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Research Article

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Graduate Nursing Students' Experiences with the Use of Artificial Intelligence in Education and Clinical Practice

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Abstract

Background: *The integration of artificial intelligence in healthcare is inevitable, particularly in the nursing sector. The purpose of the study is to explore the experiences of graduate nursing students with the use of artificial intelligence in education and clinical practice.*

Methods: *A descriptive cross-sectional study was conducted at the Graduate College of Al-Neelain University, Sudan. The study engaged 101 graduate nursing students using a systematic sampling method. Descriptive statistics were applied after collecting data through a structured, self-administered questionnaire.*

Results: 40.6% of nurses are using artificial intelligence tools on a weekly basis for educational activities, and 59% of nurses reported improvements in their academic performance when using artificial intelligence-based tools. On the other hand, 60.8% of nurses are currently utilizing artificial intelligence in their clinical practice, and 64.4% of nurses see artificial intelligence as aiming to improve patient care and efficiency.

Conclusion: *Graduate nursing students recognize artificial intelligence as a valuable tool for improving quality of patient care and nurses' academic performance.*

Keywords: Graduate Nursing Students, Artificial Intelligence, Nursing Education and Clinical Practice.

Introduction

Background

Artificial intelligence is the use of powerful computer systems to do jobs that were previously performed by people. AI is becoming increasingly vital across various professions. In healthcare, particularly in nursing, artificial intelligence has potential professional roles [1].

In 2021, the World Health Organization published a report providing guidelines for the use of artificial intelligence in healthcare. The report highlights the importance of upholding human rights, dignity, and ethical principles while ensuring accountability, safety, fairness, equity, transparency, and inclusivity [2].

Artificial intelligence is still not widely used in nursing practice. Nursing is recognized as a dynamic and rapidly evolving field , and since nurses have more direct patient interactions than other health care professionals, it is critical to assess their current level of AI proficiency, nurses' attitudes and behaviors about both present and future AI uses . Prior research has examined how patients, healthcare professionals, and medical students in different nations view and feel about the use of AI in medicine [3].

To properly integrate AI into nursing education and prepare future nurses for the evolving healthcare environment, it is crucial to understand nurses' perspectives, opinions and their plans to adopt AI technology . Integrating artificial intelligence into nursing is transforming the profession and improving patient care. Therefore, nurses must develop the necessary skills and expand their knowledge to adapt to the inevitable incorporation of artificial intelligence in future practice [4].

Graduate nursing students are future leaders and educators in the profession, and their perspectives on artificial intelligence integration will influence the development of nursing education, research, and practice. Understanding their perspective is crucial for preparing the next generation of nurse scientists, educators, and practitioners. This study explored graduate nursing students' experiences with the use of artificial intelligence in education and clinical practice [5].

Method

The participants were graduate nursing students at the nursing sciences graduate college. The students include Doctor of Philosophy, Master's, and Diploma students. At the time of the study, each degree includes students from the following specialties: medical–surgical nursing, community health nursing, pediatric nursing, and obstetric nursing, with no other specialties available. The inclusion criteria were that all students are currently pursuing higher degrees and actively practicing nursing. Students who were not actively working and students who were unavailable at the time of the study due to lack of internet access were excluded [6].

A simple random sampling technique was employed to select the participant. Participants were selected by assigning numbers to their names and using a tossing method to randomly choose from them. A total of 101 nurses comprised the sample [7]. A standardized questionnaire was developed by the researchers and subsequently piloted. The final questionnaire was created using Google Forms to collect data and was distributed to graduate nursing students via WhatsApp. Participants responded to the questions through various formats, including yes/no questions, multiple-choice questions, and Likert scale items to indicate the frequency of their use. The data were cleaned, managed, analyzed, and entered using Statistical Package for the Social Sciences (SPSS) version 25. Frequency and percentage descriptive measures have been implemented [8-10].

The study received ethical approval from the Institutional Review Board (IRB), Deanship of Scientific Research at Al-Neelain University and the participants involved. The study's aim was communicated to participants, informing them that the information would be utilized exclusively for research purposes. The consent process is conducted online before accessing the questionnaire. Participants were provided with comprehensive information regarding the study, encompassing its title, objectives, purpose, confidentiality protocols, voluntary nature of participation, and the right to withdraw at any time without penalty. Graduate nursing students consented to participate by clicking the 'Agree' button included in the link [11-13].

Results

Table 1: Graduate nursing students' demographic characteristics. (n=101)

Gender.		
Gender	Frequency	Percentage %
Male	22	21.8
Female	79	78.2
Total	101	100%
Age group.		
Age	Frequency	Percentage %
20–29 years	22	21.8
30–39 years	59	58.4
40–49 years	16	15.8
50 years and above	4	4.0
Total	101	100%
Years of experience.		
Experience	Frequency	Percentage %
Less than 5 years	19	18.8
5–9 years.	18	17.8
10–14 years	40	39.6
15 years and above	24	23.8
Total	101	100%
Nurses' specialty.		
Specialty	Frequency	Percentage %
Medical-Surgical Nursing	59	58.4
Community Health Nursing	15	14.9
Pediatric Nursing	11	10.9
Obstetrical Nursing	16	15.8
Total	101	100%

Students nurse current role.		
Current job	Frequency	Percentage %
Staff Nurse	57	56.4
Clinical Instructor	7	6.9
Nurse Manager	7	6.9
Educator	21	20.8
Researcher	1	1.0
Charge Nurse	7	6.9
Infection prevention and control nurse	1	1.0
Total	101	100%
Training in Artificial Intelligence (AI)		
Training courses in AI	Frequency	Percentage
Yes	30	29.7
No	71	70.2
Total	101	100%

Table 2: Frequency of AI tools used for educational activities. (n=101)

Frequency	Frequency	Percentage %
Daily	30	29.7
Weekly	41	40.6
Monthly	21	20.8
Never	9	8.9
Total	101	100%

Table 3: Aims of AI in nursing practice: (n=101)

Primary aim	Frequency	Percentage %
Improve patient care and efficiency	65	64.4
Help in clinical judgment	25	24.8
Reduce nursing workforce	6	5.9
Focus only on technology	5	4.9
Total	101	100%

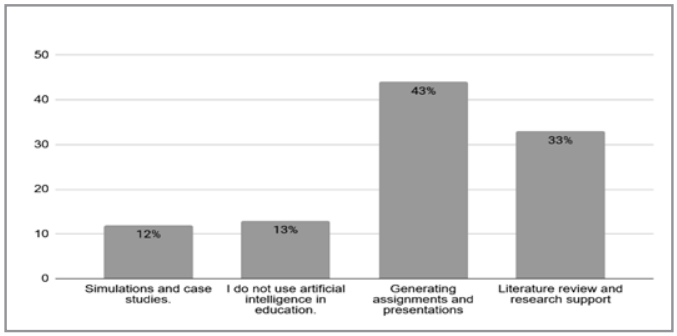

Figure 1: Uses of AI in educational activities. (n=101)

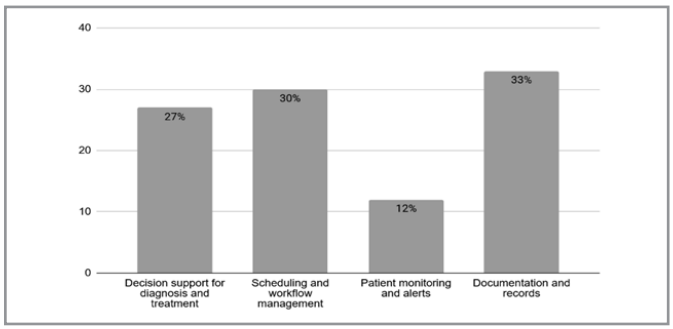

Figure 2: Usage of AI in clinical practice activities.

Figure 3: Effect of AI on nursing staff shortage. (n=101)

Discussion

The demographic characteristics of the graduate nursing students indicate that two-thirds of the participants have more than ten years of experience, and over half are staff nurses specializing in medical–surgical care, which may offer greater practical insights into the outcome. Conversely, the educator group is more likely to provide theoretical insights into the outcome (Table 1).

The results of this study indicate that nurses lack adequate formal education in artificial intelligence, which is essential for developing an in-depth understanding of how technology is utilized in the nursing profession (see table 1). It is essential for nurses to make sure that they have the appropriate understanding to successfully apply artificial intelligence in nursing.

Table 2 illustrates that approximately one-third of nurses utilize artificial intelligence daily, focused on boosting academic performance, whereas advanced applications such as simulation are used less frequently (Fig. 1). As mentioned in a previous study, the incorporation of AI into nursing education has the potential to produce improvements in both the quality and efficacy of education, including the enhancement of academic integrity, critical thinking, and equitable access.

This study found nurses are using AI in clinical practice for documentation and reporting (Fig 2), but adoption in administrative tasks is lower, which could reflect some barriers such as lack of access to AI-enabled electronic health record (EHR) systems, training gaps, or institutional resistance. This study differs from the previous one done by TR. Clancy presents opportunities for the deployment of artificial intelligence systems in a variety of nursing care settings. The graduate nursing students believe that AI is a driving force for improving patient outcomes and perceive a clear positive impact of AI on care quality (see Table 3). This result is consistent with a previous survey of nurse managers, which determined that artificial intelligence would assist nurses.

Nurses do not believe that AI will reduce nursing shortages (Fig. 3), highlighting their recognition that AI may improve efficiency but cannot replace bedside presence or complex critical thinking. Similarly, a study conducted in Qatar found that many students held favorable opinions of AI, viewing it as reliable and beneficial for expediting processes and assisting in diagnosis.

Limitations

The WhatsApp distribution may have excluded individuals with restricted internet connections or low levels of digital literacy.

The study did not explore specific competencies or abilities for applications of AI in education and practice.

Relying on participants' opinions and honesty for data collections through self-administered questionnaire.

Conclusion

While nurses trust AI's potential to enhance patient care and quality, they remain realistic about its limitations in solving workforce shortages. AI is a supportive technology, requiring careful integration into nursing practice and education. To prepare future nurses for artificial intelligence integration, it is essential to expand training opportunities, embed artificial intelligence in nursing curricula, and develop artificial intelligence-assisted nursing roles within healthcare systems.

Implication of the study

Nurses perceive AI as an augmentative instrument rather than a substitute. Implementation of structured training programs that focus on the use of AI in both education and clinical practice.

Declarations

Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of Al-Neelain University. We adhered to the principles of the Declaration of Helsinki and all relevant guidelines. All participants were informed that their involvement was entirely voluntary and that they were free to withdraw from the study at any time without consequence. All participants provided informed consent.

Consent for Publication

Not applicable

Data Availability

The data for this study will be made available upon request from the corresponding author.

Competing Interests

The authors declare that they have no competing interests.

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All budgetary expenses are covered by the authors.

Authors' contributions

All authors participated in the project development, data collection, and manuscript writing. All authors read and approved of the final manuscript.

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