

## Impact of Military Medicine Training on the Perception and Future Performance of Graduates from National Defence University of Malaysia

### ABSTRACT

**Background:**The integration of Military Medicine into medical undergraduate programme in National Defence University of Malaysia (NDUM) has shaped the landscape of the formal existing framework of medical education, creating a platform to enhance feasibility of doctors to work effectively in austere environment and towards interagency collaboration between military and civilian.

**Objectives:**This study aims to explore the impact of Military Medicine training on NDUM medical graduate's perception and their future performance in the categories of (i) personal and professional development, (ii) as a platform for future military-civilian cooperation, (iii) readiness to participate in future military-civilian cooperation: Knowledge, Skills and Attitude.

**Methods:**This is a quantitative research design, conducted among six batches of graduates to explore the impact of Military Medicine training on their perception and future performance. The non-probability purposive sampling method was used and medical graduates have responded the online structured questionnaire. The questionnaire was distributed using snow ball techniques through online Google form. Informed consent was taken from the responders.

**Results:**A total of 90 medical graduates responded to the study. The participation pool included military doctors (48.9%, n=44) and civilian doctors (51.1%, n=46). The study feedback shows that most graduates viewed that their participation in the Military Medicine courses has positively affected their personal development (93.3%, n=84), work performance (93.3%, n=84) and personality (85.6%, n=77). 93.3% (n=84) opined that Military Medicine courses is useful for their career progression. The participants' feedback highlighted that the training has enhanced their perceptions (98.9%, n=89) and is a very useful platform for future military-civilian cooperation in Malaysia (80%, n=72). Amongst important values that graduates have gained from their participation in Military Medicine training are teamwork, esprit de corps and cooperation, perseverance and mental readiness and new experiences in providing care beyond comfort zone of hospital settings.

**Conclusion:**NDUM medical graduate have benefited positively from the Military Medicine module and enhance their perception toward military-civilian cooperation.

*Keywords: Military Medicine training; medical graduates; impact on perception; impact on future performance*

### Introduction

National Defence University of Malaysia–NDUM (also known as Universiti Pertahanan Nasional Malaysia-UPNM) is the only higher learning institution in Malaysia that offers Military Medicine training to medical students. The Faculty of Medicine and Defence Health (FMDH) at NDUM adopts a hybrid medical curriculum; a curriculum that combines the best aspects of both the modern and the conventional medical curricula with emphasis on a subject-based, system-synchronized preclinical curriculum, complemented by problem-based learning and early clinical exposure. In-line with the university's mission and vision, the unique composition of students and the support from the Malaysian Armed Forces (MAF), FMDH has been able to integrate Military Medicine into the formal existing framework of clinical setting. The added-value of Military Medicine module is designed with the aim to complement the medical knowledge with vital military soft skills so that they become competent doctors with the ability to manage the medical demands of various contingencies[1].

In NDUM, all medical students must undergo the Military Medicine module which comprises of Military Trauma Life Support(year-1), Army Medicine(year-2), Aviation Medicine, and Naval and Underwater Medicine(year-3), Advanced Cardiac Life Support and Battlefield Medicine(year-5)[1]. During the courses, students have the opportunity to experience field training with the MAF, namely the Malaysian Army, Royal Malaysian Navy, Royal Malaysian Air Force, Royal Medical Corp, and to some extent; training with the civilian agencies such as the Malaysian Civil Defence Department, Malaysian Maritime Enforcement Agency, and the Fire and Rescue Department of Malaysia. To date, the university has produced over 300 medical graduates and most of them serve in the Malaysian Armed Forces, Malaysia Ministry of Health and some have ventured into private practice.

Numerous studies have been conducted to address the effectiveness of Military Medicine in augmenting medical students' learning[2- 7]. As a follow-up study of our paper published on Military Medicine training to undergraduates in NDUM [1], the findings of this study are reported.

**Objectives:** This study aims to explore the impact of Military Medicine training on NDUM medical graduates' perception and their future performance in the categories of (i) personal and professional development, (ii) as a platform for future military-civilian cooperation, (iii) readiness to participate in future military-civilian cooperation: Knowledge, Skills and Attitude.

## **Methods and Data collection**

This is a quantitative research design as its aim is to explore the impact of Military Medicine training on NDUM medical graduate's perception and their

future performance. The study was conducted among six batches (graduates of year 2016 to year 2020) who have completed the Military Medicine module face-to-face during their undergraduate study.

The non-probability purposive sampling method was used and a total of 90 medical graduates have responded to the online questionnaire. Data were collected using a structured questionnaire. It was pretested on ten students before collection from respondents. The questionnaire was in English language as it is the medium for teaching and learning for NDUM medical programme. The questionnaire was prepared by going through paper published earlier from UPNM [1] and modification was made to suit Military Medicine curriculum. The questionnaire was distributed using snow ball techniques through online Google form as most of the medical graduates are serving nationwide.

### Consent from the participants

A written online-consent was included in the questionnaire. The purpose of the study was explained to the responders and was included in the questionnaire. The responders were informed that completed questionnaires and computer data were kept confidential and all data collected were used for academic purposes only. The consent form indicated that participation was voluntary and by returning the answered questionnaire, they gave their consent to participate. To ensure confidentiality is maintained, participants were assigned randomized identification numbers to track their data for analysis.

### Results

A total of 90 medical graduates responded to the study. Fifty-nine (65.6%) of them were males; majority of the responders were Malay (63.3%); 44 (48.9%) were military cadets during their undergraduate education (Table-1). It is worth to highlight that 11 medical graduates joined the Pasukan Latihan Pasukan Simpanan - PALAPES (also known as Reserve Officer Training Unit) as part of their undergraduate co-curriculum activities. Forty-four responders are military doctors; forty-five responders are medical officers who are employed by the Malaysian Ministry of Health while one respondent has ventured into private practice.

**Table 1. Demographic Profile of Respondents (n=90)**

Variables	Number	Percentage	
Age:	23-25 years old	44	48.9%
	26-28 years old	31	34.4%

	above 29 years old	15	16.7%
<b>Gender:</b>	Male	59	65.6%
	Female	31	34.4%
<b>Race:</b>	Malay	57	63.3%
	Chinese	7	7.8%
	Indian	25	27.8%
	Pribumi	1	1.1%
Status During Undergraduate:	Military cadet	44	48.9%
	Ordinary civilian students	29	32.2%
	Civilian students who joined the military reserve training	11	12.2%
	Cadet-turned-civilian student	6	6.7%
<b>Current Status:</b>	Military Doctor	44	48.9%
	Medical Officer	45	50.0%
	Private Practice Doctor	1	1.1%

The graduates' responses on the impact of Military Medicine training on their Personal and professional development is shown in Table-2. Eighty-four (93.3%) graduates responded that the Military Medicine training has positive impact on their personal development, work performance and career progression, while 6 (6.7%) responders were neutral. Seventy-seven (85.6%) graduates responded that the Military Medicine training has positive impact on their personality. No responder reported that the military training has impacted them negatively on any of the above.

**Table 2. Graduates' responses on the impact of Military Medicine training on their personal and professional development (n=90)**

Questions and Responses	Number	Percentage
<b>1. on personal development as a person</b>		
Positive impact	84	93.3%
Neutral	6	6.7%
Negative impact	0	0%
<b>2. on your work performance</b>		
Positive impact	84	93.3%
Neutral	6	6.7%
Negative impact	0	0%
<b>3. on your personality</b>		
Positive impact	77	85.6%
Neutral	13	14.4%
Negative impact	0	0%
<b>4. on usefulness for career progression</b>		
Yes	84	93.3%
No	6	6.7%

When asked about their opinion on the Military Medicine module as a platform for future military-civilian cooperation (Table-3), 72 (80%) graduates rated it as very useful, 17 (18.9%) as moderately useful while 1 (1.1%) rated as not useful at all. Eighty-nine respondents (98.9%) rated that Military Medicine training enhanced their perception towards working effectively in military-civilian cooperation in Malaysia while one respondent rated that he/she did not perceive the training as enhancing military-civilian cooperation. These findings highlighted the graduate's opinion on the Military Medicine module as a platform for future military-civilian cooperation.

**Table 3. Graduate's opinion on the Military Medicine module as a platform for future military-civilian cooperation (n=90)**

Questions and Responses	Number	Percentage
<b>1. as a platform for future military-civilian cooperation?</b>		
Very Useful	72	80%
Moderately useful	17	18.9%
Not useful at all	1	1.1%
<b>2. enhances your perception towards working effectively in military-civilian cooperation in Malaysia</b>		
Yes	89	98.9%
No	1	1.1%

Table-4 highlighted graduate's opinion on the impact of Military Medicine towards their readiness to participate in future military-civilian cooperation: Knowledge, Skills and Attitude. On the aspect of knowledge, 69 (76.7%) graduates believed that the training has improved their knowledge on military-civilian cooperation/collaboration; 64 (71.7%) graduates believed that the training enhanced their understanding on the roles of other agencies in providing healthcare; and 54 (60%) believed that the training has served as a platform for comprehensive delivery system in providing medical care in various environment.

On the aspect of skill, 72 (80%) graduates believed that the training has enhanced their ability to practice decision-making in complex and dynamic environment; 71 (78.9%) believed that the training has enhanced their ability to work as a team in any military-civilian collaboration; and 50 (55.6%) believed that the training has enhanced their ability to perform collaborative practice and their readiness for future acquaintance and collaborative practice.

On the aspect of attitude, 66 (73.3%) graduates believed that the training instilled awareness on the culture of other profession such as the Army, Navy, Air Force, Civil Defence and the Malaysia Maritime Enforcement; 54 (60%) believed that the training improved their perceptions toward civilian and military

engagement/participation/work ethics; and 53 (58.9%) believed that the training has enhanced trust (trust building) among civilian and military personnel.

**Table 4. Graduate's opinion on the impact of Military Medicine toward their readiness to participate in future military-civilian cooperation: Knowledge, Skills and Attitude (n=90).**

Questions and Responses	Number	Percentage
<b>1. On the aspect of knowledge, the Military Medicine training has:</b>		
• enhanced my understanding on the roles of other agencies (NGO)/healthcare profession and their support in providing healthcare	64	71.7%
• improved knowledge on military-civilian cooperation/collaboration	69	76.7%
• improved patient's care and planning (eg procedure to request for TUDM mercy flight as in Aviation Medicine module)	37	41.1%
• served as a platform for comprehensive delivery system in providing medical care in various environment	54	60.0%
• enhanced my knowledge on care coordination efforts and functions	47	52.2%
<b>2. On the aspect of skills, the Military Medicine training has:</b>		
• enhanced my ability to work as a team in any military-civilian collaboration	71	78.9%
• enhanced my ability to perform collaborative practice	50	55.6%
• enhanced my ability to practice decision-making in complex and dynamic environment	72	80.0%
• enables me to bridge gaps that could have arisen in military-civilian cooperation	30	33.3%
• enhanced my readiness for future acquaintance and collaborative practice	50	55.6%
<b>3. On the aspect of attitude, the Military Medicine training has:</b>		
• improved my perceptions toward civilian and military engagement/participation/work ethics	54	60.0%
• instilled awareness on the culture of other profession (Army, Navy, Air Force, Civil Defence, Malaysia Maritime Agency etc)	66	73.3%
• enhanced trust (trust building) among civilian and military	53	58.9%
• foster team work	49	54.4%
• developed mutual beneficial relationship & respect	51	56.7%

In an open-ended question, responders were asked to list the most important values that they have benefited from their participation in the Military Medicine training as shown in Table-5. Forty-seven (52.2%) graduates listed teamwork, esprit de corps

and working with other agencies while 20 (22.2%)opined that exposure to healthcare management in various environments beyond their comfort zone as the most important value that they have benefited during their undergraduate Military Medicine training; and10(11.2%) listed the benefits as perseverance, positive mind, mental readiness, compassion and flexibility.Other beneficial responseslisted werediscipline, communication, leadership and patriotism.

**Table 5. Graduate’s opinion on the most important value that they have benefited from their participation in the Military Medicine training(n=90)**

Question and responses	Number	Percentage
<b>The most important value that you benefited from participations in Military Medicine training:</b>		
• teamwork, esprit de corps, cooperation and <i>working</i> relationship with other agencies	47	52.2%
• exposure to new experiences beyond comfort zone (health hazard and healthcare management in various disaster environment)	20	22.2%
• perseverance, positive mind, mental readiness, compassion and flexibility	10	11.2%
• discipline	9	10.0%
• communication	2	2.2%
• leadership	1	1.1%
• patriotism	1	1.1%

## Discussion

This study sought to explore the impact of Military Medicine module on NDUM medical graduate’s performance; and the findings confirmed that NDUM medical graduate have benefited positively from the Military Medicine module. The opportunity to participate in the field training among medical cadets and civilian students has enabled them to develop *kinship* (bonding). The exposure to “stressful environment” provided a priceless experience for medical students to weave together, creating teamwork and esprit de corps that can drive intellectual and profession excellence in providing healthcare under austere environment. It also instilled awareness, reduced misconception and enhanced understanding towards the military profession which in turn, can build trust, inculcate respect and solidify teamwork.

Feedback from medical graduate also revealed that they have gained important values such as teamwork, esprit de corps, cooperation and working relationship with other agencies,exposure to new experiences beyond comfort zone, perseverance, positive mind, mental readiness, compassion and flexibility, communication, discipline and patriotism.

The findings of this study are consistent with many research on the inclusion of Military Medicine into medical curriculum [3-7]. The US Department of Defence acknowledges the importance of competencies and soft skills such as cultural adaptability and sensitivity to local priorities to enable successful global health engagement. [2] As such, the US Uniformed Services University of the Health Science (USUH) has developed programmes and offers graduate-level education and courses that incorporated the tiered education that transforms global health education desired outcomes, such as interoperability, from a concept into attainable and sustainable goals.

Samuel and colleagues [3] conducted a pilot study to investigate the effectiveness of a six-week online course on the fundamental of Military Medicine in USUH. The course is an initiation to bridge the gap in the fundamental knowledge of Military Medicine for military physicians who are recruited through the Health Professions Scholarship Program (HPSP). The module feedback survey revealed that most participants spent 1 to 3 hours on each of the modules and there was no difference between the overall quality of the three modules (Introduction, Roles and Responsibility and Psychological Well-being). Overall, the pilot study showed that the course has provided the required fundamentals of Military Medicine that is important to HPSP students to perform effectively and efficiently as a military physician.

After identifying the difficulties that were encountered by the newly commission military doctor, Lall and his colleagues [4] conducted a qualitative research over a period of two years to develop and implement a structured Military Medicine module for the Indian Armed Forces. The feedback from the first and second batches of the young military doctors on the inclusion of Military Medicine module into the medical curriculum has revealed a need for multidisciplinary curriculum integration for doctors-to-be military officers to perform efficiently as medical caregiver in times of war and natural disasters. Important skills and abilities for military doctors such as leadership, communication skills, ability to handle stress, decision making skills and critical thinking, were not part of the medical education curriculum in India.

In year 2017, a qualitative study by Dana and Mohammadi Mehr [5] using snowball sampling techniques to select sample for the study, revealed that most of the educational programmes in Tehran provided basic clinical skills that are needed by physician in hospital setting. However, to be able to perform effectively in unknown environments, physicians needed to possess more complete set of soft skills. Amongst the utmost important and necessary skills are the crisis management, mental health management, emergency and pre-hospital skills such as field triage management, relief and transferring victims for treatment of military forces.

Following that, Dehganzadeh, and Mohammadi Mehr [6] conducted a mixed method research to identify the potentially-suitable characteristics of Military Medicine to be added into the clinical expertise curriculum (specialization) in Iran. They concluded

that the inclusion of Military Medicine curricular into the general medicine curriculum has enhanced the Iranian military medical universities in training physicians to meet the needs in military operation of the Iranian Armed Forces.

Similar to NDUM, the Phramongkutkiao College of Medicine (PCM), Thailand also imbedded Military Medicine into its medical curriculum with the aim to prepare medical cadets to work in austere medical settings upon their graduation as military physician[7]. The PCM Military Medicine curriculum comprises of four modules which starts in the first semester of the second-year. During the course, medical cadets are exposed to knowledge in Military Medicine and field training experiences to enable them to serve in the Thai Armed Forces with insight, morals and the professional attitudes of military doctors.

This study also highlighted the imperative roles of Military Medicine in NDUM medical programme increasing a platform of field experiences to enhance doctor's ability to provide and manage medical care in various scenarios. Exposure and experiences in field training has necessitated a paradigm shift in nurturing the art of knowledge and skills of medical care provision in a setting that is beyond the comfort of hospital setting. Military Medicine module is also about nurturing minds, igniting curiosity, and empowering NDUM medical students to reach their full potential i.e. competent doctors with the ability to manage the medical demands in various contingencies such as natural calamities (floods, earth quake, landslides) or in war scenarios – military doctors. Interagency collaboration is an important strategy to improve service delivery and healthcare resources. However, establishing collaborative interagency relationships is a challenging and complex process. The awareness and understanding of other organizational culture is the basis to the development of future military and civilian collaboration.

The provision and sustainability of medical and healthcare during disaster is complex and transcends beyond the Ministry of Health[8]. Trust, understanding and respecting professional boundaries and teamwork are among the important foundations for achieving genuine collaboration strong collaboration between all agencies especially where resources are scarce and limited.

### **Significance of the study**

This study provides insight into the opinions, experiences and perspectives of NDUM medical graduates on the educational experience that they have gained from their participation in Military Medicine training and the impact of the experience towards working effectively in various environment and future military-civilian cooperation in Malaysia. The findings of this study provided evidence that the integration of Military Medicine into academic programme does contribute to the effort in nurturing an effective and efficient healthcare provision. The findings will serve as a baseline for

educators of the medical faculty in NDUM to continue striving in its effort to spearhead the collaboration between military and various agencies collaboration.

### **Limitations**

The number of responders is small in this study. It is ideal to have a large number of responders to implement the findings of any study in the practice of education.

### **Conclusion**

The faculty of medicine of NDUM continuously strives to improve the Military Medicine module as comprehensive learning experience through lectures, visits and field training with the Army, Air force and Navy facilities of MAF and other enforcement agencies, which made our medical graduates as the ambassadors in bridging the gap between military-civilian collaboration in Malaysia especially in providing medical support during disasters. In addition to team building through field training, exposure to the role of other profession is the epitome to facilitation of trust, team work; which subsequently enhances readiness to mutual beneficial relationship and more collaborate practice in the future. Two things for sure are that the Military Medicine training has positively impacted our graduates and the integration of Military Medicine into medical education has altered the landscape of the formal existing framework of medical education in Malaysia.

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