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Analysis of M.D. Learning Environment Regarding Attention to Education Personal Development Competency

Background: One of the necessities for doctor of medicine (M.D.) curriculum is educating seven competencies, including individual competency development, which helps students acquire and use effective abilities in their personal and professional life, including self-knowledge, psychology of change, strategic and management principles, and informatics. Given the importance of these types of competencies in performing professional roles by graduates, this study aimed to analyze the M.D. learning environment regarding attention to training individual competency development.

Methods: This qualitative case study which was performed in research environment of Mashhad School of Medicine and included 34 M.D. students, six faculty members (M.D. course), three medical education experts, four department managers, and two heads of university, selected by purposive sampling. Data were collected after 15 semi-structured interviews, two focus group discussions (FGD) and four observations, and review of documents. Notably, the process continued to reach data saturation. Moreover, the data obtained was managed in MAXQDA-10 software, and data analysis was performed by qualitative content analysis method based on Graneheim & Lundman's six-stage model.

Results: The collected data were summarized in semantic units and turned into 33 sub-themes by forming, comparing, and systematically classifying 302 primary codes. Undervaluing individual competency development in some M.D. levels, eliminating competency-related courses in the current curriculum, excessive thickening of the curriculum with theoretical content, lack of a specific model for fostering competency, lack of using new technologies, improper content and strategies, cultural-social gap, environmental limitations, inefficient evaluation and the art of turning knowledge into practice were among the most important sub-themes obtained in the study. In the end, five themes (paradoxes of curriculum, learning experiences, balance in distribution, authentic evaluation and professors' ability) were extracted in response to the research questions.

Conclusion: According to the results, the learning environment of school of medicine had unfavorable condition for training individual competency development. Therefore, our findings can be used to design proper learning environments to nurture this competency.

Keywords: Doctor of Medicine (M.D.), Personal Development Competency, Education, Learning Environment

تحليل محیط یادگیری پزشکی عمومی از منظر توجه به پرورش شایستگی پیشرفت فردی

زمینه و هدف: یکی از الزامات مهم برنامه درسی پزشکی عمومی، پرورش هفت شایستگی محوری از جمله شایستگی پیشرفت فردی است که به دانشجویان کمک می‌کند توانمندی‌های موثر در زندگی فردی و حرفه‌ای مانند خودشناسی، روان‌شناسی تغییر، اصول راهبردی و مدیریت و دانش انفورماتیک را بدانند و به کار ببندند. با توجه به اهمیت این شایستگی برای ایفای نقش‌های حرفه‌ای دانش‌آموختگان، هدف پژوهش حاضر تحلیل محیط یادگیری رشته پزشکی عمومی از منظر توجه به پرورش شایستگی پیشرفت فردی است.

روش: این پژوهش با رویکرد کیفی و روش مطالعه موردی انجام شد. محیط پژوهش دانشکده پزشکی مشهد و مشارکت‌کنندگان شامل ۳۴ دانشجوی پزشکی عمومی، ۶ عضو هیات‌علمی دوره پزشکی عمومی، ۳ متخصص آموزش پزشکی، ۴ مدیر گروه، ۲ مدیر دانشگاه بودند که به روش نمونه‌گیری هدفمند انتخاب شدند. جمع‌آوری اطلاعات پژوهش با انجام ۱۵ مصاحبه نیمه‌ساختارمند، ۲ بحث گروهی متمرکز، ۴ مشاهده و مرور اسناد تا رسیدن به اشباع داده‌ها ادامه یافت. اطلاعات به‌دست‌آمده با استفاده از نرم‌افزار MAXQDA-10 مدیریت شد و با روش تحلیل محتوای کیفی براساس الگوی گرنه‌ایم و لاندمن تحلیل گردید.

یافته‌ها: اطلاعات جمع‌آوری شده به واحدهای معنایی خلاصه و با ایجاد ۳۰۲ کد اولیه و مقایسه و دسته‌بندی سیستماتیک آنها به ۳۳ زیرمضمون تبدیل شد. به نادان به شایستگی پیشرفت فردی در بعضی از مقاطع پزشکی عمومی، حذف دروس مرتبط با این شایستگی در برنامه درسی فعلی، فرجه شدن بیش از حد برنامه درسی با محتوای نظری، فقدان مدل مشخص برای پرورش شایستگی، عدم استفاده از فناوری‌های نوین، استراتژی‌ها و محتوای نامناسب، شکاف فرهنگی و اجتماعی، محدودیت‌های محیطی، ارزشیابی نامناسب و هنر تبدیل دانش به عمل از مهمترین زیرمضمون‌های به‌دست آمده از تحلیل اطلاعات بود. نهایتاً در پاسخ به سوالات پژوهش ۵ مضمون شامل "یادادکس‌های برنامه درسی، تجارب یادگیری توازن در توزیع، ارزشیابی اصیل و توانمندی اساتید" استخراج شد.

نتیجه‌گیری: تحلیل یافته‌ها موبد آن است که در دانشکده پزشکی محیط یادگیری برای پرورش شایستگی پیشرفت فردی از وضعیت مطلوبی برخوردار نمی‌باشد. نتایج پژوهش حاضر می‌تواند برای طراحی محیط یادگیری مناسب برای پرورش این شایستگی مورد استفاده قرار گیرد.

واژه‌های کلیدی: پزشکی عمومی، شایستگی پیشرفت فردی، پرورش، محیط یادگیری

تحليل لبيئة التعلم الطبي العام فيما يتعلق بالاهتمام بالتنمية الشخصية

الخلفية والهدف: يتمثل أحد المتطلبات المهمة في المنهج الطبي العام في تطوير سبع كفاءات أساسية، بما في ذلك الكفاءة التنموية الشخصية التي تساعد الطلاب على اكتساب قدرات فعالة واستخدامها في الحياة الشخصية والمهنية مثل المعرفة الذاتية و تغيير علم النفس والمبادئ الاستراتيجية والإدارة و المعلوماتية. بالنظر إلى أهمية هذه الكفاءة بالنسبة للأدوار المهنية للخريجين، فإن الغرض من هذه الدراسة هو تحليل بيئة التعلم في المجال الطبي العام من منظور تطوير كفاءة التنمية الشخصية.

الطريقة: أجريت هذه الدراسة مع النهج النوعي وطريقة الدراسة. كانت البيئة البحثية كلية مشهد للطب و المشاركين 34 من طلاب الطب العام و ستة من أعضاء هيئة التدريس في الطب العام و ثلاثة من خبراء و أخصائيي التعليم الطبي و اربعة من رؤساء الأقسام و اثنين من مديري الجامعة. تم اختيارهم من خلال أخذ عينات هادفة. استمر جمع البيانات البحثية من خلال 15 مقابلة شبه منظمة و مناقشتين للمجموعات المركزة و 4 ملاحظات و مراجعة للوثائق حتى تشبع البيانات. تمت إدارة البيانات التي تم الحصول عليها باستخدام برنامج MAXQDA-10 وتحليلها من خلال تحليل المحتوى النوعي استناداً إلى نموذج Lundman و Graneheim المكون من ست مراحل.

النتائج: تم تلخيص و جمع المعلومات في وحدات الدلالية وتحولت إلى 33 سمة فرعية عن طريق إنشاء 302 رموز أولية ومقارنتها بشكل منهجي. بغض النظر عن كفاءة التنمية الفردية في بعض كليات الطب العام، إزالة الدروس المتعلقة بهذه الكفاءة في المناهج الدراسية الحالية، توسيع غير ضروري في المناهج الدراسية النظرية، عدم وجود نموذج محدد لتدريب و رعاية الكفاءة، عدم استخدام التقنيات والاستراتيجيات الجديدة، استخدام الاستراتيجيات و المحتوى غير المناسب، الفجوات الثقافية والاجتماعية، القيود البيئية، التقييم غير الملائم و عدم الكفاءة في القدرة على تحويل المعرفة إلى ممارسة كان من أهم مجالات تحليل المعلومات من بين الموضوعات الفرعية. أخيراً، استجابته لاسئله البحث تم استخراج خمسة محاور منها "مفردات المناهج الدراسية، تجارب التعلم، التوازن في التوزيع، التقييم الحقيقي و يمكن أعضاء هيئة التدريس".

الخلاصة: يؤكد تحليل النتائج أن بيئة التعلم في كلية الطب ليست مواتية لتطوير الكفاءة للتنمية الفردية. يمكن استخدام نتائج هذه الدراسة لتصميم بيئة تعليمية مناسبة لتعزيز هذه الكفاءة.

الكلمات المفتاحية: دكتور في الطب العام (M.D.)، تطوير الكفاءات للتنمية الشخصية، التعليم، بيئة التعلم

فردی شایستگی اور تعلیمی پیشرفت کے مد نظر جنرل فزیشینز کے تعلیمی ماحول کا جائزہ

بیک گراؤنڈ: جنرل فزیشینز کی تعلیم کے لئے سات صفات کی پرورش ضروری ہے۔ ان صفات میں پڑھائی میں فردی پیشرفت کی صفت کو پروان چڑھانا بھی بنیادی اہمیت کا حامل ہے۔ اس سے جنرل فزیشینز کو اپنی انفرادی زندگی میں پیشہ ورانہ حیثیت سے خود شناسی اور خود اعتمادی حاصل ہوتی ہے اس کے علاوہ وہ نفسیات میں بھی ماہر ہوجاتے ہیں اور کیس مینجمنٹ کی مہارت بھی حاصل کر لیتے ہیں، البتہ ان تمام مہارتوں کے ساتھ ساتھ انفارمیٹیک کی جانکاری بھی ضروری ہے۔ یہ تمام صلاحیتیں جنرل فزیشینز کی پیشہ ورانہ زندگی میں نہایت اہم رول ادا کرتی ہیں۔

روش: یہ تحقیق مشہد یونیورسٹی آف میڈیکل سائنس میں انجام دی گئی، اس میں جنرل میڈیسن کے چونتیس طلباء، جنرل فزیشینز کورس کے اکیڈمیک کونسل کے چھ رکن، میڈیکل تعلیم دینے والے تین ماہر اساتذہ، چار گروپ مینیجر، دو یونیورسٹیوں کے سربراہان نے شرکت کی۔ تحقیق میں شرکت کرنے والوں سے انٹرویو لئے گئے، دو مرتبہ متمرکز بحث کی گئی اور چار مرتبہ دستاویزات کو دیکھا گیا تاکہ تحقیق میں کوئی کمی نہ رہ جائے۔ حاصل شدہ ڈیٹا کا تجزیہ میکسوڈا ٹن سافٹ ویئر سے کیا گیا، اسکے علاوہ گرانہیم اینڈ لندزمنز سیکس اسٹیج ماڈل سے بھی استفادہ کیا گیا۔

نتیجے: تجزیہ شدہ معلومات کو تینتیس ذیلی عناوین میں بانٹا گیا اور تین سو دو پرائمی کوڈ بنائے گئے۔ ان ذیلی عناوین میں انفرادی صلاحیتوں کو نظر انداز کرنا، صلاحیتوں کو پروان چڑھانے والے مواد کو نصاب سے حذف کرنا، نصاب کا زیادہ تفصیلی ہونا، نئی تکنالوجیوں سے استفادہ نہ کرنا، نامناسب استراتیجی اور مضامین، ثقافتی اور سماجی خلیج، اور بہت سی مہارتوں کا نظر انداز کرنا شامل ہے۔

سفرش: اس تحقیق سے معلوم ہوتا ہے کہ میڈیکل یونیورسٹیوں میں طلباء کی پیشرفت اور اعلیٰ صلاحیتیں حاصل کرنے کا ماحول نہیں ہے اسے سدھارنے اور اس میں اصلاحات لانے کی ضرورت ہے۔

کلیدی الفاظ: جنرل فزیشینز، افراد ترقی، تعلیم کا ماحول

INTRODUCTION

Medicine is a field of applied sciences, and M.D. (doctor of medicine) is considered the basis and foundation for all specialized medical fields. The M.D. is a six-year program with 293 credits presented in four stages of basic sciences, introduction to clinical medicine, externship, and internship. Graduation from an M.D. course is a matter of success in the practical test of clinical competences (skills). In addition, modifying the content of educational programs based on the health needs and university conditions is taken into account during the program (1). On the other hand, competency is the realization of a lasting trait of learning used to express the integration between knowledge, ability, and skill in learners. In addition, it is a combination of cognitive and metacognitive skills, explicit and implicit knowledge, motivation, values, attitudes, emotions and social behaviors to carry out a professional practice in a particular field (2).

Professional competencies are the keyword in today's corporate environment (3) and their development and education have become a serious concern for higher education systems, especially the medical sciences education. This issue has been considered in the national M.D. curriculum, the document of the capabilities of M.D. graduates and the health higher education program of the ministry of health and medical education. The main axes of these abilities include clinical skills, communication skills, patient care, health promotion and prevention in the health system, individual advancement, professional commitment, medical ethics and laws, as well as decision-making, deduction, and problem-solving skills (4). The present research mainly focused on individual competency development which helps individuals improve their knowledge and identity, strengthen their motivations, and foster their learning skills and talents. In addition, it can be used to design special programs for the individual, educational, and occupational development of students through official and unofficial activities (5). Moreover, this concept has been introduced in the document of M.D. graduates' skills as one of the seven key competencies, according to which medical students must learn and practice effective skills in their individual and professional lives, such as self-awareness, anger and stress control, time management, targeting, planning, and knowledge of informatics (4).

Individual competency development comprises four psychological, social-occupational, life-long learning, and information technology abilities. However, it must be fostered and developed during the education period (6). The importance of development and education has been emphasized in many medical education associations, centers, and valid documents in Iran and the world. Health Canada considers an ideal physician to be a fully-qualified and professional person, who is able to provide services in the health system (7). On the other hand, the UK General Medical Council emphasizes the importance of individual competency development, problem-solving, communication skills and other core competencies in curricula, recommending schools of medicine to establish learning

environments that can help students achieve and develop professional competencies (8).

For health promotion, the Australian document on core competencies has obligated the medical education of the country to modify the educational design models and teach processes to promote professional competencies, especially those related to the soaring of medical students in personal and professional developments (9). Furthermore, the world federation of medical education (WFME) has explicitly indicated that one of the cores of the M.D. curriculum is communication and personal development of capabilities, which must be considered in all schools of medicine to train highly-qualified physicians (10). In Iran, the document of capabilities of M.D. graduates issued to universities of medical sciences in the country as curriculum appendix has explicitly emphasized the necessity of acquiring and developing this type of competency during the education period (4).

Acquisition and fostering individual competency development require perseverance and continuation of educational activities, and the success of these educations greatly depends on the type of learning environment. According to the Levine's theory, human behavior is shaped by the interaction between individuals, the whole environment and the situation around them (11). In general, learning is a continuous and consistent process which depends on two external and internal factors, argued by psychologists. In this regard, one of the external factors is the learning environment. Therefore, paying attention to the environment situation and related contexts becomes a necessity (12). Some researchers define the learning environment as the place, a series of features, specific principles and all conditions and facilities that lead to learning. Therefore, the learning environment refers to both the place and learning facilities, as well as the conditions governing the environment. This term involves the culture governing the institution and curriculum, individuals' ethics and moods, characteristics of educational spaces, communication with others, and methods used by instructors to organize the education environment to facilitate learning (13).

However, paying attention to the learning environment is a curriculum requirement in order to develop and nurture individual competency development. In Iran, studies have shown that despite the extensive efforts of universities of medical sciences to nurture core competencies in M.D. students, there is still a long way to the full realization of this term. For instance, results obtained by Kamyabi, Foroughi Abri, and Yarmohamadian have indicated a need for revising some of the fundamental higher education policies related to life-long learning capabilities (14). In research by Roshan et al., students faced challenges in integrating what they learned with the integrated knowledge and how to use it to solve problems in their professional lives and work environments (15). In addition, results obtained by Mansoorian, Karimi Moonaghi, Yazdani, Ahmadi, and Khosravan confirmed the overlooking of leadership and management capabilities in M.D. learning environments in Iran (16).

One of the main obstacles to optimal education of competencies is inadequate knowledge of learning environments. According to Momeni Mahmoudi, Kazempour, and Tafreshi, higher education curricula have not been successful in education and strengthening the required competencies in graduates. The curricula have only wasted financial sources and reduced effectiveness in occupational areas (17).

Given the lack of a study in this field, it was necessary to perform the present study to analyze the M.D. learning environment in terms of attention to individual competency development. To realize this goal, three questions were raised: how the fostering of individual competency development is considered in the upstream documents of the M.D. field of study? What are the strengths and weaknesses of the M.D. curriculum in terms of fostering individual competency development? and, what are the views and experiences of educational helpers regarding fostering individual competency development in the M.D. field of study?

METHODS

This qualitative case study, which is one of the common methods in psychological and educational science research (18), was performed in Mashhad University of Medical Sciences during May 2018-July 2019 to assess M.D. learning environments in terms of attention to capabilities and components of individual competency development. The research population included M.D. professors (N=6), medical education experts (N=3), educational department managers (N=4), education managers of school and university (N=2) who had participated in public medical education and had a background or interest in the national M.D. curriculum, and M.D. students (N=34). Subjects were selected by purposive sampling and were enrolled in the study after completing the demographic characteristics questionnaire. Notably, the informed consent was obtained prior to the study, and the sampling process continued to data saturation. Faculty inclusion criteria were teaching an M.D. course and having a minimum work experience of five years. On the other hand, the inclusion criteria for medical education experts were having an MSc and Ph.D. degree in M.D., and at least two years of cooperation with medical education research and development centers as well as affiliated units. Furthermore, the student inclusion criterion was studying in the M.D. field of study in the school of medicine and affiliated units in Mashhad universities of medical sciences.

Data were collected using semi-structured interviews, participant observation, focus group discussion (FGD), and document assessment. The interviews were conducted in-person and at the workplace of participants (based on their choosing), and all interview sessions were recorded via a cellphone and they were transcribed at the end. In total, 15 interviews were carried out with the executives, managers of departments, professors and medical education experts. Due to the lack of a confidential subject of the research, FGD sessions were held to analyze students' views. In this

regard, 34 students were selected, including nine students from basic science classes, 12 externs and 13 interns, in coordination with the Department of Education of the School of Medicine and collaboration with the Student Advisory Committee.

After designating the meeting place for the majority of participants, students' views and perspectives were obtained by attracting their active participation in answering predesigned questions in two 90-min interviews featuring the researcher as a guide and one facilitator of public medical professors with specialization in medical education. It is notable that the interviews were recorded with the permission of the participants. In addition, since the researcher was a faculty member at Mashhad University of Medical Sciences and participated in the education of M.D. students since 2002, participant observation was used for data collection. In this context, the present situation was evaluated with regard to the competency development in the real environment by visiting four different educational environments. The M.D. curricula document was also studied and reviewed several times. All information related to individual competency development and related capabilities were extracted. Information related to the national M.D. curricula document was also extracted and recorded from individual competency development and relevant causes by the research team after precise study and reviewing multiple times applying a checklist composed of four psychological, continuous learning, occupational development, and information technology capabilities.

With regard to the features and methods of data collection, the study setting was very diverse; however, it was attempted to perform the research process where individuals' experiences occur. Observations were carried out in real areas of education, such as M.D. classes, clinical skill center of the university, special halls for holding educational workshops and clinical sections of Imam Reza and Qaem training hospitals affiliated to Mashhad school of medicine, each being responsible for a part of the education of M.D. students at clinic stage. In addition, FGD sessions were held for medical students at the school of medicine and the clinical skill center of the university. Data were collected until conceptual data saturation and completion of the dimensions and features of the study's themes. In addition, data management was carried out using MAXQDA 10 software. Furthermore, research accuracy was strengthened by taking measures to increase data reliability, including credibility, transferability, dependability, and confirmability based on Guba and Lincoln recommendations (19). To this end, the researchers attempted to obtain real data by devoting sufficient time to gathering data and communicating with participants appropriately. Moreover, member checking was applied to confirm the accuracy of results and their agreement with the obtained results. In addition, the transcribed interviews, codes, and results were provided to two other researchers working in this area in order to receive complimentary opinions and ensure data credibility. Furthermore, participants were selected with maximum diversity, in terms of gender, work experience,

and age, to ensure generalizability.

It is worth noting that research objectives were explained to the participants and written informed consent was obtained to adhere to ethical considerations in the implementation of the research. Moreover, the interviews and FGD sessions were recorded through the participants' consensus. However, they were ensured to have an anonymous transcription of the interviews and demolition of the recorded conversations at the end of the research. Data analysis was performed using qualitative content analysis and Graneheim & Lundman's six-stage model (20). In this respect, individuals' interviews and FGD sessions were recorded with a cellphone, the observations were noted, and the curriculum information was classified and typed at the end. In the first stage, the content prepared was reviewed multiple times. In the second stage, primary semantic units were extracted from the information, then they were managed and classified in a highlighted form in the software. In the third stage, 302 primary codes were created by summarizing the semantic units from the previous stage. The fourth stage included reviewing the codes, comparing them to each other and determining 33 themes through systematic classification.

In the fifth stage, the themes were compared to each other and the main text, which this led to the formation of five main themes. The final stage included discussion and analysis of the content by researchers and a medical education expert, which led to reaching a consensus about the main themes after making the necessary changes.

RESULTS

Demographic characteristics of the participants are shown in Table 1.

The main and sub-themes extracted from data analysis are shown in Table 2.

Analysis of the M.D. curriculum has shown that despite the emphasis of curricula planners on the importance of seven competencies and the use of document of the capabilities of M.D. graduates in the course planning, unequal attention has been paid to these competencies. As observed in the specifications of the course curriculum and syllabus, three competencies of clinical skills, patient care, and health promotion were more emphasized, compared to communication skills, personal development, medical ethics, and decision-making. This was evident in the statements of the participants as well. In this respect, one of the faculty members stated: "the fact is that our medical education is disease-centered. There is nothing in the history of this country to question a professor for failing to teach critical thinking to students. Meanwhile, professors would be held accountable in case of lack of teaching toward students".

Despite the revision of the M.D. curriculum in 2017 and emphasis on the use of task and problem-based strategies to teach competency orientation, there are serious obstacles to the implementation of these strategies and numerous inconsistencies in the learning environment due to various reasons such as large volume of theoretical topics, limitations of the physical environment, and large number of students

Table 1. Demographic characteristics of participants in research

Column	Characteristic	N
1	Class standing	Basic sciences (N=9)
		Externship (N=12)
		Internship (N=13)
2	Gender	Female (N=23)
		Male (N=26).
3	Scientific rank	Assistant professor (N=5)
		Associate professor (N=6)
		Professor (N=4)
4	Position	Department manager (N=4)
		Faculty member (N=6)
		Medical education expert (N=3)
		Educational managers (N=2)
5	Work experience	Less than 10 years (N=4)
		Between 10-20 years (N=9)
		More than 20 years (N=2)
6	Level of education	M.D. PhD (N=5)
		PhD (N=2)
		Specialized physician (M=8)

in classes and educational areas. According to the researcher's observations, while students must learn procedures at the clinical skill centers in a practical form, they learn the skills in rooms with the layout of the classroom after one or two times of being practiced by the professors. This is mainly due to inadequate expensive equipment and simulators. One of the participants (a faculty member) expressed: "in my opinion, it is not necessary to change much content in the program to train a qualified physician. What is most needed to change is the educational strategies, methods, and atmosphere which affect the transfer of hidden curriculum to students and the development of professional competencies in individuals". In addition, another faculty member marked: "in this medical practice lesson that was added to the new curriculum for teaching competencies, the professor describes these competencies with a lecture. Do you think this leads to student empowerment? Of course, it has no effect. For example, you explain anger control techniques and even provide some real examples of medicine. However, the training is ineffective as long as the student does not learn and apply the skills".

Despite the significant emphasis in M.D. upstream documents, it seems that there has not been a proper understanding of the individual competency development and its significance in the field of medicine among faculty members. Therefore, most of them lack the knowledge of specific characteristics of a learning environment for competency development. As a result, students neglect their educational needs to acquire relevant abilities, and in a defective cycle, neither the teacher has any specific

Table 2. Main and sub-themes		
Column	Main theme	Sub-theme
1	Curriculum paradoxes	Learner-centeredness at the heart of teacher-based culture
		Determining preset goals for learning complex and evolving topics
		Course drop and emphasis on its learning
		Curricula thickening
		The lack of a specific model
2	Learning experiences	Attention to individual differences
		Passive and one-sided education
		Missing loop technology
		Theorizing to build skills
		Complete assignments based on reality (If I do, I will learn)
		Environmental constraints (time/space/equipment/number)
		Competency training or education ? (strategy and methods)
		Unclear expectations of students
		M.D. or specialized medicine education?
		Professor-student social and cultural interactions
Learnings unrelated to professional needs		
3	Balance in distribution	Superiority of clinic to basic sciences
		Competency-free content
		Educational islands (integration in the whole course and all units)
		Opportunistic training (primary and secondary function of courses)
		Unattainable goals (stipulated and ignored)
4	Authentic evaluation	Response-based evaluation
		Reflective evaluation
		Continuous evaluation at all levels
		Indirect evaluation
		Self-evaluation, the neglected dimension of assessment
5	Capacity of faculty	Role model
		Innovation and change (lost opportunity)
		Psychological insight
		Work commitment
		The art of transforming knowledge into practice
		Creativity
		Unqualified professors (inefficient)

expectations of students regarding the subject, nor does the student perceive the gap in the teaching of these abilities. In this respect, one of the participants (a department manager) stated: "I have not seen the competency documents and I do not talk about these things in class. However, years of teaching have demonstrated that students who are more capable in these sub-skills are more successful as well".

Another participant (a student) stated: "this is the first time that I hear this word, but I think it is interesting. I am sure that I will browse the internet for a few hours from this session onward and it will be important for me to learn about this issue". Another participant (a university authority)

expressed: "there is no emphasis on latent professional abilities that are actually needed by physicians (e.g., mental and social capabilities) in the M.D. curriculum".

In terms of targeting for competency development in basic sciences, the goals related to individual development components have been considered only in the course of medical practices. However, some of the skills related to this competency are recognized as goals of the course in health psychology, health service principles, and the English language. Nonetheless, since the courses at this level are generally theoretical and subject-oriented and their objectives are more in line with the cognitive domain of

learning, they are not enough to train individuals' capabilities. At the level of introduction to the clinic, the only place, where goals related to several personal ability developments, is the history taking and physical examination lesson. This defect has been somehow compensated in externship and internship levels, and almost all the courses have explicitly emphasized the capabilities related to this competency. It is worth noting that the majority of participants, including students and faculty members, emphasized the superiority of teaching capabilities at the clinic level.

Problems in the learning environment make it difficult for students to learn, develop and apply personal developmental skills. In this regard, irregularities in the clinical ward environment, lack of facilities for students in the departments, excessive number of students, emphasis of professors on education of assistants in clinical environments and the number of students' shifts at internship level, passive presence of students in educational programs, being concerned about respecting individual personality in educational environments, theoretical learning of sub-skills and weaknesses in high-school education system in terms of attention to social-psychological issues of students (before entering the university) were recognized as educational problems. Regarding the educational environment, most participants believed that appropriate environments and facilities, especially in clinical settings, can facilitate the learning process of competencies. In this context, one of the participants (a faculty member) affirmed: "due to studying so hard before entering the university, medical students have limited social interactions. Therefore, this concept is completely new to them".

In the study, the participants emphasized that one of the obstacles to teaching capabilities is the social and cultural differences between professors and students. In this regard, one of the faculty members stated: "when as a professor, I do not even understand my students' spoken language and I am constantly comparing the hardships of my student life with the well-being of today's children, how can I understand and teach the needs of this generation for personal development?" Limitations make it difficult for students to learn abilities. A part of these limitations has personal aspects and is related to student personality traits and motivations. In this context, one of the participants (a medical intern) expressed: "some students have a sense of pride and self-esteem and find themselves so superior that they think learning these abilities is degrading". Lack of motivation, anxiety, feeling of inadequacy, lack of interest in the medical field, and role conflict are individual limitations.

According to the results, common teaching strategies and practices are more teacher-oriented and proportional to theoretical topics. This reduces students' participation in the learning process, preventing them from direct experience and performing real assignments. In this regard, one of the participants (a student) affirmed: "in the emergencies, our professor demands us to remain calm upon seeing an open hand or leg fracture. However, it does not matter what else I need to be taught to take care of this person and manage those special conditions through medical information".

One of the notable results of the present study was the lack of a predetermined sequence for teaching individual competency development. According to participants, one of the major barriers to learning is the fragmentation and segregation of content in theoretical education of basic science abilities and the time gap between the use of learning in externship and internship. Offering a two-unit medical ethics course in basic science level that should theoretically cover the core competencies alone shows that instead of integrating proper content to nurture individual competency development during the course in all lessons and paying attention to the topic as a secondary course performance, the contents are segmented in ways that they would be forgotten and not deeply comprehended by students at the end of the course.

At present, no attempt is made to transfer learning to the real world. In this regard, one of the participants (a faculty member) pointed out: "I have no idea why there is a two-credit course of medical ethics in the new curriculum to make a competency-oriented program, would one swallow to make a summer? These competencies must be considered in all courses". Students view educational content related to personal development as a set of scattered and unrelated theoretical content that does not create a direct and a transparent relationship between that content and the capabilities they need. In addition, they face difficulty integrating what they are learning with integrated knowledge and applying sophisticated cognitive skills to solve new problems and transfer them to a real-world, task-based environment. In fact, learning is more opportunistic than predetermined.

Overlooking the components of personal developmental ability in exam design and failure to provide continuous and appropriate feedback to students by professors in the field of personal competency were other results in this study. One of the participants (a medical education expert) stated: "while professors involving in M.D. education do not have the opportunity to directly train this competency, they can analyze, find the source, critique student-related behaviors throughout the semester, and provide appropriate feedback to improve and develop their behavior. For instance, they can develop planning or time management skill from students' disorderliness in the classroom."

Another participant (an intern) expressed: "once in an internship, I annoyed an infant's mother and made disorder in the ward due to failure to manage the proper conditions for the infant's examination. Instead of blaming me, our professor established a meeting and asked everyone to think about this incident and said what would they do if they were in my shoes? What knowledge or skills do we need to have proper performance in such conditions? Our professor intelligently used this incident to show us how much the communication skills, self-confidence, and management are important for a physician and how the content learned in theoretical classes can be combined with practice. This was my only encountering with teaching individual competency development in six and a half years of my education in the M.D. field".

The technology of missing loop in teaching and learning of

individual abilities is one of the research findings that shows the inattention of professors to the use of new educational technologies. One of the students (basic sciences) expressed: “the teacher must behave in a way that the student does not confine himself to the book and not purely be dependent on the professor. Especially as we live in the 21st century and we are born with electronic devices, so we can easily get the latest knowledge in the least time”. In this respect, one of the faculty members asserted: “the teacher has to force the students to self-educate themselves. Most students have the most modern cell phones and spend most of their active time on their cell phones. On the other hand, as a teacher, I cannot talk about personal development skills in class due to the shortage of time. Therefore, the best solution is reinforcing learning motivation in these individuals and teaching them how to use electronic sources or popular computer games as learning tools instead of controlling stress, management, or leadership”.

According to the researchers, one of the most important results of the study is that many current medical professors do not have the necessary personal competencies under the current circumstances. Therefore, in order to teach this competency to students, faculty first need to be empowered in this field. The quotation of one of the professors in this field is worth considering: “as a professor, I know nothing about personal development and might need extensive learning in this field. How can I nurture competency in my students?”

Discussions on evaluating individual developmental abilities in the field of M.D., along with other research results, show the failure of current methods to assess these abilities. Current evaluations are in most cases response-oriented, meaning that students produce responses expected by teachers rather than producing responses and applying their intellectual abilities, which are mainly from designated sources and textbooks. Current evaluation methods are not capable of judging students' performance and their creativity in applying what they have learned to do in real situations. Feedback on students, rather than helping to refine their learning experiences, also emphasizes exam scores. One of the major weaknesses of the learning environment in the present study was the lack of a specific, scientifically-based model that has a great impact on students' teaching and learning. In this context, one of the participants (a medical education expert) emphasized: “I have concluded that modeling is not a topic of discussion in training at all; especially of competency training. I have asked about the method of teaching, content used, and the number of individuals in educational sessions; however, I have concluded that there is no specific pattern in this area”.

DISCUSSION

According to the analysis performed on M.D. learning environmental elements in terms of attention to individual competency development, the following results were obtained:

The content of curriculum paradoxes extracted from five sub-themes included learner-centered at the heart of teacher-based culture, determining preset goals to learn complicated

topics, course dropping and emphasis on its learning, thickening the curriculum and lack of a specific model.

The theme of learning experience was derived from 11 sub-themes including attention to individual differences, passive and one-sided education, missing loop technology, theory for skill-building, complete assignments based on reality (if I do, I will learn), environmental constraints (time/space/equipment/number), teaching competency or education it? (strategies and methods), unclear expectations of students, specialized or general medical education? Student-professor cultural and social interactions, and learnings unrelated to professional needs.

Balance in distribution as the third theme was derived from sub-themes of clinical preference over basic sciences, competency-free content, educational islands (integration in the entire education period and all courses), opportunistic education (primary and secondary course performance), and unattainable goals (explicit and neglected).

The theme of the authentic evaluation was derived from five sub-themes of response-centered evaluation, reflection evaluation, continuous evaluation at all levels, indirect assessment and self-evaluation as neglected dimension of assessment.

The final theme obtained was professor abilities extracted from six sub-themes of role model, innovation and change (wasted opportunity), psychological insights, work commitment, the art of changing knowledge into practice, creativity, and incompetent professors.

These results are in line with the content of upstream documents and findings of some previous studies. Citing the National Public Medical Curriculum Document, student-centered, problem-based, and active learning strategies must be used to teach and promote axial competencies. Not only these strategies provide an opportunity for more practice and continued learning and engaging students in the teaching process, but they increase the process of transferring learning to the real world. Role-playing, peer-learning, task-based independent learning, e-learning, writing scientific criticism, workshops, Grand Rand, and morning reports based on assignments were the educational methods highlighted by the participants and also they were emphasized in the document. In general, teaching methods that are attractive to students and increase their motivation to be engaged more in the learning process are more effective.

According to the results of the present study, one of the most important requirements of a learning environment for individual competency development is explicit or implicit coverage of competencies in the syllabus of all M.D. courses. By doing so, competencies can constantly be developed since enrolment up to graduation. In addition, professors can always focus on this issue in their teachings. Some solutions have been presented in curriculum implementation standards and regulations, including having authority to modify educational programs based on macro-regional needs and designing 16 selected credits with the permission of the curriculum planning committee of schools of medicine with the agreement of the secretariat of the M.D. education council (1).

In the M.D. curriculum, it is explicitly stated that competency development is continuous and cannot be achieved by providing separate units within a limited timeframe (1). Therefore, it could be stated that teaching individual competency development is not limited to specific sessions related to its components and it must be presented by designing the proper learning environment at the four levels of basic sciences, introduction to clinic, externship, and internship in an intertwined manner. For instance, Roshan et al. marked that in classes of team-based or independent learning, students can practice interpersonal relations, critical thinking and personal development skills in addition to learning topics such as sugar metabolism owing to the nature of these educational methods (15).

A practical solution to developing individual competencies in students is encouraging them to use effective technologies in medical education, so that the content becomes richer and students become more familiarized with information technology skills, which ultimately results in self-directed learning. Some of these technologies include specialized medical software, such as up-to-date databases, virtual education, use of multimedia, social networks, computer games, and stimulators. In this regard, one of the faculty members of the study considered up-to-date software as the medical Quran.

With regard to several complexities and delicacies of the M.D. field of study, authentic evaluation is a proper replacement for the current assessments (21). In this process, students memorize separate and unrelated information to pass the exam. Therefore, performance-based evaluations, which emphasize the application of what is learned in solving real-life problems, are more appropriate methods to improve students' learning and evaluate their developments. In the curriculum document, selecting the evaluation method based on the conditions of each school is the responsibility of the curriculum committee. In this regard, a wide range of methods such as Objective Structured Clinical Examination (OSCE), Objective Structured Long Examination Record (OSLER), Objective Structured Field Examination (OSFE), Direct Observation of procedural skills (DOPS), evidence-based self-evaluation, dashboard, work-based assessment, and 360-degree test are recommended for evaluation of professional behaviors of students (1). Reflective evaluation can also help students to relate the content of theory and actual performance as a formative form of evaluation. In fact, it is an opportunity to improve performance based on the existing evidence so that students' learning could be maximized (22). However, little attention has been paid to this method in the M.D. curriculum as a solution to improve the effectiveness of education and evaluate learning development in students.

Developing individual abilities will only be possible when students receive competencies by modeling the competent people. The success of any educational system depends primarily on professors' professional competencies (23). The key role of the teacher in the learning environment is to foster core competencies, support, and influence students' thinking processes, and subsequent learning process. Providing supportive information and students' support for

independent learning, a complete homework, and problem-solving in the real world, also focusing on students' personality traits and increasing their motivation for learning are among the responsibilities of professors as a competency-based training designer. In this context, our findings are congruent with the results obtained by Mahram & Kharokhzadeh (3).

An M.D. learning environment can be effective in training individual competency development when education is related to the actual life and profession of students and can face them with challenges but not stressful situations. This environment should also create a connection between learning contents and real experiences of learners. On the other hand, education is effective when it involves a combination of a wide range of task-based learning resources, activities, and topics. Training sub-skills of competency requires the application of active methods in content selection and design, as well as implementation of teaching and learning participatory processes. In brief, the current learning environment with its features is not capable of fostering individual competency development in M.D. students.

In other words, these issues illustrate the inadequacy of the current chaotic environment for competency learning. A chaotic learning environment refers to an environment in which educational designs remain entrenched (24). In a study by Changiz, general practitioners' abilities in many skills listed in the document of capabilities which are not desirable (25). Therefore, it is necessary to design an effective learning environment by adopting a proper approach. In a study by Emadzadeh et al., it was reported that using the right model could play an important role in teaching the core competencies of M.D. students (26). It is suggested that our findings be used in future studies to design a learning environment which is suitable for training individual competency development.

There were some problems in the implementation stages of the research. For instance, some of the participants had no knowledge of specialized concepts in the field of curriculum. To eliminate this issue, some materials were prepared in the form of a guide file and provided to the participants prior to the interview. In addition, there were problems in performing interviews and holding FGDs due to the engagement of professors in educational and treatment activities, as well as diversity in the curricula and grades of students. Therefore, a significant amount of time was spent on this part of the present research. However, the problems were reduced as much as possible by previous coordination and appreciable cooperation of the participants and the authorities of the school of medicine.

Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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