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KNOWLEDGE, ATTITUDES AND PRACTICE TOWARD USING ARTIFICIAL INTELLIGENCE IN PATIENTS' CARE AMONG HEALTHCARE STAFF

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ABSTRACT

Artificial intelligence (AI) plays a growing role in enhancing patient care and clinical decision-making in healthcare settings. Understanding healthcare professionals' knowledge, attitudes, and practices toward AI is essential for its effective and safe implementation. This study aimed to assess healthcare staff's knowledge, attitudes, and practices regarding the use of artificial intelligence in patient care. This cross-sectional descriptive study was conducted among healthcare staff at Dawadmi General Hospital. A total of 150 healthcare staff members who were willing to participate and had not been involved in similar studies were included. Data were collected using a structured questionnaire developed in Google Forms. The questionnaire link was distributed to participants via email. Data collection took place from January to November 2025. Most participants were aged 20–30 years (60%), with a mean age of 29.8 ± 6.3 years, and predominantly female (61.3%). Most were nurses (86.7%) with 10–15 years of experience (64.7%). Significant differences were observed between nurses and physicians in AI knowledge, including general familiarity (20.6% of nurses vs. 13.3% of physicians), understanding of computational principles (22.6% vs. 12%), and perception of AI limitations (28.6% vs. 8.6%) ($p \leq 0.001$). Graduates reported the highest confidence in AI's usefulness and applications (28–35%), while 20.6% of diploma holders expressed concern that AI could replace jobs. In practice, most nurses used AI once (36.6%), whereas physicians used AI two to four times (18.6%). Significant associations were also found between occupation and AI perceptions, including AI's emotional limitations ($p \leq 0.013$), ability to provide opinions in unexpected situations ($p \leq 0.005$), and views on developers' clinical experience ($p \leq 0.001$). Significant differences were observed in healthcare staff's knowledge, attitudes, and practices toward the use of artificial intelligence in patient care based on their professional qualifications. Incorporate AI education into professional development and continuing medical education to improve practical application and familiarity with AI tools in clinical practice.

KEYWORDS: Artificial Intelligence, Healthcare Staff, Knowledge, Attitudes, Practice, and Patient Care.

1. INTRODUCTION

Artificial intelligence (AI) is considered an umbrella term used today to describe multidisciplinary approaches that integrate mathematical, statistical, and computer sciences to simulate intelligent human behavior. Recently, AI and its related technologies have begun to be applied in the healthcare field, particularly in radiology and pathology, where their potential to shape many aspects of patient care has become evident. Although the use of AI in healthcare remains limited, especially in low-income countries due to insufficient innovation and technological constraints, its importance continues to grow (Kazmi et al., 2024). The integration of AI has led to a transformative revolution in healthcare systems, significantly reshaping how healthcare is delivered, monitored, managed, and improved. This innovative shift introduces new possibilities to enhance accuracy, efficiency, and overall patient outcomes through support in disease diagnosis, personalized treatment planning, continuous patient monitoring, and evidence-based healthcare recommendations. Therefore, understanding healthcare professionals' knowledge, attitudes, perceptions, and clinical practices related to AI utilization is crucial for effective implementation in healthcare settings (Habib, Hoodbhoy, & Siddiqui, 2024).

The integration of AI into healthcare systems is a major public health concern worldwide. Healthcare professionals aim to deliver high-quality care at an affordable cost to diverse populations. AI holds great promise in addressing these challenges by integrating real-world, data-driven insights into patient care. Artificial intelligence refers to high-performance computerized systems capable of performing tasks like human activities but with greater speed and efficiency (Alruwaili, 2024). Serbaya et al. (2024) reported that AI is increasingly used as a technological advancement in healthcare; however, Saudi literature addressing healthcare workers' knowledge, attitudes, and behaviors toward AI remains limited. Their findings indicated good awareness and optimistic attitudes among healthcare workers in Jeddah, although many expressed concerns about AI potentially replacing their current job roles. Similarly, Habib et al. (2024) emphasized that AI technologies represent a promising solution for improving healthcare efficiency and patient outcomes.AI adoption has emerged as a significant concern among healthcare professionals in Saudi Arabia, particularly regarding data quality, data management, patient information security, and the reliability of AI-generated recommendations. Professional liability and lack of transparency in AI decision-making processes further contribute to healthcare workers' apprehension. Despite high awareness of AI's potential benefits, limited hands-on experience with AI technologies remains a major barrier to adoption (Alsaedi et al., 2024).

Mariano et al. (2025) reported varying levels of knowledge among healthcare professionals regarding AI and its applications, with most participants demonstrating a satisfactory understanding, although gaps requiring improvement were identified. Participants expressed mildly positive attitudes toward AI use in nursing, believing that it could reduce healthcare costs, increase access to services, and improve diagnostic and treatment accuracy. Practice levels were moderately positive, with many participants acknowledging the need for specialized training and the importance of addressing ethical and societal challenges. However, there remains room for improvement in expanding AI applications beyond nursing and improving ease of use. Similarly, Alabbad et al. (2025) identified a clear gap between general awareness of AI and specific knowledge of its subtypes among healthcare staff. Although overall familiarity with AI was high, formal education and structured training on AI were lacking, and concerns about AI's impact on clinical roles persisted. Karaferis et al. (2025) further reported that most participants demonstrated confidence in AI applications and perceived that its benefits outweighed potential risks. Despite the growing integration of artificial intelligence in healthcare, limited evidence exists regarding healthcare staff's knowledge, attitudes, and practices toward AI use in patient care, particularly in Saudi healthcare settings. Understanding these dimensions is essential to identify educational needs, address concerns, and support the effective and ethical implementation of AI in clinical practice. Therefore, this study aims to assess healthcare staff's knowledge, attitudes, and practices toward using artificial intelligence in patient care.

1.1. Study Significance

Using artificial intelligence (AI) in the healthcare system has the potential to accelerate patient diagnosis, improve care outcomes, and enhance the overall quality of healthcare services. Rapid advancements in AI technologies can revolutionize healthcare delivery through effective integration into clinical practice. For successful implementation of AI in healthcare, it is essential to equip healthcare providers with the necessary knowledge, skills, and

tools, as this has a significant impact on both healthcare staff performance and patient outcomes. Therefore, healthcare professionals need to be fully aware of how to use AI, develop positive attitudes toward its application in patient care, and acquire the ability to practice AI-supported care effectively. In addition, healthcare staff and administrators should recognize the importance of integrating AI into healthcare systems, increase awareness of AI applications, and address potential challenges to ensure its safe and effective adoption in clinical practice.

1.2. Study Aim

To assess healthcare staff's knowledge, attitudes, and practices regarding the use of artificial intelligence in patient care.

1.3. Research Hypotheses

1. There is a significant correlation between healthcare staff's level of knowledge about artificial intelligence and their job type.
2. There is a significant correlation between healthcare staff's attitudes toward artificial intelligence and their professional qualifications.
3. There is a significant correlation between healthcare staff's perceptions of artificial intelligence and their professional qualifications.
4. There is a significant correlation between healthcare staff's practice and application of artificial intelligence and their job type.

2. METHODOLOGY

2.1. Design

This cross-sectional study employed a descriptive research design to assess healthcare staff's knowledge, attitudes, and practices regarding the use of artificial intelligence in patient care.

2.2. Sample Size

All healthcare staff members of Dawadmi General Hospital who were willing to participate and had not been involved in a similar study were considered for inclusion. The required sample size was determined using a power analysis to ensure adequate statistical power for detecting significant relationships between variables. Assuming a 95% confidence level, 80% power, and an effect size of 0.3, the calculated sample size was 150 healthcare staff members, which was achieved in this study. Inclusion criteria were healthcare personnel who were willing to participate, completed the study, and had not participated in a similar study. Exclusion criteria included staff that was unwilling to participate, did not complete the study, wished to withdraw, or had been exposed to a similar study. A total of 150 healthcare staff members participated, meeting the calculated sample size requirement.

2.3. Setting

The study was conducted at Dawadmi General Hospital, Saudi Arabia, among all healthcare staff members, including nurses, physicians, and other allied health professionals. Data were collected through an online survey, which allowed participants to complete the questionnaire remotely at their convenience. The survey was created using Google Forms and distributed to participants via their official email addresses. This approach ensured accessibility, reduced physical contact, and maintained compliance with ethical and social distancing requirements. Data collection occurred over a period of January to November 2025, allowing sufficient time to reach all eligible staff members and maximize response rates. The online survey format also enabled automatic data entry, reducing the risk of manual errors and facilitating subsequent statistical analysis.

2.4. Data Tools Collection

A structured questionnaire developed by Serbay et al. (2024) was used to collect data after obtaining approval to use the tool. The questionnaire consisted of four sections. The first section collected socio-demographic information, including age, gender, type of healthcare worker, professional qualifications, and years of experience. The second, third, and fourth sections assessed participants' awareness, attitudes, and behaviors regarding artificial intelligence (AI). Specifically, the second section on awareness included six items measuring participants' knowledge about AI. The third section on attitudes comprised eight items assessing participants' perspectives toward AI, and the fourth section on practice included three items evaluating participants' application of AI in patient care. Responses for all items were recorded using a five-point Likert scale ranging from strongly agrees to strongly disagree. The questionnaire was developed based on a review of the relevant literature focusing on healthcare staff's knowledge, attitudes, and practices regarding AI. Its content validity was reviewed by university faculty members and subject experts, including physicians. A pilot study was conducted on 10% of the target population to ensure clarity and feasibility. Reliability analysis of the questionnaire demonstrated Cronbach's alpha values of 0.79, 0.77, and 0.62 for the awareness, attitude, and behavior domains, respectively, as reported by Serbay et al. (2024).

2.5. Reliability and Validity

The content validity of the questionnaire was evaluated by 3 panels of subject experts and

university faculty members, including physicians, to ensure that the items adequately measured healthcare staff's knowledge, attitudes, and practices regarding artificial intelligence. A pilot study was conducted on 10% of the target population to test the clarity, feasibility, and applicability of the questionnaire. Based on the pilot results, necessary modifications were made, including the removal of unclear or redundant items. The reliability of the questionnaire was assessed using Cronbach's alpha, which demonstrated acceptable internal consistency for the three domains: awareness (α = 0.79), attitudes (α = 0.77), and practice (α = 0.62), as reported by Serbay et al. (2024). These results indicate that the questionnaire is a reliable and valid tool for assessing healthcare staff's knowledge, attitudes, and practices regarding AI in patient care.

2.6. Procedure

The study was conducted after obtaining ethical approval from the Standing Committee on the Ethics of Scientific Research at Shaqra University and permission from Dawadmi General Hospital administration. All participants were provided with information about the study's purpose, procedures, and voluntary nature, and electronic informed consent was obtained. Confidentiality, anonymity, and the right to withdraw at any time were assured. The study participants included all healthcare staff at Dawadmi General Hospital, including nurses, physicians, and allied health professionals. Participants were included if they were willing to participate, completed the questionnaire, and had not participated in a similar study. Those unwilling or unable to complete the survey were excluded. Data was collected using a structured questionnaire developed by Serbay et al. (2024). The questionnaire was distributed to participants via an online link sent to their official email addresses, allowing them to complete it at their convenience. The estimated time to complete the questionnaire was 20–30 minutes. Participants were informed that if they had any questions or needed clarification while completing the survey, the researchers were available to provide guidance. Electronic informed consent was obtained from all participants before they began the questionnaire. All completed responses were collected online, ensuring accuracy and minimizing errors, and the data were subsequently analyzed systematically. The questionnaire's content validity was confirmed by university faculty and subject experts, and a pilot study on 10% of the target population ensured clarity, feasibility, and ease of use. Based on the pilot results, unclear or redundant items were removed. Reliability analysis showed acceptable internal consistency, with Cronbach's alpha values of 0.79 (awareness), 0.77 (attitudes), and 0.62 (practice). Data collection took place over the period January to November 2025, during which all participants' responses were gathered and prepared for statistical analysis.

2.7. Statistical analysis

The collected data were organized, tabulated, and analyzed using SPSS version 26. Descriptive statistics were used to summarize categorical variables, with results presented as numbers and percentages. The Chi-square test was applied to examine associations between participants' awareness and attitudes toward AI according to their specialty. Additionally, One-Way ANOVA was used to compare differences in variables across groups and p-value of ≤ 0.05 was considered statistically significant.

3. RESULTS

Table 1: Demographic and Professional Characteristics of the Studied Subjects (n = 150)

%	No	Items
Age		
60	90	20-30 Years
36	54	31-41 Years
4	6	42-52 Years
29.8±6.3		**Mean ±SD**
Gender		
38.7	58	Male
61.3	92	Female
Occupation		
94	141	Healthcare worker
6	9	Administrative employee
Job Type		
13.3	20	Physician
86.7	130	Nurse
Professional Qualification		
35.3	53	Graduate
31.3	47	Postgraduate
33.3	50	Diploma
Duration of experience		
29.3	44	Less than 5 Years.
6	9	From 5-10 Years.
64.7	97	From 10-15 Years

Table 1 shows that most participants were aged 20–30 years (60%), with a mean age of 29.8 ± 6.3 years, and more than half (61.3%) were female. Most participants were healthcare workers (94%), with nurses comprising the largest group (86.7%) compared to physicians. Educational qualifications were evenly distributed across graduates (35.3%), postgraduates (31.3%), and diploma holders (33.3%). Regarding professional experience, most participants had 10-15 years of experience (64.7%), 29.3% had less than 5 years, and 6% had 5–10 years of experience.

Table 2: Correlation between Subjects' Knowledge Regarding AI and their Job Type (n =150)

P	X^2	Type of Job				Response Options	Knowledge
		Nurse		Physician			
		%	No	%	No		
0.001	61.3	20.6 14 52	31 21 78	0 13.3 0	0 20 0	Agree Don't know Disagree	You have good familiarity AI?
0.001	74.0	22.6 7.3 56.6	34 11 85	0 12 1.3	0 18 2	Agree Don't know Disagree	You have understanding basic computational principle of AI?
0.001	18.7	43.6 7.3 44.6	52 11 67	0 4.6 8.6	0 7 13	Agree Don't know Disagree	You comfortable with the nomenclature of AI?
0.004	11.26	28.6 2.6 55.3	43 4 83	8.6 1.3 3.3	13 2 5	Agree Don't know Disagree	You understand limitations of AI?
0.79	0.066	40.6 0 46	61 0 69	6.6 0 6.6	10 0 10	Agree Don't know Disagree	AI abilities are superior to human experience?
0.001	14.28	12 0 38.6	18 0 58	1.3 0 48	2 0 72	Agree Don't know Disagree	AI has useful applications in the medical field?
0.001	38.48	31.3 36.6 18.6 0	47 55 28 0	0 1.3 12 0	0 2 18 0	None One Two to four More than	How many applications of AI in your work?
0.001	19.56	44.6 35.3 6.6 0	67 53 10 0	6.6 1.3 5.3 0	10 2 8 0	None One term Both, unclear Both, clear	Do you know difference between machine learning and deep learning?
0.001	60.96	44.6 35.3 6.6 0	67 53 10 0	6.6 1.3 5.3 0	10 2 8 0	Never Rarely Weekly Daily	How often do you use speech recognition or transcription applications?

Table 3: Correlation between Subjects' Attitudes toward AI and their' Professional Qualification (n = 150)

P	X^2	Professional qualifications						Attitude
		Diploma		Post graduate		Graduate		
		%	No	%	No	%	No	
Diagnostic ability of AI is superior to doctor clinical experience?								
0.001	63.8	4.6 11.3 17.3	7 17 26	11.3 20 0	17 30 0	14.6 20.6 0	22 31 0	Agree Don't know Disagree
AI can help reduce number of medical errors?								
0.001	63.6	0 20.6 12.6	0 31 19	4.6 19.3 20.6	7 29 31	22 13.3 0	33 20 0	Agree Don't know Disagree
AI can deliver clinically relevant, vast amounts of high-quality data in real time?								
0.001	116.9	0 14.6 1.3	0 22 2	5.3 11.3 32	8 17 48	26 9.3 0	39 14 0	Agree Don't know Disagree
AI has no emotional exhaustion or physical limitation.								
0.001	144.8	2 14 17.3	3 21 26	3.3 24 4	5 36 6	35.3 0 0	53 0 0	Agree Don't know Disagree
Are you worried that AI will replace you at your job?								
0.001	53.3	14.6 6.6 10.6 1.3	22 10 16 2	0 10.6 20.6 0	0 16 31 0	12 6.6 5.3 7.3	18 10 8 11	Extremely worried Moderately worried Mildly worried Not worried at all
You would always use AI in future making medical decisions?								
0.001	128.1	0 0 33.3	0 0 50	5.3 22 4	8 33 6	8.6 26.6 0	13 40 0	Agree Don't know Disagree
If medical and artificial intelligence's judgments different which, will you follow?								
0.001	52.388	0 5.3 0	0 8 0	0 8.6 16	0 13 24	36.3 17.3 17.3	53 26 26	Physician's opinion Artificial intelligence opinion Patient's choice
Do you think there may be serious privacy issues with the use of AI?								
0.001	77.06	0 21.3 12	0 32 18	3.3 19.3 13	5 29 13	24 10.6 0	37 16 0	Agree Don't know Disagree

3.1. Significant P ≤ 0.001

Table 2 demonstrates significant differences between nurses and physicians through AI knowledge at p= 0.001, general AI familiarity (20.6% nurses agreed compared to 13.3% physicians don't know), 22.6% nurses agreed against 12% physicians don't know of understanding basic computational principles, and comfort with AI nomenclature (43.6% nurses agreed vs. 8.6% physicians Disagree). A similar pattern was seen in understanding AI limitations (28.6% nurses compared to 8.6% physicians agreed). Subjects also showed stronger belief in AI's usefulness in the medical field (12% nurses vs. 1.3% physicians agreed). Regarding practical usage, most nurses reported using one time AI applications (36.6%), while 12% of the physicians used two to four times (36.6% one application, 18.6% two to four). Knowledge of the difference between machine learning and deep learning was higher among physicians, and 6.6% of the physicians agreed never used AI speech-recognition tools against 44.6% from nurses). The only item without a significant difference was the belief that AI abilities exceed human experience (40.6% nurses vs. 6.6% physicians agreed; p = 0.79).

3.2. Significant P ≤ 0.001

Table 3 reveals a statistically significant association between professional qualification and attitudes toward AI for all items at p = 0.001. The highest agreement percentages were consistently observed among graduates, mainly for statements such as 14.6% of participants can deliver AI clinically applicable, 22% of them agreed for AI can help reduce the number of medical errors and (26%) of them had vast amounts of high-quality data in real time. 35.3% of participants was AI has no emotional exhaustion or physical limitation and 8.6% of them always use AI in future medical decisions Similarly, items related to privacy concerns with the use of AI and medical judgment differ with AI(36.3% and 24% agreed of participants respectively). These findings suggest that graduates have the highest confidence in AI's capabilities and potential applications. Conversely, diploma holders showed the highest percentages agreed responses, 20.6% agreed of worried that AI will replace your job.

Table 4: Correlation between Subjects' Perceptions toward AI and their Professional Qualification (n = 150)

P	X^2	Professional qualifications						Perceptions
		Diploma		Post graduate		Graduate		
		%	No	%	No	%	No	
How useful do you think AI could be in medical field?								
0.001	122.1	0	0	2.6	4	32	48	Useful
		27.3	41	17.3	26	3.3	5	Of limited use
		6	9	11.3	17	0	0	Of no use at all
In which field do you think AI will be most useful?								
0.001	71.6	12.6	19	7.3	11	28	42	Making a diagnosis
		12	18	12.6	19	7.3	11	Making treatment decisions
		12	18	11.3	17	12.6	19	Direct treatment (including surgery)
Which healthcare sector do you think will be the first to commercialize AI?								
0.001	162.5	0	0	0	0	30	46	Public primary health centers
		6.6	10	17.3	26	4.6	7	Primary care in private clinics
		12.3	19	0	0	0	0	Specialized clinics.
		14	21	14	21	0	0	University hospitals
What are you concerned about application of AI in medicine?								
0.001	164.3	0	0	0	0	25.3	38	Provide opinions in unpredicted situations.
		8.6	13	17.3	26	10	15	Difficult to apply to controversial subjects
		14.6	22	0	0	0	0	Applied to every patient.
		10	15	5.3	8	0	0	Low ability to patient emotional wellbeing.
		0	0	8.6	13	0	0	Developed by a specialist with little clinical experience.

3.3. Significant P ≤ 0.001

Table 4 shows that graduates and post graduate participants reported the highest agreement on AI's usefulness in the medical field (32%) for graduates compared to 17.3% for post graduate and 27.3% for diploma. 28% of graduates known making a diagnosis as the area where AI would be most useful and 12.6% of post graduate and diploma making treatment decisions. They also 30% graduates' participants' perceived public primary health centers as the first sector likely to commercialize AI against 26% of post graduate participants supposed primary care in private clinics while a 14% of diploma concern about university hospitals as the first sector likely to commercialize AI and 25.3% of graduates participants used AI to provide opinions in unpredicted situations in medicine compared to 17.3% post graduate applied AI to every patient in medicine also 14.6% of diploma had Difficult to apply to controversial subjects toward AI in medicine. There was a significant association between professional qualification and perceptions of AI in healthcare at p = 0.001.

Table 5: Correlation Subjects' Practice (Applications of AI) and Job Type (n = 150)

P	X^2	Type of Job				Response Options	Application AI
		Nurse		Physician			
		%	No	%	No		
0.001	52.42	20.6	31	0	0	Agree	AI cannot be used to provide opinions in unexpected situations.
		15.3	23	13.3	20	Don't know	
		50.6	76	0	0	Disagree	
0.005	10.49	29.3	44	0	0	Agree	AI is not flexible enough to be applied to every patient.
		7.3	11	2.6	4	Don't know	
		50	75	10.6	16	Disagree	
0.001	29.67	26	39	0	0	Agree	AI has low ability to sympathize and consider patients' emotional well-being.
		10	15	8	12	Don't know	
		50.6	76	5.3	8	Disagree	
0.001	16.41	18	27	0	0	Agree	AI was developed by a specialist with little clinical experience in medical practice.
		22.6	34	9.3	14	Don't know	
		46	69	4	6	Disagree	

Table 6: One-Way ANOVA for Knowledge and Application of Artificial Intelligence and by Occupation Groups (n = 150)

P	Occupation Groups	Response Options	Items
	Mean Square		
Knowledge AI			
.009	3.266	Agree / Don't know/ Disagree	You have good familiarity AI?
.033	1.915	Agree / Don't know/ Disagree	You have understanding basic computational principle of AI?
.236	.590	Agree / Don't know/ Disagree	You comfortable with the nomenclature of AI?
.184	.539	Agree / Don't know/ Disagree	You understand limitations of AI?
.002	2.343	Agree / Don't know/ Disagree	AI abilities are superior to human experience?
.020	1.354	Agree / Don't know/ Disagree	AI has useful applications in the medical field?
.003	5.336	None/ One/Two to four/More than four	How many applications of AI in your work?
.001	6.779	None /One term / Both, unclear/ Both, clear	Do you know the difference between machine learning and deep learning?
.553	0.189	Never/ Rarely/ Weekly/ Daily	How often do you use speech recognition or transcription applications?
Application AI			
.005	3.731	Agree / Don't know/ Disagree	AI cannot be used to provide opinions in unexpected situations.
.071	1.164	Agree / Don't know/ Disagree	AI is not flexible enough to be applied to every patient.
.013	2.646	Agree / Don't know/ Disagree	AI has low ability to sympathize and consider patient's emotional well-being .
.001	5.388	Agree / Don't know/ Disagree	AI was developed by a specialist with little clinical experience in medical practice.

3.4. Significant P ≤ 0.001

Table 5 demonstrates that 20.6% of nurses reported levels of agreement than physicians regarding AI limitations for the statement "AI cannot be used to provide opinions in unexpected situations" compared to 13.3% of physicians said "don't know". 29.3% of nurses agreed for "AI is not flexible enough to be applied to every patient" compared with 10.6% of physicians disagree with them. Regarding the belief that "AI has low ability to sympathize and consider patients' emotional well-being" agreement was again higher among nurses (26%) against 8% of physicians said doesn't know. Also, 18% of nurses agreed for the statement "AI was developed by specialists with little clinical experience" compared with 9.3% of physicians said doesn't know. Finally, there were statistically significant differences between nurses and physicians in their perceptions of AI application in clinical practice with job type at $p < 0.001$.

3.5. Significant P ≤ 0.001

Table (6) shows that; significant differences were found for familiarity staff knowledge with AI (p = .009), understanding basic computational principles for AI (p = .033), and insights of AI abilities compared to human experience (p = .002). Similarly, significant associations were identified regarding the confidence that AI has useful applications in the medical field (p = .020) and the number of AI applications used in work settings (p = .003). A strong significant relationship was also noted for understanding the difference between machine learning and deep learning (p = .001). Also, frequency of using speech recognition technologies (p = .553). Occupation was significantly associated with Application AI ability to provide opinions in unexpected situations (p = .005),

AI's emotional limitations (p = .013), and views about AI developers' lack of clinical experience (p = .001). However, no significant differences were detected for comfort with AI terminology (p = .236), understanding AI limitations (p = .184) and the belief that AI is not flexible enough to apply to all patients did not reach statistical significance (p = .071).

4. DISCUSSION

Regarding socio demographic characteristics in table one; 90% from subjects aged between 20-30 years old, 68.7% were nurses, and the highest percentage (64.7%) have 10 -15 years of experience in the medical field. This is agree with Serbaya et al., (2024) study which showed that individuals under 45, employed in tertiary hospitals, possessing a master's degree or higher, and hopeful about the future of medical AI, were more inclined to use it. About 50% of healthcare professionals felt confident in their knowledge of AI in current study, while roughly 75% stated that they grasped the fundamental computational concepts of AI which supported with Catalina et al. study in 2023. A significant differences between nurses and physicians AI knowledge which mean 1st research hypothesis was accepted and a correlation was found between subjects' knowledge about AI and their professional qualification as clear from table 2, only 20.6% of health workers possess good knowledge of AI, 22.6% understand the basic computational principles of AI, and most health workers, approximately 47.3%, believe that AI capabilities exceed human experience which indicated a correlation between AI knowledge level and subjects' type of job. Earlier research in Europe, the United States, and other areas has identified and validated a deficiency in knowledge, familiarity, and confidence, as well as moral concerns and ethical dilemmas. Syed, et al., 2023 indicated that 57% of people had a limited grasp of AI, while 4.7% were entirely oblivious to it. Furthermore, 64.7% possessed limited knowledge about AI in nursing, while 13.4% were unaware of AI's role in the field. The current study is consistent with Higgins et al., (2023), who noted that only 45% of nurses in Saudi Arabia demonstrated a basic understanding of AI applications in the healthcare field and only 40% of nurses felt assured about their understanding of AI algorithms.

Table 3 reveals a statistically significant association between professional qualification and attitudes toward AI for all items so the 2nd research question was accepted where; 26.6% of health care professionals were concerned that AI might take their job, whereas there is a strong awareness and positive outlook regarding AI as reported by Higgins, et al., (2023) also supported with Lambert, et al., (2023) declares although they had a favorable understanding and outlook, most were concerned about the possible repercussions of AI taking over their jobs which aligns with Abdullah et al., (2020) study which indicated that approximately 78% of healthcare professionals believed their roles could be threatened by the introduction of AI in their workplaces and Syed et al., in 2024 showed opposing results, with only 25.6% believing that AI would ultimately take over healthcare roles. Current study result indicated that 14.6% of graduated nurses believe that AI's diagnostic capabilities surpass those of doctors with clinical experience, whereas only 11.3% of postgraduates share this view, and just 4.6% of diploma nurses do. Majority of healthcare workers recognized the benefits of AI in their professional field as mentioned by Serbaya et al., (2024) and in the same line with Karaferis et al., (2025) that mentioned subjects' acknowledge the transformative potential of AI technologies for future outcomes but had a fear of job displacement due to application of AI in health sector.

Regarding table 4 reflect a significant correlation was noticed between subjects' professional qualification and participants' perceptions toward using AI in healthcare with (p = 0.001) so the 3rd research hypothesis was accepted and perception of studied subjects correlate with their qualification. This finding aligns with Liu et al., (2023), who reported that educational background strongly influences AI knowledge and acceptance among health professionals. Similarly, Oh et al., (2021) found that higher educational levels correlate with greater confidence and readiness to use AI in clinical settings. In the present study, graduates expressed the strongest agreement regarding AI's usefulness in the medical field. This is consistent with Pinto dos Santos et al., (2019), who showed that clinicians with more exposure to digital tools have more positive perceptions toward AI applications. Likewise, Sit et al., (2020) highlighted that clinical experience and ongoing professional training increase acceptance of AI in diagnostic decision-making.

Differences also emerged in how each qualification group perceived the most useful applications of AI. Graduates viewed diagnostic support as the main benefit of AI, aligning with findings from Alsudairy et al., (2025), who reported that 59.5% of Saudi primary-care professionals using AI relied on it primarily for diagnostic purposes. In contrast, post-graduates and diploma holders emphasized treatment-related decisions, consistent with Sivaraman, Bukowski, Levin, Kahn, and Perer (2023), which showed that clinicians engage with AI-based

treatment recommendations in varied ways trusting, ignoring, or negotiating them depending on clinical judgment. Regarding expected early adopters, graduates anticipated public primary healthcare centers to lead, which corresponds with national trends highlighted in the Future Health Index 2024 report (Philips, 2024), noting that AI is increasingly used for treatment planning and patient monitoring in Saudi facilities. Meanwhile, post-graduates' expectation that private clinics would adopt AI more rapidly aligns with evidence that private institutions often implement advanced digital tools sooner due to greater flexibility and investment capacity. The differences in how participants applied AI in clinical scenarios are also supported by literature. Graduates frequently used AI in unpredictable situations, consistent with Mesko & Topol (2019), who stated that AI can assist clinicians in complex, uncertain clinical environments. Diploma holders reported difficulty applying AI to controversial subjects, who align with European Institute of Innovation & Technology Health (2020), highlighting that limited training leads to uncertainty and ethical concerns regarding AI implementation. Overall, the findings reinforce what has been documented in prior research: professional qualification directly shapes attitudes, comfort, and readiness to integrate AI into healthcare practice. Increasing structured AI education and targeted training across all levels of healthcare professionals is crucial for equitable AI adoption.

The findings presented in Table 5 show statistically significant differences between nurses and physicians regarding their perceptions of AI applications in clinical practice ($p < 0.001$) which indicate is a correlation between subjects' practice and applications of AI and their job type so the fourth research question was accepted. Overall, nurses demonstrated higher levels of concern and uncertainty about AI capabilities and limitations compared with physicians. This pattern is consistent with earlier literature indicating that nurses often express more apprehension toward AI integration due to differences in training, technological exposure, and perceived impact on patient interaction roles Oh et al., (2021). In the current study, nurses were more likely (20.6%) than physicians (13.3%) to agree that AI cannot be used reliably in unexpected clinical situations. Liu et al., (2023) suggest that nurses frequently rely on contextual, situational judgments and may feel that AI lacks the adaptability needed in unpredictable or rapidly changing patient care scenarios. Physicians, on the other hand, have been shown to report greater trust in AI-driven decision support tools, particularly in diagnosis and risk prediction (Mesko & Topol, 2019).

Similarly, nearly one-third of nurses (29.3%) agreed that AI is not flexible enough to apply to every patient, whereas a notable proportion of physicians (10.6%) disagreed with this concern. This difference may reflect the clinical roles of nurses, who spend more direct time with patients and often manage personalized, moment-to-moment care needs. Sit et al., (2020) highlighted that nurses are more sensitive to patient-centered nuances, which may lead them to perceive AI systems as too standardized or rigid to accommodate the variability of individual patient presentations. The belief that AI has limited capacity to sympathize with patients and consider emotional well-being was also more prevalent among nurses (26%), compared with physicians, of whom only 8% expressed uncertainty. This aligns with Mesko & Topol (2019), who emphasize that nurses prioritize emotional support, therapeutic communication, and holistic care areas where AI is currently limited. Nurses may therefore perceive AI as potentially undermining the human relationship central to nursing practice.

Additionally, 18% of nurses agreed that AI systems were developed by specialists with limited clinical experience, compared with 9.3% of physicians who responded "don't know." Pinto dos Santos et al., (2019) noted that healthcare professionals often express concern that AI developers may lack awareness of real-world clinical workflows, nursing responsibilities, and the emotional and relational dimensions of care. Physicians, who are more commonly involved in clinical AI development and consultation, may be less likely to perceive this disconnect. These findings underscore important professional differences in attitudes toward AI. Nurses consistently demonstrated greater skepticism and concern about AI limitations, while physicians were generally less uncertain and more accepting. This suggests that job type plays a meaningful role in shaping perceptions of AI readiness, safety, and appropriateness in patient care. Liu et al., (2023) argue that tailored training and interdisciplinary education are essential to ensure that all healthcare professionals feel confident, informed, and prepared to integrate AI into clinical practice.

The results of Table 6 reveal statistically significant differences among occupation groups regarding both knowledge and application of artificial intelligence (AI) in clinical practice. Significant differences were found in staff familiarity with AI ($p = .009$), understanding of basic computational principles ($p = .033$), and insights into AI abilities compared to human experience ($p =$

.002). These findings are consistent with Reddy et al. (2019), who reported that healthcare professionals' knowledge of AI varies by professional role, clinical experience, and exposure to technology-driven initiatives. Similarly, Ting et al., (2020) highlighted that comprehension of AI concepts is often stronger among professionals with formal training or research involvement. Significant associations were also identified for confidence in AI's usefulness in the medical field ($p = .020$) and the number of AI applications used in work settings ($p = .003$). This suggests that occupational role influences both the adoption and integration of AI tools, supporting the conclusions of Castaneda et al., (2019), found confidence in AI applications correlates with familiarity and practical experience. A strong relationship was also observed for understanding the distinction between machine learning and deep learning ($p = .001$).

It was significantly associated with perceptions of AI's ability to provide sound judgments in unexpected clinical situations, its emotional limitations, and views on AI developers' lack of clinical experience. This aligns with recent empirical and qualitative work: Raimo et al. (2022) found that nurses and other patient-facing staff are more cautious about AI's capacity to replicate human judgment and consider emotional or relational aspects of care, whereas physicians demonstrate greater trust in AI-assisted decision support. On the other hand, studies by Alghamdi et al. (2024) reported that registered nurses view AI adoption cautiously, citing concerns about technical challenges, data privacy, potential deskilling, and whether AI can uphold the "human elements" of nursing such as empathy, individualized care, and professional autonomy. Conversely, physicians appear more optimistic about AI's potential to improve workflow or assist clinical decision-making (Alanzi et al., 2025).

Conversely, no significant differences were detected for comfort with AI terminology, understanding AI limitations, or the perception that AI is not flexible enough to apply to all patients. This may indicate that baseline knowledge about AI, such as terminology and general limitations, is relatively uniform across occupation groups, potentially due to shared institutional training or exposure to organizational AI policies (Mesko & Topol, 2019). Taken together, these findings suggest that occupational role shapes both AI knowledge and application in healthcare, highlighting the need for targeted training and professional development programs tailored to specific occupational needs to enhance understanding, confidence, and safe use of AI in clinical practice (Castaneda et al., 2019).

5. CONCLUSION

The study findings support the research hypotheses, demonstrating significant correlations between AI knowledge levels and participants' job type, as well as between attitudes and perceptions toward AI and professional qualifications. Furthermore, participants' practice and application of AI in clinical settings were significantly associated with their job type. Overall, healthcare staff showed moderate knowledge, generally positive attitudes, and limited practical application of AI in patient care. Graduates were the most confident in AI's capabilities, whereas diploma holders expressed concern about AI potentially replacing jobs. These findings highlight the need for targeted educational programs and training initiatives to enhance AI literacy, confidence, and practical use among healthcare professionals, thereby supporting the safe and effective integration of AI into patient care.

6. RECOMMENDATIONS

1. Incorporate AI education into professional development and continuing medical education to improve practical application and familiarity with AI tools in clinical practice.
2. Encourage interdisciplinary collaboration between AI developers and healthcare professionals to align AI applications with clinical needs and increase staff confidence in AI tools.
3. Conduct follow-up studies to evaluate the effectiveness of AI training programs and monitor improvements in knowledge, attitudes, and practical application in healthcare settings.

Study Limitation

This study was limited to a sample of healthcare staff working at Dawadmi General Hospital, which may restrict the generalizability of the findings to other healthcare setting.

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Ethical Consideration

Confidentiality and privacy of all participants were strictly maintained, and all collected data were used solely for research purposes. Participation was voluntary, and each participant had the right to withdraw from the study at any time without any consequences. Informed consent was obtained from

all participants prior to completing the survey. The study was approved by the Ethics Committee of Shaqraa University, Deanship of Scientific Research (Approval No. ERC_SU_F_202400073), on Monday, May 12, 2025.

Conceptualization

W.H.A. contributed to the theoretical framework, methodology, data collection, manuscript revision, and publication. H.D.K. was responsible for statistical analysis, discussion of results, and manuscript revision. W.E. contributed to statistical analysis, discussion, and manuscript revision. All authors have read and approved the final version of the manuscript.

Conflict of Interest

No potential conflict of interest was reported by the author(s).

REFERENCES

Kazmi, S., Singh , G., Rahat, F., & Gupta, V., (2024): knowledge and attitude toward application of artificial intelligence in health care among doctors of Bahraich, India International Journal of Academic Medicine and Pharmacy ISSN (O): 2687-5365; ISSN (P): 2753-6556,1282-1288.

Habib, M.,Hoodbhoy, Z., & Siddiqui, R., (2024): Knowledge, attitudes, and perceptions of healthcare students and professionals on the use of artificial intelligence in health care in Pakistan. PLOS Digit Health. 2024 May 10;3(5): e0000443. doi: 10.1371/journal.pdig.0000443. PMID: 38728363; PMCID: PMC11086889.

Alruwaili, M., Abuadas F, Alsadi M, Alruwaili, A., Ramadan,O., Shaban,M., Al Thobaity,A., Al Thobaity,s., & Adel El Arab, R., (2024): Exploring nurses' awareness and attitudes toward artificial intelligence: Implications for nursing practice. DIGITAL HEALTH. 2024;10. doi:10.1177/20552076241271803.

Serbaya, H., Khan,A, Surbaya,H., Alzahrani, M., (2024): Knowledge, Attitude and Practice Toward Artificial Intelligence Among Healthcare Workers in Private Polyclinics in Jeddah, Saudi Arabia. Adv Med Educ Pract. 2024;15:269-280 https://doi.org/10.2147/AMEP.S448422.

Alsaedi, R., Alneami, N., Almajnoni, F., Alamri, O., Aljohni, K., Alrwaily, K., Eid, M, Budayr A, Alrehaili MA, Alghamdi MM, et al. Perceived Worries in the Adoption of Artificial Intelligence Among Healthcare Professionals in Saudi Arabia: A Cross-Sectional Survey Study. Nursing Reports. 2024; 14(4):3706-3721. https://doi.org/10.3390/nursrep14040271

Swed, S., Alibrahim, H., Elkalagi, H, et al. (2022): Knowledge, attitude, and practice of artificial intelligence among doctors and medical students in Syria: a cross-sectional online survey. Front Artif Intell 2022; 5: 1011524.

Schepman, A., & Rodway, P. (2023). The General Attitudes towards Artificial Intelligence Scale (GAAIS): Confirmatory validation and associations with personality, corporate distrust, and general trust. International Journal of Human–Computer Interaction, 39(13), 2724-2741. https://doi.org/10.1080/10447318.2022.2085400

Schepman A, Rodway P. Initial validation of the general attitudes towards artificial intelligence scale. Comput Hum Behav Rep 2020; 1: 100014.

Schepman A and Rodway P. The general attitudes towards artificial intelligence scale (GAAIS): confirmatory validation and associations with personality, corporate distrust, and general trust. Int J Hum Comput 2023; 39: 2724–2741.

Maria Elena Mariano, Mahmoud Abdel Hameed Shahin, Shangrila Joy Ancheta, Minimole Vijayan Kunjan Nasrah Mubarak Dossary, Sarah Fahad Ojaimi, Sajeda Abdulla Al Qudah & Hajer Fayez Al Harbi. Exploring artificial intelligence knowledge, attitudes, and practices among nurses, faculty, and students in Saudi Arabia: A cross-sectional analysis (2025) Sciences & Humanities Open journal Social Sciences & Humanities Open 11 (2025) 101384 ,https://doi.org/10.1016/j.ssaho.2025.101384

Alabbad, Faisal A.1; Almeneessier, Aljohara S.2; Alshalan, Mohammed Hisham3; Aljarba, Mohammad N.4. Knowledge, attitude, and practice of artificial intelligence among doctors and medical students in Saudi Arabia. Journal of Family Medicine and Primary Care 14(4): p 1459-1464, April 2025. | DOI: 10.4103/jfmpc.jfmpc_1812_24

Karaferis D, Balaska D, Karaferi ME, Pollalis Y. Assessment of Knowledge and Attitudes of Healthcare Personnel Towards Artificial Intelligence Technologies in Greece: A Survey Study. Hygiene. 2025; 5(4):44. https://doi.org/10.3390/hygiene5040044

Catalina QM, Fuster-Casanovas A, Vidal-Alaball J, Escalé-Besa A, Marin-Gomez FX, Femenia J, Solé-Casals J. Knowledge and perception of primary care healthcare professionals on the use of artificial intelligence as a healthcare tool. Digit Health. 2023 Jun 14; 9:20552076231180511. doi:

10.1177/20552076231180511. PMID: 37361442; PMCID: PMC10286543.

Syed W, Basil A. Al-Rawi M. Assessment of Awareness, Perceptions, and Opinions towards Artificial Intelligence among Healthcare Students in Riyadh, Saudi Arabia. Medicina (Kaunas). 2023 Apr 24;59(5):828. doi: 10.3390/medicina59050828. PMID: 37241062; PMCID: PMC10221309.

Higgins O, Short BL, Chalup SK, Wilson RL. Artificial intelligence (AI) and machine learning (ML) based decision support systems in mental health: An integrative review. Int J Ment Health Nurs. 2023 Aug;32(4):966-978. doi: 10.1111/inm.13114. Epub 2023 Feb 6. PMID: 36744684.

Lambert SI, Madi M, Sopka S, Lenes A, Stange H, Buszello CP, Stephan A. An integrative review on the acceptance of artificial intelligence among healthcare professionals in hospitals. NPJ Digit Med. 2023 Jun 10;6(1):111. doi: 10.1038/s41746-023-00852-5. Erratum in: NPJ Digit Med. 2023 Jul 11;6(1):125. doi: 10.1038/s41746-023-00874-z. PMID: 37301946; PMCID: PMC10257646.

Abdullah R, Fakieh B. Health Care Employees' Perceptions of the Use of Artificial Intelligence Applications: Survey Study. J Med Internet Res. 2020 May 14;22(5):e17620. doi: 10.2196/17620. PMID: 32406857; PMCID: PMC7256754.

Syed W, Al-Rawi MBA. Community pharmacists awareness, perceptions, and opinions of artificial intelligence: A cross-sectional study in Riyadh, Saudi Arabia. Technol Health Care. 2024;32(1):481-493. doi: 10.3233/THC-230784. PMID: 37694330.

Liu, X., Zhang, L., Ye, C., & Chen, Y. (2023). Healthcare professionals' knowledge, attitudes, and acceptance of artificial intelligence in clinical practice. BMC Medical Informatics and Decision Making, 23(1), 1–12. https://doi.org/10.1186/s12911-023-02145-9

Oh, S., Kim, J. H., Choi, S. W., Lee, H. J., Hong, J., & Kwon, S. H. (2021). Physician confidence in artificial intelligence: An online survey of Korean doctors. Journal of Medical Internet Research, 23(3), e25695. https://doi.org/10.2196/25695

Pinto dos Santos, D., Giese, D., Brodehl, S., Chon, S. H., Staab, W., Kleinert, R., & Baeßler, B. (2019). Medical students' attitude towards artificial intelligence: A multicentre survey. European Radiology, 29(4), 1640–1646. https://doi.org/10.1007/s00330-018-5601-1

Sit, C., Srinivasan, R., Amlani, A., Muthuswamy, K., Azam, A., Monzon, L., & Poon, D. S. (2020). Attitudes and perceptions of UK medical students towards artificial intelligence and radiology: A multicentre survey. Insights into Imaging, 11(1), 1–12. https://doi.org/10.1186/s13244-020-00883-7

Alsudairy, A., Alshammari, M., Alharbi, S., & Alqahtani, F. (2025). Adoption of artificial intelligence in primary healthcare settings in Saudi Arabia. Journal of Primary Care & Community Health, 16, 1–9.

Sivaraman, V., Bukowski, J., Levin, D., Kahn, C. E., & Perer, A. (2023). How clinicians engage with AI-based treatment recommendations. CHI Conference on Human Factors in Computing Systems Proceedings, 1–15. https://doi.org/10.1145/3544548.3580780

Philips. (2024). Future health index 2024: Transforming healthcare with AI. Philips Healthcare.

Mesko, B., & Topol, E. (2019). The imperative for regulatory oversight of artificial intelligence in healthcare. NPJ Digital Medicine, 2(1), 1–5. https://doi.org/10.1038/s41746-019-0142-6

European Institute of Innovation & Technology Health. (2020). Artificial intelligence in healthcare: Barriers and opportunities. EIT Health.

Reddy, S., Allan, S., Coghlan, S., & Cooper, P. (2019). A governance model for the application of AI in healthcare. Journal of the American Medical Informatics Association, 27(3), 491–497. https://doi.org/10.1093/jamia/ocz192

Ting, D. S. W., Pasquale, L. R., Peng, L., Campbell, J. P., Lee, A. Y., Raman, R., Tan, G. S. W., Schmetterer, L., Keane, P. A., & Wong, T. Y. (2020). Artificial intelligence and deep learning in ophthalmology. British Journal of Ophthalmology, 103(2), 167–175. https://doi.org/10.1136/bjophthalmol-2018-313173

Castaneda, C., Nalley, K., Mannion, C., Bhattacharyya, P., Blake, P., Pecora, A., Goy, A., & Suh, K. (2019). Clinical decision support systems for improving diagnostic accuracy. Journal of the American Medical Informatics Association, 26(7), 643–650. https://doi.org/10.1093/jamia/ocz020

Raimo, N., De Turi, I., Ricciardelli, A., & Vitolla, F. (2022). Digitalization in healthcare: The role of AI and professional resistance. Technological Forecasting and Social Change, 174, 121227. https://doi.org/10.1016/j.techfore.2021.121227

Alghamdi, M., Ur Rehman, S., & Alqahtani, A. (2024). Nurses' perceptions and readiness for artificial intelligence adoption in healthcare. Nursing Open, 11(1), 1–10.

Alanzi, T., Althumairi, A., & Alshammari, F. (2025). Physicians' perspectives on artificial intelligence adoption in clinical decision-making. Healthcare Informatics Research, 31(1), 1–9.

Among Healthcare Workers in Private Polyclinics in Jeddah, Saudi Arabia, Adv Med Educ Practice. 2024 Apr

5;15:269–280. doi: 10.2147/AMEP.S448422

Catalina QM, Fuster-Casanovas A, Vidal-Alaball J, Escalé-Besa A, Marin-Gomez FX, Femenia J, et al. Knowledge and perception of primary care healthcare professionals on the use of artificial intelligence as a healthcare tool. Digit Health. Jun 14, 2023;9:20552076231180511. [FREE Full text] [CrossRef] [Medline].

Syed W, Basil A, Al-Rawi M. Assessment of awareness, perceptions, and opinions towards artificial intelligence among healthcare students in Riyadh, Saudi Arabia. Medicina. 2023;59(5):828. doi: 10.3390/medicina59050828 [DOI] [PMC free article] [PubMed] [Google Scholar]

Higgins, O.; Short, B.L.; Chalup, S.K.; Wilson, R.L. Artificial intelligence (AI) and machine learning (ML) based decision support systems in mental health: An integrative review. Int. J. Ment. Health Nurs. 2023, 32, 966–978. [Google Scholar] [CrossRef] [PubMed]

Higgins, O.; Short, B.L.; Chalup, S.K.; Wilson, R.L. Artificial intelligence (AI) and machine learning (ML) based decision support systems in mental health: An integrative review. Int. J. Ment. Health Nurs. 2023, 32, 966–978. [Google Scholar] [CrossRef] [PubMed]

Abdullah R, Fakieh B. Health care employees' perceptions of the use of artificial intelligence applications: survey study. J Med Internet Res. 2020;22(5):e17620. doi: 10.2196/17620 [DOI] [PMC free article] [PubMed] [Google Scholar]

Syed W, Al-Rawi MBA. Community pharmacists awareness, perceptions, and opinions of artificial intelligence: a cross-sectional study in Riyadh, Saudi Arabia. Technol Health Care. 2024;32(1):481–493. doi: 10.3233/THC-230784 [DOI] [PubMed] [Google Scholar]