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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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ARTIFICIAL INTELLIGENCE UTILIZATION AND ITS ASSOCIATION WITH NURSING PRACTICE IN CARDIOLOGY AND INTENSIVE CARE UNITS: A CROSS-SECTIONAL STUDY

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Abstract.

Background: Artificial intelligence (AI) technologies are increasingly integrated into cardiology and intensive care settings to enhance clinical decision-making, patient monitoring, and workflow efficiency. However, limited evidence exists regarding AI utilization among nurses and its association with nursing practice in high-acuity units.

Objective: To assess the level of AI utilization among nurses working in cardiology and intensive care units (ICUs) and examine its association with nursing practice performance.

Methods: A descriptive cross-sectional study was conducted among 53 nurses working in cardiology and ICUs at tertiary hospitals. Data were collected using a structured, self-administered questionnaire assessing demographic characteristics, AI utilization (clinical decision support systems, predictive monitoring tools, and electronic documentation), and nursing practice performance. Data were analyzed using descriptive statistics, chi-square tests, and logistic regression. Statistical significance was set at $P \leq 0.05$.

Results: Nurses with high AI utilization demonstrated significantly better nursing practice performance compared to those with low utilization, (69.2% vs. 23.8%, P = 0.013). AI training was significantly associated with higher utilization levels (OR = 2.45, 95% CI: 1.08–5.54, P = 0.031). Additionally, years of experience showed a significant relationship with effective AI use (P = 0.044).

Conclusion: AI utilization is significantly associated with improved nursing practice in cardiology and ICU settings. Strengthening AI training programs and institutional support may enhance nursing performance and quality of patient care.

Key words. Artificial intelligence, nursing practice, cardiology, intensive care unit.

Introduction.

Artificial intelligence (AI) is rapidly transforming healthcare systems worldwide by enabling the analysis of large volumes of complex clinical data, enhancing diagnostic accuracy, and supporting evidence-based decision-making [1]. AI technologies—including machine learning, deep learning, and natural language processing—are increasingly integrated into clinical environments to optimize workflow efficiency and improve patient outcomes [2]. In high-acuity settings such as cardiology departments and intensive care units (ICUs), where timely and precise decisions are critical, AI applications have demonstrated substantial potential in early risk detection, continuous monitoring, and predictive analytics [3].

In cardiology, AI systems are widely used in electrocardiogram (ECG) interpretation, cardiac imaging analysis, and risk stratification of cardiovascular diseases [4]. Advanced algorithms have shown high sensitivity in detecting arrhythmias, heart failure, and ischemic changes, sometimes outperforming conventional diagnostic approaches [5]. AI-driven predictive models can also identify patients at risk of adverse cardiac events, thereby supporting proactive intervention and reducing morbidity and mortality [6]. Such innovations are particularly relevant in cardiac care units, where nurses play a central role in continuous monitoring and rapid response to patient deterioration.

Similarly, AI applications in ICUs have been associated with improved early warning systems and prediction of sepsis, respiratory failure, and hemodynamic instability [7]. Machine learning models can analyze real-time physiological data to detect subtle changes that may not be immediately apparent to clinicians [8]. These capabilities enhance clinical surveillance and may reduce preventable complications and length of hospital stay [9]. Since ICU nurses are directly involved in patient monitoring, medication administration, and implementation of care plans, AI tools have the potential to significantly influence nursing workflow and performance.

Beyond clinical prediction, AI technologies also contribute to administrative efficiency by automating documentation, optimizing staffing allocation, and reducing repetitive tasks [10]. This reduction in administrative burden may allow nurses to dedicate more time to direct patient care and critical thinking activities [11]. However, the integration of AI into nursing practice is not solely dependent on technological availability; it is strongly influenced by nurses' knowledge, attitudes, and readiness to adopt digital innovations [12].

Despite the growing presence of AI in cardiology and critical care, concerns remain regarding ethical implications, data privacy, algorithm transparency, and professional accountability [13]. Nurses must understand both the benefits and limitations of AI systems to ensure safe and effective patient care. Studies suggest that adequate training and institutional support are essential to foster positive perceptions and improve AI utilization among healthcare professionals [14]. Furthermore, interdisciplinary collaboration between nurses, physicians, and information technology specialists is necessary to facilitate successful AI implementation [15].

Although global literature highlights the clinical advantages of AI in high-risk units, limited empirical research has specifically examined the level of AI utilization among nurses and its direct association with nursing practice performance in cardiology and ICU settings [16]. Understanding this relationship is critical for guiding policy development, educational strategies, and resource allocation to maximize AI's contribution to healthcare delivery

[17]. Therefore, investigating AI utilization and its association with nursing practice in these specialized units can provide valuable insights into how emerging technologies influence frontline nursing care and patient outcomes [18]. Accordingly, this study aimed to assess the level of AI utilization among nurses working in cardiology and intensive care units (ICUs) and examine its association with nursing practice performance.

Materials and Methods.

Study Design and Setting: A descriptive cross-sectional study design was employed to assess artificial intelligence (AI) utilization and its association with nursing practice performance. The study was conducted at Port Sudan Heart Hospital, Sudan, specifically in the cardiology units and intensive care units (ICUs). These units provide specialized cardiac and critical care services and are equipped with electronic health record systems and AI-supported monitoring technologies.

Study Population and Sample: The study population consisted of registered nurses working in the cardiology and ICU departments at Port Sudan Heart Hospital during the study period. Nurses were selected using a convenience sampling technique.

Sample Size: The total sample size was 53 nurses who met the eligibility criteria and agreed to participate in the study.

Inclusion criteria: Registered nurses working in cardiology units or ICUs, minimum of six months of clinical experience in the current unit, direct involvement in patient care, and willingness to participate in the study.

Exclusion criteria: Nurse managers or administrative nurses not involved in direct patient care, nurses on leave during the data collection period, and interns and nursing students.

Data Collection Tools: Data were collected using a structured, self-administered questionnaire developed after reviewing relevant literature.

The questionnaire consisted of three main parts:

1. Demographic and professional characteristics: age, gender, educational level, years of experience, and previous AI-related training.

2. AI Utilization Scale: Items assessed the use of AI-based systems such as clinical decision support systems, predictive monitoring tools, smart alarms, and electronic documentation systems. Responses were measured using a 5-point Likert scale (from strongly disagree to strongly agree).

3. Nursing Practice Performance Scale: Assessed perceived quality of nursing care, decision-making efficiency, patient monitoring effectiveness, and workflow management. Responses were also measured using a Likert scale.

Scores were categorized into low, moderate, and high levels based on standardized scoring criteria.

Validity and Reliability:

Content validity was established through review by a panel of five experts in nursing administration, critical care, and health informatics. Modifications were made according to their recommendations to ensure clarity and relevance. Reliability was tested using Cronbach's alpha coefficient. The AI Utilization Scale demonstrated good internal consistency ($\alpha = 0.88$), while the Nursing Practice Performance Scale showed acceptable reliability ($\alpha = 0.91$). Although content validity and internal consistency were confirmed, formal construct validity testing using exploratory or confirmatory factor analysis was not conducted due to the limited sample size. Therefore, the dimensional structure of the instrument should be interpreted with caution, and further validation in larger samples is recommended.

Data Collection Procedure: After obtaining official approval from hospital administration, eligible nurses were approached during working shifts. The purpose of the study was explained, and informed consent was obtained. The questionnaire was distributed in paper form and required approximately 15–20 minutes to complete. Data collection was conducted over a four-week period.

Ethical Considerations: Ethical approval (No. SU-2025) was granted by the institutional research ethics committee prior to data collection. Participation was voluntary, and informed consent was obtained from all participants. Confidentiality and anonymity were maintained using coded questionnaires without personal identifiers. Participants were informed of their right to withdraw at any time without penalty.

Data Analysis: Data were coded and entered the Statistical Package for Social Sciences (SPSS) version 26. Descriptive statistics were used to summarize study variables. Continuous variables (age and years of experience) were presented as mean ± standard deviation (SD), while categorical variables were summarized using frequencies and percentages. For inferential analysis, the association between AI utilization and nursing practice performance was first examined using chi-square tests for categorical variables and independent t-tests for continuous variables, as appropriate.

To preserve statistical power and avoid information loss associated with arbitrary categorization, continuous variables (age and years of experience) were retained in their original continuous form in regression analyses. Multivariate logistic regression was performed to identify independent predictors of high nursing practice performance. Variables with $P \leq 0.05$ in bivariate analysis were entered into the adjusted model.

Given the limited number of outcome events (n = 16), the number of predictors included in the multivariate model was restricted in accordance with the events-per-variable (EPV) principle to reduce overfitting and improve model stability. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were reported. Statistical significance was set at $P \leq 0.05$.

Results.

Table 1 shows the study included 53 nurses with a mean age of 32.8 ± 6.4 years and mean professional experience of 7.6 ± 4.8 years. Most participants were female (67.9%) and held a bachelor's degree (77.4%). Slightly more than half (54.7%) had not received formal AI-related training prior to participation.

Table 2 shows overall, 60.4% of nurses demonstrated moderate-to-high AI utilization, while 39.6% reported low utilization.

Table 3 shows approximately 67.9% of nurses reported moderate-to-high nursing practice performance.

Table 4 shows a statistically significant association between AI utilization and nursing practice performance ($\chi^2 = 8.74$, P =

0.013). High AI utilization was associated with higher practice performance (69.2%), while low utilization was linked to lower performance (42.9%), indicating a positive relationship between AI use and nursing performance.

Table 5 shows multivariate logistic regression analysis showed that high AI utilization independently increased the likelihood of high nursing practice performance (AOR = 3.98, P = 0.015). AI training was also a significant predictor (AOR = 2.32, P = 0.041). Age and years of experience, treated as continuous variables, were not independently associated with performance.

Discussion.

The present study explored the level of artificial intelligence (AI) utilization among nurses in cardiology and intensive care units (ICUs) and its association with nursing practice performance. The finding that 60.4% of nurses reported moderate-to-high AI utilization indicates a growing penetration of intelligent technologies into critical care environments. Recent studies have shown that AI-enabled clinical decision support systems and predictive analytics are increasingly embedded in ICU workflows, contributing to improved situational awareness and prioritization of care [3,19]. Nevertheless, the proportion of nurses reporting low AI utilization suggests variability in access, confidence, or institutional readiness, which has been identified as a persistent barrier in digital health transformation initiatives [20].

The majority of participants demonstrated moderate-to-high nursing practice performance (67.9%). Emerging evidence indicates that AI integration can streamline nursing documentation, reduce alarm fatigue through smart monitoring systems, and support early recognition of patient deterioration [21,22]. In high-acuity units such as cardiology and ICUs, these capabilities are particularly relevant because nurses continuously interpret complex physiological data and coordinate rapid interventions. AI-assisted tools may therefore

Table 1. *Demographic and Professional Characteristics of the Study Participants (n = 53).*

Variable	**Mean ± SD / n**	**%**
Age (years)	32.8 ± 6.4	
Years of experience	7.6 ± 4.8	
Gender		
Female	36	67.9
Male	17	32.1
Education		
Bachelor's degree	41	77.4
Postgraduate	12	22.6
AI Training		
Yes	24	45.3
No	29	54.7

Table 2. *Level of AI Utilization among Nurses (n = 53).*

AI Utilization Level	**n**	**%**
Low	21	39.6
Moderate	19	35.8
High	13	24.6

Table 3. *Level of Nursing Practice Performance (n = 53).*

Nursing Practice Level	**n**	**%**
Low	17	32.1
Moderate	20	37.7
High	16	30.2

Table 4. *Association Between AI Utilization and Nursing Practice Performance (n = 53).*

AI Utilization Level	**High Practice n (%)**	**Moderate Practice n (%)**	**Low Practice n (%)**	**χ^2**	***P*-value**
Low (n=21)	5 (23.8%)	7 (33.3%)	9 (42.9%)	8.74	0.013*
Moderate (n=19)	6 (31.6%)	8 (42.1%)	5 (26.3%)		
High (n=13)	9 (69.2%)	3 (23.1%)	1 (7.7%)		

**Statistically significant at P ≤ 0.05.*

Table 5. *Multivariate Logistic Regression for Factors Associated with High Nursing Practice Performance (n = 53).*

Variable	**Adjusted OR**	**95% CI**	***P*-value**
High AI Utilization	3.98	1.31–12.08	0.015*
AI Training (Yes)	2.32	1.02–5.21	0.041*
Years of Experience (continuous)	1.08	0.95–1.22	0.214
Age (continuous)	1.03	0.92–1.15	0.541

**Statistically significant at P ≤ 0.05.*

enhance efficiency and clinical responsiveness, ultimately supporting improved nursing performance.

A statistically significant association was observed between AI utilization and nursing practice performance (P = 0.013). Nurses with high AI utilization were substantially more likely to demonstrate high performance levels. This aligns with studies reporting that AI-supported early warning systems improve clinical outcomes and facilitate proactive nursing interventions in critical care settings [23]. Furthermore, evidence suggests that digital decision-support technologies can enhance nurses' confidence in clinical judgment, particularly in environments characterized by high patient acuity and time pressure [21]. The present findings reinforce the concept that AI functions as a supportive augmentation tool rather than a replacement for professional expertise.

Multivariate analysis revealed that high AI utilization independently predicted high nursing practice performance (OR = 4.13, P = 0.018). Similar associations have been reported in research examining technology-enabled care models, where advanced analytics significantly improved workflow coordination and reduced preventable adverse events [24]. These findings suggest that when nurses actively engage with AI systems, measurable improvements in practice performance may occur.

AI training was also a significant predictor of performance (OR = 2.45, P = 0.031). Prior research emphasizes that structured education programs enhance digital literacy, increase technology acceptance, and strengthen nurses' ability to interpret algorithm-generated insights [25]. Training initiatives not only improve competence but also reduce resistance to technological change, which is often linked to uncertainty about role adaptation and accountability [26]. Therefore, institutional investment in continuous AI education may be critical for maximizing clinical benefits.

Years of experience showed a positive but non-significant association with high nursing practice performance (Adjusted OR = 1.08, 95% CI: 0.95–1.22, P = 0.214). Although the odds ratio suggests a slight increase in the likelihood of high performance with each additional year of experience, the confidence interval crossed unity and the p-value exceeded the 0.05 threshold, indicating that the relationship was not statistically significant. This finding implies that greater professional longevity alone may not necessarily translate into superior performance outcomes. Previous literature suggests that while experience contributes to clinical judgment and confidence, performance in contemporary healthcare settings may depend more on ongoing professional development, adaptability, and engagement with evidence-based practices rather than years of service alone [27].

In contrast, postgraduate education and age were not significant predictors of performance. This finding indicates that practical exposure and targeted AI competency development may exert greater influence on effective AI utilization than demographic or academic characteristics. Contemporary evidence highlights that organizational culture, leadership support, and usability of AI systems are stronger determinants of successful integration than individual sociodemographic variables [20,26].

Overall, the findings of this study support growing international evidence that AI utilization positively influences nursing practice performance in high-acuity environments. However, sustainable integration requires structured training, supportive leadership, and ethical governance frameworks to ensure safe and effective use of intelligent systems [28]. Strengthening these components may enhance nursing performance and optimize patient outcomes in cardiology and intensive care settings.

While the findings suggest a positive association between AI utilization and nursing practice performance, the results should be interpreted cautiously. Because data were collected using self-reported measures, the possibility of social desirability bias cannot be excluded. Nurses may have reported higher levels of AI engagement or performance due to perceived professional expectations. Moreover, the absence of formal construct validation limits certainty regarding the dimensional robustness of the measurement tools. Future studies employing validated instruments and objective performance indicators are warranted.

Limitations.

This study has several limitations. First, the use of convenience sampling from a single institution (Port Sudan Heart Hospital) limits the generalizability of the findings. AI utilization and its impact on nursing practice may vary substantially across healthcare institutions depending on factors such as technological infrastructure, AI system implementation status, interface usability, leadership support, and quality of staff training programs. Therefore, the results may not be directly applicable to other hospitals with different organizational, technological, or cultural contexts. Second, the relatively small sample size may reduce statistical power and limit broader inference. Third, the use of a self-administered questionnaire introduces the possibility of response bias, including social desirability bias. Finally, the cross-sectional design prevents causal interpretation between AI utilization and nursing practice performance.

Conclusion.

This study demonstrated that artificial intelligence utilization is significantly associated with improved nursing practice performance in cardiology and intensive care units. High AI use and AI training exposure were key predictors of better performance. Strengthening AI education, institutional support, and workflow integration strategies may enhance nursing efficiency, clinical decision-making, and overall quality of patient care in high-acuity settings.

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