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# Assessing the Awareness of Dental Undergraduates Regarding the Use of ChatGPT in Dentistry: A Questionnaire Survey

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**Abstract**

**Aim:** The present study aims to evaluate the awareness and engagement of dental undergraduate students with ChatGPT.

**Material and Method:** Utilizing a succinct and focused questionnaire, the investigation gauges the students' knowledge, application, and attitudes towards this AI tool in an academic and clinical context. The study involves a simple, seven-item survey distributed electronically among dental undergraduates. It probes whether students are informed about ChatGPT, if they have previously used it, and their perception of its utility in educational and patient communication tasks within dentistry. Additionally, the awareness of ethical implications of employing AI in academics is queried.

**Result:** A total of 500 undergraduate students participated in the study. Of these, about 78% students were familiar with the concept of ChatGPT whereas 65% of students utilized ChatGPT for academic use.

**Conclusion:** AI can help with a variety of activities for medical practitioners, including diagnosis, patient monitoring, research, and medical education. However, it is necessary to carefully evaluate and address any potential drawbacks and ethical issues before putting ChatGPT into use.

**Keyword:** AI, ChatGPT, Dental Students

**Introduction:** ChatGPT is an advanced language model that leverages deep learning techniques to produce human-like responses to natural language inputs.[1] The emergence of artificial intelligence (AI) has revolutionized various fields, including healthcare and education. While ChatGPT has shown promising capabilities in various medical applications, including some positive outcomes in medical licensing examinations, recent studies, have, highlighted the need for careful consideration of its limitations in specific assessment contexts.[2, 3]

The advent of artificial intelligence technologies has been revolutionary across various scientific domains, including healthcare and dental education. ChatGPT, an AI-powered conversational agent, offers a myriad of potential applications, from enhancing research to improving patient education. However, the extent to which future dental professionals are prepared to leverage such technologies remains uncertain.

Beyond the technological dimension, ChatGPT extends medical information access to patients, promising personalized healthcare enhancements across diverse clinical disciplines, such as dentistry, cardiology, endocrinology, and gynecology.[4]

This study assesses dental undergraduates' knowledge, attitudes, and practices regarding ChatGPT, contemplating its significance in their forthcoming dental careers. The study's initiative to probe the readiness of dental undergraduates for AI incorporation is a step towards understanding and shaping future dental educational frameworks to better align with the rapid technological advancements.

**Material and Method:**

**Study Design and Population:** This cross-sectional survey was conducted among dental undergraduates from multiple dental schools. The population will include students from final years of study.

**Sample Size Determination:** The sample size was estimated using the following formula: $n = P \times (1-P) \times z2/d2$. With a margin of error (d) of 10%, a confidence level of 95%, a population size of 500 dental students was selected from 5 dental schools.

**Ethical Considerations:** Ethical approval for the study was granted by the Institutional Ethical committee.

**Pre-testing of Questionnaire:** A self-administered, structured questionnaire was developed and tested among a convenient sample of 20 dental students. The questionnaire was later amended based on the feedback of the students. Internal reliability of the questionnaire was found to be 0.80 using Cronbach’s coefficient. The questionnaire was later distributed either electronically via email or social media platforms or in printed form.

**Survey Instrument:** The designed questionnaire comprised of 7 questions and assessed awareness among dental students about uses of artificial intelligence in dentistry and educational settings. The participant’s responses were ranked according to how much they agreed with each statement that was based on the 3 point scale with alternatives: Yes, No and Don’t know. Information regarding their Name, Age, Gender was also gathered.

**Questionnaire on the awareness of dental undergraduates regarding ChatGPT:**

1. Are you aware of the AI language model ChatGPT developed by OpenAI?

2. Have you ever utilized ChatGPT for academic or personal purposes?
3. Do you believe ChatGPT can assist in finding relevant dental literature and research articles?
4. Have you been informed about the capabilities of ChatGPT in understanding and generating human-like text?
5. Do you think that ChatGPT could be a useful tool for patient education and communication in dentistry?
6. Are you aware of the ethical considerations related to the use of AI models like ChatGPT in academic settings?
7. Have you ever discussed or been instructed on the use of AI tools like ChatGPT in your dental curriculum?

**Data Analysis:** The collected data was tabulated and analyzed using IBM **SPSS Statistics 23**. Chi-square test was applied to explore associations between level of study and awareness or attitudes towards ChatGPT. A p-value of less than 0.05 and power was set at 80%.

**Scoring:** The scoring was made as 3 to 1 (3- YES, 2-NO, 1-DON'T KNOW) for given set of 10 questions. A total score for each respondent by adding scores against each response. The knowledge level only gives a numerical score, it does not have standardized categories of low, average and high level of knowledge. Because of this a self definition of categories range was developed (Max. score 30 & min. score=10). Therefore three levels of knowledge are Good (21-30), average (11-20) poor (Below 10).

**Table 1: Distribution of participants according to Gender**

| Sample Characteristics | Frequency |
|---|---|
| Gender | |
| Male | 110 (22%) |
| Females | 390 (78%) |

**Table 2: Knowledge of respondent regarding AI**

| **Questions** | **Yes** | **No** | **Don't know** | **Knowledge level** |
|---|---|---|---|---|
| Are you aware of the AI language model ChatGPT developed by OpenAI | **390(78%)** | **100(20%)** | **10(2%)** | **Good** |
| Have you ever utilized ChatGPT for academic or personal purposes? | **325 (65%)** | **150 (30%)** | **25 (5%)** | **Good** |
| Do you believe ChatGPT can assist in finding relevant dental literature and research articles? | **350 (70%)** | **125 (25%)** | **25 (5%)** | **Good** |
| Have you been informed about the capabilities of ChatGPT in understanding and generating human-like text? | **365(73%)** | **75 (15%)** | **60 (12%)** | **Good** |
| Do you think that ChatGPT could be a | | | | |

| | | | | |
|---|---|---|---|---|
| useful tool for patient education and communication in dentistry? | **340(68%)** | **50 (10%)** | **110 (22%)** | **Good** |
| Are you aware of the ethical considerations related to the use of AI models like ChatGPT in academic settings? | **175 (35%)** | **250 (50%)** | **75 (15%)** | **Poor** |
| Have you ever discussed or been instructed on the use of AI tools like ChatGPT in your dental curriculum? | **200 (40%)** | **275 (55%)** | **25 (5%)** | **Average** |

**Results:** Table 1 describes the demographic details. The final sample that was included in the study was 500 final year dental students. 78% participants that were included were females i.e. 390, the rest 110 (22%) that were included were males.

Table 2 depicts the knowledge of respondents regarding AI. When the participants were asked about awareness of the AI language model ChatGPT developed by OpenAI, 78% (390) participants were aware of the AI tool. Only 2 % (10) participants did not know of the AI tool. When they were asked if they had used the tool 65% (325) participants had used the tool in some form. About 30% (150) of the participants had not used it.

About 73% (365) participants were informed about the capabilities of ChatGPT in understanding and generating human-like text. A few participants 12% (60) were not aware. When participants were asked about useful tool for patient education and communication in dentistry 68% (340) agreed that it could be used for this purpose. However, 22% (110) were completely unaware about this concept. It was alarming that only 35% (175) were aware of the ethical considerations related to the use of AI models like ChatGPT in academic settings, nearly 50% (250) had no idea of ethical considerations of using ChatGPT in an academic setting.

**Discussion:** The implementation and application of the large-scale language model, ChatGPT, is increasing tremendously in clinical training and education. It offers capabilities that, in some respects, exceed the limitations of humans, but in others, it is surpassed by human´s versatility, emotional intelligence, and comprehending complex intersecting concepts.[5]

In our study 65% of the participants utilized ChatGPT for academic or personal purposes and 70% believed that ChatGPT assist in finding relevant dental literature and research articles. Similarly, in another study by Bonsu EM [6] et al their students also agreed that the answers generated by artificial intelligence were accurate. However other researchers have arguedand recommended adopting these innovative technologies in higher education, accompanied by regulatory measures concerning ethical challenges such as creativity, misuse, and copyright issues.

In our study 73% of the participants were aware about the capabilities of ChatGPT in understanding and generating human-like text. However, although ChatGPT creates articles with less plagiarism, they are not totally free of it and require human editing.[7] When AI-generated language is used for commercial reasons, it is crucial to make sure that it does not violate any underlying copyrights. It should be emphasized that, at present, language models like ChatGPT are not capable of completely taking over the role of human writers, as they lack a similar level of comprehensionand specialized knowledge in the field of medicine. Thus, those who employ

language models in their use must acknowledge these limitations and take measures to guarantee the precision and reliability of the written materials.

Currently, patient education is accomplished via in-person instruction or generic handouts, which are often considered to be traditional method of patient education. In our study 68% (340) participants were of the thought that ChatGPT could be used as model for doing patient education. Despite its enormous potential, the tool currently remains unreliable, as it may provide incorrect or fabricated answers without sourcing. Chat-GPT's current iteration is trained on massive amounts of text data from the Internet pre-2021, primarily from non-medical contexts. This can result in the provision of erroneous or incomplete information when the source material is flawed. These inaccuracies can be misleading due to their authoritative and plausible presentation, which is backed by seemingly credible sources.[8]

**Conclusion**: Modern language models like ChatGPT have many benefits and uses in the medical and healthcare industries. It can help with a variety of activities for medical practitioners, including diagnosis, patient monitoring, research, and medical education. However, there are a number of ethical issues and restrictions associated with using ChatGPT, including biases, plagiarism, copyright violations, and believability. Thus, it is necessary to carefully evaluate and address any potential drawbacks and ethical issues before to putting ChatGPT into use.

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