Educational Needs of General Practitioners in the Domain of Orthopedic Disorders: Investigating the Differences from the Viewpoints of Medical Trainees, Interns, Orthopedic Assistants, and Professors

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Abstract

Background: To characterize the educational needs of different sectors and to improve educational quality, investigating learners' attitudes is of utmost importance. Thus, the present study was designed and implemented to assess the educational needs of general medicine from the viewpoints of medical trainees, interns, orthopedic assistants, and professors.

Methods: In this cross-sectional study, 154 medical trainees, interns, orthopedic assistants, and professors at Isfahan University of Medical Sciences, Iran, in 2018 were investigated. The data collection instrument was a researcher-made questionnaire, comprised demographic characteristics information and 44 common symptoms of orthopedic disorders. The validity and the reliability of this research instrument was further reviewed and verified in a pilot study.

Results: The findings of this study revealed top 10 priorities of educational needs in the groups included low back pain, carpal tunnel syndrome, ankle sprain, General Principals of Fracture and Dislocation, lower limb fractures, diabetic foot problems, upper limb fractures, osteoporosis, and spinal discopathy, as well as complications of fractures and dislocations. Besides, a significant difference was among the study groups in the cases of low back pain, carpal tunnel syndrome, diabetic foot problems, and spinal discopathy.

Conclusion: The study results led to identify top 10 priorities of educational needs in general practitioners associated with orthopedic symptoms and disorders. It is recommended to carry out further investigations to ascertain appropriate contexts for teaching such priorities and organizing the relevant educational contents.

Keywords: EDUCATIONAL NEEDS ASSESSMENT, GENERAL MEDICINE, ORTHOPEDICS, MEDICAL EDUCATION

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Introduction

The basic role of general practitioners (GPs) as one of the mainstays in a health system, in the front lines of treating patients is an evident fact (1). Moreover, the main goal of training physicians at medical schools is to improve physical, mental, and social health status in individuals covered by health systems (2). The given goals cannot be realized and met without

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considering the medical education quality; thus, attention to enhance medical education efficiency in Iran has been considered since the 1990s (3). Improving the quality and efficiency of educational system through the students learning needs assessment is also a significant key step in education (4). In this respect, needs assessment is known as a method by which the needs are assessed and identified in practice and even distinguished by target groups (5). In the educational system, needs are similarly the most important factors to design training courses, teaching required topics, and design the type of education that is desirable for learners; however, the need for medical education in Iran seems to be inferior to that in developed countries (6). Besides, studies have shown that no identification of learners' needs is one of the main causes of educational problems. Therefore, if medical education programs are not designed and implemented in accordance with the fundamental needs, they can result in loss of appropriate educational opportunities in addition to waste of resources and facilities, which will solve neither the problems nor the needs in the society (5).

Given the ever-increasing changes in academic and therapeutic contexts; the more efficient the clinical education, the more prepared the today's students for the future (7). However, studies are confirming the lack of knowledge and skills in graduates of medical schools in this regard as well as their dissatisfaction with the training provided (8, 9). The speed of changes in the health system, especially orthopedic medicine and community needs, have even made it essential to revise and make changes in medical education so that skilled and qualified GPs will be trained (10, 11). On the other hand, inconsistency between the needs of society in the domain of orthopedic disorders and traumas and attention to this issue in the medical students' curriculum, along with 15-30% prevalence of visits of outpatient-related diseases in the United States and Canada have covered up the needs to fundamental changes in teaching these topics, according to the main needs of GPs (8, 12, 13).

Accordingly, studies conducted in this domain such as one at the University of Sheffield in the United Kingdom (UK) have been specified the essential educational contents for GPs. For this purpose, in this study a list of signs and symptoms of common disorders was determined by using educational resources of medical schools. Then, the more common cases were selected and subsequently prioritized by using the comments of the university professors. In the next stage, the required educational contents utilized for training GPs were specified through evaluating the opinions of professors who work in different departments (12). In another study at the University of Manchester, the UK, 215 critical clinical situations were identified for GPs (13). At Isfahan University of Medical Sciences, Iran; a survey was done on 64 GPs working in urban and rural healthcare centers, doctors' offices, and round-the-clock clinics in the city of Isfahan, Iran, based on the diseases related to pediatric, surgery, obstetrics and gynecology, and internal medicine and the results were classified according to the most common signs and symptoms (14).

Due to the limited number of studies on the community needs in terms of the prevention and treatment of orthopedic disorders and the need for educational planning in accordance with the medical requirements of GPs, the importance of assessment of educational needs of GPs and medical students in the field of orthopedic disorders, as well as uncertainty about the attitudes of medical trainees, medical interns, orthopedic assistants, and professors in this field; the present study was designed and implemented to assess and compare the educational needs of GPs from the viewpoints of medical trainees, interns, orthopedic assistants, and professors at different levels of activity.

Methods

This cross-sectional study was conducted

in 2018 at Isfahan University of Medical Sciences, Iran. The study population consisted of trainees and interns of general medicine as well as assistants and professors of the Department of Orthopedics at the School of Medicine. The inclusion criteria were taking at least one clinical orthopedics course (for medical trainees and interns), willingness to participate in the study, and having enough time to complete the research instrument. In this study, all the assistants and professors of the Department of Orthopedics were selected by using census method. Systematic random sampling method was also used to select the study samples out of the students enrolled from 2010 to 2012.

The data collection instrument was a researcher-made questionnaire, which consisted of two sections: demographic characteristics information and educational needs. The demographic characteristics information section of the questionnaire included participants' names (optional), sex, and age.

The educational needs section was also designed by using the orthopedics course book for medical trainees and interns entitled as Selected Textbook of Orthopedics and Fractures (second edition) (2015) (15). The order of the topics was also randomly selected. In the final item, the participants were asked to add any topics of an orthopedics course that they had considered important but had not been listed. In this respect, the study participants could tick at least ten topics assumed necessary for general medicine education. The given questionnaire was prepared in both print and electronic formats. All the orthopedic assistants and professors also completed the questionnaire in person. However, the medical trainees and interns completed the given questionnaire in person or online. The face validity and the content validity of the questionnaire were reviewed and verified by four orthopedic professors and one medical education specialist. The mean score of each symptom or disorder was considered as the important and educational needs of that symptom or disorder; so that, score 1 indicated the choice of the topic and score zero showed no selection. The mean score of each symptom and disorder was correspondingly calculated and the priorities were mentioned based on the highest scores obtained. Comparing the mean scores of the symptoms and disorders between the study groups was also done using analysis of covariance (ANCOVA) with sex matching. Moreover, Tukey's post-hoc test was used provided that the results were significant. Data description and analysis were conducted by using SPSS software (version 23.0).

Results

Out of the total number of 154 participants, 40.3% were medical trainees, 31.8%, and 13.6% of these individuals were medical interns and orthopedic assistants; respectively while the number of orthopedic professors was 22 individuals (14.3%). Among the medical students, the highest groups were enrolled in the 11th semester, representing 33.8% of the participants. As well, 61.7% of the study population was male (table 1).

Of the 44 commonly observed symptoms and disorders, based on the mean scores obtained, top 5 priorities from the viewpoints of the medical trainees included low back pain, carpal tunnel syndrome, ankle sprain, fractures and dislocations, and Lower limb fracture. Also top 5 educational priorities from the interns' view included low back pain, fractures and dislocations, carpal tunnel syndrome, knee osteoarthritis, and ankle sprain. Top 5 priorities of orthopedic assistants were knee osteoarthritis, low back pain, diabetic foot problems, knee osteoporosis, and ankle sprain, and finally the top 5 priorities of the professors of the Department of Orthopedics were fractures and dislocations, knee osteoarthritis, ankle sprain, low back pain, and osteoporosis whose means and standard deviations were illustrated in table 2.

Based on the examination of the top 10

Table 1: Demographic characteristic of the participants

Variable		Number of persons	Percentage
Degree	Extern	62	40.3
	Intern	49	31.8
	Resident	21	13.6
	Attend	22	14.3
Semester (general medical students)	10	10	6.5
	11	52	33.8
	12	14	9.1
	13	13	8.4
	14	22	14.3
Sex	male	95	61.7
	Female	59	38.3

Table 2: Mean and standard deviation of the first five priorities

Degree	Disease or sign	Mean	Standard deviation	Degree	Disease or sign	Mean	Standard deviation
Extern	Low back pain	0.93	0.24	Resident	Knee osteoarthritis	0.76	0.43
	Carpal tunnel syndrome	0.83	0.37		Low back pain	0.76	0.43
	Ankle sprain	0.83	0.37		Diabetic foot	0.71	0.46
	General Principals of Fracture and Dislocation	0.82	0.38		Osteoporosis	0.71	0.46
	Lower limb fracture	0.80	0.39		Ankle sprain	0.66	0.48
Intern	Low back pain	0.91	0.27	Attend	Generalities of fracture and dislocation	0.86	0.35
	General Principals of Fracture and Dislocation	0.81	0.39		Knee osteoarthritis	0.81	0.39
	Carpal tunnel syndrome	0.79	0.40		Ankle sprain	0.72	0.45
	Knee osteoarthritis	0.75	0.43		Low back pain	0.72	0.45
	Ankle sprain	0.73	0.44		Osteoporosis	0.63	0.49

educational priorities outlined by the four study groups, 12 symptoms or disorders were considered as the most important educational needs for students of general medicine. These 12 disorders highlighted in four study groups were investigated via ANCOVA with sex matching (Table 3). The results of inter-group comparison also showed a significant difference between the study groups regarding low back pain (P=0.019), carpal tunnel syndrome (P=0.006), diabetic foot problems (P=0.001), and spinal discopathy (P= 0.001). Further Tukey's post-hoc test was employed to examine the groups and identify the sources of these differences. Regarding the topic of low back pain, the study results demonstrated a significant difference between the medical trainees and the orthopedic professors; so that, according to the medical trainees, this topic was more important for general medicine students (P=0.04, MD=0.208). Regarding the carpal tunnel syndrome, a significant difference was reported between the medical interns and the orthopedic professors; in this respect, the medical interns believed that the given issue were more important for students

Table 3: Comparing between groups of educational priorities*

Disease or sign	Mean square	F	Sig
Low back pain	0.35	3.42	0.01
Carpal tunnel syndrome	0.77	4.33	0.006
Ankle sprain	0.2	1.14	0.33
General Principals of Fracture and Dislocation	0.16	1.06	0.36
Lower limb fracture	0.52	2.48	0.06
Diabetic foot	1.06	5.51	0.001
Upper limb fracture	0.49	2.37	0.07
Osteoporosis	0.14	0.73	0.53
Spinal discopathy	1.28	5.63	0.01
Complications of fracture and dislocation	0.38	1.81	0.14
Knee osteoarthritis	0.02	0.12	0.94
Osteomyelitis and septic arthritis	0.53	2.27	0.08

*Analysis of covariance (ANCOVA) with sex matching

Table 4: Post hoc test for paired comparison in the groups

Disease or sign	Degree		The mean difference	Sig	Confidence interval 95%	
					Lower limit	Upper limit
Low back pain	Extern	Intern	0.017	0.99	-0.14	0.17
		Resident	0.173	0.14	-0.03	0.38
		Attend	0.208	0.04	0.00	0.41
	Intern	Resident	0.156	0.24	-0.06	0.37
		Attend	0.191	0.1	-0.02	0.40
	Resident	Attend	0.034	0.98	-0.22	0.29
Carpal tunnel syndrome	Extern	Intern	0.042	0.95	-0.16	0.25
		Resident	0.219	0.17	-0.05	0.49
		Attend	0.338	0.08	0.06	0.61
	Intern	Resident	0.176	0.37	-0.10	0.46
		Attend	0.295	0.03	0.01	0.57
	Resident	Attend	0.119	0.79	-0.21	0.45
Diabetic foot	Extern	Intern	0.092	0.69	-0.12	0.31
		Resident	0.092	0.84	-0.19	0.38
		Attend	0.442	0.00	0.15	0.72
	Intern	Resident	0.000	1.00	-0.29	0.29
		Attend	0.350	0.01	0.05	0.64
	Resident	Attend	0.350	0.04	0.01	0.69
Spinal discopathy	Extern	Intern	0.259	0.02	0.02	0.49
		Resident	0.218	0.25	-0.08	0.52
		Attend	0.426	0.00	0.12	0.72
	Intern	Resident	-0.040	0.98	-0.35	0.27
		Attend	0.166	0.50	-0.14	0.47

of general medicine (P=0.03, MD=0.295). Regarding the diabetic foot problems, the study results suggested a significant difference between the medical trainees, the interns, the orthopedic assistants, and the professors. This issue was more important for training students of general medicine in the views of the medical trainees (P<0.01, MD=0.442), the interns (P=0.01, MD=0.350), and the orthopedic assistants (P=0.04, MD=0.350). With regard to spinal discopathy, there was a significant difference between the medical trainees and interns and the orthopedic professors; so that the medical trainees believed that the given issue was more important for training general medicine students (table 4).

Discussion

Given the considerable encounters of medical students with orthopedic and traumatic patients in general medicine course as well as the need for knowledge and skills in the field of orthopedics, providing education for medical students in the orthopedics course was assumed of great importance (16). The purpose of this study was also to assess the educational needs in orthopedic and traumatic domains among medical students, orthopedic assistants, and professors in order to provide the grounds for orthopedics course syllabus for medical internship students at Isfahan University of Medical Sciences. According to Dadgostarnia and colleagues, educational planning based on needs assessment in medical students could increase their satisfaction and learning (17). Among the 44 common orthopedic and traumatic topics; students, assistants, and professors specified top 10 priorities including low back pain, carpal tunnel syndrome, ankle sprain, General Principals of Fracture and Dislocation, lower limb fractures, diabetic foot problems, upper limb fractures, osteoporosis, spinal discopathy, as well as complications of fractures and dislocations. In line with the present study, Faghihy Maraghi and others also reported similar results in an investigation on GPs in Isfahan province, Iran, about the musculoskeletal diseases (18).

Among the top 10 selections by orthopedic professors, assistants, and medical students, several differences were reported in their priorities. Accordingly, low back pain was the first priority of the medical trainees, while it was considered as a lower priority in the viewpoints of the orthopedic professors. In this regard, the attitudes were significantly different. The justification for this finding could be the lack of referral of low back pain cases to specialized clinics and orthopedic professors and performing such treatments by GPs as well as the tunnel vision of professors as specialists in the field of orthopedics or those more skilled in one part of orthopedics visiting patients. On the other hand; in addition to the Department of Orthopedics, the medical students were visiting patients with low back pain in various departments; therefore, this issue was of more importance for them because of their encounters (18). The medical trainees and interns gave a higher educational priority to carpal tunnel syndrome compared with the orthopedic professors, which could be because of the prevalence of the disorder and the referral of patients to various specialties such as physical medicine, neurology, and neurosurgery, which may lead to more visit of such patients by the students (19, 20). On the other hand, most referral patients with this problem refer to an orthopedic specialist with a hand sub-specialist, so most orthopedic professors are not involved (20). The topic of diabetic foot problems was also one with a higher educational priority, according to the viewpoints of medical trainees, interns, and orthopedic assistants compared with the orthopedic professors. Considering the team-based approach to deal with diabetic foot problems and the need for different specialties to treat patients with such foot problems, this topic was considered to be less important for the orthopedic professors (21). In addition, because of visiting diabetic foot patients by specialists of infectious diseases and providing counseling services in the Department of Orthopedics, which often involved senior-level counseling, orthopedic assistants as well as medical students were more likely to be involved in this domain in teaching hospitals (22).

Moreover, spinal discopathy was reported more important for training GPs in the views of the medical trainees than the views of orthopedic professors and medical interns. Like the topic of low back pain, much more visits of patients with spinal discopathy in clinics and different clinical settings and the commonality of the topic between various medical specialties as well as the referral of patients with spinal discopathy to spinal cord specialist professors who were among the few who were surveyed; could be a reason why

the orthopedic professors paid less attention to the spinal discopathy topic (23). Regarding the disagreements between the medical trainees and interns, the problems of the educational system imposing a heavy burden of treatment and often a bureaucratic burden on interns' shoulders could be pointed out as the reason leading to the less presence of the medical interns in clinics compared with the medical trainees (1, 24).

Among the limitations of this study were the lack of prioritization of orthopedic symptoms and disorders from each individual's attitudes, as well as no examination of other universities in Isfahan province to increase the generalizability of the study results. Finally; following specifying the main educational priorities in the Department of Orthopedics, it is recommended to focus more on detailed and comprehensive teaching of the mentioned topics and to conduct further studies to determine appropriate settings to teach these priorities and relevant educational contents.

Conclusion

The study results led to identify top 10 priorities of educational needs in general practitioners associated with orthopedic symptoms and disorders. It is recommended to carry out further investigations to ascertain appropriate contexts for teaching such priorities and organizing relevant educational contents.

Conflict of Interest: None Declared.

References

1. Mortazavi SAA, Razmara A. Medical student satisfaction in different educational locations. IJME. 2001;1:51-4. (Article in Persian)
2. Gonnella JS, Hojat M. Medical education, social accountability and patient outcomes. Med Educ. 2012;46:3-4. Doi: 10.1111/j.1365-2923.2011.04157.x
3. Zahedi M, Amirmaleki Tabrizi H. Medical education effectiveness from the viewpoints of medical students of Tehran University of Medical Sciences. IJME. 2008;7:289-98. (Article in Persian)
4. Bazrafkan L, Nikseresht A, Bazargany A. Need assessment of medical education's general objectives in basic sciences & physiopathology periods according to intern's views. IJME. 2002;2:18. (Article in Persian)
5. Abdi K, Ghanaatian Chabzari S, Khankeh H, Hosseini M. The educational needs assessment of curriculum of rehabilitation management: A qualitative study. Journal of Advances in Medical Education (JAMED). 2018;1:13-8.
6. Yar Mohammadian Mh, Bahrami S, Forughi Abari AA. Health directors and experts, and proper need assessment models. IJME. 2003;3:71-9. (Article in Persian)
7. Mohanna K, Cottrell E, Chambers R, Wall D. Educational concepts: The theory behind the practical aspects of teaching and learning. In: Mohanna K, Cottrell E, Chambers R, Wall D. Teaching made easy: A manual for health professionals. Boca Raton, Florida: CRC Press; 2016.
8. Pinney SJ, Regan WD. Educating medical students about musculoskeletal problems. Are community needs reflected in the curricula of Canadian medical schools? J Bone Joint Surg Am. 2001;83:1317-20. Doi: 10.2106/00004623-200109000-00004
9. Freedman KB, Bernstein J. The adequacy of medical school education in musculoskeletal medicine. J Bone Joint Surg Am. 1998;80:1421-7. Doi: 10.2106/00004623-199810000-00003
10. Towle A. Changes in health care and continuing medical education for the 21st century. Bmj. 1998;316:301-4. Doi: 10.1136/bmj.316.7127.301
11. Geyman JP, Gordon MJ. Learning outcomes and practice changes after a postgraduate course in office orthopedics. J Fam Pract. 1982;15:131-6.

12. Newble D, Stark P, Bax N, Lawson M. Developing an outcome-focused core curriculum. Med Educ. 2005;39:680-7. Doi: 10.1111/j.1365-2929.2005.02198.x
13. O'Neill PA, Metcalfe D, David TJ. The core content of the undergraduate curriculum in Manchester. Med Educ. 1999;33:121-9. Doi: 10.1046/j.1365-2923.1999.00342.x
14. Omid A, Haghjuy Javanmard S, Eghbali B, Hoseini M. General practitioners and patients' disease in Isfahan: One step toward social accountability. IJME. 2012;11:1376-84. (Article in Persian)
15. Alami Harandi B, eds. Gozideye darsnameh orthopedy va shekastegiha. 2nd ed. Tehran: Andishe rafie; 1394. (Book in Persian)
16. Mirzatolooei F. Evaluation and impact of medical student's attendance in orthopedic operating room on their ward and comprehensive exam scores. J Urmia Univ Med Sci. 2012;23(5):544-8. (Article in Persian)
17. Dadgostarnia M, Vafamehr V. Assessment of training needs of students' clinical skills prior to entering the clinical course and impact of preliminary courses of training clinical skills on students. IJME. 2014;14(1):52-63. (Article in Persian)
18. Faghihy Maraghi A, Yamani N, Motaghi P, Dehghani Z. Needs assessment of continuing medical education for general physicians: The musculoskeletal signs and diseases. IJME. 2014;14(8):669-79. (Article in Persian)
19. Safari Ashtiani M, Emam Hadi MR. Carpal tunnel syndrome and its different clinical and demographic features. Jour guilan uni med sci. 2006;14:80-5. (Article in Persian)
20. Nabavi M, Bozorgi P. Barrassiye ala'eme balini va electrophysiologic syndrome majraye dasti (carpal tunnel) dar 70 bimare mobtala. Daneshvar Medicine. 2005;12:67-72. (Article in Persian)
21. Alami Harandi B, Alami Harandi A, Siavashi B. Diabetic foot ulcer management review of literature. Iranian Journal of Surgery. 2009;16(4):1-7. (Article in Persian)
22. Pinzur MS, Slovenkai MP, Trepman E, Shields NN. Guidelines for diabetic foot care: Recommendations endorsed by the Diabetes Committee of the American Orthopaedic Foot and Ankle Society. Foot Ankle Int. 2005;26:113-9. Doi: 10.1177/107110070502600112
23. Borenstein DG. Epidemiology, etiology, diagnostic evaluation, and treatment of low back pain. Curr Opin Rheumatol. 2001;13:128-34. Doi: 10.1097/00002281-200103000-00006
24. Nasri K, Kahbazy M, Noroozy A, Nasri S. The medical education problems and possible Solutions in stagers and intern's view points of Arak University of Medical Sciences, 2006-07. J Arak Uni Med Sci. 2010;12:111-21. (Article in Persian)