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Original research article

A COMPARATIVE STUDY REGARDING THE PERCEPTION OF PHYSICAL THERAPISTS AND PHYSICAL THERAPY STUDENTS ABOUT THE USABILITY OF ARTIFICIAL INTELLIGENCE CHATBOT, I.E, OPENAI-CHATGPT, FOR THE RETRIEVAL OF INFORMATION IN ACADEMIC AND CLINICAL SETTINGS

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Abstract: *In the modern era dominated by technological advancements, artificial intelligence (AI) has transcended the realm of science fiction to become a pivotal aspect of various fields, including health sciences. AI innovations like ChatGPT, an AI-based chatbot, have sparked discussions regarding their practical applications in healthcare and academia.* ***Objectives:*** *The primary objective of this study was to assess and compare the perceptions of physical therapists and physical therapy students regarding the usability of ChatGPT for information retrieval in academic and clinical settings.* ***Method:*** *A cross-sectional study design was employed. The sample size, calculated to be 176 using G*Power analysis, was equally divided into two groups: 88 physical therapists and 88 physical therapy students. Data collection was conducted via Google Forms and manual questionnaires.* ***Result:*** *Out of the respondents, 39 (47.6%) physical therapy students and 43 (52.4%) physical therapists reported that they perceived ChatGPT and related AI technologies as effective tools for enhancing job performance and academic studies. Additionally, 49 physical therapy students and 52 physical therapists found AI chatbots easy to use. However, statistical analysis revealed no significant difference ($p > 0.05$) in the perceptions of usability between the two groups.* ***Conclusion:*** *The study concluded that physical therapists and physical therapy students share similar perceptions regarding the usability of AI chatbots like ChatGPT for information retrieval in clinical and academic settings. A significant majority of both groups acknowledged the potential benefits of these technologies, highlighting their applicability in professional and educational environments.*

Keywords: Artificial Intelligence, Physiotherapists/Physical therapists, Physiotherapy students/Physical therapy students. ChatGPT, Chatbot.

Introduction

Artificial intelligence (AI), an interdisciplinary domain integrating computer science and linguistics, aims to create machines capable of executing tasks that typically require human intellect (1). The journey of AI began in 1950 when Alan Turing introduced the idea of simulating intelligent behavior through computers, igniting a surge of interest in this field (2). In 1955, John McCarthy defined AI as "the science and engineering of making intelligent machines," providing a foundational framework for AI's development (2). Since these formative years, AI has seen rapid evolution, propelled by advancements in computational capabilities and machine learning algorithms (3).

A landmark in AI history was Joseph Weizenbaum's 1964 introduction of Eliza, a primitive chatbot that utilized substitution methods to mimic conversation. Despite Eliza's limited ability to engage in meaningful dialogue, it demonstrated AI's potential in natural language processing and set a precedent for future chatbots (2). As we progress through the fourth industrial revolution, AI has expanded its influence to include robotics, autonomous vehicles, facial recognition, and virtual agents, marking a new era of technological integration (4).

AI-powered chatbots have become pivotal as virtual assistants in healthcare, offering health-related information and services and simulating human interaction. These virtual agents provide essential support, especially in technology-enhanced treatments, thus addressing the growing demands of healthcare environments (5). Among these innovations, ChatGPT has emerged as a significant advancement with its ability to deliver quick, informative responses, facilitating understanding of complex topics (6). Despite its capabilities, concerns about inherent biases and the potential for generating factually inaccurate or misleading information—a phenomenon known as hallucination—persist due to the limitations of the datasets used for training these systems (7).

The reliance on AI in clinical settings remains a contentious issue, evidenced by studies highlighting its utility and risks. While some reports suggest that AI could revolutionize healthcare by alleviating professional burnout, others caution against its deployment in clinical settings where the margin for error is minimal (8-10). Moreover, research indicates that although AI tools like ChatGPT are user-friendly and have passed specific performance tests, their reliability in clinical scenarios has yet to be fully established (10, 11). Thus, further investigation is necessary to evaluate these technologies comprehensively.

Recognizing these dynamics, this study aims to assess and compare the perceptions of physical therapists and physical therapy students concerning the usability of AI-powered chatbots, specifically ChatGPT, for information retrieval in both clinical and academic settings. This evaluation will provide valuable insights that could inform future research

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and guide the development of protocols governing the use of AI in healthcare.

Methodology

A cross-sectional study design was employed to collect data from physical therapy students and physical therapists with clinical and academic experiences. Participants were recruited from the School of Health Sciences at the University of Management and Technology Lahore, the University of Lahore, and the University of South Asia. The study duration spanned two months, utilizing convenience sampling to select participants. To ensure statistical reliability, the sample size was determined using G*power analysis, aiming for a 95% confidence interval with a 5% margin of error, resulting in a total sample size of 176. This accounted for an attrition rate of 5%. The study population included male and female participants: physical therapy students aged 18-25 and physical therapists aged 26-35. Exclusion criteria targeted physical therapists with no awareness of artificial intelligence, those residing in remote areas, and individuals unfamiliar with emerging medical technologies. Students from other medical fields, such as physicians, surgeons, radiographers, and dieticians, were also excluded.

The data collection instrument combined three questionnaires: the Technology Acceptance Model (TAM), a previously utilized questionnaire from existing literature (12), and a web-based questionnaire developed for this study. AI experts were consulted to integrate these tools effectively. A pilot study was conducted to verify the validity of the questionnaire, which comprised 18 questions. Data was gathered through both Google Forms and paper-based surveys. Informed consent was obtained from all participants before their inclusion in the study, ensuring ethical compliance and participant awareness of the study's scope and purpose.

Results

The study investigated the perceptions of physical therapy students and physical therapists regarding the usability of AI-powered ChatGPT for tasks in academic and clinical settings. The participants' demographics showed an equal distribution, with each group comprising 88 individuals, representing 50% of the total sample size of 176 respondents.

In assessing perceived usefulness, responses varied from 'Strongly Disagree' to 'Strongly Agree.' For the statement, "Using ChatGPT in my job/study would enable me to accomplish tasks more quickly," 42.2% of students agreed, compared to 57.8% of physical therapists who also agreed. In contrast, 67.7% of students 'Strongly Agreed' that ChatGPT enhances task speed, against 32.3% of therapists. Across all perceived usefulness questions, the p-values ranged from 0.183 to 0.564, indicating no significant difference between the two groups in their perception of AI's efficacy in improving job or study performance.

The participants also showed varying levels of agreement regarding the ease of use. For the statement, "Learning to operate ChatGPT would be easy for me," a balanced view was noted, with 49% of students and 51% of therapists agreeing. The p-values for ease of use responses varied slightly, with values from 0.573 to 0.979, suggesting no statistically significant difference in the ease of using ChatGPT between students and therapists.

The responses to whether ChatGPT would make job or study tasks easier also highlighted a mixed reaction. A notable response was, "Using ChatGPT would make it easier to do my job/study," where 48.5% of students and 51.5% of therapists agreed. Similarly, 70% of students 'Strongly Agreed' that ChatGPT is useful, compared to 30% of therapists, reflecting a more favorable inclination among students toward the utility of ChatGPT.

Overall, the results reflect a consensus on the utility and user-friendliness of ChatGPT, albeit with no significant statistical difference between physical therapy students and practicing therapists. The data suggests that both groups perceive AI chatbots as potentially beneficial tools for enhancing the efficiency and effectiveness of their professional and academic endeavors.

Table 1: Demographics

		Frequency	Percent
Valid	Physiotherapy Student	88	50.0
	Physiotherapist	88	50.0
	Total	176	100.0

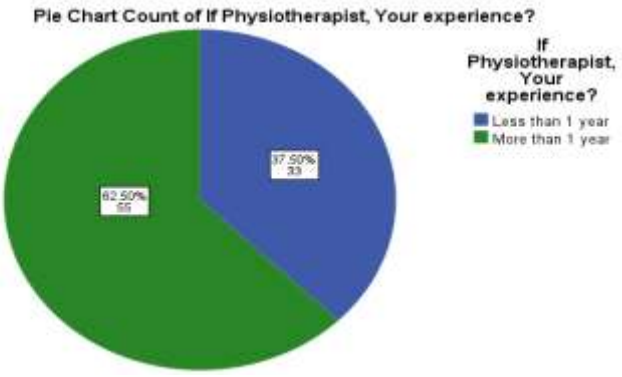

Figure 1: Years of experience

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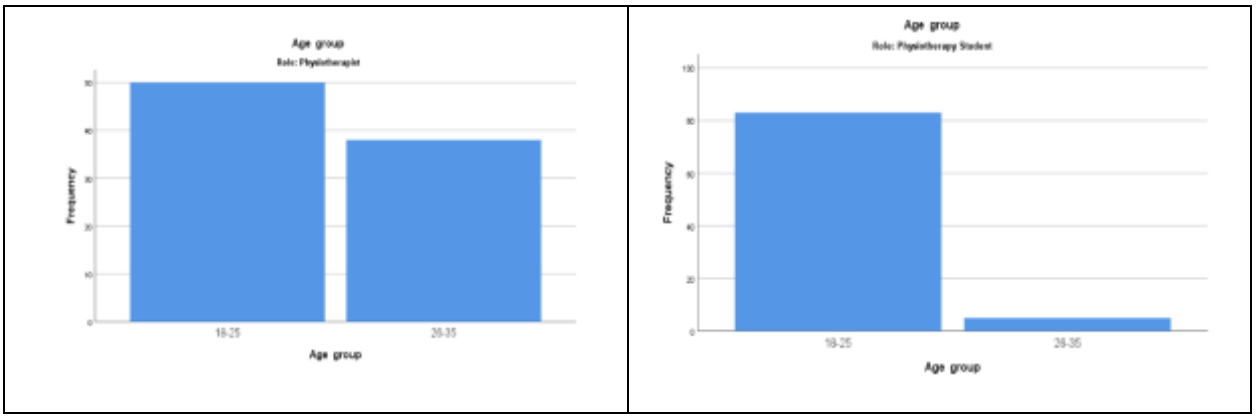

Figure 2: Distribution of age groups among the study population

Table 2: Frequency of Questions Related to perceived usefulness of AI

			Role Physiotherapy Student	Physiotherapist	P-Value
P1: Using Chat GPT in my job/study would enable me to accomplish tasks more quickly.	Strongly Disagree	Count	3	2	0.183
		Row N %	60.0%	40.0%	
	Disagree	Count	6	5	
		Row N %	54.5%	45.5%	
	Neutral	Count	23	23	
		Row N %	50.0%	50.0%	
	Agree	Count	35	48	
		Row N %	42.2%	57.8%	
	Strongly Agree	Count	21	10	
		Row N %	67.7%	32.3%	
PU 2. Using chat GPT would improve my job/study performance.	Strongly Disagree	Count	5	5	0.354
		Row N %	50.0%	50.0%	
	Disagree	Count	5	12	
		Row N %	29.4%	70.6%	
	Neutral	Count	24	23	
		Row N %	51.1%	48.9%	
	Agree	Count	39	39	
		Row N %	50.0%	50.0%	
	Strongly Agree	Count	15	9	
		Row N %	62.5%	37.5%	
PU3. Using chat-GPT in my job/study would increase my productivity.	Strongly Disagree	Count	1	3	0.512
		Row N %	25.0%	75.0%	
	Disagree	Count	15	14	
		Row N %	51.7%	48.3%	
	Neutral	Count	28	23	
		Row N %	54.9%	45.1%	
	Agree	Count	33	41	
		Row N %	44.6%	55.4%	
	Strongly Agree	Count	11	7	
		Row N %	61.1%	38.9%	
PU 4. Using chat-GPT would enhance my effectiveness in my job/study.	Strongly Disagree	Count	1	2	0.564
		Row N %	33.3%	66.7%	
	Disagree	Count	11	13	
		Row N %	45.8%	54.2%	
	Neutral	Count	26	25	
		Row N %	51.0%	49.0%	
	Agree	Count	39	43	
		Row N %	47.6%	52.4%	
	Strongly Agree	Count	11	5	

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		Row N %	68.8%	31.3%	
PU 5. Using chat-GPT would make it easier for me to do my job/study.	Strongly Disagree	Count	2	1	0.058
		Row N %	66.7%	33.3%	
	Disagree	Count	5	9	
		Row N %	35.7%	64.3%	
	Neutral	Count	15	21	
		Row N %	41.7%	58.3%	
	Agree	Count	49	52	
		Row N %	48.5%	51.5%	
	Strongly Agree	Count	17	5	
		Row N %	77.3%	22.7%	
PU 6. Chat-GPT is helpful in my job/study.	Strongly Disagree	Count	3	3	0.307
		Row N %	50.0%	50.0%	
	Disagree	Count	7	6	
		Row N %	53.8%	46.2%	
	Neutral	Count	17	25	
		Row N %	40.5%	59.5%	
	Agree	Count	47	48	
		Row N %	49.5%	50.5%	
	Strongly Agree	Count	14	6	
		Row N %	70.0%	30.0%	

Table 3: Frequency of Questions Related to perceived Ease of use of AI

			Role Physiotherapy Student	**Physiotherapist**	**P-Value**
EOU 1: Learning to operate chat-GPT would be easy for me.	Strongly Disagree	Count	1	0	
		Row N %	100.0%	0.0%	0.573
	Disagree	Count	8	7	
		Row N %	53.3%	46.7%	
	Neutral	Count	15	20	
		Row N %	42.9%	57.1%	
	Agree	Count	50	52	
		Row N %	49.0%	51.0%	
	Strongly Agree	Count	14	9	
		Row N %	60.9%	39.1%	
EOU 2: I find it easy to get chat-GPT to do what I want.	Strongly Disagree	Count	0	1	0.574
		Row N %	0.0%	100.0%	
	Disagree	Count	10	8	
		Row N %	55.6%	44.4%	
	Neutral	Count	20	26	
		Row N %	43.5%	56.5%	
	Agree	Count	47	46	
		Row N %	50.5%	49.5%	
	Strongly Agree	Count	11	7	
		Row N %	61.1%	38.9%	
EOU 3: My interaction with chat-GPT would be clear and understandable.	Strongly Disagree	Count	1	1	0.979
		Row N %	50.0%	50.0%	
	Disagree	Count	5	7	
		Row N %	41.7%	58.3%	
	Neutral	Count	27	28	
		Row N %	49.1%	50.9%	
	Agree	Count	43	41	
		Row N %	51.2%	48.8%	
	Strongly Agree	Count	12	11	
		Row N %	52.2%	47.8%	
EOU 4: chat-GPT would be clear and understandable.	Strongly Disagree	Count	2	1	0.430
		Row N %	66.7%	33.3%	
	Disagree	Count	5	9	
		Row N %	35.7%	64.3%	

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	Neutral	Count	30	25	
		Row N %	54.5%	45.5%	
	Agree	Count	39	46	
		Row N %	45.9%	54.1%	
	Strongly Agree	Count	12	7	
		Row N %	63.2%	36.8%	
EOU 5: It would be easy for me to become skillful at using chat-GPT.	Strongly Disagree	Count	2	2	0.610
		Row N %	50.0%	50.0%	
	Disagree	Count	6	11	
		Row N %	35.3%	64.7%	
	Neutral	Count	31	27	
		Row N %	53.4%	46.6%	
	Agree	Count	37	40	
		Row N %	48.1%	51.9%	
	Strongly Agree	Count	12	8	
		Row N %	60.0%	40.0%	
EOU6: I would find chat-GPT easy to use.	Strongly Disagree	Count	1	0	0.585
		Row N %	100.0%	0.0%	
	Disagree	Count	4	8	
		Row N %	33.3%	66.7%	
	Neutral	Count	21	24	
		Row N %	46.7%	53.3%	
	Agree	Count	49	44	
		Row N %	52.7%	47.3%	
	Strongly Agree	Count	13	12	
		Row N %	52.0%	48.0%	

Discussion

The reliability of AI-powered chatbots such as ChatGPT remains debatable in the medical community. While these technologies have demonstrated utility in various applications, their deployment in clinical settings is often scrutinized due to the potential risks associated with errors (13). For instance, a taxonomy of health care revealed that ChatGPT had only passed some performance tests, underscoring concerns about its reliability and the high stakes of deploying it in environments where accuracy is critical (13).

Case studies, a cornerstone of medical literature, highlight AI's potential and limitations. An illustrative case involved a first-year medical student using ChatGPT to draft a case report on dysphagia requiring Nissen Fundoplication. The interaction demonstrated that while ChatGPT provided relevant responses, achieving contextual coherence required repeated questioning and substantial input from the user, suggesting that the chatbot's effectiveness is contingent on the quality of information (14). This scenario underscores the importance of developing robust frameworks to mitigate risks and harness AI's potential effectively in clinical research.

The gap in comprehensive tools to measure the perceived usability of AI chatbots is evident. Studies have attempted to address this by evaluating existing measures like the UMUX-lite scale; however, findings suggested that this scale might need to be completed to assess chatbot usability, indicating the need for more tailored research tools (15). Similarly, exploratory analyses have tried to clarify the relationship between users and AI chatbots, revealing usability issues that conventional methods may need to capture (16) fully.

In a related domain, the utility of AI in enhancing physical activity was explored through a quasi-experimental study involving machine learning synchronized with physical activity trackers like Fitbit. This study found that participants rated these technologies' usability and effectiveness highly, suggesting that AI can significantly enhance exercise performance when integrated with physical activity (17, 18).

However, the perception of AI varies across different healthcare professionals. A study conducted in 2022 using a ten-item questionnaire focused on the professional act of AI and preparedness of AI revealed significant effects, with variance impacts of α=0.832 and α=0.632, respectively. This indicates that while AI impacts allied health professionals, other groups may not be as prepared for its integration (19).

In the current study, physical therapists' and physical therapy students' perceptions regarding the usability of ChatGPT were similarly positive, with no significant differences between the groups. This finding supports the potential for broader acceptance and utilization of AI chatbots in academic and clinical settings. Nonetheless, developing comprehensive guidelines and protocols is crucial to ensure AI technologies' safe and effective use.

While the benefits of AI in healthcare are acknowledged, the concerns regarding its reliability cannot be ignored. The need for rigorous protocols to facilitate the safe use of AI in healthcare is evident, as is the potential for AI to significantly impact public health and clinical practice when

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used judiciously and supported by appropriate infrastructural adaptations.

Conclusion

The study determined that there is no significant difference in the perceptions of usability between physical therapy students and physiotherapists concerning AI chatbots such as ChatGPT. Despite a sizable portion of both groups finding AI usable for their roles, many still regard AI as unreliable and challenging to utilize effectively in academic and clinical contexts. Notably, many participants still need to be more hesitant to rely on AI chatbots for information retrieval. The study's scope was limited to assessing perceptions of reliability, ease of use, and usability without establishing the actual reliability or providing guidelines for the safe application of AI chatbots in professional settings.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.
Ethics approval and consent to participate.
It is approved by the department concerned. (IRB-UMTLHR-9237/22)
Consent for publication
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Conflict of interest

The authors declared an absence of conflict of interest.

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