# Original Article

## Attitude of Medical Institution Faculty and Undergraduate Medical Students towards Artificial Intelligence

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**Abstract**

**Background:** Artificial Intelligence (AI) is the science to use computers simulate human behaviors, learning, judgment and decision-making qualities. AI is being successfully used in clinical, diagnostic, rehabilitative, surgical, and predictive practices.

**Objective:** Due to increased used of AI in education, this study was designed to assess the perception and attitude of Faculty and undergraduate medical students towards Artificial Intelligence"

**Methods:** A quantitative analytical study was conducted on undergraduate medical students and faculty at a public sector institute from January, 2024 to March, 2024 after seeking ethical approval. pre-validated and reliable questionnaire General Attitudes towards Artificial Intelligence Scale (GAAIS) was used after taking consent from the authors. Data was analyzed using spss version 25.0, employing Independent Samples t-tests and One-Way ANOVA.

**Results:** Statistically, the mean score related to positive attitudes towards AI for students was 3.767 (SD = ±0.030), and for faculty, it was 3.762 (SD = ±0.074). Regarding negative attitudes towards AI, the mean score for students was 2.683 (SD = ±0.042), and for faculty, it was 2.622 (SD = ±0.079).

Moreover, a One-Way ANOVA test showed no significant difference in the positive and negative responses towards the use of AI among students based on their years of education ($p > 0.1$ for all comparisons), suggesting that the year of study does not significantly affect students' attitudes towards AI.

**Conclusion:** The study at Punjab Medical College reveals a broadly positive perception of artificial intelligence (AI) among faculty and undergraduate medical students, highlighting a collective readiness to incorporate AI into medical education and practice

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## Introduction

Artificial Intelligence (AI) is the science to use computers simulate human behaviors, learning, judgment and decision-making qualities[1]. It has tremendous advantages and is being widely used in numerous industries with remarkable results[2]. Like

other fields, use of artificial intelligence in health care system is becoming very common and has brought transformative changes in the medical field[3]. AI is being successfully used in clinical, diagnostic, rehabilitative, surgical, and predictive practices.[4] Medical professionals and students should be knowledgeable about the benefits and limitations of AI as its use is increasing in health care fields and they will be soon using it in their professional lives.[5] Due to the increasing significance and use of AI in medical profession, it needs to be included in the medical curricula as well to properly train the future health professionals in this specific area.[6] 99.1% of medical students in Arab region agreed that AI would play an important role in healthcare and More than half of the students ( (60.5%) understood the basic principles of AI.[7] similarly, 88% of students in United kingdom believed that AI will play an important part in health care.[8] A qualitative study conducted on medical faculty and students revealed that 91.11% of respondents believed AI systems would positively impact medical education, especially in research, knowledge gain, assessment, and simulation and felt a need for training on AI use (80%) and that the curriculum could adapt to integrate AI (64.44%), though current resources required to be improved.[9] Undoubtedly, the role of AI in the future of medicine will be significant, and AI-based medical practice is required. There was a strong consensus that AI will not replace doctors but will drastically transform healthcare practices.[9] This study was designed to get an insight on the general attitudes of Faculty and undergraduate medical students towards AI in Pakistan especially in Punjab region. By understanding the perceptions of faculty and undergraduate medical students about AI, we can develop targeted education and training programs, promote AI literacy, and prepare the next generation of healthcare professionals to work effectively with AI systems. The objective of the study was to assess the perception and attitude of undergraduate medical students and faculty about Artificial Intelligence.

## Methods

A quantitative analytical study was conducted at Punjab medical college, a public sector institute affiliated with Faisalabad medical university (FMU) after approval from ERC board of Faisalabad Medical University No. 48/ERC/FMU/2023-24-372. Simple random sampling was used and all the undergraduate MBBS students were included in study. Sample size was calculated as 316 using Open epi and keeping confidence interval of 95%. Faculty from both basic and clinical sciences including Professors, Associate professors, Assistant professors, senior demonstrators and demonstrators were included in study and convenient sampling was used. A pre-validated and reliable questionnaire General Attitudes towards Artificial Intelligence Scale (GAAIS) was used and permission was taken from the author.[7,8] The questionnaire consisted of total 21 items, with one item for attention check, 12 were positive items and 8 were negative items. Each item was ranked on a 5-point like scale with options ranging from strongly agree, agree, neutral, disagree to strongly disagree. For Positive items, 5 points were given to strongly agree and 1 to strongly disagree. Negative items were reversed scored with 5 points given to strongly disagree and 1 point given to strongly agree. After obtaining approval from the FMU ERC board, questionnaires were distributed to students and faculty via Google Forms, using digital communication tools including email and WhatsApp. Data was be analyzed using SPSS. The mean of the positive items was calculated to form an overall score for the positive subscale, and the mean of the negative items was calculated to form the negative subscale. The higher the score on each subscale, the more positive the attitude towards AI. P value of less than 0.05 was taken as significant. The Independent Samples t-test and One-Way ANOVA were used to analyze attitudes, with a significance level set at $p < 0.05$.

## Results

Our study aimed to assess the attitudes of faculty and undergraduate medical students towards artificial intelligence (AI) within a medical academic setting. Utilizing the General Attitudes towards Artificial Intelligence Scale (GAAIS),[10-11] we collected responses from both faculty members and students at Punjab Medical College, affiliated with Faisalabad Medical University.

The participant demographics indicated a diverse representation across different years of study, with 319 students and 81 faculty members participating. The distribution was as follows: 67 first-year students, 29 second-year students, 30 third-year students, 47 fourth-year students, and 146 final-year students. This diversity allowed for a comprehensive analysis of attitudes across different levels of medical education and professional expertise.

Statistically, the mean score related to positive attitudes towards AI for students was 3.767 (SD = ±0.030), and for faculty, it was 3.762 (SD = ±0.074). Regarding negative attitudes towards AI, the mean score for students was 2.683 (SD = ±0.042), and for faculty, it was 2.622 (SD = ±0.079). These results indicate a generally positive attitude towards AI among both students and faculty, with minor variations between the two groups. (Table I) Statistically significant differences were considered at $p < 0.05$.

**Table 1:** *Mean score of students and faculty regarding general attitudes towards Artificial Intelligence*

| | No. of Obs. | Mean | Standard Deviation | p-value |
|---|---|---|---|---|
| **Positive items** | | | | |
| **Student** | 319 | 3.767 | ±0.03 | 0.16 |
| **Faculty** | 81 | 3.762 | ±0.074 | |
| **Negative Items** | | | | |
| **Student** | 319 | 3.767 | ±0.03 | 0.66 |
| **Faculty** | 81 | 3.762 | ±0.074 | |

An Independent Samples t-test was conducted to compare the positive attitudes towards AI between students and faculty. The results showed no significant difference ($p = 0.16$), indicating that both students and faculty members generally share similar positive perceptions of AI in the medical field. Likewise, the analysis of negative attitudes towards AI revealed no significant difference between students and faculty ($p = 0.66$), further supporting the notion of a shared viewpoint on the potential challenges or drawbacks associated with AI in medicine. (Table I)

Moreover, a One-Way ANOVA test showed no significant difference in the positive and negative responses towards the use of AI among students based on their years of education ($p > 0.1$ for all comparisons), suggesting that the year of study does not significantly affect students' attitudes towards AI.(Table II)

In conclusion, our study's results confirms a positive disposition towards AI within the medical community at Punjab Medical College. This positive attitude across both faculty and students, irrespective of the educational level, underscores the potential for broader integration of AI in medical education and practice, aligning with global trends towards technologically enhanced healthcare delivery.

**Table 2:** *Comparative analysis of students regarding general attitudes towards Artificial Intelligence based on their study year*

| Comparative Analysis: One-Way ANOVA – Positive Response | | | |
|---|---|---|---|
| **w.r.t. 1st year** | **Mean Difference** | **Standard Deviation** | **p-value** |
| 2nd Year | 0.122 | ±0.117 | 0.838 |
| 3rd Year | 0.069 | ±0.119 | 0.978 |
| 4th Year | -0.098 | ±0.102 | 0.871 |
| 5th Year | -0.088 | ±0.079 | 0.799 |
| Levene test: 0.791 | | | |
| Sig: 0.532 | | | |
| **Comparative Analysis: One-Way ANOVA – Negative Response** | | | |
| 2nd Year | 0.097 | ±0.166 | 0.978 |
| 3rd Year | 0.316 | ±0.168 | 0.333 |
| 4th Year | -0.026 | ±0.144 | 1 |
| 5th Year | 0.056 | ±0.112 | 0.987 |
| Levene Test: 1.52 | | | |
| Sig: 0.196 | | | |

## Discussion

This study was designed to investigate the general perception and attitudes of medical professionals, including both students and faculty, towards AI and the results showed a generally positive attitude of both cohorts, a finding that aligns with existing literature suggesting an increasing acceptance of AI within healthcare professions.[12] This study was conducted at a public sector teaching medical institution showing a positive attitude of faculty and towards AI hence highlighting the importance to incorporate AI in medical settings.

The students and faculty members participated in the current study showed a positive general attitude towards AI as indicated by the mean scores on the GAAIS scale showing their eagerness and acceptance for AI technologies to be used in medical world and settings. This characteristic is mandatory for the integration of AI into medical curricula, a step advocated by Paranjape et al. (2019), to equip future healthcare professionals with the knowledge and skills necessary to leverage AI in clinical settings.[13] similarly, 74.5% of undergraduate medical students stated that they have no formal education about AI

despite the growing significance of the technology and 70.5% advocated the need to revolutionized the curriculum in this regard.[14]

Furthermore, no significant difference in attitudes towards AI was found between the faculty and students and also between the students from different academic years indicating and highlighting a uniform awareness and acceptance of AI's potential benefits and challenges across the academic community. These findings are in contradiction to the general expectations that more experienced clinicians or older students might view AI with more cynicism and doubt due to concerns over automation or job displacement.[2] Instead, our results suggest a shared positivity about AI's role in enhancing medical diagnostics, treatment planning, and patient care in alignment with Zhao et al.'s (2020) observation of AI's transformative use in power electronics, which equals its significance in healthcare as well.[2,] A survey on 387 pharmacy student opinions across 16 faculties and 12 countries showed predominantly positive attitudes towards AI in medicine (58%, ) with a strong desire for more AI education (72%) but a limited general knowledge of AI (63%).[15]

These findings are very important in understanding the acceptance and perception about AI in the medical world. Keeping in view of the significantly increasing role of AI in healthcare, the positive attitude observed among both faculty and students is encouraging for the integration of AI-focused content in medical curricula. The results of this study also indicate readiness among medical professionals to engage with AI technologies in structural and planned manner in order to use AI in clinical practice for better healthcare outcomes.

The uniform interest in AI among students across different academic years presents an opportunity to integrate AI concepts into the medical curriculum from an early stage. Early exposure to AI could demystify the technology and foster a more profound understanding of its practical applications in healthcare, as supported by Jha et al. (2022) who highlighted the importance of AI knowledge among medical students and interns.[5]

However, our study's findings also point out the need for ethical application and structured educational strategies to enhance understanding of AI in clinical practice. Like other fields, AI technologies are also evolving and updating at a very fast pace indicating the need to revise the curriculum as global needs to equip our future health professionals with adequate knowledge and skills related with AI so that they can use them in the best interest of their community fulfilling all ethical obligations.[16] Bias and lack of transparency in AI decision-making can also happen because of the personal beliefs of those setting up or managing these systems. Using large, diverse data from different backgrounds to train AI can help reduce this bias, making AI decisions fairer."

In another study conducted by Ahmed et al. (2022), 48(19.4%) of medical students in Pakistan were aware of the medical applications of artificial intelligence and 76.7% individuals supported curriculum upgradation.[17] In another study by Abid et al. (2021), conducted by on health professionals in Pakistan, 78.7%, had never had any formal sessions or training in AI during their studies while 41.6% advocated that AI education must be included in health care training especially at undergraduate level to prepare future health professionals for clinical practice.[18] . Habib et al.(2024) did a study on medical faculty and results showed that 50% of participants were aware of the use of AI in medical profession.[19]

To conclude, the results of this particular study showing a positive general attitude of medical fraternity towards AI clearly indicates the will of health professionals to adopt AI in their professional careers. Furthermore, similarity is being observed between faculty and students at different levels of their academic journey which clearly indicates the need to modify and update curriculum in relation to advances in AI technologies to equip health professionals with competency in this particular domain as well as per national and international standards.

As a single-center study, results may not be generalizable to other regions. This raises the need to conduct study across the country to get more insight regarding behavior of population with different background.

## Conclusion

The study at Punjab Medical College reveals a positive perception of medical faculty and undergraduate medical students toward artificial intelligence (AI) highlighting the need to incorporate AI into medical education and practice. The absence of significant differences in attitudes towards AI across faculty and student groups, as well as among students of different years, suggests a uniform acceptance and optimism regarding the use of AI in

healthcare. This uniformity indicates the opportunity for integrating AI concepts throughout medical curricula to prepare future healthcare professionals for current and innovative medical advancements and utilize al such technologies for improved medical education and health care provision to their community. The findings advocate for the continued evolution of medical education to include AI, emphasizing the importance of preparing students to effectively utilize AI in improving healthcare delivery and outcomes. Further multicenter studies are recommended to validate these findings across different medical education environments.

**Ethical Approval:** The Ethical Review Committee, Faisalabad Medical University, Faisalabad approved this study vide letter No 48.ERC/FMU/2023-24-372.

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**Authors' Contribution:**

**ZAC:** Conception & design, final approval of the version

**AA:** Acquisition of data, analysis & interpretation of data, drafting the article

**MA:** Acquisition of data, critically revision for important intellectual content

**MMT:** Acquisition of data, analysis & interpretation of data

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