Research Article

Awareness and Perception Regarding the Use of Artificial Intelligence (AI) among Teaching Faculty at Indus Hospital and Health Network

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Abstract: Background: Artificial intelligence (AI) is gaining traction in medical education, yet faculty awareness and acceptance in countries like Pakistan remain underexplored.

Objective: This study was designed to evaluate awareness and perceptions towards artificial intelligence (AI) among the teaching faculty of Indus Hospital and Health Network (IHHN).

Materials and Methods: A two-month cross-sectional study was conducted from 15th December 2023 to 15th April 2024 at Indus Hospital and Health Network (IHHN). Data collection was completed during this period. All teaching faculty members were invited to participate through an anonymous, self-administered questionnaire distributed via the RedCap system, after obtaining informed consent. The questionnaire was self-developed and pilot-tested for clarity and reliability (Cronbach's alpha = 0.812). It covered demographic details, awareness, perceptions, perceived impact, and prior AI-related training. Data were analyzed using SPSS version 28. Descriptive statistics were computed, and associations between categorical variables were assessed using Chi-square or Fisher's exact tests, with a significance level set at $p < 0.05$.

Result: Overall, 77.5% of participants were aware of AI use in medical education. Among the 81 respondents (70.4% female), most were aged 35-44 years (40.7%) and had 1-5 years of teaching experience (28.8%). While 72.8% had no prior AI training, gender and age differences were noted: women favored AI in worksheet design ($p = 0.040$), and younger faculty showed both greater interest in slide creation ($p = 0.042$) and more fear of AI ($p = 0.001$).

Conclusion: The results emphasize the necessity for formal AI training programs to facilitate faculty preparedness and generational issues in medical education.

Keywords: Artificial intelligence (AI), Medical education, Teaching faculty, Awareness, Perceptions, AI training.

INTRODUCTION

Artificial intelligence (AI) has introduced transformative changes across multiple sectors, including healthcare and education, where its application is rapidly evolving. In health professions education, AI is increasingly being integrated into teaching, learning, and administrative processes due to its ability to analyze large datasets, automate routine tasks, and enhance decision-making [1, 2]. Both healthcare and academic environments face growing demands, including the need to manage extensive information and adopt evolving educational strategies. AI offers potential solutions by improving efficiency and reducing workload-related burnout among professionals through intelligent automation [3, 4]. Despite varying perceptions about its adoption, there is growing consensus that AI will play a critical role in shaping the future of healthcare delivery and medical education [5].

The COVID-19 pandemic hastened the application of AI in education (AIEd). With the sudden transition to remote learning and the necessity to ensure continuity of education, institutions turned rapidly to AI-driven educational platforms that could improve online interaction and support learning at a distance. These include Google Classroom, Google Slides, and Kahoot! They became the centerpiece of virtual learning environments -along with AI functionality that customizes content, monitors student progress, and keeps students engaged within a remote environment. As this trend indicated great promise for AI within the education sector, it emphasized even more strongly the necessity for AI-informed tools capable of adapting to the dynamic educational environment and varied needs of students [6, 7].

Large language models such as Gemini and the well-known ChatGPT have recently taken another giant leap in health professions education. Such models powered by artificial intelligence provide students and teachers with tools for the instant retrieval of information, the solution of intricate problems, and even for interactive learning sessions [7]. For instance, a conversational agent named ChatGPT can be used to assist students in exercising diagnostic reasoning or managing clinical situations to enhance critical thinking. These tools can be utilized by faculty to plan lessons, produce assessment materials, or create different

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ways of demonstrating intricate concepts. Such Large language models (LLMs) open up a new frontier for AI innovation in education that can lead to innovation in teaching and learning [7, 8].

Globally, studies have shown that AI-driven educational technologies are increasingly used to enhance student engagement, personalize learning, and improve assessment strategies. For example, research from high-income countries demonstrates that medical educators are exploring AI applications such as adaptive tutoring systems, intelligent simulations, and chatbots to supplement clinical training [8]. However, while such tools offer promising results, studies also report skepticism among faculty regarding accuracy, ethical use, and the potential replacement of human educators [9].

In South Asia, including Pakistan, there is limited literature on the academic use of AI among teaching faculty in medical institutions. A few recent surveys suggest that while awareness of AI tools is increasing, structured training and institutional policies for AI integration remain underdeveloped [9, 10]. Furthermore, most available studies focus on AI in clinical practice (diagnostics, imaging, decision support) rather than on its role in education. This lack of contextual research highlights the importance of examining how educators in resource-constrained settings perceive AI and their readiness to adopt it in academic environments [10, 11].

Despite these rapid global advancements, there is a lack of empirical evidence on how medical educators in low- and middle-income countries (LMICs), including Pakistan, perceive and utilize AI in their academic roles. Most existing literature is centered on Western institutions, leaving a critical gap in understanding local awareness, attitudes, and readiness to integrate AI into health professions education. Without such evidence, institutions may struggle to design effective faculty development programs or policies to support the ethical and responsible adoption of AI in teaching and learning.

In this regard, the purpose of this study is to investigate the awareness and attitudes of educators engaged in clinical and non-clinical teaching across various departments of the ABC Hospital and Health Network. The focus is specifically on the academic use of artificial intelligence in teaching and learning, rather than clinical applications. The results of this study may serve as a useful guide for designing targeted faculty development programs that promote the ethical and effective integration of AI tools into educational practices. Such initiatives are essential to ensure that medical education evolves in parallel with global technological advancements

MATERIALS AND METHODS

This is a two-month cross-sectional study carried out at The Indus Hospital and Health Network (IHHN) (IRB# IHHN_IRB_2023_12_004) from 15th December 2023 to 15th April 2024. The study was carried out with all the teaching faculty who were presently involved in teaching work at IHHN, if they agree to participate in the study. The persons who did not give consent were excluded from the study. Prior approval of necessary clearances was taken from the Institutional Review Board (IRB) of IHHN prior to collection of data.

To facilitate data collection, a list of email addresses of all teaching personnel at IHHN were obtained from the relevant authorities. The participants were contacted via email, and the study questionnaire were distributed through the RedCap platform after obtaining their online consent. The data was gathered using a self-developed questionnaire, based on previously validated tools cited in literature. The final instrument consisted of 12 items and was reviewed by three medical educationists to ensure accuracy and relevance. The content validity of the questionnaire was assessed using the methodology proposed by Polit, Beck, and Owen (2007), which emphasizes both item-level and scale-level evaluation. Three subject matter experts independently rated each item's relevance on a 4-point Likert scale. The Item-Level Content Validity Index (I-CVI) was calculated as the proportion of experts rating each item as either 3 (quite relevant) or 4 (highly relevant). Fourteen out of fifteen items achieved an I-CVI of 1.00, indicating perfect agreement among the experts. One item had an I-CVI of 0.33, falling below the recommended threshold of 0.78 for three reviewers and was therefore categorized as invalid. Awareness was evaluated through seven Likert-scale items that explored familiarity with AI in medical education, frequency of AI use in teaching, and awareness of AI's role in slide generation, assignment design, worksheet creation, question generation, and feedback provision. Respondents were also asked to identify the AI tools they had used, such as ChatGPT, Kahoot, or Google Classroom, and how they came to know about these tools. The remaining five items assessed perceptions of AI, including attitudes related to fear, ethics, enthusiasm, and the perceived need for formal training.

STATISTICAL ANALYSIS

Quantitative data were analyzed using SPSS version 28. As the dataset primarily consisted of categorical and ordinal variables—such as responses on a Likert scale—the assumptions of normality were not applicable. A p-value of less than 0.05 was considered statistically significant. The variables analyzed included those related to awareness and perception of AI. Awareness-related variables encompassed familiarity with AI in medical education, frequency of AI use in teaching, and awareness of AI applications such as slide generation, assignment design, worksheet creation, question generation, and feedback provision. Perception-related variables included feeling scared by AI, the belief that AI may replace educators, finding AI exciting, the view that AI use is unethical, and the perceived need for AI-related training. These outcome variables were analyzed in association with demographic factors such as age, gender, academic discipline, teaching experience, and level of computer literacy.

RESULT

The study included 81 participants, and their demographic characteristics are summarized in Table **1**. The study also inquired

about the computer literacy level in which most of the participants were competent can perform more advanced tasks, like creating spreadsheets, working with files and folders, and troubleshooting basic issues, (57.5%) followed by literate can perform simple tasks such as using email, web browsing, and basic word processing, (38.7%) and Proficient have advanced computer skills, including graphic design, or advanced software use (3.8%). The majority (72.8%) of the participants did not have any prior AI training.

Table 1. Demographics.

Variables	n=81 (Percentage)
Age (n=81)	
25-34	30(37%)
35-44	33(40.7%)
45 and above	18(22.3%)
Gender (n=81)	
Male	24(29.6%)
Female	57(70.4%)
Academic Discipline (n=81)	
Nursing	15(18.5%)
Physical Therapy	8(9.9%)
Medical Laboratory Sciences	5(6.2%)
Medicine & Allied	21(25.9%)
Surgery & Allied	4(4.9%)
Other	28 (34.6)
Years of Teaching Experience (n=81)	
Less than 1 year	14(17.5)
1-5 years	23(28.8)
6-10 years	18(22.5)
11-20 years	16(20)
Over 20 years	9(11.3)

A significant majority (77.5%) are familiar with the use of AI in medical education, and 46.9% reported frequent use of AI in teaching practice. Participants displayed a strong awareness of AI's role in specific educational tasks, with 50.6% recognizing AI's contribution to slide generation and 54.3% acknowledging its involvement in assignment design. Similarly, 66.7% agreed that AI is instrumental in generating questions, while 49.3% identified its role in providing feedback. 61.7% of respondents disagreed with the notion that AI is unethical, and only 14.8% reported being scared by AI. Moreover, while 45.7% disagreed that AI would replace educators, 23.5% expressed concerns. Importantly, 96.3% of participants agreed that educators require training to effectively utilize AI. Finally, an overwhelming 82.7% fund AI in teaching to be exciting (Fig. **1**).

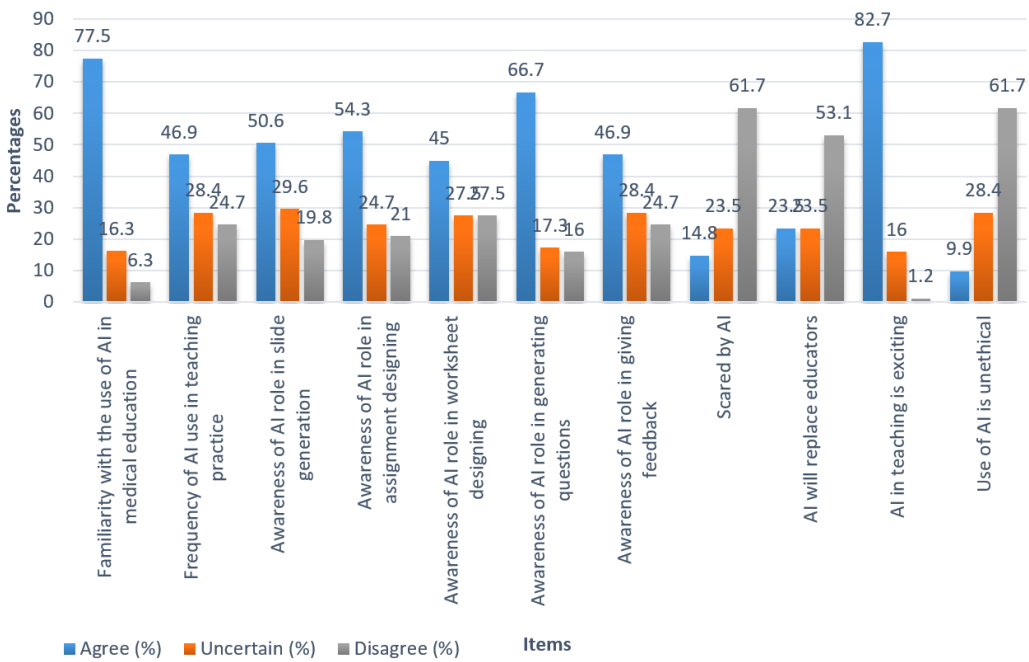

Fig. (1). Descriptive Responses of Participants regarding Awareness and Perception of AI.

The association of gender with awareness and perception of AI in education, did not reveal many significant findings except in one domain. A statistically significant gender difference was observed in awareness of AI's role in worksheet designing (p=0.026), where 53.6% of females agreed compared to 25% of males (Table **2**). Results showed that 83 % of participants in the age group 25-34 years showed their perception that they have a fear of using AI. While other age groups showed a higher perception of uncertainty and disagreement (Table **3**).

The majority of the participants who had a 'competent' computer literacy level agreed that they are familiar with the use of

artificial intelligence in medical education 63.9% while all the participants with a 'literate' computer literacy level disagreed 100% (P=0.026), Similarly, majority of the participant who had 'competent' computer literacy level showed agreement in the frequent use of the AI in their teaching practice 68.4%. However, the participants with 'literate' computer literacy levels did not use AI in their teaching practice frequently 65% (P=0.048). Furthermore, a higher proportion i.e, 65.9% of agreement was observed among those who had 'competent' computer literacy regarding the awareness of the role of AI in assignment designing while the majority of the literate computer literacy level participants showed disagreement 70.6% (P= 0.022) (Table **4**).

Table 2. Association of Gender with Awareness and Perception.

Variable	Awareness and Perception vs Gender							P-Value
	Gender	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	Total	
Familiarity with the use of AI in medical education	Male	3(12.5)	15(62.5)	5(20.8)	1(4.2)	-	24(100)	0.845 ŧ
	Female	12(21.4)	32(57.1)	8(14.3)	3(5.4)	1(1.8)	56(100)	
	Total	15(18.8)	47(58.8)	13(16.3)	4(5)	1(1.3)	80(100)	
Frequency of AI use in teaching practice	Male	1(4.2)	9(37.5)	8(33.3)	5(20.8)	1(4.2)	24(100)	0.991 ŧ
	Female	4(7.1)	23(41.1)	15(26.8)	11(19.6)	3(5.4)	56(100)	
	Total	5(6.3)	32(40)	23(28.7)	16(20)	4(5)	80(100)	
Awareness of AI role in slide generation	Male	4(16.7)	6(25)	8(33.3)	4(16.7)	2(8.3)	24(100)	0.524 ŧ
	Female	6(10.5)	25(43.9)	16(28.1)	7(12.3)	3(5.3)	57(100)	
	Total	10(12.3)	31(38.3)	24(29.6)	11(13.6)	5(6.2)	81(100)	
Awareness of AI role in assignment designing	Male	3(12.5)	7(29.2)	7(29.2)	6(25)	1(4.2)	24(100)	0.108 ŧ
	Female	2(3.5)	32(56.1)	13(22.8)	7(12.3)	3(5.3)	57(100)	
	Total	5(6.2)	39(48.1)	20(24.7)	13(16)	4(4.9)	81(100)	
Awareness of Al role in worksheet designing	Male	2(8.3)	4(16.7)	11(45.8)	6(25)	1(4.2)	24(100)	0.040*ŧ
	Female	3(5.4)	27(48.2)	11(19.6)	12(21.4)	3(5.4)	56(100)	
	Total	5(6.3)	31(38.8)	22(27.5)	18(22.5)	4(5)	80(100)	
Awareness of Al role in generating questions	Male	4(16.7)	10(41.7)	6(25)	4(16.7)	-	24(100)	0.497 ŧ
	Female	7(12.3)	33(57.9)	8(14)	9(15.8)	-	57(100)	
	Total	11(13.6)	43(53.1)	14(17.3)	13(16)	-	81(100)	
Scared by AI	Male	1(4.2)	2(8.3)	7(29.2)	9(37.5)	5(20.8)	24(100)	0.294 ŧ
	Female	-	9(15.8)	12(21.1)	29(50.9)	7(12.3)	57(100)	
	Total	1(1.2)	11(13.6)	19(23.5)	38(46.9)	12(14.8)	81(100)	
Al will replace educators	Male	1(4.2)	6(25)	7(29.2)	6(25)	4(16.7)	24(100)	0.258 ŧ
	Female	1(1.8)	11(19.3)	12(21.1)	28(49.1)	5(8.8)	57(100)	
	Total	2(2.5)	17(21)	19(23.5)	34(42)	9(11.1)	81(100)	
Al in teaching is exciting	Male	6(25)	12(50)	6(25)	-	24(100)	24(100)	0.420 ŧ
	Female	12(21.1)	37(64.9)	7(12.3)	1(1.8)	57(100)	57(100)	
	Total	18(22.2)	49(60.5)	13(16)	1(1.2)	81(100)	81(100)	
Educators training for AI use	Male	16(66.7)	6(25)	1(4.2)	1(4.2)	24(100)	24(100)	0.216 ŧ
	Female	33(57.9)	23(40.4)	1(1.8)	-	57(100)	57(100)	
	Total	49(60.5)	29(35.8)	2(2.5)	1(1.2)	81(100)	81(100)	
Use of AI is unethical	Male	1(4.2)	3(12.5)	9(37.5)	7(29.2)	4(16.7)	24(100)	0.199 ŧ
	Female	2(3.5)	2(3.5)	14(24.6)	30(52.6)	9(15.8)	57(100)	
	Total	3(3.7)	5(6.2)	23(28.4)	37(45.7)	13(16)	81(100)	
Awareness of Ai role in giving feedback	Male	5(20.8)	5(20.8)	9(37.5)	4(16.7)	1(4.2)	24(100)	0.080 ŧ
	Female	3(5.3)	25(43.9)	14(24.6)	13(22.8)	2(3.5)	57(100)	
	Total	8(9.9)	30(37)	23(28.4)	17(21)	3(3.7)	81(100)	

* p <0.05, ŧ Fisher's test.

Table 3. Association of Age with Awareness and Perception.

Variable	Awareness and Perception vs Age							P-Value
	Frequency and Percentage							
	Age	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	Total	
Familiarity with the use of AI in medical education	25-34	7(23.3)	15(50)	5(16.7)	2(6.7)	1(3.3)	30(100)	0.465 ŧ
	35-44	6(18.8)	22(68.8)	4(12.5)	-	-	32(100)	
	45 and above	2(11.1)	10(55.6)	4(22.2)	2(11.1)	-	18(100)	
	Total	15(18.8)	47(58.8)	13(16.3)	4(5)	1(1.3)	80(100)	
Frequency of AI use in teaching practice	25-34	1(3.3)	15(50)	8(26.7)	4(13.3)	2(6.7)	30(100)	0.161 ŧ
	35-44	3(9.4)	14(43.8)	7(21.9)	8(25)	-	32(100)	
	45 and above	1(5.6)	3(16.7)	8(44.4)	4(22.2)	2(11.1)	18(100)	
	Total	5(6.3)	32(40)	23(28.7)	16(20)	4(5)	80(100)	
Awareness of AI role in slide generation	25-34	3(10)	14(46.7)	10(33.3)	-	3(10)	30(100)	0.04*ŧ
	35-44	6(18.2)	11(33.3)	8(24.2)	8(24.2)	-	33(100)	
	45 and above	1(5.6)	6(33.3)	6(33.3)	3(16.7)	2(11.1)	18(100)	
	Total	10(12.3)	31(38.3)	24(29.6)	11(13.6)	5(6.2)	81(100)	
Awareness of AI role in assignment designing	25-34	2(6.7)	18(60)	6(20)	2(6.7)	2(6.7)	30(100)	0.147 ŧ
	35-44	3(9.1)	15(45.5)	7(21.2)	8(24.2)	-	33(100)	
	45 and above	-	6(33.3)	7(38.9)	3(16.7)	2(11.1)	18(100)	
	Total	5(6.2)	39(48.1)	20(24.7)	13(16)	4(4.9)	81(100)	
Awareness of Al role in worksheet designing	25-34	2(6.7)	15(50)	7(23.3)	4(13.3)	2(6.7)	30(100)	0.227 ŧ
	35-44	2(6.1)	12(36.4)	8(24.2)	11(33.3)	-	33(100)	
	45 and above	1(5.9)	4(23.5)	7(41.2)	3(17.6)	2(11.8)	17(100)	
	Total	5(6.3)	31(38.8)	22(27.5)	18(22.5)	4(5)	80(100)	
Awareness of Al role in generating questions	25-34	5(16.7)	17(56.7)	5(16.7)	3(10)	-	30(100)	0.303 ŧ
	35-44	4(12.1)	20(60.6)	3(9.1)	6(18.2)	-	33(100)	
	45 and above	2(11.1)	6(33.3)	6(33.3)	4(22.2)	-	18(100)	
	Total	11(13.6)	43(53.1)	14(17.3)	13(16)	-	81(100)	
Scared by AI	25-34	-	10(33.3)	4(13.3)	15(50)	1(3.3)	30(100)	0.001*ŧ
	35-44	-	1(3)	10(30.3)	14(42.4)	8(24.2)	33(100)	
	45 and above	1(5.6)	-	5(27.8)	9(50)	3(16.7)	18(100)	
	Total	1(1.2)	11(13.6)	19(23.5)	38(46.9)	12(14.8)	81(100)	
Al will replace educators	25-34	1(3.3)	9(30)	7(23.3)	10(33.3)	3(10)	30(100)	0.705 ŧ
	35-44	-	6(18.2)	8(24.2)	16(48.5)	3(9.1)	33(100)	
	45 and above	1(5.6)	2(11.1)	4(22.2)	8(44.4)	3(16.7)	18(100)	
	Total	2(2.5)	17(21)	19(23.5)	34(42)	9(11.1)	81(100)	
Al in teaching is exciting	25-34	7(23.3)	17(56.7)	5(16.7)	1(3.3)		30(100)	0.575 ŧ
	35-44	8(24.2)	22(66.7)	3(9.1)	-		33(100)	
	45 and above	3(16.7)	10(55.6)	5(27.8)	-		18(100)	
	Total	18(22.2)	49(60.5)	13(16)	1(1.2)		81(100)	
Educators training for AI use	25-34	19(63.3)	9(30)	1(3.3)	1(3.3)		30(100)	0.923 ŧ
	35-44	20(60.6)	12(36.4)	1(3)	-		33(100)	
	45 and above	10(55.6)	8(44.4)	-	-		18(100)	
	Total	49(60.5)	29(35.8)	2(2.5)	1(1.2)		81(100)	

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Use of AI is unethical	25-34	2(6.7)	4(13.3)	9(30)	12(40)	3(10)	30(100)	0.454 ŧ
	35-44	-	1(3)	8(24.2)	17(51.5)	7(21.2)	33(100)	
	45 and above	1(5.6)	-	6(33.3)	8(44.4)	3(16.7)	18(100)	
	Total	3(3.7)	5(6.2)	23(28.4)	37(45.7)	13(16)	81(100)	
Awareness of Ai role in giving feedback	25-34	3(10)	12(40)	9(30)	5(16.7)	1(3.3)	30(100)	0.452 ŧ
	35-44	3(9.1)	13(39.4)	7(21.2)	10(30.3)	-	33(100)	
	45 and above	2(11.1)	5(27.8)	7(38.9)	2(11.1)	2(11.1)	18(100)	
	Total	8(9.9)	30(37)	23(28.4)	17(21)	3(3.7)	81(100)	

* p <0.05, ŧ Fisher's test.

Table 4. Association of Computer Literacy Level with Awareness and Perception.

	Computer Literacy	Agree	Uncertain	Disagree	Total	P-Value
Familiarity with the use of AI in medical education	Literate: Basic	19(31.1)	7(53.8)	5(100)	31(39.2)	0.026 ŧ
	Competent:	39(63.9)	6(46.2)	0(0)	45(57)	
	Proficient:	3(4.9)	0(0)	0(0)	3(3.8)	
	Total	61(100)	13(100)	5(100)	79(100)	
Frequency of AI use in teaching practice	Literate: Basic	10(26.3)	8(36.4)	13(65)	31(38.8)	0.048 ŧ
	Competent:	26(68.4)	13(59.1)	7(35)	46(57.5)	
	Proficient:	2(5.3)	1(4.5)	0(0)	3(3.8)	
	Total	38(100)	22(100)	20(100)	80(100)	
Awareness of AI role in slide generation	Literate: Basic	11(27.5)	10(41.7)	10(62.5)	31(38.8)	0.097 ŧ
	Competent:	26(65)	14(58.3)	6(37.5)	46(57.5)	
	Proficient:	3(7.5)	0(0)	0(0)	3(3.8)	
	Total	40(100)	24(100)	16(100)	80(100)	
Awareness of AI role in assignment designing	Literate: Basic	12(27.3)	7(36.8)	12(70.6)	31(38.8)	0.022 ŧ
	Competent:	29(65.9)	12(63.2)	5(29.4)	46(57.5)	
	Proficient:	3(6.8)	0(0)	0(0)	3(3.8)	
	Total	44(100)	19(100)	17(100)	80(100)	
Awareness of Al role in worksheet designing	Literate: Basic	12(27.3)	7(36.8)	12(70.6)	31(38.8)	0.260 ŧ
	Competent:	29(65.9)	12(63.2)	5(29.4)	46(57.5)	
	Proficient:	3(6.8)	0(0)	0(0)	3(3.8)	
	Total	44(100)	19(100)	17(100)	80(100)	
Awareness of Al role in generating questions	Literate: Basic	19(35.2)	5(38.5)	7(53.8)	31(38.8)	0.741 ŧ
	Competent:	32(59.3)	8(61.5)	6(46.2)	46(57.5)	
	Proficient:	3(5.6)	0(0)	0(0)	3(3.8)	
	Total	54(100)	13(100)	13(100)	80(100)	
Scared by AI	Literate: Basic	4(33.3)	9(47.4)	18(36.7)	31(38.8)	0.743 ŧ
	Competent:	7(58.3)	10(52.6)	29(59.2)	46(57.5)	
	Proficient:	1(8.3)	0(0)	2(4.1)	3(3.8)	
	Total	12(100)	19(100)	49(100)	80(100)	
Al will replace educators	Literate: Basic	8(42.1)	10(52.6)	13(31)	31(38.8)	0.470 ŧ
	Competent:	10(52.6)	9(47.4)	27(64.3)	46(57.5)	
	Proficient:	1(5.3)	0(0)	2(4.8)	3(3.8)	
	Total	19(100)	19(100)	42(100)	80(100)	

Continued

Continued

AI in teaching is exciting	Literate: Basic	8(42.1)	10(52.6)	13(31)	31(38.8)	0.682 ŧ
	Competent:	10(52.6)	9(47.4)	27(64.3)	46(57.5)	
	Proficient:	1(5.3)	0(0)	2(4.8)	3(3.8)	
	Total	19(100)	19(100)	42(100)	80(100)	
Educators training for AI use	Literate: Basic	28(36.4)	2(100)	1(100)	31(38.8)	0.164 ŧ
	Competent:	46(59.7)	0(0)	0(0)	46(57.5)	
	Proficient:	3(3.9)	0(0)	0(0)	3(3.8)	
	Total	77(100)	2(100)	1(100)	80(100)	
Use of AI is unethical	Literate: Basic	2(25)	9(39.1)	20(40.8)	31(38.8)	0.731 ŧ
	Competent:	6(75)	14(60.9)	26(53.1)	46(57.5)	
	Proficient:	0(0)	0(0)	3(6.1)	3(3.8)	
	Total	8(100)	23(100)	49(100)	80(100)	
Awareness of AI role in giving feedback	Literate: Basic	15(39.5)	5(22.7)	11(55)	31(38.8)	0.217 ŧ
	Competent:	21(55.3)	16(72.7)	9(45)	46(57.5)	
	Proficient:	2(5.3)	1(4.5)	0(0)	3(3.8)	
	Total	38(100)	22(100)	20(100)	80(100)	

* p <0.05, ŧ Fisher's test, ¥ Pearson Chi Square Test

DISCUSSION

This research uncovered profound findings regarding the awareness and perception of AI among healthcare educators. Most of our participants did not receive any AI training, most likely being the reason for the differing levels of awareness and perception found in this research.

Our results indicated that age affected the attitudes of the faculty and that the younger teachers (25-34 years) were more enthusiastic and embracing about the adoption of AI in general areas, while the older participants (35-44 years) were more cautious and had a higher percentage in the 25-34 group who felt threatened by AI. These results are in line with a research which pointed out the "last mile" issue in AI implementation, where the shift from technical viability to actual application is frequently thwarted by user acceptance [11, 12].

Our research also resonated with the past studies that the acceptance of AI is influenced positively by the computer literacy of people. Kang *et al.* indicated that social capital and computer literacy significantly influence perceptions of artificial intelligence (AI) [13].

Notably, although a high percentage of participants acknowledged the ability of AI in improving educational tools such as generation of slides and worksheets, the absence of previous AI training presented a vital hindrance [14]. The same applies to Cai *et al.* who pointed out that adequate onboarding and training are instrumental for the effective implementation of AI in healthcare environments. Cai's research shows that clear expectations and comprehensive training can mitigate resistance and enhance user engagement with AI technologies [14]. Our study supports this, highlighting the need for targeted AI training programs to bridge the knowledge gap and reduce uncertainty among educators.

Finally, the concern that AI could replace educators, expressed by some participants, reflects broader fears of losing professional autonomy. Kocaballi *et al.* discussed similar anxieties, noting that AI's increasing role in decision-making processes can challenge traditional professional roles and autonomy within healthcare [15]. Our findings suggest that these fears are also present in the educational context, where educators may view AI as a threat rather than a complementary tool, reinforcing the need for clear communication about AI's role in supporting rather than replacing human expertise [16, 17].

The findings of this study reveal that while a majority of teaching faculty acknowledge the growing role of artificial intelligence in medical education, their familiarity and practical use of AI tools remain limited. This aligns with previous studies conducted in similar contexts, where educators expressed interest in AI's potential but reported insufficient training and institutional support [18-22]. Notably, perceptions of AI varied by age and teaching experience, with younger faculty members more open to AI integration but also more likely to perceive it as a potential threat to traditional teaching roles. These attitudes may reflect both generational differences in technology adoption and uncertainties about the evolving role of educators. Furthermore, a significant proportion of respondents emphasized the need for structured training programs and ethical guidelines, underscoring the importance of institutional readiness. Similar concerns have been raised in global literature, which calls for faculty development initiatives to bridge the gap between AI's capabilities and educators' preparedness to use them responsibly [23-25]. The results support the notion that effective AI adoption in education must be accompanied by capacity-building, policy clarity, and continuous dialogue between academic stakeholders.

STRENGTHS

One of the strengths of this research is the fact that it involved a diverse sample of teachers across different fields of study in the healthcare industry, giving a general picture of AI awareness and perception among different educational backgrounds and levels of teaching experience. The research also employed a validated questionnaire to ensure the reliability of the data gathered.

LIMITATIONS

Despite this, the research is not without its shortcomings. The convenience sampling used may have introduced selection bias, as those participants who were more conveniently available or willing to participate may not be representative of the wider healthcare educator population. Furthermore, the study is cross-sectional and gives only a snapshot view of existing attitudes, and these may not reflect how perceptions of AI evolve over time with extended exposure and training. The comparatively modest sample size (81 respondents) also reduces the external validity of the results, and the use of self-reported data can be at risk of response bias, where respondents give socially acceptable replies instead of their actual perceptions.

RECOMMENDATIONS

Longitudinal studies could be the focus of future research to follow up changes in AI perception over time, especially as educators become increasingly experienced with AI tools through specially designed training programs. Increasing the sample size and involving teachers from more institutions would also increase the generalizability of the findings. Additionally, there is a need to design holistic AI training programs that address the particular needs and concerns of various groups of educators, especially those who are more experienced and might feel threatened by the introduction of AI into educational environments. Such programs ought to concentrate on showcasing how AI will augment as opposed to eliminate the work of instructors, thereby cutting down resistance and promoting a more positive understanding of AI use in education.

CONCLUSION

The study revealed moderate awareness and generally positive perceptions of AI among teaching faculty, with a clear need for training and guidance on its educational use. Addressing these gaps through structured faculty development can support the responsible integration of AI in medical education and better prepare educators for future technological advancements.

ABBREVIATIONS

AI: Artificial Intelligence.

AIEd: AI in Education.

LMICs: Low- and Middle-Income Countries.

AUTHORS' CONTRIBUTION

Madiha Ata: Conceptualization, Study design, Methodology, Data analysis and interpretation, Critical review and revision the manuscript, Final approval, final proof to be published.

Sadia Rehman: Conceptualization, Writing draft, Critical review and revision the manuscript, Final approval, final proof to be published.

Shafaq Sultana: Study design, Methodology, Data analysis and interpretation, Critical review and revision the manuscript.

Raheela Rafique: Writing draft, Critical review and revision the manuscript.

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DECLARATIONS

Data Availability

Data will be available from the corresponding author upon a reasonable request

Ethical Approval

The study was commenced with the approval Ethical Review Committee of The Indus Hospital and Health Network (IHHN) (IRB# IHHN_IRB_2023_12_004).

Consent to Participate

All the study participants were enlisted with their written informed consent.

Consent for Publication

All authors give consent for the publication of this work.

Conflict of Interest

Declared none.

Competing Interest/Funding

Declared none.

Use of AI-Assisted Technologies

The authors declare that no generative artificial intelligence (AI) or AI-assisted technologies were utilized in the writing of this manuscript, in the creation of images/graphics/tables/captions, or in any other aspect of its preparation.

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