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Designing the Curriculum of General Medicine Course with Military Approach

Background: Military medicine is one of the important parts of military system that takes responsibility for providing health services to the military forces. Military physicians need to have fundamental knowledge and skills. In today's world, different countries have designed and developed certain activities and curricula for military medical education at general and professional levels. The present research was carried out to design a curriculum for doctoral degree in General Medicine with military medicine approach.

Methods: This study is a combinational research. In the qualitative section, the content analysis of global experience was used to develop a need-assessment questionnaire and in the quantitative section, survey method and Delphi need-assessment technique were used. The samples of the present research in the qualitative part were from America and Russia, however the quantitative part consisted of 35 experienced professionals in 2 Military Medical Universities.

Results: According to the findings, 30 theoretical-practical courses have been added to the existing courses in General Medicine in doctoral degree and also the special curricula of military medicine were added to each of the available courses.

Conclusion: Addition of 30 special courses of Military Medicine and changes in any of the courses available and also the addition of special military topics can play very important role in training the special physicians for military environments.

Keywords: Military Medicine, Medical Education, Curriculum

تصميم المنهج الدراسي في الطب العام مع النهج العسكري

الخلفية: الطب العسكري هو واحد من الفئات الهامة للأنظمة العسكرية التي تتحمل مسؤولية توفير الخدمات الصحية لقوات الجيش. يحتاج الأطباء العسكريون إلى المعرفة والمهارات اللازمة لدورهم. في عالم اليوم، قامت بلدان مختلفة بتصميم وتطوير بعض الأنشطة والمناهج للتعليم الطبي العسكري على الصعيدين العام والخاص. تم إجراء البحث الحالي لتصميم منهج تعليمي في الطب العام مع نهج الطب العسكري. للوصول إلى الهدف، تم استخدام طريقة البحث المختلط.

الطرق: هذه الدراسة هي بحث مشترك. في القسم النوعي؛ تم استخدام تحليل محتوى التجربة العالمية لتطوير استبيان لتقييم الاحتياجات. و في القسم الكمي؛ تم استخدام طريقة المسح وتقنية دلفي لتقييم الاحتياجات. عينات من هذا البحث في الجزء النوعي كانت دول أمريكا وروسيا و في الجزء الكمي يتكون من 35 من المهنيين ذوي الخبرة في 2 الجامعة الطبية العسكرية.

النتائج: وفقًا للنتائج، تمت إضافة 30 دورة دراسية نظرية إلى الدورات الحالية في الطب العام بدرجة الدكتوراه وأيضًا تمت إضافة المناهج الدراسية الخاصة للطب العسكري إلى كل دورة من الدورات المتاحة.

الخلاصة: إضافة 30 نهج خاصة في الطب العسكري والتغييرات في أي من المناهج المتاحة وأيضًا إضافة مواضيع عسكرية خاصة يمكن أن تلعب دورًا مهمًا للغاية في تدريب الأطباء الخاصين على البيئات العسكرية.

الكلمات المفتاحية: الطب العسكري، التعليم الطبي، المناهج

طراحی برنامه درسی دوره پزشکی عمومی با رویکرد طب نظامی

زمینه و هدف: طب نظامی یکی از رسته های مهم سیستم های نظامی است که مسئولیت ارائه خدمات بهداشتی و درمانی به نیروهای نظامی را بر عهده دارد. پزشکان نظامی نیازمند دانش و مهارت لازم برای ایفای نقش خود هستند. امروزه، در دنیا کشورهای مختلف برای تربیت و آموزش پزشک نظامی در سطوح عمومی و تخصصی، فعالیتها و برنامه های درسی مشخصی را طراحی و تدوین کرده اند. پژوهش حاضر با هدف طراحی برنامه درسی دوره پزشکی عمومی با رویکرد طب نظامی انجام شده است. برای دستیابی به این هدف، از روش تحقیق ترکیبی استفاده شده است.

روش: در بخش کیفی، با استفاده از تجزیه و تحلیل محتوای به دست آمده از تجربیات جهانی برای تهیه پرسشنامه سنجش نیاز استفاده شد و در بخش کمی، روش پیمایشی و تکنیک ارزیابی نیاز دلفی استفاده شد. نمونه های پژوهش حاضر در بخش کیفی کشورهای آمریکا و روسیه و در بخش کمی مشتمل بر 35 نفر از متخصصان با تجربه در 2 دانشگاه پزشکی نظامی بودند.

یافته ها: بر اساس نتایج پژوهش حاضر، 30 واحد در قالب دروس تئوری-عملی به برنامه درسی فعلی دوره پزشکی عمومی اضافه شده است. این واحدها، برنامه های درسی ویژه پزشکی نظامی است که به هر یک از دوره های موجود اضافه شد.

نتیجه گیری: افزودن 30 واحد تخصصی پزشکی نظامی و تغییر در هر یک از دوره های موجود و همچنین افزودن مباحث خاص نظامی می تواند در آموزش پزشکان عمومی برای محیط های نظامی نقش بسیار مهمی داشته باشد.

واژه های کلیدی: طب نظامی، آموزش پزشکی، برنامه درسی

ملٹری میڈیسن کے پیش نظر جنرل فزیشن کے تعلیمی نصاب کی تیاری

بیک گراؤنڈ: ملٹری میڈیسن بر ملک کی فوج کا اہم ترین شعبہ ہوتی ہے اور ملٹری میڈیسن کے عملے کے افراد فوجیوں کو طبی خدمات دیتے ہیں۔ ملٹری کے ڈاکٹروں کو اپنی ذمہ داریاں پوری کرنے کے لئے ٹریننگ دی جاتی ہے۔ مختلف ممالک نے ملٹری طبی عملے کو عام اور ماہرانہ تعلیم دینے کے لئے مختلف پروگرام بنائے ہیں۔ ہماری یہ تحقیق ملٹری میڈیسن کو مد نظر رکھ کر انجام دی گئی ہے۔

روش: کیفی لحاظ سے عالمی سطح پر ملٹری طبی عملے کے تجزیوں سے ضروری وسائل کی فراہمی کے لئے سوالنامہ تیار کیا گیا اور کمی لحاظ سے سروے کا طریقہ اور ڈلفی سسٹم استعمال کیا گیا۔ کمی لحاظ سے امریہ اور روس کو معیار بنایا گیا اور ان ملکوں کی دو ملٹری یونیورسٹیوں کے پینتیس تجربہ کار پیشہ ورانہ فوجیوں کے تجزیوں سے استفادہ کیا گیا ہے۔

نتیجے: اس تحقیق سے پتہ چلتا ہے کہ ملٹری میڈیکل طلباء کے موجودہ کورس میں تیس یونٹ شامل کئے گئے ہیں جن میں پندرہ یونٹ تھیوری اور پندرہ یونٹ عملی پریکٹیس سے متعلق ہیں۔ اس کے علاوہ ملٹری میں طبی تعلیم کے لئے مخصوص مواد کا بھی اضافہ کیا گیا ہے۔

سفارش: ملٹری میڈیکل نصاب میں تیس یونٹوں کا اضافہ اور خاص فوجی امور کا اضافہ، ملٹری ڈاکٹروں کی ٹریننگ میں بہت مفید ثابت ہوا ہے۔

کلیدی الفاظ: ملٹری میڈیسن، طبی تعلیم، نصاب

INTRODUCTION

In today's world, disputes and conflicts among states have caused numerous and widespread wars. Meanwhile, the campaign and greed of arrogant powers against other countries may lead to human losses and damages during the defense of the raided countries. However, the use of weapons by invading countries has become various and widespread. The existence of these conditions has made the formation, development and qualifying of military medicine foundations in military forces inevitable as well as necessary, especially in training professional human resources to protect the health and combat power of military forces. In this regard, Leone (2005) wrote: Considering the current military clashes around the world and the high number of victims, the need to prepare more military medical personnel is more obvious than ever and the role of medical services to victims has become important (1).

Since, military medicine is traditionally thought in non-military medical colleges in most countries, today teaching and training military personnel and making them ready through the military medical academies and training programs have been considered more seriously.

Jackson (2010) on the need of the military medicine for professional physicians wrote: "In undergraduate degree, there is no much difference between military medical training and non-military medical training, but in graduate schools that the special military skills are addressed, a resident chooses a special type of military Medicine profession to study (2). Shapir (2011), in relation to the kinds of expertise needed in the army, stated: after the completion of the training period or internship, a medical student receives the Medical degree (MD) and then enters to the military medical courses, which include: Mobile medicine in peacetime, advanced trauma of nuclear, chemical and biological war, military physiology, aviation medicine, space medicine, economy in military medicine, military epidemiology and military psychology (3).

Department of Military Medicine (2009) has introduced the professional issues and topics required in military medical training program as follows:

Military medicine before and after transferring of troops are: soldiers' medicine, medicine before transferring army and mobility-moral in military medicine, rehabilitation medicine, work health in the army forces, military medicine in operations, the treatment and care of the wounded, care for victims of war and tactics, trauma management of war, surgery in war emergencies, military dermatology, military psychology, environmental medicine, heat stroke, frostbite, forest frost, mountain sickness, seasickness, naval medicine, air medicine, military medicine related to chemical, biological and nuclear agents, crisis medicine, and military preventive medicine (4).

In countries where military medicine does not exist, their civilian medicine is usually used in addressing the needs of the injured and victims, as well as the events of war. According to the researcher and considering the experiences of the early years of Iran- Iraq war, non-military physicians, despite their plenty contribution in treatment of the war

wounded, had weakness in military clinics for responding different therapeutic needs of war victims, especially in relation to injuries caused by modern weapons because of differences between military medicine and non-military medicine. Obviously, this weakness was due to lack of enough knowledge, attitude, and skills in relation to military medicine for non-military physicians.

Regarding the similarities and differences between military and non-military medicine, military department (2009) wrote: Many subjects of military medicine have interdisciplinary overlapping with civilian medicine. Many military physicians first are trained in non-military medicine and then trained in various subjects of military medicine (4). According to the researcher, because of some differences in military medicine and non-military medicine, the military systems need physicians educating in military medicine. In this regard, Holcombe (2007) stated: Military and non-military traumas are different in four aspects including the following:

1. Difference in the causes of trauma,
2. Difference in the setting of occurred trauma,
3. Difference in people who take care of the wounded (expressing the need to military physician to take care of the wounded),
4. Difference in the time of the evacuation and transferring the wounded that usually takes longer time (5).

In relation to the difference between the military and civil traumas and their requirements Troit et al (2011) wrote: Comparison of these two types of trauma has been shown that there is much difference between the two in terms of mechanism and distribution of trauma. So it is necessary for the care and management of trauma to provide the necessary preparations for training surgeon (6). Also Kashen (2011; quoted from Rahman, 2013) stated that: Training of military specialist physicians in America to acquire the knowledge, attitudes, skills and qualifications is beyond traditional civilian training. The mission of military specialist medicine is to train physicians with high quality an official certification to serve in the military environments (7,8). Kohl (2013) also stated that military medicine curriculum is very different from civilian medicine, because the conditions and applications of military medicine are different from those of civilian medicine (9).

Islamic Republic of Iran has always been threatened by different enemies in the military areas. Considering these facts that today's changes, new weapons and their deployment complexities, complications and their emerged effects, as well as the armed forces that are routinely confronted to specific work issues of their military ranks such as artillery, missiles, armor, etc. and also because our country is one of the accident-prone places in terms of natural disasters such as floods and earthquakes, it is necessary for military medical universities to adopt the necessary measures to develop training and education of military medicine physicians.

Since we are at the early stages of developing military medicine by considering the primary needs of war and disaster accidents to medical emergencies and also according to the theory of new orientations of military medicine in

military missions, it seems that the establishment of the specialized course of military medicine has a priority and can provide the need of armed forces to carry out their missions successfully.

Given the deficiency of graduated military physician in Iran in current conditions and the necessity of the presence of armed forces in the war fields and unpredicted events, this study was done to design a curriculum of military medicine in Army Medical University in Islamic Republic of Iran by investigating the global experiences in this field and considering the opinion of experts for the first time in Iran. In fact, researcher sought to answer the main question that "what are the characteristics of military medicine's clinical expertise curriculum in Iran based on international experience and experts' opinions?"

Research questions

What are the special courses of Military Medicine in doctoral degree at major universities?

What are the general medicine curriculum goals with military medicine approach?

What are the special courses of Military Medicine in doctoral degree of general medicine in Iran?

METHODS

The present research was done using mixed method research of continuous exploratory design. In this study, among the qualitative research methods, the qualitative content analysis method was used. In the quantitative aspect, after developing the framework of qualitative methods, the Delphi descriptive method was used to collect data.

Statistical population

The statistical population of the research consists of all universities and training centers implementing military medicine curricula, all physicians and military faculty members of Army University of Medical Sciences of the Islamic Republic of Iran, and some experts of other Iranian Medical Sciences and nurses of military faculty members.

Sample and sampling method

The purposive sampling method was used in the present study. Also, sampling method using Delphi and snow ball techniques were used to select a sample of military physicians of Army University of Medical Sciences of the Islamic Republic of Iran and medical professors of other Iranian Universities of Medical Sciences with military medical experiences.

Collecting information through the study of literature

In documental research, the researcher collects the needed information through the study of literature. One of the important steps in this type of study is note-taking. In other words, data collection from sources and documents is one of the important steps in the research called note-taking in the library studies.

In the second phase of this research, the opinion poll of experts, in relation to the curriculum of military medicine, was used through the two researcher-made questionnaires as follows:

A) The first phase questionnaire: This questionnaire was designed for need assessment of military medicine course and the study of the features of its curriculum as a semi-structured

one with open-ended questions and multiple questions in five-point Likert scale for survey on the needs for this discipline, goals, and other key factors.

B) The second phase questionnaire: this questionnaire was designed as a structured questionnaire after collecting information in the first phase and applying the experts' opinions. It consisted of four sections including objectives, content, methods of teaching-learning, and evaluation according to specialists.

The procedures and processes of doing research

This study was done according to the following diagram by studying documents, resources and global experience in military medicine by doing a comparative study and a survey of experts through Delphi method.

The validity and reliability of questionnaires

The first stage questionnaire (basic curriculum of Military Medicine): This questionnaire was designed based on a global survey of military medicine curriculum that its validity was reviewed, modified and approved through content validity method and experts' opinions. The reliability of the questionnaire was obtained equal to 0.88 by Cronbach's alpha coefficient. With preparation of the questionnaire, collecting data from experts was performed by Delphi method in three stages as follows:

The first stage: At this stage, the groups of experts were selected by purposive sampling. The pre-prepared questionnaires were delivered to and collected from these experts through direct and non-direct (e-mail) methods. The questionnaire in this stage was unstructured. It collected the opinions of experts about the need assessment of military medicine curriculum, content, teaching-learning methods, and evaluation.

The second stage: in this stage, the data derived from the questionnaires were analyzed. According to the results of the first stage, especially about the need assessment of military medicine discipline in Iran and considering the common opinions of the experts, a structured questionnaire was designed including four sections of objectives, content, teaching-learning method, and evaluation. The new questionnaire was distributed to the experts of the previous stage. The results of this phase were analyzed. The elements of the curriculum which had obtained over than 75% of the experts' favor votes were selected.

The third stage: At this stage, the designed and developed military medicine curriculum was studied by the expert group in an expert panel and ultimately it was approved.

RESULTS

What are the goals of designing the curriculum of military medicine at the universities of the world?

The objectives of military medicine in Russia

1. Maintaining and strengthening the health of military personnel, enhancing the level of preparedness and quality of medical assistance in all possible cases specified by laws of the Defense Ministry, 2. Modernizing and updating the knowledge and equipment in the public health centers, convalescent homes, hospitals and health centers of military epidemiology, 3. Participation in federal health programs, 4.

Participation and coalescence in national health researches through enhancing the level of the health of the personnel and their families as the members of the society, 5. Planning for teaching and managing the necessary surgical and non-surgical treatments when confronting with a large number of the wounded of the war and paying due attention to development of the concept of war-field or surgeries of the war-field, 6. Professional research and development on issues of military medicine that the army is confronted when mobilizing the army forces and operations, such as infectious diseases, vaccines, medicine, environmental health, water and food, and systems of evacuating the wounded and military epidemiology, 7. Military psychology and psychiatric for mentally selecting individuals appropriate for various military jobs, creating and developing modern psychological methods for preparing personnel to do presented missions and treating the resulted psychological damages in the war-field, 8. Rehabilitation of the victims of war 9. Attempting to train and prepare completely the military physicians in all specialties required and related paramedics (cited from 7&8).

Objectives and competencies required in training military doctors with expertise in environmental and workplace medicine at American University of USUHS

1. Training military physicians working in occupational and environmental medicine and using their knowledge, skills and abilities in a full range of occupational and environmental medicine at public health level and individual diseases, 2. The residents are trained with

unique conditions in the military career in a military environment, 3. The residents acquire medical and public health qualifications and work as the chief physicians in the high ranks of Department of Defense, 4. Acquiring knowledge, attitudes and skills in epidemiology, infection control, and tropical diseases in war, 5. Paying attention to occupational and environmental health in military divisions, 6. Medical responsibility against nuclear, biological, and chemical events, 7. Paying attention to special health cases in basic trainings such as acute respiratory infections and designing barracks, 8. Considering the aspects of health in the quick replacement of forces and assessment of medical threats and their security, 9. Organizing the activities of physicians of military medicine and professional medicine in the barracks within the established military forces, 10. Paying attention to legal requirements and regulations in the region and the states that have military personnel and posts, 11. Medical cares from workers exposed to nuclear, biological, and chemical substances (4).

What are the specialized courses of Military Medicine at doctoral degree in world's leading universities?

The courses of General Military Medicine in Slovakia that have been cited (10) as the following (Table2).

What are curriculum design objectives of the general physician with military approach in Iran?

It is expected for the specialists of general military medicine to have the following abilities (knowledge, attitude and experience) (Table 3)

Table1. The courses of the American USUHS University are presented in the following table.

Military Emergency Medicine	Biochemistry	Military Preventive Medicine	Family Medicine
Introduction to clinical reasoning	Clinical head and neck and applied neuroscience	Military event medicine	Medicine
Ethical, logical and social aspects of medical cares	Diagnostic parasitology and medical zoology	Military emergency medicine	Obstetrics and Gynecology
Human behavior	Principles of biometric and epidemiology	Neurology	Pediatrics
An introduction to clinical medicine (1)	Human in the framework of treatment and health		Psychiatry
An introduction to clinical medicine (2)	An introduction to clinical medicine	Medicine elective courses (internal medicine, pediatrics, family, radiology, dermatology)	Surgery
Microbiology and infectious diseases	An introduction to structure and function	Surgery elective courses (general surgery, specialized surgery, anesthesia, obstetrics and gynecology)	Family medicine
Military studies (2)	Psychiatry	Elective courses of behavioral sciences	Medicine
Pathology	Military studies and history of medicine	Elective training	Obstetrics and Gynecology
Pharmacology	Field studies of military medicine	Military preventive medicine	Pediatrics
Preventive medicine	The structure and function of systems	Medicine of military events	Psychiatry
Surgery			

Table2. The courses of General Military Medicine in Slovakia	
Medicine of events	Military epidemiology
Social Sciences	Military health
Protection against weapons of mass destruction	Physical training
Tactics	Medical commitments
Military health management	Surgery in war
Medicine of crisis in summer camps	Internal medicine in war
Organizing and tactics in military health services	English language
Health justice	Professional training of war
Medical training in war operations	Patient care operations
Radiology	Professional training of internal medicine in war
Toxicology	professional training in operation
Military pharmacology	Health training and professional epidemiology in military operations
Current issues in military medical services	Training of war surgery simulation
Organizing military medicine in peace	Professional training of internal medical simulation

Table3. Abilities (knowledge, attitude and experience)			
The abilities that are expected a specialist physician of the military medicine to have.	Agree	No idea	Disagree
Having enough interest and motivation for a military job	78.1	9.4	12.5
Having the necessary health and ability and physical fitness as a military physician officer	71.9	12.5	15.6
Having basic knowledge and general skill in relation with military sciences	84.4	12.5	3.1
Having skill and knowledge in preventive medicine special for military careers	93.8	3.1	3.1
Having skill and knowledge in environmental medicine special for military careers	78.1	12.5	9.4
The ability to evaluate and manage patients and the injured and doing triage and transport of the injured in war conditions and accidents	93.8	3.1	3.1
The ability to care for trauma victims and patients at the scene of military	100	0	0
The ability to manage victims and patients in the conditions of natural disasters	68.8	21.9	9.4
The ability to treat the injured and the patients of war	100	0	0
The ability to manage and treat biological, radiological, chemical and nuclear injured	84.4	15.6	0
The ability in training military medicine	71.9	21.9	6.3
The ability in research in military medicine	90.6	6.3	3.1
The ability to manage health centers in war and accidents	84.4	9.4	6.3
The ability to manage clinical centers in war and accidents	78.1	18.8	3.1
The ability to manage and organize the missions of military medicine	71.9	0.25	3.1
Having the knowledge in affaires related to military nourishment	93.8	6.3	0
Having the knowledge in behavioral affaires related to military individuals	84.4	12.5	3.1

The above table shows that the objectives determined for general military medicine were approved by experts and elites of military medicine. All determined objectives were agreed by more than 70 percent and some important goals such as nutrition affairs, research in military medicine, care for the injured and patients, the treatment of the injured and trauma patients, and preventive medicine was agreed by experts with more than 90%, because the objectives have determined from the results of need assessment and the intended needs have been specified by these experts.

What are the specialized courses of Military Medicine at doctoral degree in Iran?

In your opinion, how much the proposed content is appropriate for the determined objectives?

Table 4 shows that the experts agreed more than 70 percent with designed lessons for intended objectives except the Radiography Interpretation that received an agreement of 61 percent to be incorporated in the curriculum of the general military medicine. According to this table, the key courses such as medical ethics, care and treatment of the sick and

Table 4. Specialized courses of Military Medicine in Iran

Items	High	Intermediate	Low
Medicine of events (such as floods, storms, firing)	71.9	0.025	3.1
Military psychology and psychiatry	0.075	21.9	3.1
Protection against weapons of mass destruction	0.075	21.9	3.1
Disaster medicine	90.6	7.3	2.1
Toxicology	78.1	20.8	1.1
Military epidemiology (diseases of military careers) and crises	0.075	20.9	4.1
Military health	90.6	9.4	0.0
Microbiology and virology	81.3	18.8	0.0
Principles of military medicine (1) (military environments and weapons)	0.075	21.9	3.1
Principles of military medicine (2) (history of military medicine in Iran and world)	78.4	17.5	4.1
Principles of military medicine (3) (the structure and organization of operational military medicine and its functional levels)	78.1	18.8	3.1
Principles of military medicine (leadership, human resources management, management of physical resources and military therapeutic and health resources)	0.075	20.9	4.1
Information and communication technology-databases in medical sciences	0.075	0.025	0.0
Epidemiology of diseases in war (diseases of military careers) and crises	79.1	15.8	5.1
Health and preventive medicine in times of crisis and war	84.4	12.5	3.1
Traumatology in war and crisis conditions	81.3	12.5	6.3
Triage (evacuating and transferring the wounded and the sick)	78.1	16.6	5.3
Environmental medicine for military individuals (tropical, cold, mountain diseases and bites)	0.085	10.6	4.4
Aerospace medicine	80.9	13.8	5.4
Marine medicine	81.9	12.8	5.4
Modern warfare agents	78.1	15.6	6.3
Military traumatology and accidents	83.1	16.9	0.0
First aid in war	81.3	18.8	0.0
Management of operational medical centers in war	71.9	28.1	0.0
An introduction to clinical medicine	81.3	12.5	16.3
Military nourishment	78.1	15.6	16.3
Military sciences	81.3	18.8	0.0

wounded, military health, crisis (disaster) medicine, etc., received an agreement of more than 90 percent.

Table 5 shows the new courses of general medicine curriculum in doctoral degree. For each course, in addition to the current curriculum, the following military courses have been presented.

The learning-teaching methods and evaluation

According to the type and content of new courses and also the characteristics of learners in new curriculum the teaching methods of lecture, question and answer, goal and scenario-based learning, discussion in small groups, cooperative learning, problem solving, field trips in military environments, film screenings and also the evaluation methods of the internship report or practical project, portfolio, participation in discussions, conferences in the classroom, translation (article or book), the written assessments (continued and final) will be used more.

DISCUSSION

Medical curriculum at military medical universities in the world is different based on their circumstances. In American University of USUHS, there is a special curriculum for military medical students. The content of this curriculum is 700 hours more than the curriculum of other universities. In this curriculum, the topics of military preventive medicine, medicine of military events, military emergency medicine, medical logistics, management and administration of the wounded on the battlefield, etc., are emphasized. By passing these courses of military medicine, students will receive the preparedness to recognize and treat diseases and combating and non-combating trauma injuries (10). The Czech and Slovakia military curriculum for military medical students includes about 54 theoretical and practical specific military medicine courses (11).

Table 5. Courses of Military Medicine

Courses	No.	Theoretical	Practical
Military sciences	2	1	1
Information and communication technology-databases in medical sciences	2	1	1
Principles of military medicine (1) (familiarity with military environments and weapons)	2	1	1
Triage (evacuating and transferring the wounded and the sick)	2	2	-
Management in military medicine	2	1	1
Medicine of events (floods, storms, firing)	1.5	1.5	-
Military nourishment	2	1.5	0.5
Military health	2	1	1
Health and preventive medicine in times of crisis and war	2	2	-
Environmental medicine for military individuals (tropical, cold, mountain diseases and bites)	2	2	2
Military psychology and psychiatry	3	3	-
Military and event traumatology	3	3	3
Marine medicine	2	1.5	0.5
Management of operational medical centers in war	1	1	-
First aids in war	1	0.5	0.5
Modern warfare agents	3	2	1
Aerospace medicine	2	1.5	0.5

Thailand has a unique medical curriculum for medical officers in relation to military medicine. In terms of content, the curriculum includes the topics of prevention, assessment of threatening health issues, clinical care of illnesses and injuries caused by occupational exposure and evacuate the sick and injured. In other words, the curriculum includes military science, medical skills of war, military preventive medicine, applied military physiology and medicine of military job accidents (12). The Australian Quizland University has introduced a curriculum for military medicine aiming at training military physician officers to medical operations in military environments. The most important topics of this curriculum includes an introduction to health services in war (defense) for one week, medical inspection for two weeks, occupational and environmental health for 5 weeks, defense services in confronting chemical, biological and nuclear weapons for 6 weeks, aviation medicine for 7 weeks, medical air evacuation for 8 weeks, tropical medicine for 9 weeks, submarine medicine for 10 weeks, military epidemiology for 11 weeks, health care for soldiers for 12 weeks and practical ethics in military medicine for 13 weeks (7). In Jerusalem Hebrew University and Hadassah University in occupied Palestine, specific curriculum of military medicine includes marine medicine, air medicine, war medicine, internal medicine, emergency medicine, trauma and terror medicine, sport medicine, climate medicine (vulnerability due to weather and climate conditions) and management of mass casualties in war conditions and unexpected crises (13).

Baghiattollah (AJ) University of Medical Sciences has designed the discipline of military medicine in military emergency in doctoral degree. In this curriculum the

teaching aspects of the curriculum includes objectives, content, teaching-learning strategies and evaluation, and the important courses such as principles of military medicine, health and preventive medicine in crisis and war, disaster medicine, medical ethics, forensic medicine, triage and transporting the wounded, emergency medicine, anesthesiology, emergency cyclic courses, environmental medicine, statistics and research methodology, surgery, internal medicine, clinical traumatology, orthopedics, aerospace medicine, familiarity with accidents, and occupational diseases in armed forces (7,8).

With more serious institutional need to military medicine and not allowance to continue this trend, that is, the training of physician with the same typical and national program, and also according to the importance of military medicine for the armed forces, reviewing the curriculum of the military medicine at the universities of Iran is a matter of urgency (7). So Iranian military medical universities must review their curricula according to the needs of the audiences of the curricula as what there were in the present study.

Military medicine curriculum designed with the military medicine approach in this study is a special program that includes materials of 30 theoretical-practical and training course related to military medicine. As well as some changes have been made in the rest of the existing courses, that is, the specific topics of military medicine in basic and clinical courses have been added to the existing curriculum consistent with present study. In fact, the curriculum and its content is an additional program to the general medicine curriculum in doctoral degree. In the present program, physicians can be trained to have enough knowledge, skills and attitudes to meet the needs of military medicine for

health of military personnel. Limitations of the present study include limited research sample of faculty members and experts in Baqiyatallah and AJA University of Medical Sciences. The lack of the available resources on military medicine in other countries, and the poor cooperation of some experts to participate are noted in the present study.

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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REFERENCES

1. Leone Villavicencio J, Merrill Daniel M, Rich Norman M. The Military Medical School of Mexico: A tradition of excellence. *World J Surg.* 2005;29(1):99-104.
2. Jackson Henry M. (Foundation for the Advancement of Military Medicine, Inc.). *Military Graduate Medical Education: Uniformed Services University of the Health Sciences: annual report.* 2010.
3. Shapira S. *Specialty Courses in Military Medicine* [monograph on the Internet]. Jerusalem: Military Medical School at Hebrew University-Hadassah Medical Campus; 2007 [cited 2011 Sept 18]. Available from: <http://medicine.huit.icPage.aspx?PID=128-2007>
4. U.S. Army medical department [homepage on the internet]. Texas: Carl R. Darnall Army Medical Center. [Updated 2015 Oct 12]. Available from: <http://www.crdamc.amedd.army.mil/emres/index.asp?page=curic>
5. Holcomb JB, Butler Jr FK, Giebner SD, Mc Swain NE, Bagian J. Tactical combat casualty care 2007: evolving concepts and battlefield experience. *Military Medicine.* 2007;172(Supplement_1):1-19.
6. Truitt MS, Johnson V, Riverra M, Mangram A, Lorenzo M, Dunn E. Civilian and Military trauma: Dose Civilian Training prepare surgeons for the Battlefield. *Am Surg.* 2011; 77(1):19-21.
7. Rahmani R, Mehrvarz Sh. Designing the general physician field study curriculum with military medicine approach. Tehran: Research Design; 2013. Persian.
8. Abbaspour A, Maleki H, Ebrahimneia M, Rahmani R, Mehrvarz Sh, Zare'e Zavaraki E. Curriculum designing of military emergency medicine course in a military university. *Mil Med J.* 2012;14(1):7-14. Persian.
9. Cation LJ. Military internal medicine resident performance on the American Board of Internal Medicine Certifying Examination. *Military Medicine.* 2014;167(5):421.
10. Grant J. Principles of curriculum design. *Understanding Medical Education: Evidence, Theory and Practice.* 2010:1-15.
11. Dana A, Mohammadimehr M. Instructional design Modular periods of Military Medicine with life-long learning approach. AJA University research plan; 2016.
12. U.S Army Medical Department [homepage on the Internet]. *Military Medicine.* 2009 June 19. Available from: http://www.cs.amedd.army.mil/about_amedd.aspx
13. Keshavarz M. *Military medicine.* MMJ. 2008;1(1-2):1-6.