

# Implementation of an initiative for the prevention and management of chronic non-communicable diseases in the Brazilian army

## Mise en œuvre d'une initiative pour la prévention et la gestion des maladies chroniques non transmissibles dans l'armée brésilienne

E.B.F. Chaves<sup>1</sup>, V.C.S. Vale<sup>1</sup>, J.W.V. Figueiredo<sup>1</sup>. BRAZIL

### Abstract

**Introduction:** Chronic non-communicable diseases – NCDs (cardiovascular diseases, cancer, diabetes and chronic respiratory diseases) constitute a serious public health problem. In 2019, data from the Oswaldo Cruz Foundation (FIOCRUZ) indicate that 54.7% of deaths registered in Brazil were caused directly by NCDs, with 41.8% of these deaths considered premature, that is, at an age younger than the expectation for the Brazilian population. The Brazilian Army (EB), with its health system, is present in all regions of the country, characterized by its vast capillarity and internalization. It is assumed, therefore, that such diseases, with their consequences, affect military personnel and dependents in a similar proportion to the Brazilian population, reducing the work capacity and ready employment necessary for the Land Force. This work aims to promote an initiative to prevent the occurrence of NCDs within the scope of EB.

**Materials and Methods:** Technical manuals were prepared on the main diseases, containing suggested treatment flows and screening for complications, and these documents were distributed to all EB Military Organizations that had doctors on their staff. With the aim of standardizing knowledge, cycles of lectures and instructions were held via videoconference, covering medical professionals who work in primary care in the EB Health System (Health Sections and Medical Posts). As a way of evaluating the effectiveness of these educational measures and estimating the impact that the measure had on improving medical knowledge to address NCDs, pre-test (before instructions) and post-test (after instructions) questionnaires were administered to participating officers. The results were tabulated and analyzed using Microsoft Excel software.

**Results:** A significant improvement in the level of knowledge of professionals in the basic aspects of diagnosis and treatment of NCDs was observed after the cycle of lectures held.

**Conclusion:** With the present study it was noted that low-cost educational initiatives can be of great relevance, being a tool for improving health promotion strategies within the Armed Forces.

**Keywords:** NCD, public health, primary attention, preventive medicine, military medicine

### Résumé

**Introduction :** Les maladies chroniques non transmissibles - MNT (maladies cardiovasculaires, cancer, diabète et maladies respiratoires chroniques) représentent un grave problème de santé publique. En 2019, les données de la Fondation Oswaldo Cruz (FIOCRUZ) ont révélé que 54,7 % des décès enregistrés au Brésil étaient directement causés par des ce type de MNT, 41,8 % de ces décès étant considérés comme prématurés, à savoir à un âge inférieur à l'âge attendu dans la population brésilienne. L'armée brésilienne (EB), avec son système de santé, est présente dans toutes les régions du pays et se caractérise par sa grande capillarité et son internalisation. On suppose donc que ces maladies, avec leurs conséquences, affectent le personnel militaire et les personnes à charge dans une proportion analogue à celle de la population brésilienne, réduisant ainsi la capacité de travail et la disponibilité de l'emploi nécessaires à la force terrestre. Ce travail cherche à promouvoir une initiative visant à prévenir l'apparition de maladies non transmissibles dans le cadre de l'EB.

**Matériels et méthodes :** Des manuels techniques ont été préparés sur les principales maladies, contenant des suggestions de traitement et de dépistage des complications. Ces manuels ont été distribués à toutes les organisations militaires de la EB qui comptaient des médecins parmi leur personnel. Dans le but d'uniformiser les connaissances, des cycles de conférences et d'instructions ont été organisés par vidéoconférence, à l'intention des professionnels de la santé qui travaillent dans le domaine des soins primaires au sein du système de santé de la EB (sections de santé et postes médicaux). Afin d'évaluer l'efficacité de ces mesures éducatives et d'estimer l'impact qu'elles ont eu sur l'amélioration des connaissances médicales en matière de maladies non transmissibles, des questionnaires pré-test (avant les instructions) et post-test (après les instructions) ont été administrés aux officiers participants. Les résultats ont été présentés sous forme de tableaux et analysés à l'aide du logiciel Microsoft Excel.

Résultats : Une amélioration significative du niveau de connaissance des professionnels sur les aspects fondamentaux du diagnostic et du traitement des maladies chroniques non transmissibles a été observée après le cycle de conférences organisé.  
 Conclusion : La présente étude a permis de constater que des initiatives éducatives peu coûteuses peuvent s'avérer très pertinentes et constituer un outil d'amélioration des stratégies de promotion de la santé au sein des forces armées.  
**Mots-clés** : MNT, santé publique, attention primaire, médecine préventive, médecine militaire

## Introduction

Chronic Noncommunicable Diseases (NCDs) are groups of diseases that are characterized by having an uncertain etiology, multiple risk factors, long latency periods, prolonged course and by being associated with deficiencies and functional disabilities. They are the biggest causes of morbidity and mortality in the world<sup>1,2</sup>.

The main groups of NCDs are diseases of the circulatory system, cancer, chronic respiratory diseases and diabetes. These diseases have in common a set of modifiable risk factors, capable of preventive actions. These factors are mainly: smoking, physical inactivity, excessive consumption of alcohol and other drugs, obesity, dyslipidemia and inadequate nutrition, with insufficient intake of fruits and vegetables<sup>1,2</sup>.

In recent decades NCDs have become the leading causes of death in Brazil, surpassing mortality rates from infectious and parasitic diseases (DIP) in the 1980s. As a result of the drop in mortality and fertility in the country, the number of elderly people increased, particularly the group over 80 years old. Over the next 20 years, projections point to a doubling of the elderly population in Brazil, from 8 to 15%. The elderly are the highest risk group for developing NCDs, often as a result of bad habits developed throughout life such as: poor diet, physical inactivity, alcoholism, smoking, among others associated with a failure to achieve national preventive medicine programs<sup>3</sup>.

In Brazil, the Ministry of Health has been developing several actions in conjunction with various governmental and non-governmental sectors aiming to promote quality of life and prevent and control NCDs. NCD Surveillance brings together a set of actions that make it possible to understand the distribution, magnitude and trend of these diseases and their risk factors in the population, identifying their social, economic and environmental conditions, with the aim of supporting the planning, execution and evaluation of prevention and control thereof. The prevention and control of

NCDs and their risk factors are essential to avoid an epidemic growth of these diseases and their harmful consequences for the quality of life and the health system in the country<sup>4,5</sup>.

In 2019, data from the Oswaldo Cruz Foundation (FIOCRUZ) indicate that 54.7% of deaths registered in Brazil were caused directly by NCDs, with 41.8% of these deaths considered premature, that is, at an age younger than the expectation for the Brazilian population<sup>6</sup>.

The Brazilian Army (EB), with its health system, is present in all regions of the country, characterized by its vast capillarity and internalization as can be demonstrated in Fig. 1.

Such military health organizations serve military personnel and dependents at different levels of complexity and in different flows. When necessary, especially in remote areas, the Army Health System also serves the local population, often being the only presence of health professionals in those regions.

It is assumed, therefore, that NCDs, with their consequences, affect military personnel and dependents in a similar proportion to the Brazilian population<sup>7,8</sup>, being an important cost factor in the Brazilian Army's health system. Furthermore, the occur-

rence of these diseases and their consequences can reduce the work capacity and ready employment required by the Land Force.

The present work aims to promote an initiative to prevent the occurrence of NCDs within the scope of EB, focusing on simplicity, economy and efficiency.

## Method

Technical manuals<sup>9,10</sup> were prepared on the main diseases, containing suggested treatment flows and screening for complications, and these documents were distributed to all EB Military Organizations that had medicine doctors on their staff (Fig. 2).

These manuals were prepared based on documents published by the Brazilian Ministry of Health, updated by the main guidelines of Medical Societies<sup>11,12</sup> With the aim of standardizing knowledge and increasing the engagement of military doctors in the project, cycles of lectures and instructions were held via videoconference, aiming to cover medical professionals who work in primary care in the EB Health System (Health Sections and Medical Posts).

As a way of evaluating the effectiveness of these educational measures and estimating

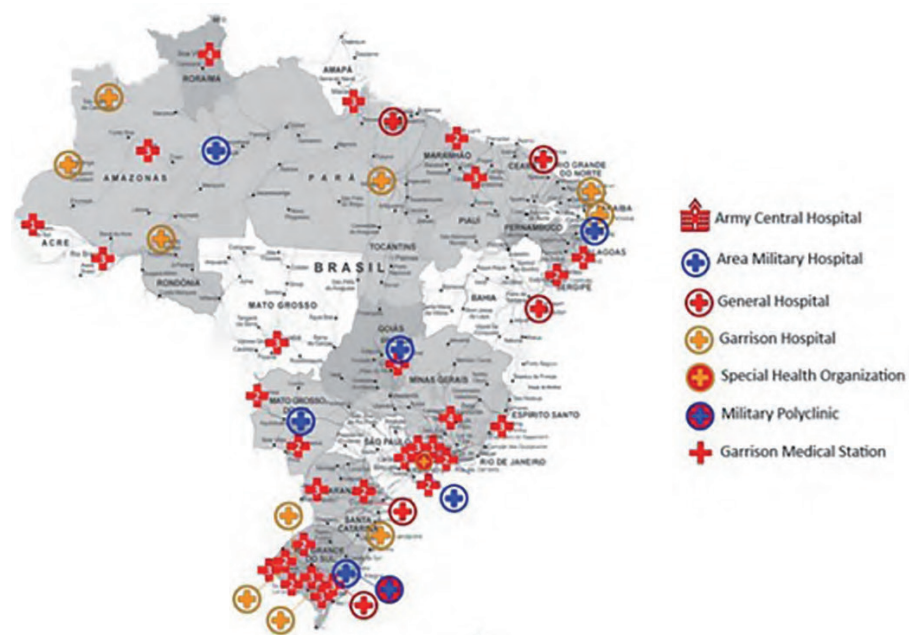


Fig. 1: Map of Brazil showing the location of the main military health units. Source: Health Directorate of the Brazilian Army (adapted).

<sup>1</sup> Brazilian Army Health Directorate



Fig. 2: Covers of preventive health notebooks for Diabetes, Hypertension and Obesity, already launched by the, NCD Prevention Initiative.



Fig. 3: Videoconference meeting to launch the training initiative for medical professionals of the Brazilian Army throughout the national territory, chaired by Gen. Div. Méd. Marco – Health Director of Brazilian Army.

the impact that the measure had on improving medical knowledge to address NCDs, tests were administered before and after instructions to participating officers. To exclude a possible prior preparation bias, participants were not informed that there would be a test to be performed during the instruction.

Each assessment was composed of 10 multiple-choice questions containing clinical cases and/or knowledge relevant to clinical practice on the topic of NCDs. The assessment after the instruction covered the same knowledge as the first. The results were tabulated and analyzed using Microsoft Excel software.

## Results and Discussion

It is observed that according to Figure 4, the majority of doctors who received training are in the initial positions of their career (up to 8 years of service), with these military personnel, due to their hierarchical po-

sition within the health service, mostly in functions direct service to the public. Therefore, it is assumed that any educational action was successful in its objective of reaching doctors who work at the entry points of the Army Health System. The

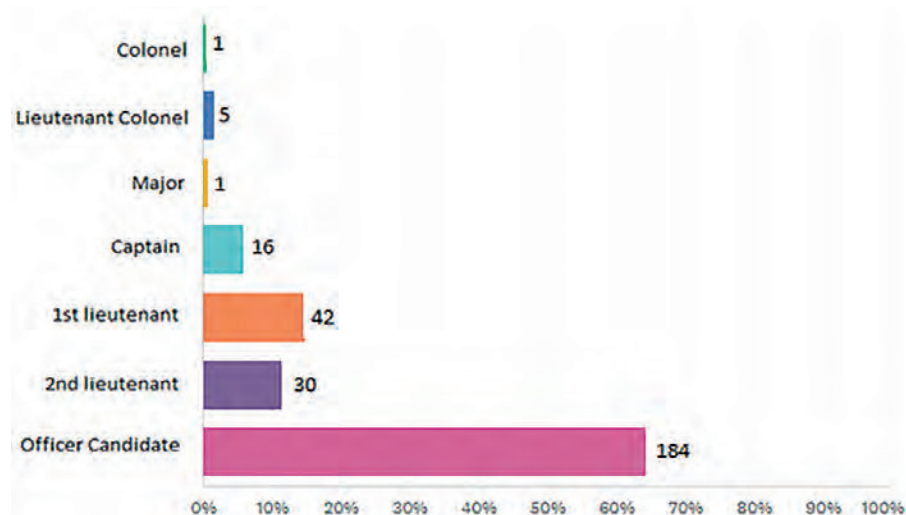


Fig. 4: Extract of medical officers participating in videoconference on NCDs distributed by hierarchical position.

Table 1. List of multiple choice questions applied to medical officers with respective accuracy rates before and after instructions

Question	Trial test	Post test	Variation
1	12%	52%	+40%
2	53%	70%	+17%
3	61%	82%	+21%
4	68%	84%	+16%
5	72%	85%	+13%
6	74%	86%	+12%
7	77%	87%	+10%
8	77%	87%	+10%
9	80%	89%	+09%
10	82%	91%	+09%

training of this public will unequivocally reflect on improving the quality of care in the Brazilian Army Health System and consequently in its economy.

Analyzing the Table 1, there was a wide variety in the degree of accuracy of the professionals involved in the initiative depending on the subject covered in the test, with a variation from 12% to 82% in the pre-test and 52 to 91%. It is clearly noted that for all questions there was an increase in the success rate after the instruction given, which demonstrates the commitment of the trainee officers to absorb the knowledge taught by the instruction team. Based on this same premise, we can see that the instructors were successful in addressing the topics necessary for good medical practice in NCDs.

Table 2 contains the test data summarized and processed into measurements. It is noted that the average number of correct answers in all tests was greater than 66%, which demonstrates the good level of prior knowledge of the participating profession-



Table 2. Comparison of the participants performance(0-100%) before the cycle of lectures (Trial test) and after the instruction (Post test);

Test	Minor score	Higher score	Average	Median	Standart Desviation
Trial test	20%	100%	66%	70%	18%
Post test	20%	100%	81%	90%	17%
Improvement	0	0	<b>27,54%</b>	<b>20%</b>	-1%

als. However, even so, a significant improvement in the level of knowledge of officers in the basic aspects of diagnosis and treatment of NCDs was observed after the cycle of lectures carried out with a total average increase of 27.5% in correct answers.

## Conclusion

With this study, it was noted that it is feasible to implement a low-cost educational initiative to train medical professionals aimed at preventing and managing chronic non-communicable diseases. It was noted that such actions require little logistics, have a good adherence rate and effectively increase the professionals' ability to deal with problems in the day-to-day office in order to safely take the best actions. Therefore, it is concluded that educational initiatives in this sense can be of great relevance, being important tools for improving health promotion strategies within the Armed Forces.

## References

1. MALTA, Deborah Carvalho et al . The construction of surveillance and prevention of non-communicable childhood chronic diseases in the context of the Unified Health System. *Epidemiol. Serv. Saúde, Brasília* , v. 15, n. 3, p. 47-65, set. 2006 .
2. Brasil. Ministério da Saúde. Secretaria de Vi-

- gilância em Saúde. Departamento de Análise de Situação de Saúde. Strategic action plan to combat chronic non-communicable diseases (NCDs) in Brazil 2011-2022. Brasília, 2022.
3. BARRETO, S. M. Surveillance of chronic non-communicable diseases in Brazil. Brasília: Ministério da Saúde, Secretaria de Vigilância em Saúde, 2004.
4. BRASIL. MINISTÉRIO DA SAÚDE. Secretaria de Vigilância em Saúde; Instituto Nacional do Câncer. Household survey on risk behavior and reported morbidity from non-communicable diseases and conditions: Brazil, fifteen capitals and the Federal District, 2002-2003. Rio de Janeiro, 2003.
5. ORGANIZAÇÃO PAN-AMERICANA DA SAÚDE. CARMEN – Initiative for a Set of Actions for the

Multi-factorial Reduction of Non-communicable Diseases. 2003.

6. SCHRAMM, J. M. A et al. Epidemiological transition and the study of disease burden in Brazil. *Ciência &Saúde Coletiva*, v. 9, n. 4, p. 897-908, 2004.
7. MALTA, D. C. Chronic non-communicable diseases, a major challenge for society. *Revista de Saúde Coletiva: Editorial*. Rio de Janeiro, v. 19, n. 1, p. 4, jan. 2014.
8. BRASIL. Ministério da Defesa. Exército Brasileiro. Diretoria de Saúde, Preventive Health Notebooks, Diabetes Mellitus, Brasília, 2023.
9. BRASIL. Ministério da Defesa. Exército Brasileiro. Diretoria de Saúde, Preventive Health Notebooks, Arterial Hypertension, Brasília, 2023.
10. BRASIL. Ministério da Defesa. Exército Brasileiro. Diretoria de Saúde, Preventive Health Notebooks, Obesity, Brasília, 2023.
11. SOCIEDADE BRASILEIRA DE HIPERTENSÃO; SOCIEDADE BRASILEIRA DE CARDIOLOGIA; SOCIEDADE BRASILEIRA DE NEFROLOGIA. Brazilian Arterial Hypertension Guidelines. *Revista Hipertensão, [S.I.]*, v. 13, ano 13, jan./fev./mar. 2010.
12. SOCIEDADE BRASILEIRA DE DIABETES. Brazilian Diabetes Society Guideline. Update 1/2023.

## LIEUTENANT Eldo de Brito Ferreira CHAVES, MD



LIEUTENANT Eldo de Brito Ferreira CHAVES, MD, was born in Teresina, northeast of Brazil at November 22<sup>nd</sup>, 1985. In this city he graduated in Medicine in 2014 from the Federal University of Piauí. He joined the military ranks in 2015, when he performed mandatory military service for one year. In 2018 he completed the medical residency program at the Internal Medicine at the State Public Servant Hospital in São Paulo and joined the Brazilian Army as a career doctor. He was initially assigned to a small army unit located in Petrolina, city of the state of Pernambuco where he developed activities related to health support in military operations in desert environments.

He was transferred in 2022 to the capital of Brazil, Brasília, where he works in the Army Health Directorate in activities related to the creation and implementation of public health programs among military personnel.

Lt. Chaves is married to Lt. Daniella, a member of the Support Staff, specialist in Legal Service of the Brazilian Air Force and together they have a daughter, Maria Júlia, a 4 months old baby.



  
**45TH ICMM WORLD CONGRESS  
ON MILITARY MEDICINE**  
**Military Medicine  
Shaping Global Health**  
 22-27 SEPTEMBER 2024  
 BRISBANE CONVENTION & EXHIBITION CENTRE  
 QUEENSLAND AUSTRALIA