

Research Article



Design, Implementation, and Evaluation of a Logbook for Clinical Education of Undergraduate Physiotherapy Students

Maryam A. Saba¹ , Nastaran Ghotbi^{1*} , Movahed Haghjoo¹ , Amirhossein Shamsi¹ , Rasool Bagheri²

1. Department of Physical Therapy, School of Rehabilitation, Tehran University of Medical Sciences, Tehran, Iran.

2. Department of Physical Therapy, School of Rehabilitation, Semnan University of Medical Sciences, Semnan, Iran.



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ABSTRACT

Introduction: Clinical performance without documentation, assessment, and feedback may lead to an inefficient internship in the field. Logbooks are recommended to assess physiotherapy (PT) students' clinical practice in the curriculum, therefore, this study aims to design, implement, and evaluate a logbook for undergraduate PT students.

Materials and Methods: The present study includes three phases. In the first phase, a logbook was designed based on the existing evidence, undergraduate PT program curriculum, and opinions of clinical instructors of the relevant internships. After that, it was adjusted based on the topics of clinical rotations. In the implementation phase, students completed these logbooks during neurology, musculoskeletal inpatient, outpatient, and cardiovascular inpatient rotations. In the third phase, a 29-item questionnaire was used to assess the students' and instructors' perspectives on the logbook.

Results: The designed logbook for undergraduate PT students consisted of two major sections, assessment of students' clinical competencies and documentation of clinical experience. Sixty-nine students and 12 clinical instructors completed the questionnaires. Approximately 49% of the students and 87% of the instructors felt that the logbook's quality was satisfactory. Nearly 53% of the students and over 90% of the instructors consider the use of the logbook and its content essential.

Conclusion: A logbook was developed as a workplace-based assessment (WBA) method. It was designed to cover different internships, including PT in musculoskeletal, cardiovascular, and neurological conditions in outpatient or inpatient settings. Both students and instructors agreed on using the designed logbook to assess the student's clinical performance.

Keywords:

Clinical competence; Logbook; Physiotherapy; Assessment; Education

* Corresponding Author:

Nastaran Ghotbi, Professor.

Address: Department of Physical Therapy, School of Rehabilitation, Tehran University of Medical Sciences, Tehran, Iran.

Tel: +98 (21) 77533939

E-mail: nghotbi@tums.ac.ir



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Introduction

Physiotherapy (PT) entry-level educational programs integrate theory, evidence, and practice [1]. The initial two years of the programs concentrate on basic sciences and principles of PT, while the clinical exposure begins in the second year. The practice aims to help the students merge theoretical knowledge and practical experience and acquire the practical skills required in everyday work [2]. The combination of clinical and theoretical teachings should be a significant focus of PT training to narrow the possible gaps between theory and practice [3, 4]. PT professional entry-level education programs should prepare the students for advanced communication and decision-making skills to work collaboratively with their patients/clients, colleagues, and other healthcare professionals [1]. These programs should teach students the skills that they can use in different situations required in the workplace [5]. PT clinical education (CE) began in the 1930s and is a significant component of the undergraduate curriculum [6]. The American Physical Therapy Association has published standards for designing and implementing CE programs for PT students as a guideline. However, it is unclear how regularly it is used [7]. A systematic review concerning CE in PT has shown insufficient substantial evidence to define and measure the quality of CE programs in PT [8]. Compared to traditional teaching methods, modern approaches, such as flipped classrooms in PT education have improved students' performance [9]. New approaches recruited in clinical settings for assessment may have the same effects on students' clinical performance.

However, clinical experience without assessment and feedback may lead to an inefficient internship in the field [10]. Considering that different medical programs have different educational components, the workplace-based assessment (WBA) of PT students needs to be unique. WBA consists of methods to gather evidence of clinical competence observed in clinical environments [11]. The logbook is a WBA method that consists of different sections. The main section aims to document and accumulate the students' clinical experience. It helps the students monitor their competence, recognize the gaps in their practice, and address them appropriately. Clinical practice documentation through reflective thinking and paying attention to different events during the treatment process will lead to conscious decision-making [12, 13]. The other section may include a global rating scale (GRS) form to assess the student's clinical competencies from the clinical instructors' viewpoint. Both

these sections are necessary for formative and summative assessment. In CE, with an active learning model in which the student, instructor, and patient interact cooperatively, instructors can improve experimental learning and comprehensive clinical reasoning [14]. Menatnia et al. have investigated the problems of CE from the PT students' viewpoints in Iranian universities, indicating that demotivation among students and poor participation of learners in the teaching-learning process is one of the obstacles to the success of clinical training [15]. A logbook is a tool that guides and informs the students on the goals of practical training, which allows the students to know what to learn and how to evaluate their learning experience when entering the clinical phase [16]. When appropriately designed and used, the logbook highlights the importance of quality rather than quantity of patient interactions, encourages a deeper level of reflection, and provides thoughtful feedback in undergraduate medical settings [17]. As shown in a study conducted by Talebi et al., PT students view logbooks as an effective and valuable tool to improve the teaching, learning, and evaluate the clinical skills of the learners [18]. It seems that cooperative learning can lead to better clinical judgment in the four domains of clinical competency, patient assessment, treatment planning, patient management, and professional behavior [19]. The proper evaluation of students' clinical competencies depends on the quality of their documentation.

Nevertheless, the assessment of clinical performance of PT students in rehabilitation schools in Iranian universities is limited to the clinical instructors' opinion during internships based on students' clinical activity, conference presentations, and oral or written exams as a summative assessment. Based on the evidence, no WBA method exists, such as a logbook designed explicitly for inpatient and outpatient settings and different fields. Therefore, this study was conducted to design, implement, and evaluate a logbook for undergraduate PT students that can be applied in different settings and internships.

Materials and Methods

This developmental and cross-sectional study has three phases, design, implementation, and evaluation, as shown in following flowchart:

Reviewing the available internal and external evidence, and collecting information and extracting students' clinical competencies

↓

Designing a GRS form to determine the students' clinical competency score

↓

Designing the documentation section, including students' clinical experience and lectures

↓

Completing the logbook

↓

Evaluating the logbook

Design phase

The design phase started in September 2018 and had two steps. During the first step, students' clinical competencies were selected, and in the second step, the documentation section was added.

First step: Clinical competency is an ability to assess the planning of the treatment program based on the assessment and diagnosis, patient management, and communication skills [20]. At first, 'expected procedural skills' were extracted from the PT bachelor's degree program approved by the Iranian Ministry of Health and Medical Education. Meanwhile, electronic information resources were being searched. Then, in an expert panel, including PT faculty members and clinical instructors from the School of Rehabilitation, [Tehran University of Medical Sciences \(TUMS\)](#), 13 essential items for PT students' clinical competencies were identified. These items included four main domains, patient assessment, treatment planning, PT interventions, and professional behaviour. Finally, the items were presented as a GRS form based on a 5-point Likert scale to determine the students' competencies score.

Second step: As mentioned earlier, assessing clinical competencies needs appropriate documentation. Therefore, in this step, we designed a section to document the students' clinical activities. The section itself included several parts [21]. One major part was called "students' clinical experience." Since the CE of PT students includes inpatient and outpatient settings, we designed a

framework for each. For this purpose, the physician's diagnosis and PT prescription, patient assessment, chest PT, and different types of exercise therapy (upper or lower limbs or four limbs, balance training) were added to the inpatient setting's logbook. For the outpatient setting's logbook, physician's diagnosis and PT prescription, patient assessment, types of thermal or electrical modalities, and manual therapy techniques (as a general term) were added. Since various PT interventions were observed depending on the patient's assessment (either in outpatient or inpatient setting), PT intervention items were extracted based on the most common PT treatments, i.e. electrotherapy, exercise therapy, and manual therapy. Furthermore, an item named "other" was added to cover all PT interventions. Considering the different nature of each internship, 'clinical experience' was modified and specialized for musculoskeletal, cardiovascular, or neurology internships, separately consulting with their relevant clinical instructors. In addition, some parts included to document the students' lectures, the total number of patients each student visited, and the estimated duration of each PT session.

Implementation phase

The designed logbook was introduced in the implementation phase, and the students were instructed to complete the 'documentation' section. Then the students completed their logbooks during clinical rotations in inpatient or outpatient settings. They selected each PT intervention item with a "√" (tick symbol). Students were allowed to note extra explanations about patient assessment or PT interventions in a relevant column in the 'clinical experience' part of the 'documentation' section.

Evaluation phase

This phase was performed in both Tehran and Semnan Universities of Medical Sciences. At first, a 5-point Likert scale researcher-made questionnaire was prepared based on previous studies [22] and the opinions of clinical experts. This questionnaire had three main parts, including logbook item content quality (11 items), the necessity of use (10 items), and the necessity of each item's existence (8 items). In addition, an open-ended question was asked at the end of the questionnaire. The content validity of the questionnaire was done with a qualitative approach and using an expert panel. This 29-item questionnaire was used to evaluate the various parts of the designed logbook from the viewpoints of PT students and clinical instructors at Tehran and Semnan Universities of Medical Sciences. The Likert scale with five levels ranging from 'strongly agree' to 'strongly

disagree’ was used to score the item. To calculate the participants’ perspectives about the logbook as a whole and its three main parts, each item was classified into three levels, satisfied was indicated as both agree and strongly agree (scores 4 and 5), ‘no idea’ indicated score 3, and ‘unsatisfied’ indicated both strongly disagree and disagree (scores 1 and 2). Therefore, a higher score indicates a more positive view of the participants.

Only students who had experienced at least one rotational internship were allowed to participate in this phase. Both groups were informed about the study’s aim and voluntarily completed the anonymous electronic form.

Results

Design and implementation phase

The designed logbook as a WBA method included two main sections. One section determined the students’

clinical competencies score, a GRS form with 13 items in four domains (Table 1). In the other section, called the ‘documentation’ section, students recorded all clinical activities during their internships. This section had several parts. A significant part was dedicated to recording the students’ clinical experience. This part was designed separately for each clinical rotation, i.e. musculoskeletal, cardiovascular, and neurology internships, and each setting (inpatient or outpatient). The ‘clinical experience’ part contained a table named PT interventions. In addition, some parts included to documenting students’ lectures, the total number of patients the student visited, and the estimated duration of each PT session. Tables 2 and 3 present two samples of “student’s clinical experience” parts.

As a relationship is observed between perceived competence in clinical skills and appropriate performance for patient treatment, students’ perceptions and attitudes toward their clinical skills significantly predict their actual

Table 1. Student’s clinical competencies GRS form

No.	Item	Very Good	Good	Moderate	Weak	Very Weak	Not Applicable
1	History taking and specifying patient’s complaints						
2	Careful examination and evaluation of the patient						
3	Paying attention to para-clinical reports						
4	Ability to extract the necessary information from the patient’s medical history (in the case of hospitalized patients)						
5	Ability to set short-term treatment goals based on evaluations						
	Ability to set long-term treatment goals based on evaluations						
6	Ability to determine treatment plans according to the goals						
7	Ability to re-evaluate and change the treatment plan based on the patient’s recovery						
8	Accurate documentation of assessments and treatment plans in the patient’s file or in the logbook (documentation skills)						
9	Education of the patient and, if necessary, his/her companions						
10	Inter-professional communication skills						
11	Appropriate communication with the patient and his/her companions						
12	Punctuality and timely attendance at the internship						
13	Feeling responsible for the patient						

Table 2. Student’s clinical experience of the musculoskeletal outpatient rotation

Clinical Diagnosis or Patient’s Chief Complaint	Physician Prescription for PT	PT Assessments	PT Interventions	Treatment Session Number	Clinical Instructor Confirmation
	<input type="checkbox"/> Exercise therapy <input type="checkbox"/> Electrotherapy <input type="checkbox"/> TENS <input type="checkbox"/> Laser <input type="checkbox"/> US <input type="checkbox"/> Hot pack <input type="checkbox"/> Other (Please write)		<input type="checkbox"/> Thermal agents <input type="checkbox"/> Electrical stimulators <input type="checkbox"/> Exercise therapy <input type="checkbox"/> Proprioception training <input type="checkbox"/> PNF <input type="checkbox"/> Manual therapy techniques <input type="checkbox"/> Other (Please write)		

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Abbreviations: PT: Physiotherapy; TENS: Transcutaneous electrical nerve stimulation; PNF: Proprioceptive neuromuscular facilitation; US: Ultrasound.

performance [3]. Therefore, another part was added for self-assessment of the student’s clinical skills in the GRS form with an open-ended question in which the students could explain what else they needed to improve their CE experience and the topics they wished to learn more about. Therefore, a comprehensive logbook was developed based on the competence and clinical experiences of PT students, including 6 parts.

The designed logbook has been used since September 2019 in neurology, musculoskeletal, and cardiovascular clinical rotations at [Tehran University of Medical Sciences \(TUMS\)](#) and [Semnan University of Medical Sciences \(SEMUMS\)](#). During this phase, the designers received feedback from the students and instructors to enhance the logbook.

Evaluation phase

The students and instructors answered the researcher-made questionnaire containing 29 items to evaluate different parts of the designed logbook. The questionnaire was completed by 69 students and 12 internship instruc-

tors at [TUMS](#) and [SEMUMS](#). Statistical analysis was performed by SPSS software, version 21. Descriptive statistics, such as Mean±SD, median, and percentage were used to report data.

Test re-test reliability of the questionnaire performed on 45 undergraduate PT students over ten days revealed a high internal consistency (Cronbach’s $\alpha=0.93$). The test re-test correlation coefficient ICC for the total score of the questionnaire was 0.93 ($P<0.001$), indicating high reproducibility. Moreover, the ICC for the item content quality was 0.82 ($P<0.001$), the ICC for the necessity of each item’s existence in the logbook was 0.67 ($P<0.005$), and the ICC for the necessity of use was 0.91 ($P<0.001$). The standard error of measurement was 1.15, and the minimal detectable change was 3.21 with 95% confidence.

A total of 48 students (69.6 %) were girls. The students’ mean age was 21.68 ± 1.21 years, with a grade point average (GPA) of 16.67 ± 1.29 out of 20; 50.7% of the students were in their third year of education; 49.60% of the students felt the logbook’s item content quality was sat-

Table 3. Student’s clinical experience of the neurology inpatient rotation

Clinical Diagnosis or Patient’s Chief Complaint	Physician Prescription for PT	PT Assessments	PT Interventions	Treatment Session Number	Clinical Instructor Confirmation
	<input type="checkbox"/> 4 limbs exercise therapy <input type="checkbox"/> Lower limb exercise therapy <input type="checkbox"/> Left/ right side limb exercise therapy <input type="checkbox"/> Upper limb exercise therapy <input type="checkbox"/> Chest PT <input type="checkbox"/> Balance training <input type="checkbox"/> Other (Please write)		<input type="checkbox"/> Limbs exercise therapy (please write which limb/s) <input type="checkbox"/> Balance training <input type="checkbox"/> Proprioception training <input type="checkbox"/> PNF <input type="checkbox"/> Patient education <input type="checkbox"/> Patient’s family or career education <input type="checkbox"/> Breathing exercises (<input type="checkbox"/> Expansions <input type="checkbox"/> Vibration <input type="checkbox"/> Percussion) <input type="checkbox"/> Other (Please write)		

PT: Physiotherapy; PNF: Proprioceptive neuromuscular facilitation.

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Table 4. Comparison of the students’ and instructors’ viewpoints of the logbook

Viewpoints of the Logbook	Mean±SD (Median)			Total
	The Necessity of Use	The Necessity of Each Item Existence	Item Content Quality	
Students (n=69)	3.48±0.85 (3.60)	3.55±0.69 (3.75)	3.41±0.64 (3.45)	3.48±0.63 (3.55)
Instructors (n=12)	4.59±0.56 (4.95)	4.45±0.51 (4.50)	4.37±0.52 (4.45)	4.47±0.51 (4.61)
P	0.000	0.000	0.000	0.000

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isfactory. The necessity of use (52.02%) and the necessity of each item’s existence (53.80%) were considered essential by all students. Twelve instructors (eight from TUMS and four from SEMUMS) who were involved in the CE of students filled out the questionnaire. Their positive opinion about the logbook was 90.33%. Table 4 compares students’ and instructors’ viewpoints of the logbook as a whole and its three main parts, including the necessity of use, the necessity of each item’s existence, and the quality of logbook item content.

When comparing the opinions of TUMS and SEMUMS students, despite TUMS achieving a higher score in each part (Figure 1), no significant difference was observed between them (P>0.05).

TUMS instructors showed greater satisfaction with both the necessity of use (93.75%) and the necessity of each item’s existence (92.19%) in the logbook. The logbook item content quality score was greater for SEMUMS instructors (90.91%). However, no statistically

significant difference was observed between the two universities in none of the parts.

Discussion

In the present study, a logbook was designed as a WBA method. It consisted of two main sections, a GRS form to assess undergraduate PT students’ clinical competencies and a documentation section with different parts. After developing and implementing the logbook, students’ and instructors’ perspectives about the logbook were evaluated. Both students and instructors confirmed item content quality, the necessity of use, and the necessity of each item’s existence in the designed logbook.

The main reason for CE in medical sciences is to develop students’ professional competencies [23]. A review of previous studies has shown that CE in rehabilitation sciences, including PT, can affect various factors, such as professional ethics, motivation, clinical competence, evidence-based treatment, and individual and environmental factors [14]. Cross, a lecturer in the Department

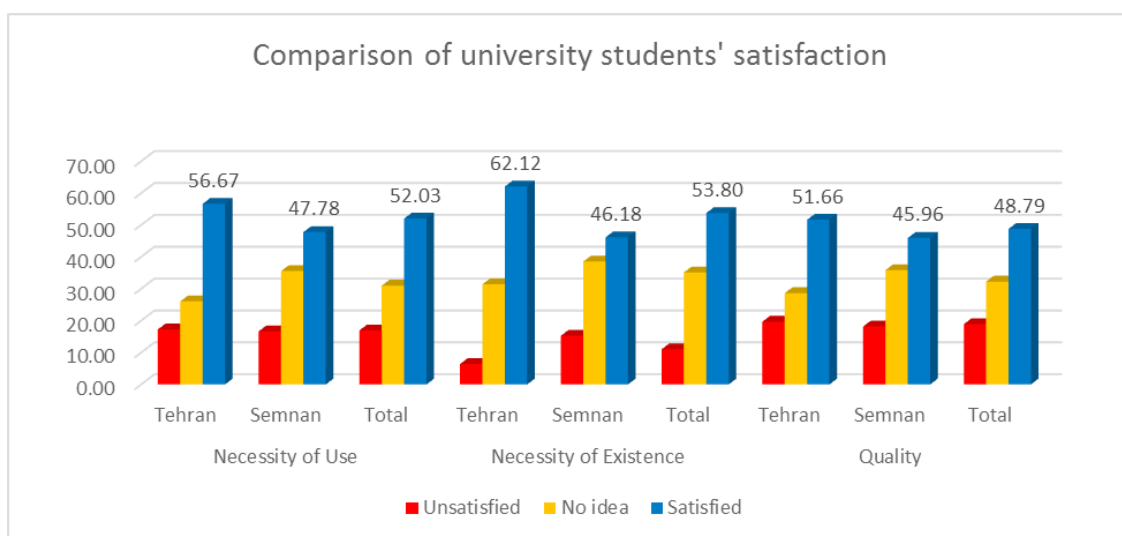


Figure 1. Comparison of students’ satisfaction

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of PT at the University of Birmingham, recruited PT students as learners and professional therapists as clinical educators and investigated the effect of recording therapeutic activities during CE [12]. His study showed that structured assignments to record therapeutic activities encouraged feedback thinking and created a space to thoughtfully examine what happened during the treatment process, which may lead to informed decision-making. The results also revealed that recording the events and considering them as a basis for personal and career development requires unique skill sets and is not easy. A scoping review by Anderson et al. investigated the implementation and use of WBA in clinical learning environments indicating that many WBA tools and programs have been implemented while barriers were common across fields and specialties. Students' concerns about the impact of WBA tools and programs on educational and learning experiences are reported as one of the barriers [11]. Dale et al. revealed in their study that the success of a logbook depends on proper communication between the learners and the clinical instructors. The learner must be prepared to take responsibility for their education, and the clinical instructor should take the time to review the logbook and be actively involved in checking and correcting it as part of their clinical duties [24]. Milanese et al. have concluded that clinical instructors should provide an adequate explanation of the educational activities that are not directly related to patient care [25]. Logbooks are frequently used in medical education to enhance and monitor students' learning, while some barriers that may diminish the benefits have been reported. The present study was conducted to evaluate the usefulness of logbooks in students' learning experience and identify the factors that may contribute to their outcomes in learning milieus. It showed that using a logbook can be a useful way to quantify and assess CE for undergraduate PT students. Faculty development programs and careful supervision of students' work may improve the outcome of logbooks in clinical placements.

Previous studies demonstrated that using a logbook may be a suitable and reliable method to assess the quality of medical education. The content, design, and implementation can affect the results as well. Hosseini et al. evaluated the clinical performance of operating room technology bachelor students using a logbook. The assessment includes 20 questions in the domains of fairness (2 questions), motivation and learning (4 questions), proper physical space for keeping and transporting (3 questions), having stress (2 questions), relevance with educational goals (3 questions), and good arrangement of contents (2 questions). The results showed that 83.3% of the students believed that the contents were

not designed in an appropriate order in the logbook, and 66.3% believed that evaluation with a logbook can cause stress [26]. Khorashadizadeh et al. evaluated the students' perceptions concerning the advantages and limitations of logbooks and their feedback. Their logbook questionnaire assessment tool to evaluate the quality of CE had three open-ended questions: What are the advantages of logbooks; what are the limitations of logbooks; and what are your recommendations to improve the use of logbooks [27]. Compared to our work, there are some differences in the results. In our study, 49.60% of the students felt the logbook item content quality was satisfactory. However, 83.3% of the students in the study of Hosseini et al. [26] believed that the contents were inappropriate. Other items, such as the necessity of use and the necessity of each item's existence, were not evaluated in previous studies. However, our results demonstrated that the necessity of use and the necessity of each item's existence was considered essential to some extent by the students.

Talebi et al. reported the opinion of 24 undergraduate PT students based on a 23-item questionnaire that had participated in at least one internship during the last six months about the logbook [18]. Their logbook was different from ours by five sections. Although it was more similar to a portfolio, it had no checkbox for easy documentation of PT interventions or a section to compare the physician's order and PT interventions. It did not have a section to document the estimated duration of each therapy session or compare the instructors' and students' evaluation of clinical competencies based on a unique GRS form. Furthermore, it was neither explicitly designed for different clinical settings (outpatient vs. inpatient) nor each specialized internship. The results showed that using a logbook for the CE of students, along with learning how to record and complete a patient's medical history and using the practical experiences of other students in treatment and recording these experiences, provide more self-confidence in using these experiences in the clinical environment.

Using a logbook as one of the components of a comprehensive assessment system, like any other assessment method, has its advantages and disadvantages, and its advantages depend on reducing the disadvantages. As Ghanbari et al. indicated in their study, for the logbooks to be considered a helpful assessment method that affects the overall improvement of educational goals, students should be monitored and receive feedback [28]. It seems appropriate to set up a training course to introduce the necessary skills for using the logbook during internships to make it more practical. Also, Maroufi et

al. investigated the status of the assessment system in one of the most prominent Iranian medical universities with 80 departments. They concluded that it is necessary to establish workshops to empower faculty members on the use of various tools based on WBA and also to employ medical education graduates to encourage the use of evaluation methods and continuous monitoring [29].

O'Connor et al., in their systematic review, discussed that nationally agreed assessment tools are relatively new in PT education. Ongoing development and examination of existing assessment instruments should be considered by PT professionals to ensure a more rigorous examination of the assessment tools. Engagement with other medical and allied health education providers may provide the PT profession with new perspectives on clinical performance assessment that may assist with reinforcing the current processes [30]. Another systematic review was conducted by Buckley et al. on the educational effects of portfolios on students' learning, focusing on clinical courses that led to training professional graduates [31]. The portfolio definition in this study was any tool to gather students' activities and their personal educational experiences, such as the information about the patients they visited and the related articles they read. For the logbooks to be considered in this study, they had to have the characteristics above and did not only include a list with the ability to tick. Nineteen out of 69 researchers included in the study belonged to medical programs, such as dentistry, PT, and radiology. The results showed educational benefits, including improvement in students' awareness and the ability to combine theory and practice and prepare for graduation, as well as improving the relationship between the students and instructors.

Mofateh et al. investigated the satisfaction of clinical performance evaluation using a checklist based on feedback from 43 undergraduate PT students who passed at least one internship. For data collection, they used a 19-item researcher-made questionnaire, including 8 domains at the end of the internship. The results showed that the mean satisfaction of PT students was 58.11%. The mean score of each domain in terms of the percentage of its maximum score showed that the lowest percentage was related to suitability (57.6%) and the highest percentage belonged to skill development (64.45%). The mean score of all domains was above 50% [32]. Najafi et al. examined the views of 100 nursing students who had two years of experience using logbooks during their internships in different clinical departments and 24 instructors at the Faculty of Nursing and Midwifery on the impact of using logbooks in the clinical environ-

ment [22]. The data collection tool was a 42-item Likert questionnaire and an open-ended question. The results showed that the instructors evaluated the necessity of using the logbook, how to complete it, and the success of using it more positively than the students. The researchers concluded that since a logbook should meet the learning needs of the students, it is necessary to revise its content continuously. In the present study, the logbook item content quality score was not different between SEMUMS instructors and the TUMS instructors (90.91%). Previous studies have not evaluated different university centers to compare the instructors' opinions about their logbooks' design. In this study, we did not implement any training classes or feedback that would cause uniformity in the induction of logbook completion in the two universities. Therefore, this study indicates the consistency and appropriateness of the content of the logbook for the students of the mentioned universities.

Conclusion

A logbook was developed to assess the clinical performance of undergraduate PT students that consisted of clinical experience and competencies in outpatient or inpatient settings. Both students and instructors were satisfied by the item content quality, necessity of use, and necessity of each item. Using a logbook seems to have encouraged personal development and contributed to the advancement of PT practice in clinical rotations.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles are considered in this article. The participants were informed of the purpose of the research and its implementation stages. They were also assured about the confidentiality of their information and were free to leave the study whenever they wished, and if desired, the research results would be available to them.

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Authors' contributions

Study design: Nastaran Ghotbi; Original draft preparation: Maryam A. Saba; Critical appraisal and manuscript revisions: Maryam A. Saba and Nastaran Ghotbi; Writing, data gathering, and data analysis: All authors.

Conflict of interest

The authors declared no conflict of interest.

References

- [1] World Confederation for Physical Therapy. Standards of physical therapy practice. London: World Physiotherapy; 2011. [Link]
- [2] Wrenn J, Wrenn B. Enhancing learning by integrating theory and practice. *International Journal of Teaching and Learning in Higher Education*. 2009; 21(2):258-65. [Link]
- [3] Talberg H, Scott D. Do physiotherapy students perceive that they are adequately prepared to enter clinical practice? An empirical study. *African Journal of Health Professions Education*. 2014; 6(1):17-22. [Link]
- [4] Vissers D, Van Daele U, De Hertogh W, de Meulenaere A, Denekens J. Introducing competency-based education based on the roles that physiotherapists fulfil. *Journal of Novel Physiotherapy and Physical Rehabilitation*. 2014; 1(3):1-6. [DOI:10.17352/2455-5487.000010]
- [5] Jones M, McIntyre J, Naylor S. Are physiotherapy students adequately prepared to successfully gain employment? *Physiotherapy*. 2010; 96(2):169-75. [DOI:10.1016/j.physio.2009.11.008] [PMID]
- [6] Rindflesch AB, Dunfee HJ, Cieslak KR, Eischen SL, Trenary T, Calley DQ, et al. Collaborative model of clinical education in physical and occupational therapy at the Mayo Clinic. *Journal of Allied Health*. 2009; 38(3):132-42. [PMID]
- [7] Soper S. American council of academic physical therapy clinical education summit. Alexandria: ACAPT; 2017. [Link]
- [8] McCallum CA, Mosher PD, Jacobson PJ, Gallivan SP, Giffre SM. Quality in physical therapist clinical education: A systematic review. *Physical Therapy*. 2013; 93(10):1298-311. [DOI:10.2522/ptj.20120410] [PMID]
- [9] Røe Y, Rowe M, Ødegaard NB, Sylliaas H, Dahl-Michelsen T. Learning with technology in physiotherapy education: Design, implementation and evaluation of a flipped classroom teaching approach. *BMC Medical Education*. 2019; 19(1):291. [DOI:10.1186/s12909-019-1728-2] [PMID] [PMCID]
- [10] Raghoobar-Krieger HM, Sleijfer D, Bender W, Stewart RE, Popping R. The reliability of logbook data of medical students: An estimation of interobserver agreement, sensitivity and specificity. *Medical Education*. 2001; 35(7):624-31. [DOI:10.1046/j.1365-2923.2001.00963.x] [PMID]
- [11] Anderson HL, Kurtz J, West DC. Implementation and use of workplace-based assessment in clinical learning environments: A scoping review. *Academic Medicine*. 2021; 96(11S):S164-74. [DOI:10.1097/ACM.0000000000004366] [PMID]
- [12] Cross V. The professional development diary a case study of one cohort of physiotherapy students. *Physiotherapy*. 1997; 83(7):375-83. [DOI:10.1016/S0031-9406(05)65791-4]
- [13] Benner P, Hughes RG, Sutphen M. Clinical reasoning, decisionmaking, and action: Thinking critically and clinically. In: Hughes RG. *Patient safety and quality: An evidence-based handbook for nurses*; Rockville: Agency for Healthcare Research and Quality; 2008. [Link]
- [14] Pashmdarfard M, Shafarood N. Factors affecting the clinical education of rehabilitation students in Iran: A systematic review. *Medical Journal of the Islamic Republic of Iran*. 2018; 32:114. [DOI:10.14196/mjiri.32.114] [PMID] [PMCID]
- [15] Menatnia F, Dehkordi SN, Dadgou M. Problems of clinical education from the viewpoints of the physiotherapy students in Iran universities. *Journal of Modern Rehabilitation*. 2017; 11(4):245-50. [Link]
- [16] Lotfi M, Zamanzadeh V, Abdollahzadeh F, Seyyed Rasooli A, Jabbarzadeh F. [The effect of using logbook on nursing students learning in gynecology wards (Persian)]. *Nursing and Midwifery Journal*. 2010; 5(19):33-8. [Link]
- [17] Gouda P. The need for logbooks to evolve in the undergraduate medical setting. *Perspectives on Medical Education*. 2016; 5(1):65. [DOI:10.1007/S40037-015-0249-X] [PMID] [PMCID]
- [18] Talebi GA, Ghaderi F, Eteraf Oskouei MA. [Using log book in clinical education of physiotherapy students (Persian)]. *Development Strategies in Medical Education*. 2014; 1(2):51-8. [Link]
- [19] DeClute J, Ladyshevsky R. Enhancing clinical competence using a collaborative clinical education model. *Physical Therapy*. 1993; 73(10):683-9. [DOI:10.1093/ptj/73.10.683] [PMID]
- [20] Mori B, Norman KE, Brooks D, Herold J, Beaton DE. Canadian physiotherapy assessment of clinical performance: Face and content validity. *Physiother Canada*. 2016; 68(1):64-72. [DOI:10.3138/ptc.2015-35E] [PMID] [PMCID]
- [21] Mori B, Brooks D, Norman KE, Herold J, Beaton DE. Development of the Canadian physiotherapy assessment of clinical performance: A new tool to assess physiotherapy students' performance in clinical education. *Physiotherapy Canada*. 2015; 67(3):281-9. [DOI:10.3138/ptc.2014-29E] [PMID] [PMCID]
- [22] Najafi F, Kermansaravi F, Mirmortazavi M, Gheisaranpour H. [The efficacy of logbook in clinical wards from the viewpoints of nursing faculty members and students (Persian)]. *Research in Medical Education*. 2017; 9(3):64-55. [DOI:10.29252/rme.9.3.64]
- [23] Hasanpour M, Mohammadi R, Dabbaghi F, Oskouei F, Nikravesh MY, Salsali M, et al. [The need for change in medical sciences education: A step towards developing critical thinking (Persian)]. *Iran Journal of Nursing*. 2006; 18(44):39-49. [Link]
- [24] Dale VH, Pierce SE, May SA. Benefits and limitations of an employer-led, structured logbook to promote self-directed learning in the clinical workplace. *Journal of Veterinary Medical Education*. 2013; 40(4):402-18. [DOI:10.3138/jvme.1212-115R] [PMID]
- [25] Milanese S, Gordon S, Pellatt A. Undergraduate physiotherapy student perceptions of teaching and learning activities associated with clinical education. *Physical Therapy Reviews*. 2013; 18(6):439-44. [DOI:10.1179/1743288X12Y.0000000060]

- [26] Hosseini M, Irajpour A, Hayrabedian A, Khusravi M, Rarani S, Ghadami A. A study of the views of bachelor students in operating room on evaluation of clinical performance using paper logbook, Isfahan University of Medical Sciences. *Annals of Tropical Medicine and Public Health*. 2017; 10(6):1668-72. [DOI:10.4103/ATMPH.ATMPH_576_17]
- [27] Fatemeh K, Alavinia SM. Students' perception about logbooks: Advantages, limitation and recommendation - A qualitative study. *The Journal of the Pakistan Medical Association*. 2012; 62(11):1184-6. [PMID]
- [28] Ghanbari A, Monfared A. [Survey of clinical evaluation process based on logbook and cognitive and psychomotor learning in nursing students (Persian)]. *Research in Medical Education*. 2014; 6(2):28-35. [DOI:10.18869/acadpub.rme.6.2.28]
- [29] Maroufi SS, Moradimajd P, Jalali M, Ramezani G, Alizadeh S. Investigating the current status of the student evaluation system in Iran University of Medical Sciences: A step to improve education. *Journal of Education and Health Promotion*. 2021; 10:231. [DOI:10.4103/jehp.jehp_1428_20] [PMID] [PMCID]
- [30] O'Connor A, McGarr O, Cantillon P, McCurtin A, Clifford A. Clinical performance assessment tools in physiotherapy practice education: A systematic review. *Physiotherapy*. 2018; 104(1):46-53. [DOI:10.1016/j.physio.2017.01.005] [PMID]
- [31] Buckley S, Coleman J, Davison I, Khan KS, Zamora J, Malick S, et al. The educational effects of portfolios on undergraduate student learning: A best evidence medical education (BEME) systematic review. BEME guide No. 11. *Medical Teacher*. 2009; 31(4):282-98. [DOI:10.1080/01421590902889897] [PMID]
- [32] Mofateh R, Orakifar N, Moradi N. [Satisfaction of clinical performance evaluation using checklist based on feedback from undergraduate physiotherapy students of Ahvaz Jundishapur University of Medical Sciences (Persian)]. *Educational Development of Judishapur*. 2021; 11(4):644-52. [DOI:10.22118/edc.2020.226250.1307]