



EXPLORING PHYSIOTHERAPIST PERSPECTIVE ON ARTIFICIAL INTELLIGENCE (AI): AWARENESS, FEASIBILITY, READINESS AND EFFECTIVENESS IN PRACTICE AND UNDERSTANDING VIEW ON AI IN PRACTICE WITHIN PUNE, MAHARASHTRA.

¹Tanaya Satam, ²kiran Jeswani

¹ Intern, Bachelor of Physiotherapy, PES Modern College of Physiotherapy, Pune, Maharashtra, India

² Professor, PES Modern College of Physiotherapy, Pune, Maharashtra, India

ABSTRACT:

PURPOSE: To find out Physiotherapist perspective on Artificial intelligence: awareness, feasibility, readiness, and effectiveness in practice and understanding physiotherapist view on AI in practice.

MATERIAL AND METHOD: 273 Physiotherapist participated in an online and cross-sectional study. A customized questionnaire was developed and validated by an expert panel of 10 Physiotherapist (S-CVI/Ave = 0.938). Data was collected using Google form and analyzed using descriptive statistics.

RESULT: The study included 273 practicing Physiotherapist, predominantly early- to mid-career clinicians with under ten years of experience, working across hospital and private clinic settings. A majority reported awareness of AI in physiotherapy, with a large proportion has observed its direct application in clinical practice. Most participants agreed that AI could improve care standards and patient outcomes, identifying personalized treatment plans and predictive analytics as the primary benefits. Roughly seven out of ten clinicians reported felt prepared for AI integration and had utilized AI software, though data privacy issues and a lack of technical understanding were identified as the primary implementation barriers. Key concerns centered on the potential loss of human touch and data privacy risks, though well over half of respondents maintained that AI would serve to support clinical practice or have minimal impact rather than replace human therapists.

CONCLUSION: Physiotherapist have high level of awareness, positive attitude and willingness towards including AI technologies into clinical practice. However successful integration requires formal education, training programs, structured clinical guidelines, strong data privacy frameworks, and approach that preserves the important human-centric relationship in physiotherapy care.

KEYWORDS: Artificial intelligence, Physiotherapy, Physiotherapist.

INTRODUCTION

Physiotherapy is an essential part of clinical practice and is commonly the most effective treatment for a variety of illness. Physiotherapists are an essential part of the medical team ⁽¹⁾ Physiotherapy is used in conditions like Osteoarthritis and other pain related disorders, as well as following operation or accidents, particularly those involving bone and joints ⁽¹⁾ Decreasing pain and maintaining or regaining optimal physical function are the main objectives of physical therapy. Although physiotherapy is an important part, it's necessary to take into account various medical therapies as well as modern technologies like Artificial Intelligence (AI) ⁽²⁾ Before we understand what is meant by Artificial Intelligence it is necessary to know what is intelligence. Intelligence is a general mental ability that involves reasoning, planning, problem solving, abstract thinking, comprehending complex ideas, and learning from experience. It also reflects a broad and deep capacity for understanding our environment ⁽²⁾ Artificial intelligence (AI) describes how computers that are capable of "thinking" are able to carry out tasks that typically need human intelligence ⁽³⁾ According to its scientific definition, it is the advancement of technology that is applied to carry out scientific procedures that suggest the use of human intelligence ⁽⁴⁾ Artificial intelligence (AI) technologies including deep learning, machine learning, and neural networks and are becoming increasingly important in various health-related services ⁽⁵⁾

Healthcare practitioners use these technologies for clinical diagnosis, patient management, and decision-making ⁽⁵⁾ The main uses of AI in physiotherapy and rehabilitation include prediction algorithms, dexterous robotics, virtual assistants, risk analysis, and video analysis ⁽⁵⁾ The procedures of function classification, disability prediction, and data analysis and implementation may all benefit from and be improved by these techniques ⁽⁵⁾ There are various AI-based therapeutic technology applications that physiotherapists use like, Video game-based AI technologies, Virtual reality-based AI technologies, Mobile Application-based AI technologies, Tele-rehabilitation approaches, Orthotics Prosthesis AI Technologies, Robotic-Assisted AI Technologies ⁽⁵⁾ Few studies have showed that Implementing AI in physiotherapy has proven beneficial; it facilitates the PT job and tasks and improves performance, increases patient outcome and decreases workload ⁽⁴⁾ On the other hand, few studies investigating the knowledge and attitudes of PTs towards AI applications reported that their understanding of AI applications in rehabilitation was lower than their general knowledge about AI ⁽⁵⁾ There are many other concerns related to the use of AI like health data and liability, available enforcement tools, security, and ethics due to insufficient knowledge, socio-technical ignorance ⁽⁵⁾ Also, a number of researchers think that the field of physiotherapy will be threatened by artificial intelligence and deep learning applications ⁽⁴⁾ Therefore, the aim of this study was to evaluate the Physiotherapist perspective on artificial intelligence (AI): awareness, feasibility, readiness and effectiveness in practice and understanding view on AI.

MATERIAL AND METHODS

The cross-sectional study was done using a questionnaire created using Google Forms which was administered to 273 Physiotherapist in Pune over a period of 6 months.

SUBJECTS

The participants were invited via link of Google form on social media platforms like Whatsapp, Instagram and Facebook and were informed about the aim of the survey in the introduction of the questionnaire. The purpose of the study was explained and consent to the participants was given to the physiotherapist. The

participants included were working in hospital, private clinic, rehabilitation center, Practitioner and academic faculties. The prior sample size that was calculated was 385 based on the cross-sectional studies formula sample size with the margin of error set at 5% and confidence level as 95% so the link of questionnaire was sent to 385 subjects.

DATA AND STATISTICAL ANALYSIS

The data was collected through Google forms. Survey was analyzed using the data collected through the Google Forms, which provided descriptive statistics in the form of frequencies and percentage.

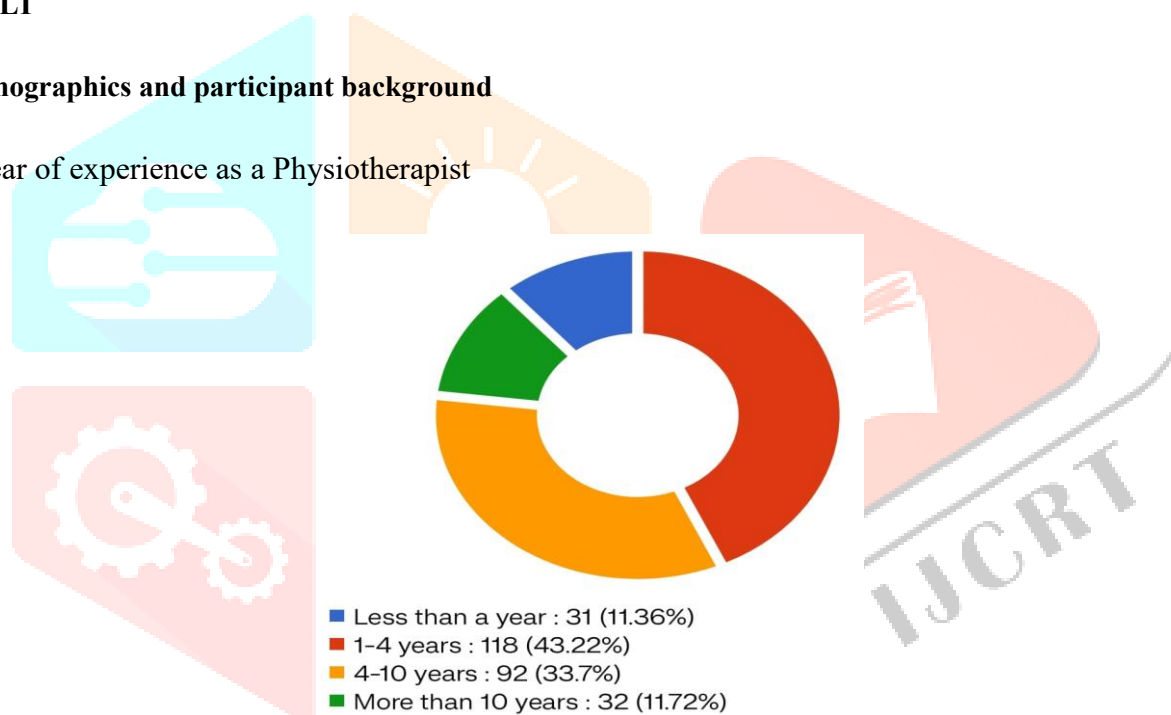
Graphical representations such as pie charts and bar graphs were automatically generated to illustrate the distribution of responses.

The analysis focused on identifying physiotherapists' perspectives on ARTIFICIAL INTELLIGENCE (AI): Awareness, Feasibility, Readiness and Effectiveness in practice and understanding Physiotherapist view on AI in practice.

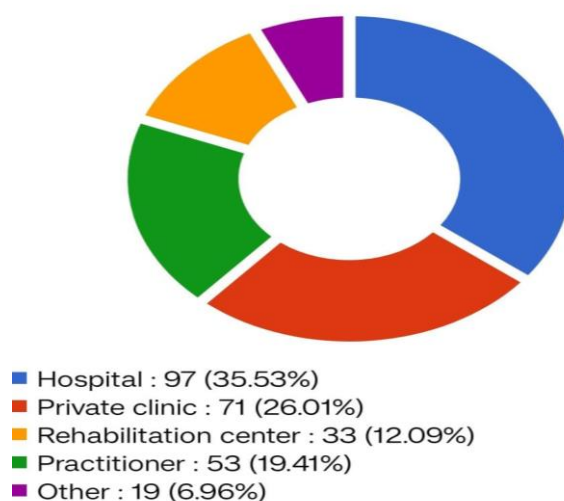
RESULT

1. Demographics and participant background

1.1 Year of experience as a Physiotherapist



1.2 Type of healthcare facility physiotherapist work in

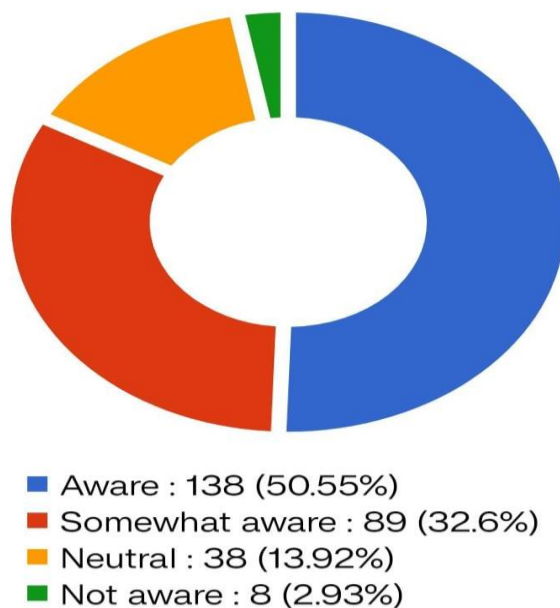


A total of 273 responses were received from the physiotherapist. Of the total participants (n=31, 11.36%) have professional experience for less than a year, (n=118, 43.22%) have experience between 1-4 years, (n=92, 33.7%) have 4-10 years and only (n=32, 11.72%) have more than 10 years of experience.

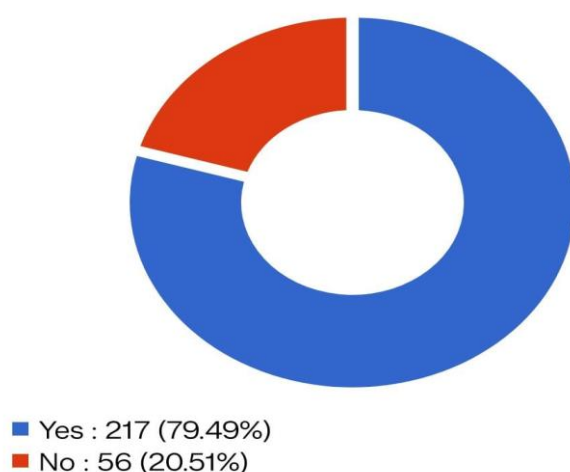
A major population participated in the study work in hospital settings (n=97, 35.53%), followed by participants from private clinics (n=71, 26.01%) and practitioner (n=53, 19.41%). There are (n=33, 12.09%) respondents working in rehabilitation centre and the least number of respondents were others that can be private patients, academic institutes (n=19, 6.96%).

2. Awareness of AI in physiotherapy:

2.1 How much awareness do you feel you have about artificial intelligence (AI) in the field of physiotherapy?



2.2. Have you seen AI applications in your practice or professional development?



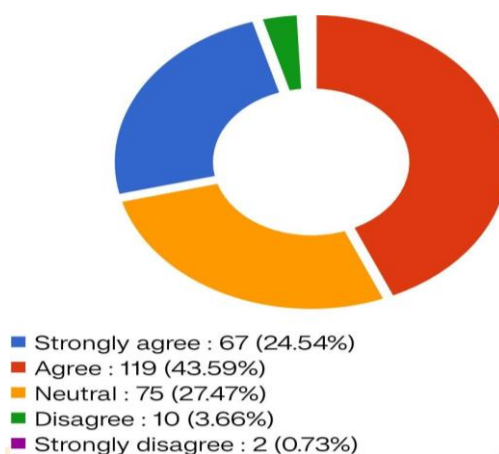
The respondents were assessed based on their awareness about Artificial intelligence (AI) in the field of physiotherapy through a 4 point score i.e 1= Aware, 2= Somewhat aware, 3= Neutral, 4= Not aware.

A significant number of participants (n=138, 50.55%) were aware and n=89(32.6%) was somewhat aware of AI in physiotherapy. Out of 273 n=38(13.92%) had neutral opinion and only few (n=8, 2.93%) were not at all aware about AI in the field of physiotherapy.

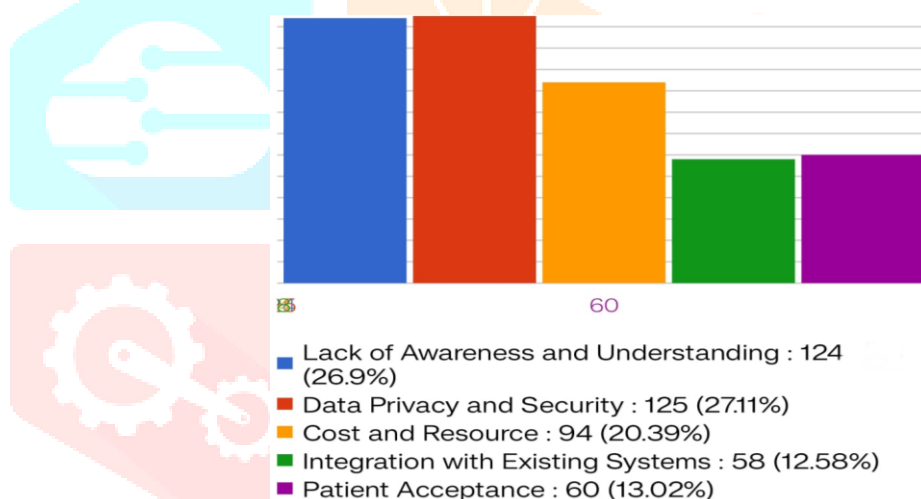
A large population of the participants (n=217, 79.49%) have seen the use of AI in practice. Rest of the participants (n=56, 20.5%) are unaware of the use of AI in their professional development.

3) Feasibility of implementing AI in physiotherapy:

3.1. Do you believe AI can improve the standard of physiotherapy treatment?



3.2. What do you think as the main barriers in implementing AI in physiotherapy practice?

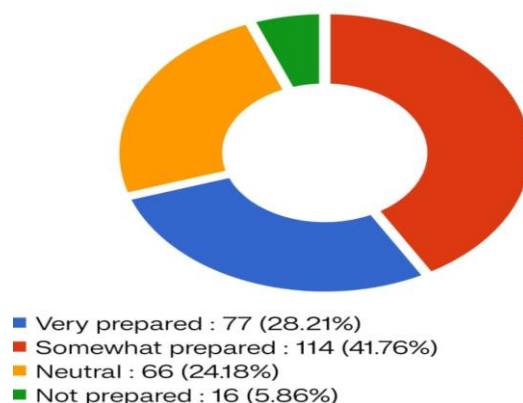


A significant number of participants ($n=186$, 68.13% i.e. $n=67+119$) strongly agreed with the statement that AI improve the standard of physiotherapy treatment. A minority of physiotherapist ($n=87$, 31.86%) either do not agree or remain unconvinced that Artificial intelligence enhance the quality of physiotherapist care.

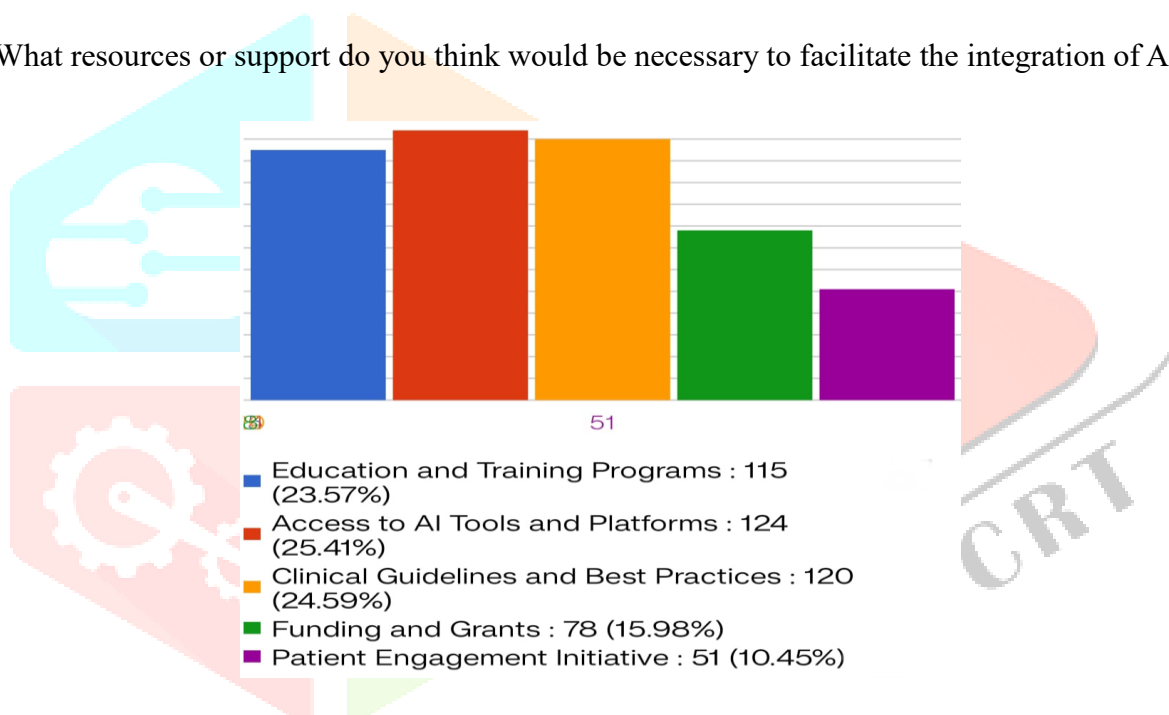
Data Privacy and Security ($n=125$, 27.11%) and Lack of Awareness and Understanding ($n=124$, 26.9%) were the two most dominant barriers in implementing AI in physiotherapy practice as per the participants. Other concerns were related to cost and resource ($n=94$, 20.39%), integration with existing systems ($n=58$, 12.58%) and Patient acceptance ($n=60$, 13.02%).

4)Readiness for ai implementation in physiotherapy:

4.1. How prepared do you feel you and your workplace is for implementing AI into physiotherapy practice.



4.2. What resources or support do you think would be necessary to facilitate the integration of AI?



A combined (n=191, 69.97%) feel they and their workplace are very “prepared” or “somewhat prepared” for implementing AI into physiotherapy practice. Nearly one-third (n=82, 30.04%) are “neutral” or “not prepared”

The bar chart indicates that, in order to successfully integrate Artificial Intelligence (AI) into practice the three most desired resources are Access to AI Tools and Platforms (n=124, 25.41%), Clinical Guidelines and Best Practices (n=120, 24.59%), and Education and Training Programs (n=115, 23.57%). The remaining support is divided between Funding and Grants (n=78, 15.98%) and Patient Engagement Initiative (n=51, 10.45%).

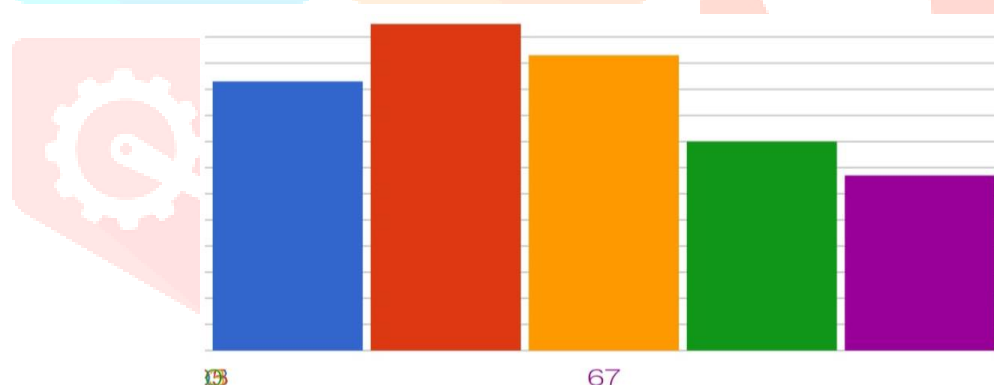
5) Perceived effectiveness of AI in physiotherapy:

5.1. How effective do you think AI-based tools and technologies are in enhancing patient outcomes in physiotherapy



■ Very effective : 67 (24.54%)
 ■ Effective : 118 (43.22%)
 ■ Neutral : 81 (29.67%)
 ■ Ineffective : 4 (1.47%)
 ■ Very ineffective : 3 (1.1%)

5.2. Are there specific areas within physiotherapy where you believe AI could be particularly beneficial?

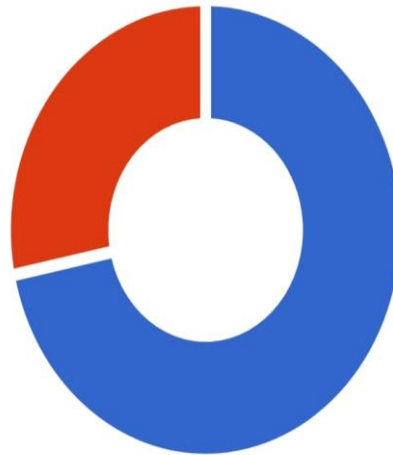


■ Assessment and Diagnosis : 103 (21.11%)
 ■ Personalized Treatment Plans : 125 (25.61%)
 ■ Predictive Analytics : 113 (23.16%)
 ■ Telehealth and Remote Monitoring : 80 (16.39%)
 ■ Data Management : 67 (13.73%)

A significant majority of respondents rated that AI based tools and technologies are effective in enhancing patient outcomes in physiotherapy. 67.76% of participants found AI to be effective or very effective, combining those who answered “Very Effective” (n=67, 24.54%) and “Effective” (n=118, 43.22%). The next largest group of participants, were “Neutral” (n=81, 29.67%). A negligible portion of the respondents perceived AI to be either “Ineffective” (n=4, 1.47%) or “Very Ineffective” (n=3, 1.1%). The bar chart illustrates the specific areas within physiotherapy where respondents believe Artificial Intelligence (AI) could be particularly beneficial. The top area identified is “Personalized Treatment Plans” (n=125, 25.61%). Following this is “Predictive Analytics” (n=113, 23.16%), and “Assessment and Diagnosis” (n=103, 21.11%). Less emphasis was placed on “Telehealth and Remote Monitoring” (n=80 votes, 16.39%) and “Data Management” (n=67, 13.73%).

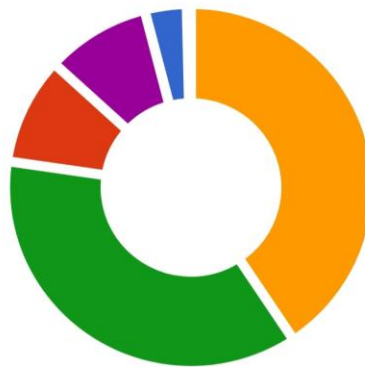
6) PERSONAL EXPERIENCE AND ATTITUDES

6.1. Have you personally used any ai-driven tools or software in your physiotherapy practice?



■ Yes : 196 (71.79%)
■ No : 77 (28.21%)

6.2. IF YES PLEASE DESCRIBE YOUR EXPERIENCE WITH AI TOOLS /SOFTWARE



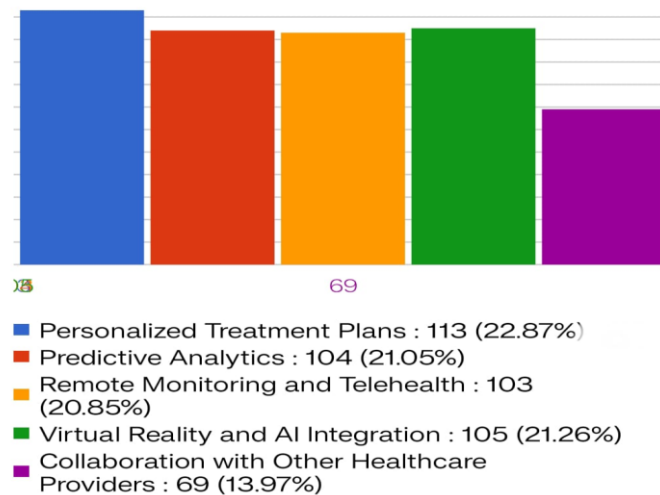
■ Very Dissatisfied : 10 (3.66%)
■ Dissatisfied : 26 (9.52%)
■ Neutral : 111 (40.66%)
■ Satisfied : 100 (36.63%)
■ Very Satisfied : 25 (9.16%)

The data clearly indicates that a large majority of physiotherapists surveyed have used AI tools in their practice. 71.79%(n=196) responded “Yes”, while only 28.21% responded “No”, confirming they haven’t personally used AI-driven software.

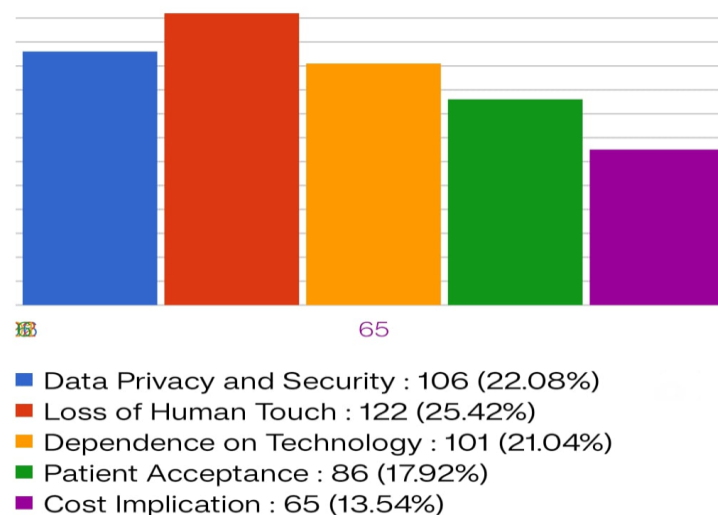
The overall experience appears to be positive, with 45.79% of users reporting they are either Satisfied (n=100, 36.63%) or Very Satisfied (n=25, 9.16%) with the tools/software. However, a large portion of users were Neutral (n=111, 40.66%).

7) Future outlook

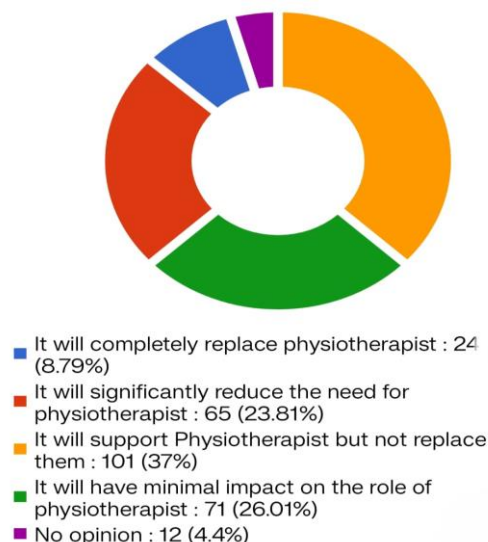
7.1. In what aspect of physiotherapy do you see AI evolving in the next 5-10 years?



7.2. What concerns do you have about the increasing integration of AI in physiotherapy practice?



7.3 Do you believe the use of ai in healthcare will reduce the need for physiotherapist in the future?



Personalized Treatment Plans is again the top aspect that is seen to be evolving in next 5-10 years with response from n=113, 22.87% participants. This is immediately followed by Virtual Reality and AI Integration (n=105, 21.26%), Predictive Analytics (n=104, 21.05%), and Remote Monitoring and Telehealth (n=20, 20.85%). These four areas combined represent over 86.03% of the expected evolution. Collaboration with Other Healthcare Providers is seen as the least prominent area for AI evolution, at 13.97%.

The primary concerns about the increase integration of AI in physiotherapy practice are ethical and practical, led by Loss of Human Touch (n=122, 25.42%), Data Privacy and Security (n=106, 22.08%), and Dependence on Technology (n=101, 21.04%). These three concerns represent nearly 69% of the total responses. Secondary concerns include Patient Acceptance (n=86, 17.92%) and Cost Implication (n=65, 13.54%).

This pie chart shows practitioners' belief regarding AI's future impact on their profession. The dominant view is that AI will support physiotherapists but not replace them, held by 37%(n=101) of respondents. Furthermore, a significant portion, 26.01%(n=71), believes AI will have only a minimal impact on their role. Only a minority expressed concern about replacement, with 23.81%(n=65) believing AI will significantly reduce the need and 8.79% (n=24) fearing it will completely replace the physiotherapist role.

DISCUSSION

The findings of this study establish a clear picture of the physiotherapy profession's engagement with Artificial Intelligence (AI). The results confirm a high level of awareness and positive anticipation, yet on the other hand reveal significant practical and ethical barriers that must be addressed for successful integration. Most participants surveyed knew about Artificial Intelligence (AI) in physiotherapy. A large majority, over 8 out of 10 people (83.15%), are either aware or somewhat aware of AI. Because of this high awareness, people generally feel positive about AI. More than two-thirds (68.13%) of those surveyed agree that AI has the potential to improve the standard of physiotherapy treatment. The data shows that the use of AI is not just theoretical but it's already practical. The high usage rate (71.79%) and the strong belief in its effectiveness (67.76% find it effective) show that AI is becoming a real part of daily practice. This supports the most recent research on the growing use and importance of AI in physiotherapy today.

This result aligns with the previous literature put forward by Davenport and Kalakota (2019), who stated that AI has the power to make medical field work more efficient and help doctors and therapists make more accurate clinical decision in diagnosis and personalized treatment plans. This also matches with the work of Ramanandi (2021), who discuss the growing importance of AI in physiotherapy and Estel et al. (2022), who talk about the overall move towards digital tools in the field of physiotherapy. ⁽¹²⁾⁽⁷⁾⁽⁸⁾

Even though most physiotherapist participated in the study are positive about AI, there are two major problems that stand out: Data Privacy and Security (27.11%) and a Lack of Awareness and Understanding (26.9%) of the technology. Same concern is highlighted by experts like Aziz et al. (2023). The concern about data security is a big ethical and legal issue. Since AI relies on using huge amounts of patient information for things like predicting outcomes, it naturally brings up questions about who is responsible if data is misused or leaked. Therefore, dealing with this requires creating strong and clear rules for how health organizations handle this data. ⁽⁹⁾

The second most important barrier in implementing AI in physiotherapy practice that is felt by the respondents is awareness and understanding of AI, which shows that physiotherapists need more than just a basic understanding of AI; they need deep knowledge (AI literacy). This supports the previous finding from researcher like Söderlund (2019) to actively prepare the profession for a digital future. The strong demand for more Education and Training Programs and clear Clinical Guidelines is a direct request from practitioners who want to move from simply knowing about AI to being able to use it correctly and ethically. ⁽⁶⁾

The most defining aspect of this study is the profession's commitment to the human element of care. The deepest anxiety that identified is the Loss of Human Touch (25.42%). This emphasizes how important things like empathy, manual assessment, and the therapeutic as well as personal relationship with the patient are, and this qualities AI cannot replicate. This concern is balanced by the fact that majority respondents (37%) believe that AI will support physiotherapists but not replace them. This perspective strongly reinforces the concept of a "Shifting Paradigm from Human Intelligence to Artificial Intelligence in Rehabilitation" (Pattanshetty & Khan, 2022), where human clinical reasoning remains the most important factor. The results imply that AI must be strategically implemented to free up the therapist's time from administrative or repetitive measurement tasks (like data management), allowing them to reinvest that time into the patient-centric interactions and complex decision-making that define the profession. The future success of AI in physiotherapy therefore depends on ensuring technology improves the patient's experience of caring, personalized treatment rather than making it feel less human.

(11)

CONCLUSION:

The present study concludes that physiotherapist accept Artificial intelligence (AI) and believe it will improve the quality of treatment. Their current needs are practical knowledge (access to tools) and ethical base (data privacy). Their main condition is that AI must support their work and not sacrifice the essential human touch.

LIMITATION

Limited access to AI-based technologies and institutional exposure may have influenced participants' perceptions of feasibility and effectiveness.

FUTURE SCOPE OF THE STUDY

1. To conduct a comparative study of AI assisted treatment protocol versus standard in-person physiotherapy treatment for a common condition (low back pain).
2. Conduct economic evaluations comparing the total costs and health outcomes (recovery rates) of an AI-assisted treatment protocol versus traditional in-clinic care for a specific patient population (e.g., chronic osteoarthritis)
3. Use focus group to explore physiotherapist and patients' specific concerns regarding data governance, security, and algorithmic bias.

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