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Knowledge towards Physical Medicine and Rehabilitation among Training Doctors and Medical Students at the Mohammed VI University Hospital of Marrakech

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Abstract

The aim of our study is to evaluate the knowledge regarding physical medicine and rehabilitation among physicians in training and medical students at the Mohammed VI University Hospital in Marrakech, to approach the knowledge, attitudes, and practices of doctors regarding physical medicine and rehabilitation and evaluate the knowledge in theoretical training related to PRM among the students. We conducted a monocentric cross-sectional analytical study, using a web-based anonymous survey, carried out among 558 undergraduate student and training doctors, randomly selected in the form of a survey on the knowledge towards Physical Medicine and rehabilitation. We received 558 survey duly completed by students of the Faculty of Medicine and Pharmacy of Marrakech (62.4%) and training doctors (37.6%). The mean age of the participants was 24.53 ± 3.9 years, with extremes ranging from 17 to 39 years. 52.7% of the participants were from the former educational reform, The predominance of participation was remarkable among pediatricians 23%, The population who knew PRM was the majority (79.3%), 40.7% of the participants were unaware of the availability of a PRM department at Mohamed VI University Hospital, 0.5% of all training doctors and medical students questioned strongly agreed with the sufficiency of their training in disability management were belonging to the new reform, 84.1% of participants had never attended or referred a patient to the PRM department. 23.2% of training doctors affirmed the referral of patients to PRM for further management. Despite the essential role of PRM in the management of diseases, it remains little known by training doctors and medical students. This lack of knowledge of PRM reflects the lack of the undergraduate and postgraduate of the medical education in the field of rehabilitation.

Keywords

Physical Medicine and Rehabilitation, PRM, Knowledge, Training Doctors, Medical Students

1. Introduction

Physical medicine and rehabilitation (PRM) is a medical specialty formalized by the World Health Organization (WHO) in 1968 [1]. The Pan American Health Organization (PAHO) defines rehabilitation as a set of interventions designed to optimize functioning and reduce disability in people with health problems in interaction with their environment and recognizes rehabilitation as one of the essential services defined in the framework of universal health care coverage [2] [3] [4].

The aim of our study is to evaluate the knowledge regarding physical medicine and rehabilitation among physicians in training and medical students at the Mohammed VI University Hospital in Marrakech, in order to approach the knowledge, attitudes and practices of doctors regarding physical medicine and rehabilitation and evaluate the knowledge in theoretical training related to PRM among the students, to raise medical staff awareness to the importance of this field, and its main role in the follow-up of chronic diseases, in order to improve the collaboration between physicians and PRM doctors.

2. Materials and Methods

We conducted a monocentric cross-sectional analytical and descriptive study involving 558 individuals, comprising students, interns, and residents. Participants were randomly selected through a survey assessing knowledge related to Physical Medicine among healthcare professionals, including students, interns, and residents. The study was carried out at the Mohammed VI University Hospital in Marrakech over a 6-month period from April 2021 to October 2021.

Our investigation specifically targeted training doctors, including interns and residents at the Mohammed VI University Hospital, in addition to students enrolled in the Faculty of Medicine and Pharmacy in Marrakech spanning from the 1st to the 8th academic year. The study excluded healthcare professionals such as nursing staff, midwives, anesthetists, wound care specialists, service supervisors, and laboratory technicians. Furthermore, PRM (Physical and Rehabilitation Medicine) training doctors and individuals unwilling to participate in the study were also excluded.

Studied Variables: The variables under investigation encompassed sociodemographic characteristics, including age, gender, professional category, and length of service for residents; academic year and exposure to the medical study reform for students and interns. Additionally, aspects related to knowledge about the Physical Medicine and Rehabilitation (PMR) discipline were ex-

amined, such as the source of knowledge, age group targeted for care, skills of a specialized PMR physician, and information about the PMR service within Mohammed VI University Hospital. The study also delved into the attitudes and practices of personnel, exploring collaboration between different specialties and PMR, as well as the training of students and interns in disability management.

For data collection, an anonymous individual survey was implemented using the Google Forms platform. The survey was disseminated within closed groups of students, residents, and interns on Facebook and WhatsApp, as well as through direct messaging via the Messenger instant messaging application.

To ensure broad participation, the survey was distributed in three rounds in April, June, and late July 2021. Statistical analyses were performed using SPSS version 21 software, with qualitative variables presented as percentages and quantitative variables as mean ± standard deviation for continuous variables. A significance threshold of $p < 0.05$ was established for determining statistical significance. Microsoft Excel and Word version 2013 were employed for generating graphical representations.

Participation in the study was voluntary, and participants had the autonomy to withdraw at any point. Submission of the completed survey indicated informed consent. The study adhered rigorously to the principles of participant anonymity, refraining from making value judgments about individuals surveyed. A formal expression of gratitude was extended to all participants for their involvement.

3. Results

3.1. Description of the Population by Socio-Demographic and Occupational Characteristics

We received 558 surveys duly completed by students of the Faculty of Medicine and Pharmacy of Marrakech (62.4%) and training doctors (37.6%) (**Figure 1**).

1) Gender:

In our study, 186 physicians and students were male (33.4%), for a sex ratio of 0.5. (**Figure 2**)

2) Age:

The mean age of the participants was 24.53 ± 3.9 years, with extremes ranging from 17 to 39 years. (**Figure 3**)

3) the new reform of medical studies:

52.7% of the participants were from the former educational reform, consisting of 67.70% training doctors, 32.3% students. The new reform of medical studies represented 47.3% of the surveyed population consisting of 95.8% students and 4.2% training doctors (**Figure 4**).

4) Training doctors' specialties:

The predominance of participation was remarkable among pediatricians 23%, gynecologists 12.3%, and then 6.2% of radiologists. The rest of the participation in the different specialties was close, varying between (4.3% - 0.6%) (**Table 1**).

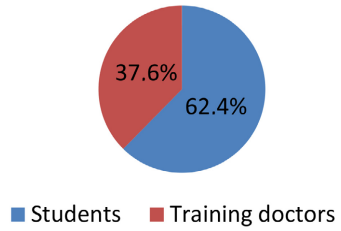

Figure 1. Participation rates.

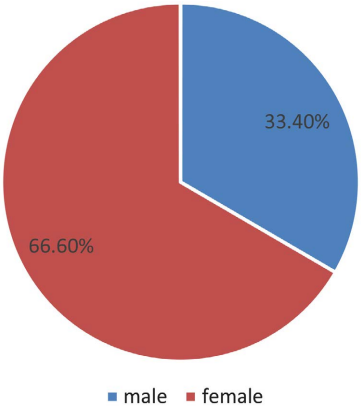

Figure 2. Participants by gender.

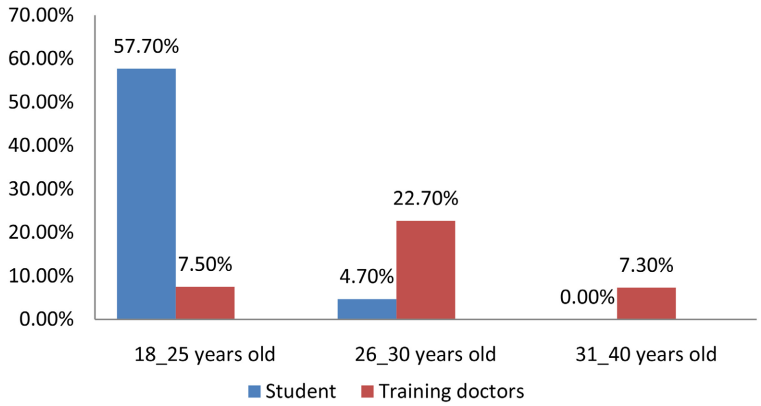

Figure 3. Distribution of participants by age.

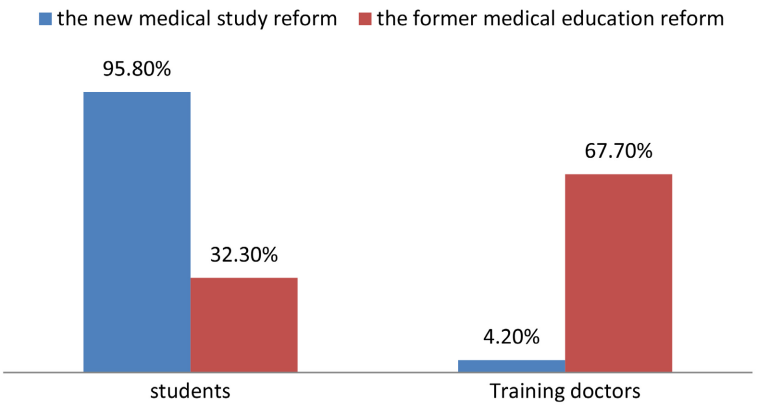

Figure 4. Distribution of participants by medical education reform.

Table 1. Percentage of participating training doctors specialties.

specialty	percentage	specialty	percentage
Biology	3.1%	Otorhinolaryngology	0.6%
Cardiology	1.2%	Pediatrics	23.5%
Cardiovascular surgery	1.2%	Clinical Pharmacology	0.6%
General surgery	3.7%	Pneumology	3.1%
Maxillofacial surgery	0.6%	Psychiatry	2.5%
Pediatric surgery	2.5%	Radiology	6.2%
Dermatology	4.3%	anesthesiology	3.7%
Endocrinology	1.9%	Rheumatology	2.5%
Epidemiology	0.6%	Trauma to-orthopedics	3.1%
Gastroenterology	2.5%	Urology	0.6%
Gynecology	12.3%	Ophthalmology	1.2%
Hematology	1.9%	Once-radiotherapy	3.1%
Infectious Diseases	1.9%	Neurology	3.7%
Community Medicine	1.2%	Neurosurgery	1.2%
Internal Medicine	3.7%	Nephrology	1.9%

3.2. Description of the Population by Knowledge and Attitudes

1) Knowledge of the specialty of physical medicine and rehabilitation (PMR):

Have you ever heard of the specialty of Physical Medicine and Rehabilitation (PMR)?:

The population who knows PRM was the majority (79.3%); composed of (54.60%) students, and training doctors (45.40%). The population unaware of PRM represented (20.6%) of the sample, predominated by students (92.2%), while training doctors occupied a total of 7.8%. (Figure 5)

- **Have you ever studied physical medicine and rehabilitation (PMR)?**

68.5% of the participants in the different functions had not studied physical medicine and rehabilitation, of which 47.8% were students, 52.2% training doctors (Figure 6). 31.5% of the participants who answered yes, were composed of 94.3% students and 5.7% training doctors (Figure 7).

2) Knowledge of the availability of the physical medicine and functional rehabilitation department (PMR) at the Mohammed VI University Hospital Centre.

40.7% of the participants were unaware of the availability of a PRM department at Mohamed VI University Hospital, of which 84.1% were students, 15.9% were training doctors, 59.3% of participants who affirmed the availability of the PRM department, at each function: 45.1% of the total number of students, 54.9% were training doctors participating in the study (Figure 8).

3) Training of medical students and training doctors in the management of disabilities:

Do you think that you are sufficiently trained in the management of disability?

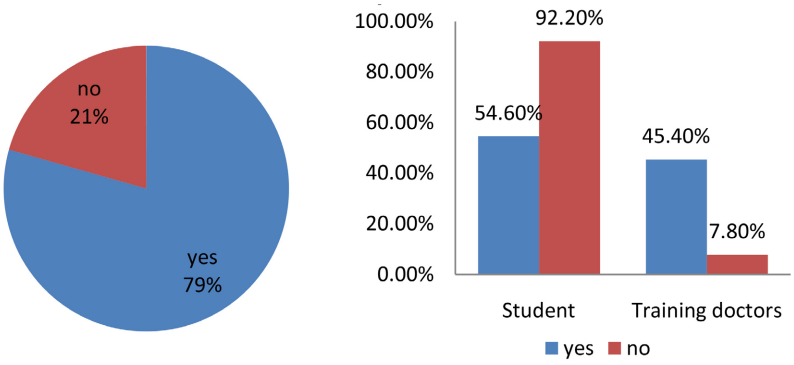

Figure 5. Distribution of participants who knows PRM.

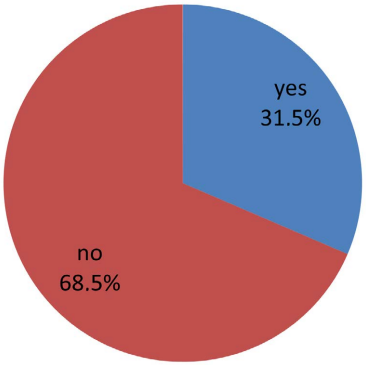

Figure 6. Distribution of participants according to their PRM study.

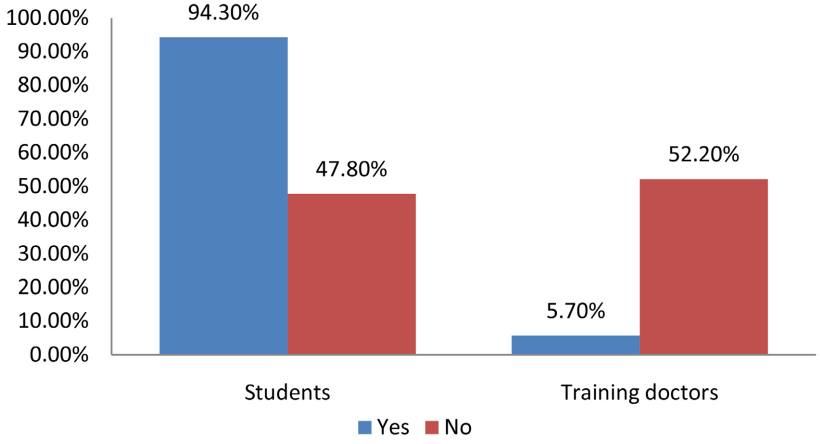

Figure 7. Distribution of participants according to their PRM study.

0.5% of all training doctors and medical students questioned strongly agreed with the sufficiency of their training in disability management belonging to the new reform (100%). 8.9% of these participants agreed and were satisfied with their training, 91.4% of this category were from the new medical education reform, compared to 8.6% from the old medical education reform. The main part had expressed its incapacity of this management: (50.8%) totally disagreed and (39.8%) in clear disagreement, composed this time of a more significant number of participants being part of the former medical study reform 35.5% (**Figure 9**).

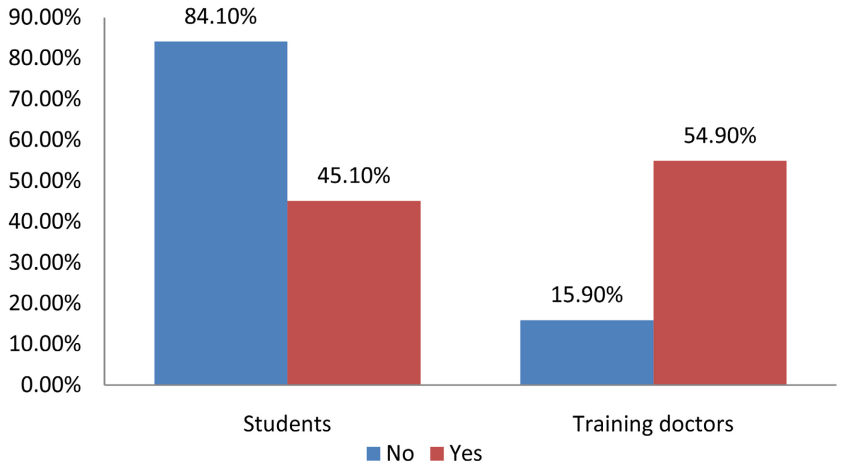

Figure 8. Participants' knowledge of the availability of the PMR department at the university hospital, by function.

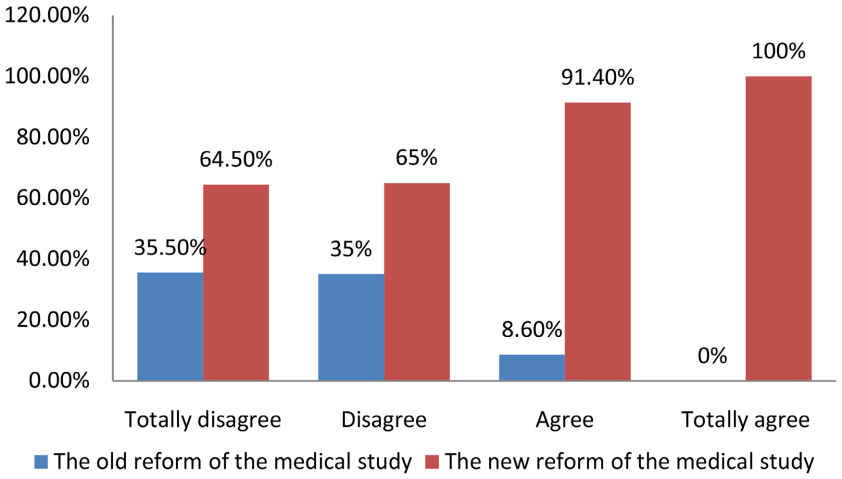

Figure 9. Estimation of training doctors and medical students on their training in the management of disability according to the medical study reform that they had.

3.3. Coordination between the Different Departments and Physical Medicine and Rehabilitation (PMR)

Have you ever referred, or assisted a patient referred to the PRM department?

84.1% of participants had never attended or referred a patient to the PRM department. 23.2% of training doctors affirmed the referral of patients to PRM for further management, according to their specialty, 15.3% of these training doctors were neurologists; followed by internal medicine 13.2%; 7.9% equally by traumatology and pediatrics. 15.2% of training doctors had requested a specialized consultation from the PRM doctor, 20% was done by Internal Medicine residents, 12% was requested equally by pediatricians and neurologists (**Figure 10**).

3.4. Analytical Study

To study the relationship between knowledge and participants category, we collected the correct answers to all questions about knowledge of physical medicine

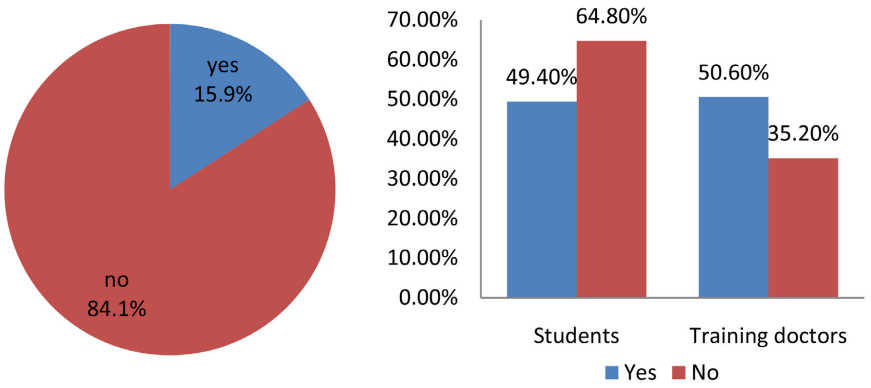

Figure 10. Percentage of participants' responses by function on referral to the PRM department.

and rehabilitation among physicians in training and medical students into a knowledge score (scored out of 20 points), each question in the knowledge portion scored 1 (means true) or 0 (means false), and the score in the knowledge portion ranged from 0 to 2, The scores of the different groups questioned were then calculated, to determine the presence or absence of a significant relationship between professional experience and knowledge of the interviewed providers, we used the correlation test for students, training doctors.

3.5. Correlation between Knowledge and Participants Category

Medical students' knowledge about PRM:

We find a lower-than-average knowledge score which is 9.84 + 4.16. The comparison of the averages between the years ranks, the 5th year students at the top with an average of 12.11 + 3.3, followed by the 4th and 6th year students, the score of the other groups of 1st, 2nd and 3rd year students was remarkably low 5.26 ± 3.343, also the 7th and 8th year.

Knowledge of training doctors about PRM:

The average score of training doctors was 12.32 + 3.9. The comparison of averages between the different specialties ranks, internal medicine residents at the top followed by oncology-radiotherapy, neurology, and rheumatology, anesthesiology, and pediatric surgery with a significant difference with the other groups where the average knowledge score did not exceed 10 such as dermatology, general surgery, maxillofacial surgery.

4. Discussion

Many studies have focused on the knowledge of healthcare personnel regarding PMR [5]-[10]. In our study, student participation is the largest (62.4%), in Morocco, the study by Fourtassi et al carried out in the university hospitals of Rabat and Casablanca contained 307 participants consisting strictly of training doctors [5].

In our study, we find a lower-than-average knowledge score for students, followed by training doctors with an above-average knowledge level (10), the cor-

relation between the knowledge level and the professional category is statistically significant, it has been shown that the knowledge score increases significantly with the professional seniority (the scale of professional category) ($p < 0.05$). Similar results were noted among training doctors at the University Hospital of Casablanca and Rabat in the Fourtassi and al. series. The average score for the level of knowledge of PMR was 15.63 + 4.51 on a scale of 0 to 25 [5].

The result of the students is close to the study of Khosrawi and al, where The average score of knowledge about PMR and its role in the diagnosis and treatment of disorders was: 5.16 ± 1.90 which is lower than the average (=7), which was an indication of low general knowledge [7].

Previous studies in Poland by P. Tederko and all using similar tools have shown a low level of knowledge regarding the role of PMR in health care among medical students and non-PMR physicians [8]. Similarly, Dénes Zoltán's study in Hungaria found that medical students and physicians do not have sufficient knowledge of rehabilitation to sufficiently perform medical activities [9].

The comparison of averages between the different specialties shows internal medicine training doctors at the top followed by oncology-radiotherapy, neurology, and rheumatology, reanimation and pediatric surgery with a significant difference with the other groups where the average knowledge scores did not exceed 10 such as dermatology, general surgery, maxillofacial surgery. This statistically significant difference is explained by the frequent collaboration of these specialties with PMR, so it is essential for these providers to have sufficient knowledge about the skills of these physicians.

These results are similar to the Fourtassi study, where 16.2% of the participating physicians were unaware that specialist training for physical medicine and rehabilitation is available in Morocco, and 19% thought that there were no specialists in this discipline practicing in Morocco [5]. In contrast, in SAUDI ARABIA 185 (92.5%) physicians reported knowing and/or having heard of PMR, while 40 (20%) responded that it was identical to physiotherapy [10].

In another study conducted in Saudi Arabia identifying general practitioners' attitudes toward PMR, most participants (92.2%) expressed insufficient knowledge imparted in musculoskeletal education in general practitioners' training courses and 84.3% had not studied courses on disability at all, general practitioners indicated that musculoskeletal physical examination was the most requested area of training [11].

The inauguration of the physical medicine and rehabilitation department within the Mohammed VI University Hospital of Marrakech was made in 2016 and the assignment of training doctors had begun in the 2016-2017 academic year. In our study, 45.1% of students confirmed the existence of a PMR department at the Mohammed VI University Hospital in Marrakech, although only 18.9% knew the year in which this discipline began.

In the POLAND study by P. Tederk *et al.*, 90% were aware of the existence of a rehabilitation service in the local medical school, 8.1% were unaware of it and 1.5% of these students thought that it did not exist but should be established [8].

A PRM specialist can diagnose, treat and provide rehabilitation methods for neurological, musculoskeletal, and other systemic diseases and disabilities (including sports and occupational cases) and the long-term management of disabled patients. He or she may lead multidisciplinary rehabilitation teams to create maximum improvement in physical, psychological, social and vocational function in patients whose abilities are limited due to disease, trauma, birth defects, or pain. The management of spasticity therapies is to be privileged in a rehabilitation environment in order to optimize the functional utility. The setting of personalized functional care pathways such as the pathway for amputees, hemiplegics, spinal cord injuries, etc [12]. Also iso-kinetic assessments, urodynamic assessments, for diagnostic and therapeutic follow-up, electro-physiological examination for complementary diagnostic purposes, detailed analysis (digital or not) of gate with or without devices, of gestures and postures, joint and vertebral manipulations, infiltrations under ultrasound guidance, for antalgic and anti-inflammatory purposes, for joint visco-supplementation, platelet-rich plasma in tendon fissures and certain stages of osteoarthritis, for the injection of botulinum toxin and alcohol.

In our study, 34.7% out of 62.4% of the total number of students interviewed believed that physiotherapy is one of the competencies of a PRM physician; in addition to this, massage appeared in 21.6% of their answers, as well as occupational therapy which was ticked off by 25.4% of the students, which are not part of the practices of a PRM physician. On the other hand, a percentage, 41.4% out of 62.4% of students, knew the different attributions of the PRM field.

According to the Greenville study, PRM physicians have a wide range of skills that include: amputation rehabilitation, orthopedic devices, management of developmental problems in children with disabilities, disability awareness and assessment, EMG, nerve conduction studies, patient/caregiver education related to rehabilitation, prevention of secondary medical problems in patients with disabilities, spinal cord injury rehabilitation, support for patients/families with disabilities [13].

In Poland, the PRM specialist has a central role in rehabilitation when there is a complex combination of deficiencies, such as cognitive, behavioral and physical deficiencies, in which physicians are trained to provide a holistic analysis of the situation and to bring together the assessments provided by allied health professionals [14].

Similar studies have been done in Croatia and Hungaria; 52% of the respondents see the leading role of the PRM doctor in overall rehabilitation, also 76% of the students in the sample, state that PRM is a basic medical specialty and that the referral to a consultation with a PRM specialist, as with any consultation with a specialist, can be delivered by any attending physician [8].

Our study showed a very limited collaboration between PRM and the following services: neurology, rheumatology, internal medicine, trauma and pediatrics, which request more specialized advice and refer their patients to the PRM department for appropriate management. Similar results on the level of collabora-

tion with PRM physicians were observed in the Fourtassi study which was as follows: 57.7% of the physicians questioned never sought PRM advice, while 79% referred their patients directly to physiotherapists [5]. This lack of collaboration of training doctors of university hospitals with PRM could be explained by the paucity of institutions with rehabilitation care units, as well as by the low medical demography [5]. In the Saudi Arabian study, it was observed that 55% of the physicians referred their patients to PRM care. Among the physicians referred in this study, 92 (46%) reported follow-up of their referred patients, 146 (73%) physicians reported patient improvement after PRM care, and 176 (89.5%) physicians highlighted the need for a specialist physician for rehabilitation care. In fact, 90% of the total number of physicians indicated that Saudi Arabia needs more rehabilitation hospitals [10]. The study done in Eastern Europe in Hungary, Poland, and Croatia, indicates that the percentage of specialist physicians who know and recommend to the treating physicians to refer the concerned patients to consultations as any specialty was 72% of the participating physicians [8].

Recommendation

Given our results and those of the literature [5] [15] [16] [17] [18], we recommend the integration of PRM into the first and second-year medical programs offers significant benefits on several levels: for medical students, for patients and for the field itself. More focus on PRM in the medical school program is needed. Major changes to medical education programs to implement mandatory rotations in PRM that are designed to focus on neuromuscular and musculoskeletal rehabilitation. More conferences and teaching sessions dedicated to rehabilitation after stroke or disability and specialized physical medicine courses should be offered during medical training. collaboration between medical school administrations, hospitals and national PRM organizations. standardized guidelines for rehabilitation training in medical schools.

5. Conclusion

Despite the essential role of PRM in the management of diseases, it remains little known by training doctors and medical students. This lack of knowledge of PRM reflects the lack of the undergraduate and postgraduate of medical education in the field of rehabilitation. In order to improve knowledge of this specialty and ensure its promotion, there is a need for action on several levels and collaboration between medical school administrations, curricular committees, hospitals and national PRM organizations.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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