

## Original Article

# Knowledge, Attitude and Skills of Physiotherapists Towards Tele-Rehabilitation

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## ABSTRACT

**Background:** With the rapid integration of information and communication technology in healthcare, telerehabilitation has emerged as a vital tool in physiotherapy, offering an alternative to traditional care methods. This evolution necessitates an understanding of physiotherapists' readiness and capability to employ such technologies in clinical practice.

**Objective:** The study aimed to evaluate the knowledge, attitudes, and skills of physiotherapists regarding telerehabilitation, to ascertain their proficiency and perceptions of its application in clinical settings.

**Methods:** A cross-sectional study was conducted over four months, post-approval of the research synopsis. Data were collected using the Telemedicine- Awareness, Knowledge, Attitude & Skills (AKAS) Questionnaire via an online Google Form from a non-probability convenience sample of 350 clinical and academic physiotherapists in Lahore. Participants had a minimum of six months of clinical experience and were aged 24 years or older. The data were analyzed using SPSS version 21.0 to interpret the survey responses statistically.

**Results:** Among the participants, 89.7% displayed a positive attitude toward the use of telecommunications in telerehabilitation. A significant majority (79.1%) recognized telerehabilitation as a legitimate service, with 80.6% agreeing on its efficacy in patient follow-up. Computer literacy varied, with 27.4% possessing advanced knowledge, 47.1% mediocre, and 25.4% beginner levels. Statistically significant correlations were observed between levels of computer knowledge and attendance at training programs ( $p < 0.05$  for advanced and mediocre knowledge).

**Conclusion:** The study concluded that physiotherapists generally hold a positive view of telerehabilitation, recognizing its importance in the continuum of care. Nonetheless, the variability in ICT skills highlights the need for comprehensive training to fully exploit the capabilities of telerehabilitation in enhancing patient care.

**Keywords:** Telerehabilitation, Physiotherapy, Information and Communication Technology, Digital Health, Telemedicine, E-Health, Professional Training, Health Services Accessibility, Patient Care Management, Cross-Sectional Study.

## INTRODUCTION

The expansion of telecommunications through information technology has fundamentally transformed the landscape of medical management across the globe. This transformation is particularly evident in the domain of rehabilitation, where the integration of electronic media and information and communication technologies (ICT) has revolutionized the delivery of health services and information (1, 2). Notably, physiotherapy has significantly benefited from this evolution, seamlessly incorporating internet and telecommunication technologies to offer interventions that rival the outcomes of traditional, in-person sessions with physical

therapists. This integration addresses critical issues such as delays in accessing care, thereby enhancing the efficiency and reach of rehabilitation services (3, 4).

Furthermore, rehabilitation, especially in the fields of physical therapy and neurological rehabilitation, plays a pivotal role in monitoring the progress of patients recovering from cerebrovascular accidents (CVA) (2, 4). The application of artificial intelligence in this context facilitates automated, computerized approaches to overcoming neural challenges, enabling effective and timely initiation of therapy. The convenience and efficacy of conducting physical therapy or e-rehabilitation at home, for both assessment and ongoing observation, underscores its value and profitability, particularly when initiated immediately following disease onset, as recommended for optimal recovery (5-8).

E-rehabilitation also expands access to services for individuals in rural areas, mitigating the necessity for travel to access specialized care. This modality of rehabilitation offers flexibility and independence to patients and their families, which is especially beneficial in rural settings. Additionally, the use of video conferencing in urban contexts presents a cost-effective means of screening, further illustrating the versatility and economic advantages of telerehabilitation. In essence, telerehabilitation provides an efficient mechanism for delivering economical and appropriate physical therapy services to patients in the comfort of their homes, leveraging telecommunications to facilitate the ongoing assessment and enhancement of recovery processes (9-12).

Telerehabilitation encompasses two primary modalities: 'contemporaneous', wherein therapists and patients interact in real-time but from different locations, and 'non-contemporaneous', which involves asynchronous 'store and forward' data transfer, including digital images, video clips, and other telecommunications tools. This distinction highlights the adaptability of telerehabilitation to various clinical and patient needs. Despite the potential of telerehabilitation, its implementation demands a thorough understanding of care delivery standards and accuracy, alongside a commitment to maintaining the quality of care. Consequently, healthcare professionals, particularly physicians, must cultivate a reliable partnership with developers of telerehabilitation technologies to ensure the comprehensive effectiveness of these interventions throughout the patient care continuum (13-15).

Historically, research on the perception of telerehabilitation has focused on patients, students, and allied rehabilitation professionals. However, the present study aims to bridge this gap by evaluating the knowledge, attitudes, and skills of physiotherapists towards telerehabilitation. This focus is pivotal in understanding the readiness and capability of physiotherapists to embrace and effectively implement telerehabilitation practices, thereby contributing to the broader application and success of these technologies in enhancing patient care and rehabilitation outcomes.

## MATERIAL AND METHODS

The study adopted a cross-sectional design and was conducted over a period of four months, following the approval of the research synopsis. A sample size of 350 participants was determined through the use of RaoSoft, ensuring a 95% confidence level and a margin of error of 5%. The recruitment strategy employed a non-probability convenient sampling method, targeting both clinical and academic physiotherapists based in Lahore, who had accrued a minimum of six months of clinical experience. The inclusion criteria specified that participants must be physiotherapists aged 24 years or older (16), including both genders, to ensure a diverse and representative sample. Exclusion criteria were set to omit undergraduate Doctor of Physical Therapy (DPT) students and other allied health professionals, such as occupational therapists, speech therapists, dieticians, and pharmacists, from the study (17).

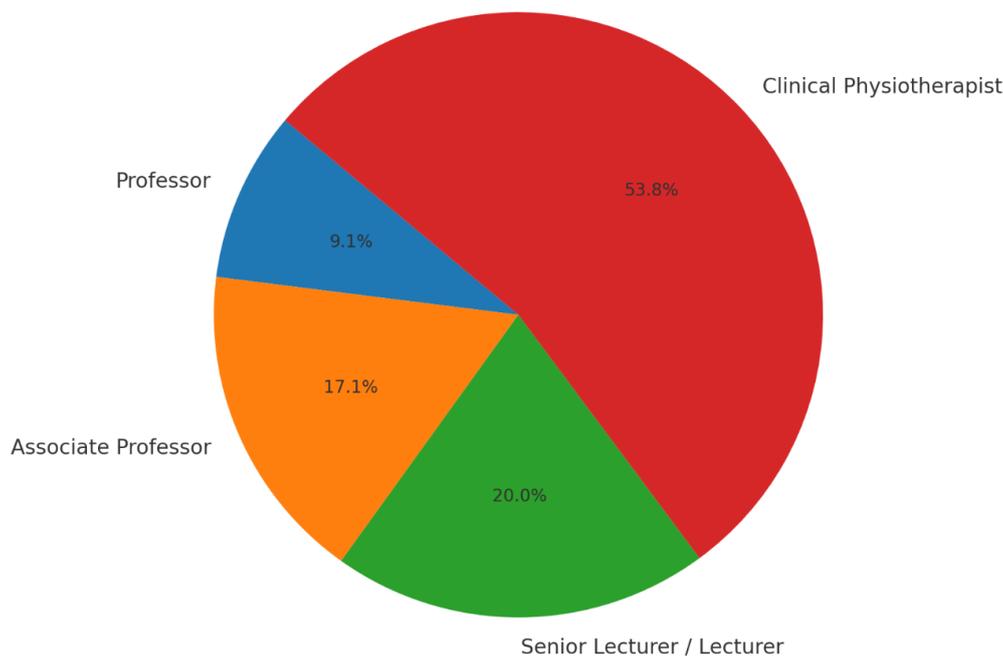
Data collection was facilitated through the Telemedicine- Awareness, Knowledge, Attitude & Skills (AKAS) Questionnaire, which was distributed via an online Google Form. This questionnaire was rigorously validated through a Content Validity Index assessment and comprised various sections aimed at gathering comprehensive information on the demographics, knowledge, attitudes, and skills related to telemedicine practices among the participants. In alignment with the ethical considerations of medical research, the study adhered strictly to the principles outlined in the Declaration of Helsinki, ensuring the protection of participant rights, confidentiality, and informed consent. Participants were informed about the purpose of the study, the nature of their involvement, and their right to withdraw at any stage without any repercussions.

Following the completion of data collection, the analysis was performed using SPSS version 21.0 statistical software. This phase involved a detailed examination and interpretation of the data, employing appropriate statistical tests to assess the awareness, knowledge, attitudes, and skills of physiotherapists in the context of telemedicine applications. The analytical process was designed to identify significant patterns and insights, contributing to the existing body of knowledge on tele-rehabilitation practices among physiotherapy professionals. Through this methodical approach, the study aimed to furnish substantive evidence on the proficiency and disposition of physiotherapists towards the adoption and implementation of telemedicine in their professional practice.

## RESULTS

In examining the relationship between the level of computer knowledge and attendance at training programs, a noteworthy pattern emerged. Participants with an advanced understanding of computers demonstrated a significant tendency to attend training programs, with 82 out of 96 in this category affirming attendance, suggesting a meaningful correlation between computer literacy and professional development engagement (Table 1;  $p < 0.05$ ). In contrast, beginners in computer knowledge did not show a statistically significant difference in training attendance, with 81 out of 89 attending training programs, which implies that the level of computer knowledge might not be a decisive factor for training participation in this subgroup (Table 1;  $p > 0.05$ ). Interestingly, for those with mediocre computer skills, a significant majority, 151 out of 165, also attended training programs, which could indicate a drive towards improving their skills through additional training (Table 1;  $p < 0.05$ ).

Distribution of Participants by Professional Role



When the data pivoted to encompass knowledge of telecommunication, the findings were somewhat different. Here, advanced and mediocre groups did not exhibit a statistically significant difference in training attendance (Table 1;  $p > 0.05$ ). However, beginners, curiously, showed a significant pattern of attendance, with 84 out of 89 participating in training programs (Table 1;  $p < 0.05$ ). This suggests that those with a more nascent understanding of telecommunications may be more inclined or able to benefit from training opportunities.

Figure 1 Distribution by Professional Role

Table 1: Cross-tabulations of Training Program Attendance by Knowledge and Use of Technology

Knowledge of Computer	Attend Training Program:		Total	p-value	
	No	Yes			
Advanced	14	82	96	<0.05	
Beginner	18	81	89	>0.05	
Mediocre	14	151	165	<0.05	
Knowledge of Telecommunication		Attend Training Program: No	Attend Training Program: Yes	Total	p-value
Advanced		16	80	96	>0.05
Beginner		5	84	89	<0.05
Mediocre		15	150	165	>0.05
ICT Enabled Health Services		Health Care: No	Health Care: Yes	Total	p-value
No		32	41	73	>0.05
Yes		69	208	277	<0.05

Knowledge of Computer	Attend Training Program:		Total	p-value	
	No	Yes			
Training Courses in ICT		Knowing More: No	Knowing More: Yes	Total	p-value
No		14	28	42	>0.05
Yes		34	274	308	<0.05

Table 2: Knowledge of Managing e-Discussion Forums

e-Discussion Proficiency	Knowing More About ICT: No	Knowing More About ICT: Yes	Total	p-value
Expert	6	81	87	<0.05
Learner	13	88	101	>0.05
Mediocre	20	99	119	>0.05
Unskilled	3	40	43	>0.05

Table 3: Cross-tabulation of Participants Using Medical Sites and e-Discussion Forums

e-Discussion Proficiency	Medical Site: Expert	Medical Site: Learner	Medical Site: Mediocre	Medical Site: Unskilled	Total	p-value
Expert	54	7	24	2	87	<0.05
Learner	14	56	19	12	101	>0.05
Mediocre	39	20	55	5	119	>0.05
Unskilled	8	25	3	7	43	>0.05

Regarding ICT-enabled health services, participants who acknowledged the importance and use of such services also reported a significantly higher attendance at training programs (Table 1;  $p < 0.05$ ). Specifically, 208 out of 277 participants who engaged with ICT in health care attended training programs, compared to only 41 out of 73 among those who did not use ICT-enabled services. In exploring the impact of knowledge about ICT on managing e-discussion forums, a clear divide was observed. Those who considered themselves experts and were familiar with ICT were significantly more involved in e-discussion forums (Table 2;  $p < 0.05$ ), with 81 out of 87 experts actively participating. Meanwhile, learners, intermediates, and unskilled participants did not show a statistically significant difference in their involvement with e-discussion forums (Table 2;  $p > 0.05$ ).

## DISCUSSION

The study sought to gauge the perceptions and competencies of physiotherapists in the realm of telerehabilitation (TR), a burgeoning field that intersects healthcare and technology. Data was meticulously gathered via online surveys over a four-month period, reflecting the expedited nature of research in the digital era. Sami Ullah and colleagues (2020) had previously distributed questionnaires among 82 rehabilitation professionals, discovering that while nearly half were cognizant of TR technologies, a smaller fraction actually employed them in practice. Notably, a significant majority regarded TR as an optimal method of service delivery. Mirroring this sentiment, the current study observed that a substantial 89.7% of physiotherapists harbored a favorable stance towards utilizing telecommunications for dispensing information and services through TR, with a minority of 10.3% exhibiting reluctance(18).

In a similar vein, Adesola et al. (2020) delved into Nigerian physiotherapists' perceptions of TR, extracting four central themes: knowledge, information sources, feedback, usability, and benefits. Their insights resonated with the current study's findings that a majority (79.1%) of physiotherapists acknowledged TR as a legitimate service, though 20.9% remained skeptical of healthcare delivery via the internet (19). Goris Hung KN and collaborators (2019) undertook a survey to evaluate the application of TR in vocational therapy, confronting challenges in maintaining consistent follow-up and reporting outcomes. Contrastingly, the present analysis indicated that a strong majority (80.6%) of physiotherapists believed patient follow-up could be efficiently managed through TR, with a dissenting 19.4% finding it cumbersome (20).

The research by Mazen et al. (2019) sought to understand patient awareness and perception of TR, noting a marked increase in understanding post-intervention. This present study echoes these findings, with 79.1% of participants concurring that internet-based healthcare is reputable, whereas 20.9% opposed this viewpoint (21). Furthermore, BELINDA et al. (2018) examined Australian physical therapists' willingness to utilize telephonic and internet-mediated services for arthritis patients, finding a consensus on the non-infringement of patient privacy and time-saving benefits. This aligns with the current study's results, where physiotherapists'

computer literacy varied from beginner (25.4%) to advanced (27.4%), indicating a spectrum of readiness to engage with TR technologies (22).

Sara et al. (2015) assessed the rehabilitation professionals' perspectives toward the implementation of TR, with a vast majority endorsing this technological integration. The current study similarly observed that a notable proportion (82.9%) of professionals were adept in applying ICT to healthcare services, recognizing the financial efficiencies it affords, although a subset (17.1%) was less convinced of its benefits (23). Synthesizing these various strands of inquiry offers a granular understanding of the attitudes towards and competencies in TR amongst physiotherapists. Despite the overarching optimism about TR's potential to enhance accessibility and convenience of care, concerns linger, particularly with regard to sustaining patient follow-up, preserving privacy, and the differential ability of healthcare providers to leverage technological tools effectively.

This study's strengths lie in its comprehensive data collection and analysis, contributing valuable insights to the burgeoning field of TR. Nonetheless, the limitations are noteworthy, including the reliance on self-reported data and the potential for selection bias due to the convenience sampling method. Future research should strive for randomized sampling techniques to ensure broader generalizability. As the landscape of healthcare continues to evolve, recommendations center on bolstering the technological proficiency of healthcare professionals, ensuring robust privacy protections, and streamlining TR processes to ameliorate follow-up protocols. By addressing these critical areas, the full potential of TR can be harnessed, heralding a new era of efficient, patient-centered care.

## CONCLUSION

The findings of this study underscore a predominantly positive disposition among physiotherapists towards telerehabilitation, signifying its promise as an accessible and cost-effective mode of healthcare delivery. However, the varying degrees of experience and expertise with digital platforms call for targeted educational programs to enhance proficiency across the profession. The broader implication for human healthcare is the potential for telerehabilitation to bridge service gaps, especially in remote or underserved regions, ultimately fostering a more inclusive healthcare ecosystem that leverages technology to meet diverse patient needs.

## REFERENCES

- Schmeler MR, Schein RM, McCue M, Betz KJJoT. Telerehabilitation clinical and vocational applications for assistive technology: research, opportunities, and challenges. 2009;1(1):59.
- Bello IS, Arogundade FA, Sanusi AA, Ezeoma IT, Abioye-Kuteyi EA, Akinsola AJJomlr. Knowledge and utilization of Information Technology among health care professionals and students in Ile-Ife, Nigeria: a case study of a university teaching hospital. 2004;6(4):e35.
- Zampolini M, Todeschini E, Hermens H, Ilsbroux S, Macellari V, Magni R, et al. Tele-rehabilitation: present and future. 2008;44(2):125-34.
- Parmanto B, Saptono AJJJoT. Telerehabilitation: state-of-the-art from an informatics perspective. 2009;1(1):73.
- Mani S, Sharma S, Omar B, Paungmali A, Joseph LJJoT, telecare. Validity and reliability of Internet-based physiotherapy assessment for musculoskeletal disorders: a systematic review. 2017;23(3):379-91.
- Jagos H, David V, Haller M, Kotzian S, Hofmann M, Schlossarek S, et al. A framework for (tele-) monitoring of the rehabilitation progress in stroke patients. 2015;6(04):757-68.
- Larson EB, Feigon M, Gagliardo P, Dvorkin AYJN. Virtual reality and cognitive rehabilitation: a review of current outcome research. 2014;34(4):759-72.
- Burdea GC, Cioi D, Kale A, Janes WE, Ross SA, Engsberg JRJIToNS, et al. Robotics and gaming to improve ankle strength, motor control, and function in children with cerebral palsy—a case study series. 2012;21(2):165-73.
- Ahn JJTCR. Policy, technology, and practice in cyber charter schools: Framing the issues. 2011;113(1):1-26.
- Ciccio AH, Whitford B, Krumm M, McNeal KJJoT, Telecare. Improving the access of young urban children to speech, language and hearing screening via telehealth. 2011;17(5):240-4.
- Cherry COB, Chumbler NR, Richards K, Huff A, Wu D, Tilghman LM, et al. Expanding stroke telerehabilitation services to rural veterans: a qualitative study on patient experiences using the robotic stroke therapy delivery and monitoring system program. 2017;12(1):21-7.
- Geisler F, Kunz A, Winter B, Rozanski M, Waldschmidt C, Weber JE, et al. Telemedicine in prehospital acute stroke care. 2019;8(6):e011729.
- Jana Cason D, Kim Hartmann PhD O, Tammy Richmond MJTAJoOT. Telehealth. 2013;67(6):S69.
- Hostetter M, Klein S, McCarthy DJNY, NY: The Commonwealth Fund. Taking Digital Health to the Next Level. 2014.

15. Tuckson RV, Edmunds M, Hodgkins MLJNEJoM. Telehealth. 2017;377(16):1585-92.
16. Jadoo SAA, Sulku SN, Aljunid SM, Dastan IJJoHE, Research O. Validity and reliability analysis of knowledge of, attitude toward and practice of a case-mix questionnaire among Turkish healthcare providers. 2014;2(1):96-107.
17. Zayapragassarazan Z, Kumar SJJoc, JCDR dr. Awareness, knowledge, attitude and skills of telemedicine among health professional faculty working in teaching hospitals. 2016;10(3):JC01.
18. Ullah S, Maghazil AM, Qureshi AZ, Tantawy S, Moukais IS, Aldajani AAJT, et al. Knowledge and attitudes of rehabilitation professional toward telerehabilitation in Saudi Arabia: A cross-sectional survey. 2021;27(5):587-91.
19. Odole AC, Afolabi KO, Ushie BA, Odunaiya NAJEJoP. Views of physiotherapists from a low resource setting about physiotherapy at a distance: a qualitative study. 2020;22(1):14-9.
20. Hung KN G, Fong KNJHKJoOT. Effects of telerehabilitation in occupational therapy practice: A systematic review. 2019;32(1):3-21.
21. Algudairi G, Al-Eisa ES, Alghadir AH, Iqbal ZAJBhsr. Patient satisfaction with outpatient physical therapy in Saudi Arabia. 2018;18:1-8.
22. Lawford BJ, Bennell KL, Kasza J, Hinman RSJAc, research. Physical therapists' perceptions of telephone-and internet video-mediated service models for exercise management of people with osteoarthritis. 2018;70(3):398-408.
23. Movahedazarhouligh S, Vameghi R, Hatamizadeh N, Bakhshi E, Khatat SMMIJJot, applications. Feasibility of telerehabilitation implementation as a novel experience in rehabilitation academic centers and affiliated clinics in Tehran: Assessment of rehabilitation professionals' attitudes. 2016;2015:7-.