

PERCEPTIONS OF TELEREHABILITATION AMONG PHYSIOTHERAPY STUDENTS: OPPORTUNITIES AND CHALLENGES

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Abstract: Introduction/Background. Physiotherapy students' perceptions of telerehabilitation are increasingly recognized as a key factor influencing its future adoption in clinical practice, yet many students report limited curricular exposure and low confidence in remote physical assessment and patient engagement. These findings highlight the need for structured digital education in physiotherapy curricula. The e-PHYSIO project (2022–2025) was launched to modernize bachelor-level physiotherapy programs in the Western Balkans through innovative digital resources and interactive learning platforms.

Materials and Methods. The project involved eight higher education institutions from Albania, Kosovo, Romania, Bulgaria, and Turkey. Educational outputs included: Telerehabilitation e-Course, Digital Approaches for Online Education e-course, Online Rehabilitation Protocols and Modules across clinical specialties, delivered through the e-PHYSIO e-learning platform and a virtual space. Pilot testing by structured questionnaires engaged 37–62 participants per output, combining descriptive statistics with thematic analysis of qualitative feedback.

Results. For the Telerehabilitation Course 98.2% of respondents confirmed an appropriate theory–practice balance and 96.3% recommended it, despite most having no prior experience. In the Digital Approaches Course, 73.7% of staff had limited digital skills, yet 96.3% found the content relevant. The e-learning platform was rated user-friendly by 75.9% of participants, with 77.8% reporting no technical issues, though 22.2% noted slow loading or navigation challenges.

Conclusions. Pilot testing confirmed that digital physiotherapy resources can be effectively integrated into education in the Western Balkans. Students and educators expressed strong engagement and satisfaction, citing interactivity, case-based learning, and content relevance as major strengths. The e-PHYSIO project thus offers a scalable and innovative model for aligning physiotherapy education with global digital health strategies and preparing graduates for contemporary rehabilitation practice.

Keywords: Telerehabilitation; Digital Physiotherapy Education; e-Learning; Curriculum Innovation; Western Balkans

Introduction

Telerehabilitation (TR), a branch of digital health, has gained increasing prominence in physiotherapy education and practice, particularly following the COVID-19 pandemic. The World Health Organization (2021), through its *Global Strategy on Digital Health 2020–2025*, emphasizes the integration of digital tools as a core aspect of future healthcare delivery. Similarly, World Physiotherapy and the International Network of Physiotherapy Regulatory Authorities (INPTRA, 2021) highlight TR as part of “digital practice” and urge educational programs to prepare students with competencies in remote assessment, safety, ethics, and patient communication. These policy-level endorsements reflect a growing global consensus that future physiotherapists must be equipped to work effectively in digital environments.

Clinical evidence has also reinforced the value of TR. Withers and colleagues (2024) demonstrated

that remotely delivered physiotherapy can be as effective as face-to-face services, with comparable outcomes and, in some cases, improved adherence. Rettinger, Meyer, and Kahn (2024) further observed in a scoping review that structured telehealth education for allied health students enhances confidence, usability, and clinical reasoning. These findings underscore both the legitimacy and pedagogical potential of TR.

Within physiotherapy education, several authors have investigated student perspectives. For example, Davies et al. (2024) found that most students acknowledged the relevance of telehealth and supported blended care models. Similarly, Başer Seçer and Çeliker Tosun (2022) reported moderate awareness among Turkish physiotherapy students, though formal training exposure was limited. In the Middle East, Ramalingam, Al-Jasim, and AlJaber (2025) noted that students recognized TR as essential for sports rehabilitation but highlighted the need for more

curricular integration. McConnell and colleagues (2025), through a systematic review protocol on digital placements, pointed to inconsistencies in student experiences across institutions, signaling a broader gap in educational provision.

Opportunities reported by students align with the wider literature: improved access for patients with geographical or mobility barriers, continuity of care during service disruptions, and enhanced patient engagement through home-based supervision (Mc Evoy et al, 2024). Digital placements during the pandemic demonstrated that TR could provide authentic learning environments, allowing students to develop clinical reasoning and communication skills in real-time (Davies et al., 2024). Rettinger et al. (2024) confirmed that such experiences positively influenced professional identity formation and telehealth readiness.

At the same time, challenges are evident. Sia, Gani, and Chee (2024) identified barriers such as limited hands-on practice, difficulties in exercise progression, and sustaining therapeutic alliance remotely. Peng, Major, and Sonn (2024) highlighted infrastructure limitations, including patient digital literacy and internet connectivity, as major obstacles. Students also expressed concerns about privacy, consent, and data security (Başer Seçer & Çeliker Tosun, 2022; Ramalingam et al., 2025). These findings suggest that while students are generally optimistic, their readiness is constrained by curricular, technological, and regulatory limitations.

Taken together, the literature indicates that physiotherapy students view TR as an essential component of modern practice but remain underprepared in several domains. Mapping these perceptions—particularly the balance between perceived opportunities and challenges—can guide competency frameworks, curriculum development, and faculty training. As emphasized by WHO (2021) and World Physiotherapy/INPTRA (2021), embedding TR within education is not only timely but necessary for aligning physiotherapy practice with global digital health strategies.

Materials and Methods

Due to the actuality of the problem and our strong interest in advancing digital physiotherapy education, we developed the project entitled "*Modernization of Physiotherapy Education for Bachelor Degree in Western Balkan Countries through Innovative Ideas and Digital Technology*", acronym e-PHYSIO. The e-PHYSIO project (2023–2026) is a capacity-building initiative involving eight higher

education institutions (HEIs) from Albania, Kosovo, Romania, Bulgaria, and Turkey. Its overall aim is to modernize bachelor-level physiotherapy curricula through digital innovation and the integration of telerehabilitation into academic and clinical practice.

A quality assurance report prepared by the partnership examined online education through a comprehensive review of training materials and educational methods, using insights from trainees' feedback during pilot testing. The evaluation focused on the quality, effectiveness, and impact of the developed materials, ensuring their alignment with modern physiotherapy education standards and digital learning approaches, while allowing the identification of weak points and solutions for improvement.

The educational resources under review included:

- a Telerehabilitation Course, introducing students to the principles and applications of remote physiotherapy services;
- a course on Digital Approaches for Online Education in Physiotherapy, designed to equip students and educators with digital tools and strategies;
- Online Rehabilitation Protocols for clinical specialties (cardiorespiratory, neurological, orthopaedic, and rheumatological rehabilitation);
- Online Rehabilitation Modules, guiding students in the delivery of online rehabilitation;
- Rehabilitation Updated Courses providing structured patient protocols across different fields.

For each resource it was offered info text, PPTs and videos on different topics.

All resources were hosted on the e-PHYSIO e-learning platform and virtual space, offering interactive and accessible learning experiences. These outputs were tested in pilot sessions with physiotherapy students and educators from Albania and Kosovo.

Data collection was carried out using structured questionnaires administered online, aiming to measure the effectiveness of the outputs and user experience, as well as clarity, interactivity, usability, impact and technical functionality. Responses were gathered automatically through Google Forms, ensuring consistent formatting and real-time data recording (available at <https://drive.google.com/drive/folders/1nOgdI6X8EEeL8DaolQ4E6F96mWh0rIcA>). The raw data (numerical scores and open-text comments) were exported into Excel spreadsheets for analysis.

A mixed-methods approach was employed, combining descriptive statistics with thematic analysis of qualitative feedback. We used descriptive statistics for the quantitative component, including calculation of frequencies, percentages, and distribution patterns for each closed-ended question. These descriptive indicators allowed the team to assess trends in clarity, usability, interactivity, technical functionality, and overall satisfaction across outputs.

For the qualitative component we used a thematic analysis approach. Open-ended responses were reviewed, coded, and grouped into recurring themes such as strengths, challenges, and suggestions. This allowed triangulation of quantitative and qualitative findings and a deeper contextual interpretation of participant experiences.

The evaluation followed an iterative, formative process: feedback collected from each pilot

session was used to refine the materials. A dedicated evaluation team documented observations using a Usability Trial Checklist, enabling structured comparison of results against predefined quality criteria (functionality, navigation, content clarity, and applicability in physiotherapy education).

Results

Telerehabilitation Course

Fifty-six respondents (34 from Albania, 22 from Kosovo) completed the pilot testing. Most students (67.3%) had no prior experience with telerehabilitation, which highlights the novelty of the subject in their curricula. The balance between theory and practice was considered appropriate by 98.2% of participants. Overall satisfaction was high, with 96.3% recommending the course (table 1, figure 1). Minor concerns related to course length and complexity for beginners.

Table 1. Telerehabilitation Course Results

Indicator	Percentage (%)
No prior TR experience	67.3
Theory–practice balance appropriate	98.2
Would recommend course	96.3

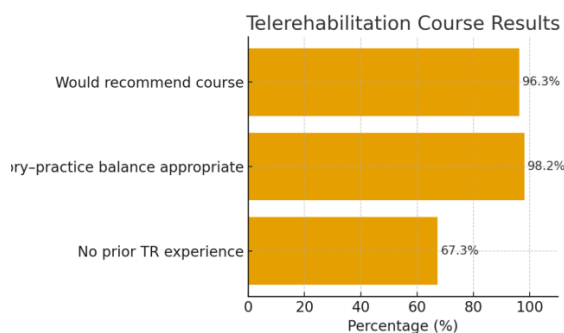


Figure 1. Telerehabilitation Course – results representations

Digital Approaches Course

This course was tested with 52 academic staff members (34 from Albania, 18 from Kosovo). Results revealed a digital competency gap: 73.7% of educators reported none or limited prior experience with e-learning platforms. Nonetheless, 96.3% of participants found the content relevant to teaching and research needs, and 87% agreed that course materials were well-structured and easy to follow (table 2, figure 2).

Table 2. Digital Approaches Course Results

Indicator	Percentage (%)
No/limited prior digital platform use	73.7
Content relevance	96.3
Materials structured & clear	87.0

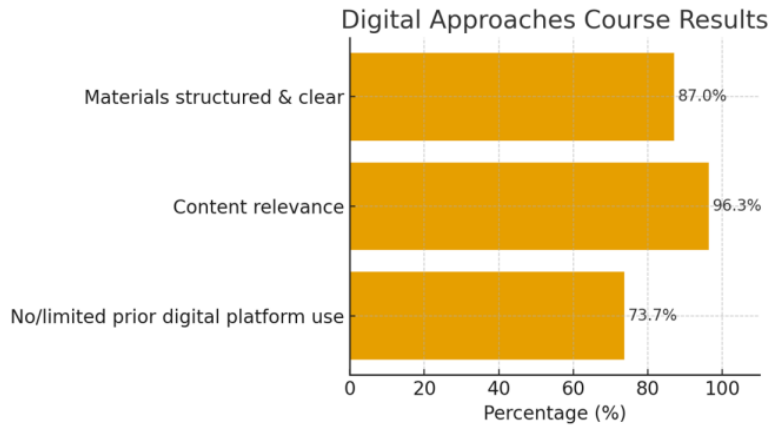


Figure 2. Digital Approaches Course – results representations

Online Rehabilitation Protocols

These protocols, based on case studies across several clinical specialties, were perceived as clear, structured, and relevant for student learning. Respondents appreciated their applicability in guiding clinical decision-making. Suggested improvements included adding further multimedia resources and integrating interactive tools to better support practical application.

Online Rehabilitation Modules

Students valued the modules for bridging theory and practice in online rehabilitation. Interactivity and guidance were highlighted as key strengths, while some participants requested simpler formats and more personalized learning paths. The addition of further real-world case studies was also recommended.

e-PHYSIO e-learning Platform

The majority of respondents (77.8%) reported no technical difficulties, and 75.9% considered the platform “very user-friendly.” Still, a minority (22.2%) experienced issues such as slow loading times or navigation challenges (see table 3, figure 3).

Table 3. e-PHYSIO Platform Results

Indicator	Percentage (%)
No technical issues	77.8
Rated very user-friendly	75.9
Reported technical issues	22.2

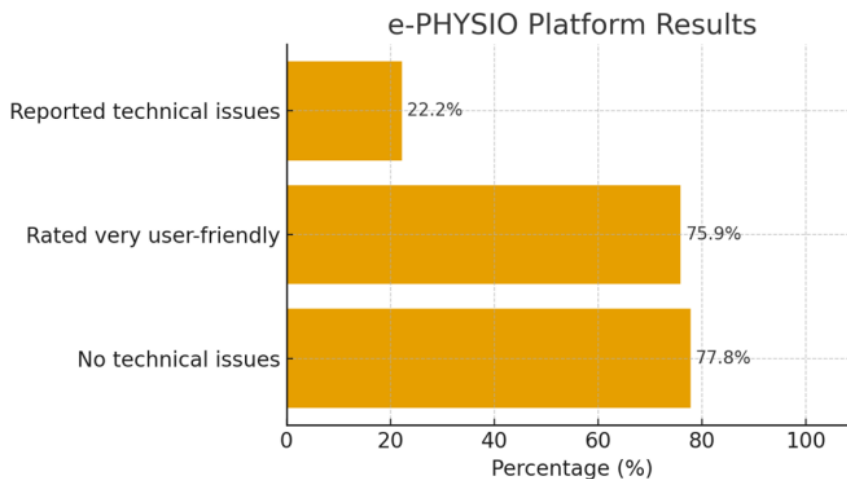


Figure 3. e-PHYSIO Platform – results representations

e-PHYSIO Virtual Space

Students appreciated the potential of the virtual space for integrating patient-centered resources and simulating real-world rehabilitation settings. While generally well-received, feedback emphasized the need for more structured instructions, enhanced personalization, and improved guidance on navigation.

Conclusions

The pilot testing of e-PHYSIO outputs demonstrated that digital physiotherapy education resources can be effectively integrated into academic curricula in the Western Balkans. Student and staff engagement was high, and satisfaction levels were consistently positive across all outputs. The research identifies some key strengths and challenges that can be address in the future.

Key strengths included:

- interactive and engaging content;
- case-based learning that supports clinical decision-making;
- strong responsiveness of instructors and course staff.

Challenges centred on:

- limited prior exposure of students and staff to telerehabilitation and digital education;
- technical and navigation issues affecting a minority of users;
- requests for more practical scenarios and flexible learning pathways.

Overall, the evaluation confirmed that the e-PHYSIO initiative is a significant step toward modernizing physiotherapy education, supporting the digital transformation of health professions in the region. By incorporating the feedback gathered, the project can refine and optimize its educational materials, ensuring that graduates are well-prepared for both traditional and digital rehabilitation practice.

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