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Survey of medical students' attitude and knowledge toward physical medicine and rehabilitation in Isfahan University of Medical Sciences

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Abstract:

CONTEXT: Physical medicine and rehabilitation (PMR) is a specialized clinical field of musculoskeletal diseases and physical impairment that is unknown for most of the medical students.

AIMS: This study aimed to assess medical students' attitude and knowledge toward PMR and its role in the diagnosis and treatment of musculoskeletal diseases.

SETTING AND DESIGN: This cross-sectional study was done on 175 medical students of Isfahan University of Medical Sciences from 2015 to 2016. Sample population was selected by random sampling among 350 students.

MATERIALS AND METHODS: Participants were evaluated by a research-made questionnaire with confirmed validity and reliability. This questionnaire included 36 questions divided in four parts including demographic data, knowledge, attitude, and performance ranking.

STATISTICAL ANALYSIS USED: Data were analyzed using SPSS 20. Statistical test for quantitative and qualitative variables was carried out by mean \pm standard deviation and percentage or number, respectively. For analyzing variables, Student's *t*-test and Chi-square test were used.

RESULTS: In this study, 150 medical students with a mean age of 24.48 ± 1.48 years participated of which 40% of them were male. The mean score of Student's knowledge about PMR and its role in diagnosis and treatment of disorders was 5.16 ± 1.90 , and 91.3% had low level of knowledge. The mean score of student's attitude toward PMR and its role in the diagnosis and treatment of musculoskeletal problems was 3.33 ± 0.46 , and 69.3% had attitude level above the average. Evaluation of student's performance showed that when they manage patients with musculoskeletal problems as general physician, they refer the patients to physiatrists at the first step if it is necessary.

CONCLUSION: Understanding the factors influencing the attitudes and knowledge of medical students is prime to help establishing the roles, providing proper facilities, carrying out successful planning to train expert physicians and create a motivated environment in medical schools.

Keywords:

Attitude, diagnosis, knowledge, musculoskeletal diseases, physical medicine and rehabilitation, treatment

Introduction

Physical medicine and rehabilitation (PMR) is a specialized clinical field of musculoskeletal diseases and physical impairment. Three major fields of PMR

include physical medicine, rehabilitation, and electrodiagnosis.^[1]

Musculoskeletal impairments are one of the common causes of visiting general practitioner around the world. Arthritis and other physical impairments are the second common medical condition after

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hypertension, which need medical treatment.^[1-3] Although general practitioners are the main group who evaluate and treat patients suffering from musculoskeletal disorders, PMR training and knowledge about this field are limited in Iran country.^[3] There are limited educational plans in most of the universities for PMR learning and in most health-care centers, patients' disabilities were denied.^[2]

There are limited studies on evaluating medical student's knowledge about PMR. York in his study indicated that it is necessary to measure and develop medical students' attitude toward physical medicine to improve patient care in this field.^[4] In a study held on 217 general practitioners in Shiraz, a medical educational course of low back pain was planned for these general practitioners. After that, these participants were evaluated by a questionnaire, of which 92% of them believed that their musculoskeletal education is insufficient, especially in physical examination field, and 56.8% of them reported that they had visited at least one patient with these problems during last month.^[2] Also, a 2-year study was conducted on 138 medical students. They followed a 2-week curriculum and did pre- and posttest about the attitudes and knowledge of students toward PMR. About 76% of them believed that musculoskeletal education is very important for medical students and 42% of them reported that this clinical curriculum should be planned in longer time duration.^[5] In Raeissadat *et al.*'s study, residents' attitude toward PMR was evaluated. Results of this study showed that specific programs are necessary for improving PMR collaboration with all specialties. Moreover, it is necessary to enhance the familiarity of medical residents with the field of PMR.^[6] Despite the burdens of health care, scant attention is devoted to musculoskeletal medicine in medical curriculum. Specifically, <3% of curriculum period in medical training is allocated to musculoskeletal medicine.^[7,8] A medical college association journal revealed that only 41.8% of medical universities had a musculoskeletal framework in preclinical years while only 20.5% of them have clinical course. The mean curriculum period was 2.3 weeks. Students of Harvard University had not enough confidence about musculoskeletal and physical examination skills.^[9] If more time is allocated for musculoskeletal and physical examination skills in curriculums, it can improve knowledge, attitude, skill, confidence, and proficiency of physicians in musculoskeletal disorders. Most of the Iran's medical universities lack systematized training of PMR. Only students of Shiraz Medical University has PMR curriculum in a month.^[2] Psychiatrists can fill this gap in medical training with sufficient skills in musculoskeletal anatomy, kinesiology, electrodiagnosis, physical examination, injection techniques, and evaluation of pain and impaired patients. Psychiatrists also participate in

cares of musculoskeletal disorders relating to different fields of study.^[10-15]

As PMR department of Isfahan University of Medical Sciences (IUMS) has been newly established as compared with other universities in Shiraz, Tabriz, and Tehran, we aimed to determine the knowledge and attitude of Isfahan University medical students toward PMR and its roles in the diagnosis and treatment of musculoskeletal diseases and subsequently in the development of educational activities.

Materials and Methods

This study was a cross-sectional descriptive study, which examined medical students of medicine faculty of IUMS from 2015 to 2016. Inclusion criteria were students studying medicine at the time of study, being at least in the 4th year of medical education course, and willingness to participate in this study. If students incompletely answered questions in questionnaire or if they did not want to continue their participation, they were excluded.

Sample population was selected by random sampling among 350 students. About 175 students were enrolled based on the available sampling methods and based on the number of medical students who satisfied the inclusion criteria. All medical students at internship and externship levels were enrolled to participate in this study.

Data were gathered by a research-made questionnaire which includes 36 questions in four parts including demographic data, knowledge (13 questions), attitude (10 questions), and performance (5 questions) toward PMR and its role in the diagnosis and treatment of musculoskeletal diseases. This questionnaire was researcher made and newly designed by ten professionals of PMR. After that, in a pilot study, this questionnaire was distributed among ten students and then Cronbach's alpha was calculated as 0.75.^[16]

Demographic data included age, gender, and educational level. Thirteen questions concerning knowledge were as follows: question 1 examined knowledge about the role of PMR in doing electrodiagnosis test, questions 2–6 examined knowledge level about the diagnosis and treatment of musculoskeletal problems, questions 8–10 evaluated their knowledge about cares of impaired patients in outpatient center, and questions 11 and 7 evaluated awareness about rehabilitation and improvement of quality of life in diseases such as multiple sclerosis (MS) and cerebrovascular diseases (CVD). Each question in knowledge part scored 1 (means true) or 0 (means false), and the score of knowledge part ranged from 0 to 13.

Attitude part included ten questions as follows: questions 1, 2, 4, and 6–9 evaluated attitude level of students toward diagnosis and treatment of musculoskeletal disorders while question 10 examined attitudes toward cares of impaired patients in outpatient clinics and question 3 evaluated attitudes toward rehabilitation and improvement of quality of life in diseases such as MS, Parkinson's disease, and CVD. Question 5 examined attitudes toward the role of PMR in doing electrodiagnosis test. Answers of these questions ranged from 1 (very slight) to 5 (very high), and the score of attitude part ranged from 10 to 50.

The third part evaluated student's performance as a general physician (GP), in referring the patients with neuromusculoskeletal disease to the physiatrists, orthopedists, neurologists, pediatricians, rheumatologists, and physiotherapists by asking five questions. About five cases were reported, and participants chose to which specialist should visit the patient and ranked these specialists from 1 to 6.

At the end of the questionnaire, students' tendency to participate in the field of PMR was evaluated by asking questions and their tendency was ranked from very low to very high.

All data were entered into SPSS version 20 (SPSS Corp., Chicago, IL, USA) and then analyzed. For reporting quantitative and qualitative variables, mean ± standard deviation and percentage or number, respectively, were used. For analyzing variables, Student's *t*-test and Chi-square test were used. A two-sided α level of 0.05 was used to assess statistical significance. This study was approved by Regional Bioethics Committee of IUMS.

Results

About 175 medical students were evaluated using questionnaires. 25 students returned incomplete questionnaires and so they were excluded from the study) response rate = 85.7%). Then, data about 150

participants were analyzed. The mean age of participants was 24.48 ± 1.48 years and 40% ($n = 60$) of them were male. About 42.7% ($n = 64$) were in internship and 57.3% ($n = 86$) were in externship.

The mean score of students' knowledge about PMR and its role in the diagnosis and treatment of disorders was 5.16 ± 1.90 , which was an indication of the general knowledge. Specifically, scores of the 137 (91.3%) students were less than the average. Furthermore, separate evaluations of awareness level about diagnosis and treatment of musculoskeletal problems, care of hospitalized impaired patients, improvement of quality of life in impaired diseases, and electrodiagnostic test showed that knowledge of electrodiagnostic test was at the greatest level (83.3%) and knowledge of the function of PMR in improving quality of life in impaired diseases was at the least knowledge level as compared with the average limit. Generally, awareness level about diagnosis and treatment was only acceptable as regard electrodiagnostic test while the other knowledge levels were below the average and were statistically insignificant [Table 1]. Moreover, the mean score of students' attitude toward PMR and its role in the diagnosis and treatment of musculoskeletal problems was 3.33 ± 0.46 . In 104 cases (69.3%), the attitude level reached above the average, which was statistically significant and acceptable ($P < 0.001$) [Table 2].

On the other hand, attitude toward care of inpatients (i.e., 3.74 ± 1.0) (was greater than attitude toward rehabilitation and improvement of quality of life in impaired diseases (i.e., 3.65 ± 1.19) and electrodiagnostic test (3.37 ± 1.06). Statistically, all levels of attitude were significant and above the average level [Table 2].

Evaluation of impacts of demographic parameters upon level of knowledge and attitude revealed that there were no statistical differences in knowledge and attitude mean score among participants with different age, gender, and level of education (knowledge: $P = 0.36, 0.52,$ and 0.23 and attitude: $P = 0.93, 0.67,$ and $0.34,$ respectively) [Table 3].

Table 1: Evaluation of students' knowledge about roles of physical medicine and rehabilitation

Knowledge	Range	Criteria*	Median	Mean±SD	P*
General knowledge	0-13	≤7	137 (91.3%)	5.0	5.16±1.90
		>7	13 (8.7%)		
Diagnosis and treatment of musculoskeletal diseases	0-7	≤3	136 (90.7%)	2.0	2.14±1.08
		>3	14 (9.3%)		
Care of hospitalized impaired patients	0-2	≤1	134 (89.3%)	1.0	0.80±0.61
		>1	16 (10.7%)		
Rehabilitation and improvement of quality of life in impaired diseases	0-2	≤1	129 (86%)	0.5	0.64±0.71
		>1	21 (14%)		
Role of PMR in doing electrodiagnostic test	0-1	0	25 (16.7%)	1.0	0.83±0.37
		1	125 (83.3%)		

*Criteria are the defined limit of materials and methods. Level of significance is measured by performing binomial test accordingly, * $P=0.05$. SD=Standard deviation, PMR=Physical medicine and rehabilitation

Table 2: Evaluation of students' attitudes toward roles of physical medicine and rehabilitation

Attitude	Range	Criteria*	Median	Mean±SD	P*	
General attitude	1-5	≤3	45 (30%)	3.25	3.27±0.41	<0.001
		>3	105 (70%)			
Attitudes toward diagnosis and treatment of musculoskeletal diseases	1-5	≤3	46 (30.7%)	3.28	3.33±0.46	<0.001
		>3	104 (69.3%)			
Attitudes toward care of hospitalized impaired patients	1-5	≤3	47 (31.3%)	4.0	3.74±1.03	<0.001
		>3	103 (68.7%)			
Attitudes toward rehabilitation and quality of life in impaired diseases	1-5	≤3	52 (34.7%)	4.0	3.65±1.19	<0.001
		>3	98 (65.3%)			
Attitudes toward the role of PMR in doing electrodiagnostic test	1-5	≤3	68 (45.3%)	3.0	3.37±1.06	<0.001
		>3	82 (54.7%)			

*Criteria mean the defined limitation of materials and methods. Level of significance is measured by performing binomial test accordingly, *P=0.05. SD=Standard deviation, PMR=Physical medicine and rehabilitation

Table 3: Evaluation of impacts of demographic parameters upon level of knowledge and attitude of medical students

Variables	Factors	Mean±SD	P*
Attitude	Male	3.27±0.31	0.932
	Female	3.27±0.47	
	Training	3.25±0.39	0.679
	Internship	3.28±0.41	
	Age ≤25 years	3.29±0.39	0.347
	Age >25 years	3.22±0.44	
Knowledge	Male	5.33±1.68	0.367
	Female	5.04±2.01	
	Training	5.04±1.69	0.521
	Internship	5.24±2.02	
	Age ≤25 years	5.06±1.90	0.232
	Age >25 years	5.51±1.90	

*P=0.05. SD=Standard deviation

Evaluation of students' performance showed that when they manage patients with musculoskeletal problems as GP, they refer the patients to physiatrists at the first step if it is necessary (mean ranking = 12.53) [Figure 1].

Tendency of students to practice in the field of PMR is statistically insignificant. About 32% (n = 48) of students believe that specialized courses of physical medicine should be offered during their medical education [Table 4].

Discussion

This study evaluated knowledge, attitude, and performance of medical students of Iran University of Medical Sciences about PMR. Most of the students in this study had a low level of knowledge about PMR and a high level of attitude. Most of the students refer PMR patients to physiatrists.

PMR is a medical expertise with the combination of physical medicine and rehabilitation.^[2] A physiatrist can diagnose, treat, and provide rehabilitation methods for neurological, musculoskeletal, and also the other systemic diseases and disabilities (including sports

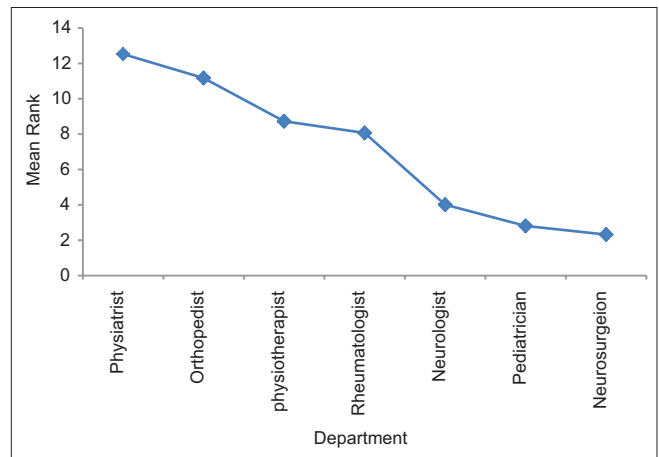


Figure 1: Ranking mean of performance of students as regard diagnosis and treatment of musculoskeletal problems

and occupational cases) and long-term management of disabled patients. He/she can lead multidisciplinary rehabilitation teams to create maximum improvement in physical, psychological, social, and occupational functions in patients with restricted abilities due to disease, trauma, birth defects, or pain.^[2,4]

With the burden of debilitating diseases and injuries that cause long-term disabilities, it is important that medical students are exposed to the principles of rehabilitation medicine. Some GPs are managing disabled patients in the clinics attached to organizations intended to deal with handicapped and disabled patients, and some visit more than fifty disabled patients monthly, but most have not studied the areas of rehabilitation relevant to these patients. Many GPs work in areas with poor access to specialized facilities. GPs should therefore be aware of the core principles of rehabilitation, be able to recognize rehabilitation needs in their patients, and have sufficient knowledge of their local rehabilitation services to trigger the referral process.^[13] Hence, it has a very important position in the medical field and it seems necessary to evaluate the level of students'

Table 4: Frequency distribution of students' tendency to the field of physical medicine and rehabilitation and necessity of physical medicine course

Tendency of students to physical medicine as a special field	Frequency (%)
Very low	47 (31.3)
Low	36 (24)
Moderate	41 (27.3)
High	15 (10)
Very high	11 (7.3)
The necessity of physical medicine course in curriculum	
Very low	27 (18)
Low	23 (15.3)
Moderate	52 (34.7)
High	31 (20.7)
Very high	17 (11.3)

understanding and knowledge and also their attitudes in this regard.

The results of this study showed that the level of knowledge about the field of PMR and its roles in the diagnosis and treatment of musculoskeletal system problems were weak so that the lowest level of knowledge was seen in the diagnosis and treatment and the highest level of knowledge was seen in the performance of electrodiagnostic test. In contrast, positive attitude was desirable and acceptable in the students as the highest level of attitude was toward the care of hospitalized disabled patients or outpatients. In fact, it should be stated that, although the level of knowledge about the field of PMR was not satisfactory, the attitude has been good.

There are limited studies that evaluated medical students' knowledge, attitude, and performance in the field of PMR. This study demonstrated that a majority of medical students had high level of attitudes and low level of knowledge toward PMR when compared to the average limit. Raissi *et al.* reported that most of the respondents believed that musculoskeletal education had not been sufficient in general practitioner training courses whereas musculoskeletal physical examination was the most needed educational field cited by general practitioners.^[2] This study clearly documented the inadequacy of basic rehabilitation training in medical schools. The findings reveal the most needed and preferred rehabilitation areas for general practitioners, and these should be considered in the establishment of rehabilitation training programs for Iranian medical students. Another study was done on 4th year medical students enrolled in a 2-week mandatory clerkship of the Department of PMR. At the start and end of the rotation, the participating students were tested by performing twenty physical examination maneuvers on an investigator. At the end of the rotation, the students also completed a survey.

The results indicated that the students felt that they had limited exposure to musculoskeletal examination skills before rotation and this rotation helped them achieve competency in performing the maneuvers, and that this would improve their future patient care irrespective of the field of choice.^[17] In this regard, Jahromi *et al.* in their study found that the average knowledge of nurses in two hospitals of Tehran University on one of the musculoskeletal diseases (osteoporosis) was more than 50% of the maximum score of knowledge,^[18] which in the opposite of the current study, the highest knowledge was in the area of diagnosis and prevention. Zhang and Chandran also checked the level of knowledge of nurses working in hospitals, rehabilitation centers, and clinics in the field of osteoporosis as one of the musculoskeletal disorders and reported a lower level of knowledge of nurses working in hospitals than rehabilitation centers and clinics and reported the highest score achieved in knowledge about diagnosis and prevention in the three centers.^[19] In line with this study, Yağmur has evaluated the knowledge level of medical staff including nurses and doctors, both during education and after graduation, that was low in more than 65% of them.^[20] Pérez-Edo *et al.* showed that primary care practitioners had a good level in the assessment of risk factors and prevention recommendations and also had an active and influential role in the diagnosis and follow-up of patients with osteoporosis.^[21]

In a study by Day *et al.*, medical students rated musculoskeletal education to be of major importance (3.8 from 5), but rated the amount of curriculum time spent on musculoskeletal medicine as poor (2.1 from 5). Third-year students felt a low-to-adequate level of confidence in performing a musculoskeletal physical examination (2.7 from 5) and failed to demonstrate cognitive mastery in musculoskeletal medicine (passing rate on competency examination: 7%), whereas 4th year students reported a similar level of confidence (2.7 from 5) and exhibited a higher passing rate (26%). Increasing exposure to the subject by taking clinical electives resulted in greater clinical confidence and enhanced performance on the examination.^[22]

In this study, a high level of knowledge in students about electrodiagnostic studies is an advantage because electrodiagnosis is an important, specific diagnostic method in the diagnosis of disease, its causes and treatment of neurological and musculoskeletal disorders can be useful for the specialists. So, perhaps, the students in our study have taken the first step on the path to success because it usually requires a positive attitude to reach the goal or practice, but regarding the medical students who are considered as a subset of the main forces in the health-care system and as they should maintain and promote public health in the future, it is

necessary to take strategies to increase their awareness and knowledge.

In addition, evaluating the role of demographic factors on knowledge and attitudes of the students indicated that factors such as gender and educational level had no significant role in the level of knowledge and attitude, although the level of knowledge and attitude of interns was slightly higher than that of trainees.

As stated earlier, the high prevalence of musculoskeletal conditions and the impact they have on patients across a broad spectrum of medical practices such as pediatrics, emergency medicine, family practice, and internal medicine justify the need for all medical students on the basic understanding of musculoskeletal medicine.

Finally, the tendency of students to physical medicine as a special field was very low in 31.3% and very high in 7.3%; they have stated that it is necessary to add a course of physical medicine in curriculum to increase the level of their knowledge in this area.

This study has several limitations like other researches. This study evaluated 150 medical students in one medical university and this sample size is too short for generalizing these findings to the whole population. Further studies are needed to evaluate medical students in greater sample size who are selected from more than one medical university in the country. In this study, a research-made questionnaire was used for evaluating knowledge and attitude of medical students toward PMR and for future studies, maybe it is better to use more standard and an international questionnaire to make more availability for comparing study findings with that of other international studies.

Conclusion

Understanding the factors influencing the attitudes and knowledge of medical students is prime to help establishing the roles, providing proper facilities, carrying out successful planning to train expert physicians and create a motivated environment in medical schools.

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Conflicts of interest

There are no conflicts of interest

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