

## How ChatGPT will effect the future of nursing education?

Hatice Ceylan<sup>1\*</sup>, Cigdem Aydin Acar<sup>1,2</sup>

<sup>1</sup>Department of Nursing, Burdur Mehmet Akif Ersoy University, Bucak School of Health, Burdur 10249, Turkey. <sup>2</sup>Department of Health and Biomedical Sciences, Burdur Mehmet Akif Ersoy University, Burdur 10249, Turkey.

\*Correspondence to: Hatice Ceylan, Department of Nursing, Burdur Mehmet Akif Ersoy University, Bucak School of Health, Alparslan Turkes Boulevard, No:58, Bucak-Burdur 10249, Turkey. E-mail: [hceylan@mehmetakif.edu.tr](mailto:hceylan@mehmetakif.edu.tr).

### Introduction

Nursing education is designed to equip students with the knowledge, skills, and attitudes required to provide safe, effective, and compassionate patient care. Traditionally, nursing education relied on classroom lectures, textbooks, and clinical experiences to prepare students for nursing practice. While these methods remain essential, nursing education has evolved to incorporate technology [1]. The use of technology in nursing education is an integral part of preparing nursing students to become competent and confident health care providers. Over the years, nursing education has evolved with the advancement of technology. Technology has made it possible for nursing students to access information, communicate with instructors, and collaborate with peers. While some of these technology-driven trends in nursing education may seem futuristic, most are extensions of everyday life. Concepts such as smartphones, apps, and virtual conferencing are so deeply embedded in a student's lifestyle that applying them in the context of a nurse educator curriculum is a seamless process for most students [2, 3].

Technology has played a critical role in nursing education over the years. The use of technology in nursing education has facilitated student-centered learning, increased student participation and improved the quality of nursing education. Creative technological methods should be included in nursing education to stay up to date in nursing practice, attend conferences on best practice teaching and learning strategies, follow developments in health technology, and enable students to have a variety of clinical experiences [2]. Technology has made it possible for nursing students to access information anytime and anywhere. Online learning platforms, electronic health records and simulation technology have been integrated into nursing education to improve learning outcomes. These platforms provide nursing students with access to learning materials, lectures and assessments. It also allows students to learn at their own pace, interact with instructors, and collaborate with peers. Electronic health records have become a critical tool in nursing education. Nursing students can access patient information, review medical histories, and develop care plans using electronic health records. Chatbots have gained popularity as a teaching aid for nurses as a result of the development of artificial intelligence (AI) and Natural language processing (NLP) [4, 5].

Education in all fields of health sciences seems to undergo a change thanks to artificial intelligence (AI). In fact, this change is starting to happen right now. Artificial intelligence has been defined as technology that enables a computer system or computer-controlled robot to "learn, reason, perceive, infer, communicate, and make decisions similar to or better than humans" [6]. AI is also defined as systems that imitate human intelligence to perform certain tasks and can improve themselves by repeating the information gathered over the internet. The most important feature that distinguishes artificial intelligence from today's technology systems is that it can imitate human intelligence. This system observes the existing situations and processes the relevant situation in line with the predetermined parameters and gives a reaction accordingly. In this process, artificial intelligence processes state-related data by combining it with fast, iterative and intelligent algorithms.

It is stated that the use of AI-based technologies to support learning in nursing undergraduate education will positively affect the transition to nursing practice [1]. At the graduate level, it is

recommended to support the use of data science methods including AI and to ensure the use of big data by nursing educators [6]. At the same time, it is also recommended to organise doctoral-level courses for nurses to improve their competencies in predictive modelling, biostatistical programming, data management, risk management, multivariate regression, big data governance and cyber threats [6, 7].

In recent years, with the COVID-19 pandemic, traditional lectures in nursing education have been transformed into video lectures and non-face-to-face lectures. And in this process, it was seen that there was a need for new strategies to improve students' self-directed learning and efforts to encourage interaction between instructors and students. This has led to increased interest in the use of chatbots in the field of education. A chatbot, also called a "talking bot", is a type of software that has emerged prominently in the field of information technology, capable of verbal or written conversations with human users and meeting their requests with a question-answer format [1, 8, 9, 10] A chatbot also has various applications in the education field, as people can use it to learn without time and space restrictions. It also improves the effect of self-directed learning as learners experience low levels of stress while engaging in conversations with a chatbot and repeated learning. Furthermore, it facilitates immediate user feedback through conversations during the learning process, and provides customized contents based on the feedback [11].

In the last five years, the current and expected effects of AI on nurse educators, nursing students, and nurse practitioners have been examined by various reviews and research studies. It is predicted that nursing and nursing education will change as nurse educators become more familiar and familiar with the concepts and realities that AI will bring. Additionally, in order to successfully implement AI into their practice, nurses in clinical practice urgently need new knowledge and skills [6].

Generative Pre-trained Transformer (ChatGPT) is a state-of-the-art artificial intelligence chatbot developed in 2022 by OpenAI, an American AI research lab [12]. This AI chatbot uses deep learning techniques to generate natural language texts [13]. One of the key features of ChatGPT is its ability to generate human-like responses [14]. It is developed on a large collection of online text data such as articles, websites, magazines, news and books. Generates text in response to a wide variety of prompts, including questions, statements, and information requests. To use ChatGPT, users simply type a prompt or question, and the chatbot will respond based on its understanding of the language and context of the input. ChatGPT can understand context and engage in a coherent and relevant conversation [15, 16].

ChatGPT has the potential to revolutionize nursing education by providing students with personalized learning experiences, promoting critical thinking, and enhancing communication skills. ChatGPT-3 has contributed significantly to the field. ChatGPT-4 is the latest and most advanced version of the OpenAI language models. ChatGPT-4 offers significant advances in accuracy, context understanding, and adaptability. GPT-4 is said to be able to generate more truth-based statements and provides greater reliability than GPT-3 and GPT-3.5. It is also multimodal, meaning it can accept images as input and generate titles, classifications, and analyses. These enhancements empower nursing students with more precise and personalized learning experiences, resulting in better patient care and propelling the nursing profession to new heights [13, 17, 18]. While current language models generally utilise deep learning with a focus on

supervised learning, future evolutionary models may be built more on reinforcement learning [19, 20].

Numerous possible advantages could result from the use of ChatGPT4 in nursing education. First, ChatGPT4 can be used to simulate patient interactions in a controlled environment, allowing students to practice their clinical reasoning skills without putting real patients at risk. This can be especially useful in situations where access to clinical areas is limited, or where clinical experiences are highly variable in quality. ChatGPT4 can provide students with immediate responses to a multitude of queries, covering a vast range of topics, content, and information. This can be an invaluable tool in enhancing students' grasp of complex concepts, such as pathophysiology, pharmacology, diagnostic reasoning, and critical thinking. With additional prompts, it can efficiently outline rationales for decision making in complex clinical scenarios [21].

Traditional nursing education consists of only lecture-based teaching, which often lacks interaction time, opportunity for practice, and customized feedback. Most nursing students consider physical examination a very important and difficult task, as it is a complex technique aimed at assessing a patient's physical condition using information gathered through observations and questions, as well as the results of medical tests. Nursing students need to have the correct physiological knowledge as well as the competencies to carry out examination, auscultation, percussion, and palpation to correctly complete a physical examination task [7, 21, 22]. By using chatbot systems, students can relate the information they learn to real problems they encounter in their practice.

ChatGPT can offer specific feedback on student achievement and help students identify areas for improvement. This feedback can also be used to meet the individual learning needs of each student. As it can be delivered in real time, it enables students to rapidly change patient treatment strategies. Additionally, ChatGPT can be used to design engaging learning experiences that engage students and motivate them to take an active role in their education. For example, it can be programmed to ask students questions and provide feedback based on their answers, or to present clinical scenarios that require students to make decisions and provide justifications for their choices [21, 23].

ChatGPT are accessible from anywhere at any time, making them a flexible and cost-effective tool for nursing education. This can be particularly beneficial for students who cannot attend classes in person or who balance their nursing education with other responsibilities such as work or family obligations [21, 23].

Despite its potential benefits, there are some limitations to the use of ChatGPT in nursing education. First, ChatGPT lack the emotional intelligence and empathy of real humans, which can limit their ability to accurately simulate patient interactions. Also, ChatGPT may not be able to respond to unexpected events or changes in a patient's condition, which may limit their usefulness as a learning tool [24]. On the other hand, the quality of feedback provided by ChatGPT may be limited by their reliance on pre-programmed responses. This may limit their ability to provide accurate feedback or to respond meaningfully to unexpected situations [24]. Finally, there may be concerns about the potential for chatbots like ChatGPT to replace human instructors or undermine the importance of human interaction in nursing education. This is especially true when ChatGPT replaces, rather than supplements, clinical experience [24, 25]. The benefits, risks, concerns, and limitations of ChatGPT in nursing education are summarized in Table 1 [7, 22, 26].

### Conclusion

In conclusion, ChatGPT has the potential to completely transform nursing education, by advancing how students engage with technology, providing fast and easy access to information, and improving students' capacity to produce text-based knowledge. The use of ChatGPT4 in nursing education has the potential to revolutionize the way that students learn and practice clinical skills. By providing a flexible, cost-effective, and engaging learning tool,

**Table 1 The benefits, risks, concerns and limitations of ChatGPT in nursing education**

Benefits	Risks, Concerns, Limitations
Personalized learning experience	Questionable accuracy
Encourage critical thinking	Citation issues
Developing communication skills	Data security issues
Answering questions	Plagiarism risk
Providing feedback	Limited information for 2021
Reinforcement of learning	Lack of depth and insight in responses
Question preparation	Lack of emotional and personal support
Provide patient, family, and health professional roles	Lack of judgment
Ensuring clinical note-taking	Reasonable explanations for wrong answers (hallucination)
Providing case simulation	Inability to understand the complexity of biological systems
Supporting learning with visuals, animations and videos	Lack of experimental validation
Remote patient monitoring	
Medication management	
Patient triage	
Provide access to a wealth of medical information, including anatomy, physiology, pharmacology, and pathology	
Helping overcome language barriers that promote equality in research	
Assist in medical writing	
Help summarize research papers	
Fast response time; Help provide easily accessible and understandable information about CPR to the general public	
Help reduce errors in care delivery	

chatbots can help to overcome some of the limitations of traditional nursing education. However there are also limitations, academic honesty is a legitimate worry, though, as students might be enticed to use the model to cheat on tests or projects. Nursing education can profit from ChatGPT while avoiding its possible pitfalls by using it wisely and responsibly. Incorporating a critical analysis of the use of technology into nursing education can also encourage its ethical and responsible use while training students for the healthcare industry's quickly changing technological environment.

### References

1. Sitterding MC, Raab DL, Saupe JL, Israel KJ. Using Artificial Intelligence and Gaming to Improve New Nurse Transition. *Nurse Leader* 2019;17(2):125–130. Available at: <http://doi.org/10.1016/j.mnl.2018.12.013>
2. Gause G, Mokgaola IO, Rakhudu MA. Technology usage for teaching and learning in nursing education: An integrative review. *Curationis* 2022;45(1):e1–e9. Available at: <http://doi.org/10.4102/curationis.v45i1.2261>
3. Özsezer G. The future of artificial intelligence in nursing. *Human Sci* 2022;19(2):285–299. Available at: <http://doi.org/10.14687/jhs.v19i2.6217>
4. Ronquillo CE, Peltonen L, Pruinelli L, et al. Artificial intelligence in nursing: Priorities and opportunities from an international invitational think-tank of the Nursing and Artificial Intelligence Leadership Collaborative. *J Adv Nurs*

- 2021;77(9):3707–3717. Available at: <http://doi.org/10.1111/jan.14855>
5. Chang CY, Kuo SY, Hwang GH. Chatbot-facilitated Nursing Education: Incorporating a Knowledge-Based Chatbot System into a Nursing Training Program. *Educ Technol Soc* 2022;25(1):15–27
  6. Buchanan C, Howitt ML, Wilson R, Booth RG, Risling T, Bamford M. Predicted Influences of Artificial Intelligence on Nursing Education: Scoping Review. *JMIR Nurs* 2021;4(1):e23933. Available at: <http://doi.org/10.2196/23933>
  7. Sallam M. ChatGPT Utility in Healthcare Education, Research, and Practice: Systematic Review on the Promising Perspectives and Valid Concerns. *Healthcare (Basel)* 2023;11(6):887. Available at: <http://doi.org/10.3390/healthcare11060887>
  8. Han JW, Park J, Lee H. Analysis of the effect of an artificial intelligence chatbot educational program on non-face-to-face classes: a quasi-experimental study. *BMC Med Educ* 2022;22(1):830. Available at: <http://doi.org/10.1186/s12909-022-03898-3>
  9. Shorey S, Ang E, Yap J, Ng ED, Lau ST, Chui CK. A Virtual Counseling Application Using Artificial Intelligence for Communication Skills Training in Nursing Education: Development Study. *J Med Internet Res* 2019;21(10):e14658. Available at: <http://doi.org/10.2196/14658>
  10. Tanioka T, Yasuhara Y, Dino MJS, Kai Y, Locsin RC, Schoenhofer SO. Disruptive Engagements With Technologies, Robotics, and Caring. *Nurs Adm Q* 2019;43(4):313–321. Available at: <http://doi.org/10.1097/NAQ.000000000000036>
  11. Essel HB, Vlachopoulos D, Tachie-Menson A, Johnson EE, Baah PK. The impact of a virtual teaching assistant (chatbot) on students' learning in Ghanaian higher education. *Int J Educ Technol High Educ* 2022;19(1):57. Available at: <http://doi.org/10.1186/s41239-022-00362-6>
  12. Taecharungroj V. "What Can ChatGPT Do?" Analyzing Early Reactions to the Innovative AI Chatbot on Twitter. *Big Data Cogn. Comput.* 2023;7(1):35. Available at: <http://doi.org/10.3390/bdcc7010035>
  13. Alkhaqani AL. ChatGPT and Nursing Education: Challenges and Opportunities. *Al-Rafidain J Med Sci* 2023;4:50–51. Available at: <http://doi.org/10.54133/ajms.v4i.110>
  14. Pavlik JV. Collaborating With ChatGPT: Considering the Implications of Generative Artificial Intelligence for Journalism and Media Education. *Journalism Mass Commun Educ* 2023;78(1):84–93. Available at: <http://doi.org/10.1177/10776958221149577>
  15. Gilson A, Safranek CW, Huang T, et al. How Does ChatGPT Perform on the United States Medical Licensing Examination? The Implications of Large Language Models for Medical Education and Knowledge Assessment. *JMIR Med Educ* 2023;9:e45312. Available at: <http://doi.org/10.2196/45312>
  16. Kung TH, Cheatham M, Medenilla A, Sillos C, et al. Performance of ChatGPT on USMLE: Potential for AI-assisted medical education using large language models. Dagan A, editor. *PLOS Digit Health* 2023;2 (2):e0000198. Available at: <http://doi.org/10.1371/journal.pdig.0000198>
  17. Sun GH, Hoelscher SH. The ChatGPT storm and what faculty can do. *Nurse Educ.* 2023;48(3):119–124. Available at: <http://doi.org/10.1097/NNE.0000000000001390>
  18. Gunawan J. Exploring the future of nursing: Insights from the ChatGPT model. *Belitung Nurs J* 2023;9(1):1–5. Available at: <http://doi.org/10.33546/bnj.2551>
  19. Uc-Cetina V, Navarro-Guerrero N, Martin-Gonzalez A, Weber C, Wermter S. Survey on reinforcement learning for language processing. *Artif Intell Rev* 2022;56(2):1543–1575. Available at: <http://doi.org/10.1007/s10462-022-10205-5>
  20. Dwivedi YK, Kshetri N, Hughes L, et al. Opinion Paper: "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management* 2023;71:102642. Available at: <http://doi.org/10.1016/j.ijinfomgt.2023.102642>
  21. Baskara FX. The Promises and Pitfalls of Using Chat GPT for Self-Determined Learning in Higher Education: An Argumentative Review. *Prosidi Semin Nas Fak Tarbiyah dan Ilmu Keguruan IAIM Sinjai.* 2023;2:95–101. Available at: <http://doi.org/10.47435/sentikjar.v2i0.1825>
  22. Shen YT, Chen L, Yue WW, Xu HX. Digital Technology-Based Telemedicine for the COVID-19 Pandemic. *Front Med* 2021;8:646506. Available at: <http://doi.org/10.3389/fmed.2021.646506>
  23. Kuhail MA, Alturki N, Alramlawi S, Alhejori K. Interacting with educational chatbots: A systematic review. *Educ Inf Technol* 2022;28(1):973–1018. Available at: <http://doi.org/10.1007/s10639-022-11177-3>
  24. Archibald MM, Clark AM. ChatGPT: What is it and how can nursing and health science education use it? *J Adv Nurs.* 2023;1:1–4. Available at: <http://doi.org/10.1111/jan.15643>
  25. Ahmad S, Jenkins M. Artificial Intelligence for Nursing Practice and Management. *Comput Inform Nurs* 2022;40(3):139–144. Available at: <http://doi.org/10.1097/CIN.0000000000000871>
  26. Vitorino LM, Júnior GHY. ChatGPT and the teaching of contemporary nursing: And now professor? *J Clin Nurs* 2023;32 (21–22):7921–7922. Available at: <http://doi.org/10.1111/jocn.16706>
- Competing interests**  
The authors declare no conflicts of interest.
- Acknowledgments**  
This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.
- Citation**  
Ceylan H, Acar CA. How ChatGPT will effect the future of nursing education?. *Nurs Commun.* 2023;7:e2023032. doi: 10.53388/IN2023032.
- Executive editor:** Na Liu.  
**Received:** 08 October 2023, **Accepted:** 15 November 2023, **Available online:** 16 November 2023.  
© 2023 By Author(s). Published by TMR Publishing Group Limited. This is an open access article under the CC-BY license. (<https://creativecommons.org/licenses/by/4.0/>).