

## Original Article

# Knowledge Towards Artificial Intelligence among Physical Therapists Working in Pakistan

Mamoona Tasleem Afzal<sup>1</sup>, Fatima Mehreen<sup>1</sup>, Nahid Ali<sup>1</sup>, Rozina Aftab<sup>1</sup>, Iqra Habib<sup>1</sup> and Muhammad Rauf Ahmed<sup>1</sup>

<sup>1</sup>Institute of Rehabilitation Sciences, Shaheed Zulfiqar Ali Bhutto Medical University, Islamabad, Pakistan

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### \*Corresponding Author:

Mamoona Tasleem Afzal  
Institute of Rehabilitation Sciences, Shaheed  
Zulfiqar Ali Bhutto Medical University, Islamabad,  
Pakistan  
[drmamoona Tasleem@szabmu.edu.pk](mailto:drmamoona Tasleem@szabmu.edu.pk)

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## ABSTRACT

AI is a software system that simulates human intelligence in performing tasks and actions. In modern healthcare system, key aspects of AI include diagnosis, treatment, and prevention of disease. **Objective:** To determine the knowledge about AI among physical therapists working in Pakistan and to find out level of agreement related to advantages of AI, regarding use of AI in Rehabilitation and impact of AI on future of Rehabilitation. **Methods:** The study used convenience sampling in Pakistani hospitals and clinics, collecting data from 305 physiotherapists via hospital visits and an online questionnaire. Analysis was done using SPSS 23. **Results:** Out of 305 participants, 120 were males and 185 were females. 116 were employed in public sector and 186 were employed in private sector. The frequency of physiotherapists who are familiar with AI came out to be 92.5%. About 56.4% physical therapist agreed about uses of AI in rehabilitation. 55.1% physical therapist believed that there are advantages of AI in rehabilitation and there will be a positive impact of AI on rehab in future according to 53.8% of physical therapist. **Conclusions:** The findings suggest that high frequency of knowledge of AI among physical therapist working in Pakistan. Many physical therapists believed that AI has the positive impact on rehabilitation.

## INTRODUCTION

A machine's capacity to execute an essential activity under the supervision of an intelligent human is known as artificial intelligence (AI) [1]. It has reduced human intervention from minimum to none. AI, which blesses the non-living machines with the humanly trait of intelligence, was born in 1956 [2]. AI is referred to as the fourth industrial revolution as it has drawn tremendous interest recently [3]. The basic principles, of artificial intelligence, Virtual (informatics), or physical (robotics) can be employed by Physiotherapy clinics to educate patients and track their progress [4]. The virtual branch incorporates informatics techniques that include everything from deep learning and information management to the oversight of health management systems, such as electronic health records,

and actively assists physicians and therapists in their decision of choosing the appropriate treatment [2]. The use of robotics in rehabilitation turns the repetitive exercises into challenging games, motivating the patient to do it. Robots provide assistance and analyse the activity quantitatively which demonstrates the use of robots in daily life [5]. The initial use of robotic technology in orthopaedic surgery began in 1992 [6]. Nowadays, diverse healthcare research disciplines incorporate AI technology and researchers are looking into the potential applications of these tools. AI has been utilized in physiotherapy to enhance patient care by helping physiotherapists with a variety of tasks, such as conducting thorough assessments, forecasting patient outcomes, and

diagnosing patients. Furthermore, AI has played a part in problems related to X-ray diagnosis and in designing the treatment protocol for patients. The above-mentioned functions are the basic components of the physiotherapy profession [1]. And also, there are methods that are assisted by AI technology to enhance balance and fitness, gait and locomotion and functions of upper and lower limbs [7].

This study is essential to assess physiotherapists' knowledge and perceptions of AI in rehabilitation, ensuring its effective integration into clinical practice.

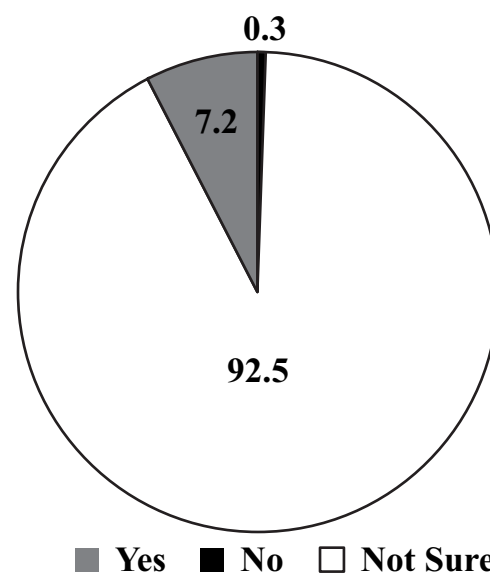
## METHODS

The cross-sectional study was carried out in public and private hospitals of Pakistan from June 2024 to November 2024. A sample size of 305 participants was selected which was calculated by using WHO calculator. Data was gathered by visiting hospitals and also through an online questionnaire (Saudi Arabian Questionnaire, Exploring Physical Therapists' Opinion Regarding Artificial Intelligence Applications in Healthcare and Rehabilitation) facilitated by google doc. Data was analyzed through SPSS 23. Non-probability convenient sampling was used to select the participants. The physiotherapists having 2 years' experience were included in the study. The study excluded physiotherapists with less than two years of experience, students, interns, those unwilling to consent, those working outside Pakistan, and those with incomplete or inconsistent responses. Descriptive statistics were used to summarize categorical variables such as knowledge AI, understanding of AI, and gender, and experience, year of graduation workplace as frequencies and percentages. After applying Shapiro Wilk Test for normality, non-parametric, Chi-square test was applied to determine the association between the physical therapists' knowledge and year of experience.

## RESULTS

Out of 305 participants, 120 (39.3%) were males and 185 (60.7%) were females. 116 participants were working in public sector and 189 were working in private sector. The frequency of physiotherapists who are familiar with AI came out to be 92.5%. (Figure 1).

### Familiarity with AI



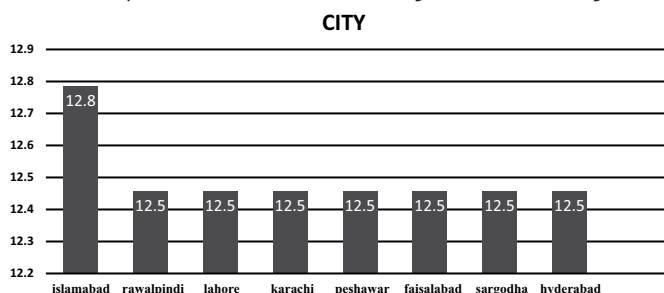
**Figure 1:** Familiarity with AI

About 56.4% physical therapist agreed about uses of AI in rehabilitation. 55.1% physical therapist believed that there are advantages of AI in rehabilitation and there will be a positive impact of AI on rehab in future according to 53.8% of physical therapist (Table 1). Chi square test was applied to check association between gender and qualification of physical therapists. Gender and Qualification significantly influenced the knowledge towards AI with p-value <0.05, mostly females and physiotherapists with masters having more familiarity with AI in accordance to the results of study.

**Table 1:** Different Point of Views of Participants Regarding AI

Variables	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Uses of AI in Rehabilitation	24.3%	55.1%	18.4%	1.3%	1%
Advantages of AI in Rehabilitation	26.6%	56.4%	15.1%	1.3%	0.7%
Positive impact of AI on Rehab in future	21.6%	53.8%	22%	3%	0.2%

Data was collected from participants belong to different cities of Pakistan. Mostly participants from the Islamabad and Rawalpindi which showed the higher interest (Figure 2).



**Figure 2:** Working City of Participants

## DISCUSSION

To the best of knowledge, the noted fact regarding knowledge towards Artificial Intelligence among physical therapists working in Pakistan is meager, as previous studies only integrated medical students and doctors from all specialties leaving behind physical therapists. The current study with sample size of 305, out of which 92.5% showed familiarity with AI, while 71.5% heard about AI technology being used in rehabilitation. In 2022, Ea Perrier *et al.*, concluded from the results of study carried out in France, where 90% pediatricians had basic understanding of AI, coherent with the current study findings [8]. Approximately 44% physical therapists didn't come across any AI application at workplace, as these results were consistent with the findings of qualitative study in UK carried out by Simone Castagno and Mohamed Khalifa in 2020 [9]. Majority of participants had prior information about AI was remarkably through Social Media (66.9%), harmonized with the findings of research conducted in USA [10]. Up to the level of agreement, 55.1% agreed that the AI's capacity to reduce physical therapists work load, easing patient care and preventing disease were aligned with the facts documented by Tasneem Burhani in systematic review of 2021 [11]. Artificial intelligence (AI) is increasingly transforming healthcare by enhancing diagnostic accuracy, optimizing treatment plans, and improving patient outcomes, as stated by Al Kuwaiti *et al.*, in 2023 [12]. Machine learning-powered assistive devices are revolutionizing physical therapy by enhancing patient mobility and rehabilitation efficiency, as highlighted by Xiao *et al.* in 2021 [13]. The findings of current study reported, approximately 76% physical therapist agreed that AI applications should be taught in rehabilitation curriculum coinciding with the similar outcomes of previous study [10]. Chi-square test was applied to see the correlation where Gender and qualification significantly influenced the knowledge towards AI with p-value <0.05. Mostly females and Physiotherapists with masters had more familiarity with AI in concordance to the previous study results reported by Sarya Swed in Syria [14]. Majority of Physical therapists (74.8%) gave importance to clinician's judgement over AI's, complementary to the research of Shihab Sarwar *et al.*, in 2019 [15]. The perspectives of healthcare students on artificial intelligence play a crucial role in shaping its integration into medical education and practice, as discussed by Teng *et al.* in 2022 [16]. Similarly, Habib *et al.*, in 2024 investigated the knowledge, attitudes, and perceptions of healthcare students and professionals regarding AI in healthcare, providing insights into their readiness and potential barriers to AI adoption [17]. Expanding on this theme, Khan *et al.*, in 2024 assessed the understanding and acceptance

of Extended Reality (XR) technology within Pakistan's healthcare community, emphasizing the role of AI in medical training and patient management [18]. Furthermore, Khan *et al.*, in 2024 explored AI-enabled telehealth rehabilitation for brachial plexus injuries, demonstrating how deep-reinforcement-learning-assisted telepresence robots can enhance in-home elbow rehabilitation [19]. In a broader context, Kitsios and Kamariotou in 2021 discussed AI's impact on business strategy and digital transformation, presenting a research agenda on how AI-driven innovations optimize efficiency and decision-making across industries, including healthcare [20]. Collectively, these studies underscore the transformative potential of AI and emerging technologies in reshaping healthcare, rehabilitation, and strategic business applications.

## CONCLUSIONS

To sum up, this study looked at Pakistani physical therapists' attitudes and understanding of AI in rehabilitation. The results showed a sizable information vacuum about the real-world uses of AI in physical therapy. Despite being aware of the potential advantages of AI, many therapists are hesitant to use these technologies in therapeutic settings. The lack of AI resources in Pakistan and worries about AI displacing human knowledge are also major obstacles to its use in the rehabilitation sector.

## Authors Contribution

Conceptualization: IH

Methodology: NA, RA

Formal analysis: MTA, MRA

Writing, review and editing: FM

All authors have read and agreed to the published version of the manuscript.

## Conflicts of Interest

All the authors declare no conflict of interest.

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## REFERENCES

- [1] Alsobhi M, Khan F, Chevidikunnan MF, Basuodan R, Shawli L, Neamatallah Z. Physical therapists' knowledge and attitudes regarding artificial intelligence applications in health care and rehabilitation: cross-sectional study. *Journal of Medical Internet Research*. 2022 Oct;24(10):e39565. doi: 10.2196/39565.
- [2] Hamet P and Tremblay J. Artificial intelligence in medicine. *Metabolism*. 2017 Apr;69:S36-40. doi:10.1016/j.metabol.2017.01.011.

- [3] Ahmed Z, Bhinder KK, Tariq A, Tahir MJ, Mehmood Q, Tabassum MS et al. Knowledge, attitude, and practice of artificial intelligence among doctors and medical students in Pakistan: A cross-sectional online survey. *Annals of Medicine and Surgery*. 2022 Apr; 76: 103493. doi: 10.1016/j.amsu.2022.103493.
- [4] Alsobhi M, Sachdev HS, Chevidikunnnan MF, Basuodan R, KU DK, Khan F. Facilitators and barriers of artificial intelligence applications in rehabilitation: a mixed-method approach. *International Journal of Environmental Research and Public Health*. 2022 Nov; 19(23): 15919. doi: 10.3390/ijerph192315919.
- [5] Babaiasl M, Mahdioun SH, Jaryani P, Yazdani M. A review of technological and clinical aspects of robot-aided rehabilitation of upper-extremity after stroke. *Disability and Rehabilitation: Assistive Technology*. 2016 May; 11(4): 263-80. doi: 10.3109/17483107.2014.1002539.
- [6] Beyaz S. A brief history of artificial intelligence and robotic surgery in orthopedics & traumatology and future expectations. *Joint Diseases and Related Surgery*. 2020 Sep; 31(3): 653. doi: 10.5606/ehc.2020.75300.
- [7] Feys P and Straudi S. Beyond therapists: Technology-aided physical MS rehabilitation delivery. *Multiple Sclerosis Journal*. 2019 Sep; 25(10): 1387-93. doi: 10.1177/1352458519848968.
- [8] Perrier E, Rifai M, Terzic A, Dubois C, Cohen JF. Knowledge, attitudes, and practices towards artificial intelligence among young pediatricians: A nationwide survey in France. *Frontiers in Pediatrics*. 2022 Dec; 10: 1065957. doi: 10.3389/fped.2022.1065957.
- [9] Castagno S and Khalifa M. Perceptions of artificial intelligence among healthcare staff: a qualitative survey study. *Frontiers in Artificial Intelligence*. 2020 Oct; 3: 578983. doi: 10.3389/frai.2020.578983.
- [10] Wood EA, Ange BL, Miller DD. Are we ready to integrate artificial intelligence literacy into medical school curriculum: students and faculty survey? *Journal of Medical Education and Curricular Development*. 2021 Jun; 8: 23821205211024078. doi: 10.1177/23821205211024078.
- [11] Burhani T and Naqvi WM. Impact of artificial intelligence in the physiotherapy rehabilitation of distal radial fracture patients: a review. *Journal of Pharmaceutical Research International*. 2021 Dec; 33(60B): 1982-8. doi: 10.9734/jpri/2021/v33i60B34889.
- [12] Al Kuwaiti A, Nazer K, Al-Reedy A, Al-Shehri S, Al-Muhanna A, Subbarayalu AV et al. A review of the role of artificial intelligence in healthcare. *Journal of personalized medicine*. 2023 Jun 5; 13(6): 951. doi: 10.3390/jpm13060951.
- [13] Xiao X, Fang Y, Xiao X, Xu J, Chen J. Machine-learning-aided self-powered assistive physical therapy devices. *ACS nano*. 2021 Dec; 15(12): 18633-46. doi: 10.1021/acsnano.1c10676.
- [14] Swed S, Alibrahim H, Elkalagi NK, Nasif MN, Rais MA, Nashwan AJ et al. Knowledge, attitude, and practice of artificial intelligence among doctors and medical students in Syria: a cross-sectional online survey. *Frontiers in Artificial Intelligence*. 2022 Sep; 5: 1011524. doi: 10.3389/frai.2022.1011524.
- [15] Sarwar S, Dent A, Faust K, Richer M, Djuric U, Van Ommeren R et al. Physician perspectives on integration of artificial intelligence into diagnostic pathology. *Non-profit Journalism Digital Medicine*. 2019 Apr; 2(1): 28. doi: 10.1038/s41746-019-0106-0.
- [16] Teng M, Singla R, Yau O, Lamoureux D, Gupta A, Hu Z et al. Health care students' perspectives on artificial intelligence: countrywide survey in Canada. *JMIR medical education*. 2022 Jan; 8(1): e33390. doi: 10.2196/33390.
- [17] Habib MM, Hoodbhoy Z, Siddiqui MR. Knowledge, attitudes, and perceptions of healthcare students and professionals on the use of artificial intelligence in healthcare. *medRxiv*. 2024 Jan: 2024-01. doi: 10.1101/2024.01.08.24300977.
- [18] Khan Z, Adil T, Oduoye MO, Khan BS, Ayyazuddin M. Assessing the knowledge, attitude and perception of Extended Reality (XR) technology in Pakistan's Healthcare community in an era of Artificial Intelligence. *Frontiers in Medicine*. 2024 Oct; 11: 1456017. doi: 10.3389/fmed.2024.1456017.
- [19] Khan MN, Altalbe A, Naseer F, Awais Q. Telehealth-enabled in-home elbow rehabilitation for brachial plexus injuries using deep-reinforcement-learning-assisted telepresence robots. *Sensors*. 2024 Feb; 24(4): 1273. doi: 10.3390/s24041273.
- [20] Kitsios F, Kamariotou M. Artificial intelligence and business strategy towards digital transformation: A research agenda. *Sustainability*. 2021 Feb; 13(4): 2025. doi: 10.3390/su13042025.