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Evaluation of Physiotherapy and Rehabilitation Undergraduate Students' of Clinical Practice Skills

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ABSTRACT

Introduction: Clinical practice courses in physiotherapy are very important for training clinically competent physiotherapists. The quality of students' clinical skills training can be enhanced by rigorously monitoring and assessing their performance in these environments.
Objective: To evaluate the observations and practices in the course forms used in the clinical practice education of physiotherapy students.
Methods: In this descriptive study, the clinical practice education of fourth-year physiotherapy students was evaluated with forms filled out by 170 students in the 2022-2023 academic year.
Results: Students achieved the minimum number of observations and applications specified in the forms for each application. The observations, evaluations and applications made by the students in clinical practice are as follows: It was found that there were exercise applications with 10.37%, electrotherapy applications with 9.49% and some evaluation methods (pain, joint range of motion and muscle strength) with 5.4%. On the other hand, there was limited participation in some neonatal assessments/applications and some specific electrotherapy (biofeedback, iontophoresis and hydrotherapy) approaches. Students mostly participated in exercises for general physiotherapy and neurological rehabilitation units. The students used electrotherapy methods mainly in pediatric and orthopedic therapies.
Conclusion: The clinical practice forms tried for the first time in this study made a limited contribution to monitoring the clinical practice performance of students. Forms have the potential to provide feedback to students and educators in areas such as planning and supervision. Ensuring that students are involved in the development of the forms and getting their views can be useful.

Keywords: Clinical Practice, Quality Processes, Physiotherapy Education, Physiotherapy Students.

INTRODUCTION

Physiotherapy education is critical in preparing a clinically competent physiotherapist by providing the integration of clinical practice and clinical experiences (1). In the physiotherapy curriculum, the final year of undergraduate education is the most practical stage of gaining hands-on experience with patients, and the focus is on developing students' clinical skills. During clinical practice, approaches that can improve students' practical reasoning skills and make them more competent in their professional lives have been studied (2-4). Most of these studies cover the teaching methods of physiotherapy students in clinical practice. However, although the goals are common, the curricula of fourth-year undergraduate students may differ between countries and regions, especially during clinical practice. New national and international reforms are needed to ensure that the role of physiotherapy in the health system is expanded (5). Studies emphasize the importance of a physiotherapy curriculum based on national and country-specific needs (6).

The development and delivery of clinical education, including national competencies, in physiotherapy and rehabilitation (PTR) undergraduate programmes in Turkey is guided by the PTR National Core Education Program (NCEP) published in 2016 (7). In the NCEP 2016, the specific competencies in the

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PTR undergraduate program have been developed under three headings; Knowledge and Foresight, Skill and Attitude. Four-year PTR undergraduate programs are designed according to the biopsychosocial model. The topics and contents related to the main components of the profession have been determined under the titles of basic sciences, psychosocial sciences, professionalism, and ethics. Additionally, the topics and contents of professional knowledge training include addressing problems based on impairment, activity, participation level, and disease within the framework of international function classification and resolving them with the clinical decision-making process. The list of skills related to basic PTR applications is defined as *"It includes basic PTR applications and related skills that the physiotherapist who graduates from the PTR undergraduate program must perform and manage at certain levels."* (7).

Clinical practice education aimed at increasing the experience and skills of undergraduate students is a core component of physiotherapy practice and the undergraduate curriculum (8, 9). The professional practice of physiotherapists is constantly evolving and these developments need to be reflected in competencies, program criteria, and standards (6). Thus, lecturers have various responsibilities such as developing effective pedagogical strategies, enhancing students' professional development, and guiding the development of their professional identity (10,11). With this aim, new improvements are proposed for the content, functioning, evaluation, and performance monitoring of the courses in the curriculum to increase the quality and standardization of undergraduate education in physiotherapy (1,5,11-14). Therefore, it is necessary to focus more on clinical practice education, which is related to both the educational curriculum and competence in professional life. Especially in the education of a qualified physiotherapist in the field, the development and implementation of undergraduate education within the framework of a competence-based approach is embraced (15). Competence is linked to measurable, permanent and trainable behaviors that contribute to the performance of activities that indicate whether a person is competent to perform their professional role to a defined standard. Activities are time-limited, trainable, and measurable task groups that draw on knowledge, skills, values, and attitudes (16). The World Physiotherapy Association (WPA) defined competence as "*the proven ability to use knowledge, skills and personal, social and methodological abilities in practice or study situations and in professional and personal development*" in the Physiotherapy Education Guide published in 2021 (12). Additionally, competence is a physical therapist's ability to practice safely and effectively in complex situations (12).

Evaluating and monitoring the practice skills of PTR students and the variety of cases they take in fourth-year clinical practice courses according to the national competencies specified in NCEP may allow PTR educators to obtain an idea about whether fourth-year students have reached professional competence before graduation. Additionally, a critical need to restructure, clarify, and unify clinical performance evaluations has recently been reported by international professional organizations such as the American Physical Therapy Association (APTA) (17).

This study aimed to evaluate the development process of clinical practice course forms of physiotherapy students at a local university and the first results obtained from student report cards. This report card included the number of cases seen by fourth-year physiotherapy students in clinical practice courses, the variety of cases, and the number and variety of PTR-specific applications. We hope that the clinical practice forms presented in this study will shed light on the development of curricula for PTR undergraduate students.

METHOD

Study Design And Ethical Approval

This descriptive study was approved by the Afyonkarahisar Health Science University Clinical Research Ethics Committee (approval number: 2023/165, date: April 7, 2023).The ethical rules of the Declaration of Helsinki (2013) were taken into consideration at all stages of this study.

Study Procedure

In the study, the student report cards of fourth-year students who completed the clinical practice course in the 2022–2023 academic year were used. These report cards covered the number of applications and

observations made by the student under the supervision of the practice education supervisor between July 2022 and July 2023. At the start of the 2022-2023 academic year, the consultant lecturer gave a seminar on the updated clinical practice guidelines to students enrolled in the course. The content of the seminar was about recording the number of applications and observations in clinical practices on student report cards and following the course rotation processes. After the seminar, clinical practice forms were distributed to the students.

Clinical Practice Guideline

To increase the student's professional knowledge, clinical practice courses involve rotating through one or more departments of the relevant institution under the supervision of the practice education supervisor. The courses are conducted in the form of maintaining practical skills on patients for one semester. Students attend full-time and face-to-face courses in groups of 30–40 at the university's Health Application and Research Center, located on the same campus as the university. These courses end with the completion of clinical practice forms, submission of the forms to the practice education supervisor, and two theoretical and practical exams administered by the practice education supervisor.

In clinical practice courses, students continue their education as a result of rotations determined by the clinical practice coordinatorship. The main rotation areas include neurological rehabilitation and orthopedic rehabilitation units, and other rotation areas include pediatric rehabilitation and general PTR units. Students complete at least two rotations in these practice units in one semester and take a total of 35 hours of weekly courses.

Developments About The Creation Of Clinical Practice Guide And Course Forms

PTR department academic staff held meetings in the department to make improvements and development studies on clinical practice courses and to determine various procedures and principles related to the course. The PTR department head, department faculty members, pratic education coordinator, and rotation-responsible physiotherapists who supervise the students in the clinic attended these meetings. During the meetings, which lasted approximately two months, various discussions were held on clinical practice courses, such as teaching the course, identifying students, the participation of students during the course, monitoring student performances, and end-of-course evaluations. The main topics were identified. These were then used to improve the course forms (Figure 1). Finally, the guide for clinical practice courses has been approved by the Faculty Education Commission, effective in the 2022-2023 academic year. The current updated clinical practice guideline includes various terms and descriptions presented in Table 1. Additionally, the new clinical practice guideline includes a workflow to evaluate and monitor students' clinical practice performance: (1) Students fill out the student practice registration form and submit it to the practice education supervisor after each rotation; (2) The practice education supervisor reviews the registration form submitted by the student and after approval, this data is recorded in the student report card; (3) The practice education supervisor fills out the clinical practice assessment form; (4) The practice education supervisor delivers the above-described approved forms, three for each student, to the clinical practice coordinatorship (Figure 2).

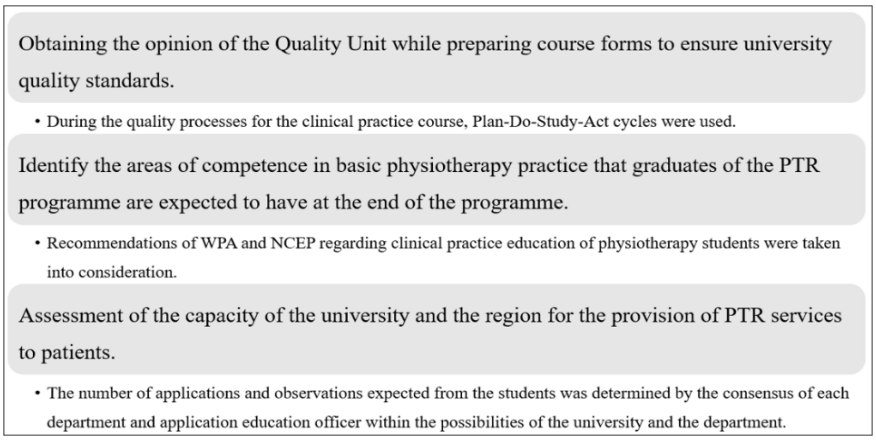

Figure 1. Major Areas for Improvement in Meetings Held for Clinical Practice Guideline.

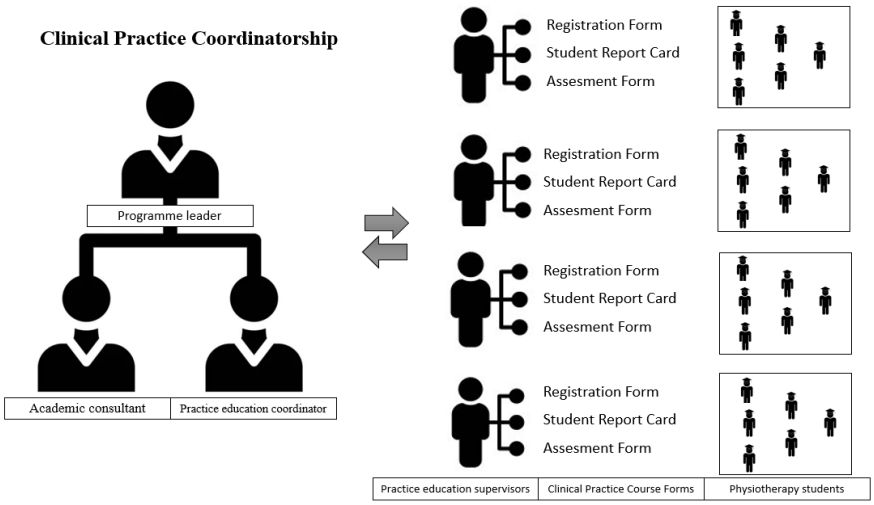

Figure 2. Workflow for Monitoring and Evaluating The Clinical Practice Course.

Data Collection

Before the data analysis, the documents containing the forms filled out by the students for the clinical practice course were received from the coordinatorship. During data processing, no missing data was encountered as these forms were previously approved by the rotation manager and the coordinatorship. The data were entered into the Excel program by three researchers. It was also checked by another researcher. At the end of the data processing process of the study, the documents were delivered to the student affairs office and archived.

Statistical Analysis

The data collected within the scope of the research were evaluated through the Microsoft Excel (Microsoft Excel for Office 365, version 1711; Microsoft Corporation, Redmond,Washington, USA) software program. A descriptive analysis was performed. Maximum and minimum frequencies and percentages were calculated for quantitative variables. Frequencies were calculated for qualitative variables.

RESULTS

The data of the study consisted of professional evaluations, observations and practices carried out by students taking the physiotherapy clinical practice course. The study included student report cards of 170 students. The student's mean aged was 22.93±3.88; 74.7% were female and 25.3% were male.

Table 1. Terms and Their Explanations in The Clinical Practice Guideline.

Terms	Explanations
Clinical practice coordinatorship	The coordinatorship consists of the programme leader, one or more academic consultants and a practical training coordinator
Academic consultant	One of the faculty members assigned by the programme leader to advise the students taking the clinical practice course
Pratice education coordinator	Institutional physiotherapist who ensures the organisation of the students during the clinical practice
Practice education supervisor	The physiotherapist of the institution that provides education to the student physiotherapist and supervises the student in rotations
Student physiotherapist	A 4th grade student who is entitled to take the clinical practice course
Student practice registration form	Clinical practice course application and observation numbers to be filled by student physiotherapist
Clinical practice course student report card	The form to be filled in at the end of the rotation by examining the student registration forms by the supervisor
Clinical practice assessment form	Guidance on the clinical practice course lecture notes to be given by the supervisor at the end of the rotation

Student report cards were prepared in the rotations carried out in four units (general physiotherapy, pediatrics, neurology, and orthopedics) according to the assessment, observation, and practice subtitles

in the reports, and study data were analyzed following these reports. Accordingly, the ten most and least used assessments or practices are listed in Table 2. Among the ten most used practices, exercise practices were the most popular with 10.37%. This was followed by some electrotherapy practices with 9.49% and some assessment methods (pain, joint range of motion, muscle strength) with 5.4%. The least frequently performed assessments or practices included some neonatal assessments/practices and some specific electrotherapy (biofeedback, iontophoresis) and hydrotherapy approaches.

Table 2. The Ten Most and Least Used Clinical Assessment and Applications.

Clinical assessment and applications	Maximum N (%)	Clinical assessment and applications	Minimum N (%)
Therapeutic exercises (P)	31554 (4.13)	Biofeedback applications (P/O)	1403 (0.18)
Applications of electrotherapy (P/O)	20860 (2.73)	Physical examination of the newborn (head circumference measurement, extremities, torticollis) (P/O)	1351 (0.18)
Superficial heat agents (P/O)	18389 (2.41)	Pool and spa applications (P/O)	1232 (0.16)
Deep heat agents (P/O)	16779 (2.20)	Iontophoresis applications (P/O)	1215 (0.16)
Use of electrotherapy modalities in early and late rehabilitation (P/O)	16410 (2.15)	Newborn normal motor development screening tests (P/O)	1181 (0.15)
Use of therapeutic exercises in early and late rehabilitation (P/O)	16295 (2.13)	Reflex control of the newborn (P)	1174 (0.15)
Home exercise program (P)	15750 (2.06)	Physiotherapy and rehabilitation in pediatric cancers (P/O)	714 (0.09)
Pain assessment (P/O)	13767 (1.8)	Physiotherapy and rehabilitation in neonatal intensive care (O)	662 (0.09)
Range of motion assessment (P/O)	13735 (1.8)	Taping in pediatric physiotherapy and rehabilitation (P/O)	282 (0.04)
Muscle strength assessment (P/O)	13571 (1.78)	Animal-assisted therapy approaches in pediatric rehabilitation (P/O)	0 (0.0)

N: Number; %: Prevelance; P: Practice; O: Observation.

The three most and least used approaches by units are listed in Table 3. Accordingly, the most used approach in general physiotherapy was exercise, while the least used approach was iontophoresis applications. While stimulation techniques are mostly used in pediatric rehabilitation, animal-assisted therapy approaches have never been used. While exercises were the most used in neurological patients, cardiovascular assessment methods were the least used. In orthopedic unıt, electrotherapy modalities were used the most, and continuous passive motion application was used the least. The percentages and pie chart of the clinical assessment and applications used in the units are shown in Figure 3.

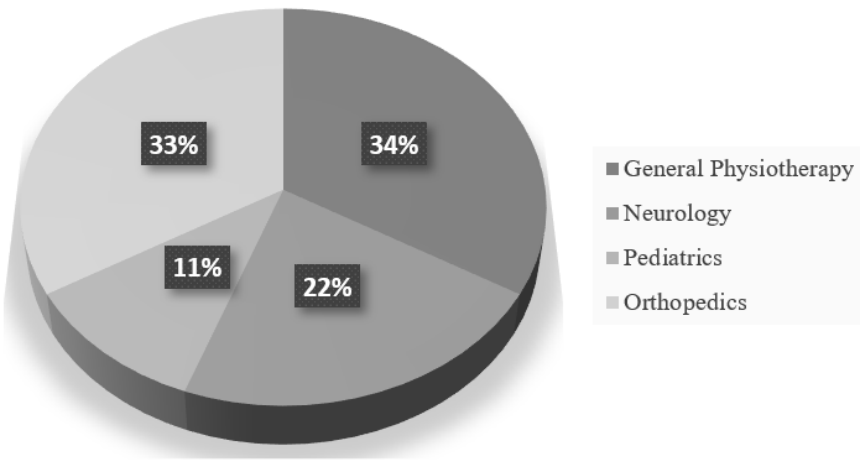

Figure 3. Overall Percentage of Approaches Used by Units.

Table 3. The Three Most and Least Used Clinical Assessment and Applications by Units.

	General Physiotherapy		Pediatrics		Neurology		Orthopedics	
	Clinical assessment and applications	**N(%)**	**Clinical assessment and applications**	**N(%)**	**Clinical assessment and applications**	**N(%)**	**Clinical assessment and applications**	**N(%)**
Maximum	Therapeutic exercises (P)	31554 (4.13)	Applications of electrical stimulation in pediatric rehabilitation (P/O)	9617 (1.26)	Therapeutic exercises in neurological patients (P/O)	11205 (1.47)	Applicationsof electrotherapy modalities in early and late rehabilitation (P/O)	16410 (2.15)
	Electrotherapy current applications (P/O)	20860 (2.73)	Using adaptive equipment in pediatric rehabilitation (standing table, triangular wedge, etc.) (P/O)	8992 (1.18)	Balance assessment (P/O)	10975 (1.44)	Applications of therapeutic exercises in early and late rehabilitation (P/O)	16295 (2.13)
	Superficial heat agents (P/O)	18389 (2.41)	Assessment of activity and participation in pediatric rehabilitation (P/O)	6300 (0.83)	Coordination assessment (P/O)	10807 (1.42)	Pain assessment (P/O)	13767 (1.8)
Minimum	Biofeedback (P/O)	1403 (0.18)	Physiotherapy and rehabilitation in neonatal intensive care (O)	662 (0.09)	Physiotherapy assessment and application in ALS and other MN diseases (P/O)	2247 (0.29)	Assessment of assistive device use (P/O)	5492 (0.72)
	Pool and spa applications (P/O)	1232 (0.16)	Taping (P/O) in pediatric physiotherapy and rehabilitation	282 (0.04)	Physiotherapy assessment and application in polyneuropathies (P/O)	2234 (0.29)	Discharge training (P/O)	4550 (0.6)
	Iontophoresis applications (P/O)	1215 (0.16)	Animal-assisted therapy in pediatric rehabilitation (P/O)	0 (0.0)	Cardiovascular system assessment of neurological disease (P/O)	2186 (0.29)	CPM applications (P/O)	2942 (0.39)

N: Number, %: Prevelance; P: Practice; O: Observation; ALS: Amyotrophic lateral sclerosis; MN: Motor neuron; CPM: Continuous passive motion.

DISCUSSION

In this study, a clinical practice guide was developed to monitor, measure and evaluate the clinical practice performance of students in clinical practice courses at the PTR department of a local university. The findings from the student report cards in this study not only show the useful aspects of the clinical practice course forms included in this guideline, but also point to several new implications or measures that need to be taken to improve them. The clinical practice guideline can be useful for monitoring how much students practice in which areas in clinical practice courses. It can give an idea about the areas in which students have gained experience. However, although it is seen that the students have reached the expected practical numbers, it still limits commenting on the nature and quality of the education provided. In the discussion section, the forms discussed within the scope of the study are presented together with the literature.

It was observed that fourth-year students at this university had more practice and observation numbers in general physiotherapy and orthopedic rotation areas compared to other rotation areas. Students gained more experience in therapeutic exercise applications, electrotherapy and heat agents, range of motion and muscle strength. These findings are probably due to the frequent use of these methods in physiotherapy practice rather than students' preferences (18). In addition, especially in their rotations in the field of pediatric physiotherapy, students had fewer practices and observations. The relatively low participation of students in this unit may have been influenced by variations depending on the patients

applying and/or the clinical conditions of the university. Generally, it is expected that the number of inpatients in the pediatric unit and the number of outpatients is lower than in other areas. On the other hand, when preparing the pediatric forms, it was not stated whether the specific types of interventions selected (e.g., animal-assisted interventions) might or might not be an opportunity to be carried out by the students. These findings supported a recommendation in the APTA Clinical Performance Instruments (CPI), which was reported at a time almost parallel to our study. APTA stated that CPIs may be graded as 'Not Applicable' for one or more of the performance criteria depending on the clinical setting in which students work (e.g., pediatrics) (19). From this perspective, the number of practices and observations that were underreported in the student report cards in our study should be updated by taking into account the recommendations in APTA CPIs. The researchers decided to update the forms by taking into account the students' opportunity areas in clinical practice in the new forms to be created in the future.

APTA updated the CPIs, which were designed in 1997 and revised in 2006 to evaluate student performance during clinical experiences, in 2023 (19). CPIs are completed by clinical instructors at midterm and at the end of the clinical experience. Students also complete a self-assessment using the same tool. During the student's clinical experience, the clinical instructor provides opportunities that allow the student to practice specific skills and behaviors (20). This new revision was made due to shortcomings in some performance criteria identified in previous CPIs (21,22). In our study, prominent shortcomings in monitoring the performance of PTR students in clinical practice areas were identified. Here, in line with the processes followed by APTA in CPI, three different forms were designed that were filled out by both the students and the clinical instructor, whom we defined as the practice education supervisor.

In the first form of the clinical practice guideline, students filled in the number of weekly applications and observations for each rotation. In this way, we aimed to ensure that students knew what was expected of them when filling out the registration forms. For this reason, the environment provided to students provided them with the opportunity to evaluate themselves, at least partially. In fact, it can be thought of as pre-notification and feedback. This process can be considered as a pre-notification phase in which the expected clinical practices are presented to the students. The pre-notification method, as a very popular research area in the field of education in recent years, covers the processes about task expectations, task-related objectives, criteria, quality and standards before students undertake a task (23). In addition, the fact that the application areas for students in clinical practices are carried out within a clearly defined framework and are followed by student notifications is similar to the tools used in physiotherapy programs in various countries, such as Canada (11).

The second form, which we define as the student report card, consists of the physiotherapist responsible for the rotation checking the student registration forms and reporting the total number of applications and observations at the end of the rotation. This was to check that the students had achieved sufficient clinical practice and observation numbers during the rotation. On the other hand, student report cards provide a similar pre-notification process for the practice education supervisor as for the students. In a previous study, clinical educators in the field of PTR reported that students were willing to be informed in advance, particularly about issues that affect student performance. Additionally, researchers have stated that if students fill out a learning needs form before each clinical practice, physiotherapy programs can identify students' educational needs and provide clinical instructors with proactive strategies to facilitate learning (24).

In the third form, the relevant rotation included *evaluation forms* that collected the students' attendance to the course, awareness of responsibility, attitude, and behavior, and the student's knowledge and productivity under four main headings. This form was graded by the practice education supervisor out of 100 points in total. If this grade is less than 60, the student is considered unsuccessful and loses the right to take the final exam at the end of the semester. The student repeats the failed rotation. Since this form was sufficient for all the students included in the study, it led us to conclude that the expected benefits of the previous two forms were achieved. The researchers agreed that students should be assessed not only for competencies in clinical skills but also for various job responsibilities, patient communications, and workplace discipline. On the other hand, it can be said that it is also suitable for

the use of CPIs previously determined by APTA "to guide the decision of clinical education directors/managers regarding the student's pass/fail status for the final year of clinical experience." (25).

Clinical education provides opportunities for students to integrate knowledge, skills, and attitudes and apply them in a clinical setting, enabling the student to become a competent, and autonomous practitioner (26). Studies continue to update and develop performance criteria in clinical practices in the field of physiotherapy around the world (19). Professional physiotherapy practice is constantly evolving. These developments should be reflected in qualifications, program criteria, and standards (6). More than 100 departments are providing PTR education at the undergraduate level in Turkey, and the occupancy rate of these departments is over 95% (27,28). Organizing the PTR undergraduate program in Turkey according to the core curriculum and implementing national and international accreditation processes in these departments, including the Bologna process, are the strengths of PTR undergraduate education in Turkey (27). Involving undergraduate students, who are among the key stakeholders in quality processes, in the process, monitoring their own professional and individual development, supporting their academic development, and receiving their feedback make very important contributions to the functioning of the process (29). In this respect, the study has the potential to contribute to future development studies on physiotherapist education in Turkey. However, the fact that students' opinions were not taken taken into account while preparing the current forms indicates the necessity of including students as stakeholders in similar studies to be conducted in the coming years. This is an inference that can enable the integration of undergraduate students into quality processes. We plan to have students contribute more to the process in the future. We intend to review the forms developed in our study at certain intervals over the years, taking into account the documentation and terminology of the NCEP, which we anticipate will be updated soon, and consultation with the internal and external stakeholders of the university as recommended by international institutions and organizations such as APTA (19,25,30).

Clinical practice is considered the most stressful module for undergraduate physiotherapy students. Similarly, previous studies have also reported that teaching students can be burdensome and stressful for clinical educators in terms of some factors, such as difficulties in supervising underperforming students and workloads in supervising multiple students at the same time (4,31-33). From this perspective, existing student report cards can support the practice education supervisor's student monitoring and evaluation process. All of the thresholds in the proficiency criteria in the student report cards in the study were achieved by the students. We think that these report cards have the potential to encourage students to practice and observe independently of the clinical instructor. We emphasize that this can be effective in reducing the stress on the practice education supervisor and the student.

The current study has some limitations. The fact that this study was conducted at a local university, with a single group of students and limited educators limits the generalizability of the findings. The aim and scope of the study are to improve clinical practice training in a single center. For this reason, it should be kept in mind that recommendations for clinical practice will be limited. On the other hand, the scarcity of similar studies at the national level makes it difficult to compare the findings with the existing literature. Feedback interviews with students after graduation or the completion of their practicum could have provided more information about the applicability of the forms. Also, feedback from graduated physiotherapists about clinical practice courses can be obtained to further improve quality processes. Although there are limitations in the current study, the fact that researchers have developed clinical practice forms within the framework of quality, and discussing the deficiencies that arise after the use of the forms can be considered an opportunity. In the field of physiotherapy, studies on quality focus more on post-graduate physiotherapists (34,35). In a recently published review focusing on quality education in physiotherapy students, it was reported that there were deficiencies in quality measures that included faculty observation and evaluation of students during clinical training (36). Quality improvement studies are of great importance in terms of improving training in clinical skills in physiotherapy (35). There should be adequate opportunities for students to acquire clinical competencies, demonstrate professional skills and behavior, and meet the expectations set out in this framework. The individual experience of each student, which may differ between students, should be monitored throughout the entire program to ensure that this broad scope is achieved and threshold competencies are met (12). Focusing on the role of the existing forms for clinical practice in helping to

identify deficiencies and areas for improvement in the student's performance and/or skills, providing a check for the student's progress during clinical experiences, facilitating the student's self-evaluation of clinical performance, identifying areas of incompatibility in the evaluation and/or expectations between the practice education supervisor and the student, and guiding the decision of the practice education supervisors regarding the successful or unsuccessful status, we believe that this first study has provided new perspectives for future processes (25).

CONCLUSION

In this study, a clinical practice guideline was developed to track and evaluate the performance of final-year physiotherapy students on clinical practice courses. Students were assessed using the forms included in the guideline. The findings from the student report cards highlight the need to review the number of applications and observations in some rotation areas. However, we believe that more comprehensive new studies should be undertaken to identify deficiencies and areas for improvement.

DESCRIPTIONS

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