Original Article

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Effects of a Nine-Week High-Intensity Interval Training Program on Anaerobic Performance and Physical Readiness in Military University Cadets: A Randomized Controlled Trial

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Abstract: High-intensity interval training (HIIT) is recognized as a time-efficient method for enhancing physical fitness. However, its effects in military populations, who require multifaceted development of physical capabilities and psychological resilience, warrant further investigation, particularly in comparison with conventional training approaches. This study aimed to compare the effects of a structured nine-week HIIT program with conventional physical training on anaerobic performance, body composition, and subjective perceptions of stress management and physical readiness in military university students. A two-arm, parallel-group randomized controlled trial was conducted with 61 first-year cadets (47 men, 14 women) from the University of Defence, Czech Republic. Participants were randomly allocated to either an intervention group (HIIT; n = 33) or a control group (CON; n = 28). The HIIT group performed two 90-minute weekly sessions featuring a periodized blend of interval running and high-intensity functional training, while the control group followed a standard, non-structured physical education curriculum. Within-group analyses showed a significant improvement in mean anaerobic power in the HIIT group ($p < 0.001$; effect size = 0.85), whereas the control group showed a non-significant change ($p = 0.132$; effect size = 0.33). Between-group differences were not statistically significant ($p = 0.151$), although the effect size indicated a small-to-moderate trend favouring HIIT. No significant differences were observed for body composition. At seven-month follow-up, mean anaerobic power in the HIIT group remained above baseline values without significant between-group differences. Participants in the HIIT group reported significantly higher perceived physical readiness ($p < 0.01$) and overall program evaluation ($p < 0.05$). These findings suggest that structured HIIT may represent a promising and time-efficient training approach in military university settings, although further research with larger samples is needed.

Keywords: High-intensity interval training; physical fitness; military personnel; body composition; stress management; randomized controlled trial; tactical athlete.

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INTRODUCTION

The optimization of physical fitness in military personnel is a cornerstone of operational readiness and mission success in high-stakes environments [1,2]. Military training programs are tasked with concurrently developing a broad spectrum of physical attributes, including cardiovascular endurance, muscular strength, anaerobic power, and agility, often within significant time constraints [3]. The nature of modern warfare, characterized by intermittent high-intensity combat engagements, necessitates that soldiers, or "tactical athletes," possess the ability to perform repeated explosive efforts under considerable physiological and psychological stress [4,5]. This has driven a paradigm shift away from traditional high-volume, low-intensity training toward more time-efficient and operationally specific methodologies [3,6].

Over the past two decades, high-intensity interval training (HIIT) has emerged as a preeminent training strategy, proven to be an exceptionally time-efficient method for inducing robust physiological adaptations [7,8]. Seminal work by Gibala et al. (2006) demonstrated that a six-week HIIT protocol could enhance aerobic capacity to a similar extent as traditional endurance training, despite a more than four-fold lower training volume [9]. A subsequent meta-analysis by Weston et al. (2014) further solidified these findings, concluding that HIIT can increase maximal oxygen uptake (VO_2max) by 4–7% within just 6–8 weeks, an improvement typically achieved only after a much longer period of conventional endurance training [10]. Beyond cardiorespiratory improvements, HIIT is known to stimulate critical metabolic adaptations, such as enhanced mitochondrial biogenesis and improved insulin sensitivity, and to promote hypertrophy of fast-twitch muscle fibers [11].

Recent research has increasingly focused on the application of HIIT and its functional variants, such as High-Intensity Functional Training (HIFT), to military populations. Studies by Clemente-Suárez and colleagues have been instrumental in this area, demonstrating that specific HIIT protocols can elicit a psychophysiological response in soldiers that closely mimics the demands of actual combat scenarios [4,12]. Their work emphasizes the need for training programs that are not only physically demanding but also psychologically preparatory, enhancing cortical arousal and stress resilience in a manner relevant to operational duties [4,13]. This aligns with a comprehensive meta-analysis by Pihlainen et al. [1], which highlighted a tendency for endurance performance to decline during prolonged military deployments, underscoring the critical need for effective and sustainable in-theater training programs to maintain physical preparedness [1]. Further evidence suggests that HIFT induces superior training adaptations in aerobic fitness and strength compared to traditional military physical training [14,15], and that interval training can lead to higher training adherence compared to traditional endurance-based programs in military personnel [16].

Despite this growing body of evidence, a distinct gap remains in the literature concerning the direct, systematic comparison of structured HIIT programs against conventional, less-structured physical education curricula within military higher education institutions. This is particularly true in the Central European context, and specifically within the Armed Forces of the Czech Republic [17]. Furthermore, while quantitative outcomes are well-documented, there is a comparative lack of research integrating these with qualitative data on soldiers' subjective perceptions of training benefits, including stress management and perceived readiness, factors that are crucial for overall psychological resilience and combat effectiveness [18-20].

Therefore, this study was designed to address this gap. In addition to aerobic capacity, military performance is characterized by repeated short-duration, high-intensity efforts such as sprinting, obstacle negotiation, and load carriage, which place substantial demands on anaerobic energy systems. Therefore, anaerobic power was selected as a primary outcome to better reflect the specific physical requirements of military tasks. Furthermore, subjective perceptions of training, including perceived physical readiness and stress management, were included as complementary outcomes, as these factors may influence both performance and adherence to training in military populations.

The main objectives of this research were: (i) to compare changes in anaerobic power (Wingate test), muscle mass, and body fat percentage between the HIIT and control groups; (ii) to assess the sustainability of any training-induced effects seven months after the conclusion of the intervention; and (iii) to analyze differences in subjective perceptions of training benefits, including stress management and physical readiness, between the two groups. It was hypothesized that a nine-week structured HIIT program would elicit greater improvements in anaerobic power compared with conventional military physical training. Additionally, it was expected that participants in the HIIT group would report more favourable perceived changes in physical readiness and stress management.

MATERIAL AND METHODS

Study Design

This study was designed as a two-arm, parallel-group randomized controlled trial (RCT), conducted over a nine-week intervention period with a seven-month follow-up. The study design, execution, and reporting adhere to the Consolidated Standards of Reporting Trials (CONSORT) 2010 statement to ensure methodological transparency and rigor [21]. This investigation constitutes the initial phase of a larger, five-year longitudinal project aimed at monitoring fitness trajectories throughout the cadets' university education. No formal a priori sample size calculation was performed. The sample size was determined by the number of eligible first-year cadets available during the study period and therefore represents a pragmatic sample within a real-world military education setting.

Participants

Participants were recruited from a cohort of approximately 300 first-year cadets enrolled at the University of Defence in Brno, Czech Republic. Inclusion criteria were: (1) full-time enrolment as a first-year cadet; (2) successful completion of the mandatory physical fitness admission test (consisting of a 12-minute run and a 1-minute sit-up test, with performance at or above the "average" threshold); and (3) being free from any medical contraindications to high-intensity exercise. Exclusion criteria comprised any pre-existing musculoskeletal injuries or conditions that would prevent full and safe participation in the training protocols. A total of 61 cadets (47 men, 14 women) who met the eligibility criteria provided written informed consent to participate in the study.

Ethical Considerations

The study protocol was reviewed and approved by the Ethics Committee of the University of Defence (Etická komise Univerzity obrany), Brno, Czech Republic (Approval No. 13/2025; meeting date: 30 October 2025). The protocol was approved unanimously by the members present. All procedures were conducted in accordance with the Declaration of Helsinki. All participants received detailed information about the study and provided written informed consent prior to participation.

Randomization and Blinding

Following baseline assessments, participants were randomly allocated to either the intervention (HIIT) or control (CON) group. The randomization sequence was generated by an independent researcher using a computer-based random number generator. To ensure allocation concealment, group assignments were prepared in advance and were not accessible to participants or instructors prior to allocation. Participants were informed of their group assignment only after completion of baseline testing.

Due to the nature of the intervention, blinding of participants and training instructors was not feasible. However, to minimize detection bias, the research personnel conducting the outcome assessments were not involved in the intervention and were blinded to group allocation.

Interventions

Both interventions were conducted over a nine-week period. Participants in both groups attended two 90-minute training sessions per week, with a minimum of 48 hours of rest between sessions.

Intervention Group (HIIT): The HIIT program was systematically designed to reflect the university's physical performance requirements (1-km run, pull-ups, 10x10 m shuttle run, and a strength-agility-coordination test) while incorporating established HIIT principles [4,8]. Each session comprised a 15-minute dynamic warm-up, a 60-minute main training block, and a 15-minute cool-down with static stretching and mobility exercises. The program was periodized into two distinct four-week phases, reflecting a blend of specific and general physical development [22]:

- Phase 1 (Weeks 1-4): This phase focused on enhancing performance in the 1-km run and pull-ups. It included running intervals at intensities near VO_2max (distances ranging from 50 m to 500 m), a method proven effective for improving aerobic capacity [23], and eccentric-isometric protocols for upper-body strength development, consistent with evidence on time-under-tension for strength enhancement [24].
- Phase 2 (Weeks 5-9): This phase incorporated elements of High-Intensity Functional Training (HIFT), utilizing multi-joint, functional exercises (e.g., squats, lunges, push-ups, TRX rows, burpees). This approach follows the principles of High-Intensity Functional Training, which has been shown to produce superior improvements in overall fitness compared with traditional military conditioning [15]. The work-to-rest ratio was manipulated, employing Tabata-style intervals (20s work: 10s rest) and 1:1 work-to-rest ratios to maximize metabolic stress and simulate operative demands [12].

Control Group (CON): The CON group participated in the standard physical education program of the university. Sessions matched the HIIT group in frequency and duration but lacked the systematic structure, periodization, and consistent high-intensity focus. The content of each session was determined by the assigned instructor and typically included a mixture of endurance runs of varying lengths and intensities, traditional calisthenics, and coordination drills. Training intensity was neither standardized nor objectively monitored, representing a conventional and commonly used approach in university-level military physical education.

Measurements and Procedures

All outcome measures were assessed at baseline (pre-intervention) and at the end of the nine-week period (post-intervention). The primary anaerobic performance test was repeated at a seven-month follow-up.

- Body Composition: Muscle mass (kg) and body fat percentage (%) were assessed using a multi-frequency bioelectrical impedance analysis (BIA) device (InBody 970, Biospace, South Korea). To ensure measurement accuracy, participants were instructed to adhere to standard pre-assessment guidelines, including fasting for at least 3 hours and abstaining from exercise and caffeine for 12 hours prior to the test.
- Anaerobic Power: Anaerobic performance was evaluated using the 30-second Wingate Anaerobic Test (WAnT) on a calibrated cycle ergometer (Monark 894 E, Sweden). Following a standardized warm-up, participants were instructed to pedal "all-out" for 30 seconds against a resistance equivalent to 7.5% of their body

mass. Peak power (Pmax) and mean power (Pmean) were recorded, and data were normalized to body mass ($W \cdot kg^{-1}$).

- Subjective perception was assessed using a brief, study-specific questionnaire administered post-intervention. The questionnaire consisted of four items evaluating perceived stress management, physical readiness, perceived changes in physical performance, and overall program evaluation. Responses were recorded using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree).

The questionnaire was developed by the authors to capture participants' subjective evaluation of the training program and was not intended as a validated psychometric instrument. Therefore, the results obtained from this questionnaire should be interpreted as exploratory.

Statistical Analysis

All statistical analyses were performed using SPSS Statistics for Windows, Version 25.0 (IBM Corp., Armonk, NY) [25]. The normality of data distribution was assessed using the Shapiro-Wilk test [26]. Baseline characteristics between the HIIT and CON groups were compared using independent samples t-tests, confirming the homogeneity of the sample and allowing for a valid comparison of intervention effects [27]. To evaluate within-group changes from pre- to post-intervention, paired samples t-tests were applied. Between-group differences in training effects were analyzed by applying Welch's independent t-test to the change scores (Δ = post-test minus pre-test). The alpha level for statistical significance was set a priori at $p < 0.05$. In addition to p-values, effect sizes for between-group comparisons were calculated using Hedges' g [28] to provide a standardized measure of the magnitude of the effect, and paired Cohen's d_z was used for within-group comparisons [29]. Effect sizes were interpreted as trivial (<0.20), small (0.20–0.49), moderate (0.50–0.79), and large (≥0.80). Although analysis of covariance (ANCOVA) is often recommended for randomized controlled trials with pre- and post-measurements, change scores were used in the present study to directly assess within-subject changes over time. Given the absence of significant baseline differences between groups and the relatively small sample size, this approach was considered appropriate for the study design. Nevertheless, the use of ANCOVA could be considered in future studies as an alternative analytical approach.

RESULTS

Participant Flow and Baseline Characteristics

A total of 61 cadets were randomized into the study. All participants completed the nine-week intervention and post-intervention testing. At the seven-month follow-up, 22 out of 28 men in the HIIT group and 22 out of 22 men in the CON group were available for re-testing. All 5 women in the HIIT group and all 6 women in the CON group completed the follow-up. At baseline, no statistically significant differences were observed between the HIIT and CON groups for demographic or performance characteristics in men (all $p > 0.05$), confirming sample homogeneity following randomization. In women, no statistically significant between-group differences were detected; however, baseline comparisons should be interpreted cautiously due to the small sample size. Baseline characteristics are presented in Table 1.

Table 1. Baseline demographic and performance characteristics of participants (Mean ± SD).

Characteristic	Age (years)		Height (cm)		Body Mass (kg)		BMI (kg/m^2)		VO_2max ($ml{\cdot}kg^{-1}{\cdot}min^{-1}$)	
Group	HIIT	CON	HIIT	CON	HIIT	CON	HIIT	CON	HIIT	CON
Men (n=47)	19.6 ± 1.1	19.5 ± 1.0	181.4 ± 6.8	183.2 ± 6.0	79.4 ± 11.3	77.4 ± 8.9	24.0 ± 2.4	23.1 ± 2.6	47.2 ± 5.7	48.3 ± 7.3
Women (n=14)	19.8 ± 1.3	19.7 ± 1.2	169.0 ± 7.2	166.2 ± 3.8	63.0 ± 8.9	60.9 ± 12.3	22.6 ± 2.1	22.1 ± 3.8	43.2 ± 4.4	37.3 ± 1.9

HIIT – high-intensity interval training; CON – control group; BMI: Body Mass Index; VO_2max: Maximal oxygen uptake. No significant between-group differences were found at baseline ($p > 0.05$).

Changes in the primary outcome variables from baseline to post-intervention are detailed in Table 2. Anaerobic Power (Wingate Test): Among male participants, the HIIT group demonstrated a statistically significant improvement in mean power output ($\Delta = +0.41 \pm 0.46$ $W{\cdot}kg^{-1}$, 95% CI 0.23 to 0.59, $p < 0.001$), corresponding to a large within-group effect size ($d_a = 0.85$). The CON group exhibited a non-significant change ($\Delta = +0.19 \pm 0.57$ $W{\cdot}kg^{-1}$, 95% CI -0.06 to 0.44, $p = 0.132$; $d_a = 0.33$). The between-group comparison of change scores showed a small-to-moderate effect favouring HIIT, although the difference was not statistically significant (mean difference = +0.22 $W{\cdot}kg^{-1}$, 95% CI -0.08 to 0.52; Hedges' g = 0.42, $p = 0.151$). Among female participants, no statistically significant within- or between-group changes were observed for anaerobic power. These changes are illustrated in Figure 1.

Body Composition: Both groups of male participants showed a statistically significant increase in muscle mass (HIIT: +0.64 kg, $p = 0.017$; CON: +0.92 kg, $p = 0.001$), but the difference in change between the groups was not significant ($p = 0.421$). For body fat percentage, statistically significant reductions were observed in the male CON group and the female HIIT group; however, no significant between-group differences were found in the magnitude of change for either sex.

Sustainability of Training Effects (7-Month Follow-up)

The follow-up assessment, conducted seven months post-intervention, showed that mean anaerobic power in the HIIT group remained above baseline values ($\Delta = +0.24 \pm 0.63$ $W{\cdot}kg^{-1}$), although this change was not statistically significant ($p = 0.095$). The control group demonstrated a statistically significant improvement during the follow-up period ($\Delta = +0.32 \pm 0.55$ $W{\cdot}kg^{-1}$, $p = 0.016$). No significant between-group differences were observed for changes from baseline to follow-up ($p = 0.63$).

Qualitative Results (Questionnaire Survey)

The anonymous post-intervention questionnaire provided subjective data on participants' perceptions of the training programs. As presented in Table 3, participants in the HIIT group rated their improvement in perceived physical readiness significantly higher than the CON group. Furthermore, the overall program evaluation was also significantly more favorable in the HIIT group. These findings should be interpreted as exploratory, as the questionnaire was administered only post-intervention and was not a validated instrument for longitudinal assessment.

Table 2. Changes in performance and body composition following the 9-week intervention (Mean ± SD)

Variable	Group	Men's Change (Δ)	p (within)	Women's Change (Δ)	p (within)	Hedges' g (between)	p (between)
Mean Power (W·kg^{-1})	HIIT	+0.41 ± 0.46	<0.001	+0.24 ± 0.51	0.263	0.42 (M)	0.151 (M)
	CON	+0.19 ± 0.57	0.132	+0.19 ± 0.55	0.427	-0.09 (W)	0.871 (W)
Muscle Mass (kg)	HIIT	+0.64 ± 1.28	0.017	+0.38 ± 0.60	0.161	-0.22 (M)	0.421 (M)
	CON	+0.92 ± 1.21	0.001	+0.38 ± 0.55	0.102	0.00 (W)	0.997 (W)
Body Fat (%)	HIIT	-0.33 ± 1.84	0.336	-1.28 ± 1.83	0.041	0.34 (M)	0.248 (M)
	CON	-0.99 ± 2.20	0.041	-0.35 ± 1.05	0.291	-0.59 (W)	0.072 (W)

HIIT – high-intensity interval training; CON – control group; Δ: change score (post – pre). Values are presented as mean ± SD, Within-group comparisons were performed using paired samples t-tests; Between-group comparisons were conducted using Welch's independent t-test on change scores; Hedges' g represents the effect size for between-group differences; (M) men; (W) women; p (within): significance of within-group change (pre vs. post); p (between): significance of between-group differences; Bold values indicate statistical significance ($p < 0.05$).

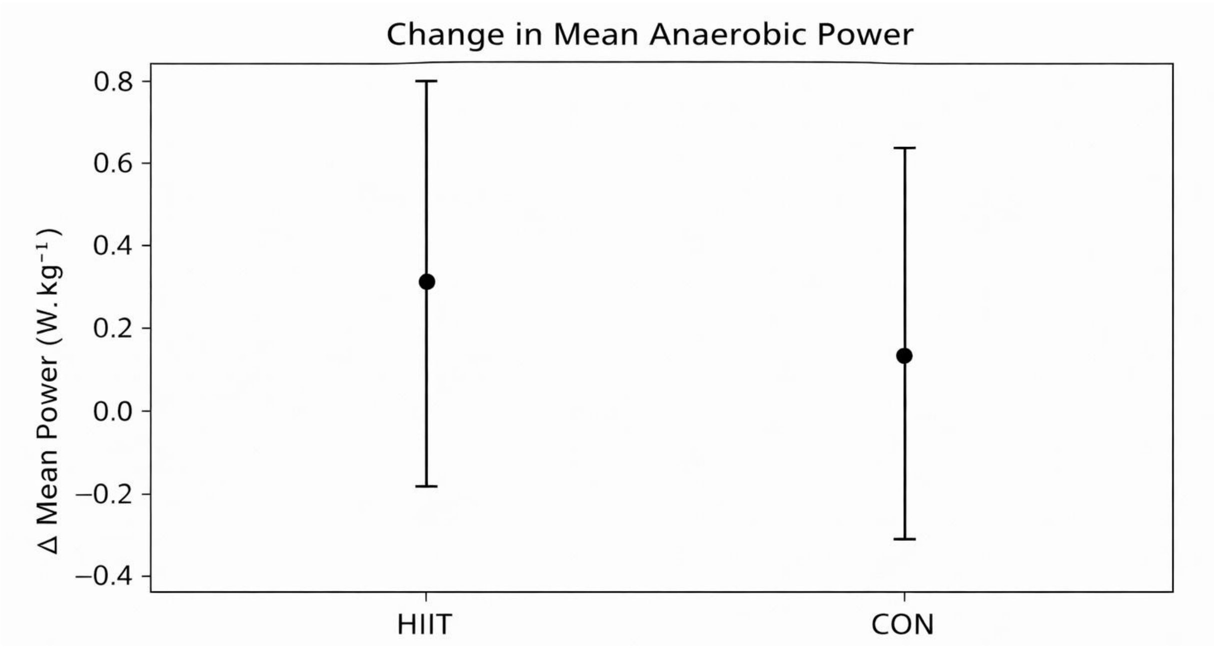

Figure 1. Changes in mean anaerobic power (W·kg^{-1}) in male participants following the 9-week intervention. Points represent mean values and error bars indicate standard deviation (SD). HIIT: high-intensity interval training group; CON: control group. Δ: change score (post – pre).

Table 3. Post-intervention subjective perception questionnaire results (Mean ± SD)

Questionnaire Item	HIIT Group	CON Group	p-value
1. Stress Management	4.07 ± 0.68	3.88 ± 0.71	0.315
2. Perceived Physical Readiness	4.33 ± 0.55	3.82 ± 0.76	**0.004**
3. Perceived Performance Change	4.29 ± 0.68	3.82 ± 0.91	0.058
4. Overall Program Evaluation	4.00 ± 0.80	3.40 ± 0.95	**0.011**

HIIT – high-intensity interval training; CON – control group; Values are presented as mean ± SD; Between-group differences were analyzed using independent samples t-tests; Scale: 1 (strongly disagree) to 5 (strongly agree).

DISCUSSION

This study demonstrated that a structured nine-week HIIT program led to significant improvements in anaerobic power within the intervention group of male military university students. Although between-group differences did not reach statistical significance, the observed effect size indicated a small-to-moderate trend favouring HIIT. In addition, the HIIT program was subjectively perceived as more beneficial for physical readiness and received a higher overall evaluation. These findings support the potential usefulness of structured HIIT in military training contexts.

The primary finding of this investigation is the greater within-group improvement in anaerobic performance, as measured by the Wingate test, in the male HIIT group. A small-to-moderate effect size (Hedges' g = 0.42) favoring the HIIT intervention, despite narrowly missing statistical significance (p = 0.151), suggests a practically meaningful difference that may become significant with a longer intervention period or a larger sample size. This outcome aligns well with previous literature reporting that HIIT can induce substantial physiological adaptations relevant to anaerobic performance [8,11,30]. The underlying adaptations likely include enhanced glycolytic enzyme activity, increased muscle buffering capacity, and superior neuromuscular mechanisms, such as faster motor unit recruitment and higher firing frequency [11,31]. The absence of a significant effect in the female group may be attributable to insufficient statistical power resulting from a small sample size—an acknowledged limitation in sports science and military research [32]—which may have masked a true effect. Future investigations with larger female cohorts are required to elucidate potential sex-specific responses to HIIT in this population.

Interestingly, the study did not find significant between-group differences in body composition changes. While both groups exhibited positive trends (e.g., increased muscle mass in males), HIIT was not superior to conventional training in this regard over the nine-week period. This is consistent with evidence suggesting that short-term HIIT interventions (<12 weeks) primarily stimulate metabolic and neuromuscular adaptations rather than marked morphological changes like significant muscle hypertrophy [11]. The meta-analysis by Pihlainen et al. [1] also reported that overall changes in body composition during military deployments were often trivial, suggesting that longer-duration or more targeted resistance training components may be necessary to induce substantial changes in muscle mass and body fat [1]. Similarly, a meta-analysis by Boutcher [33] concluded that while HIIT is effective for reducing abdominal and visceral fat, its effects on overall body fat percentage can be modest without concurrent dietary interventions.

A particularly relevant finding of this study concerns the medium-term follow-up. Although the improvement in anaerobic performance in the HIIT group was not statistically significant at the seven-month follow-up, mean power output remained above baseline values. However, no significant between-group differences were observed, and these findings should be interpreted with caution due to the reduced sample size and lack of control over training during the follow-up period.

The qualitative findings complement the quantitative results by providing additional insight into participants' perceptions of the training programs. The significantly higher perception of physical readiness and more positive overall program evaluation reported by the HIIT group suggest greater perceived benefits of this training modality and higher acceptance among participants. These findings indicate that HIIT may contribute not only to improvements in physical performance but also to psychological factors such as self-efficacy, motivation, and satisfaction [19]. Such psychological components are particularly relevant in a military context, where confidence in one's physical capabilities is considered an important factor influencing stress resilience and mission readiness [13,20].

Although no statistically significant between-group differences were observed for perceived stress management, the positive trend in the HIIT group is consistent with previous research suggesting that high-intensity training may beneficially modulate the psychophysiological stress response and improve coping with demanding conditions [4,34].

Given that the questionnaire was administered only post-intervention and relied on self-reported perceptions, these qualitative findings should be interpreted cautiously and viewed as exploratory.

Limitations

This study has several limitations that must be acknowledged. First, the sample size was relatively small, particularly for female participants, which limits the generalizability of the findings and may have reduced the statistical power to detect between-group differences and subgroup effects [32]. In addition, no a priori sample size calculation was performed, as the sample was determined by the number of eligible participants available during the study period. This may have further limited the ability to detect statistically significant differences between groups.

Second, the lack of control over participants' diet and spontaneous physical activity outside of the structured training sessions could have introduced confounding variables. Third, while outcome assessors were blinded, the nature of the intervention made it impossible to blind participants and instructors, potentially introducing performance and detection biases. Fourth, this study was conducted with first-year cadets in a university setting; therefore, the direct applicability of these findings to experienced soldiers during active deployment requires further investigation, although the results are consistent with findings reported in active-duty populations [15,16].

Another limitation of the present study is the use of a non-validated, study-specific questionnaire. Therefore, findings related to subjective perceptions should be interpreted with caution. In addition, baseline variability in aerobic fitness among female participants may have influenced the sensitivity of between-group comparisons.

Practical Applications and Future Directions

From an applied perspective, the present findings suggest that a well-structured, periodized HIIT program may represent a useful and time-efficient option within military physical training. The absence of training-related injuries in the HIIT group indicates that, with appropriate supervision and programming, HIIT can be implemented safely in this population. These observations are in line with previous research indicating that appropriately modified high-intensity training programs do not necessarily increase injury risk and may even contribute to injury reduction [35,36]. For military leaders and fitness professionals, HIIT may represent a practical approach for supporting anaerobic power development and perceived physical readiness.

Future research should aim to address the limitations of this study by employing larger, more diverse samples, particularly of female soldiers, to investigate sex-specific responses to military-specific HIIT. Future studies should also incorporate a more comprehensive battery of fitness tests, including direct measurement of VO_2max via spiroergometry and military-specific occupational performance tests (e.g., loaded marches, casualty evacuation drills). Furthermore, exploring the underlying physiological and psychological mechanisms of HIIT's benefits in military populations, using biomarkers of stress (e.g., cortisol, heart rate variability) and neurocognitive assessments, would be a valuable avenue for future inquiry. These findings may assist military training officers in optimizing time-efficient conditioning strategies within structured physical readiness programs.

CONCLUSION

In conclusion, a nine-week, periodized, and supervised high-intensity interval training program led to significant improvements in anaerobic power in male military university students and showed a favourable trend compared with conventional military physical training. Mean performance values in the HIIT group remained above baseline at the medium-term follow-up, although no significant between-group differences were observed. Furthermore, HIIT was subjectively perceived as more beneficial for physical readiness and overall program satisfaction. These findings suggest that HIIT may represent a promising and time-efficient training approach in military settings; however, further research with larger samples is warranted.

Ethical Approval and Consent to Participate: The study protocol was approved by the Ethics Committee of the University of Defence (Etická komise Univerzity obrany), Brno, Czech Republic (Approval No. 13/2025; meeting date: 30 October 2025). Written informed consent was obtained from all participants prior to inclusion in the study.

Consent for Publication: Not applicable.

Availability of Data and Materials: The datasets analyzed during the current study are not publicly available due to participant privacy restrictions but are available from the corresponding author on reasonable request.

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Conflicts of Interest: The authors declare no conflict of interest.

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