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THE ESTABLISHMENT OF MILITARY MEDICINE AS A MEDICAL SUBSPECIALITY[1]

A CRIAÇÃO DA MEDICINA MILITAR COMO SUBESPECIALIDADE MÉDICA

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Abstract

Military Medicine has specific features that distinguish it from other areas of medical knowledge. This work aims to propose tools that can be used to establish Military Medicine as a technical and professional specialisation. To that end, the study uses an inductive reasoning methodology, a mixed research strategy and a "case study" research design.

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The study revealed gaps in the training of Portuguese military doctors, especially with regards to emergency and trauma medicine. The results showed that the most appropriate model of certification for a training programme in Military Medicine is the Competency awarded by the Portuguese Medical Association, and that a comprehensive theoretical and practical training curriculum is essential to establish a technical and professional certification in Military Medicine. The main areas to be included in an accredited Military Medicine training programme are: Advanced Trauma Life Support; Tactical Combat Casualty Care; Tactical Trauma / Tactical Medicine; Stress Management; Travel and Tropical Medicine; Disaster Medicine; Environmental Medicine; Chemical, Biological, Radiological and Nuclear Medicine; Medical Evacuation; Emergency and Trauma Training; Classification and Selection; Medical Evaluation Boards; Health Economics, Management and Leadership.

Keywords: Certification, Technical and Professional Specialisation, Complementary Training in Military Medicine, Military Medicine, Military Health.

Resumo

A Medicina Militar possui características específicas que a individualizam relativamente às restantes áreas do conhecimento médico. Este trabalho tem como objetivo principal propor ferramentas catalisadoras à criação da Medicina Militar como uma diferenciação técnico-profissional. Para tal, recorreu-se a uma metodologia de raciocínio de tipo indutivo, de acordo com uma estratégia de investigação mista, seguindo um desenho de pesquisa do tipo "estudo de caso". Em termos de resultados, concluiu-se que a formação complementar em Medicina Militar em Portugal tem lacunas, principalmente ao nível da medicina de emergência e trauma. Verificou-se, ainda, que o modelo mais adequado para a certificação da Medicina Militar é a Competência pela Ordem dos Médicos, e que uma formação teórico-prática estruturada e completa constitui-se como um fator essencial para a certificação técnico-profissional em Medicina Militar. Como áreas principais a incluir num programa de formação em Medicina Militar, certificado como competência, foram elencadas: Advanced Trauma Life Support; Tactical Combat Casualty Care; Trauma Tático / Medicina Tática; Gestão do Stress; Medicina Tropical / Viajante; Medicina de Catástrofe; Medicina Ambiental; Medicina Nuclear, Biológica, Química e Radiológica; Evacuações Médicas; Formação em Emergência e Trauma; Classificação e Seleção; Juntas Médicas; Economia, Gestão e Liderança em Saúde.

Palavras-chave: *Certificação, Diferenciação técnico-profissional, Formação Complementar em Medicina Militar, Medicina Militar, Saúde Militar.*

1. Introduction

Military Medicine (MMed) consists of the set of knowledge, skills and practices required to practice medicine in military environments (Palma, 2003). In Portugal, the military medical career dates back to the 1970s, when the Status of the Military Medical Career was established by Decree-Law No. 519-B / 77 (Conselho de Revolução, 1977). In the 1990s, with the integration of military medical officers (MedOf) in multinational forces, it became

clear that there were gaps in the complementary training in Military Medicine available in Portugal (Gomes, 2006). Today, this training still falls short of the standardisation, certification and interoperability requirements of the North Atlantic Treaty Organization (NATO) (NATO, 2013b), and there is a need for a training programme common to the three branches of the Armed Forces (AAFF), managed by the Armed Forces General Staff (AFGS) (Castro, 2017). The reform of the Military Health System (MHS) introduced by the Programme of the 19th Constitutional Government brings together two components for which MedOf must be prepared: the operational component and the primary health care and hospital services component (Ministry of National Defence (MND), 2014a).

MedOf form the basis of the health support (HSup) system (Linares, 2012), performing a broad range of tasks in the field of operational medicine (OpMed) and primary health care and hospital services component. The object of study of this work is Military Medicine, more specifically, the standardisation and certification of the complementary training in Military Medicine available to the MedOf of the three branches of the AAFF.

This study aims to contribute to the creation of a technical and professional specialisation in Military Medicine. The study focuses on the complementary training in Military Medicine of the AAFF MedOf, that is, all training not included in the core curriculum of the degrees obtained through the Military Higher Education Establishments (MHEE) and the Public Higher Education Establishments (PHEE) with which protocols have been signed. To restrict the scope of this work and due to the unique features of Underwater and Hyperbaric Medicine (UHM) and Aviation Medicine, these areas are not addressed here. This study is relevant because a complementary training programme in Military Medicine common to the MedOf of the three branches of the AAFF is needed to comply with the operational health (OpH) training guidelines issued by the International Organizations (IO) of which Portugal is currently a member (particularly NATO and the United Nations (UN)). Therefore, this study will also analyse and determine the best way to accredit this training programme.

The research object is delimited in three ways: in terms of content, to complementary training in Military Medicine and its certification as a technical and professional specialisation (with the exception of UHM and Aviation Medicine, as mentioned above); in terms of space, to the MedOf of the three branches of the AAFF; in terms of time, to the current period of reforms in the Military Health (MH) system.

Therefore, the general objective (GO) of this investigation is *To propose tools that can be used to establish a technical and professional specialisation in Military Medicine,* and the specific objectives (SO) are:

SO1: To analyse how Military Medical education is structured in Portugal and in other AAFF;

SO2: To analyse how Military Medicine can become an accredited subspecialty;

SO3: To analyse the gaps in the complementary training in Military Medicine available in Portugal.

The following research question (RQ) guided the process by which the research problem was solved: *What tools can be used to establish Military Medicine as a technical and professional specialisation in Portugal?*

2. Theoretical and conceptual framework

2.1. State-of-the-art and key concepts

2.1.1. Training

Training can be defined as a set of activities that lead to the acquisition of the knowledge, skills, attitudes and behaviours required to hold a position or perform a profession (CIME, 2001). The Law on the Status of the AAFF Military Personnel states that:

[…] the education and training provided by the AAFF prepares all military personnel to hold positions and perform duties in all categories and specialties by providing training pathways through which they may acquire and develop competencies (MND, 2015, pp.3211-3212).

Training in Military Medicine covers two core areas: primary health care and hospital services and operational medicine, the latter being subdivided into two components, one common to all branches and one specific to each branch (Castro, 2017).

Portugal's responsibilities as a member of NATO and the UN, among other organizations, require the participation of the AAFF in a wide range of areas, including in international missions. NATO identifies training as one of the essential pillars to attain excellence, therefore it is crucial that health personnel be trained according to its doctrine (MND, 2016).

Despite the fact that Portugal has significantly reformed and gradually integrated the primary health care and hospital services provided by the branches, a common model of training in OpH has yet to be defined, both in terms of the training areas available and the development and implementation of training activities (Castro, 2017; AFGS, 2018).

2.1.2. Military Medicine

MH has undergone significant changes over recent years. Currently the MHS "must be structured as an integrated system covering all technical aspects of MH, with an operational component and a primary health care and hospital services component that provides assistance to military personnel and their families" (MND, 2014). The new model combines the different aspects of military health care, which has led to several changes, such as: the establishment of the Military Health Directorate (MHD) under the AFGS (MND, 2014), the reformulation of the Health Directorates (HD) of the AAFF branches (MND, 2014), the establishment of the Hospital of the Armed Forces (HAF) (MND, 2015), the extinction of the Service School of MH (SSMH) (MND, 2014), and the creation of the Unit on Teaching, Training and Research in MH (UTTRMH) (MND, 2014).

Prior to the establishment of the HAF, the military hospitals of the branches were the basis of the HSup system (Castro, 2017). The creation of the HAF changed this system, with the hospital services component becoming the responsibility of the AFGS and the primary health care services component and OpH component being provided by the Health Services of the branches. Nevertheless, both components remain interconnected (MND, 2016). Currently, the Health Support System (HSS) of the branches is structured in two components: Field Medical Support (FMS) and Basic Medical Support (BMS).

The Law on the Status of the Military Medical Career was set down in 1977 (CR, 1977), and today there are three different pathways for admission to the Medical Career Staff: through

regular tender, specialist tender, or, since 1998 / 1999, by entering an MHEE (Mendes, 2013).

In the 1990s, the integration of MHS personnel in National Deployed Forces (NDF) exposed some gaps in the complementary training in Military Medicine available in Portugal (Gomes, 2006), kick-starting the process to develop a training programme in Military Medicine. The Specialist Training Programme in MH, which took place over ten years, was implemented in 1995. Subsequently, a postgraduate degree in MH (PGMH) was created under a cooperation protocol with the Faculty of Medical Sciences of the NOVA University of Lisbon (FCM / UNL). The first class of the programme started in October 2005 (Gomes, 2006; Mendes, 2013).

2.1.3. Certification

A health *certification* aims to recognise the quality of the various actors and to encourage their commitment to continuous improvement, in order to establish a culture of quality and safety that should be adopted by all practitioners (DGS, 2014). Considering the current quality culture of healthcare, any proposal for a new complementary training programme in Military Medicine common to the three branches of the AAFF must include certification, since this is the only way to ensure that the best medical practices are properly implemented and recognised.

2.1.4. Complementary training

Complementary training refers to any additional knowledge and / or training that will lead to the acquisition of new skills. In the present work, graduate training refers to a medical degree (a first degree or an integrated master's degree) and *complementary training* refers to all training (undergraduate or post graduate diplomas) completed in addition to a medical degree.

2.2. Analysis model

This study was developed according to the concept map provided in Table 1.

Table 1 – Concept map

General Objective	Research Question	Specific Objectives	Subsidiary Questions	Concepts	Dimensions	Indicators	Instruments
GO - To propose tools that can be used to establish Military Medicine as a technical and professional specialisation in Portugal.	RQ - What tools can be used to establish Military Medicine as a technical and professional specialisation in Portugal?	SO1 - To analyse how Military Medical education is structured in Portugal and in other AAFF.	SQ1 - How is Military Medical education structured in Portugal and in other AAFF?	Training Military Medicine	Available training programmes	Ad hoc courses Structured curriculum	Literature review
		SO2 - To analyse how Military Medicine can become an accredited subspecialty.	SQ2 - How can Military Medicine become an accredited subspecialty?	Certification	Portuguese Medical Association Universities Other training institutions	Undergraduate training Post graduate training Specialty Subspecialty Competency	Literature review Semi-structured interviews Questionnaire
		SO3 - To identify the gaps in the complementary training in Military Medical available in Portugal.	SQ3 - What are the gaps in the complementary training in Military Medical available in Portugal?	Complementary training	National requirements IO requirements	Theoretical training Practical training Operational training	

3. Methodology and method

3.1. Methodology

The study used inductive reasoning, a quantitative research strategy with qualitative aspects, and a case study research design.

The research was carried out in three phases: an exploratory phase (literature review and exploratory interviews, which served to conceptually frame the object of study, to formulate the research problem and to define the research objectives); an analytical phase (which focused on data collection and analysis); and a conclusive phase (in which the research findings were analysed and the conclusions were presented).

3.2. Method

3.2.1. Participants and procedure

Participants. The study sample consisted of 128 MedOf, most of whom (Table 2) are male (70.3%), 30-39 years old (67.2%), from the Army (68.0%), in the junior officer category (60.9%), are hospital assistants (47.7%), and joined the AAFF through a MHEE (86.7%).

Table 2 – Sample sociodemographic data

Category		n
Sex	Female	38
	Male	90
Age	< 30	23
	30-39	86
	40-49	9
	> 49	10
Branch	Navy	16
	Army	87
	Air Force	25
Subcategory	Junior officer	78
	Senior officer	49
	General officer	1
Medical career category	Common year resident	7
	Interruption year resident	10
	Specific training resident	39
	Hospital assistant	61
	Assistant graduate	9
	Head of service	2
Admission into the AAFF	External applicants who have completed a specialty	1
	External applicants holding a medical degree	17
	Through an MHEE	111

The study sample also included 5 participants / interviewees: the Director of Military Health, Rear Admiral Naval Doctor José Jesus Silva; a member of the Committee on the

Establishment of the Military Medicine Competency of the Portuguese Medical Association (PMA), Dr João Gaspar de Almeida e Sousa; a member of the Committee that established the Medical Emergency Competency of the Portuguese Medical Association; a member and the head of the UTTRMH Establishing Committee, Medical Colonel João Carlos Santana Mairos; and a representative of the branches with special interest and experience in OpMed[2], the Head of the Operational Department of the Navy Training Centre, Medical Lieutenant Commander Helder Duarte e Silva.

Procedure. After obtaining proper authorisation from the military authorities, a link to the questionnaire was sent by email to potential respondents (the MedOf of the AAFF) between 16 May and 26 June 2019. The respondents were informed of the purpose of the questionnaire, of the fact that there were no right or wrong answers, and were assured of the anonymity and confidentiality of their answers, which were collected for strictly statistical purposes. The semi-structured interviews were conducted by email and face-to-face.

3.2.2. Data collection instruments

The questionnaire was prepared on "Google Forms" and consisted of 16 questions divided into five parts: the first part collects sociodemographic data; the second addresses the training of MedOf; the third assesses the duties / roles performed by MedOf; the fourth analyses the disciplines to be included in a complementary training programme in Military Medicine; and the fifth focuses on certification. The second, third and fifth parts of the questionnaire feature two types of questions: yes / no questions to determine if MedOf have knowledge and / or experience in certain areas; questions answered on a five-point Likert scale ranging from *Totally disagree* (1) to *Totally agree* (5) and *Not important* (1) to *Very important* (5). The fourth part lists possible disciplines in a proposed complementary training programme in Military Medicine, which respondents scored on a six-point Likert scale ranging from *Not important* (1) to *Very important* (5) and *I disagree* (6). The fourth part includes an open-ended question where respondents can suggest other areas of interest.

Additionally, a semi-structured interview scrip was prepared comprising eight semi-open-ended questions.

Analysis of the questionnaire data. Since it was important to assess the needs and difficulties experienced by the MedOf, the second and third sections of the questionnaire assess the training of MedOf and the duties / roles performed by MedOf, respectively. The answers to these questions (expressed/presented in relative frequencies for a total sample of n = 128) can be found in Table 6. The fourth part of the questionnaire was based on the literature review and lists possible disciplines in a complementary training programme in Military Medicine. The answers to this section are provided in Table 7. Respondents were also presented an open-ended question asking them to list other possible disciplines for a complementary training programme in Military Medicine, such as: the ACLS course and a damage control surgery course.

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[2] As the only Branch that responded to the request was the Navy, the views of the Army and the Air Force could not be ascertained.

4. Data presentation and discussion of results

4.1. Training in Military Medicine in Portugal and in other Armed Forces

The AAFF of other NATO and UN member and partner countries with which Portugal has relations have different strategies to manage training of their MedOf. To obtain a broader outlook on these schemes, this study will analyse some different models. In addition to the Portuguese reality, the study will analyse the model used by the Spanish AAFF, whose recruitment and training programme is similar to the one currently being considered for Portugal (AFGS Work Group, 2018); the model of the United States, the country that produces the most doctrine in numerous areas, including Military Medicine; the model used by Ireland, where Military Medicine is an accredited specialty with training pathways and curricula that are of interest to the present work.

4.1.1. Portugal and other Armed Forces

4.1.1.1. Portugal

In Portugal, most MedOf complete their integrated master's degree in Medicine at three MHEE: the Naval School, the Military Academy and the Air Force Academy (MND, 2008). All scientific aspects and academic degrees are managed and awarded through cooperation protocols between the MND and civilian medical universities (MND, 1999) in which the MHEE coordinate all complementary military education and training. After completing the Integrated Master's in Medicine, MedOf begin their common year, during which they receive twelve months of post graduate theoretical and practical training in a tutoring scheme (MS, 2018); upon completion of this year, MedOf are considered fit to be recruited to operational units; at this stage, they interrupt their civilian training and are assigned to their respective units. In addition to admission through the MHEE, the AAFF may also launch a public tender to recruit autonomous medical practitioners with a medical degree who are enrolled in a military training programme, as set down by law (Assembly of the Republic (AR), 1999).

The hospital health care services component of MedOf training begins with the integrated master's degree in medicine (MND, 2016) and continues with Generalist Training and Specialist Training in a specialty, upon authorisation from the branches, as determined by the AFGS. The operational component of the complementary training in Military Medicine is the responsibility of each branch. Currently, a model common to the three branches does not exist. OpH can be divided into two core components: a generalist component common to all branches that covers medical emergencies and evacuation; and a component specific to each branch, such as Aviation Medicine in the Air Force (PoAF) and UHM in the Navy (Castro, 2017).

In the Navy, the operational component of the complementary training in Military Medicine is the responsibility of the Navy Health Sevices. The UHM Centre provides specialised training in Diving Medicine to the Navy's MedOf (Guerra, 2013). The Naval Technologies School also offers training in Advanced Life Support (ALS) (Guerra, 2013). MedOf deployed to missions attend the Advanced Trauma Life Support (ATLS) course in a civil establishment.

In the Army, the Army Health Services is in charge of the operational component of the complementary training in Military Medicine and collaborates in managing, training and providing

technical specialisation to its medical personnel (MND, 2015c). To meet the Army's operational needs, MedOf attend some of the courses taught at the SSMH. The SSMH also provides the specialist component of the Captains' Promotion Course (CPC), which mainly focuses on planning and organizational training and does not cover practical training in Military Medicine.

In the PoAF, the operational component of the complementary training in Military Medicine is the responsibility of the PoAF Health Services. MedOf in this branch of the AAFF attend the Basic Life Support (BLS) course of the Training and Survival Centre and ATLS, Pre-hospital Trauma Life Support (PHTLS), and ALS courses at accredited civilian schools. When needed, the PoAF uses the SSMH to deliver a Medical Emergency techniques course tailored to the NDF (Guerra, 2013).

Upon completing their Integrated Master's in Medicine, the MedOf of the AAFF currently attend a PGMH [Post Graduate Diploma in Military Health] at the SSMH. The programme is divided into three levels which correspond to stages of the military career (Gomes, 2006): Level 1 is administered immediately after the medical degree; Level 2 corresponds to the 1st Lieutenant / Captain rank; and Level 3 is administered during the transfer from 1st Lieutenant / Captain to senior officer. Only Level 1 of the course has been implemented so far. Level 1 is accredited by the FCM / UNL and takes place over 20 working days, during which the curriculum described in Table 3 is covered. Currently, the PGMH does not include training in medical emergency or medical evacuation.

Table 3 - Level 1 Curriculum of the Post Graduate Diploma in Military Health

Training Units / Modules / Others	Training time-frame (hours)
Environmental Medicine	20
CBRN Medicine	33
Epidemiology	12
Field Medical Support	18
Tropical Medicine	25
Medical Support to International Missions	10
Evaluation	2

Source: Adapted from SSMH (2016).

4.1.1.2. Spain

Established in 1989 under the authority of the Undersecretary of Defence, the *Cuerpo Militar de Sanidad* (CMS) is the MH corps that provides medical support to the Spanish AAFF and the *Guardia Civil*. The CMS is coordinated by the General Health Inspection and provides medical, pharmacy, veterinary, dental, psychology and nursing services (Carvalho, 2016; Ortiz Gonzáles, 1999). The main training body is the Military School of Health, which offers both military and medical training (Ortiz Gonzáles, 1999).

Currently, recruitment to the CMS is done through an annual joint tender, regardless of the AAFF branch to which the officer will be enrolled. The number of vacancies depends on the specialty. There are three recruitment pathways: before enrolling in higher education (most applicants are inducted this way), by holding a medical degree

or a medical specialisation (Convocatoria, 2019; Farinha, 2017).

All candidates who already hold a medical degree receive similar technical military training (the curriculum is provided in Table 4). For those who join through a higher education establishment, training occurs over six years, during which they also attend medical training at the University of Alcalá. The training given to medical graduates and specialists is condensed into a year. During the first four months, they attend generalist military training in the different military academies, after which they receive technical training in Military Medicine at the *Escuela Militar de Sanidad*. (BOD, 2015; Convocatoria, 2019; CUD Madrid, 2017; Farinha, 2017)

Table 4 - Specific training curriculum in Military Medicine in Spain

Year	Topic	Subtopic
1st Year	Health Organization and Management	Defence Business Intelligence Tools
	Logistics and HSup	Health Organization and Logistics
2nd Year	Health Organization and Management	Occupational Hazards Prevention Environment and Environmental Protection
	Logistics and HSup	Medical Support in CBRN Environments
	Public and Community Health	Stress aManagement
		Foundations of Primary Care
3rd Year	Logistics and HSup	Force Health Protection Medical Intelligence
	Public and Community Health	Public Health
	Clinical Competencies	Clinical Electrocardiography Simulation Environments
4th Year	Health Organization and Management	Occupational Medicine and Occupational Health
	Health Care in Tactical Environments	Medical Support in Multi-Casualty Incidents and Disasters
	Healthcare Management	Forensic Medicine
	Clinical Competencies	Radiological Protection for Directors of Radiodiagnostic Facilities
		Diagnostic Radiology and Imaging Techniques
5th Year	Medical Support in Special Environments	Medical Support in the Maritime Environment
		Medical Support in the Air Environment
		Medical Support in CBRN Environments II
6th Year	Health Care in Tactical Environments	Advanced Combat Life Support
	Healthcare Management	Medical and Surgical Emergency Management

Source: Prepared from DOB (2015).

4.1.1.3. United States of America

The United States (US) MHS is divided into five major organizations that answer to the Department of Defense (DoD): the Office of the Assistant Secretary of Defense for Health Affairs, the Defense Health Agency, the Army Medical Command, the Navy Bureau of Medicine and Surgery, and the Air Force Medical Service. Each contributes separately and individually to the core mission of the MHS. (Mendez, 2018)

The recruitment of MedOf is managed independently by each branch. There are two pathways to recruitment: through the Military Medical School, which awards a higher education degree, or by enlisting as medical students or doctors with a degree from a medical school accredited by the American Medical Association / American Osteopathic Association. After obtaining a medical degree, doctors who graduated in a civilian university attend five weeks of generalist military training in a military education establishment (US Army Medical Education, 2019).

MedOf receive the same general and clinical training as civilian doctors. The DoD is responsible for the specific military training of all MedOf. The Tactical Combat Casualty Care (TC3) course is the standard training for all first responders, medical or otherwise, but there are numerous other training programmes, which vary according to the establishment providing the training.

4.1.1.4. Ireland

The Faculty of Military Medicine of Ireland (FMMI) was established in 2012 and aimed to achieve formal recognition of the Military Medicine specialty by the Irish Medical Council, which occurred in October 2015 (ICDG, n.d.). It was determined that the professional characteristics required of MedOf are mainly generalist, thus, the training curriculum was developed jointly by the FMMI and the Irish College of General Practitioners (ICGP). Therefore, the curriculum and training programme of the Military Medicine specialty reflect the broad set of theoretical knowledge, skills and attitudes that characterise General Practitioners (GP). It was also determined that, in order to successfully complete the specialty, candidates must be approved by both the ICGP and the FMMI (ICGP, n.d.).

Candidates to the Military Medicine specialty apply to a medical internship programme, and, in order to join the AAFF, they must meet the requirements of both the ICGP and the AAFF. To be eligible, candidates must be under 35 years of age, hold a first degree / masters' degree in Medicine, and be registered with the Medical Council of Ireland. Once candidates are accepted and complete three months of training at the Cadets School, they are inducted into the AAFF.

In the FMMI, the training is divided into a two-stage programme: initial specialist training and higher specialist training. Initial specialist training is the initial two-year period during which Military Medicine trainees are promoted to Lieutenant and attend the common programme for GP trainees. During this period, they rotate through hospitals with quality training in medicine, paediatrics, emergency, psychiatry and an optional placement. Between the third and fifth year of training Military Medicine trainees are promoted to Captain and begin higher specialist training. During this period, training takes place at military health units, and the curricula cover military general practice and military occupational medicine. Regardless of where they train, trainees are supervised and assigned a tutor, and receive training in providing primary care to military personnel, conducting medical examinations, and a range of military occupational medicine activities.

The specialist curriculum in Military Medicine covers topics of the GP core curriculum and specific topics of Military Medicine (ICGP, n.d.), such as: Medical Military Law, Occupational Medicine, Tropical and Travel Medicine, Sports and Exercise Medicine,

Pre-hospital Medicine, Chemical, Biological, Radiological and Nuclear Medicine (CBRN), Tactical Medicine, Disaster and Humanitarian Medicine, Major Incident Management, Preventative Medicine, among other topics.

4.1.2. Brief overview and answer to SQ1.

The above analysis provided the answer to SQ1 – *How is Military Medical education structured in Portugal and in other AAFF?* It was ascertained that the complementary training in Military Medicine available in Portugal is not common to the three branches, the sole exception being the PGMH, which MedOf attend in the initial stage of their career, and which was created as a modular programme that accompanies MedOf throughout their career. The programme is divided into 3 levels, however, only Level 1 (a 120-hour module accredited by the FCM UNL) has been implemented so far. Although the PGMH is an ambitious programme, it is insufficient and not robust enough because it lacks a medical emergency and evacuation curriculum. The Army's MedOf receive complementary training in Military Medicine (in the CPC), but it does not include practical training in OpH, therefore, the training offer falls short of what is needed; the Navy and the PoAF already offer accredited specialist training in OpH through their UHM and Aviation Medicine specialisations, respectively; none of the branches offers emergency and evacuation training for deployed forces.

As for the complementary training programmes in Military Medicine of other AAFF, the analysis revealed that Military Medicine is an accredited specialty in Ireland and that, although Spain has defined a training curriculum, it has not been granted certification so far. In Ireland, applicants must hold a degree in medicine before joining the AAFF, and complementary training in Military Medicine is administered simultaneously with GP training. The US recruitment model is complex and the complementary training in Military Medicine is also diverse, including several theoretical and practical training components provided by a wide range of training bodies. In Spain, candidates who do not hold a degree when they enlist in the AAFF attend complementary training at the same time as they complete a medical degree. Candidates who already hold a medical degree when they enlist attend a condensed version of this training.

4.2. Certification of Military Medicine

Because the process of achieving formal recognition for a medical area of knowledge is one of the pillars that ensure best medical practices and quality in medicine, there must be clearly defined and validated goals in terms of knowledge and performance, as stated by J.A. Sousa (face-to-face interview, 5 June 2019).

Despite the specific features of the different branches of the AAFF and the fact that MedOf are trained in different specialties, there is a common set of essential knowledge and skills that form the basis for an accredited programme in Military Medicine (Palma, 2003; J.A. Sousa, *op. cit.*).

According to the literature, a certification in Military Medicine can be achieved in one of two ways: by integrating it in a Higher Education programme (both undergraduate and post

graduate) (Gomes, 2006) or by making it a technical and professional specialisation accredited by the PMA (AR, 2015). In some cases the models are combined, that is, obtaining a post graduate diploma allows access to the respective technical and professional specialisation from the PMA.

With regards to the certification obtained through integration in Higher Education: the undergraduate curriculum can be included in the curricular units taught during the period MedOf attend an MHEE; like in other medical fields, the postgraduate curriculum can be developed through a robust and organized postgraduate medical education programme (a post graduate diploma or a master's degree) that offers higher specialist training in Military Medicine.

With regards to the technical and professional specialisation by the PMA,

[…] Pursuant to Articles 75 and 97 of the Statutes of the Portuguese Medical Association, the following types of technical and professional specialisation are formally recognised:

– **Specialty**. Specialist doctors are qualified professionals with a specialty that corresponds to a set of specific skills obtained after successfully completing specialised training in an area of medical knowledge, who are registered with the respective college of their specialty as specified in Articles 123 *et seq.* of the Statutes of the PMA.

– **Subspecialty**. A title that awards a specialisation in a specific area of a specialty to members of the respective College. It is granted after a curricular evaluation or examination. It may have the same designation in different Colleges as long as they have been recognised as equivalent.

– **Competency**. A title that recognises technical and professional qualifications common to various specialties. It can be obtained by any physician after a curriculum evaluation or an examination. (OM, 2016, pp.20728)

The answers to the questionnaire revealed that 85.9% of respondents find certification to be "important" or "very important".

As stated by J.A. Sousa (*op. cit.*), the technical and professional specialisation granted by the PMA that best suits Military Medicine is the competency, which can be obtained by MedOf before they complete a specialty, as with the Medical Emergency competency, provided the candidate meets the required curriculum and training requirements. Given the specific characteristics of the military career, complementary training in Military Medicine can be phased or continuous, without this affecting the awarding of the Competency by the PMA (J.A. Sousa, *op. cit.*).

The Military Medicine Competency is registered with the PMA, and an Establishing Committee was approved by the PMA National Council of 17 December 2016 (OM, 2019). By creating this technical and professional specialisation, the PMA will have access to a pool of qualified technicians who can advise the organization's bodies on specific issues pertaining to this area of expertise, and who will guarantee the quality of the training acquired by doctors with this competency (AR, 2015).

According to J.A. Sousa (*op. cit.*), the certification of Military Medicine as a technical and professional specialisation is a difficult process that presents several challenges: the recognition of Military Medicine as a subspecialty that corresponds to a specific set of knowledge and competencies; MedOf's motives for acquiring a competency should be to

enhance their knowledge, not only to bolster their CV; MedOf must be encouraged to attend additional training and enhance their professional skills through lifelong training.

4.2.1. Brief overview and answer to SQ2.

The above analysis provided the answer to SQ2 - *How can Military Medicine become an accredited subspecialty?* It was ascertained that the most appropriate model to accredit Military Medicine is the Competency awarded by the PMA. To obtain a competency in Military Medicine, MedOf must complete a pre-defined training curriculum (which can be carried out in stages) and undergo a curriculum appreciation by a PMA Committee.

With regards to certification, the respondents unanimously agree that it would be beneficial if Military Medicine were an accredited specialisation, with 85.9% of respondents considering this certification to be "important" or "very important". All interviewees believe that complementary training in Military Medicine should include a structured and comprehensive curriculum that provides advanced specialist training in Military Medicine.

4.3. Gaps in the complementary training in Military Medicine.

4.3.1. Possible curriculum for a training programme in Military Medicine.

The training of the military personnel of the MHS is a permanent concern because it represents a critical need for the MH of the Portuguese AAFF (Mendes, 2013). The working group responsible for preparing the 2018 MH Report outlined several proposals for a training model of MedOf (AFGS, 2018), as illustrated in Table 5. The proposals are currently under consideration.

Table 5 - Proposed training curricula for the military doctors of the Portuguese Armed Forces

Thematic	Type of training
Multipurpose basic military training for military personnel transferring from the Specialist Health Staff to the Career Staff	Regardless of the branch they were admitted to, candidates attend complementary joint training in: – The three branches; – The UTTEMH, with specific training in: - OpH: trauma response, ALS, field medical support, exercise physiology and pathology, diving physiology and pathology, aviation physiology and pathology, humanitarian assistance; - Occupational health: damage assessment and health maintenance and promotion. – HAR.
Continuos training in OpH	Specialisation courses (to be determined), with refresher courses every three years until they are promoted to senior officer.
Training in Health Service Management	Provides specialised training in health service management to senior officers who hold management and leadership positions in MHS bodies.
Health Training	Integration of MedOf in the National Institute of Medical Emergencie to integrate Medical Emergency and Resuscitation Vehicles (MERV) teams or civilian emergency services. Possible training in a Medical Simulation environment.

Source: Military Health Report – AFGS (2018).

In addition to this national concern, the IO to which Portugal has obligations, especially NATO, require that member countries have appropriate and standardised HSup procedures to ensure the provision of high quality interoperable healthcare (NATO, 2013b).

The AMedP-8.3 Training Requirements for Health Care Personnel in Military Operations (NATO, 2013b) specify that all NATO nations must meet minimum training requirements to participate in Alliance activities. The main stakeholders in the provision of health services (doctors, nurses and first responders) should have Basic Training for Healthcare Professionals. Additionally, doctors and nurses participating in multinational missions under military command should be trained in the following areas: General Trauma and Tactical Trauma Training and Techniques, Multinational Relations and Medical Ethics, Environmental and Tropical Hazards, and Stress Management (NATO, 2013b).

It is also of interest to know the complementary training requirements of UN missions. The UN HSup system aims to provide appropriate support and medical personnel for all operations (United Nations, 2015). Due to the specific features of UN Peacekeeping Operations (PO), the type of HSup provided is complex and practitioners must be able to deal with a variety of circumstances, often without access to medical facilities within the mission area. To facilitate interoperability within the UN HSup System, mission-specific, multinational training is provided, including: first aid training; pre-mission training for MedOf in PO; mission-specific training (United Nations, 2015).

The complementary training in Military Medicine available in Portugal is not aligned with either the NATO or UN guidelines on specialised training. According to Castro (2017, p. 31), there are training gaps "in areas such as emergency and trauma, stress management, disaster medicine and mission-oriented training".

As shown in Table 6, most MedOf have attended some complementary training in Military Medicine (69%), but most find that this training did not fully prepare them to practice Military Medicine. The vast majority of MedOf (at least >60%) have participated in Classification and Selection activities, Inspections, and Medical Evaluation Boards, however, they do not feel prepared to perform these roles.

Table 6 – Training and Roles / Activities of a MedOf

	1 Totally Disagree (n/%)	2 Partly Disagree (n/%)	3 Neither Agree Nor Disagree (n/%)	4 Partly Agree (n/%)	5 Totally Agree (n/%)	YES (n/%)	NO (n/%)
Training of military doctors							
During the military training you've received, you were informed of the roles performed by military doctors.	31/24.2	53/41.4	14/10.9	26/20.3	4/3.1	-	-
Did the Medical Officer Training Course include complementary training in Military Medicine?	-	-	-	-	-	88/68.8	40/31.3
The training curricula were relevant to the roles I have performed to date.	9/8.1	27/30.7	13/14.8	38/43.2	2/2.3	-	-
The training fully prepared me to practice Military Medicine (operational and primary health care services components).	19/21.6	41/46.6	12/13.6	15/17.0	1/1.1	-	-

Do you hold a post graduate diploma in Military Health from the Military Health Service School?	-	-	-	-	-	107/83.6	21/16.4
The training curricula were relevant to the roles I have performed to date.	17/15.9	34/31.8	21/19.6	34/31./8	1/0.9	-	-
Roles / Activities performed by Military Doctors							
Have you participated in Classification and Selection activities?	-	-	-	-	-	107/83.6	21/16.4
I feel prepared to perform Classification and Selection activities.	13/10.2	36/28.1	20/15.6	44/34.4	15/11.7	-	-
I received training to perform Classification and Selection activities.	88/68.8	21//16.4	11/8.6	11/8.6	8/6.3	-	-
Have you participated in Inspections (audits)?	-	-	-	-	-	78/60.9	50/39.1
I feel prepared to perform Inspections (audits).	47/36.7	27/21.1	14/10.9	31/24.2	9/7.0	-	-
I received training to perform Inspections (audits).	87/68.0	20/15.6	17/13.3	3/2.3	1/0.8	-	-
Have you participated in Medical Evaluation Boards?	-	-	-	-	-	78/60.9	50/39.1
I feel prepared to participate in Medical Evaluation Boards.	39/30.5	27/21.1	21/16.4	30/23.4	11/8.6	-	-
I received training to participate in Medical Evaluation Boards.	85/66.4	15/11.7	18/14.1	8/6.3	2/1.6	-	-
Have you ever performed roles in an Operational Unit (OpUn)?	-	-	-	-	-	122/95.3	6/4.7
I feel prepared to perform the assistance roles assigned to me in an OpUn (that is, provide primary health care).	9/7.0	20/15.6	12/9.4	67/52.3	20/15.6	-	-
I feel prepared to perform the operational roles assigned to me in an OpUn (field exercises, traumatology and others).	19/14.8	23/18.0	15/11.7	51/39.8	20/15.6	-	-
I feel prepared to perform the roles assigned to me as a member of the Technical General Staff / provide decision-making support in an OpUn.	12/9.4	22/17.2	20/15.6	59/46.1	15/11.7	-	-
Have you ever been on mission with a NDF?	-	-	-	-	-	62/48.4	66/51.6
I feel prepared to perform the assistance roles assigned to me in a NDF (that is, provide primary health care).	14/10.9	18/14.1	22/17.2	56/43.8	18/14.1	-	-
I feel prepared to perform the operational roles assigned to me in a NDF (field exercises, traumatology, others).	18/14.1	32/25.0	19/14.8	41/32.0	18/14.1	-	-
I feel prepared to perform the roles assigned to me as a member of the Technical General Staff / provide decision-making support in a NDF.	16/12.5	23/18.0	26/20.3	48/37.5	15/11.7	-	-

As shown in Table 7, at least 50% of MedOf consider that, in the list of possible disciplines in a Military Medicine training programme, the following are *Important* or *Very Important*: Exercise / Sports Medicine, Stress Prevention and Treatment, Emergency Medicine, Medical Evacuation, Disaster Medicine, ATLS, PHTLS, Medical Emergency and Resuscitation Vehicles, TC3, Critical Patient Transport.

Table 7 – Possible disciplines in a complementary training programme in Military Medicine

	1	2	3	4	5	6
	Not important (%)	Not very important (%)	Indifferent (%)	Important (%)	Very important (%)	Disagree (%)
Occupational Medicine	3.1	4.7	9.4	42.2	36.7	3.9
Exercise / Sports Medicine	0.0	1.6	2.3	33.6	60.2	2.3
CBRN Medicine	0.0	10.2	9.4	44.5	34.4	1.6
Environmental Medicine (extreme environments)	0.0	3.1	6.3	44.5	44.5	1.6
Stress Prevention and Treatment	1.6	3.1	8.6	54.7	30.5	1.6
Tropical Medicine	0.8	4.7	10.2	47.7	33.6	3.1
Emergency Medicine	0.0	0.0	1.6	12.5	82.0	3.9
Medical Evacuation	0.0	0.8	1.6	16.4	78.1	3.1
Disaster Medicine	0.0	1.6	2.3	34.4	57.8	3.9
Advanced Trauma Life Support	1.6	0.8	0.8	17.2	75.0	4.7
Pre-Hospital Trauma Life Support	2.3	0.8	2.3	16.4	72.7	5.5
Medical Emergency and Resuscitaion Vehicle	0.0	1.6	5.5	21.9	64.8	6.3
Tactical Combar Casualty Course	2.3	3.9	7.8	22.7	57.8	5.5
Critical patient transport	0.0	2.3	3.1	25.8	63.3	5.5
Aviation Medicine	2.3	4.7	15.6	37.5	35.9	3.9
Hyperbaric and Underwater Medicine	2.3	5.5	21.1	39.8	27.3	3.9
Medical Evaluation Boards	0.8	1.6	14.8	46.9	32.0	3.9
Economics / Management / Health Leadership	3.1	5.5	15.6	47.7	24.2	3.9
Health quality	3.1	10.9	23.4	44.5	15.6	2.3
Health logistics	2.3	5.5	10.2	46.9	31.3	3.9
Ethics and international humanitarian law	4.7	8.6	24.2	39.8	20.3	2.3
Joint medical planning	0.8	4.7	15.6	41.4	33.6	3.9
MedIntel	0.8	5.5	14.8	43.8	32.8	2.3
Classification and selection	0.8	1.6	14.8	44.5	34.4	3.9
Telemedicine	4.7	9.4	24.2	40.6	18.0	3.1
Public health	3.1	10.9	22.7	44.5	16.4	2.3
Patient Evacuation Coordination Cell	2.3	3.9	14.1	44.5	31.3	3.9
Trainer training course	3.9	15.6	25.8	34.4	16.4	3.9

Key:

> 50%	40-49%	30-39%	20-29%	10-19%	0-9%

Analysis of the interview data. Three answers were obtained from the interviews with (Table 8): the Head of the Operational Department of the Navy Training Centre, the Chairman of the UTTRMH Establishing Committee, the Director of Military Health for the AAFF

Table 8 - Results of the interviews with MedOf who provide training in Military Medicine

Perguntas	Respostas
1. What are the essential features of a structured training programme in MMed?	- To ensure that MedOf with experience and training in MMed from the 3 branches of the AAFF and the GNR are involved in training; - To define specific areas unique to MMed and plan the training curricula accordingly; - To know the range of activities involved in the different operational environments and to define a mandatory curriculum and specific complementary disciplines.
2. Should Portugal adopt the MMed training model of another country?	- The models used by other countries should be studied, especially in the case of NATO countries, because military health practitioners may have to perform in multinational environments; - Because Portugal is currently restructuring its MH system, this will determine the training model to be adopted, and there is the opportunity to create a new model that combines the best qualities of a Public Health System with profit-based models, which are the most popular today.
3. At which point of their training in MMed?	- The training time-frame will depend on the type of training: operational activity vs. planning and organization; - Throughout their career; as early as possible after the basic medical knowledge acquired has been consolidated and tested; - MedOf should discuss both their expectations and their career path with the military institution because the type of training they receive can influence their career progression.
4. How many hours of theoretical and pratical training do you believe are necessary for the MMed techinal competency to be considered an asset of the AAFF?	- The number of training hours will depend on: - The curriculum, because each area has essential theoretical and practical knowledge that must be covered; - The type of technical and professional specialisation that will be created for MMed; - Proposal: 400 hours + undergraduate training; - Some training areas that are not mandatory for all MedOf may be excluded.
5. How will MedOf benefit from MMed being recognised as a technical and professional specialisation accredited by the PMA?	- Formal recognition by peers and institutions; - Recognition as a separate, easily-identified area of knowledge could increase recruitment; - Providing MedOf the technical competencies they require to perform their duties.
6. What is your view / opinion on the creation of a MMed training curriculum common to the different AAFF branches?	- It is a sensible measure that should be implemented; - It is essential because some training areas should be common to all operational environments.
7. How should a joint MMed training programme be structured?	- The programme can be adapted according to area of expertise, adjusted to the specific duties MedOf will perform, and adapted to the specific features of each branch; - A proposal currently under analysis structures the theoretical component in three phases: Level 1: Generalist Training (induction and orientation), Level 2: Operational Training (technical and tactical), Level 3: Complementary Training (management and strategy); the proposal includes a complementary practical component to be delivered in the beginning of the military career along with Levels 1 and 2 of the theoretical training component.
8. In you opinion, what disciplines should be included in a MMed training programme?	Emergency, Pre-hospital Emergency, Tactical / Combat Emergency, Disaster Medicine, ALS in CBRN Incidents, Infectious Diseases and Travel or Tropical Medicine, Healthcare Associated Infections, Healthcare in Extreme Environments, Event Medical Care, Combat / damage control surgery, Medical Readiness, MEDINTEL, Operational health planning, Emergency management and urgent patient guidance, Medical Evacuation; Depending on the model chosen to restructure MH, some competencies may not be common to all MedOf: Naval medicine; Diving and hyperbaric medicine; Aviation medicine; Healthcare in extreme environments; however, specific curricula may cover the fundamentals of these areas; The following complementary training areas were suggested: Military Medical Law (national and international), History of Military Medicine, Health Quality, Health Management, Training of Trainers, Health Leadership.
9*. In your opinin, what shouuld be the body responsible for creating / supervising the certification of MMed as a technical and professional specialisation?	The MHDChief because one of its tasks is to "collaborate in the elaboration of proposals for policies on MH." * This question was only asked to the Director of Military Health, J.J. Silva (face-to-face interview, 28 June 2019)

4.3.2. Brief overview and answer to SQ3

The analysis carried out provided the answer to SQ3 – "*What are gaps in the complementary training in Military Medicine available in Portugal?*" It was ascertained that these gaps have already been identified by several studies and that the measures to address them have not been easy to implement. The gaps in the training of MedOf are linked to their performance in multinational environments, as some required areas are not adequately covered by the complementary training offer.

With regards to the activities that MedOf perform in national territory, the health care component of the training for a given specialty is provided (in most cases) by the education establishment of the National Health System where MedOf complete their residency. The fact that, in Portugal, the first year of a medical residency consists of generalist training in several areas could explain why most respondents feel prepared to perform the primary health care duties assigned to them. With regards to the operational component, their performance may be hindered by lack of training in specific areas, which correspond to the training gaps identified in the Military Health Report (AFGS, 2018). The present study found that about half of the respondents feel prepared to perform the operational duties assigned to them in both a UNOp and NDF. As mentioned earlier, most MedOf stated that they do not feel prepared to participate in classification and selection activities, inspections or medical evaluation boards, which represents a training gap in these areas.

When asked what disciplines should be included in a complementary training programme in Military Medicine, more than 50% of respondents marked the following disciplines as important or very important: Exercise / Sports Medicine, Stress Prevention and Treatment, Emergency Medicine, Medical Evacuation, Disaster Medicine, ATLS, PHTLS, MERV, TC3 and Critical Patient Transport. About half of respondents considered the following disciplines to be important: Tropical Medicine, Medical Evaluation Boards, Health Economics / Management / Leadership, Health Logistics; 44.5% also classified as important: CBRN Medicine, Environmental Medicine, Health Quality, Classification and Selection, Public Health and Patient Evacuation Coordination Cell.

The interviewed MedOf stated that there is a core curriculum that must be provided by a complementary training programme in Military Medicine of the Portuguese AAFF: Emergency, Pre-hospital Emergency, Tactical Medicine / Combat Emergency , Disaster Medicine, ALS in CBRN incidents, Infectious Diseases and Travel or Tropical Medicine, Healthcare Associated Infections, Healthcare in Extreme Environments, Event Medical Care, Combat / Damage Control Surgery, Medical / Health Readiness, MEDINTEL, Medical Operational Planning, Emergency Management and Urgent Patient Guidance, Medical Evacuation. As for Naval Medicine, UHM, Aviation Medicine and Medicine in Extreme Environments, the interviewees stated that specific curricula may include basic notions of these areas; additionally, at a later stage of the MedOf career, the training curriculum could include disciplines such as: Military Medical Law (national and international), History of Military Medicine, Health Quality, Health Management, Training of Trainers, and Health Leadership.

4.4. Tools to establish Military Medicine as a technical and professional specialisation and answer to the RQ

In Portugal, complementary training in Military Medicine is neither standardised nor common to the three branches of the AAFF as would be desirable. After identifying the gaps in the complementary training in Military Medicine of the Portuguese AAFF, and after analysing the models of other AAFF, the Spanish model was found to be the most similar to the reality of the Portuguese AAFF, which are open to candidates with medical degrees or to those who enter through a higher education establishment, and in which all doctors receive similar military technical training. The training of MedOf admitted through a military higher education establishment takes place over six years, during which they also acquire civilian medical training. The training given to graduates or specialists is condensed into a year. The first four months correspond to generalist military training in different military academies, after which MedOf receive technical training in Military Medicine.

The certification of a medical area of knowledge is one of the pillars of medical best practices and health quality, therefore, any Military Medicine training programme must be accredited. Although each Branch of the AAFF and each medical specialty has its own specific features, there is a common set of knowledge and competencies that could become the core curriculum of an accredited training programme in Military Medicine. The most appropriate model of certification for Military Medicine is the Competency awarded by the PMA. To obtain a competency in Military Medicine, MedOf must complete a pre-defined training curriculum (which can be carried out in stages) and undergo curriculum evaluation by a PMA Committee.

The training of the military personnel of the MHS is a permanent concern because it represents a critical need for the MH of the Portuguese AAFF. The working group responsible for preparing the 2018 MH Report outlined several proposals for a training model, which are currently under consideration. In addition to this national concern, the IO to which Portugal has commitments, namely NATO, require appropriate and standardised HSup procedures to ensure the provision of high quality interoperable healthcare. With regards to the activities that MedOf perform in the national territory, the study found that the training for the health care component is successfully provided by the graduate training attended by MedOf. However, this work identified several training gaps in the operational component of Military Medicine training. Furthermore, it revealed that most MedOf do not feel prepared to participate in classification and selection activities, inspections or medical evaluation boards, which constitutes a training gap. When asked what disciplines should be included in a complementary training programme in Military Medicine, more than 50% of respondents marked the following as important or very important: Exercise / Sports Medicine, Stress Prevention and Treatment, Emergency Medicine, Medical Evacuation, Disaster Medicine, ATLS, PHTLS, MERV, TC3 and Critical Patient Transport. About half of respondents considered the following topics important: Tropical Medicine, Medical Evaluation Boards, Health Economics / Management / Leadership, Health Logistics; 44.5% also classified as important: CBRN Medicine, Environmental Medicine, Health Quality, Classification and Selection, Public Health and Patient Evacuation Coordination Cell. The interviewed MedOf

consider that there is a core curriculum that must be included in the complementary training programme in Military Medicine of the Portuguese AAFF: Emergency, Pre-hospital Emergency, Tactical Medicine / Combat Emergency, Disaster Medicine, ALS in CBRN incidents, Infectious Diseases and Travel or Tropical Medicine, Healthcare Associated Infections, Healthcare in Extreme Environments, Event Medical Support, Combat / Damage Control Surgery, Medical / Health Readiness, MEDINTEL, Medical Operational Planning, Emergency Management and Urgent Patient Guidance, Medical Evacuation; additionally, at a later stage of the MedOf career, the training curriculum could include disciplines such as: Military Medical Law (national and international), History of Military Medicine, Quality, Health Management, Training of Trainers, and Health Leadership.

The above analysis provided the answer to the RQ - *What tools can be used to establish Military Medicine as a technical and professional specialisation in Portugal?* The study revealed that this can be achieved by setting up a complementary training programme common to the three branches of the AAFF, accredited as a Medical Competency by the Portuguese Medical Association, with a curriculum that includes the disciplines listed in Table 1.

Table 9 - Proposed Curriculum

ATLS
TC3
Tactical Trauma / Tactical Medicine
Stress Management
Tropical / Travel_Medicine
Disaster Medicine
Environmental Medicine
CBRN Medicine
Medical Evacuation
Emergency and Trauma Training (MERV)
Classification and Selection
Medical Evaluation Boards
Economics / Management / Health Leadership

As the complementary training programme in Military Medicine must include a minimum of theoretical and practical training hours, a study should be carried out to harmonise the number of hours required to obtain a qualification and proficiency in the areas proposed with the branches' need to employ their MedOf in their assigned missions.

5. Conclusions

Military Medicine consists of the set of knowledge, skills and practices required to practice medicine in military environments. The reform of the MHS outlined in the Programme of the 19th Constitutional Government includes two components in which MedOf must be trained: the operational component and the primary health and hospital care component. Gaps have been identified in the complementary training in Military Medicine available to MedOf, therefore

this training must be standardised, accredited and aligned with NATO and UN requirements.

This work addressed *The Establishment of Military Medicine as a Medical Subspecialty*. The study analysed the key concepts to be considered should the project be implemented. First, it was necessary to define Military Medicine and to determine its status in Portugal. This was achieved by describing the training pathways of the AAFF's MedOf over the last decades. Since the 1990s, with the integration of Portuguese MedOf into multinational forces, it became clear that there were gaps in their military medical training. Several studies have been carried out since 2006 (and even earlier) to address the need for complementary training in Military Medicine (Gomes, 2006), and the core curriculum of the training programme has also been defined (AFGS, 2018; Gomes, 2006; NATO, 2013b). However, despite the fact that complementary training in Military Medicine does exist in Portugal, it does not meet NATO and UN doctrinal requirements (Gomes, 2006; Castro, 2017).

Therefore, the answer to SQ1 achieves SO1, *To analyse how Military Medical Education is structured in Portugal and in other AAFF*. The study identified important gaps in the training in Military Medicine available in Portugal, especially with regards to medical emergency training, which in fact represents non-compliance with the requirements of NATO and UN, with whom Portugal collaborates in multinational scenarios. Currently, this complementary training does not provide MedOf the skills they need to perform their duties. Despite this, and thanks to their personal commitment, which possibly comes from their high level of proactivity, these medical practitioners feel prepared to perform both their healthcare and operational duties. MedOf feel that they are not well prepared for management, medical evaluation boards, inspections and selection activities, and there is currently no structured training programme geared towards enhancing those skills. The Portuguese training model for Military Medicine could follow NATO / UN guidelines or draw inspiration from a model used by a partner country such as Spain, which this study analysed and found to be the most similar to the Portuguese reality; however any model must always to be adapted to the needs of the Portuguese AAFF.

The answer to SQ2 achieved SO2, *To analyse how Military Medicine can become an accredited subspecialty*. The study found that a competency certification would be the most appropriate model to accredit a Military Medicine specific training because this Competency will encompass different medical specialties and because it can be achieved before completing specialist training in a Specialty. Furthermore, it should be ensured that the training pathways that already exist in Portugal prepare military doctors to practice medicine in emergency and combat environments, as well as to perform damage assessment and selection activities. Thus, the creation of a Military Medicine Competency would represent a paradigm shift in Portuguese MH, improving MedOf's ability to perform their duties but also increasing the responsibility of all stakeholders in the process, from decision makers, commanders / directors / supervisors to trainers and even trainees.

With regards to SQ3 and SO3, *To analyse the gaps in the complementary training in Military Medicine available in Portugal*, it was found that some competencies are common to the 3 branches and that, regardless of the changes to the MHS, some training areas may be specific to the branches or to a specific role. Therefore, the curriculum of a complementary

training programme in Military Medicine common to the three branches should include the following contents: ATLS, TC3, Tactical Trauma / Tactical Medicine, Stress Management; Travel and Tropical Medicine, Disaster Medicine; Environmental Medicine, Chemical, Biological, Radiological and Nuclear Medicine, Medical Evacuation; MERV, Classification and Selection; Medical Evaluation Boards; Health Economics, Management and Leadership.

This work provides a *contribution to knowledge* by identifying some areas to which the MedOf are assigned, but for which they do not feel fully prepared: Classification and Selection, Medical Evaluation Boards and Inspections (audits).

Although numerous areas relevant to the topic of this GRW were discussed, the present work had several *limitations*. The questionnaire sent to MedOf was missing the ALS course (considered an essential part of the basic training of a MedOf) from the list of possible disciplines in the training curriculum, a shortcoming that was only identified after analysing the results. Although, in the authors' opinion, a sample of 128 MedOf is a robust sample within the universe of the Portuguese AAFF, it fell short of expectations mainly because 68% of respondents were from the Army. Although, in relative terms, the Army has the highest percentage of MedOf in the AAFF, the low number of respondents from the Navy and the PoAF may have skewed the importance attributed to the training areas described in the questionnaire. Another possible bias is that, if complementary training in Military Medicine is indeed inadequate, this could limit the respondents' ability to prioritise the areas that could be included in a training programme in the topic of this study. The other limitation was that, due to time constraints, it was not possible to interview OpH experts from the Army and the PoAF; their contribution would have provided a greater diversity of opinions.

Finally, while it did not fall within the scope of the present study to analyse the HS models of other countries, this is a relevant and interesting topic that could be addressed by *future studies* on how to best implement the Military Medicine competency.

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