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Expert Opinion Article

Perception And Awareness Of Artificial Intelligence Among Medical Professionals In India

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ABSTRACT

Background: Machine learning (AI) is taking over many aspects of healthcare, from diagnosis through treatment to patient care. Nonetheless, the implementation of AI is highly contingent on the awareness, attitude, and willingness of the healthcare professionals towards the adoption of such technologies.

Objective: To evaluate the perception, awareness, and readiness of medical professionals in India towards the application of AI in clinical practice.

Methodology: This was a descriptive cross-sectional study conducted at Mahatma Gandhi Medical College & Hospital, Jaipur, on medical professionals (MBBS students, postgraduates, and faculty)– 344 in number. A structured online questionnaire was developed to assess demographic characteristics, knowledge, attitude, and perception regarding AI. Data were analyzed using SPSS with chi-square and logistic regression tests. Statistical significance was set at a p-value of <0.05.

Results: The majority of respondents were male (68.3%) and aged between 22 and 25 years (60.8%). Good knowledge of AI was noted in 68.6% of participants while 88.1% and 76.7% of participants had a positive attitude and favorable perspective, respectively, towards the implementation of AI in healthcare. There were noteworthy correlations between knowledge, attitude, and perspective implications and education, income, and exposure to AI-related training ($P < 0.05$). A younger age and being male were also associated with more positive attitudes.

Conclusion: While there is a high receptiveness towards the adoption of AI by the medical professionals in India, there are also significant knowledge gaps. Systematic initiatives for the education and training of AI will be paramount to address these gaps and to enable an effective, ethical and sustainable implementation of AI in clinical practice

INTRODUCTION:

AI (Artificial Intelligence) can be defined as a sub-field of computer science related to the development of intelligent machines that can function and learn like humans. It is the mimicry of the estimations of programming that work like the human cerebrum some of such techniques are learning, learning, reasoning, partaking and feeling. AI aims to mimicking the properties of human brain.[1,2] As a complex and difficult environment for all stakeholders, the health system has changed with a variety of data, artificial intelligence (AI) has played a significant role in various fields, including healthcare and medical care that can improve patient treatment, even quality of life. Rapid achievements in the field of AI can innovate medical services and realize integration with clinical practice. These messages on the role of AI in clinical practice are crucial for ensuring proper implementation by equipping key stakeholders in the medical service providers with essential knowledge and tools. [3,4,5] Biomedical science expansion, including genomics, digital medicine, artificial intelligence (AI), and its subset, i.e. mechanical learning (ML), presents an environment through which the transfer of medical attention based on new emerging technology occurs and demands new kinds of work and practical standards. [6] AI algorithms that are sophisticated as well as prediction study, used in healthcare, will enhance the diagnosis of ailments, treatment methods, patients, operations, and the course of active medical treatment procedures by improved health results. AI application in healthcare: AI is algorithm based analytical program that is train on

Data by People.[7] Also, the medical AI usage has increased substantially such that AI applications have derived variations in disease diagnosis and management and gradual enhancements in patient treatment outcomes. In particular, the approval of AI systems for regular clinical practice, such as the independent agency approval of auto diagnosis of diabetic retinopathy have underpinned the efficiency and effectiveness of use of AI in clinical practice. [8]
This fast pace of AI technology development holds promise for its use in a clinical setting, which could change how care is delivered. It is essential to collect and share information about the operation of AI in clinical practice to prepare healthcare providers to effectively use AI in patient care. This study aims to provide the current state of knowledge, attitude and perceived behavioural assessment of healthcare workers regarding AI implementation at their workspace.

MATERIALS AND METHOD:

Study design:

The study was carried out at mahatma Gandhi medical college and hospital in Jaipur involving both genders, consisting of MBBS students, MD, MS, DM/ Mch super speciality postgraduates. An online survey was conducted from 1st July 2024 to 31st October 2024 and only those professionals who provided informed consent and filled the entire survey questionnaire were taken into consideration.
A total of 450 took part in the survey, 344 participants completed the survey, and the rest were not eligible as they did not fill the questionnaire adequately, provided improper answers to questions related to exclusion, and offered the same responses to all the questions. To include a variety of participants in each professional strata, we employed both stratified and snowball sampling methods. Participants were randomly selected from each strata at the Mahatma Gandhi Medical College & Hospital and they were urged to forward the information to other employees within their respective organizations, resulting in snowball sampling. The questionnaire consisted five major domains of interest; demographic, perspectives, attitude, and knowledge. Ethical approval was taken from the Institutional Ethics Committee of Mahatma Gandhi Medical College & Hospital.

Measurements:

The measure for the study was based on prior instruments used in previous studies [1,9,10,11]. the validity of the content was confirmed by a public health specialist, a clinical psychologist, and a senior medical faculty member. The online survey consisted of several questions regarding demographic information, awareness, beliefs, and experiences related to AI, and the challenges in its application.

STATISTICAL ANALYSIS

The study had a descriptive design, and the results are summarized in tables and figures in the form of frequencies and/or percentages. The reliability of the scales was established by calculating Cronbach's alpha coefficients to determine their internal consistency. To determine the relationship between two variables, chi-square tests were performed when the variables were nominal. To examine AI-related outcome measures according to participants' characteristics, univariate and multivariable logistic regression analyses were performed to calculate adjusted odds ratios and confidence intervals. The level of statistical significance was used at $p < 0.05$.

RESULTS

Table A: Socio-demographic Characteristics of Participants (n = 344)

Variable	Categories	Frequency (%)
Gender	Male	235 (68.3%)
	Female	109 (31.7%)
Age Group	18–21	25 (7.3%)
	22–25	209 (60.8%)
	26–29	110 (32.0%)
Education Level	Interns	184 (53.49%)
	MD/MS	75 (21.8%)
	Final Year MBBS	29 (8.43%)
	3rd Year MBBS	25 (7.27%)
	DM/MCh	15 (4.36%)
	2nd Year MBBS	8 (2.33%)

Variable	Categories	Frequency (%)
	1st Year MBBS	5 (1.45%)
	Postgraduate	3 (0.87%)
Monthly Income	₹20k–40k	14 (4.1%)
	₹40k–80k	121 (35.2%)
	₹80k–1.5L	140 (40.7%)
	₹1.5L–3L	55 (16.0%)
	₹3L–6L	14 (4.1%)
Attended AI Talk	Yes	218 (63.4%)
	No	126 (36.6%)

In table A, description of the demographic profile of the 344 subjects is provided. Most participants were male (68.3%) and aged between 22 and 25 (60.8%), representing a predominantly young and early-career sample. The majority of respondents were Intern (53.5% at the time of data collection), MD/MS professionals were 21.8% of them, indicating a variables pool of the healthcare professionals studied. On income, 40.7% were in the ₹80,000 to 1.5 lakhs a month range, pointing to a well-off workforce. Not surprisingly, 63.4% of respondents had attended AI lectures or webinars, indicating decent baseline exposure to AI concepts.

Table B: Knowledge, Attitude, and Perspective Score Summary

Score Type	Criteria for "Good/Positive"	n (%) Good/Positive	Total (n)
Knowledge	> 3 out of 6	236 (68.6%)	344
Attitude	> 8 out of 14	303 (88.1%)	344
Perspective	> 3 out of 5	264 (76.7%)	344

Table B describes the distribution of knowledge, attitude, and perspective scores among participants. About 68.6% only had good knowledge on AI, showing a strong foundational knowledge. 88.1% of respondents expressed a positive perception, i.e., openness and receptiveness towards AI in healthcare. Moreover, the responses concerning the overall perspective of healthcare professionals toward AI technologies (79.8%) and their preparedness to adopt the technology (79.2%) were positive as well, suggesting that the respondents in general had a favourable view.

Table C: Association Between Demographic Variables and KAP

Variable	Knowledge p-value	Attitude p-value	Perspective p-value
Gender	0.233	0.718	**0.008**
Age Group	0.638	**0.016**	**<0.001**
Education Level	**0.019**	**0.001**	**<0.001**
Monthly Income	**0.031**	**0.007**	**<0.001**
Attended AI Talk	**<0.001**	**<0.001**	**0.014**

Table C analyses the correlation of demographic variables with KAP i.e., Knowledge, Attitude, and Perspective towards AI. There was a statistically significant association between gender and perspective ($p = 0.008$), with males being more optimistic toward AI adoption. Significant associations were noted between age and attitude ($p = 0.016$) and perspective ($p < 0.001$), with younger professionals demonstrating a more positive disposition. It was found that educational level significantly affected all three domains, implying that those professionals with higher education were more likely to possess greater knowledge and are more positive towards AI. All three outcomes were also significantly associated with monthly income, suggesting higher income professionals might have better access to AI resources or training. Finally, prior exposure to AI-related talks or courses was

significantly correlated to knowledge, attitude, and perspective (all $p < 0.05$), again providing further evidence that training triggers AI readiness.

DISCUSSION

This investigation examined the knowledge and perception of AI amongst medical professionals in India, and demonstrated mostly positive views and acceptance of AI integration. The knowledge of AI among the participants was significantly good, as this constituted about 68.6% of the respondents, while the positive attitude (88.1%) and positive perspective (76.7%) were even higher. This implies a willingness to embrace AI despite knowledge deficiencies. Higher levels of education, income, and previous exposure to AI-related content were significantly associated with better knowledge and more favourable attitudes and perspectives. This suggests that training promotes AI acceptance since participants who had attended AI talks or courses showed good scores in all domains. Interestingly, it was rather younger professionals and men who provided somewhat greater positive perspectives, consistent with those observed in other international studies. This may indicate a receptive group for future integration efforts as the majority of respondents were at the early stages their careers.

CONCLUSION

Attitude and willingness to use AI were found to be strongly favourable, as the healthcare professionals in this study demonstrated a very positive approach towards the use of AI. But knowledge gaps must be addressed through education and training. Integrating Artificial Intelligence modules into medical curricula as well as conducting workshops will also greatly improve awareness and competence in responsible utilization of AI in Indian health care settings.

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