	26	43.3%
		TOTAL	60	
Chat GPT can provide treatment options to dental professionals during planning	G1	DISAGREE	42	65.6%
		AGREE	22	34.4%
		TOTAL	64	
	G2	DISAGREE	36	60%
		AGREE	24	40%
		TOTAL	60	
Chat GPT can help in dental health monitoring	G1	DISAGREE	44	68.8%
		AGREE	20	31.3%
		TOTAL	64	
	G2	DISAGREE	36	60%
		AGREE	24	40%
		TOTAL	60	

The chi-square test was used to compare/ find the association of the knowledge and attitudes regarding Chat-GPT among G1 and G2 groups. The p-values in

Table 3 suggest that there was a statistically insignificant difference between the knowledge of freshmen and graduate students. Similarly, the p values in Table IV indicate an insignificant difference between the attitudinal responses of both groups. The null hypothesis was accepted at the end of the study that there was no difference in the knowledge and attitude of first and final-year students regarding Chat-GPT.

Table 2: Frequency and Percentage of Attitude

Behavior questions	Response	Frequency	Percentage	
You are currently using Chat GPT for dental studies	G1	DISAGREE	38	59.4%
		AGREE	26	40.6%
		TOTAL	64	
	G2	DISAGREE	42	70%
		AGREE	18	30%
		TOTAL	60	
How often do you use Chat GPT for dental studies weekly/yearly	G1	Yearly/never	3	46.9% / 9.4%
		Daily/weekly	12	18.7% / 25%
		TOTAL	64	
	G2	Yearly/never	3	53.3% / 13.4%
		Daily/weekly	0/20	0% / 33.3%
		TOTAL	60	
Will u continue using Chat GPT in future	G1	DISAGREE	34	53.1%
		AGREE	30	46.9%
		TOTAL	64	
	G2	DISAGREE	42	70%
		AGREE	18	30%
		TOTAL	60	
Did you find Chat GPT more convenient and user friendly	G1	DISAGREE	32	50%
		AGREE	32	50%
		TOTAL	64	
	G2	DISAGREE	34	56.7%
		AGREE	26	43.3%
		TOTAL	60	
Will you recommend others to use Chat GPT?	G1	DISAGREE	24	37.5%
		AGREE	40	62.5%
		TOTAL	64	
	G2	DISAGREE	30	50%
		AGREE	30	50%
		TOTAL	60	
Will you buy the paid version of Chat GPT.	G1	DISAGREE	52	81.3%
		AGREE	12	18.8%
		TOTAL	64	
	G2	DISAGREE	50	83.3%
		AGREE	10	16.7%
		TOTAL	60	

Table 3: Chi-Square Test for Knowledge

Knowledge questions	value	df	Asymptomatic significance (2 sided)	Exact sig (2 sided)
Do you Know What is chat GPT?	.484	1	.486	.576
Chat GPT can assist in providing dental health information	1.189	1	.276	.287
Patients can receive personalized responses, from chat GPT	.093	1	.760	.856
Chat GPT can educate dental students	1.950	1	.163	.187
Chat GPT can help with appointment schedule	.553	1	.457	.477
Chat GPT can provide treatment options to dental professionals	.420	1	.517	.579
Chat GPT can help in dental health monitoring	1.036	1	.309	.351

Table 4: Chi-Square Test for Attitude

Attitude questions	value	df	Asymptomatic significance (2 sided)	Exact sig (2 sided)
You are currently using Chat GPT for dental studies	1.527	1	.217	.261
How often do you use Chat GPT for dental studies weekly/yearly	1.416	1	.234	.271
Will you continue using Chat GPT in the future?	3.717	1	.054	.066
Did you find Chat GPT more convenient and user-friendly	.553	1	.487	.477
Will you recommend others to use Chat GPT?	1.968	1	.161	.205
Will you buy the paid version of Chat GPT?	.092	1	.762	.817

4. Discussion

The results of our study showed that statistically, there was no significant difference in knowledge and attitude towards Chat-GPT between the two groups G1 and G2. Both groups had inadequate knowledge of Chat-GPT. Only two questions showed more than 70% agreement in the knowledge questionnaire. In terms of attitudinal response, a larger percentage of students exhibited

negative behaviour toward the use of Chat-GPT in both G1 and G2 groups. A similar study on the perception of artificial intelligence (AI) among medical students showed that most students were positive and willing to adopt it in medical education.¹¹ Most of the previously conducted studies addressed AI-related knowledge in medical students and dentistry students have never been specifically tested for knowledge and attitude towards Chat-GPT. In a Canadian study, (78.9%) of medical students showed a good understanding of AI, however, in the same study students could not answer the true/false questions containing facts and fallacies about AI.¹²

The reason behind the majority of students not showing positive results in terms of knowledge and attitude could be that AI courses are rarely offered to the faculty at RIHS, giving students little opportunity to get trained in this field. Previous studies from the UK reported that the number of students exposed to AI in medical schools was 9.2%, respectively, showing a lower percentage similar to our study.¹³ Chi-square test was used to compare G1 and G2 students in terms of their knowledge and attitude towards Chat-GPT. There was a statistically insignificant difference between the responses of both groups. However, when comparing the percentages, final-year students demonstrated that they integrate Chat-GPT into their educational and clinical practices to a lesser extent than first-year students. 40.6% of G1 and 30% of G2 students stated that they are currently using Chat-GPT for their dental studies. Another study conducted by Masters has shown that medical school curriculum designers need to be proactive and prepare students for AI-driven medical practices.¹⁴ In our study a higher number of G2 students 46.9% indicated a willingness to continue using Chat-GPT in the future, compared to 30% of G1 students. This was the only statistically significant value between the two groups in terms of attitude. Sun and Yin found that most medical students are interested in incorporating AI-related courses in their medical curriculum, but the progress in this regard is still poor.¹⁵ According to our study, students in both groups were unwilling to spend money on purchasing Chat-GPT, i.e. 18.8% in G1 and 16.7% in G2. U.S. healthcare spending accounted for about 16.77% of GDP in 2019, and that spending continued to grow to \$21.8 trillion in 2022, according to WHO.¹⁶ In 2020, the total cost of healthcare in China was about 7% of GDP.¹⁷ This trend of government financial support is increasing the use of AI in healthcare in developed

countries. A local study conducted by Saima and Baber found that 61.7% of medical students in Peshawar had no prior knowledge of AI but showed a positive attitude towards AI which is contradictory to our study.¹⁸ According to our study, the reduced potential of final-year dental students for integrating Chat GPT into dental education, is quite discouraging as they are about to become practicing professionals. This necessitates the need for ongoing training and updates to ensure the reliable and ethical use of Chat-GPT in clinical settings.¹⁹ However these negative results can be because of the social desirability bias, because the students are filling the survey conducted by their teachers so they might want to portray that they don't use Chat-GPT for their assignment since they have little knowledge and no attitude towards its utilization. Overall, the number of students who are familiar with AI health applications is very low. Reasons for this can be the lack of accreditation standards and licenses to introduce AI into medical education and the lack of competent AI faculty.^{20,21}

The limitations of this study are that it was a single-centre study and should have been designed in a multicenter manner for more reliable results. Second, the research population of international studies is different from our study population with different learning environments and cultures, plus most of these studies were done on medical students. Third, the study was based on a self-reported questionnaire, which may have suffered from reporting bias. Further research and implementation strategies should be explored to realize the full potential of Chat-GPT specifically, rather than AI in general, to improve the use of this AI tool in maintaining the highest academic and patient care standards in the field of dentistry.

5. Conclusion

The results of this study can potentially inform educators and policymakers that our dental students need more knowledge and a positive attitude towards Chat-GPT. They should be encouraged to use AI tools to complement and enhance the learning experience while maintaining the highest standards of dental education and patient care in Pakistan.

CONFLICTS OF INTEREST- None

Financial support: None to report.

Potential competing interests: None to report

Contributions:

S.N - Conception of study

H.G.K - Experimentation/Study Conduction

S.N - Analysis/Interpretation/Discussion

H.G.K - Manuscript Writing

N.N - Critical Review

M.S - Facilitation and Material analysis

All authors approved the final version to be published & agreed to be accountable for all aspects of the work.

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