

Original Research Article

Knowledge Attitude and Practice Regarding Use of Artificial Intelligence among Medical Students - A Comparative Study

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ABSTRACT

Background: Artificial Intelligence (AI) is described as “the theory and development of computer systems capable of performing tasks ordinarily requiring human intellect, such as visual perception, speech recognition, decision-making, and language translation”. AI can simulate cognitive abilities for real-world problem solving and the development of machine learning and human-like reasoning. It can mimic cognitive operations, such as image recognition, speech recognition, and annotation generation. It is important for physicians to understand the potential of AI and the issues associated with it to make informed decisions and provide comprehensive treatment. The application of AI in healthcare can lead to exquisite improvement in providing healthcare. This study research was done to help gain knowledge about importance of AI and how various aspects of AI can be utilized for the improvement of healthcare among Undergraduate (UG) medical students. This will afford insights into the influence of artificial intelligence platforms on various facets of health care, encompassing physical, mental, and social well-being.

Objectives

1. To assess the Knowledge, Attitude and Practice on Artificial intelligence among undergraduate medical college students.
2. To compare Knowledge, Attitude and Practice on Artificial intelligence among 1st, 2nd, 3rd and 4th year undergraduate medical college students.

Methods: A cross sectional comparative study was conducted among the medical college students. A total of 100 medical college students participated in the study. Knowledge, Attitude and Practice on Artificial intelligence among undergraduate medical college students was assessed using a pretested semi structured questionnaire. Comparison was done among 1st, 2nd, 3rd and 4th year undergraduate medical college students. Independent sample t test will be used for finding the mean difference between the groups.

Results: Among the 100 medical students, a total of 25 study participants each from the 1st, 2nd, 3rd, and 4th year of medical college were selected by random sampling method. The age group representation was predominantly 17-20 years (44%), followed by 21-22 years (45%), with smaller proportions in the 23-25 years range (11%). The study participants were almost evenly split, with 51% female and 49% male. Overall, 47% of participants had solid very solid knowledge of AI, 48% had good knowledge on AI and 5% had very basic knowledge on AI. The average knowledge score across the 4 years of medical students was 2.59. The average attitude score across the 4 years of study participants was 3.85. only 4% of study participants are very confident of using their AI skill in practice.

Conclusions: Despite moderate knowledge and positive attitudes, actual implementation and use of AI in healthcare practices are minimal. Implementing health and technology strategies can accelerate the practical use of AI in healthcare and institutions.

Keywords: Artificial Intelligence, Medical Students, Healthcare.

INTRODUCTION

Artificial Intelligence (AI) is described as “the

theory and development of computer systems capable of performing tasks ordinarily requiring human intellect, such as visual perception, speech recognition, decision-making, and language translation". AI can simulate cognitive abilities for real-world problem solving and the development of machine learning and human-like reasoning. It can mimic cognitive operations, such as image recognition, speech recognition, and annotation generation. It is important for physicians to understand the potential of AI and the issues associated with it to make informed decisions and provide comprehensive treatment. Clinicians and health informatics professionals who design AI applications must have a solid knowledge of the basic ideas of the technology to apply and filter AI-based judgments. Depending on the algorithms, data sources, and methods used, the application of AI in healthcare can either lead to exquisite improvement in providing healthcare or lead to unintended consequences and misleading conclusions. AI-based technologies have reported to improve human life quality, making life easier, safer and more productive.^[1,2]

Globally, most of the universities have already embedded AI literacy and competencies into undergraduate, postgraduate, and continuing education programs.^[3] This study research was done to help gain knowledge about importance of AI and how various aspects of AI that can be utilized for the improvement of healthcare among Undergraduate (UG) medical students. This will afford insights into the influence of artificial intelligence platforms on various facets of health care, encompassing physical, mental, and social well-being. Universities need to actively support and ensure that AI initiatives align with goals such as competency-based education and health care system reform. There is a risk that AI will be viewed as a top-down mandate poorly and integrated into everyday teaching.^[4,5]

As we transition into the era of preventive medicine, it becomes essential to evaluate community health and well-being proactively, facilitating timely interventions before issues escalate to a curative stage. This study will assist us in achieving this goal, leading to the privilege of residing in a healthier society with stronger and more meaningful social connections.

Objectives

1. To assess the Knowledge, Attitude and Practice on Artificial intelligence among undergraduate medical college students.
2. To compare Knowledge, Attitude and Practice on Artificial intelligence among 1st, 2nd, 3rd and 4th year undergraduate medical college students.

MATERIALS & METHODS

Study Participants

Study subjects are Undergraduate students of medical college at Bangalore.

Study Design

This is a comparative, cross-sectional study to assess knowledge attitude and practice of AI among UG medical college students at Bangalore. A survey was conducted with certain questions to know about the extent of information a medical student is having regarding the use of AI in the medical field.

Inclusion Criteria

The study included undergraduate medical students who gave informed consent to participant in the study.

Exclusion Criteria

The medical students who are unwilling to participate in the survey and don't respond for more than a week were excluded from the study.

Data Collection and Study Analysis

Permission from the college Principal and the Ethics Committee were taken. Questionnaire link was provided to UG medical students. Informed consent form was collected with the participant's signature. Anonymity and confidentiality of the responses was maintained. There were 15 questions in the questionnaire link related to knowledge, attitude and practice was sent through Telegram and Email. A time interval of 1 week was given to submit the responses. If the response is not received within the given time, then that student was excluded from the survey. The responses received were studied, analyzed with the usage of relevant tools and the results were documented.

Sampling Method

The Sample size is calculated by using G* power software for independent sample t test, formula is

$$n = \frac{2[z_{1-\alpha/2} + z_{1-\beta}]^2}{(d/\sigma)^2}$$

$z_{1-\alpha/2}$ = Standard normal score at 95% of level of confidence.

$z_{1-\beta}$ = Power

d/σ = Effect size

At 95% level of confidence and 90% power with standard effect size is 0.5 so the minimum sample size is 86 rounding off to 100 undergraduate students of medical college.

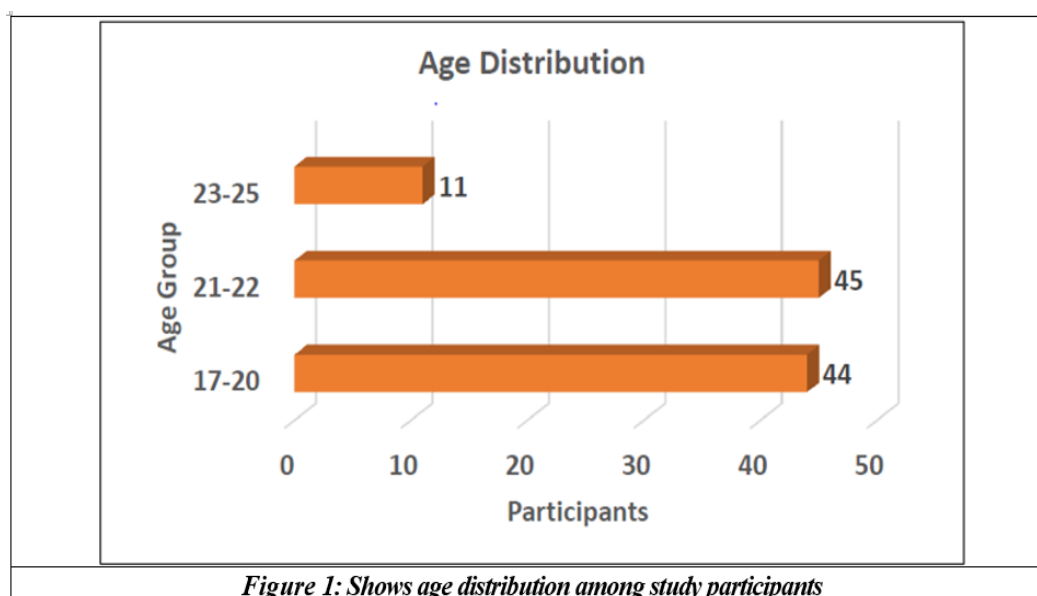
Statistical Analysis

Data was entered in MS Excel and analyzed using SPSS version 23. Descriptive analysis of

all the explanatory and outcome parameters was done using mean and standard deviation for quantitative variables, frequency and proportions for categorical variables. Independent sample t test was used for finding the mean difference between the groups.

RESULTS

The study included 100 participants, distributed across various demographic categories. The age group representation was predominantly 17–20 years (44%), followed by 21–22 years (45%), with smaller proportions in the 23–25 years range (11%), as shown in figure 1.



In terms of gender as shown in the Table 1, the participants were almost evenly split, with 51% female and 49% male. The participants were all undergraduate students of a medical college, evenly distributed across their years of study. A

total of 25 study participants each of them from the 1st, 2nd, 3rd, and 4th year of a medical college as shown in the table 2. This diverse representation ensures a balanced analysis across age, gender, and academic progression.

Medical Students	Frequency (%)
Female	51 (51)
Male	49 (49)
Total	100

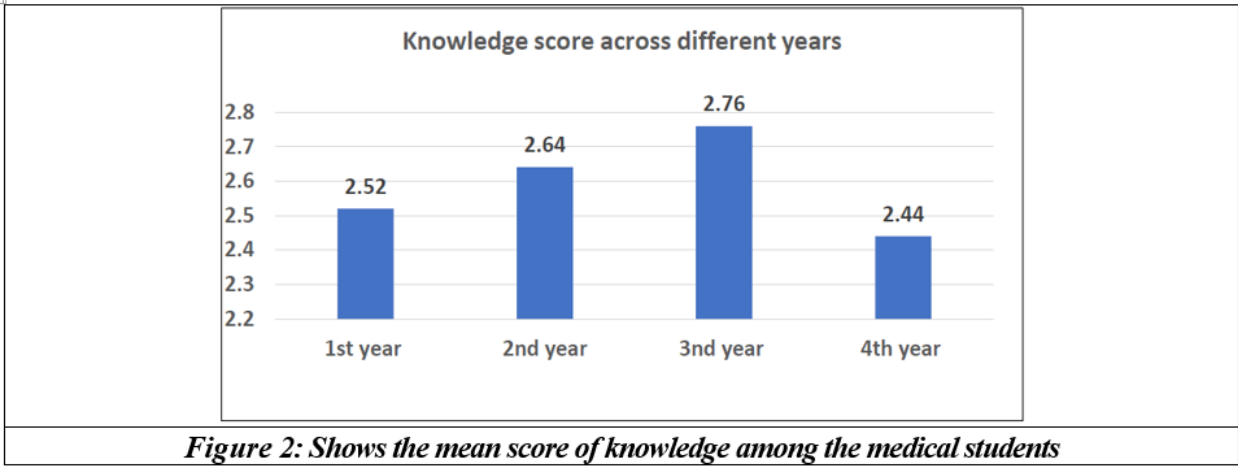
Table 1: Distribution of Medical Students according to their Gender

Medical Students	Frequency (%)
1 st year students	25 (25)
2 nd year students	25 (25)
3 rd year students	25 (25)
4 th year students	25 (25)
Total	100

Table 2: Distribution of Medical students according to their Year of Studying

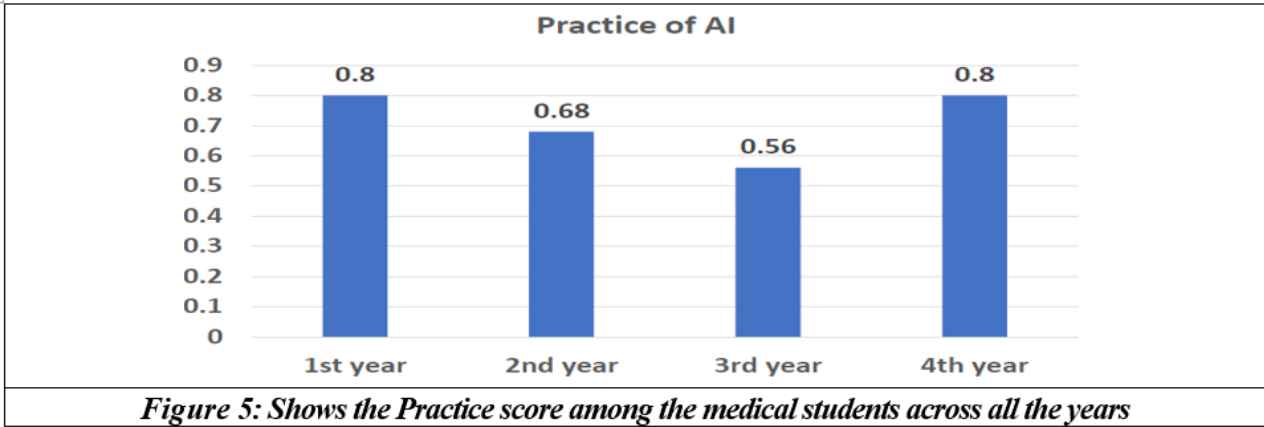
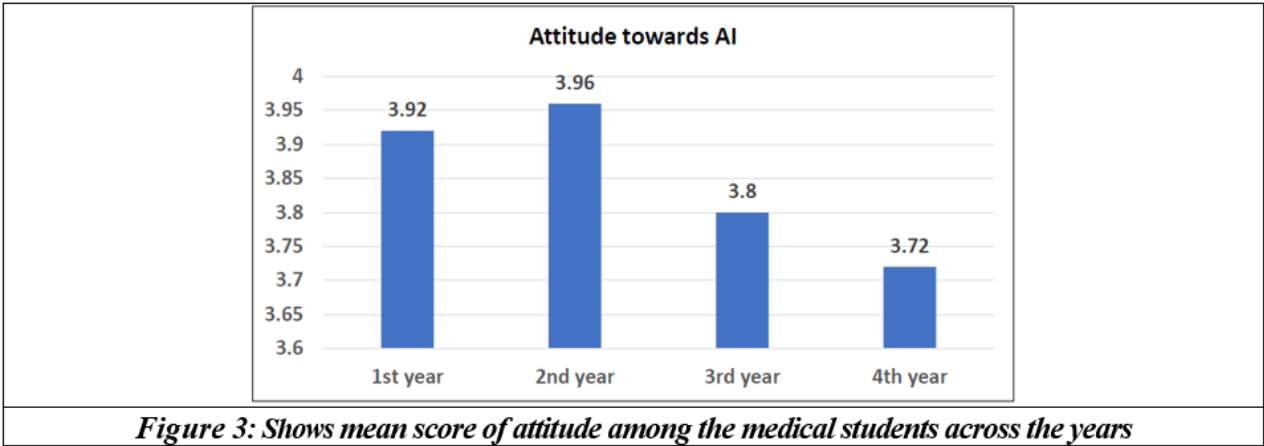
Overall, 95% of participants had Good knowledge of AI and 5% had very basic knowledge on AI. The

average knowledge score across the 4 years of medical students was 2.59 as shown in the figure 2.



The figure 3 represents participant’s attitude. Most of them felt that AI helps in improving quality and efficiency of research & development products, helps in support & improved delivery of more personalized care and facilitates access to care & improves the diagnosis. The average attitude scores showed

minor variations among the groups, with 2nd year students having the highest average score of 3.96 and 4th year students having the lowest average score of 3.72. This shows that there is positive attitude among participants towards AI across all the four years of medical students.



Practice scores are very low as demonstrated in figure 5. A total of 4% of

participants are very confident of using their AI skill in practice and 46% are somewhat

confident and over 50% are uncertain. The 1st year and 4th year students had the highest average score of 0.8 and 3rd year students having the lowest average score of 0.56.

DISCUSSION

The average knowledge scores showed minor variations among the groups, with 3rd year students having the highest average score of 2.76 and 4th year students having the lowest average score of 2.44. Study was based on a systematic literature review of artificial intelligence in healthcare suggested that AI can raise the quality of services in the healthcare industry.^[6] Medical students with appropriate knowledge will help to achieve timely diagnosis and treatment.

The average attitude score across the 4 years was 3.85. These findings are comparable with the study done by Mehta N et al^[7] among the medical students. This indicates a favorable perception of AI in healthcare among participants, which is critical for the adoption and integration of AI technologies within the health care services and institutions.

The average practice score across the 4 years was 0.71. This shows that despite knowledge and positive attitudes, actual implementation and use of AI in healthcare practices are minimal. This observation is as similar to the study conducted by AIIMS Nagpur.^[8,9]

In our study we conclude that the knowledge and attitude towards AI are consistent across groups, however they may reflect a lack of focused AI-specific learning progression and practice as students advance in their studies. This is consistent with study done in Nepal by Teijlingen et al.^[10]

Recommendations

To increase the use of AI in institutions and healthcare, following may be adopted:

Education and Training

Develop and offer structured training programs and workshops focused on the practical applications of AI in healthcare for healthcare professionals, practitioners, administrators and students. Adding AI related modules or subjects in healthcare curriculum and medical & institutional management courses will emphasize real-world applications and case studies.

Infrastructure Development

Implementation of robust electronic health records and data storage systems and ensuring access to cloud computing and AI development

platforms for researchers and institutions.

Collaboration and Partnerships

Partner with AI Companies and working with tech firms to pilot AI and to support academic and corporate partnerships to innovate AI solutions.

Implementing these strategies can accelerate the practical use of AI in healthcare and institutions.

Conflict of Interest

NIL

Funding

Self

Ethical approval

Yes

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