Impact of Instructional Guidelines on Surgical Nurses' Knowledge and Attitude regarding Artificial Intelligence Application

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Abstract

Background: Artificial intelligence applications have grown vastly across all aspects of healthcare. Nursing practice is critical and AI technology will enhance practice and patient outcomes. **The current study** aimed to determine the impact of instructional guidelines on surgical nurses' knowledge and attitude regarding artificial intelligence applications. **Design**: A quasi-experimental design was utilized to fulfill the aim of this study. **Setting:** This study was conducted in surgical departments at Sohag University Hospitals. **Sample**: A convenience sample included (50) nurses were selected from the previously mentioned settings. **Tools:** Two tools were used to collect the data: A self-administered Artificial Intelligence Knowledge Questionnaire and A General Attitudes towards Artificial Intelligence Questionnaire. **Results**: The total level of knowledge was satisfactory among 12% of studied nurses during the instructional guidelines period, while it was 88% post instructional guidelines. Additionally, the total positive nurses' attitudes mean score improved from 44.26 ±22.08 pre-instructional guidelines to 81.07±17.54 post-instructional guidelines with statistically significant differences. Moreover, highly statistically significant differences between total knowledge and attitude level post-intervention ($P<0.001$). **Conclusion:** This study concluded that the instructional guidelines had a significant positive effect on improving the studied nurses' knowledge and attitudes regarding artificial intelligence applications. **Recommendation:** encourage nurses to increase their knowledge and attitudes toward artificial intelligence through attendance workshops and training programs regarding artificial intelligence applications, which are required to enable them to integrate artificial intelligence applications into nursing practices.

Keywords: Artificial Intelligence application, Attitude, Nurses' knowledge

Introduction:

Artificial intelligence has an impact on the roles of senior management by increasing their creativity and strategic thinking**.** Artificial intelligence has many applications in healthcare, including assisting in disease assessment, diagnosis, and solving various clinical problems, reducing lost data, enhancing good nursing communication skills, improving inpatient care management, diminishing nurse workload, and improving patient safety **(Zhou et al.,2022).** As well, **Liu et al. (2022),** clarified that nursing intervention can take advantage of AI-based medical informationprocessing.

Artificial Intelligence Technology (AIT) is a field of computer science that aims to mimic human brain function by automating a variety of activities, such as learning and decision-making, and by accomplishing tasks or solving issues that are also utilized in patient care. Three types of artificial intelligence (AI) are used in hospitals: machine learning, which is a statistical technique set for problem-solving; deep learning, which is a machine learning approach and neural network extension; and natural language processing, which is the most recent and relates to the fusion of linguistics and artificial intelligence and includes intelligent analysis of written language ((**Altas, 2020**).

A professional identity is created through internalizing professional information, abilities, attitudes, values, and ethical standards; then, in nursing education and practice, incorporating these characteristics into one's own identity and behavior. medical health nurses who possess a strong sense of professional identity recognize that their role fully satisfies these requirements in conformity with ethical norms and professional ideals. The educational environment, critical thinking, clinical practice, cognition, personal traits, societal and environmental traits, and public illustration are just a few of the many variables that affect how a professional identity develops (**Kim & Sim, 2020**).

Medical surgery nurses' perspectives on their employment influence how they approach assisting patients with their difficulties. The final objective of the nursing process is to give comprehensive care, and the qualities and abilities of certain medical health nurses can affect the quality of care and assist them in understanding patients and solving difficulties. Problem-solving is the capacity to identify appropriate and practical solutions to issues that arise in day-to-day living. An individual or group can gain focus and skill by using problem-solving strategies (**Hannaford et al., 2021**).

These days, speech acceptance, data mining, and physical deterioration forecasting are among the major AI applications employed in nursing practice. However, future developments in AI technology will help nurses integrate pertinent data and offer tailored, evidence-based care (**Ronquillo et al., 2021**).

There's a chance that this knowledge gap affects the entire field and has to be fixed. There is little doubt that the use of AI in healthcare practice and education will continue to grow. A complete understanding of the attitudes and actions of nurses regarding current and upcoming AI applications is necessary for the successful integration of AI into clinical practice. Furthermore, since nurses use technology and have direct contact with patients, evaluating their current level of AI understanding is essential to determining what future training needs will be (**O'Connor, 2021**).

The nursing profession is essential to the provision of healthcare because it works closely with patients and guarantees the effectiveness of diagnosis and treatment programs. Maintaining patient charts, documenting, taking vital signs, helping with physical examinations, and facilitating communication between patients, nursing professionals, and the administrative sector are just a few of the many and varied daily responsibilities that nurses perform. Consequently, AI will have a revolutionary effect on nursing practice. Robots for special needs, drug delivery robots, and decision-making apps for nursing diagnosis, planning, and intervention are a few instances of how artificial intelligence is being used in nursing practice (**Taryudi et al., 2022**).

Given their significance in the provision of nursing care, nurses need to be informed about artificial intelligence. Nonetheless, the majority of recent research has concentrated on the creation of AI applications and contrasted pre- and post-integration work; other studies have sought to ascertain participants' awareness of and desire to incorporate AI into their regular activities (**Booth et al., 2021**).

Significance of the study:

To realize Egypt's Vision 2030, the nation has started implementing artificial intelligence and technology across several industries. Egypt has also become a safer place to live and conduct business. Through programs meant to promote research and development domestically, the government is becoming more involved in artificial intelligence development. The government of Egypt has established a general target that by 2030, 7.7% of Egypt's GDP will come from robotics and artificial intelligence (Egypt's Artificial Intelligence Future, 2020). This goal pertains to an Egyptian society that is powered by these technologies. Furthermore, artificial intelligence technologies have the potential to improve nursing performance and enable nurses to provide more customized, evidence-based care for their patients by enhancing their professional skills **(Ronquillo et al.,2021).**

Artificial intelligence technologies can improve nursing practice, enabling surgical nurses to provide more personalized, evidence-based care to patients by enhancing nurses' professional individuality and receptiveness to problem-solving. A radical digital transformation of the healthcare industry is needed to improve competitiveness in the labor market. Since then, artificial intelligence has captured the attention of major healthcare executives and providers, who are currently faced with the dilemma of whether to integrate it fully or partially into their work (**Elsayed & Sleem, 2021).** Cost, quality, nursing outcomes, and support for effective analysis of large amounts of data will drive the development of greater adoption and value of artificial intelligence technologies across healthcare. However, few studies have explored educational interventions for nurses related to artificial intelligence technologies (**Shaik, 2020**).

Hypotheses:

H1: Knowledge scores of surgical nurses' regarding artificial intelligence will be improved after instructional guidelines intervention than pre-intervention

H2: Attitude scores of surgical nurses' regarding artificial intelligence will become positive after instructional guidelines intervention than pre-intervention

Aim of the study

This study aimed to determine the impact of instructional guidelines on surgical nurses' knowledge and attitude regarding artificial intelligence applications.

Subjects and Methods

Research design:

A quasi-experimental design was utilized to fulfill the aim of this study (a pre-and post-intervention study) to determine the effect of the instructional guidelines.

Setting:

This study was conducted in surgical departments at Sohag University Hospital

Subjects:

A convenience sample that included 50 nurses who selected from the previously mentioned settings.

Study tools:

Tool (I): A self-administered Artificial Intelligence Knowledge Questionnaire: is an AI Knowledge Questionnaire that can be self-administered. This questionnaire was created by the researchers to evaluate nurses' artificial intelligence knowledge. There are two portions in it:

Part I: The demographic information of nurses was covered in Part I, including age, gender, educational attainment, years of professional experience, prior artificial intelligence training, and the source of information regarding artificial intelligence.

Part II: To evaluate the artificial intelligence knowledge levels of nurses before and after sessions, the study team included artificial intelligence information that was generated after reviewing pertinent literature and under the direction of **Lennartz et al., (2021); and Shimon et al., (2021).** Twelve categories were used to group the questions: The nursing field's definition of artificial intelligence (2 marks), its operation (2 marks), significance (2 marks), benefits (6 marks), drawbacks (6 marks), categories of artificial intelligence (4 marks), Basic Components of AI (5 marks), obstacles (5 marks), principles (6 marks), applications (examples of AI that can assist the medical and surgical nurse, and examples of AI in the nursing field) (10 marks). Furthermore, this section inquires about artificial intelligence issues in the nursing area (10 marks), and principles (5 marks).

Scoring system:
Each true or false response was given a score of "two marks" for being complete and accurate, "one mark" for being correct but partial, and "zero" for being unclear. A score of 60% or higher indicated that the nurse had satisfactory artificial intelligence knowledge; a score of less than 60% indicated that the nurse had unsatisfactory artificial intelligence understanding.

Tool (II): General Attitudes Towards Artificial Intelligence questionnaire, Based on a five-point Likert scale with 1 representing strongly disagree, 2 representing disagree, 3 representing neutral, 4 representing agreement, and 5 representing strongly agree, it was developed from **Schepman and Rodway (2020**). It consists of 24 statements.

Scoring System:
The nurses' attitudes are categorized as negatively ≤60 and positively ≥ 61 based on a cut of the value of 60%.

Fieldwork:

Administrative and Ethical Considerations:
The Human Research Ethics Committee of Sohag University's Faculty of Nursing approved this study to be conducted. The director of the Sohag University Hospital received an official letter from the dean of the nursing faculty at Sohag University requesting permission to perform the study. Written consent was given by nurses who consented to take part in the trial. It was proven that nurses participated voluntarily. The ability to leave the study at any moment and without explanation was made clear to the nurses. By using anonymity protection, confidentiality was established.

Tools Validity and Reliability:
The researchers translated each tool from Arabic into English and back again. To evaluate the tools' face and content validity, a panel of five experts—two from the field of artificial intelligence and three from the medical surgery nursing department—tested them. For substance, clarity, simplicity, relevance, completeness, and applicability, the experts made revisions to the tools. In response to their criticism, no modifications were made. Experts deemed the instruments to be legitimate. The tools' dependability was demonstrated by their strong Cronbach's alpha value (internal consistency) of 0.923 for the nurses' knowledge and 0.884 for their attitudes.

Pilot study:
Five nurses, or 10% of the study sample, participated in it. Its purpose was to evaluate the study's instruments for feasibility and clarity. Analyses were done on the pilot trial data. nurses who took part in the pilot study were Included in the main study sample.

Instructional guidelines intervention:
From June 2023 to December 2023, a total of six months were needed for the data collection process. The following phases were followed in the implementation of the artificial intelligence instructional guidelines intervention:

I. Assessment phase:
The researchers visited the study locations after receiving approval to continue with the investigation. The process of gathering the sample of nurses was initiated by the researchers. The nurses were approached one-on-one by the researchers, who also extended an invitation to participate and provided an outline of the goals and methods of the study. Each study tool was read and explained to each nurse by the researchers, who also noted each nurse's reaction. The questionnaire took the researchers 25 to 35 minutes to complete after they started filling it out. They conducted one-on-one interviews with each nurse using the research questionnaire to get baseline information on demographics, knowledge, and attitude. The

primary purpose of the data assessment was to lay the groundwork for the intervention sessions. The confidentiality of the information gathered was reaffirmed to nurses and would not be used for any purposes other than research.

II. Planning phase:

Researchers developed a thorough understanding of every facet of artificial intelligence by consulting the literature pertinent to the field. Based on the evaluation phase results and the characteristics of the study sample, the researchers created the content of the intervention sessions. Furthermore, the investigators created a booklet with illustrations and verified content, which was given to the nurses under study in the surgical department as a self-learning aid. Collaborating with the hospital principals, the researchers identified the lecture room as an appropriate venue for the educational intervention. The lecture room serves as a training and workshop space for nurses. The data display for any lectures is located in this room. A pamphlet was created and given to nurses by the end ofeach session of the instructional guidelines.

The following procedures are how the researchers created the artificial intelligence instructional guidelines intervention for the studied nurses:

- **Instructional guidelines objectives**

General objective: The general objective of the instructional guidelines intervention was to increase nurses' knowledge levels and improve their attitudes toward artificial intelligence applications.

Specific objectives: after the current **instructional guidelines** intervention, the nurses should be able to:

- Define artificial intelligence and its characteristics in the nursing field.
- Explain the importance of artificial intelligence.
- Discuss how artificial intelligence works
- List the advantages of artificial intelligence and its strategy.
- Identify the barriers t o artificial intelligence
- Enumerate the disadvantages of artificial intelligence.
- Discuss the four types of artificialintelligence.
- Explain the components of artificial intelligence.
- Discuss the applications of artificial intelligence
- List the most important problems of artificial intelligence and their solutions in the health field.
- Explain the principles that address artificial intelligence.
- Demonstrate the problems and solutions of artificial intelligence in the nursing field.
- Discuss how to improve the positive attitudes towards artificial intelligence.

III. Implementation phase:

IV. The intervention was applied to every chosen nurse. A strategy of question and response was used to convey the point. The researchers implemented the teaching principles in the designated contexts. There were five groups of nurses, with ten nurses in each. The goals and titles of each session were determined by the content itself, which changed based on the nurse's understanding and absorption of the knowledge, the time allotted, and the session's content. The same materials were given to all nurses, and during the sessions, role models, lectures, small-group discussions, and the brochure booklet were used.

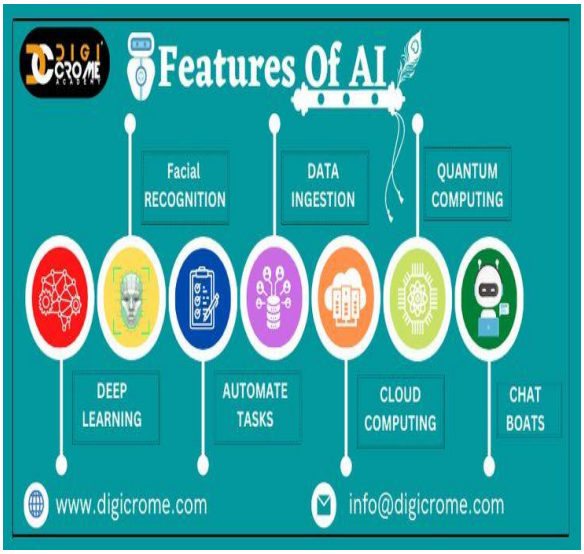
V. All computer users in the current study saw four movies on a laptop computer, which were accompanied by a PowerPoint presentation that explained the intervention. A group discussion regarding the videos' contents ensued. Furthermore, researchers assisted nurses in learning about feedback. Additionally, booklets with eye-catching pictures and straightforward, understandable writing were given out on CDs to help people following the intervention. Every session begins with an overview of the previous one's contents and an explanation of the current one's goals in plain language to suit the nurses' comprehension level. To promote active engagement and boost learning, reinforcement strategies including praise were employed during the sessions.

The sessions were as follows:

- The first session included an overview of the instructional guidelines intervention by the researchers, outlining the objectives, number of sessions, length of each session, meeting place, and schedule. Next, a pre-test was carried out with the use of data-gathering instruments.
- In the second session, the researchers gave the nurses an overview of artificial intelligence, including its definition and significance. Artificial intelligence is the foundation for creating and using algorithms integrated into dynamic computing environments to mimic the processes of human intelligence. To put it plainly, artificial intelligence is the endeavor to imitate human thought and behavior in computers. According to the figure, the researchers also talked about the key traits of artificial intelligence and the domains in which it can be used in healthcare settings.

Third session: It began with a recap of the previous session and moved into a discussion of artificial intelligence's application in nursing care as well as its mechanism. In the healthcare industry, artificial intelligence is being utilized to evaluate complicated medical and healthcare data and draw approximations of conclusions based just on input data. Artificial intelligence finds application in areas like medication discovery, treatment protocols, diagnostics, personalized medicine, and patient monitoring and care. Artificial intelligence technology can evaluate large amounts of data, including claims data, population data, clinical trial data, and health records and photographs, to find patterns and insights that would be impossible for people to find on their own **(Luca et al.,2023).**

By completing tasks that would normally be completed by people in a fraction of the time and at a fraction of the expense, artificial intelligence makes life easier for patients, nurses, doctors, and hospital managers. Artificial intelligence can facilitate remote monitoring, enhance patient empowerment through self-care, and increase the speed and accuracy of diagnoses. It can also provide practitioners with faster and simpler access to additional knowledge. The practice of medicine and the provision of healthcare could be drastically changed by artificial intelligence **(Florida et al., 2023).**



The fourth session consists of group talks regarding the benefits of artificial intelligence, including its ability to reduce human mistakes, take risks in place of people, be available around the clock, aid with repetitive tasks, provide digital assistance, make quicker judgments, and be used in everyday applications and new ideas. Additionally, strategies for artificial intelligence were also covered.

Fifth session: After reviewing the previous session, we talked about the challenges posed by artificial intelligence, including fear, cultural barriers, a lack of talent, and a lack of a strategic approach to its adoption. We also discussed potential solutions, including computing power, a lack of trust, human-level knowledge, data

privacy and security, bias issues, and scarcity of data.

- The sixth session began with an overview of the preceding ones, followed by the presentation of videos showcasing various forms of artificial intelligence. The elements of artificial intelligence were then covered by the researchers. Expert systems, robotics, computer vision, natural language processing, and machine learning are some of the elements that make up artificial intelligence. These parts make it feasible for robots to learn from, comprehend, and engage with their surroundings in ways that weren't before feasible.
- The seventh session began with a recap of the previous ones. Major emphasis was then placed on educating nurses about the various applications of artificial intelligence, including how it may benefit medical-surgical nurses. Examples of AI in the nursing profession are also provided. The issues with artificial intelligence in the healthcare industry were also discussed by the scholars. Furthermore, the principles of artificial intelligence in the nursing profession.
- Eighth session: Covers group discussions about AI's challenges and opportunities for the nursing profession. Also spoken upon was enhancing the favorable perception of artificial intelligence.
- Group talks regarding artificial intelligence's potential to improve practice and patient outcomes are covered in the ninth session. A quarter to an hour was allotted for each.
- Tenth session: The researchers listed the benefits of the instructional guidelines intervention and included a summary of all the prior sessions' talks from the nurses. To respond to the nurses' inquiries and express gratitude for their participation, it also featured avenues of communication between the researchers and the nurses.

VI. Evaluation phase

To determine the effect of the impact of instructional guidelines on surgical nurses' knowledge and attitude regarding artificial intelligence application, the same pre-test tools and distributed again after two months of the instructional guidelines implementation to compare the effect of instructional guidelines with the pre-test.

Statistical Analysis:

Version 20.0 of SPSS for Windows (SPSS, Chicago, IL) was used for all statistical analyses. The mean ±standard deviation (±SD) was used to express continuously distributed, normally distributed data. Both percentages and numbers were used to express categorical data. Variables with categorical data were compared using the chi-square test (or Fisher's exact test, if appropriate). The study's questionnaires' internal consistency test, or reliability test, was computed. The cutoff point for statistical significance was $p<0.05$.

Results:

Table (1) describes that 84% of the studied sample were females, 46% of them aged from 30–40 years. Additionally, 44 % had 10–20 years of experience, and 46% of them had a **Nursing institute** degree in nursing education.

Figure (1): Shows that 90% of the studied **surgical** nurses didn't have previous training about artificial intelligence.

Figure (2) illustrates that the primary sources of information for nurses' knowledge about artificial intelligence were from internet (70%), followed by TV (20%) and doctors (10%).

Table 2 depicts the surgical nurses' knowledge of artificial intelligence through the phases of pre-instructional guidelines implementation and post-instructional guidelines implementation. It explicates that there were significant differences in the mean difference scores of surgical nurses both before and after instructional guidelines implementation (37.33*). This indicates that the knowledge level of surgical nurses improved after the instructional guidelines intervention in all domains. This demonstrated that the post-intervention phase had the highest mean scores compared to the pre-intervention phase (34.77 ±.556 and 9.57±10.19).

Figure (2) illustrates that the total level of knowledge was satisfactory among 12% of studied nurses during the instructional guidelines period, while it was 88% post instructional guidelines.

It's cleared from **Table (4)** that there was a highly statistically significant difference (p= <0.001) and improvement in the surgical nurses' attitude mean scores in artificial intelligence pre and post-one month of instructional guidelines implementation. Additionally, the total positive nurses' attitudes mean score improved from 44.26 ±22.08 pre-instructional guidelines to 81.07±17.54 post-instructional guidelines with statistically significant differences.

Figure (3) indicates that the total level of attitude was positive among 22% of studied nurses during pre pre-instructional guidelines period while it was 78% at immediately post-instructional guidelines.

Table (4): evidence that moderate association (r = 0.562, P - value < 0.001) between knowledge of the studied sample and attitude regarding artificial intelligence pre-instructional guidelines, Also, there association between knowledge of the studied sample with attitude regarding artificial intelligence post instructional guidelines (r = 0.223, P - value < 0.001).

Table (1): Number and Percent Distribution of Nurses' Demographic data (n=50)

Items	N	%
Age (years)		
< 30	11	22.0
30 – 40	23	46.0
> 40	16	32.0
Mean ±SD	36.8 ±7.5	
Gender		
Male	8	16.0
Female	42	84.0
Educational qualifications		
Secondary nursing	12	24.0
Nursing institute	23	46.0
B.Sc.N,	15	30.0
Experience (Years)		
Less than 10	13	26.0
10 – 20	22	44.0
More than 20	15	30.0

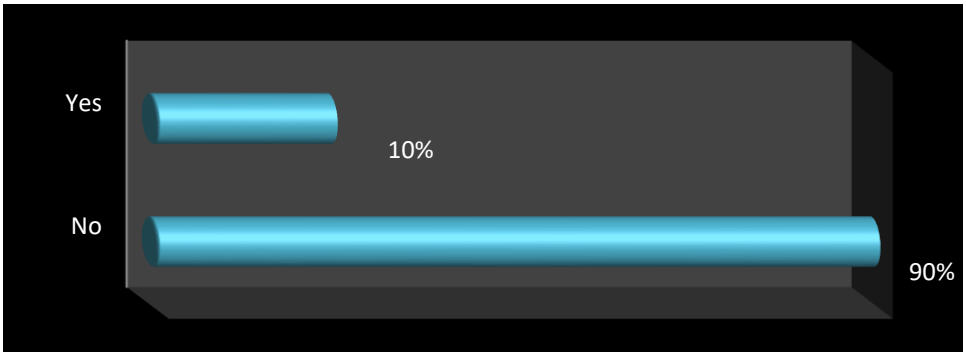


Figure (1): Previously training about artificial intelligence distribution among surgical nurses (n=50).

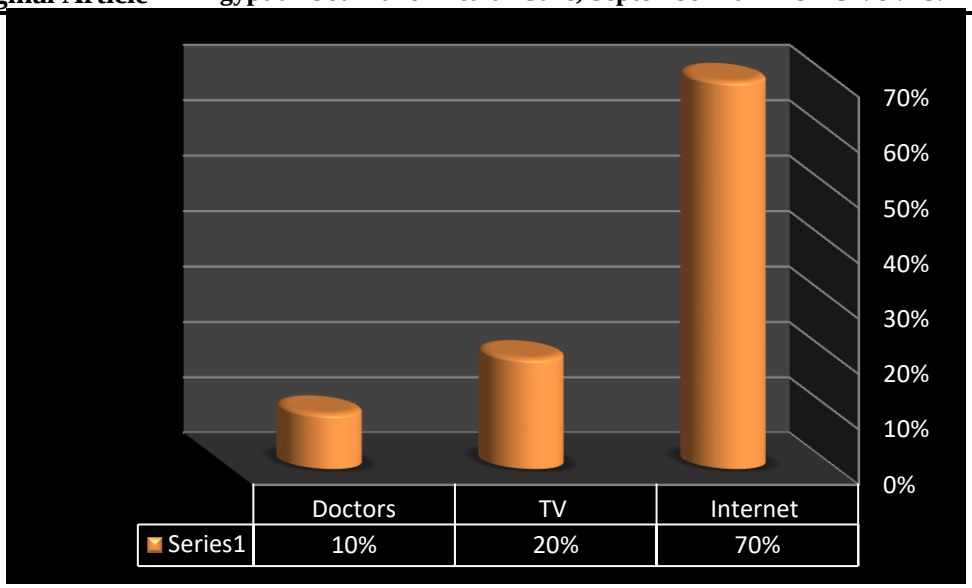


Figure (1): Sources of information about artificial intelligence distribution among surgical nurses (n=50).

Table (2): Differences in surgical nurses' knowledge mean scores related to artificial intelligence pre and post-two months of instructional guidelines implementation (n=50).

Items	Pre-test	Post-test	X2	P-value
Surgical nurses' knowledge mean scores	9.57±10.19	34.77 ±.556	37.33	<0.000

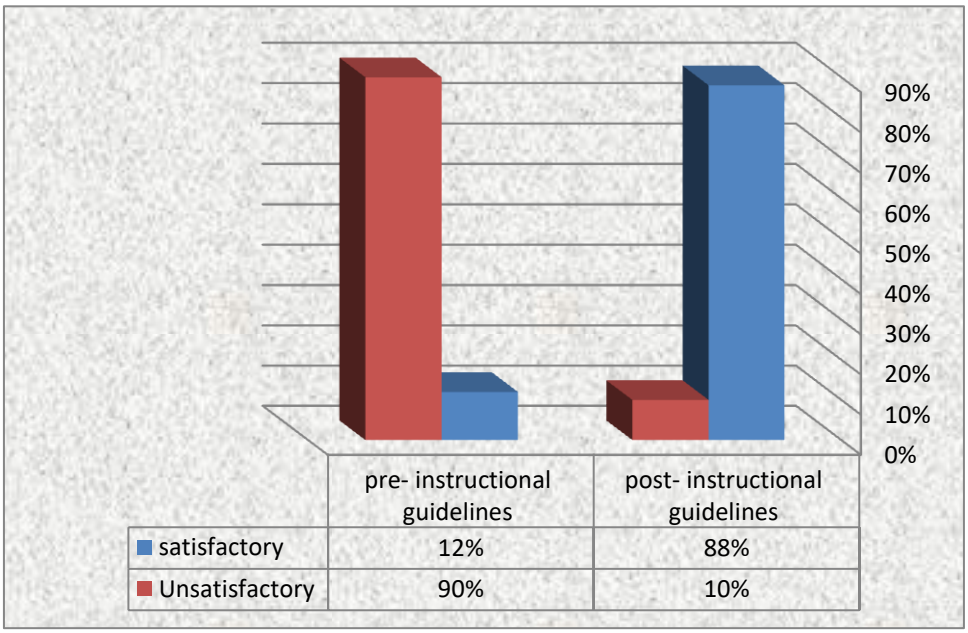


Figure (2) Nurses' Knowledge Total level **related to artificial intelligence pre and post-two months of instructional guidelines implementation (n=50).**

Table (3): Differences in surgical nurses' attitudes **mean scores related to artificial intelligence pre and post-two months of instructional guidelines implementation (n=50).**

Items	Pre-test	Post-test	X2	P-value
Surgical nurses' attitudes **mean scores**	44.26 ±22.08	81.07±17.54	37.33	<0.000

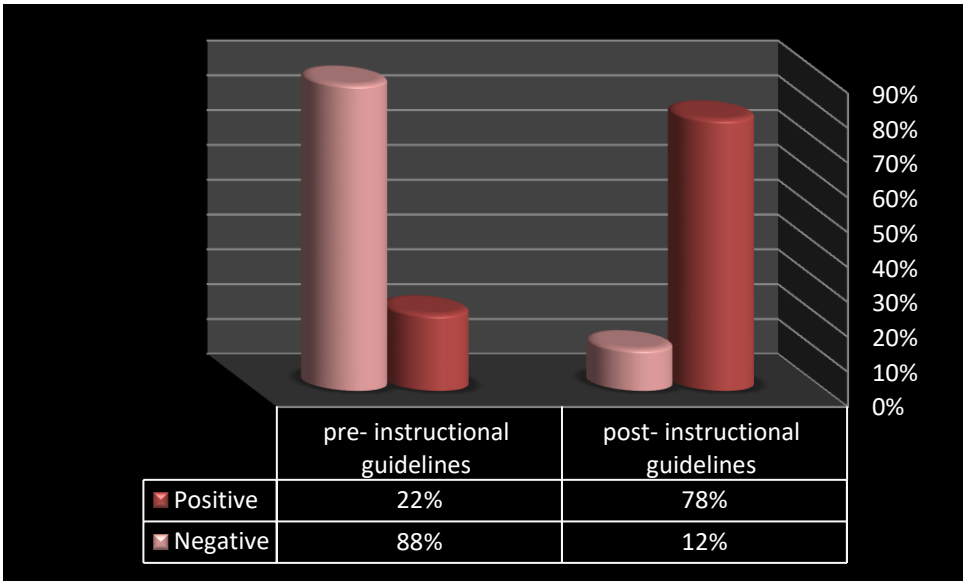


Figure (3) Nurses' attitude Total level **related to artificial intelligence pre and post-two months of instructional guidelines implementation (n=50).**

Table (4): Correlation matrix between knowledge and attitude of the studied surgical nursesregarding artificial intelligence pre and post-two months of instructional guidelines implementation.

Items		Knowledg escores (pre)	Total attitude scores (pre)	Total Knowledge Scores (Post)	Total attitude scores (Post)
Total Knowledg escores (pre)	r *P* - value				
Total attitud escores (pre)	r *P* - value	0.562 0.001**			
Total Knowledg eScores (Post)	r *P* - value				
Total attitud escores (Post)	r *P* - value			0.223 0.001**	

*Correlation is significant at the 0.05 level **Correlation is significant at the 0.01 level

Discussion:

To apply AI expertise to clinical practice, nurses must possess the necessary skills and knowledge. AI can help healthcare firms treat patients proactively, lower future risks, and streamline business processes. Healthcare organizations need to integrate AI due to the rapid advancements in technology, law, and patient expectations. Due to these difficulties, healthcare organizations are now vital to the system's performance and development since they save money while maintaining a high standard of treatment (**Ahlstedt et al., 2020**).

According to the current study, the majority of nurses were female with around half of them in the 30- to 40-year age group. In addition, the majority of them had between 10 and 20 years of experience, a bachelor's degree in nursing, and were married in slightly higher percentages. These results may be explained by the fact that nurses value involvement. In the past, only women were allowed to pursue careers in nursing.

According to the current study, the majority of surgical nurses who were investigated had never interacted with artificial intelligence before. According to the researchers, this verified that the maternity nurses under study needed to follow the most recent artificial intelligence training guidelines. The fact that the majority of nurses said that the nursing curriculum did not cover the principles of artificial intelligence and that they had never taken any prior artificial intelligence training courses may help to explain this finding. The nurses in the study had no prior knowledge of artificial intelligence because very few of them claimed to have learned about it from postgraduate courses. Moreover, the reason for the non-existence of this training session is the disregard of accountable

The media served as the main information source for nurses' understanding of artificial intelligence in the current study. This could be a result of the internet being a priceless tool for learning and information. Because of its breadth, accessibility, timeliness, variety of viewpoints, and interpersonal connectivity, it's an invaluable resource for anybody looking to learn more about the world they live in. These results are consistent with those of **Robinson (2020),** who stated that the Internet accounted for 893.2% of the sources in Nigeria.

The use of artificial intelligence in healthcare is transforming patient care and the role of nurses. It facilitates the synthesis of information, task fulfillment, therapeutic problem-solving, decision-making, and patient outcomes. These technologies alone can improve healthcare. Learning how to use technology will change nurses' identity as professionals and open doors for future advancements in healthcare, productivity, capacity, and quality (**Ronquillo, 2021**). The lack of research on quantifiable attitudes and views among healthcare workers underscores the need to comprehend these elements. Technology perceptions can impede the success of adoption.

The present study revealed that the majority of nurses were female, less than one-half of them had a **Nursing institute** degree in nursing education, and more than a fifth of the majority of them had 10–20 years of experience. These findings might be due to the profession of nursing encourages engagement. As well, previously the nursing profession used to accept only females. These results are consistent with those of an **Egyptian** study done by **Mohamed et al. (2023),** who found that all head nurses were female, and51.1% were in the age range of 40 to less than 50 years. Most of them had a bachelor's degree in nursing, and the majority of them had ≥ 15 years of experience.

This result is in disagreement with the study by **Abd El-Monem et al.,(2023),** which examined " The Relationship Between Artificial Intelligence Technology and Staff Nurses' Professional Identity and Problem-Solving Skills " and indicated that more than two-fifths of staff nurses ranged in age between 25 to less than 30 years old. As well as their years of experience slightly less than two-fifths of staff nurses had 5 to less than 10 years of experience.

According to the current study, the majority of surgical nurses who were investigated had never interacted with artificial intelligence before. According to the researchers, this verified that the maternity nurses under study needed to follow the most recent artificial intelligence training guidelines. The fact that the majority of nurses said that the nursing curriculum did not

cover the principles of artificial intelligence and that they had never taken any prior artificial intelligence training courses may help to explain this finding. The nurses in the study had no prior knowledge of artificial intelligence because very few of them claimed to have learned about it from postgraduate courses.

In the present study, the primary sources of information for nurses' knowledge about AI were from **media**. This might be due to that the Internet is an invaluable resource for knowledge and learning. Its vastness, accessibility, timeliness, diversity of perspectives, and ability to connect with others make it a valuable tool for anyone seeking to expand their knowledge and understanding of the world around them. These results contrast with those of **Abuzaid et al (2022)** in **Sharjah, Sharjah, USA,** who found that 51% of respondents stated their knowledge of AI was obtained through self-taught measures for most of the participants, while 20% of them gained it through various courses. Only 8% stated they learned through postgraduate courses.

According to the study's findings, there were improvements and statistically significant changes in all artificial intelligence-related knowledge items between the pre-and post-one-month adoption of instructional guidelines. From the perspective of the researchers, it validated the beneficial impact of implementing instructional guidelines that satisfied the investigated maternity nurses' requirement to increase their knowledge of artificial intelligence.

This result aligns with the findings of **Abuzaid et al. (2022**), who explored an inadequate understanding and knowledge of AI principles and technical potential in the nursing profession and concluded that higher education institutions and healthcare organizations must design and implement appropriate AI educational and training programs for nursing staff to improve their competency in promoting the safe integration and application of AI into nursing practice.

The results of the current study revealed that Most of the studied surgical nurses had unsatisfactory total knowledge scores regarding artificial intelligence in the pre-test phase, while the majority of them had total satisfactory knowledge scores after instructional guidelines implementation**.** This result was, by these results, **Lai, et al. (2020)**, confirmed a general deficiency of knowledge in the participants of AI in a study entitled "A Qualitative Survey Study of French Actors' Perceptions of AI in Healthcare". On the other hand. This result was not similar to the finding of **Mohamed et al. (2023)**, who revealed that only a tiny percentage of head nurses had adequate knowledge of artificial intelligence pre-instructional guidelines implementation in their study.

In the present study, findings confirmed the first research hypothesis, which stated that applied artificial intelligence instructional guidelines affect nurses' knowledge levels of artificial intelligence technologies. The current study results revealed that a pre-intervention minority of nurses had unsatisfactory knowledge regarding AI. However, after educational intervention, there were statistically significant differences among alldomain's scores of nurses' knowledge of artificial intelligence between before and immediately after intervention and follow-up. This indicates that the overall knowledge level of nurses improved immediately after **Swan (2021**) also investigated nursing staff knowledge and attitudes towards artificial intelligence in healthcare settings in the United States and discovered that the majority of nurses were unaware of or did not understand AI in clinical practice. These findings contradict those of **Sheela (2022**), who found that more than half of the participants had adequate knowledge of AI.

As well, these results were in agreement with those of **Abuzaid et al. (2022),** in **Sharjah, USA,** who found a lack of knowledge toward AI. 75% of all respondents agreed that the nursing curriculum should include some basic knowledge of AI. These results were in line with the findings of a very recent study carried out by **Mohamed et al. (2023**), who mentioned that there were significant differences in the mean difference scores of head nurses both before and after intervention (25.196) and between pre-intervention and follow-up (25.033).

After the instructional guidelines, the results of the current study confirmed the second

research hypothesis, which stated that applied artificial intelligence instructional guidelines have an effect on nurses' positive attitude levels toward artificial intelligence. Pre-test the findings revealed that AI is exciting was considered the high mean score among nurses attitudes toward using artificial intelligence. Those findings might be related to that artificial intelligence can speed up the healthcare process, and can help reduce the number of medical errors, AI can deliver massive amounts of clinically relevant, high-quality data in real-time. As well, artificial intelligence helps the patient to get answers instantly without any restrictions of time or place, helps in performing tedious administrative tasks that can take a long time, and helps reduce human error. Additionally, AI can work 24/7 without physical stress; can predict surgical outcomes for patients, and helps in the field of public health and epidemiology. Moreover, AI can enhance patient engagement and treatment compliance; predictive modeling to deal with patient flow, hospital capacity, and resource availability, and artificial intelligence software that helps predict, diagnose, and treat diseases, which in turn helps improve care and reduce workload.

These previous findings were supported by the results of **El-Sayed and El-Salim (2021)**, in Egypt, whose study aimed to assess nurses' views and attitudes regarding the use of AI in health, and found that artificial intelligence is exciting gained average high scores for nurses' attitudes towards the use of AI. These results are in line with those of **Dicuonzo et al. (2023)**, whose similar study aimed to assess the transformation of healthcare using AI and the impact on the workforce and the organization, stating that AI has the potential to transform healthcare delivery.

Additionally, in the current study, the total attitude positive score improved post-instructional guidelines intervention. As well, there were statistically significant differences among all items of attitudes scale (P= 0.001), in nurses' attitudes towards artificial intelligence. These results may be due to that artificial intelligence knowledge which increased post-intervention had a direct effect on their attitudes. Moreover, it has become of great importance nowadays due to the tendency of the health sector to use it in its various fields and seek to provide the necessary information on how to apply it in line with Egypt's Vision 2030, which aims to digitalize all society sectors.

These results were similar to an Egyptian study done by **Mohamed et al. (2023),** which aimed to evaluate the effect of the artificial intelligence program on nurses' attitudes, They mentioned that the mean score of the pre-, post, and follow-up phases of attitudes showed statistically significant differences. Furthermore, this finding was supported by those of **Kwak et al. (2022),** who reported that positive attitudes toward AI initially expected its usage and application. As well, **Mehdipour (2019),** highlighted that nurses who use AI effectively will be able to provide better, faster, and safer services.

The results of the current study revealed that there was a correlation between the total knowledge and attitude among surgical nurses. It clarifies that there is a highly statistically positive correlation between total knowledge and attitude regarding artificial intelligence applications. From the researchers' point of view; this result may be due to the nurses being exposed to the information and environmental incentives that influence the way they think and their impression about AI. This result answers the second question asking about the nurses' levels of attitude regarding artificial intelligence applications.

Conclusion:

Based on the study results, it was concluded that the instructional guidelines had a significant positive effect on improving the studied nurses' knowledge and attitudes regarding artificial intelligence application

Recommendations:

Based on the findings of the current study, the researchers suggested the following recommendations

- Attending workshops and training programs regarding artificial intelligence applications to encourage nurses to increase their knowledge and attitudes toward artificial intelligence and enable them to integrate artificial intelligence applications into nursing practices.

- Conducting the current study again with a bigger sample size of nurses in other situations to generalize the findings.

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