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Review

Military physical training in Brazil's Air Force: weekly frequency and cross training as an alternative

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Abstract

Professional Military Physical Training (TFPM) in the Brazilian Air Force (FAB) is conducted in two weekly two-hour sessions. This study critically analyzed the frequency and format of TFPM in light of military regulations and the literature and discussed alternatives for its organization. This Study is theoretical-reflective, qualitative and descriptive, based on bibliographic and documentary research, with the purposive selection of 18 sources, including military regulations, international guidelines and position statements, and studies on training frequency and high-intensity functional training, which were analyzed through thematic synthesis. Results indicate that the planned weekly volume (240 minutes) lies within the range recommended by the World Health Organization, but the frequency of two sessions per week falls below the three to five sessions indicated for cardiorespiratory adaptations, and adherence tends to be compromised by administrative workload. Cross training appears as a varied, high-intensity, shorter-duration modality applied in military settings, but the available evidence is limited and does not support claims of superiority. The Study concludes that the redistribution of TFPM into five weekly sessions, with volume and intensity control and the possible inclusion of cross training, constitutes a hypothesis to be tested in intervention studies.

Keywords: Military Personnel. Physical Fitness. Physical Conditioning Human. Exercise.

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Introduction

To maintain a healthy level of physical fitness, the World Health Organization (WHO) recommends that adults aged 18 to 64 accumulate, each week, 150 to 300 minutes of moderate-intensity aerobic physical activity, 75 to 150 minutes of vigorous-intensity activity, or an equivalent combination of both (World Health Organization, 2020).

The Brazilian Air Force (FAB) maintains a physical conditioning program based on varied physical training sessions held twice a week, each lasting two hours, for a total of 240 minutes per week. The main purpose of this training is to physically prepare personnel to fulfill the constitutional mission and, complementarily, to maintain or improve the health and physical fitness of personnel, develop the affective, cognitive, psychomotor and moral domains, encourage continuous sports practice, and prepare personnel for the Physical Fitness Assessment Test (TACF) (Brasil, 2020).

The literature associates the practice of regular physical activity and adequate levels of physical fitness with benefits for health and health-related quality of life in adults (Araújo & Araújo, 2000). In the military context, these benefits add to the requirement of readiness for tasks that demand strength and endurance, which makes the organization of physical training a matter of both occupational health and operational capability.

Weekly frequency is one of the central variables of exercise prescription, together with intensity, time and type of exercise, a set known as the FITT principle (Physiopedia, 2022). The American College of Sports Medicine position stand recommends, for most adults, moderate-intensity cardiorespiratory exercise for at least 30 minutes on five or more days per week, or vigorous-intensity exercise for at least 20 minutes on three or more days, in addition to resistance exercises for the major muscle groups on two to three days per week (Garber et al., 2011). These recommendations express the understanding that training adaptations depend on the regular repetition of the stimulus throughout the week, so the distribution of volume is not irrelevant to outcomes.

Despite this relevance, the adequacy of the weekly frequency and the method of delivering physical training in the FAB remains little discussed. Adopting a new physical preparation methodology involves challenges such as available time, infrastructure, equipment and personnel engagement, which requires eventual changes to be grounded in regulations, health recommendations and evidence on training methods.

Regarding terminology, this article makes use of the term *cross training* to designate the high-intensity functional training modality, characterized by constantly varied, multi-joint functional movements that combine aerobic and muscle-strengthening exercises and can be adjusted to any fitness level (Feito et al., 2018). The term CrossFit®, a registered trademark, is used only when referring to the historical origin of the modality or to studies that specifically investigated programs under this brand.

Accordingly, this study aimed to critically analyze the frequency and format of Professional Military Physical Training (TFPM) in the FAB in light of military regulations and the literature on training frequency and high-intensity functional training, and to discuss alternatives for its organization, with emphasis on increasing weekly frequency and the possible inclusion of *cross training*.

Methods

The study is theoretical-reflective with a qualitative and descriptive approach, based on bibliographic and documentary research. The design was chosen because the study analyzes an

institutional physical training policy, without primary data collection.

The corpus comprised three sets of sources: (a) regulatory documents on military physical training and assessment, namely NSCA 54-4 (Brasil, 2019) and NSCA 54-5 (Brasil, 2020), issued by the Air Force Command, and the Military Physical Training manual of the Brazilian Army (Brasil, 2015); (b) international guidelines and position stands on physical activity and exercise prescription (Garber et al., 2011; World Health Organization, 2020); and (c) scientific and technical literature on physical fitness, training frequency, physical training in military academies, and high-intensity functional training in military and public security populations.

The search was carried out in two stages. In the first, which gave rise to the initial version of the study in October 2023, SciELO, PubMed Central, Oasisbr and the institutional websites of the Air Force Command and the Brazilian Army were consulted using the terms, alone or combined with Boolean operators, “treinamento físico militar” [military physical training], “frequência de treinamento” [training frequency], “aptidão física” [physical fitness], “CrossFit”, “military” and “physical training”. In the second, conducted in November 2026 during manuscript revision, the search was supplemented in PubMed with the terms “high-intensity functional training”, “CrossFit”, “military” and “exercise prescription”, to incorporate position stands, reviews and synthesis studies.

Sources with full text available in Portuguese, English or Spanish and relevant to at least one axis of the objective were included: training frequency, organization of military physical training, or high-intensity functional training as a method. In the second stage, systematic reviews, reviews and position stands of scientific bodies published in peer-reviewed journals were prioritized. Selection was made by reading titles and abstracts, followed by full-text reading of potentially relevant sources. The final corpus comprised 18 sources, 13 from the first stage and 5 from the second.

The analysis consisted of analytical reading of the sources and thematic synthesis along three axes: (1) the regulatory framework of military physical training; (2) training frequency and variation; and (3) *cross training* as a methodological alternative. The findings were then compared with the organizational reality of TFPM in the FAB.

As a bibliographic and documentary study without human participants, review by a Research Ethics Committee was not required.

Results

The 18 sources that made up the corpus are summarized in Table 1, according to document type and the contribution of each to the analysis. The findings are presented below according to the three thematic axes.

Table 1. Sources included in the study corpus

Fonte	Tipo	Contribuição para a análise
World Health Organization (2020)	International guideline	Recommended weekly physical activity volume for adults
Garber et al. (2011)	Scientific position stand (ACSM)	Recommended frequency, intensity and duration for adults
Brasil (2015)	Military manual (Army)	Role-oriented TFM; mandatory training
Brasil (2019)	Military regulation (NSCA 54-4)	Purpose of the TACF; three to five weekly sessions
Brasil (2020)	Military regulation (NSCA 54-5)	Definition and purposes of TFPM; shared responsibility
Araújo e Araújo (2000)	Review article	Relationship between fitness, health and quality of life
Santos et al. (2018)	Article	TFM as a pedagogical process; West Point model
Physiopedia (2022)	Online technical source	FITT principle and weekly training frequency
Feito et al. (2018)	Review article	Definition of high-intensity functional training
Glassman (2007)	Technical article	Definition of CrossFit®
Borges (2018)	Book	Origin, components and capacities of the modality
Madden (2017)	Book	Energy systems in the modality
Haddock et al. (2016)	Review article	Benefits and gaps of HIFT in the military
Poston et al. (2016)	Review article	Safety and injury risk of HIFT in the military
Claudino et al. (2018)	Systematic review and meta-analysis	Volume and quality of evidence on CrossFit®
Evangelista e Santos (2023)	Original article	Fitness of military police officers practicing CrossFit®
Gava (2016)	Undergraduate thesis	Critical analysis of the modality in the military context
Kupper (2023)	News report	Accounts of the modality's use by military personnel

Source: prepared by the authors.

Regulatory framework of military physical training

Military Physical Training (TFM) is understood as a pedagogical process involving teaching and learning aimed at positive outcomes for personnel (Santos et al., 2018). In the Brazilian Army, the physical preparation of personnel "must be oriented toward the objectives and activities specific to their function, specialty, unit and rank" (Brasil, 2015, p. 1-1, our translation). The same manual assigns physical education specialists the task of determining the physical requirements for each objective and proposing tests and assessment profiles, and establishes that TFM is mandatory for all personnel deemed fit for active duty (Brasil, 2015).

In the FAB, TFPM is defined as "military physical activity systematically organized, practiced and continuously controlled through a pedagogical process (physical conditioning program), aiming at professional physical conditioning" (Brasil, 2020, p. 9, our translation). NSCA 54-5 also establishes the principle of shared responsibility, according to which maintaining physical fitness depends on both the Military Organization (OM) and the individual (Brasil, 2020). NSCA 54-4, in turn, regulates the TACF in admission and selection examinations, to verify whether candidates have the minimum physical fitness required during the course or training (Brasil, 2019).

Training frequency and variation

Currently, TFPM physical activity is performed twice a week in a free format. The Air Force regulations themselves, however, indicate that satisfactory and progressive physiological effects depend on three to five training sessions per week (Brasil, 2019).

Along the same lines, the technical synthesis on the FITT principle points out that training three times a week produces significant effects, that five days a week of lower-intensity exercise may be more manageable for some people, and that there is little additional benefit above five weekly sessions, with an increased risk of injury. According to the same source, training twice a week would not increase maximal oxygen uptake (VO_2max), although it may produce some functional changes (Physiopedia, 2022).

These indications converge with the American College of Sports Medicine position stand, which links the recommended frequency to intensity: five or more days for moderate exercise and three or more for vigorous exercise, with two to three days of resistance exercise (Garber et al., 2011). Taken together, the sources indicate that two weekly sessions meet the minimum recommended for muscle strengthening but fall below the recommendation for cardiorespiratory exercise, regardless of the intensity adopted.

As an organizational reference, the United States Military Academy (West Point) conducts physical training in five weekly sessions. Throughout the four years of training, cadets take courses in military fitness development, boxing, combatives, survival swimming and military gymnastics, with objectives that include developing warrior spirit, self-confidence, control of fear and stress, aggressiveness and courage (Santos et al., 2018).

Cross training as a methodological alternative

Cross training belongs to the category of high-intensity functional training (HIFT), which differs from high-intensity interval training (HIIT) by using constantly varied functional exercises of different durations that may or may not include rest; most HIFT studies have used CrossFit® training templates (Feito et al., 2018). This program originated in the United States as training for military, police and

firefighters and spread worldwide (Borges, 2018). Its creator defines it as constantly varied functional movement performed at high intensity (Glassman, 2007), combining elements of gymnastics, weightlifting, athletics, swimming, rowing and cycling, among others (Borges, 2018).

One of the foundations of the modality is the breadth of capacities trained: cardiorespiratory endurance, muscular endurance, strength, flexibility, power, speed, coordination, agility, balance and accuracy (Borges, 2018). The development of the three energy systems (anaerobic, mixed and aerobic) is balanced through continuously modified combinations of exercises that expose the body to different stressors (Madden, 2017).

In a review of this approach in military personnel, Haddock et al. (2016) list as practical benefits shorter sessions with lower volume, exercises that simulate combat tasks, lower equipment costs, less boredom due to constant variation, lower injury potential than high-volume endurance training, and scalability to all fitness levels. The same authors note, however, that no large-scale randomized trials have compared traditional military physical training with HIFT on health and injury outcomes. In a journalistic report on the U.S. Armed Forces, Miller (as cited in Kupper, 2023) states that CrossFit® prepares the body for the demands of combat roles and that its movements translate into functional actions outside the gym, including military responsibilities.

Regarding safety, Poston et al. (2016) concluded that HIFT programs, including CrossFit®, pose similar or lower injury potential than many traditional military physical training activities, which they partly attribute to lower running volume, while noting that comparisons across studies are limited by heterogeneous samples and methods.

In a study of 16 male military police officers, Evangelista and Santos (2023) compared those practicing CrossFit® in addition to military physical training (n = 10) with non-practitioners (n = 6). Practitioners showed higher upper limb strength, flexibility and cardiorespiratory capacity, and the authors concluded that regular practice suggests positive effects on the physical fitness of this professional group. In a broader synthesis, the systematic review and meta-analysis by Claudino et al. (2018) included 31 studies on CrossFit®, of which only two had a high level of evidence and low risk of bias.

Finally, Gava (2016) argues that the modality's exercises, performed at high intensity, seek general results in less practice time than traditional models. For the author, in the military context, the method would have an advantage over aerobic-centered, long-duration training, with shorter exposure to exercise and therefore a lower incidence of injuries.

Discussion

The analysis makes it possible to distinguish two problems that are often treated together: training volume and training frequency. As for volume, the 240 weekly minutes planned in TFPM fall within the WHO range of 150 to 300 minutes of moderate activity (World Health Organization, 2020). The case for change, therefore, does not rest on insufficient total prescribed time but on its distribution: the Air Force regulation, the ACSM position stand and the technical literature converge in indicating three to five weekly sessions (Brasil, 2019; Garber et al., 2011; Physiopedia, 2022), a level that the current two-session routine does not reach.

This reading, however, depends on intensity. Both the recommended volume ranges and frequencies vary depending on whether exercise is moderate or vigorous (Garber et al., 2011; World Health Organization, 2020), so volume, frequency and intensity must be considered together. Because TFPM is practiced in a free format regarding session content, the documents analyzed do not allow us to state at

what intensity the 240 minutes are actually performed. Added to this is the specificity of stimuli: military training should be oriented to the activities of each role (Brasil, 2015), and the literature on HIFT in the military suggests combining a general physical preparation base for all personnel with elements selected according to the demands of each occupation (Haddock et al., 2016). The question, therefore, is not only how many sessions are held, but also which capacities are trained and how closely they approximate operational tasks.

A third aspect is the gap between prescribed and actual training time. In the routine of the OMs, part of the personnel fails to attend TFPM sessions due to office duties or assignments. In these high-demand roles, the principle of shared responsibility (Brasil, 2020) tends to be difficult to apply, since longer working hours reduce opportunities for physical activity outside office hours. This is an institutional observation that needs to be quantified, but it suggests that long sessions concentrated on two days are more vulnerable to absences than shorter, distributed sessions.

As for the proposal of five weekly sessions, it is necessary to make explicit how the reorganization is understood, since it admits two scenarios. In the first, the current volume is preserved and only redistributed: the 240 minutes would be divided into five sessions of approximately 45 to 50 minutes, meeting the recommended frequency without reducing total time. In the second, sessions of about 30 minutes are adopted, totaling 150 minutes, less than the current volume and equivalent to the lower limit of the recommendation for moderate activity. In this case, maintaining the stimulus depends on a substantial part of the sessions being performed at vigorous intensity, for which the minimum recommendation is 75 minutes per week over at least three days (Garber et al., 2011; World Health Organization, 2020). The second scenario is not understood here as a deliberate reduction of training load but as a substitution of volume for intensity, justified only if intensity is effectively monitored; without such control, the first scenario is the more prudent one. The choice between them should consider the routine of each OM and be evaluated empirically.

It is at this point that *cross training* appears consistent with the proposal, as it combines high intensity, shorter sessions and varied stimuli (Feito et al., 2018; Glassman, 2007; Madden, 2017) and approximates the functional demands of military activity (Haddock et al., 2016; Kupper, 2023). The West Point model reinforces that a frequency of five weekly sessions is compatible with a military training routine (Santos et al., 2018). It should be emphasized, however, that the inclusion of *cross training* is presented here as a methodological possibility to be investigated, not as an alternative proven superior to traditional models.

The strength of the available evidence is limited. The study by Evangelista and Santos (2023) is comparative, with a small, non-randomized sample, and CrossFit® was practiced in addition to, not instead of, military training; its results suggest, but do not demonstrate, effects of the method. The systematic review by Claudino et al. (2018) identified only two high-quality studies, and Haddock et al. (2016) note the absence of large-scale trials in the military. Regarding injury risk, the conclusion of Poston et al. (2016) is favorable but based on heterogeneous studies, and the claim by Gava (2016) comes from an undergraduate thesis. Thus, any adoption of *cross training* in TFPM should be accompanied by load progression, adaptation of exercises to each individual's level, and supervision by physical education professionals.

This study has limitations that should guide the reading of its results. First, source selection was purposive and non-systematic, without a prior protocol or formal appraisal of methodological quality, which increases the risk of selection bias and prevents us from stating that the corpus represents all available evidence. Second, the corpus is small and includes a substantial share of grey literature and

technical or popular sources, some linked to the CrossFit® brand itself. Third, part of the evidence comes from populations different from FAB personnel, such as U.S. military personnel and military police officers, which limits transferability. Fourth, no empirical data on attendance, TACF performance or injuries among FAB personnel were analyzed. Finally, the regulations examined correspond to the versions in force at the time of consultation. For these reasons, the study should be understood as a reflective proposal whose value lies in formulating hypotheses to be tested.

From this perspective, the following future studies are suggested: (a) descriptive surveys of TFPM attendance and its determinants in the OMs; (b) quasi-experimental studies or trials randomized by OM comparing the current two-session model with five-session models, with and without *cross training*, controlling volume and intensity; (c) standardized injury surveillance; (d) assessment of outcomes such as TACF performance, body composition, health indicators and simulated operational tasks; and (e) qualitative studies on the perceptions of personnel and managers regarding the feasibility of the proposal.

Final considerations

In response to the proposed objective, the analysis suggests that TFPM in the FAB, although it provides a weekly volume compatible with the WHO recommendation, adopts a frequency of two sessions, below the three to five sessions indicated by the Air Force's own regulations and by the literature, and that its effectiveness may be reduced by competing office demands.

As a possibility to be investigated, we propose redistributing TFPM into five weekly sessions, preserving the current volume or offsetting any reduction through intensity control, and including *cross training*, which can be performed outdoors, with little equipment and with strength, endurance and functional skill stimuli adaptable to military demands. Benefits such as greater adherence, access to new sports practices, cooperation and healthy competition among practitioners remain hypotheses that require empirical verification.

Given the theoretical-reflective nature of the study and the limitations of the available evidence, it is recommended that the proposal first be implemented on an experimental basis, in selected OMs and with systematic evaluation of results, before any regulatory change.

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Declarations

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References

Araújo, D. S. M. S., & Araújo, C. G. S. (2000). Aptidão física, saúde e qualidade de vida relacionada à saúde em adultos. *Revista Brasileira de Medicina do Esporte, 6*(5), 194-203. https://www.scielo.br/j/rbme/a/7WvcGv53qG8x4V5ndjfscMD

Borges, J. R. (2018). *Crossfit: perseguindo a excelência* [E-book Kindle].

Brasil. Comando da Aeronáutica. (2019). *NSCA 54-4: Aplicação do Teste de Avaliação do Condicionamento Físico para exames de admissão e de seleção do Comando da Aeronáutica* (Portaria COMGEP nº 15/DLE, de 1º de outubro de 2019). https://www.fab.mil.br/icas/NSCA_54_4_TACF.pdf

Brasil. Comando da Aeronáutica. (2020). *NSCA 54-5: Treinamento físico profissional militar no Comando da Aeronáutica*. https://www.fab.mil.br/icas/NSCA_54_5_TACF.pdf

Brasil. Exército Brasileiro. (2015). *Manual de campanha EB20-MC-10.350: Treinamento físico militar* (4. ed.). EGGCF.

Claudino, J. G., Gabbett, T. J., Bourgeois, F., Souza, H. S., Miranda, R. C., Mezêncio, B., Soncin, R., Cardoso Filho, C. A., Bottaro, M., Hernandez, A. J., Amadio, A. C., & Serrão, J. C. (2018). CrossFit overview: Systematic review and meta-analysis. *Sports Medicine - Open, 4*(1), Artigo 11. https://doi.org/10.1186/s40798-018-0124-5

Evangelista, T. S., & Santos, G. A. B. (2023). Physical fitness of military policemen who practice CrossFit. *Revista Brasileira de Medicina do Trabalho, 21*(1), e2023854. https://doi.org/10.47626/1679-4435-2023-854

Feito, Y., Heinrich, K. M., Butcher, S. J., & Poston, W. S. C. (2018). High-intensity functional training (HIFT): Definition and research implications for improved fitness. *Sports, 6*(3), Artigo 76. https://doi.org/10.3390/sports6030076

Garber, C. E., Blissmer, B., Deschenes, M. R., Franklin, B. A., Lamonte, M. J., Lee, I.-M., Nieman, D. C., & Swain, D. P. (2011). Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: Guidance for prescribing exercise. *Medicine & Science in Sports & Exercise, 43*(7), 1334-1359. https://doi.org/10.1249/MSS.0b013e318213fefb

Gava, T. T. (2016). *Crossfit: uma análise crítica* [Trabalho de conclusão de curso, Universidade Estadual

de Campinas].

Glassman, G. (2007). Understanding CrossFit. *CrossFit Journal*, (56), 1–2.

Haddock, C. K., Poston, W. S. C., Heinrich, K. M., Jahnke, S. A., & Jitnarin, N. (2016). The benefits of high-intensity functional training fitness programs for military personnel. *Military Medicine, 181*(11), e1508–e1514. https://doi.org/10.7205/MILMED-D-15-00503

Kupper, C. (2023, 27 de março). CrossFit for duty: Soldiers lean on functional fitness to stay in shape. *Reserve & National Guard*. https://www.reservenationalguard.com/fitness/soldiers-use-crossfit-to-stay-in-military-shape/

Madden, R. G. (2017). *CrossFit: Military CrossFit workouts for beginners* [E-book].

Physiopedia. (2022). *FITT principle*. Recuperado em 10 de outubro de 2023, de https://www.physiopedia.com/FITT_Principle

Poston, W. S. C., Haddock, C. K., Heinrich, K. M., Jahnke, S. A., Jitnarin, N., & Batchelor, D. B. (2016). Is high-intensity functional training (HIFT)/CrossFit safe for military fitness training? *Military Medicine, 181*(7), 627–637. https://doi.org/10.7205/MILMED-D-15-00273

Santos, I. P., Vieira, L., & Martins, L. (2018). A importância da ciência Educação Física na preparação operacional de militares: premissas da Academia Militar dos Estados Unidos – West Point. *Revista de Educação Física, 87*(2), 393–395. https://doi.org/10.37310/ref.v87i2.774

World Health Organization. (2020). *WHO guidelines on physical activity and sedentary behaviour*. https://iris.who.int/handle/10665/336656