

Awareness Program for Nurses regarding Utilization of Artificial Intelligence in Nursing Care

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Abstract

Background: Artificial Intelligence is continuously identified as a transformative tool in healthcare for nursing and offers promise in enhancing clinical decision-making, improving workflow efficiency, and supporting patient-centered care. Nonetheless, adoption by nurses remains variable, influenced by knowledge, attitudes, organizational readiness, and ethical considerations. **Aim:** To evaluate the awareness program for nurses regarding utilization of artificial intelligence in nursing care. **Design:** A quasi-experimental research design was utilized in the current study. **Setting:** At Badr University Hospital Cairo, Egypt. **Sample:** A convenience sample included 200 nurses who worked in the previously mentioned setting. **Tools:** One tool, structured interview questionnaire encompassed three parts, **1st part:** characteristics of studied nurses, **2nd part:** Nurses' knowledge about artificial intelligence and **3rd part:** Nurses' attitude about artificial intelligence. **Results:** 90% of studied nurses had good total knowledge post awareness program compared to 30% of them pre program about artificial intelligence. While, 84.8% of them had positive total attitude post awareness program compared to 43% of them preprogram about artificial intelligence. **Conclusion:** the present study showed noticeable improvement in knowledge and attitude of studied nurses after implementation of awareness program regarding utilization of artificial intelligence in nursing care **Recommendations:** Organize continuous professional program and workshops for nurses to increase awareness about artificial intelligence in nursing care.

Keywords: Artificial Intelligence, Awareness program, Nursing care.

Introduction:

Artificial Intelligence (AI) describes how technology, especially computer systems, may mimic human intelligence processes. Learning, thinking, problem-solving, perception, and language comprehension are some of these processes. It has become a transformative force across several domains such as healthcare, education, transportation and enabling advancements in diagnostics. The development of AI is broadly divided into narrow AI, which is determined for specific tasks, and general AI, which aims to imitate human cognitive capabilities across diverse tasks. Ongoing research assures the importance of fairness, explainability, and safety in AI systems to emphasized their responsible and beneficial implementation into society (Fisher & Rosella, 2022).

Artificial Intelligence is increasingly transforming healthcare delivery, especially in nursing care, by enabling enhanced

clinical decision-making, predictive analytics, and administrative automation. AI modalities such as machine learning, robotic process automation and natural language processing are being implicated into electronic health records and bedside systems to support nurses in real-time patient monitoring, early warning systems, and risk stratification. These technologies facilitate faster data interpretation and evidence-based decisions, thereby improving patient outcomes and reducing nurse workload (Sobhy et al., 2023).

Globally in 2024, almost a fifth of healthcare facilities were in early-phase initiatives of adopting AI in their organizations. In Saudia Arabia AI has a great demand in the healthcare field. 86% of healthcare providers, tech vendors and life science companies use AI which enables the analysis of vast quantities of healthcare data to identify new insights, trends, and

correlations, accelerating medical research, drug discovery, and clinical trials, leading to the development of innovative treatments, and medical approaches to address unmet medical requirements and improve care (Motlagh et al., 2024).

Nurses' perceptions and attitudes toward AI potentially influence willingness to adopt and utilize such technologies in practice. Interventions that include interactive components, case-based discussions, and scenario simulations can help demystify AI and mitigate anxiety or misconceptions. By creating opportunities for engagement and reflection, awareness programs can empower nurses to critically assess AI tools and advocate for patient-centered, ethically grounded implementations (Amann et al., 2022).

An awareness program specifically designed for nurses can serve as a foundational strategy to bridge this knowledge gap. Such programs can provide essential insights into the basics of AI, its applications in supporting clinical decision, patient monitoring, predictive analytics, and personalized care, as well as the associated ethical, legal, and professional considerations. By equipping nurses with relevant knowledge and skills, these initiatives can promote informed participation in AI-integrated care models and support their evolving roles in a digitally enabled healthcare system (Collins et al., 2024).

The development of AI awareness programs must also be aligned with contemporary nursing curricula and professional development standards. Interdisciplinary collaboration between nursing educators, informatics specialists, and AI developers is necessary to emphasize that the content is both relevant and evidence-based. Moreover, continuous evaluation of program effectiveness is necessary to incorporate to the rapidly progressing nature of AI modalities and healthcare needs. An awareness program designed for nurses not only facilitates the practical utilization of AI in patient care but also prepares the nursing workforce to thrive in a future where technology and human expertise must work in tandem (Wang & Preininger, 2023).

Implementation of AI in nursing care presents considerable ethical challenges that must be addressed to confirm safe, equitable, and person-centered healthcare. One major concern is the potential erosion of patient autonomy and privacy, particularly when AI systems make decisions based on large volumes of personal health data without transparent mechanisms for consent or explanation. Integrating ethical training into nursing education and involving nurses in AI system development are also vital steps to ensure that technology enhances rather than undermines compassionate care (Grace et al., 2024).

Nurses have a crucial role in the integration and effective utilization of artificial intelligence technologies in nursing care, acting as key stakeholders in both the progression and integration of AI-driven tools. As frontline healthcare providers, nurses are essential in identifying clinical needs where AI can support decision-making, improve patient outcomes, and streamline workflows. Their involvement ensures that AI applications are aligned with real-world nursing practices, including patient assessment, early warning systems, predictive analytics, and documentation automation (Gupta et al., 2023).

Moreover, nurses are essential in ensuring the equitable and ethical AI usage in healthcare. They advocate for patient rights, data privacy, and informed consent in the use of AI-based tools, especially in vulnerable populations. As AI systems increasingly influence decisions about diagnoses, treatments, and prioritization of care, nurses help maintain a humanistic approach by monitoring algorithmic bias and addressing disparities that may arise from non-representative training data. Through holistic perspective, nurses act as ethical stewards, ensuring that AI supports inclusive and equitable healthcare delivery (McBride & Tietze, 2025).

Significance of the study:

Artificial Intelligence has progressed as a transformative tool in healthcare, offering new possibilities to support the efficiency, quality, and accessibility of nursing care. In Egypt, healthcare organizations often face resource constraints, overburdened staff, and disparities

in rural versus urban care access, so AI provides tools for optimizing clinical workflows and decision-making processes. AI-driven systems such as predictive analytics, and machine learning algorithms can support Egyptian nurses in early diagnosis, triage, and personalized care planning, reducing clinical errors and improving patient outcomes (El-Metwally et al., 2023).

Artificial Intelligence adoption in Egyptian nursing practice is particularly substantial in addressing workforce shortages and uneven healthcare distribution. For instance, AI-powered telehealth platforms can extend nursing care to remote and underserved areas, improving access without overextending human resources. Moreover, intelligent monitoring systems enable real-time patient surveillance, reducing the burden on nursing staff and ensuring timely interventions for high-risk patients. These technologies contribute not only to improved efficiency but also to the overall safety and satisfaction of patients and caregivers (Ahmed & Farouk, 2024).

Globally, AI facilitates improved workforce efficiency, especially in regions facing nursing shortages. Automated documentation, Electronic Health Record (EHR) management, and virtual nursing assistants can reduce administrative burdens, allowing nurses to allocate greater time to direct patient care. Furthermore, AI-supported training platforms using virtual simulations contribute to ongoing professional development and standardized competency across diverse healthcare settings. These innovations are vital in low-resource countries where training and workforce capacity remain limited, enabling equitable access to high-quality nursing care (Krittana Wong et al., 2024).

Aim:

To evaluate the awareness program for nurses regarding utilization of artificial intelligence in nursing care through the objectives:

- 1- Identify nurses' knowledge and attitude about artificial intelligence pre and post program.
- 2- Plan and implement the awareness

program about artificial intelligence.

- 3- Evaluate the effectiveness of awareness program on nurses' knowledge and attitude about artificial intelligence.

Research hypothesis

Nurses' knowledge and attitude about artificial intelligence will be improved after implementation of awareness program

Subject and Methods

Design:

A quasi-experimental research design was utilized in the current study

Setting:

This study conducted at Badr University Hospital, affiliated to Helwan university, Cairo, Egypt.

Sample: A convenience sample included 200 nurses who work in previously stated setting.

Sample size: Total number of nurses in Badr Hospital include 350 nurses. The sample size estimation was done based on the power analysis of the Herbert Equation.

$$n = \frac{p(1-p)}{(SE \div t) + [p(1-p) \div N]}$$

N = 350

t = 1.96

SE = 0.05

P = 0.50

0.50 (1-0.50)

n =

(0.05 ÷ 1.96) + [0.50 (1-0.50) ÷ 350]

n = 200

Based on this equation, the sample equals 200 nurses

Tools of data collection:

A structured interview questionnaire was created by the researchers after reviewing related literature it involved three parts:

Part I: Characteristics of nurses: include nurses' age, gender, level of education, marital status, income, place of residence, experience and training courses about dealing with artificial intelligence.

Part 2: Studied nurses' knowledge about AI:

It was designed based on (Alruwaili et al., 2024) it included 8 closed ended questions as: Meaning of AI, primary goal of AI in healthcare, types AI, functions of AI in nursing, Advantages and disadvantages of AI in nursing, AI applications in nursing and major barrier to the widespread artificial intelligence in the healthcare sector

Scoring system: the obtained knowledge was checked with a model key answer with scoring as follows: correct choice takes "one", whereas incorrect one takes "zero". The total score was transferred into percentage as follows:

- Good ($\geq 75\%$) (≥ 6 grades)
- Average ($50 - < 75\%$) ($4 - < 6$ grades)
- Poor ($< 50\%$) (< 4 grades)

Part 3: Studied nurses' attitude about artificial intelligence:

It was established based on (Yılmaz et al., 2025) included twelve items to determine the study participants' attitudes toward artificial intelligence. The attitude Likert scale was assessed from 1 to 3, as follows Agree = 3, Neutral = 2 and Disagree = 1.

Scoring system:

The overall attitude scores were 12-36 for 12 items with final score=36 grades and categorized as:

- Positive $\geq 60\%$ (22-36 grades).
- Negative $< 60\%$ (12-< 22 grades).

Validity:

A panel of three experts from Medical Surgical Nursing and Community Health Nursing, Faculty of Nursing, Helwan University reviewed them for clarity, comprehensiveness, relevance, understanding, and applicability. The tools were then modified as needed.

Reliability:

Cronbach's Alpha was utilized to identify the internal reliability of the tools. Test-retest reliability was used to compare the responses from repeated testing. It was 0.90 for knowledge and 0.87 for attitude about artificial intelligence

Ethical considerations:

The suggested research was approved by "the Scientific Research Ethics Committee, Faculty of Nursing, Helwan University" on 29/3/2023, session number (33). Inclusion in the study is entirely voluntary, and participants were fully told about the research and their role prior to providing the permission. The ethical considerations included stating the goal of the work, mentioning the ability to withdraw at any time, and ensuring data confidentiality so that no other party could access it without the subjects' permission. Ethics, morals, culture, and beliefs were respect.

Pilot study:

It was conducted on 10% (20 nurses) of the sample to determine the tools' practicability, clarity, and objectivity. After analyzing the pilot data, no alterations were done, thus studied subjects who involved in the pilot study were also enrolled in the main sample.

Preparatory phase:

In order to create instruments for gathering data, it involved examining relevant literature and theoretical understanding of different research facets using books, papers, the internet, and periodicals.

Field work:

A written letter obtained from "the Dean of Faculty of Nursing, Helwan University". Written letter was sent to the director of Badr University Hospital to obtain permission to conduct the study. The researchers were present in the work settings two days a week (Tuesday and Wednesday). It began and ended within six months, from beginning of August 2024 to the end of January 2025. Before enrolling nurses in the study, the researchers introduced themselves and discussed the research objective. Formal consent was obtained from each nurse, and the previously indicated study tool was used to conduct interviews. The researchers presented the questionnaire to the nurse and marked her responses. During the pretest, each interview took roughly 20-25 minutes to complete the questions. Following the pretest, the researchers started an awareness program about artificial intelligence. The post-test was administered immediately following the program. The study was

conducted in the following phases:

The artificial intelligence awareness program was developed in four phases: assessment, planning, implementation, and evaluation.

Assessment: It involved collecting data from nurses about AI. Each nurse was questioned using characteristic data, knowledge questionnaires and attitude questionnaire about artificial intelligence.

Planning: an awareness program was prepared based on the assessment results and considering relevant research. The program was aimed to improve the nurses' knowledge and attitude. The awareness program was created after reviewing relevant literature and determining the needs of nurses through a pre-test. The knowledge regarding artificial intelligence included the following: Meaning of AI, primary goal of AI in healthcare, types AI, functions of AI in nursing, advantages and disadvantages of AI in nursing, AI applications in nursing and major barrier to the widespread artificial intelligence in the healthcare sector. Also, include attitude about artificial intelligence.

The implementation phase: The researchers conducted an awareness program, followed by an immediate post-test. The final frequency of nurses was 200, categorized into ten groups, each group involved 20 nurses. Each group attends 5 sessions, twice a week, each lasting 30-35 minutes and containing the following:

- **Session 1:** It focused on open discussion for group identification, group integration, and explanation of awareness program goal and timetable. The researchers use brainstorming to discuss the meaning of AI and primary goal of AI in healthcare.
- **Session 2:** This session was concerned with a lecture regarding types of AI, functions and advantages of AI in nursing.
- **Session 3:** The researchers' revision of the previous session, then underlined the disadvantages of AI and applications in nursing, and major obstacles to the wide implementation of AI in the healthcare sector.
- **Session 4:** The researchers examined the

knowledge supplied in the previous session and clarify several aspects of attitude towards artificial intelligence for nurses.

• **Session 5:** The researchers summarized all previous sessions, focusing on nurses' opinions about the benefits of the awareness program. The study established contact channels between researchers and nurses to address their questions and express gratitude for their participation. Several teaching methods, including brainstorming, lectures, discussions, and an illustrated booklet provided to each nurse for reference, were used to accomplish these sessions. Use of visual aids, such as computers, videos, and images. Each session concludes with a period for questions and comments.

Evaluation: The sessions were evaluated promptly following the program by comparing the alterations in nurses' level of knowledge and attitude using the same pretest-posttest method.

Statistical Analysis

The data was analyzed using version 29 of the Statistical Package for Social Sciences (SPSS)". The initial set of data was descriptive, which was coded, reviewed, and analyzed using frequency, proportions, means, and standard deviations; parameters were compared using χ^2 test. The second section of the data dealt with correlations, Spearman's correlation was performed to analyze the interrelationships between scored and ranked variables. The results were classified as non-significant (NS) at $P > 0.05$, significant (S) at $P \leq 0.05$, and highly significant (HS) at $p < 0.001$.

Results:

Table (1): Shows that, mean age of nurse was 32.4 ± 6.7 years & 77.5 % of them were male. Regarding level of education, 82.5 % of the nurses had bachelor's degree. Moreover 77.0% of them were resident in urban areas and 47.5 % of them had experience from 1-<5 years. 97.50 % of the nurses didn't take training courses about dealing with artificial intelligence.

Table (2): Indicates that, highly statistically significant differences between all items of

knowledge for nurses at pre & post implementation of awareness program as $p = 0.001$

Figure (1): Shows that, 30%, 20% and 50% of nurses had good, average and poor knowledge about artificial intelligence at pre-program respectively. While, improved to 90%, 6% and 4% of them had good, average and poor knowledge about artificial intelligence at post awareness program respectively.

Table (3): Indicates that, highly statistically significant differences between all items of attitude of nurses at pre & post implementation of awareness program.

Figure (2): Illustrates that, 57% & 43% of nurses had negative and positive total attitude pre implement of awareness program respectively. While 84.8 % & 15.2% of them

had positive and negative total attitude post implementation of awareness program respectively.

Table (4): Clarifies that, **there** was positive correlation between studied nurses' total knowledge and attitude regarding to artificial intelligence at post awareness program. ($P = 0.000$) respectively

Table (5): Shows that, there was statistical relation between nurse's knowledge about AI at post awareness program with their age, gender, level of education, years of experience and monthly income.

Table (6): Indicates that, there was highly statistical relation between studied nurses' total attitude regarding to artificial intelligence at post awareness program with their age, gender, level of education, experience, and monthly income.

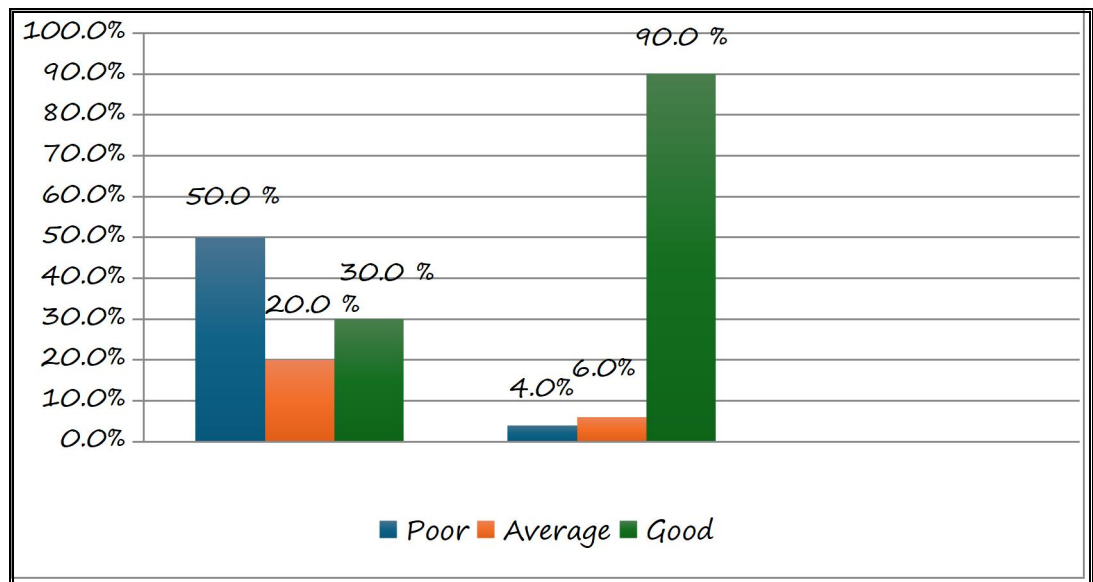
Table (1): Frequency Distribution of the Studied Nurses Characteristics (n=200).

Item	No.	%
Age (years)		
18- <30	60	30.00
30- < 40	128	64.00
40 -< 50	10	5.00
≥ 50	2	1.00
Mean ± SD = 32.4 ± 6.7 years		
Gender		
Male	155	77.5
Female	45	22.5
Marital status		
Single	18	9.00
Married	162	81.00
Divorced	8	4.00
Widow	12	6.00
Place of residence		
Urban	154	77.0
Rural	46	23.0
Monthly Income		
Sufficient and saving	24	12.00
Suffices basic needs	124	62.00
Not sufficient for basic needs	50	25.00
Level of education		
Diploma Nurses	30	15.0
Bachelor	165	82.5
Postgraduate	5	2.50
Years of experience		
< 1	24	12.00
1-<5	95	47.5
≥5	81	40.5
Training courses about dealing with the artificial intelligence		
Yes	5	2.5
No	195	97.5

Table (2): Studied Nurses' Knowledge regarding Artificial Intelligence Pre & Post implementation of Awareness Program (n=200).

Knowledge items	The studied nurses				χ^2	P value
	Pre		Post			
	No.	%	No.	%		
Meaning of Artificial Intelligence (AI)						
Correct answer	85	42.5	178	89.0	9.254	<0.001**
Incorrect answer	115	57.5	22	11.0		
Primary goal of AI in healthcare						
Correct answer	94	47.0	182	91.0	10.220	<0.001**
Incorrect answer	106	53.0	18	9.0		
Types Artificial Intelligence (AI)						
Correct answer	70	35.0	165	82.5	11.242	<0.001**
Incorrect answer	130	65.0	35	17.5		
Functions of AI in nursing						
Correct answer	62	31.0	174	87.0	11.123	<0.001**
Incorrect answer	138	69.0	26	13.0		
Advantages of AI in nursing						
Correct answer	68	34.0	172	86.0	13.410	<0.001**
Incorrect answer	132	66.0	28	14.0		
Disadvantages of AI in nursing						
Correct answer	76	38.0	171	85.5	11.240	<0.001**
Incorrect answer	124	62.0	29	14.5		
Artificial Intelligence Applications in nursing						
Correct answer	67	33.5	179	89.5	13.892	<0.001**
Incorrect answer	133	66.5	21	10.5		
Major barrier to the widespread artificial intelligence in the healthcare sector						
Correct answer	61	30.5	169	84.5	12.332	<0.001**
Incorrect answer	139	69.5	31	15.5		

** Highly significant at $p < 0.001$



$\chi^2 = 29.54$ ** P value = 0.000

Figure (1): Total Knowledge of Studied Nurses regarding AI Pre & Post implementation of Awareness Program (n=200).

Table (3): Nurses' Attitude regarding AI Pre & Post implementation of Awareness Program (n=200).

Attitude items	The studied nurses				χ^2	P value
	Pre		Post			
	No.	%	No.	%		
Think that						
AI allows nurses to focus more on patient care						
Agree	85	42.5	150	75.0	11.942	<0.001**
Neutral	60	30.0	30	15.0		
Disagree	55	27.5	20	10.0		
The integration of AI into healthcare will reduce the workload for nurses						
Agree	90	45.0	165	82.5	13.666	<0.001**
Neutral	50	25.0	20	10.0		
Disagree	60	30.0	15	7.5		
I am confident in the ability of AI systems to handle patient data securely and ethically.						
Agree	79	39.5	162	81.0	14.009	<0.001**
Neutral	95	47.5	24	12.0		
Disagree	26	13.0	14	7.0		
AI will likely lead to significant improvements in the quality of care provided to patients.						
Agree	98	49.0	170	85.0	12.663	<0.001**
Neutral	70	35.0	20	10.0		
Disagree	32	16.0	10	5.0		
AI can be a valuable tool for decision support in clinical settings, particularly for diagnosing diseases						
Agree	110	55.0	172	86.0	16.002	<0.001**
Neutral	55	27.5	16	8.0		
Disagree	35	17.5	12	6		
AI can provide equitable healthcare access, especially in underserved areas						
Agree	57	28.5	168	84.5	13.012	<0.001**
Neutral	75	37.5	8	4.0		
Disagree	32	16.0	23	11.5		
Nurses should receive formal training on the use of AI technologies in healthcare						
Agree	120	60.0	180	90.0	10.997	<0.001**
Neutral	53	26.5	15	7.5		
Disagree	27	13.5	5	2.5		
I am confident in my ability to learn how to use AI technologies effectively in my practices						
Agree	105	52.5	179	89.5	11.002	<0.001**
Neutral	55	27.5	17	8.5		
Disagree	40	20.0	4	2.0		
AI will play a central role in the future of nursing practices						
Agree	115	57.5	187	93.5	12.995	<0.001**
Neutral	60	30.0	2	1.0		
Disagree	25	12.5	9	4.5		
AI has the potential to revolutionize the role of nurses in healthcare delivery						
Agree	78	39.0	169	84.5	10.664	<0.001**
Neutral	57	28.5	8	4.0		
Disagree	65	32.5	23	11.5		
AI minimizes human errors in tasks such as data entry, diagnostics, and financial transactions						
Agree	123	61.5	183	91.5	12.002	<0.001**
Neutral	48	24.0	12	6.0		
Disagree	29	14.5	5	2.5		
AI facilitate improvement in nursing profession						
Agree	132	66.0	186	93.0	15.235	<0.001**
Neutral	50	25.0	8	4.0		
Disagree	18	9.0	6	3.0		

** Highly significant at p<0.001

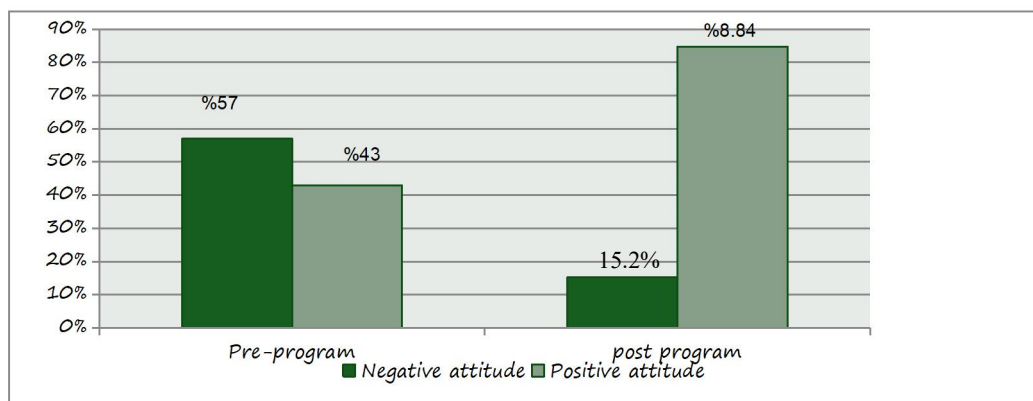


Figure (2): Studied Nurses Attitude about AI Pre & Post Awareness Program (n=200).

Table (4): Correlation between studied nurses' total knowledge and total Attitude about Artificial Intelligence at Post Awareness Program (n=200).

Variables	Total Knowledge		Total Attitude	
	r	P	R	p
Total Knowledge	-	-	.915	.000**
Total Attitude	.915	.000**	-	-

(*) statistically significant & (**) high statistically significant $P \leq 0.00$

Table (5): Relation between Characteristics of Studied Nurses and their Total Knowledge at Post Awareness Program about artificial intelligence (n=200).

Items	The studied nurses total knowledge						χ^2	P value
	Post awareness Program							
	Good n=180		Average n=12		Poor n=8			
	No.	%	No.	%	No.	%		
Nurses age								
18 <30 years	45	25.0	10	83.3	5	62.5	12.255	0.000**
30-<40 years	127	70.6	0	0.0	1	12.5		
40- < 50 years	6	3.3	2	16.7	2	25.0		
≥ 50 years	2	1.1	0	0.0	0	0.0		
Gender								
Male	150	83.3	0	0.0	5	62.5	9.325	0.002**
Female	30	16.7	12	100.0	3	37.5		
Marital status								
Single	10	5.6	8	66.7	0	0.0	4.852	.865
Married	157	87.2	0	0.0	5	62.5		
Divorced	5	2.8	0	0.0	3	37.5		
Widow	8	4.4	4	33.3	0	0.0		
Place of residence								
Urban	150	83.3	0	0.0	4	50.0	5.214	0.752
Rural	30	16.7	12	100.0	4	50.0		
Level of education								
Diploma Nurses	20	11.1	10	83.3	0	0.0	10.258	0.001**
Bachelor	160	88.9	0	0.0	5	62.5		
Postgraduate	0	0.0	2	16.7	3	37.5		
Years of experience								
< 1 years	20	11.1	4	33.3	0	0.0	12.255	0.001**
1-< 5 years	79	43.9	8	66.7	8	100.0		
≥5 years	81	45.0	0	0.0	0	0.0		
Monthly Income								
Sufficient and saving	20	11.1	4	33.3	0	0.0	13.025	0.001**
Suffices basic needs	108	60.0	8	66.7	8	100.0		
Not sufficient for basic needs	50	27.8	0	0.0	0	0.0		
Training courses about dealing with the artificial intelligence								
Yes	1	0.55	2	16.66	2	25.0	6.852	.931
No	179	99.55	10	83.33	6	75.0		

Table (6): Relation between Characteristics of Studied Nurses and their Attitude at Post Awareness Program about AI (n=200).

Awareness Program about AI (n= 200).						
Parameters	Studied Nurses				χ^2	P value
	Post awareness Program					
	Positive n=169		Negative n=31			
	No.	%	No.	%		
<i>Nurses age</i>						
18- <30 years	50	29.58	15	48.3	9.658	0.001**
30- < 40 years	111	65.6	12	38.8		
40- < 50 years	6	3.5	4	12.9		
≥ 50 years	2	1.1	0	0.0		
<i>Gender</i>						
Male	145	85.8	10	32.2	11.225	0.000**
Female	24	14.2	21	67.8		
<i>Marital status</i>						
Single	8	4.7	10	32.3	6.251	0.732
Married	155	91.7	7	22.6		
Divorced	0	0.0	8	25.8		
Widow	6	3.6	6	19.3		
<i>Place of residence</i>						
Urban	150	88.8	6	19.4	7.002	0.852
Rural	19	11.2	25	80.6		
<i>Level of education</i>						
Diploma Nurses	22	13.0	7	22.6	14.365	0.001**
Bachelor	145	85.8	20	64.5		
Postgraduate	2	1.2	4	12.9		
<i>Years of experience</i>						
< 1 years	18	10.7	7	22.6	13.658	0.000**
1-<5 years	90	53.3	9	29.0		
≥5 years	61	36.0	15	48.4		
<i>Monthly Income</i>						
Sufficient and saving	13	7.7	5	16.1	16.201	0.001**
Suffices basic needs	12	71.0	6	19.4		
Not sufficient for basic needs	36	21.3	20	64.5		
<i>Training courses about dealing with the artificial intelligence</i>						
Yes	3	1.77	2	6.45	7.525	0.675
No	166	98.30	29	93.55		

Discussion

Artificial intelligence in healthcare has the ability to improve patient care, increase the accuracy of diagnoses, and increase access to medical treatments. Being at the forefront of patient care, nurses are essential to using AI to create a health care system that is more effective and equitable. But in order to carry out this responsibility, nurses will need to get training that equips them with the abilities and information needed to use AI in an ethical and successful manner (Cary, 2024).

Regarding to studied nurse's characteristic, the present results showed that slightly less than two thirds of the nurses were 30-<40 years old with a mean $\pm$ SD 32.4 ± 6.7 years, more than three quarters of them were male and resident in urban areas. However, majority of them had bachelor's degree and didn't take training courses about dealing with artificial intelligence. In addition, less than half of them had experience from 1-<5 years. These results are congruent with those of Abuzaid et al., (2022) in the United Arab Emirates (UAE) (n= 553) who studied "Integration of artificial intelligence into nursing practice" found that 64.8% of participants in the age group of 30-<40 years with a mean $\pm$ SD 35.7 ± 5.7 and majority of them had university education. Also, these study findings were supported by Vanamali et al., (2025) in India (n=350) in their recent study survey , where the majority of Healthcare Professionals don't receive training courses about artificial intelligence. It is suggested that these could be connected to the necessity of ongoing education to maintain nurses' proficiency in using artificial intelligence into their practice.

Concerning studied nurses' knowledge regarding AI Pre & Post implementation of Awareness Program, the results of this study demonstrated that there was a highly statistically significant improvement between all items of knowledge among studied nurses at post implementation of awareness program than pre-program. Also, half of nurses had poor knowledge about artificial intelligence at pre-programs. While the highest percentage improved to good knowledge about artificial intelligence at post awareness program. This finding was in line with that of Mohamed et al., (2023) in Egypt (n=203), about "Evaluation of

Knowledge, Attitudes, and Practices among Healthcare Professionals toward Role of Artificial Intelligence in Healthcare" found that majority of participants had satisfactory knowledge after program about artificial intelligence. Also, this result was in the same line with that of the research done by Khalil& Yasir (2025) in Iraq (n=354), who studied "Nurses' Knowledge and Attitudes Regarding Artificial Intelligence Technology in Iraq" reported that about half of nurses had poor knowledge about AI.

Additionally, these study results were agreement to Awad et al., (2023) in Egypt (n=92) who studied "Effect of the Artificial Intelligence Enhancement Program on Head Nurses' Managerial Competencies and Flourishing at Work " they found that highest mean scores with a statistically significant difference for head nurses' knowledge level at post enhancement program than pre. It is suggested that this improvement in knowledge may be attributed to the implementation of an awareness program, which was an effective technique for studied nurses to acquire knowledge about artificial intelligence. Therefore, targeted educational initiatives and policy support are essential to bridge the knowledge gap and prepare the nursing workforce for the future of healthcare.

Concerning Studied Nurses' Attitude regarding Artificial Intelligence Pre & Post implementation of Awareness Program, the results of this work displayed that it was highly significance between all items of attitude of nurses at post implementation of awareness program. Also, more than half of studied nurses had negative attitude pre implementation of awareness program which improved to majority of them had positive total attitude at post awareness program. This result was in the same line with that of the study done by Alhassan et al., (2025) in Egypt (n= 77) who studied "Evaluate the Effect of an Artificial Intelligence Education Program on Nurse's Perspectives and Attitudes toward an Artificial Intelligence" and revealed that 81.8% of nurses reported a positive attitude post-intervention. Also, these study results were congruent with that of Abuadas et al., (2025) in Saudi Arabia (n= 115), whose study entitled "The impact of an AI-focused ethics education program on nursing students' ethical awareness, moral sensitivity, attitudes, and generative AI adoption intention: a quasi-

experimental study" and demonstrated that study group had positive attitude toward AI significantly increased post intervention than control group and indicating a strong impact of ethics education on attitude of participants.

Moreover, such findings were supported by **Khalil et al., (2025)** in Jeddah and Saudi Arabia, (n=157) who stated "Cultivating artificial intelligence (AI) competence and shaping attitudes among psychiatric hospital nurses: A quasi-experimental study" which stated that effectiveness of the intervention. Participants exhibited potential attitude improvement, with post- positive attitude scores increasing from 72.61 to 83.31. This may be attributed to the positive influence of awareness program among nurses in enhancement positive attitude regarding AI.

Regarding to Correlation and relation between studied Nurses' knowledge and Attitude about AI at Post Awareness Program, the findings of the present study revealed that there was positive correlation between studied nurses' total knowledge and total attitude regarding to artificial intelligence at post awareness program. These results are corresponding with those of **Ali et al., (2025)** in Egypt (n=61), who studied title about "Nurses' Knowledge and Attitude Regarding Application of Artificial Intelligence in Hemodialysis Unit at Benha University Hospital" and revealed that there was a positive correlation between total level of their knowledge and attitude toward AI. Also, this result was agreement with those reported by **Alhassan et al., (2025)** and found that the educational intervention had a potential positive correlation between nurses' knowledge and attitude toward AI. This improvement is attributed to increased knowledge, reduced uncertainty, and enhanced confidence in utilizing AI tools which led to increased positive attitude.

The present study results revealed that there was statistically significant relation between studied nurse's knowledge about AI at post awareness program with their age, gender, level of education, experience and monthly income. This study results were in line with **Atalla et al., (2025)** in Egypt (n=380) in their entitled "Embracing artificial intelligence in nursing: exploring the relationship between artificial intelligence-related attitudes, creative self-efficacy, and clinical reasoning competency

among nurses" and they mentioned that there was a considerable relation between nurse's knowledge about AI and their age, level of education and years of experience. This may be due to age is important, as younger generations may be more adaptable to innovative technology, whilst older can benefit from specific training to bridge digital differences. Nurses' understanding and application of AI principles is influenced by their educational background, emphasizing the importance of specialized learning methods that accommodate varied levels of prior knowledge. Work experience influences how perceive AI's role in their professions, with more experienced nurses frequently concentrating on how AI may improve efficiency and decision-making. Finally, monthly income can influence access to AI-related materials and training; hence, making AI education affordable.

The current results indicated that there was highly significant relation between studied nurses' attitude regarding AI at post awareness program with their age, gender, education, experience and monthly income. This study results disagree with study done by **Sommer et al., (2024)** in Germany, entitled " Nurses' perceptions, experience and knowledge regarding artificial intelligence" and found that there is no relation between total attitude of nurse and their demographics. From researchers' point of view, education level is frequently related with more technology literacy, which may lead to more positive attitudes toward AI. Similarly, professional experience, particularly in technology, might increase familiarity and perceived usefulness with AI technologies. Finally, those with higher incomes may have easier access to AI-enabled technologies and services, leading to increased adoption and perceived benefits.

Conclusion:

The current study displayed noticeable improvement in knowledge and attitude of studied nurses after implementation of awareness program regarding utilization of artificial intelligence in nursing care.

Recommendations:

Based on the findings of this research, the following recommendations are suggested:

- **Organize continuous professional program and workshops** for nurses to increase

awareness about AI in nursing care.

- **Investigate barriers and facilitators** affecting the implementation of AI in nursing, including technological limitations, ethical concerns, and organizational readiness.
- **Conduct further research on large sample and others setting** to explore the long-term impact of AI awareness programs on nursing performance, patient outcomes, and overall quality of care.

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