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KNOWLEDGE, ATTITUDE, AND PRACTICE OF ARTIFICIAL INTELLIGENCE AMONG HEALTHCARE CARE PROFESSIONALS AT PEOPLES MEDICAL COLLEGE HOSPITAL NAWABSHAH, SINDH, PAKISTAN

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Abstract

Background: *Knowledge, attitude, and practice (KAP) are essential components in determining the effectiveness of healthcare delivery and patient outcomes. Adequate knowledge and a positive attitude among healthcare professionals are expected to promote appropriate practices in clinical settings. However, evidence suggests that a gap often exists between what individuals know and how they apply it in practice. This discrepancy can negatively impact the quality of care and overall health outcomes. Therefore, assessing KAP levels is important to identify gaps and develop strategies to improve practice and ensure better healthcare performance.*

Objective: *To assess the Knowledge, Attitude, and Practice of Artificial intelligence among health care at Peoples Medical College Hospital Nawabshah.*

Methodology: *A comparative cross-sectional study conducted among healthcare professionals and nursing students across three institutions. Data was collected through structured surveys and analyzed using SPSS version 23.*

Result: *The findings revealed that 81 (27%) had poor knowledge, whereas a majority of 219 participants (73%) demonstrated good knowledge. Further, 93 (31%) showed a poor attitude, while 207 (69%) had a good attitude. Furthermore, 126 (42%) having poor practice, whereas 174 (58%) demonstrated good practice.*

Conclusion: *This study concluded a gap between knowledge, attitude, and practice suggests that having adequate knowledge and a favorable attitude does not necessarily translate into proper practice.*

Key words : *Artificial Intelligence , Health Care Providers , Technology*

INTRODUCTION

Artificial Intelligence (AI), a branch of computer science that enables machines to simulate intelligent behavior, has become increasingly influential in various sectors, notably in nursing education and clinical practice. Integrating AI into nursing education offers promising opportunities to enhance teaching methods, improve student

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learning experiences, and ultimately lead to better healthcare outcomes.[1]

Additionally, AI algorithms can assess student performance, offer feedback, and guide skill improvement, fostering a more effective learning environment.[2] In nursing education, AI can assist students in analyzing patient data, interpreting diagnostic tests, and making informed clinical decisions. It can also help educators identify areas where students may need additional support or interventions. [3]

In clinical settings, AI can support nurses by analyzing vast amounts of patient data, including medical history, symptoms, laboratory results, and imaging studies, to provide faster and more accurate diagnoses. Furthermore, AI can predict potential health risks early on, allowing nurses to engage in preventive care and implement interventions to mitigate health risks effectively. [4]

Algorithms can assist nurses in choosing personalized treatment options, improving patient adherence, and ultimately leading to better treatment outcomes. [5]

Moreover, A. I continue to advance; it is essential to incorporate AI education into nursing curricula to ensure that nurses possess the digital literacy required throughout their careers. By embracing AI in nursing education, healthcare institutions can prepare nurses to thrive in the digital future, enhancing the quality of care provided to patients.[6]

Integrating AI into nursing education and clinical practice holds significant potential to transform healthcare delivery. By enhancing learning experiences, improving clinical decision-making, and preparing nurses for future challenges, AI can play a pivotal role in advancing the nursing profession[7]

Artificial Intelligence (AI) includes various technologies that help machines think like humans, learn from data, and make decisions. AI has different fields like Machine Learning, Natural Language Processing (NLP), Computer Vision, and Robotics, which are making a big impact in healthcare.[8]

AI is also transforming nursing. Research shows that AI affects nursing roles, patient care, and interactions between nurses and patients. To prepare future nurses for this change, nursing education must evolve, teaching students how to use AI effectively. Many nursing students are interested in AI and are more likely to use it if they find it easy to understand and helpful in their work. Adding AI to nursing education will help students see its benefits and get them ready for a future where technology plays a major role in healthcare.[9]

Like tracking diseases and managing healthcare systems. Similarly, AI is changing how healthcare professionals are trained, allowing for personalized learning experiences based on data. However, some worry that AI is developing too quickly and that there isn't enough understanding of the risks involved.[10]

AI will continue to advance nursing by improving patient care and making nurses' jobs easier. AI-powered tools can help nurses make better decisions, diagnose patients more accurately, and provide better treatment. While there are still challenges, the potential benefits of AI in nursing education and practice are enormous.[11]

AI is being used in different areas of nursing, such as patient monitoring, clinical decision-making, and education. If these challenges are addressed, AI can greatly improve nursing care and patient outcomes.[12]

Digital tools like software, apps, and online platforms play a big role in learning today. These tools help students by making education more engaging, accessible, and personalized.[13]

Objectives:

To assess the Knowledge, Attitude, and Practice among providers at Peoples Medical College Hospital Nawabshah Sindh , Pakistan.

Material and Method:

This study was a cross-sectional study, which is conducted from September to November 2025 approval of ethical review committee at college of nursing Nawabshah, Sindh, Pakistan. The stratify non-randomized sampling was used. The sample size was determined using the Rao-soft sample size calculator at a 95% confidence level, 5% margin of error, 50% response distribution, and sample size calculated as n= 300. A formal written

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permission was taken from the principal of college of Nursing, and Medical Superintendent Peoples Medical College Hospital Nawabshah. . All data was kept confidential. Any information was revealed to third party. After collection of targeted number of health care professionals, the data was analyzed in statically package for social science (SPSS) for window version 23. All continuous variables were analyzed for frequency for frequency, mean and standard deviation and for categorical variables, frequency and percentage were calculated.

Results:

Table No.01. Knowledge and Attitude, practice about AI :

Ser.	variable	Poor	Good
1	**Knowledge**	81 (27%)	219 (73%)
2	**Attitude**	93 (31%)	69% (207)
3	**Practice**	126 (42%)	174 58%

Among study participants; 81 (27%) had poor knowledge, whereas a majority of 219 participants (73%) demonstrated good knowledge. Further, 93 (31%) showed a poor attitude, while 207 (69%) had a good attitude. Furthermore, 126 (42%) having poor practice, whereas 174 (58%) demonstrated good practice.

Table no.02: Demographic Information:

Ser.	Item	Frequency (percentage)
1	**Distribution of age of subject** 20 to 30 years 31 to 40 years above 40 years	 233(77.7%) 61(20.3%) 6(2.0%)
2	**Education qualification of study subject** Bachelors Masters PhD other	7(2.3%) 179(59.7%) 90(30.0%) 24(8.0%)
3	**Working as a study subject** Private Government Other	 42(14%) 251(83.7%) 7 (2.23%)
4	**Information about AI of study subject** Media Social media Web browsing Family or friends	 36(12%) 206(68.7%) 26(8.7%) 32(10.7%)

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5	**Role in healthcare setup of study subjects**	
	Undergraduate	51(17%)
	Doctor	187(62.3%)
	Nurse	57(19%)
	other	5(1.7%)
6	**Program currently enrolled of study subjects**	
	Not a student	16(5.3%)
	MBBS	172(57.3%)
	BSN	52(17.3%)
	other	60(20%)
7	**Year of study subject**	
	1st year	60(20%)
	2nd year	8(2.7%)
	3rd year	4(1.3%)
	4th year	6(2%)
	5th year	10(3.3%)
	Other	46(15.3%)
8	**Working currently clinical of study subject**	
	Not student	26(8.7%)
	Yes	230((76.7%)
	No	44 (14.3%)
9	**AI competence of subject of subject**	
	All the upgrade level	113(37.7%)
	During internship	159(53%)
	After becoming a practicing healthcare provider	17(5.7%)
	No training necessary	11(3.7%)
11	**Any formal session about AI in your study or employment of subject**	
	Yes	92(30.7%)
	No	208(69.3%)

Table no. 02: showed demographic data of the study participant. Age of subject most participants were in 20to 30 years 233(77.7%) ,31to40 years 61(20.3%) and above 40yrs 6(2.0%). In term, Education qualification of study subject in master's 115(57%), Bachelor 7(2.3%), PhD 90(30.0%) and others are 24(8.0%). The most participating in government sectors were 251(83.7%), Private 42(14.0%) and others were 6(2.0%). The participants in which participants have information about AI through social media 206(68.7%), media 36(12.0%), web browsing 26(8.7%) and family and friends 32(10.7%). The most participated in which majority are doctors 187(62.3%), Nurses 57(19.0%), undergraduate students 51(17.0) and others are 5(1.7%) The most participated in which MBBS students who were 172(57.3%), BSN 52(17.3%) and others 60(20.0%). The most participants are in which 1st year 60(20.0%), 2nd year 8(2.7%), 3rd year 4(1.3%),4t year 6(2.0%),5th year 10(3.3%), others 46(15.3%). The most participate involve in which 230(76.7%) are currently working in clinical settings and 43(14.3%) are not working in clinical setting. The most participated in which Most learned AI during internship 159(53.0%), all upgrade level 113(37.7%).

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Gender of study subject

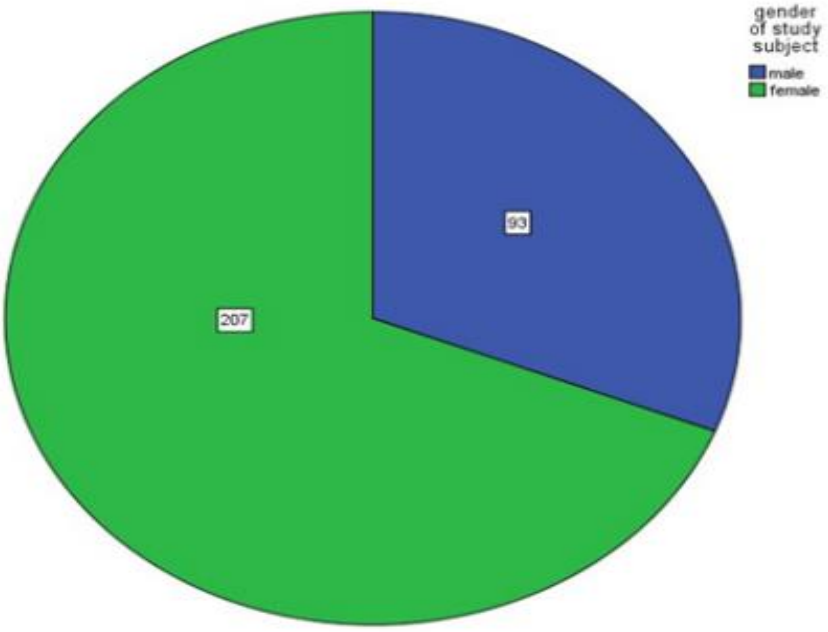

Figure: 1

The most participants involve in females 270 (69%) of male and 93(31%) are female

Table no.03: Knowledge of AI

Ser.	Item	Frequency (percentage)
1	**Do you consider yourself to be a technology adaptor of study subjects?**	
	Agree	37 (12.3%
	Somewhat agree	21(7.0%)
	strongly agree	59(19.7%)
	Neutral	52(17.3%)
	Disagree	131(43.7%)
2	**AI is machine learning, are you aware of study subject**	
	Yes	151(50.3%)
	May be	62(20.7%)
	No	87(29.0%)
3	**Many applications we use in daily life are you aware**	
	yes	245(81.7%)
	May be	36(12.0%)
	No	19(6.3%)
4	**Are you aware of AI applications in healthcare i.e. robotic surgery**	
	Yes	203(67.7%)
	maybe	24(8%)
	No	69(23%)
	5.00	2(.7%)
	11.00	2(.7%)

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Table no.03: showed that, The most participants are involved in which disagree,131(43.7%) agree, 37(12.3%) somewhat agree,21(7.0%) strongly agree and 59(19.7%) neutral 52(17.3%) about AI adaptors. The most participate involve in which 151(50.3%) answered "yes", 87(29.0%) were unaware. The most participated were involved, in which most 245(81.7%) are aware that AI is used in daily applications and 19(6.3%) are unaware. The most participants are in which 203(67.7%) are aware of AI applications in healthcare and 69(23.0%) are unaware

Table no.04: Perception about AI

Ser.	Item	Frequency (percentage)
1	**A useful way to learn about AI of study subject**	
	Q&A panels with experts	22(7.3%)
	AI symposium	81(27%)
	student led journal clubs	34(11.3%)
	formal preclinical program	19(6.3%)
	Workshop	111(37%)
	Access to program workshop	15(5%)
	others	18(6%)
2	**AI provides preventive health recommendations i.e. exercise, diet of study subject**	
	Likely	10(3.3%)
	extremely likely	19(6.3%)
	Neutral	57(19%)
	Unlikely	116(38.7%)
	extremely unlikely	98(32.7%)
3	**AI analyze PT information to reach diagnosis of study subject**	
	Likely	10(3.3%)
	extremely likely	22(7.3%)
	Neutral	47(15.7%)
	Unlikely	133(44.3%)
	extremely unlikely	88(29.3%)
4	**Read and interpret diagnostic imaging of study subject**	
	likely	27(9%)
	extremely likely	19(6.3%)
	neutral	61(20.3 5)
	unlikely	114(38%)
	extremely unlikely	79(26.3%)
5	**Evaluate when to refer PT to other health professionals**	
	likely	29(9.7%)
	extremely likely	22(7.3%)
	neutral	31(10.3%)
	unlikely	121(40.3%)
	extremely unlikely	97(32.3%)
6	**Formulate personalized treatment plans for pt of study subject**	
	likely	30(10%)
	extremely likely	53(17.7%)
	neutral	49(16.3%)
	unlikely	95(31.7%)

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	extremely unlikely	73(24.3%)
7	**Formulated personalized medication prescription for PT of study subject**	
	likely	34(11.3%)
	extremely likely	42(14%)
	neutral	106(35.3%)
	unlikely	85(28.3%)
	extremely unlikely	33(11%)
8	**Provide empathetic care to Pt of study subject**	
	likely	73(24.3%)
	extremely likely	54(18%)
	neutral	82(27.3%)
	unlikely	65(21.7%)
	extremely unlikely	26(8.7%)
9	**Monitor Pt compliance to prescribe medication, exercise and dietary recommendation of study subject**	116(38.7%)
	likely	57(19%)
	extremely likely	39(13%)
	neutral	56(18.7%)
	unlikely	32(10.7%)
	extremely unlikely	
10	**Monitor Pt compliance to prescribe medication, exercise and dietary recommendation of study subject**	77(25.7%)
	likely	42(14%)
	extremely likely	74(24.7%)
	neutral	63(21%)
	unlikely	44(14.7%)
	extremely unlikely	
11	**Perform surgery e.g. robotic surgery or nursing care of study subject**	
	likely	45(15%)
	extremely likely	23(7.7%)
	neutral	62(20.7%)
	unlikely	130(43.3%)
	extremely unlikely	40(13.3%)
12	**Provide documentation e.g. update medical record about Pt**	
	likely	25(8.3%)
	extremely likely	32(10.7%)
	neutral	54(18%)
	unlikely	87(29%)
	extremely unlikely	102(34%)
13	**Assists hospitals in capacity planning and human resources management**	
	likely	35(11.7%)
	extremely likely	37(12.3%)
	neutral	57(19%)
	unlikely	79(26.3%)
	extremely unlikely	92(30.7%)

Table no.04: showed that,The most participant in which workshops 15 (5.0%) were most preferred for learning AI, 22(7.3%) Q&A panels with experts, student led journal

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clubs 34(11.3%),12(6.0%) formal_preclinica_lprogram,19(6.3%) AI symposium,81(27.%) Accesses to program workshop,11(5.5%) Others. The most participate involve in which preventive recommendations 116(38.7%) unlikely, 19(6.3 %) extremely unlikely116(38.0%), extremely likely 10(5.0%) and neutral 57(19.0%) The most participate involve in which diagnosis assistance likely 10(3.3%), extremely likely 22(7.3%), Neutral 47(15.7%), unlikely 133(44.3%) and extremely unlikely 88(39.3%) The most participate involve in which reading imaging most said "unlikely" 144(38.0%), "extremely unlikely" 19(6.3%), likely 27(9.0%), extremely likely 79(26.3%) and neutral 61(20.0%) . The most part involves in which Referral decision- mixed views, learning toward likely 29(9.7%), extremely likely 97(32.3%), neutral 31(10.3%), unlikely 121(40.3%) and extremely unlikely 97(32.3%). The most participants involved in personalizetreatmentny were likely 30(10.0%), extremely likely 53(17.7%), neutral 49(16.3%), unlikely 95(31.7%) and extremely unlikely 73(24.3%). most participate involve in which medication prescription are like 34(11.3%), extremely likely 42(14%), neutral 106(35.3%), unlikely 85(28.3%) and extremely unlikely 33(11.0%). The most participants are in which provide empathetic care likely 73(24.3%), extremely likely 54(18.0%), neutral 82(27.3%), unlikely 65(21.7%) and extremely unlikely 26(8.7%). The most participant involved in which dietary recommendation likely 116(38.7%), extremely likely 57(19.0%), neutral 39(13.0%), unlikely 56(18.7%) and extremely unlikely 3 2(10.7%). The most participant involved in psychiatric counseling is like 77(25.7%), extremely likely 42(14.0%), neutral 74(24.7%), unlikely 63(21.0%) and extremely unlikely 44(14.7%). The most participant is in which surgery performance likely 45(15.0%), extremely likely 23(7.7%), neutral 62(20.7%), unlikely 130(43.3%) and extremely unlikely 40(13.3%). The most participant in which medical documentation is likely 25(8.3%), extremely likely 32(10.7%), neutral 54(18.0%), unlikely 87(29.0%) and extremely unlikel102 7(34.0%). The most participate in which hospital management support likely 35(11.7%), extremely likely 37(12.3%), neutral 57(19.0%), unlikely 79(26.3%) and extremely unlikely 92(30.7%)

Table no.05: Attitude about AI:

Ser.	Item	Frequency (percentage
1	**AI will reduce the number of jobs available to physicians of study subject**	
	Strongly agree	
	somewhat agree	29 (9.7%)
	neutral	37(12.3%)
	strongly disagree	119(39.7%)
	Somewhat disagree	55(18.3%)
		60(20%)
2	**AI will reduce the no of jobs in certain medical specialties more than other study subjects**	
	Strongly agree	20(6.7%)
	somewhat agree	32(10.7%)
	neutral	129(43%)
	strongly disagree	53(17.7%)
	Somewhat disagree	66(22%)
3	**AI has impacted my choice of social selection of study subjects**	
	Strongly agree	29(9.7%)
	somewhat agree	39(13%)
	neutral	147(49%)

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	strongly disagree Somewhat disagree	48(16%) 37(12.3%)
4	**AI in medicine will raise new ethical challenges of study subject** Strongly agree somewhat agree neutral strongly disagree Somewhat disagree	 15(5%) 21(7%) 73(24.3%) 127(42.3%) 64(21.3%)
5	**AI in medicine will raise new social challenges of study subject** Strongly agree somewhat agree neutral strongly disagree Somewhat disagree	 9(3%) 16(5.3%) 63(21%) 82(27.3%) 130(43.3%)
6	**AI in medicine will raise new challenges around healthy equity of study subjects.** Strongly agree somewhat agree neutral strongly disagree Somewhat disagree	 11(3.7%) 23(7.7%) 55(18.3%) 80(26.7%) 131(43.7%)
7	**AI will improve healthcare in general of study subject** Strongly agree somewhat agree neutral strongly disagree Somewhat disagree	 16(%.3%) 9(3%) 56(18.7%) 164(54.7%) 55(18.3%)
8	**The non-interventional physician will be replaced in the foreseeable future of study subject** Strongly agree somewhat agree neutral strongly disagree Somewhat disagree	 23(7.7%) 53(17.7% 102(34%) 76(25.3%) 46(15.3%)
9	**In the foreseeable future all physicians will be replaced with studying subjects.** Strongly agree somewhat agree neutral strongly disagree Somewhat disagree	 61(20.3%) 53(17.7%) 115(38.3%) 38(12.7%) 33(11%)
10	**These developments frighten me of studying subject** Strongly agree somewhat agree neutral strongly disagree Somewhat disagree	 25(8.3%) 51(17%) 115(38.3%) 59(19.7%) 50(16.7%)

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11	**These developments make healthcare in general more exciting me of study subject**	
	Strongly agree	28(9.3%)
	somewhat agree	23(7.7%)
	neutral	127(42.3%)
	strongly disagree	75(25%)
	Somewhat disagree	47(15.7%)
12	**How much time a month would you like to learn about AI of study subject**	
	I am not interested in learning about AI	
	<30 minutes	20(6.7%)
	1hr	79(26.3%)
	1-5hrs	110(36.7%)
	5-10hrs	40(13.3%)
	>10hrs	34(11.3%)
	7.00	9(3%)
		8(2.7%)

Table no.05: showed that, The most participate involve in which job reduction for physicians strongly agree 29(9.7%), somewhat agree 37(12.0%),, neutral 119(39.7%), strongly disagree 55(18.3%) and somewhat disagree 60(20.0%).further most participate involve in which impact of specialties strongly agree 20(6.7%), somewhat agree 32(10.7%),, neutral 129(43.0%), strongly disagree 53(17.7%) and somewhat disagree 66(22.0%).The most participant in which specialty choice influence strong agree 29(9.7%), somewhat agree 39(13.0%),, neutral 147(49.0%), strongly disagree 48(16.0%) and somewhat disagree 37(12.3%) The most participate involve in which ethical challenges strong agree 15(5.0%), somewhat agree 21(7.0%),, neutral 73(24.3%), strongly disagree 127(42.3%) and some disagree6 4(21.3%) The most participate involve in which social challenges strong agree 9(3.0%), somewhat agree 16(5.3%),, neutral 63(21.0%), strongly disagree 82(27.3%) and some disagree 130(43.3%).The most participate involve in which equity issues strong agree 11(3.7%), somewhat agree 23(7.7%),, neutral 55(18.3%), strongly disagree 80(26.7%) and some disagree 131(43.7%).The most participate involve in which improving healthcare strong agree 16(5.3%), somewhat agree 9(3.0%),, neutral 56(18.7%), strongly disagree 164(54.7%) and some disagree 55(18.3%) .The most participate involve in which replacing non-interventional physicians strong agree 23(7.7%), somewhat agree 53(17.7%), neutral 102(34.0%), strongly disagree 76(25.3%) and some disagree 46(15.3%) .The most participant is in which replacing all physicians strong agree 61(20.3%), somewhat agree 53(17.7%),, neutral 115(38.3%), strongly disagree 38(12.7%) and some disagree 33(11.0%) .The most participated in fear about developments strong agree 25(8.3%), somewhat agree 51(17.0%),, neutral 115(38.3%), strongly disagree 59(19.7%) and some disagree 50(16.7%) .The most participate involve in which time willing to learn about AI.I am not interested in learning about AI 20(6.7%), <30 minutes 79(26.3%),1hr 110(36.7%), 1-5hrs 40(13.3%) 510hrs 34(11.3%) less 10hrs 9(3.0%) and 7.00 8(2.7%)

Discussion:

This is a comparative cross-sectional study in which sample size is 300 In our study conducted at PMCH SBA Hospital, a predominantly young demographic (74.5% aged 20–30) participated, with a majority being MBBS students (60.5%) and healthcare professionals from government institutions (84%). Despite the digital age, only 29.5% had formal AI training, and 45.5% did not consider themselves technologically adept. This contrasts with the national-level study by Habib et al. (2024), where the mean participant age was higher (32.2 years), and although 78.7% also

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lacked formal AI training, a larger portion identified as tech-savvy (30.7%). In both studies, social media emerged as a key source of AI awareness (68% in our study, 66.4% nationally). While our participants showed limited belief in AI's capabilities in diagnosis, treatment planning, or empathetic care, Habib et al. found generally more optimistic perceptions—believing AI can assist in treatment and hospital planning.

However, both studies reflected skepticism about AI's role in ethical, social, and workforce implications, with over 70% of our respondents and 70.3% in the national study anticipating ethical challenges. These parallel findings highlight the urgent need to integrate AI education into undergraduate curricula to bridge the gap between interest and actual competence in AI in healthcare settings.[15]The comparison between literature and our study highlights key differences and similarities in AI awareness and perceptions among healthcare professionals.

While the literature largely centers on nursing populations and explores AI's influence in both academic and clinical education, our study focused predominantly on young, postgraduate medical professionals, with limited representation from nursing. Both sources reveal a gap in formal AI education, with participants relying heavily on informal channels like social media. Although the literature discusses AI integration optimistically, our findings show skepticism toward AI's clinical capabilities, particularly in diagnostic and decision-making roles. Ethical and job-related concerns were also less pronounced among our participants. However, there was strong agreement in recognizing the need for AI education, with workshops and symposiums favored as effective learning methods.[2]The literature highlights that nursing students demonstrated strong digital skills, commendable digital health literacy (DHL), and positive attitudes toward digital transformation and AI, with senior students showing even greater competence. In contrast, findings from our study revealed that while participants— mostly doctors—were largely aware of AI in daily life (81%) and healthcare (67.5%), their self-perceived tech adaptation was low, with 45.5% disagreeing about being tech-savvy. Furthermore, only 29.5% reported formal AI training, and perceptions of AI's clinical usefulness remained skeptical. This contrast suggests that although nursing students in other contexts are embracing digital tools and AI positively, our study population reflected limited confidence and preparedness, possibly due to a lack of structured exposure and training.[16]The literature emphasizes the transformative potential of AI in nursing by enhancing clinical practice, expanding accessibility through robotics and telehealth, and raising awareness of the need for education and ethical considerations. In contrast, findings from our study reflect limited readiness among healthcare professionals, with only 29.5% having formal AI training and many expressing skepticisms toward AI's role in tasks like diagnosis, treatment planning, and surgery. While 67.5% acknowledged AI applications in healthcare, overall confidence in its clinical utility remained low. This contrast highlights a gap between the promising integration of AI discussed in the literature and the cautious, underprepared perspective observed in our study population.[17]

Although integrating AI into healthcare offers immense promise—such as enhancing diagnosis, optimizing treatments, reducing errors, saving costs, and personalizing patient care—this study reveals a noticeable gap between that potential and current perceptions or readiness among healthcare participants. While a majority of respondents were aware of AI applications (especially via social media), many expressed skepticisms about AI's capabilities in key clinical functions like diagnosis, surgery, and documentation. Preventive health advice, empathetic care, and treatment personalization saw mixed confidence. Notably, concerns persisted regarding ethical, social, and equity challenges, as well as job displacement, although many remained neutral. The results indicate a need for greater education, exposure, and confidence-building in AI's role within healthcare to fully harness its advantages.[15] Knowledge about AI most participant good 73% and poor 27%and Attitude 69%good and 31%poor and practice 58%good and 42% poor.

Conclusion:

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This study concluded a gap between knowledge, attitude, and practice suggests that having adequate knowledge and a favorable attitude does not necessarily translate into proper practice. Therefore, there is a need for targeted interventions, such as practical training programs, skill-based workshops, and continuous monitoring, to improve the application of knowledge into practice.

Recommendations

- Integrate AI modules into nursing and healthcare curricula.
- Organize regular training sessions and workshops.
- Foster interdisciplinary collaboration between tech and health departments.
- Develop ethical guidelines and risk awareness around AI use.
- Provide infrastructure and tools for AI-based learning environments.

Strengths and Weaknesses of the Study

- Covers multiple institutions, enhancing generalizability.
- Mixed data sources including survey and interviews.
- Focus on both students and professionals for holistic insight Weaknesses:
- Limited sample size compared to total population.
- Potential self-report bias in responses.
- Short study duration may not capture longitudinal changes.

REFERENCE:

Pailaha AD. The Impact and Issues of Arti fi cial Intelligence in Nursing Science and Healthcare Settings. 2023;

Profile SEE. Artifical Intelligence in nurse education Artifical Intelligence in nurse education. 2023;(July).

Kondaguli SV. Revolutionizing Healthcare : the transformative Role of Artificial Intelligence in the Nursing Profession - an opinion Review. 2023;(August).

Alowais SA, Alghamdi SS, Alsuhebany N, Alqahtani T, Alshaya AI. Revolutionizing healthcare : the role of artificial intelligence in clinical practice. 2023;1–15.

Aly E, Hashish A. Digital proficiency : assessing knowledge , attitudes , and skills in digital transformation , health literacy , and artificial intelligence among university nursing students. 2024;3:1–11.

Buchanan C, Howitt ML, Wilson R, Richard G. Predicted Influences of Artificial

Intelligence on Nursing Education : Scoping Review Corresponding Author : 2021;4:1–11.

Connor SO, Permana AF, Hasanuddin U, Denis-lalonde D. Artificial intelligence in nursing education 2: opportunities and threats. 2023;(October).

In AI, Education N. Ai in nursing education. 3:135–44.

Embracing artificial intelligence in nursing education : preparing future nurses for a technologically advanced healthcare landscape. 2025;28(1):103815.

Glauberman G, Ma AI fujita, Ma SK. Spotlight on Nursing Artificial Intelligence in Nursing Education : Opportunities and Challenges. 2023;82(12):302–5.

Karim M, Rony K, Rina M, Silvia P. Advancing nursing practice with artificial intelligence : Enhancing preparedness for the future. 2024;(November 2023):1–9.

Nursing J, Wrenlee E. Revolutionizing Nursing Education : The Influence of Artificial Intelligence on Future Healthcare Professionals. 2024;13(2019):3–4.

Wei Q, Pan S, Liu X, Hong M. The integration of AI in nursing : addressing current applications , challenges , and future directions. (4).

No P. International Journal of Advance Research in Nursing Revolutionizing nursing education : Emerging trends for the future. 2024;266–8.

Al-sabawy MR. Artificial Intelligence in Nursing : A study on Nurses ' Perceptions and

Readiness Artificial Intelligence in Nursing : A study on Nurses ' Perceptions and Readiness. 2023;(January).

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Connor SO, Lecturer S, Yan Y. Artificial intelligence in nursing and midwifery : A systematic review. 2022;(July).

Singam AK. The Revolution of Artificial Intelligence in Nursing Education and Practice. 2024;V(9):8–10.

Johnson KB, Wei W-Q, Weeraratne D, Frisse ME, Misulis K, Rhee K, et al.Precision Medicine, AI, and the Future of Personalized Health Care. Clinical and Translational Science. 2021; 141:86–93. doi.org/10.1111/cts.12884 PMID: 32961010

Annarumma M, Withey SJ, Bakewell RJ, Pesce E, Goh V, Montana G. Automated Triaging of Adult Chest Radiographs with Deep Artificial Neural Networks. Radiology. 2019; 2911:196–202. . org/10.1148/radiol.2018180921 PMID: 30667333

Sapci AH, Sapci HA. Artificial Intelligence Education and Tools for Medical and Health

Informatics Students: Systematic Review. JMIR Med Educ. 2020; 61:e19285. PMID: 32602844

Robert N. How artificial intelligence is changing nursing. Nurs Manage. 2019; 509:30–9. . org/10.1097/01.NUMA.0000578988.566 22.21 PMID: 31425440

Announcement of Results of 7th Population and Housing Census-2023 'The Digital Census' [Internet]. 2023; 5th August, 2023. Available from: Press%20Release.pdf

Bosal IU. Federal Budget 2023–24. In: Division F, editor. 2023.

Ke Xu PS, Jowett Matthew, Indikadahena Chandika, Kutzin Joe and Evans David B. Exploring the thresholds of health expenditure for protection against financial risk. 2010. Available from: who.int/media/docs/default-source/health-financing/whr-2010-backgroundpaper-19.pdf

Shah KG, Moazzam M, Rashid M AND Nizami SF. An Analysis of the National Health Vision Pakistan (2016–2025). 2022. Available from:

Pakistan's WHO EMRO eHealth Survey 2016. In: Organization WHO, editor. 2016 Available from:

Jiang J, Qi K, Bai G, Schulman K. Pre-pandemic assessment: a decade of progress in electronic health record adoption among U.S. hospitals. Health Affairs Scholar. 2023; 15.

Kazi AM QS, Ahsan N, Khawaja S, Sameen F, Saqib M, Khan Mughal MA, Wajidali Z, Ali S, Ahmed RM, Kalimuddin H, Rauf Y, Mahmood F, Zafar S, Abbasi TA, Khoumbati K, Abbasi MA, Stergioulas LK Current Challenges of Digital Health Interventions in Pakistan: Mixed Methods Analysis. Journal of Medical Internet Research. 2020;229.

Telecommunication MoIT. National Artificial Intelligence Policy. In: Telecommunication MoIT, editor. 2022.

Laraib Umer MHK, Yasar Ayaz. Transforming Healthcare with Artificial Intelligence in

Pakistan: A Comprehensive Overview. PAKISTAN ARMED FORCES MEDICAL JOURNAL. 2023;

Sit C, Srinivasan R, Amlani A, Muthuswamy K, Azam A, Monzon L, Poon DS. Attitudes and perceptions of UK medical students towards artificial intelligence and radiology: a multicentre survey. Insights into Imaging. 2020; 111:14. PMID: 32025951

Ahmed Z, Bhinder KK, Tariq A, Tahir MJ, Mehmood Q, Tabassum MS, et al. Knowledge, attitude, and practice of artificial intelligence among doctors and medical students in Pakistan: A cross-sectional online survey. Annals of Medicine and Surgery. 2022;76. PMID: 35308436

Abid S AB, Ismail T, Sarwar N, Sarwar G, Tariq M, et al. Artificial Intelligence: Medical

Students' Attitude in District Peshawar Pakistan. Pakistan Journal of Public Health. 2019; 91.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Wahl B, Cossy-Gantner A, Germann S, Schwalbe NR. Artificial intelligence (AI) and global health: how can AI contribute to health in resource-poor settings? BMJ Global Health. 2018; 34:e000798. doi.org/10.1136/bmjgh-2018-000798 PMID: 30233828

Mesko´ B. Prompt Engineering as an Important Emerging Skill for Medical Professionals: Tutorial. J Med Internet Res. 2023; 25:e50638. PLOS DIGITAL HEALTH

Knowledge, attitudes, and perceptions of healthcare professionals on AI PLOS Digital Health | May 10, 2024

Ali S, Akhlaq F, Imran AS, Kastrati Z, Daudpota SM, Moosa M. The enlightening role of explainable artificial intelligence in medical & healthcare domains: A systematic literature review. Computers in Biology and Medicine. 2023; 166:107555.

Abdullah R, Fakieh B. Health Care Employees' Perceptions of the Use of Artificial Intelligence Applications: Survey Study. J Med Internet Res. 2020; 225:e17620. PMID: 32406857