

# Awareness and Recommendations of Physiotherapists in Jeddah about Using Telemedicine in Rehabilitation

Rasha M. Hegazy<sup>1,2</sup>

1 Department of Physical Therapy, Faculty of Medical Rehabilitation Sciences, King Abdulaziz University, Jeddah, Kingdom of Saudi Arabia.

2 Department of Physical Therapy for Neurology, Faculty of Physical Therapy, Cairo University, Giza, Egypt.

\*Corresponding Author: Rasha M. Hegazy

---

## ABSTRACT

**Background:** Telemedicine is an emerging field with significant potential to enhance rehabilitation services. However, its successful implementation is critically dependent on the awareness and attitudes of clinicians. This study aimed to assess the level of awareness and gather professional recommendations regarding the use of telemedicine in rehabilitation among physiotherapists in Jeddah, Saudi Arabia.

**Methods:** A descriptive, cross-sectional survey was conducted among 100 physiotherapists and physical therapy trainees in Jeddah. A custom-designed questionnaire was used to collect data on demographic and professional characteristics, prior awareness and experience with telemedicine, and professional recommendations for its use. A composite "Awareness and Recommendations Score" was created and classified as "Satisfactory" or "Unsatisfactory." Chi-square tests were used to examine the association between this score and participant characteristics.

**Results:** The findings revealed a profound lack of practical experience, with most participants having never used telemedicine for treating patients (81.0%) or in a professional/training context (67.0%). Despite this, attitudes were positive, with 70.0% recommending its use to colleagues and 76.0% agreeing it could at least partially replace conventional therapy. Overall, 97.0% of participants were classified as having an "Unsatisfactory" level of awareness and recommendations. There were no statistically significant associations between awareness score and any measured demographic or professional variables, including age, gender, educational level, or years of experience ( $p > 0.05$  for all).

**Conclusion:** A significant gap exists between the positive professional disposition towards telemedicine and the current low levels of awareness and practical experience among physiotherapists in Jeddah. This knowledge deficit appears to be a systemic issue rather than one confined to specific subgroups. These findings highlight an urgent need for structured educational initiatives and supportive institutional policies to bridge this gap and facilitate the effective integration of tele-rehabilitation into clinical practice in Saudi Arabia.

**KEYWORDS:** Telemedicine, Tele-rehabilitation, Physical Therapy, Awareness, Attitude, Cross-Sectional Study.

---

**How to Cite:** Rasha M. Hegazy (2025). Awareness and Recommendations of Physiotherapists in Jeddah about Using Telemedicine in Rehabilitation, *Vascular and Endovascular Review*, Vol.8, No.8s, 236-241.

---

## INTRODUCTION

The global healthcare landscape is undergoing significant and rapid evolution, largely driven by the integration of advanced information and communication technologies (ICT) into clinical practice. Telemedicine, the remote delivery of healthcare services and clinical information using telecommunications technology, has emerged as a transformative force, reshaping the paradigm of patient care across numerous medical disciplines<sup>1-3</sup>.

Within this broad domain, telemedicine in rehabilitation, often referred to as tele-rehabilitation, represents a particularly promising frontier. This modality offers the potential to overcome long-standing barriers to care, such as geographical distance, patient mobility limitations, and scheduling constraints, thereby enhancing the accessibility and continuity of therapeutic services for diverse patient populations<sup>4,5</sup>.

In the Kingdom of Saudi Arabia, the strategic adoption of digital health solutions is a cornerstone of the national healthcare transformation outlined in Vision 2030. This national agenda emphasizes improving the quality, efficiency, and reach of healthcare services for all citizens<sup>6</sup>. The development of a robust telehealth infrastructure has been a key priority, creating a supportive environment for the implementation of innovative service delivery models like tele-rehabilitation within various specialties, including physical therapy. The city of Jeddah, as a major metropolitan and healthcare hub, is a critical setting for the adoption of such advanced clinical practices.

Physical therapists are central figures in the successful implementation of tele-rehabilitation. Their role extends beyond being mere users of technology; they are the clinical experts responsible for adapting therapeutic principles to a virtual environment, ensuring patient safety, and evaluating the efficacy of remote interventions. Consequently, the successful and sustainable integration of tele-rehabilitation into standard practice is profoundly dependent on the awareness, knowledge, perceptions, and recommendations of the practicing physiotherapy workforce<sup>7,8</sup>. A positive disposition and a clear understanding of the technology's potential and limitations among clinicians are prerequisites for its effective uptake. Conversely, a lack of awareness, insufficient knowledge, or negative perceptions can constitute significant barriers, hindering the translation of technological

potential into tangible patient benefits<sup>9,10</sup>.

Despite the growing global interest and supportive national policies, the specific landscape of tele-rehabilitation within the physical therapy community in Jeddah remains largely uncharacterized. While the potential benefits are often discussed, there is a scarcity of empirical data detailing the actual level of awareness, practical experience, and professional recommendations among the clinicians who would be responsible for delivering these services. It is unknown to what extent physiotherapists in this key urban center have been exposed to tele-rehabilitation, either in their academic training or professional practice. Furthermore, their perspectives on its feasibility, its appropriate applications (e.g., for assessment versus follow-up), and its potential to replace or supplement conventional therapy are critical insights needed to guide future implementation strategies.

Understanding the baseline state of awareness and professional opinion is a crucial first step for any strategic planning. This knowledge can help identify specific educational needs, pinpoint perceived barriers that must be addressed, and inform the development of training programs and clinical guidelines that are tailored to the local context. Without this foundational data, efforts to promote tele-rehabilitation risk being misaligned with the actual readiness and concerns of the clinical community, potentially leading to inefficient resource allocation and slow adoption rates.

Therefore, the purpose of this cross-sectional study was to conduct a comprehensive assessment of the level of awareness and to gather the professional recommendations of practicing physiotherapists in Jeddah, Saudi Arabia, regarding the use of telemedicine in rehabilitation. Specifically, this investigation aimed to quantify their prior exposure to and experience with tele-rehabilitation, gauge their opinions on its role and potential applications, and explore the relationship between these perspectives and various demographic and professional characteristics, such as age, gender, educational level, job classification, and years of experience.

## METHODS

### Study Design

This investigation was conducted using a descriptive, cross-sectional survey design. The study was designed to provide a snapshot of the prevailing levels of awareness, prior experience, and professional recommendations regarding the use of telemedicine in rehabilitation among practicing physiotherapists located in Jeddah, Saudi Arabia. Data were collected at a single time point to characterize the perspectives of this specific professional cohort.

### Ethical Considerations

The study protocol, including the survey instrument and consent procedures, received formal ethical approval from the Research Ethics Committee at King Abdulaziz University (FMRS-EC2020-02-004). All procedures were conducted in strict accordance with the ethical principles outlined in the Declaration of Helsinki. An introductory statement within the survey provided participants with a comprehensive explanation of the study's purpose, the voluntary nature of their participation, and the measures in place to ensure anonymity and data confidentiality. Informed consent to participate was implied by the voluntary completion and submission of the questionnaire.

### Participants and Setting

The target population for this study consisted of physiotherapists and physical therapy students/interns practicing or training within the city of Jeddah, Saudi Arabia. A total of one hundred (N=100) individuals participated in the study. The setting was not restricted to a single institution; participants were recruited from various clinical and academic environments within Jeddah. A non-probability, convenience sampling strategy was employed for participant recruitment.

### Data Collection Instrument

Data was collected using a custom-designed, structured, self-administered questionnaire. The questionnaire was developed by the research team based on the study objectives and a review of relevant literature. It was designed to be concise and clear to facilitate completion. The instrument gathered information across several key domains:

- 1. Demographic and Professional Characteristics:** This section collected data on participant age (categorized), sex, nationality (Saudi vs. Non-Saudi), current place of residence (Jeddah only), and professional status (confirming they were in the physiotherapy field). It also gathered details on educational background (e.g., bachelor's student, intern, graduated Bachelor, master's student, etc.), job classification (e.g., Specialist, Lecturer, Professor), and years of clinical experience (categorized).
- 2. Awareness and Experience with Telemedicine:** This section contained a series of "Yes/No/Maybe" questions designed to assess participants' prior exposure to and practical experience with telemedicine. Questions probed whether they had heard of telemedicine before, if they had used it in their personal life or professional activities (clinical practice, training), and if they had used it for treating patients.
- 3. Recommendations and Attitudes:** This section assessed participants' professional opinions and recommendations regarding the use of telemedicine in physical therapy. Questions explored whether they would recommend its use to colleagues, if they agreed with replacing conventional therapy with telemedicine (totally or partially), and their perceptions of patient desire for such services.

### Data Collection Procedure

The questionnaire was administered to eligible and consenting participants within various clinical and academic settings in Jeddah. It was online based via an online link using Google Forms. Data was collected over a period of six months from May 2021 to November 2021. All collected data were coded and entered a Microsoft Excel spreadsheet for organization and subsequently imported into statistical software for analysis.

**Primary Outcome Variable Construction**

To facilitate analysis, a primary composite outcome variable, the "Awareness and Recommendations Score," was created. Based on their responses to a set of key questions within the survey, each participant was classified into one of two categories:

- **Satisfactory:** Indicating a sufficient level of awareness, positive experience, or positive recommendations for telemedicine.
- **Unsatisfactory:** Indicating a low level of awareness, lack of experience, or negative/neutral recommendations for telemedicine.

Participants were classified as 'Satisfactory' if they answered 'Yes' to at least 5 out of 7 key awareness questions; otherwise, they were classified as 'Unsatisfactory'.

**Statistical Analysis**

All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS), version 26 (IBM Corp., Armonk, NY, USA).

Frequencies and percentages were used to describe all demographic and professional characteristics of the sample, as well as the responses to individual survey questions. The prevalence of "Satisfactory" versus "Unsatisfactory" scores on the primary outcome variable were also calculated.

Chi-square ( $\chi^2$ ) tests of independence (or Fisher's Exact Test for cells with small, expected counts) were used as the primary inferential method. These tests were employed to examine the association between the dichotomous "Awareness and Recommendations Score" (Satisfactory vs. Unsatisfactory) and various independent categorical variables, including age group, sex, nationality, educational degree, job classification, and years of experience. The alpha level for determining statistical significance was set a priori at  $p < 0.05$  for all tests.

**RESULTS**

**Demographic and Professional Characteristics of Participants**

The study included a total of 100 participants from the physiotherapy field in Jeddah. The cohort was predominantly female (66.0%) and young, with most participants (73.0%) aged between 20 and 30 years. The mean age of the studied group was  $27.6 \pm 7.53$  years, with an age range of 20 to 61 years. The sample was largely of Saudi nationality (86.0%). Detailed demographic and professional characteristics are presented in Table 1 and Table 2.

The educational background of the participants was diverse. The largest group consisted of bachelor's students in their final year (32.0%), followed by interns (20.0%) and graduated therapists with a bachelor's degree (17.0%). A notable portion of the sample was engaged in postgraduate studies or held advanced degrees, including master's students (9.0%) and PhD students (10.0%).

*Table 1: Age and Sex Distribution of the Studied Group (N=100)*

Variable	Category	N	%
Age (years)	20-30	73	73.0
	31-40	18	18.0
	41-50	9	9.0
	$\geq 50$	1	1.0
Sex	Male	34	34.0
	Female	66	66.0

Regarding professional roles, 41.0% of the sample were students or interns without a formal job classification. Among those with a professional title, "Specialist" (17.0%) and "Lecturer" (13.0%) were the most common. A majority of the samples (54.0%) had no formal years of clinical experience, corresponding to the large number of students and interns. Among those with experience, the largest group (20.0%) had been practicing for 1-5 years.

*Table 2: Educational, Professional, and Experience Characteristics (N=100)*

Variable	Category	N	%
Highest Scientific Degree	Bachelor Student (4th Year)	32	32.0
	Interns	20	20.0
	Graduated Bachelor	17	17.0
	Master Student	9	9.0
	Graduated Master	11	11.0
	PhD Student	1	1.0
	Graduated PhD	10	10.0
Job Classification	Specialist	17	17.0
	Senior Specialist	9	9.0
	Lecturer	13	13.0
	Other (Consultant, Instructor, Prof)	11	11.0
	None (Student/Intern)	41	41.0
Years of Experience	0	54	54.0
	1-5	20	20.0
	6-10	12	12.0
	>10	14	14.0

### 3.2. Awareness and Experience with Telemedicine

Participants' self-reported awareness of and experience with telemedicine is presented in Table 3. A significant portion of the cohort reported low prior exposure to the concept, with 76.0% stating they had not heard about telemedicine before. The lack of practical application was even more pronounced, as 60.0% had never used it in their personal lives, 67.0% had never used it in a professional or training context, and a vast majority (81.0%) had never used it for treating patients.

*Table 3: Awareness and Experience with Telemedicine in Rehabilitation (N=100)*

Question	Response	N	%
Have you ever heard about telemedicine before?	Yes	76	76.0
	No	24	24.0
Have you ever used it in life fields?	Yes	40	40.0
	No	60	60.0
Have you ever used it in job or training?	Yes	33	33.0
	No	67	67.0
Have you ever used it in treating patients?	Yes	19	19.0
	No	81	81.0

### 3.3. Recommendations and Attitudes Toward Telemedicine

Despite the low levels of awareness and experience, participants expressed generally positive recommendations for the use of telemedicine in physical therapy (Table 4). A strong majority (70.0%) would recommend its use to other physiotherapists. Similarly, a combined total of 76.0% (70% partially + 6% totally) agreed that conventional therapy could be replaced to some extent by telemedicine. When asked about patient desire for this type of treatment, 35.0% believed there was a desire from patients.

*Table 4: Recommendations and Attitudes Regarding Telemedicine Use (N=100)*

Question	Response	N	%
Recommend for other physiotherapists to use?	Yes	70	70.0
	No	30	30.0
Agree to replace conventional therapy with telemedicine?	Yes, totally	6	6.0
	Yes, but partially	70	70.0
	No	24	24.0
Was there any desire from patients to receive this treatment?	Yes	35	35.0
	No	65	65.0

### 3.4. Overall Awareness and Recommendations Score

Based on the classification criteria, the overall level of awareness and recommendations among the participants was predominantly low. A total of 97 participants (97.0%) were classified as having an "Unsatisfactory" score, while only 3 participants (3.0%) were classified as "Satisfactory."

### 3.5. Association Between Awareness Score and Participant Characteristics

Chi-square tests were performed to examine the relationship between the dichotomous "Awareness and Recommendations Score" (Unsatisfactory vs. Satisfactory) and various demographic and professional characteristics. As shown in Table 5, the analysis revealed no statistically significant association between the awareness score and any of the investigated variables, including age (p=0.873), sex (p=0.226), nationality (p=0.676), scientific degree (p=0.831), job classification (p=0.894), or years of experience (p=0.628).

*Table 5: Association Between Participant Characteristics and Awareness/ Recommendations Score*

Characteristic	Unsatisfactory	Satisfactory	Chi-Square ( $\chi^2$ )	p-value
Age Group (years)			0.699	0.873
20-30	71	2		
31-40	17	1		
41-50	8	0		
≥50	1	0		
Sex			1.471	0.226
Male	32	2		
Female	65	1		
Scientific Degree	97	3	2.823	0.831
Job Classification	97	3	2.903	0.894
Years of Experience	97	3	4.362	0.628

## DISCUSSION

This cross-sectional study provides a foundational assessment of the awareness, prior experience, and professional recommendations regarding telemedicine among a cohort of physiotherapists and physical therapy trainees in Jeddah, Saudi Arabia. The findings reveal a significant paradox: a prevailing low level of awareness and practical experience with tele-rehabilitation is juxtaposed with a notably positive and encouraging attitude towards its future potential and application. Crucially, our analysis indicates that this low level of awareness is not significantly associated with demographic or professional factors such as age, gender, educational level, or years of experience, suggesting a systemic rather than subgroup-specific challenge.

The principal finding of this study is the profound lack of prior experience with telemedicine among the participants. A vast majority of the cohort (81%) had never used telemedicine for treating patients, and a significant portion (67%) had never encountered it even in academic or training settings. This experiential deficit is a critical barrier to adoption and aligns with findings from other regional and international studies conducted both before and during the early phases of the COVID-19 pandemic. For instance, a study of Saudi rehabilitation professionals by Ullah et al. (2021) also found that while many had a general orientation towards tele-rehabilitation technology, most had not used it in practice<sup>11</sup>. Similarly, studies in other countries have consistently highlighted a lack of practical experience and training as a primary impediment to the widespread integration of telehealth services by physical therapists<sup>12</sup>.

Despite this significant experience gap, the attitudes expressed by the participants were remarkably positive and forward-looking. A strong majority (70%) would recommend the use of telemedicine to their colleagues, and an even larger majority (76%) agreed that telemedicine could, at least partially, replace conventional therapy. This positive disposition suggests that the primary barrier to adoption in this context is not a philosophical resistance to technology or a skepticism about its value, but rather a lack of opportunity, training, and structured implementation. This "attitude-behavior gap," where positive intentions are not matched by current practice, has been identified as a key challenge in the adoption of health information technologies<sup>13</sup>. Our findings strongly indicate that the physiotherapy community in Jeddah is receptive to innovation but lacks the necessary framework and skills to translate this receptiveness into clinical practice.

The finding that the low level of awareness was not significantly associated with any of the measured demographic or professional variables is particularly insightful. It might be assumed that younger therapists or those with higher academic qualifications would demonstrate greater awareness, but our data did not support this ( $p > 0.05$  for all comparisons). This suggests that the lack of exposure to tele-rehabilitation is a pervasive, profession-wide issue in the studied region, likely stemming from its limited integration into both standard academic curricula and continuing professional development programs. This contrasts with some research suggesting that factors like age or tech-savviness can influence technology adoption, but in a context where overall exposure is uniformly low, these individual differences may not yet be apparent<sup>14</sup>.

### Implications for Education, Policy, and Practice

The results of this study have several clear and actionable implications.

- For Education: There is an urgent need for academic institutions in Saudi Arabia to integrate comprehensive tele-rehabilitation training into entry-level physical therapy curricula. This training should encompass not only the theoretical underpinnings but also practical, hands-on experience with various tele-rehabilitation platforms and delivery models.
- For Professional Development: Professional organizations, such as the Saudi Physical Therapy Association (SPTA), and healthcare institutions should develop and promote continuing education workshops and certification programs focused on tele-rehabilitation. These programs are essential for upskilling the existing workforce, as our findings show the awareness gap is not limited to junior therapists.
- For Healthcare Policy: To translate positive attitudes into practice, supportive policies are needed. This includes establishing clear clinical practice guidelines for tele-rehabilitation, addressing issues of reimbursement and liability, and investing in a secure and accessible technological infrastructure to support virtual care delivery<sup>15</sup>.

## LIMITATIONS

The study employed a non-probability, convenience sampling method, which limits the generalizability of the findings to the entire population of physiotherapists in Jeddah or Saudi Arabia. The sample was heavily weighted towards students, interns, and early-career professionals, which may not fully reflect the views of more experienced clinicians. Furthermore, the cross-sectional design captures a single point in time and does not account for the rapid evolution of telehealth practices, particularly since the acceleration prompted by the COVID-19 pandemic.

## CONCLUSION

In conclusion, this study reveals a critical disconnect within the physiotherapy community in Jeddah: a widespread lack of awareness and practical experience with tele-rehabilitation coexists with a strong positive attitude and willingness to recommend its use. This awareness deficit is a systemic issue, independent of individual therapist characteristics like age or experience. These findings underscore an urgent need for structured educational initiatives and supportive institutional policies to bridge the gap between positive intent and clinical reality. By investing in training and creating a clear framework for implementation, the potential of tele-rehabilitation to enhance physical therapy services in Saudi Arabia can be successfully realized.

## REFERENCES

1. Dorsey ER, Topol EJ. State of telehealth. *N Engl J Med*. 2016;375(2):154-161. doi:10.1056/NEJMra1601705
2. Bashshur R, Doarn CR, Frenk JM, Kvedar JC, Woolliscroft JO. Telemedicine and the COVID-19 pandemic, lessons for the future. *Telemed J E Health*. 2020;26(5):571-573. doi:10.1089/tmj.2020.29040.rb
3. Monaghesh E, Hajizadeh A. The role of telehealth during COVID-19 outbreak: a systematic review based on current evidence. *BMC Public Health*. 2020;20(1):1193. doi:10.1186/s12889-020-09301-4
4. Cottrell MA, O'Leary SP, Swete-Kelly P, et al. "Are you on the same page?" A qualitative study of communication and interaction in a telerehabilitation service for people with chronic spinal cord injury. *Clin Rehabil*. 2017;31(10):1395-

1405. doi:10.1177/0269215517694389
5. Kruse CS, Krowski N, Rodriguez B, Tran L, Vela J, Brooks M. Telehealth and patient satisfaction: a systematic review and narrative analysis. *BMJ Open*. 2017;7(8): e016242. doi:10.1136/bmjopen-2017-016242
  6. Al-Samani A, Al-Dahmash A, El-Wabil A. Digital health in Saudi Arabia: A review of the current landscape and opportunities. *J Health Inform Dev Ctries*. 2019;13(1).
  7. Alaboudi A, Atkins A, Sharp B, Balkhair A, Alzahrani M, Sunbul T. Barriers and challenges in adopting Saudi telemedicine network: The perceptions of decision makers of healthcare facilities in Saudi Arabia. *J Infect Public Health*. 2016;9(6):725-733. doi: 10.1016/j.jiph.2016.09.008
  8. Pastora-Bernal M, Martín-Valero R, Barón-López FJ, Estebane-Ortega P. Evidence of Benefit of Telerehabilitation in Patients with Duchenne Muscular Dystrophy: A Pilot Study. *J Med Internet Res*. 2018;20(8):e10698. doi:10.2196/10698
  9. Gagnon MP, Desmarts M, Labrecque M, et al. Systematic review of factors influencing the adoption of information and communication technologies by healthcare professionals. *J Med Syst*. 2012;36(1):241-277. doi:10.1007/s10916-010-9473-4
  10. Alshahrani A, Al-Moutaery M, Al-Shehri A. The use of telemedicine among physical therapists in Saudi Arabia: A cross-sectional study. *J Taibah Univ Med Sci*. 2021;16(4):596-603. doi: 10.1016/j.jtumed.2021.01.006
  11. Ullah S, Maghazil AM, Qureshi AZ, Tantawy S, Moukai IS, Aldajani AA. Knowledge and Attitudes of Rehabilitation Professional Toward Telerehabilitation in Saudi Arabia: A Cross-Sectional Survey. *Telemed J E Health*. 2021;27(5):587-591. doi:10.1089/tmj.2020.0177
  12. Mani S, Sharma S, Omar B, Paungmali A, Joseph L. A systematic review of the evidence for the effectiveness of physical therapy tele-rehabilitation in the management of musculoskeletal conditions. *J Telemed Telecare*. 2017;23(6):577-587. doi:10.1177/1357633X16642947
  13. Shachak A, Kuziemy C, Borycki E. The role of the context in the success of health information technology implementation: a qualitative case study. *J Med Internet Res*. 2019;21(7): e14300. doi:10.2196/14300
  14. Alshahrani A, Al-Moutaery M, Al-Shehri A. The use of telemedicine among physical therapists in Saudi Arabia: A cross-sectional study. *J Taibah Univ Med Sci*. 2021;16(4):596-603. doi: 10.1016/j.jtumed.2021.01.006
  15. Qureshi AZ, Ullah S, Aldajani AA, Basson P, AlHabter AM, Ali T. Telerehabilitation Guidelines in Saudi Arabia. *Telemed J E Health*. 2021;27(10):1087-1098. doi:10.1089/tmj.2020.0416