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Attitude and Readiness Towards Artificial Intelligence Among Rehman College of Rehabilitation Sciences: A Cross-Sectional Study

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DECLARATIONS

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ABSTRACT

Background: Artificial intelligence applications are becoming increasingly prevalent across a wide range of fields, with healthcare being one of the most significantly impacted sectors. **Objective:** To assess the attitudes and readiness of physical therapy students at Rehman College of Rehabilitation Sciences toward artificial intelligence and to identify factors influencing their preparedness for integrating it into clinical practice and education. **Methodology:** A descriptive cross-sectional study was conducted at Rehman College of Rehabilitation Sciences for six months from June 2024 to November 2024. After the approval from the graduate study committee of Rehman College of Rehabilitation Sciences, 141 participants were screened, and informed consent was taken. The data collection tools used in this study were the Medical Artificial Intelligence Readiness Scale for Medical Students and the Artificial Intelligence Attitude Scale. Frequencies and percentages were reported for categorical data such as age, gender, year of study, and two general questions about AI. The Shapiro-Wilk test was used to check the normality of the data. An independent T-test was used to investigate the association between attitude towards artificial intelligence and gender, and a one-way ANOVA was used to examine the association between study year and readiness. Pearson's correlation test was used to find out the correlation between readiness and attitude towards artificial intelligence. **Results:** About 53.2% participants demonstrated a positive attitude towards artificial intelligence, while 46.8% exhibited a negative attitude. On the readiness scale, students scored an average of 15/40 for cognition, 38/40 for ability, 9/15 for vision, and 11/15 for ethics, yielding an overall mean readiness score of 74±18.8 out of a possible 110. Readiness levels were found to be significantly associated with students' year of study and were positively correlated with their attitudes towards artificial intelligence. **Conclusion:** The findings suggest that physical therapy students generally possess positive attitudes and strong technical abilities regarding artificial intelligence. However, gaps remain in cognitive understanding and ethical awareness. While gender differences were not significant, lower readiness levels were noted among third- and fifth-year students. Strengthening educational efforts in artificial intelligence, cognition, and ethics is recommended for more effective integration into physical therapy education.

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INTRODUCTION

Artificial intelligence (AI) is the theory and development of computer systems that include various tasks such as visual perception, speech recognition, decision-making, and language translation, typically requiring human intelligence. It has evolved to be a field central to computer science, specifically designed to replicate cognitive processes involved in human activities like speech recognition and image recognition, along with human-like reasoning.[1] The term AI was coined by John McCarthy in 1956. According to him, "AI is the science and engineering of creating intelligent machines using algorithms or a set of rules to mimic human cognitive functions such as learning and problem-solving".[2]

The AI has different subtypes like machine learning, neural networks, and deep learning, and their role in health care practices is increasing day by day.[3] Advances in digital technologies and computer sciences are driving us toward a technological society where machines are increasingly designed to meet human needs while becoming more intelligent. In broad consensus, technologies like AI, robotics, virtual reality, 3D printing, and advanced networks are proclaimed to be the most precious of the future years.[4] Many studies have been conducted regarding AI readiness in several fields, such as health care, engineering, business innovation, and governmental initiatives, including reform and development processes in China and other nations.[5] Most of these studies focus more on the governmental viewpoint because AI readiness is highly related to economic factors.

The World Health Organization (WHO) has stated that there exists a basic need for healthcare professionals to appreciate how AI works. Hence, AI would become one of the main aspects of education related to health in the future.[6,7] In 2019, "Beijing Consensus on AI and Education" was presented by the Beijing Conference. It stated that AI should be used in education. It extends UNESCO's action as to how education should be made better for everybody.[8] Since the 1970s, AI has increasingly been applied in healthcare, and one of the earliest systems was well represented in the MYCIN system for antibiotic recommendations.[9] CASNET, a glaucoma consultation program from 1976[10], and INTERNIST-I, an internal medicine diagnostic consultation tool.[11] It will revolutionize methods in delivering, managing, administering, researching, and preventing medical aspects.[12] This would accelerate early interventions of risk factors by maximizing personalized prevention strategies. In this light, healthcare professionals would use AI depending on the level of understanding of its concepts and algorithms to integrate these tools for patient care and decision-making.[13]

A study was conducted in 2023 in Europe among 88 medical students. Data obtained show that 26.1% of those mentioned above received education on AI at the lecture level, whereas 77% of respondents pointed out that they had already heard about AI in medicine, mainly through media and social media. This group had a higher percentage than clinical students who said doctors would be replaced very soon by AI. More male students than female students strongly reported knowing more about AI. Students who were aware of AI technology were much more likely to feel that the developments in AI medicine were interesting.[14] Attitudes, awareness, and preparedness of the healthcare workforce and students toward AI have been an issue of recent research conducted across the Asian region.

An opinion survey of 1st and final year students toward AI was conducted in 2021.[15] AI applications in imaging diagnostics received very positive opinions from both groups. However, as regards attitudes among fifth-year students towards AI as part of their educational process, as distinguished from lectures, clinical clerkships, and test administration, students were far more skeptical than the first-year students. While these attitudes hardly boded well for the future, both groups saw AI as an excellent learning mentor.[15]

We need to get physical therapy (PT) students ready for the digital revolution by understanding their readiness and attitudes towards the new era of health and rehabilitation practices. While previous studies have looked at AI applications in healthcare and rehabilitation, not much is known about PT students' readiness towards AI. This study aimed to explore PT students' comprehension of AI-based techniques in healthcare and rehabilitation. The study findings will help bridge the gap between current research recommendations.

METHODOLOGY

A descriptive cross-sectional study was conducted

at Rehman College of Rehabilitation Sciences. The study duration was six months from June 2024 to November 2024. The sample size for the study was 141, calculated through the OpenEpi sample size calculator with a population size of 221, a confidence interval of 95% and a margin of error 5% using convenience sampling. The selection criteria were the inclusion of physical therapy students. After the approval from the graduate study committee of Rehman College of Rehabilitation Sciences, the participants were screened, and informed consent was taken.

The data collection tools used in this study were the Medical Artificial Intelligence Readiness Scale for Medical Students (MAIRS-MS) and the AI Attitude Scale (AIAS-4 Scale). The MAIRS-MS questionnaire consists of 22 items with a 5-point Likert scale and scores students on four domains of AI readiness: cognition, ability, vision, and ethics. Each item on the MAIRS-MS is scored between 1 (minimum) and 5 (maximum) points. "Strongly disagree" is given a score of 1, and "Strongly agree" is given a score of 5. The final mean score of all respondents in each domain is calculated to evaluate their AI readiness. The AIAS-4 Scale has four questions using a 10-point Likert scale, where 1 is "not at all agree" and 10 is "completely agree."

Results were analyzed by using the Statistical Package for Social Sciences (SPSS) version 22. Frequencies and percentages were reported for categorical data such as age, gender, year of study, and two general questions about AI. The Shapiro-Wilk test was used to check the normality of the data, which shows that our data was normally distributed $p>0.05$. An independent T-test was used to find an association between attitude towards AI and gender, and a one-way ANOVA was used to find an association between study year and readiness, which shows that there is an association at <0.05. Pearson's correlation test was used to find out the correlation between readiness and attitude towards AI, which shows a strong positive correlation.

RESULTS

The study included 141 undergraduate students, most of them were female, 98 (69.5%), compared to males, 43 (30.5%). The mean age of participants was 21±1.6, with a large representation of second year (18.4%) and third year (23.4%) students. From what source did you learn about AI: social media (45.39%) was the main source of information for participants about AI tools, followed by the internet (26.23%) and Snapchat (13.48%). Since the variables in our study were numerical, we first used the Shapiro-Wilk test to determine the normality of the variables. The result of the Shapiro-Wilk test indicated that the data were normally distributed, as $p>0.05$.

The AIAS-4 scale was utilized to assess attitudes toward AI among a sample of 141 participants, with a mean score of 29±8.3. Attitude towards AI was categorized on the basis of the mean. Participants who scored below the mean exhibited a generally negative attitude toward AI, and those who scored above the mean demonstrated a more positive attitude toward AI. An independent t-test was used to investigate the association between attitudes of male and female students about artificial intelligence. The study indicated no significant difference, $p>0.05$, in male and female students' attitudes about AI. Readiness towards Artificial Intelligence: In this study, respondents scored an average of 15±5.4 points out of a potential 40 points on the cognition factor. This is the area in which respondents performed the worst and greatest scores on the ability factor, with an average of 38±9.9 out of 40. Students had a mean MAIRS-MS score of 74±18.8 out of 110.

Association between year of study and readiness: One-way ANOVA was conducted to examine the association between attitudes toward artificial intelligence (AI) across five different years of study (1st to 5th year). The analysis revealed that there were significant differences in attitudes toward AI among the different years of study, with a corresponding $p<0.05$. Mean scores of the year of study show that the third and fifth years have significantly lower mean scores compared to the first, fourth, and second years. The association between attitude and readiness was examined using a Pearson correlation analysis. The findings revealed a strong positive correlation. This suggests that students' readiness rises in

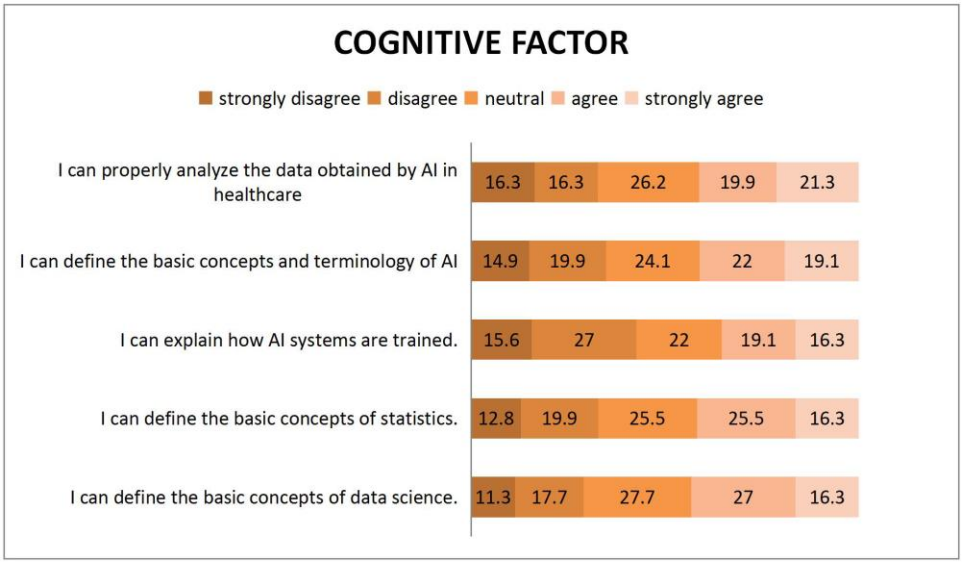
Table 1: MAIRS-MS Score

Factors	Mean MAIRS-MS Score
Cognition	15±5.4 (40)
Ability	38±9.9 (40)
Vision	9±3.5 (15)
Ethics	11±3.8 (15)
Overall	74±18.8

Table 2: Statistics of participants

	Demographics category	Frequency (f)	Percentage (%)
Gender	Male	43	30.5
	Female	98	69.5
Age	<19	26	18.4
	20-22	74	52.5
	23-25	41	29.1
Study Year	First year	33	23.4
	Second year	26	18.4
	Third year	33	23.4
	Fourth year	23	16.3
	Fifth year	26	18.4
Attitude towards AI	Positive	75	53.2
	Negative	66	46.8

Figure 1: Students' readiness in the cognition domain



conjunction with an improvement in their attitudes.

DISCUSSION

This research has been conducted to find the attitude and readiness of the Rehman College of Rehabilitation Sciences students. It also measured the association of attitude and readiness with different factors that affect attitude and readiness. According to the results of this study illustrated that 56% students showed positive attitudes toward AI on AIAS-4. However, another study in 2024 also shows that more than 50% of the participants have positive attitudes towards AI.[16] Similarly, in the year 2020, eighty-eight percent of students believe that AI will play a major role in healthcare.[17] Likewise, a study in 2024 shows that students hold substantially more positive attitudes about AI.[18] The reason for this may be that AI makes learning easier, thus more engaging. In this study, there is no statistical attitude and gender difference toward Artificial Intelligence, which is comparable with the research conducted in 2014.[19] A study in 2023 also shows that there is no gender or attitude difference among medical students. Similarly, research demonstrated that there exists a difference between gender and attitude, which shows that male students had a more positive attitude than females toward AI.[20,21]

In this study, the mean score for readiness is 74±18.8 MAIRS-MS out of 110, which displays moderate readiness for AI, but poor performance in the cognition domain indicates that students do not know much about AI, and the highest score in the ability domain showed that students are willing to use AI in the medical field. These results are consistent with a study in 2024, which exhibits that overall, AI readiness scores were 73.34 out of 110 on MAIRS-MS. According to these findings, it conveys that medical AI learning in the curriculum is necessary so that the students gain in-depth knowledge and understanding of AI.[22]

Similarly, a study in 2023 found that the mean score was 67±14.8 out of 110, which revealed that these students have low readiness on MAIRS-MS.[23] In this study, the results show that the third and fifth year students marked lower scores than those of first, fourth, and second year students. A very similar study conducted in the year 2023 found results contradicting this study, which shows that fourth-year students have significantly higher scores than second, third, fifth, and first-year students.[14] Another study in 2023 shows no significant association between year of study and attitude. First-year students scored highest on MAIR-MS than final year students because they are more familiar with AI and technology, experience less burnout, are more open to personal growth and feedback, and have a fresh perspective and enthusiasm for learning compared to final year students. Results from this study show that there is a positive correlation between attitude and readiness towards AI, which also coincides with the previous study conducted in 2023, in which a positive correlation was also observed regarding attitude and readiness.[24]

Evidence illustrates comparable results where a higher acceptance of AI technologies in medicine is reflected with a higher level of readiness. Likewise, a 2022 study also found that students who have a better understanding and positive attitude toward AI performed well on the readiness scale, and attitude and readiness are interdependent. Therefore, this is the reason that a student must gain knowledge of AI for readiness and a positive attitude toward self-learning of AI. Better knowledge and understanding of AI possessed by the students make them better prepared and have more positive attitudes; hence, it is essential to incorporate AI-related programs very effectively in the curriculum.[25]

CONCLUSION

This study examined physiotherapy students' attitudes and readiness toward AI in learning. Most had positive attitudes, with no gender differences. Readiness scores were strong in ability but weaker in cognition and ethics. A positive attitude-readiness link was found, while third- and fifth-year students showed lower readiness. The findings highlight the need to foster positive attitudes and improve cognition and ethical understanding to better prepare students for AI integration. This study recommends improving AI education for physiotherapy students by enhancing cognition and ethics, tailoring content for third- and fifth-year students, offering practical applications, raising ethical awareness, and integrating AI topics across the curriculum.

DECLARATIONS

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