Military Medicine Module Training to Undergraduate Medical Students: A Unique Approach in National Defence University of Malaysia

L. Shahidah1*, S. C. Reddy1 and V. F. Knight1

1Faculty of Medicine and Defence Health, National Defence University of Malaysia, Sungai Besi, Kuala Lumpur, Malaysia.

Authors’ contributions

This work was carried out in collaboration among all authors. Author LS designed the study, performed the literature search and wrote the first draft of the manuscript. Author SCR designed the study and corrected the draft of the paper. Author VFK managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JAMMR/2021/v33i430835

Editor(s):
(1) Dr. Emin Umit Bagriacik, Gazi University, Turkey.
(2) Dr. Rui Yu, The University of North Carolina at Chapel Hill, USA.

Reviewers:
(1) Ana Maria Vieira, Institute of Aeronautical Technology (ITA), Brazil.
(2) Pablo Domingo Depaula, Universidad de la Defensa Nacional (UNDEF), Argentina.
(3) R. Enrique Melgarejo, Military Nueva Granada University, Colombia.
(4) Ajaz Ahmad Bhat, Sidra Medical and Research Center, Qatar.

Complete Peer review History: http://www.sdiarticle4.com/review-history/65259

Received 15 December 2020
Accepted 20 February 2021
Published 12 March 2021

ABSTRACT

Background: Faculty of Medicine and Defence Health in the National Defence University of Malaysia is the only university in the country that offers a unique combination of medical education and military training into an integrated academic programme.

Objective: To communicate to all the academic staff in the medical colleges about the military medicine module training to undergraduate medical students studying in National Defence University of Malaysia.

Teaching-learning Methods: The training is charted into 5 modules: Military Trauma Life Support, Army, Aviation and Naval Medicine, Advance Trauma Life Support and Battlefield Medicine. These modules are delivered across the 5 years of the medical programme in the form of lectures, demonstrations and field training in the medical battalion, aviation medicine and underwater
medicine facilities. Visits to relevant medical institutions and simulator trainings will broaden the students’ perspectives on occupational hazards, anticipate suitable patient-care management and mode of casualty evacuation. The combination of classroom learning and field exposure will definitely promote critical thinking, develop problem solving, decision making and analytical skills. **Conclusion:** The management of patient under stipulated harsh scenarios/environments have created opportunities for students to exercise critical thinking and decision making. All the positive feedback obtained from students after the completion of their posting in each year on the knowledge, skills and attributes suggest that the Military Medicine training programme enhanced their personal attributes and complemented their medical knowledge.

**Keywords:** Military medicine; medical students; army medicine; aviation medicine; naval medicine; battlefield medicine.

1. **INTRODUCTION**

Faculty of Medicine and Defence Health (FMDH) in the National Defence University of Malaysia (NDUM) is the only university in the country that offers a unique combination of medical education and military training as an integrated academic programme. In September 2011, FMDH welcomed the first batch of medical students. Every year the intake was restricted to 50 students only and the medical degree course is for 5 years [1].

The faculty adopted a hybrid medical curriculum after series of discussions with medical educationists and subject experts based on the format recommended by the Ministry of Higher Education. The hybrid medical curriculum combines the best aspects of both the modern and the conventional medical curricula with emphasis on subject-based, system synchronized preclinical curriculum, complemented by problem-based learning and early clinical exposure while the clinical curriculum is posting-based, just like any other undergraduate medical programme. The 5-years programme comprises of 3 phases: Phase 1, Phase 2 and Phase 3. The Phase 1 mainly covers on normal in preclinical subjects (1 year) while the Phase 2 focuses on abnormality in preclinical subjects (1 year); the Phase 3 covers mainly clinical subjects (3 years).

The FMDH aims to produce competent and versatile medical officers who are well-disciplined, highly motivated and knowledgeable not only in the medical field but also capable of providing services to meet the needs of various operations/ emergencies/ disasters. Graduates from the faculty are expected to be readily deployable and able to function effectively in any circumstances. The objective of this paper is to communicate to all the academic staff in the medical colleges about the advantages of military medicine module training to undergraduate medical students (military cadets and civil students) studying in National Defence University of Malaysia.

2. **MILITARY MEDICINE MODULE TRAINING FOR MEDICAL STUDENTS**

The Military Medicine training is designed with the aim to complement the medical knowledge and application skills of the NDUM medical graduates so that they become competent doctors with the ability to manage the medical demands of operational contingencies in all kinds of environment.

To support the educational philosophy of FMDH in transforming medical students into competent and compassionate doctors with the ability to manage the medical demands of any given environment, the Military Medicine training is charted into 5 modules: Military Trauma Life Support, Army Medicine, Aviation and Naval Medicine, Advance Trauma Life Support and Battlefield Medicine [1]. These modules are delivered throughout the 5 years of the medical programme with the aims to enhance and complement the medical knowledge and skills of the NDUM medical graduates (Fig. 1). A compulsory pass in the military medicine module is a mandatory for the award of MD degree after final professional examination.

The Military Trauma Life Support (MTLS) module is conducted towards the end of first year medical programme. It is a one-week module that aims to produce competent military doctors with the ability to perform 1 and 2 rescuer cardio-pulmonary resuscitation (CPR) in adult, child and infant. At the end of the module, students should be able to explain a systematic approach to
manage and stabilize haemorrhage and trauma. They are expected to be able to perform proper splinting, bandaging and apply immobilization techniques (Fig. 2) on a simulated casualty [2]. As the emphasis is on the initial management of casualties a short exercise is conducted for students to evaluate their skills on CPR (Fig. 3) and the basic patient evacuation methods that have been taught. This module also serves as an introductory to Military Medicine.

Fig. 1. Integrated medical curricula and military medicine training module

Fig. 2. Initial splinting and bandaging of casualties on a simulated patient
The Army Medicine is conducted in year 2 of the academic programme. This 1-week module is phased into 2 teaching blocks with the aim to provide an understanding of various aspects of administration and management of casualty care and medical planning [3]. The first block focuses on lectures whereas the second block encompasses of field training and skills stations. The field training is conducted at the Medical Battalion (Fig. 4) with the supports from experienced medical officers and military paramedics. It provides opportunities for students to integrate facts learned in the medical system approach into concepts related to injuries and health problems [4]. In addition, medical students also have the opportunity to gain knowledge on chemical and biological hazard (Fig. 5) and a memorable life-experience of undergoing gas exposure.

In year 3, students have to undergo the Aviation and Naval medicine module. It is a 2-week module that provides students with basic understanding of aviation and underwater physiology in a systematic approach, which integrates basic sciences knowledge gained in year 1 and 2 of medical course [5]. In the Aviation Medicine module, they are taught on the effects of acceleration and G-forces, spatial disorientation and the aero psychology topics of situational awareness and crew resource management [6,7]. Students also have the opportunity to gain experience in emergency ejection of a pilot on a simulator and the impact of this on the body during this process (Fig. 6). They are also taught the procedure of preparing the patients for evacuation in the aircraft (Fig. 7).

The naval medicine provides an understanding into basic requirement of shipboard medicine including medical aid to the wounded, shipwreck and prisoner of war [8,9]. This module also provides a general understanding on diving and subsurface illnesses such as decompression illness, barotraumas and gas embolism and injuries due to dangerous marine animals [5]. The on-board ship training (Fig. 8), exposure to simulators and diving experience (Fig. 9) definitely enrich the student's knowledge to the various treatment modalities which they are likely to encounter in the future as a Medical Officer.

The year 5 students will undergo Advanced Trauma Life Support (ATLS) and Battlefield Medicine modules. ATLS is a one-week course that seeks to provide a foundation for skills that students will have to master and later be assessed upon as a part of their Houseman training [10]. It teaches students on how to prioritize and stabilize a critically injured patient using concise guidelines that can be applied to any patient by any physician. This module aims to provide the student with a safe, reliable method to assess the patient's condition rapidly and accurately, resuscitate and stabilize them according to priority (Fig. 10), determine if there's a need to transfer the patient to another facility, arrange for inter-hospital transfer and ensure that optimal care is provided.

The final module of Military Medicine programme is the Battlefield Medicine. It is designed to enhance the operational medical readiness skills of future military doctors with the ability to manage medical demands of operational contingency in all kinds of environments (Fig. 11). The module incorporates various real-world scenarios of problem-solving exercises where medical students must perform the duties of their respective career-field positions as well as the duties of first responders [4,11]. They will have the opportunity to demonstrate competency in selecting appropriate medical intervention and treatment modalities on the battlefield and various operations other than war [12,13]. In this final module of Military Medicine component, students are expected to incorporate the facts learnt in the medical management and treatment modalities into various scenarios of medical support. They are briefly exposed to the requirements and establishing a field hospital in emergency situation (Fig. 12).

3. TEACHING-LEARNING METHODS

Generally, the Military Medicine module consists of two instructional blocks focusing in a myriad of medical readiness topics taught through didactic lectures and the application of Military Medicine in various scenarios which is also known as field training [1]. In the didactic lectures, students are provided with an under-standing of the various contingency operations and its adverse conditions. They are exposed to the theoretical aspects of military medicine, administration and management of medical support as well as practical information needed for planning and delivering health services. The series of didactic lectures are classroom lectures, movie and seminar type discussions. Interactive case presentations and discussions are also incorporated as an integral part of the scenarios developed for the skills stations/learning stations. Students are divided into groups and are to attend each skill station with the instructors.
Fig. 3. Students’ assessment on cardiopulmonary resuscitation skills

Fig. 4. Introduction to tactical combat casualty care
Fig. 5. Patient assessment and management under chemical, biological, radiation and nuclear environment

Fig. 6. Student experiencing the ejection seat simulator procedure
Fig. 7. Preparation of a simulated patient for evacuation in the aircraft C130

Fig. 8. Medical evacuation of patients on the sea
The field skill trainings include field demonstrations by experts, practical workshop and field duties. Students are placed in situations that challenge their abilities to make quick, sound decisions under the pressure of simulated combat conditions [3,11]. They are exposed to administration and management of casualty as well as practical information essential for planning and delivering health services. The Medical Battalion is incorporated in the Army Medicine and Battlefield Medicine as a training site to create “real” environment for field-care [4].

Fig. 9. Training about diving procedure

Fig. 10. Procedure of Resuscitation and stabilizing the patient
Medical management and casualty evacuations are conducted with assistance of aircraft from the Malaysian Armed Forces. Visits to relevant medical institutions and simulator trainings will
broaden their perspectives on occupational hazards, anticipate suitable patient-care management and mode of casualty evacuation. The combination of classroom learning and field exposure will definitely promote critical enquiry, develop problem solving, decision making and analytical thinking skills.

4. ASSESSMENT METHODS

The Military Medicine training emphasizes heavily on providing a learning experience for students to develop working knowledge of prehospital care based upon accepted standards and organize and execute triage in austere environments. The field trainings are the important elements that encourage the enhancement of “technical” competency; application of medical knowledge and management of a casualty, evaluating the possible physiology of injuries, casualty triage and echelons of care in a prehospital environment [3,4,11]. Field skill exercise is implemented to evaluate students’ competency and proficiency of leadership, teamwork, problem solving and likely medical management of casualty. Students are put on rotating leadership cycle during which they serve as leader/team member and are placed in situations that challenge their abilities to make quick, sound decisions under the pressure of simulated austere conditions. The various roles of appointment will inculcate fundamental attitudes of intellectual honesty, respect, compassions for others and dedicated medical officers. All these exposures; field and simulators trainings, visits and exposures will enable medical students to understand the people and work environment for which they will have future medical responsibility.

5. CONCLUSION

At the end of the module training, the students are able to: (1) demonstrate knowledge of military and operational medical deployments with an emphasis on threat identification, preparation and mitigation, (2) demonstrate knowledge of illness, injuries and disabilities sustained and/or arising from various military operations, humanitarian assistance and disaster relief operations, (3) demonstrate understanding of the people and work environment for which they will have future medical responsibility, (4) develop an ethical and professionalism attitude towards the practice of medicine emphasizing on military and security type deployments, and (5) develop leadership skills, field medical knowledge in conducting level II healthcare operations in austere environment.

The combination of medical education and military training into an integrated academic programme has challenged medical students to achieve greater heights of achievement. The management of patient under stipulated harsh scenarios/ environments have created opportunities for students to exercise critical thinking and decision making. To become a competent and caring doctor, it requires more than just medical knowledge and skills but a combination of strong of medical knowledge, mastery of skills and right attitude. Hopefully, the learning experiences and exposures in the Military Medicine training can trigger intellectual curiosity and encourages medical graduates to take active responsibility for their learning.

CONSENT

As per international standard or university standard, patient’s written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the author(s).

ACKNOWLEDGEMENTS

The authors are very much thankful to many experienced military medicine practitioners and subject matter experts who have contributed to the development of the Military Medicine module training. The authors would like to accolade special appreciation to Mejar Jeneral Prof Dato’ (Dr) Mohd Zin bin Bidin (Rtd) for his exemplary leadership in starting the medical faculty, and to all the personnel in the Royal Malaysian Army, Royal Malaysian Navy, Royal Malaysian Air Force, Royal Medical and Dental Corps and Royal Engineer Regiment for their help and contributions in training the medical students in this module.

COMPETING INTERESTS

Authors have declared that no competing interests exist.
REFERENCES


