Original Article

Assessment of Rehabilitation Medicine Education in Thai Undergraduate Medicine Curricula and its Relevance to General Practice: A Cross-Sectional Study

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ABSTRACT

Objectives: To evaluate the content of rehabilitation medicine in undergraduate medicine curriculum and its relevance to general practice

Study design: Cross-sectional study

Setting: Department of Rehabilitation Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Subjects: Medical graduates from the Faculty of Medicine Siriraj Hospital who practiced as general practitioners and graduated between 2018 and 2020

Methods: A total of 842 medical graduates were surveyed using a structured questionnaire consisting of three sections: basic characteristics information, rehabilitation medicine content aligned with the Medical Competency Assessment Criteria for National License 2012, and recommendations for teaching and learning management. Participants rated the content using a four-point Likert scale based on frequency and criticality. Frequency was defined as the frequency with which each topic was applied in general practice, while criticality referred to the importance of each topic in its clinical practice. Data were analyzed using the Rasch rating scale model, a psychometric approach that applied the logistic regression technique to transform ordinal ratings into an interval scale. The level of the variable is on the logit scale, and the measurement unit is referred to as a logit.

Results: The response rate was 24.2%. According to the model, the frequency scores ranged from -3.31 to 3.05 logits, and the criticalities ranged from -2.12 to 2.44 logits. Integrating these two factors determined the "relevance," representing the extent to which topics in the rehabilitation curriculum for medical graduates were relevant in their experience, with values ranging from -5.43 to 5.49 logits. The five most relevant topics covered were stroke (5.49 logits), pressure ulcers (4.68 logits), osteoarthritis (4.38 logits), diabetic foot ulcers (4.33 logits), and chronic obstructive sleep apnea (4.19 logits), respectively.

Conclusions: Stroke rehabilitation, pressure ulcers, and osteoarthritis were identified as the most relevant topics in rehabilitation medicine for general practice. Therefore, teaching management should consider the appropriate teaching hours and assessments.

Keywords: rehabilitation medicine, undergraduate medical education, program evaluation

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Introduction

Rehabilitation medicine aims to improve functional capacity and quality of life for patients with physical disabilities or impairments. These conditions impact the spinal cord, brain, nerves, joints, bones, muscles, ligaments, and tendons.[1,2] According to the report, in 2022[3], sixteen percent of people globally suffered from a major disability and required rehabilitation services.

Currently, changes in physical fitness, lifestyle, and sociodemographic patterns, such as the growing prevalence of noncommunicable diseases and an aging population, are contributing to a rapid increase in the number of people experiencing functional loss.[4] Similarly, the number of elderly individuals and persons with disabilities in Thailand, as in many places globally, is projected to increase.[5,6] Changes in public health problems, societal needs, and advancements in medical technologies prompt the need for improvements in medical knowledge and clinical practice.[7] As a result, medical schools and educational institutions need to develop and update medical curriculums in response to the changes in societal demands and provide learning strategies and assessment practices to develop medical students' skills so they will have sufficient knowledge and capabilities to become competent doctors able to deal both with patients and with such future disruptions that may arise. Therefore, the appropriate course content is a key component of the curriculum[8] and should be evaluated to determine its relevance to current societal needs, i.e., the topics covered.[9]

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The Faculty of Medicine Siriraj Hospital, Mahidol University, offers a six-year Doctor of Medicine Program. Within this curriculum, the Department of Rehabilitation Medicine provides learning experiences and knowledge in rehabilitation medicine to fifth-year medical students over a two-week duration. The course is designed to equip students with the essential knowledge related to functional impairments caused by common medical conditions. Course content is structured according to the Medical Competency Assessment Criteria for National License 2012[10], which categorizes learning into three groups based on symptoms, conditions, or diseases.

Group 1: Diseases/ symptoms/ emergency conditions in which the mechanism or disease must be understood. General practitioners (GPs) should be able to make an initial diagnosis and provide timely, appropriate treatment and management tailored to the specific situation.

Group 2: Diseases/ symptoms/ conditions in which the mechanism or disease must be understood. GPs should be capable of diagnosing, treating, and managing patients independently, including rehabilitation, health promotion, and disease prevention. In cases where the conditions are severe or too complex, GPs should manage the immediate problems and refer the patients to a specialist. Examples of such conditions include soft-tissue rheumatism, osteoarthritis, degenerative diseases of the spine, atelectasis, and lower respiratory tract infections.

Group 3: Diseases/ symptoms/ conditions in which the mechanism or disease must be understood. GPs should be able to perform differential diagnosis and understand the principles of patient care and management, including addressing immediate issues, making appropriate referral decisions, and providing rehabilitation, health promotion, and disease prevention. Examples of such conditions are peripheral nerve entrapment, such as carpal tunnel syndrome; motor impairments like hemiplegia, paraplegia, and tetraplegia; and cerebral palsy.

Rehabilitation medicine encompasses content from both groups 2 and 3, resulting in a wide range of topics that span multiple organ systems.

According to previous studies[11,12], rehabilitation medicine course content in Thailand has not been evaluated since 2006. Previous assessments identified standard procedures such as disability certification, therapeutic exercises, and bed positioning, as well as prevalent conditions like cerebrovascular diseases, musculoskeletal pain, and fractures of the extremities. Based on the previous article in China[13], the categories of rehabilitation therapy education included junior college, undergraduate, master's, and doctoral levels. The goals of the undergraduate curriculum were to develop knowledge of Chinese medicine, rehabilitation medicine techniques and technology, and work skills. In the USA, one medical school implemented a two-week musculoskeletal rehabilitation rotation to enhance clinical experiences for medical students.[14] While another medical school offered a two-week rehabilitation medicine course, including general lectures and clinical rotations alongside a physiatrist and a resident, to enhance the medical students' understanding of rehabilitation medicine.[15]

The rehabilitation medicine course has not been formally evaluated in terms of its content or alignment with the Medical Competency Assessment Criteria for the National License 2012.[10,16] The hypothesis is that the course content provides a comprehensive overview of common rehabilitation issues that medical students may encounter in clinical practice. However, some topics may be of limited relevance to GPs. Previous studies[17,18] have evaluated medical curricula by assessing the frequency of use and criticality of each topic in clinical settings. One study[19] utilized feedback from final-year medical students to evaluate preclinical content within these two domains and analyzed the results using the Rasch rating scale model to determine clinical relevance.[19] Gathering opinions from medical graduates working in diverse healthcare settings can further highlight which topics are most applicable in real-world practice. Therefore, this study aimed to explore the experiences and opinions of medical graduates from the Faculty of Medicine, Siriraj Hospital, regarding the relevance and appropriateness of the content for the rehabilitation medicine course in relation to the Medical Competency Assessment Criteria for the National License 2012. The findings could serve as a valuable resource for future revisions of the undergraduate rehabilitation medicine curriculum.

Methods

Study design

This study employed a cross-sectional design, utilizing both paper and online questionnaires as primary research instruments. The protocol for this study was approved by the Siriraj Institutional Review Board on August 17, 2020 (COA: Si 693/2020). This study was reported by the STROBE guidelines for observational studies.

Setting

This study was conducted at the Department of Rehabilitation Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand.

Participants

A total of 842 medical graduates from the Faculty of Medicine at Siriraj Hospital, with graduation years from 2018 to 2020, were invited to participate in the study. Participants were asked to complete questionnaires from September to December 2020, excluding those who had expressed an unwillingness to participate. Based on a sample size calculation of[20], the author set a 95% confidence interval, a margin of error of 7%, and an expected proportion of 0.5 in the population.[21] A minimum of 196 participants was required. Considering the anticipated dropout rate for survey study[22], at least 784 participants were expected to complete the questionnaire.[23]

As a result, all 842 medical graduates from three graduation years were provided with the questionnaire.

Outcomes measurements

A questionnaire was developed consisting of three parts, as described below.

The first part covered the variables of baseline characteristics, including graduation year, gender, age, total grade point average (GPAX), grade for the rehabilitation medicine element, types of current hospital workplace and medical field, number of hospital beds, number of physiatrist physicians in their workplace, interest in the medical field in the future, and experience in elective rehabilitation medicine.

The second part focused on the rehabilitation medicine course content domain, covering 93 topics. Of these, 58 topics pertained to medical conditions that required rehabilitation, and 35 topics focused on skills and modalities used in rehabilitation. The topics were based on the Medical Competency Assessment Criteria for National License 2012[10] and were validated by two physiatrists and one medical education specialist. Participants rated each item based on two aspects: "frequency" and "criticality," using a four-point Likert scale. Frequency referred to the number of times they applied specific knowledge in their practical experience, with the scores being 1: "never or rarely used the knowledge"; 2: "used the knowledge in a few cases"; 3: "used the knowledge sometimes"; and 4: "used the knowledge very often," respectively. In terms of criticality, this referred to the importance of each topic in their clinical practice, with the scores being 1: "unimportant," 2: "somewhat important," 3: "moderately important," and 4: "very important," respectively.

The third part of the questionnaire invited participants to offer suggestions for the teaching and learning management of rehabilitation medicine, including the appropriate class year and duration to study rehabilitation medicine, as well as open-ended suggestions for improving the course.

Statistical methods

The internal consistency reliability of the questionnaire was evaluated using Cronbach's alpha (Cα).

The usefulness of the rehabilitation medicine course content in the undergraduate medical curriculum for actual practice was analyzed using the Rasch rating scale model.[24,25] This model is a class of psychometric models that employs a logistic regression technique to transform ordinal ratings into an interval scale.[26] The key variables in considering the course content are frequency and criticality, and they are originally ordinal scales. The author aimed to transform the ordinal scale into the interval scale for mathematically analyzing the measures and investigating the relationships. The level of the variable is the logit scale, and the measurement unit is called logits.[26,27] This model allows for the comparison the obtained values. For example, the two logits are twice as much as the one logit. One logit plus two logits equal three logits. Moreover, the Rasch Rating Scale Model is capable of handling missing data without removing participants' responses entirely.

After analyzing by using the Rasch rating scale model, the sum of frequency and criticality gives the "relevance", which represents the relevant level of each topic in actual rehabilitation practice based on the GPs' experience.

For the descriptive statistics, categorical data, including the respondents' basic characteristics, were reported in terms of frequency and percentage. Numerical data, including logits of frequency, criticality, and relevance, were reported in terms of the mean and standard deviation.

The mean score for the "relevance" (on the logits scale) was compared based on each participant's characteristics using the independent samples t-test for two-group variables and one-way ANOVA for three-group variables.

Descriptive and inferential statistics analyses were performed using Statistical Package for the Social Sciences (SPSS) for Windows 18.0. The statistical significance level was considered as $p < 0.05$. The Rasch measurements were performed using WINSTEPS, a Rasch analysis and measurement software.

Additionally, open-ended suggestions for improving the course from the medical graduates were analyzed by a qualitative method.

Results

Basic characteristics of respondents

Overall, 204 respondents completed and returned the questionnaire (204/842, 24.2%), of whom 175 (85.8%) graduated in 2020. The mean age of the respondents was 24.6 years old, and 107 (52.5%) were male. The mean total grade point was 3.50 out of 4.00. The respondent cohort comprises 49 doctors working at a university hospital, 76 doctors working at a tertiary care hospital with a medical education center or a tertiary care hospital, and 79 doctors working at a secondary care hospital, community hospital, or other settings. Other characteristics were presented in terms of frequency in Table 1.

Reliability of questionnaire

Cronbach's alpha for the frequency domain in the questionnaire was 0.97. Cronbach's alpha for the criticality domain in the questionnaire was 0.98.

Frequency, criticality, and relevance of the course content in rehabilitation medicine

Frequency: The frequency scores of 93 topics that medical graduates applied during their general practitioner experience ranged from -3.31 logits to 3.05 logits, with a mean of 0 logits and a standard deviation of 1.29 logits. The five most frequent medical conditions requiring rehabilitation were stroke (3.05 logits), pressure ulcers (2.75 logits), chronic obstructive pulmonary disease (COPD) (2.62 logits), osteoarthritis (2.61 logits), and muscle strain (2.52 logits). Additionally, the

Table 1. Basic characteristics of the respondents

Basic characteristics	n (%)
Graduation year (n = 204)	
2020	175 (85.8)
2019	14 (6.9)
2018	15 (7.3)
Gender (n = 204)	
Male	107 (52.5)
Female	97 (47.5)
GPAX (n = 187)	
3.50-4.00	112 (59.9)
2.50-3.49	75 (40.1)
Grade in rehabilitation medicine (n = 186)	
A	117 (62.9)
B+, B, C+, and C	69 (37.1)
Types of current hospital workplace (n = 204)	
University hospital	49 (24.0)
Tertiary care hospital with a medical education center, tertiary care hospital alone	76 (37.3)
Secondary care hospital, community hospital, or other	79 (38.7)
Types of working[#] (n = 202)	
GP	132 (65.3)
GP with a special track	70 (34.7)
Field of interest (n = 190)	
Rehabilitation medicine	23 (12.1)
Other fields	167 (87.9)
Number of beds in the hospital (n = 202)	
< 500 beds	83 (41.1)
≥ 500 beds	119 (58.9)
Physiatrist in hospital (n = 202)	
Yes	157 (77.7)
Experience with elective rehabilitation medicine (n = 200)	
Yes	35 (17.5)

[#]Types of working

GP, general practitioner, GP with special track = general practitioner whose track involves the CPIRD (Collaborative Project to Increase the Production of Rural Doctors), or a specific track, including preclinical internship or internship in a specific ward in a university hospital; GPAX, total grade point average

five most frequent skills and modalities utilized in rehabilitation included the use of a walker (0.90 logits), use of axillary crutches (0.87 logits), advice on caring for pressure ulcers (0.64 logits), use of a lumbar support brace (0.41 logits), and teaching stretching exercises for the neck and shoulder muscles (0.39 logits).

Criticality: Among the 93 topics that medical graduates rated as important in terms of the course content they utilized during their general practitioner experience, the criticality scores ranged from -2.12 logits to 2.44 logits, with a mean of 0 logits and a standard deviation of 1.00 logits. The five most critical medical conditions requiring rehabilitation were stroke (2.44 logits), diabetic foot ulcers (1.96 logits), pressure ulcers (1.93 logits), traumatic brain injury (1.84 logits), and osteoarthritis (1.77 logits). Additionally, the five most critical skills and modalities needed in rehabilitation medicine in practice were disability certification (0.63 logits), advice on caring for pressure ulcers (0.51 logits), swallowing assessment (0.30 logits), and teaching stretching exercises for the neck and shoulder muscles and how to use a walker (0.26 logits).

Relevance: Of the 93 topics considered necessary course content based on general practitioners' experience, their relevance scores ranged from -5.43 logits to 5.49 logits, with a mean of 0 logits and a standard deviation of 2.25 logits. The ten most relevant medical conditions requiring rehabilitation were stroke (5.49 logits), pressure ulcers (4.68 logits), osteoarthritis (4.38 logits), diabetic foot ulcers (4.33 logits), COPD (4.19 logits), traumatic brain injury (3.86 logits), pneumonia (3.85 logits), gouty arthritis (3.78 logits), myofascial pain syndrome (3.69 logits), and muscle strains (3.61 logits), respectively, as shown in Table 2.

The five most relevant skills and modalities in rehabilitation practice were the use of a walker (1.16 logits), advice on caring for pressure ulcers (1.15 logits), the use of axillary crutches (1.10 logits), teaching/ providing advice on stretching exercises for the neck and shoulder muscles (0.65 logits), and teaching stretching exercises for the back muscles (0.44 logits), respectively, as shown in Table 3.

Table 2. Ten most common medical conditions requiring rehabilitation that are relevant for medical students to study in rehabilitation medicine

Rank	Topic	Relevance	Frequency	Criticality
		Logits	Logits	Logits
1	Stroke	5.49	3.05	2.44
2	Pressure ulcers	4.68	2.75	1.93
3	Osteoarthritis	4.38	2.61	1.77
4	Diabetic foot ulcers	4.33	2.37	1.96
5	Chronic obstructive pulmonary disease (COPD)	4.19	2.62	1.57
6	Traumatic brain injury	3.86	2.02	1.84
7	Pneumonia	3.85	2.19	1.66
8	Gouty arthritis	3.78	2.24	1.54
9	Myofascial pain syndrome	3.69	2.21	1.48
10	Muscle strains	3.61	2.52	1.09

Table 3. The five most relevant skills and modalities needed in rehabilitation

Rank	Topic	Relevance	Frequency	Criticality
		Logits	Logits	Logits
1	Use of a walker	1.16	0.90	0.26
2	Advice on caring for pressure ulcers	1.15	0.64	0.51
3	Use of axillary crutches	1.10	0.87	0.23
4	Teaching/Providing advice on stretching exercises for the neck and shoulder muscles	0.65	0.39	0.26
5	Teaching/Providing advice on stretching exercises for the back muscles	0.44	0.23	0.21

Conversely, the five least relevant medical conditions requiring rehabilitation were myelitis (-3.08 logits), sciatic nerve injury (-3.12 logits), common peroneal nerve injury (-3.31 logits), lumbosacral plexus injury (-3.39 logits), and poliomyelitis (-5.43 logits), respectively; In contrast, the five least relevant skills and modalities in rehabilitation were ultrasound (-3.02 logits), a below-knee prosthesis (-3.07 logits), an above-knee prosthesis (-3.22 logits), paraffin (-3.92 logits), and short wave diathermy (-3.97 logits), respectively.

Basic characteristics of the medical graduates who rated the relevance of specific rehabilitation medicine course content for actual clinical practice (relevance)

According to the basic characteristics of the medical graduate respondents, their scores for rating the necessity of the rehabilitation medicine course content for different aspects (relevance) ranged from -1.13 to 13.18 logits, with a mean of 3.91 logits and a standard deviation of 2.47 logits. The mean scores for rating the relevance of the course content by respondents who received higher grades in rehabilitation medicine (mean = 4.18, SD = 2.41) were better than those who graduated with a lower grade (mean = 3.43, SD = 2.50), $p = 0.046$. However, there were no significant differences in ratings based on other respondent characteristics, as shown in Table 4.

Suggestions for improving the rehabilitation course

Most medical graduates suggested that the fifth-class year of the medical program (93.2%) and a two-week teaching block (65.4%) were appropriate for gaining sufficient learning experience in rehabilitation medicine. At the same time, 17.6% and 14.7% of participants rated a three-week and four-week teaching block, respectively, as suitable for learning management.

From the open-ended suggestions, the results demonstrated that there were two major themes in the comments of medical graduates regarding improvements to the rehabilitation course in Doctor of Medicine Programs: learning experience (n = 15) and the use of media for education (n = 13).

Regarding the learning experience, integration with other departments and teaching in ambulatory care settings were suggested (n = 4), while other responders suggested traditional lectures should not be used (n = 2). Additionally, other participants thought rehabilitation advice, such as education in chronic diseases and practical points for consideration in rehabilitation settings for GPs, should be focused on (n = 9). Many also thought that technology-enhanced learning should be applied, such as the use of online resources (n = 8) and multimedia content and tools, including appropriate exercises for common diseases (n = 5).

Discussion

In this study, medical graduates from the Faculty of Medicine Siriraj Hospital, Mahidol University, reflected on their experiences as general practitioners (GPs) and considered the appropriate course content needed to address rehabilitation medicine and practice in Doctor of Medicine programs. The results of this study were consistent with those of previous studies in Thailand. Stroke and musculoskeletal conditions were the medical conditions for which medical graduates rated rehabilitation as the most helpful treatment, particularly Thai medical graduates who graduated between 2002 and 2004 from the Faculty of Medicine, Naresuan University.[11] Additionally, advice on caring for pressure ulcers was a commonly utilized skill in rehabilitation practice among physicians in Thai community hospitals.[12]

Stroke is prevalent in Thailand and many other parts of the world, representing a significant health burden to both individuals and society.[28,29] Stroke rehabilitation is crucial for enhancing the quality of life of stroke patients and for reducing their physical impairment and levels of functional dependency.[30] Interestingly, diabetic foot ulcers were also identified as a highly relevant topic. According to a previous study based on a multicenter registry in Thailand, the prevalence of diabetic foot ulcers in diabetic patients was 5.9%.[31] Thus, proper footwear is essential for preventing diabetic foot ulcers and their recurrence[32], and providing appropriate footwear and advice is an important aspect of the rehabilitation field. Additionally, COPD was also reported to be highly relevant in the experiences of many general practitioners. Previous literature has demonstrated that COPD is prevalent in Thailand[33] and represents both a health burden and an economic burden to patients in Thailand.[34] Therefore, pulmonary rehabilitation is crucial for improving patients' physical

Table 4. Different characteristics of the medical graduate respondents and their effects on their rating of the relevance of different rehabilitation medicine course contents for use in clinical practice

Basic characteristics	Mean (SD), logits	*p*-value
Graduation year		
2020	4.03 (2.56)	0.210
2019	3.21 (1.29)	
2018	3.12 (1.95)	
Gender		
Male	3.65 (2.26)	0.120
Female	4.19 (2.66)	
GPAX		
3.50-4.00	4.15 (2.49)	0.089
2.50-3.49	3.52 (2.42)	
Grade in rehabilitation medicine		
A	4.18 (2.41)	0.046
B+, B, C+, and C	3.43 (2.50)	
Types of current hospital workplace		
University hospital	3.83 (2.57)	0.930
Tertiary care hospital with a medical education center and tertiary care hospital alone	3.88 (2.55)	
Secondary care hospitals, community hospitals, and others	3.99 (2.34)	
Types of working[#]		
GP	3.65 (2.31)	0.055
GP with a special track	4.35 (2.71)	
Field of interest		
Rehabilitation medicine	3.58 (1.78)	0.52
Other fields	3.93 (2.58)	
Number of beds in hospital		
< 500 beds	3.94 (2.36)	0.83
≥ 500 beds	3.86 (2.56)	
Physiatrist in hospital?		
Yes	3.95 (2.52)	0.57
Experience with elective rehabilitation medicine?		
Yes	4.41 (2.85)	0.18

[#] Types of working: GP, general practitioner; GP with special track, general practitioner whose track involves the CPIRD (Collaborative Project to Increase Production of Rural Doctor), or a specific track including preclinical internship or internship in a specific ward in a university hospital

function and alleviating respiratory symptoms.[35]

Nevertheless, the present study revealed that the topics of below-knee prostheses and above-knee prostheses for general practice were of interest, given the decreasing number of amputee patients in recent years.[36] This trend might be attributed to advancements in medical knowledge and technology, as well as an increase in highly skilled vascular surgeons and orthopedic physicians over the past decade.[37]

The Medical Council of Thailand outlines broad rehabilitation competencies but provides limited guidance on disease-specific aspects. Given the short duration of rehabilitation rotations, curricula must focus on high-yield, practical topics that are relevant to the field of rehabilitation. Therefore, the rehabilitation medicine course for medical students was developed based on the Medical Council's standards, along with feedback from faculty seminars, the educational committee, and stakeholders.[12,38,39] This resulted in variations in topic selection and in allocated teaching hours across different institutions. Although our study did not directly measure teaching hours or the assessment weighting for each topic, the findings offered valuable insights to inform curriculum planning. Specifically, topics identified as highly relevant to general practice, such as stroke, pressure ulcers, diabetic foot ulcers, COPD, and musculoskeletal conditions, should be prioritized. Suppose any of these topics are currently underrepresented in teaching time or assessments. In that case, curriculum developers should consider adjusting the content accordingly to reflect their clinical importance and relevance to future practice. Specifically, we recommend emphasizing stroke rehabilitation, particularly in the acute care setting. Integration with internal medicine teaching, along with a focus on acute stroke rehabilitation, may enhance learning outcomes. For COPD, we recommend supplementing traditional content with online platforms and case-based discussions to reinforce

learning and enhance patient outcomes. Diabetic foot ulcers are already addressed within internal medicine; however, rehabilitation teaching should focus on reinforcing the importance of screening and interdisciplinary care. Musculoskeletal (MSK) pain, which was also rated highly in relevance, could benefit from expanded teaching time and diverse instructional strategies such as flipped classrooms, case-based discussions, simulations, and outpatient clinical exposure.[14] Skills-based assessment using Objective Structured Clinical Examinations (OSCEs) may also be appropriate, particularly for exercises and patient advice. In contrast, topics such as physical modalities and lower-limb prosthetics may be deprioritized if time is limited. Focus can instead be placed on the pre-prosthetic phase, including stump care and exercises, which align with the practical competencies required by the Medical Council's standards. Physical modalities might be incorporated into MSK teaching and outpatient clinics, where their use is most relevant.

Interestingly, respondents with higher grades in rehabilitation medicine gave higher ratings for the necessity of rehabilitation medicine course content, which was similar to a previous study that found a moderate positive correlation between practical scores and attitudes toward rehabilitation medicine among medical students.[40] However, other characteristics of the respondents did not affect the medical graduates' ratings of the rehabilitation medicine course content. A previous study found that neither gender nor academic level had a significant effect on the attitude of medical graduates and medical students toward rehabilitation medicine.[41]

Moreover, most medical graduates agreed that it was best to study rehabilitation medicine in the fifth-class year over two weeks. According to previous studies, an appropriate learning management approach with a two-week course dedicated to rehabilitation medicine can help medical students acquire sufficient knowledge in rehabilitation medicine[42] and improve their understanding of the rehabilitation field.[43] However, about one-third of participants suggested that rehabilitation medicine rotation should be managed over three or four weeks. This result was consistent with a previous study in a Thai Tertiary care hospital with a medical education center in the Northern area, which found that four-week rotations were considered appropriate for learning management according to students' opinions.[44] Extending the course duration from two weeks to four weeks would be highly challenging, as it would impact the overall curriculum structure. A feasible approach would be to encourage students to select rehabilitation medicine as an elective course or online platform.[44,45] Some medical graduates suggested that teachers should improve the learning experiences and use multimedia to support education in this area in future courses. Current learners might prefer further technological integration in their classrooms due to possible disruptions in education, such as those caused by the recent COVID-19 pandemic.[46] In previous studies, medical students in Croatia suggested that rehabilitation medicine courses should include more practical activities.[47] Meanwhile, medical students in the USA were impressed with the workshop format for teaching musculoskeletal diseases, physical examination, and clinical integration.[38]

This study offers valuable insights for evaluating and developing course content in rehabilitation medicine. However, the use of this information should be carefully considered, taking into account the context of each country and advancements in medicine and technology. Additionally, there are several limitations to note in this study. First, there was a low response rate, especially among medical graduates from the 2018-2019 graduation years, who predominantly worked in community hospitals. Therefore, the information might not reflect the opinions of general practitioners in community hospitals. Second, medical graduates who graduated in 2020 were surveyed when they had only limited experience as general practitioners, having worked for around four to six months, and they might not have encountered patients with certain medical conditions requiring rehabilitation in real-life settings. Third, most respondents were from the 2020 graduate year and had better GPAs and grades in rehabilitation medicine, which may represent a selection bias. Fourth, this study surveyed medical graduates from a single institute, which limits its ability to generalize the results to other institutions due to potential differences in learning experiences. Fifth, the inclusion of multiple topics in the questionnaire may have contributed to respondent fatigue, potentially affecting the accuracy of some responses.

Conclusions

Stroke rehabilitation, pressure ulcers, osteoarthritis, diabetic foot ulcers, and COPD were the most relevant contents. However, poliomyelitis, short-wave diathermy, paraffin, lumbosacral plexus injury, and common peroneal nerve injury were the least relevant contents. Most medical graduates suggested that the fifth year of the medical program, along with a two-week teaching rotation, was suitable for gaining a learning experience in rehabilitation medicine. The novel learning experience and the use of media for education were important concepts for enhancing the rehabilitation course.

Conflicts of interest declaration

The authors confirm that there is no conflict of interest related to the manuscript.

Generative AI declaration

The authors confirm that the following large language models (LLMs) or artificial intelligence (AI) tools were used in the preparation of this manuscript: ChatGPT for language editing and improving readability, and Grammarly for grammar correction. All generated content was critically reviewed and edited by the authors.

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Data availability

The data that support the findings of this study are available from the corresponding author, Phakamas Tanvijit, upon reasonable request.

Author contributions

Kanokphol Supasirimontri: conceptualization, data curation, funding acquisition, investigation, methodology, visualization, writing-original manuscript preparation,

Phairin Laohasinnarong: methodology, formal analysis, validation,

Cherdsak Iramaneerat: conceptualization, methodology, formal analysis, validation,

Phakamas Tanvijit: conceptualization, methodology, formal analysis, supervision, validation, writing-review & editing.

All authors read and approved the final manuscript.

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