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Effects of caffeine supplements on performance of martial athletes: a systematic review and meta-analysis

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Protocol status: Working

We use this protocol and it's working

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Keywords: caffeine, ergogenic aids, dietary supplements, martial arts, performance, effect of caffeine dietary supplement, effects of caffeine supplement, caffeine supplementation, caffeine dietary supplement, caffeine supplement, consuming caffeine, caffeine, performance of martial athlete, performance variables of martial artist, martial athlete, cochrane risk of bias, martial artist, including endurance, cochrane library, trials in pubmed, muscular strength, controlled trial, anaerobic power, physical performance, cochrane risk, consumed psychoactive substance, umbrella review of systematic review, psychoactive substance in the world, known ergogenic effect

Disclaimer

Funding sources/sponsors: None

Conflicts of interest: None

Abstract

Background. Caffeine (1,3,7-trimethylxanthine) is the most widely consumed psychoactive substance in the world, with approximately 80% of the world's population consuming caffeine daily. Caffeine is also one of the most widely consumed performance-enhancing substances, due to its well-known ergogenic effects. An umbrella review of systematic reviews by Grgic et al. found that caffeine supplementation improves physical performance across a wide range of tasks, including endurance, muscular strength, and anaerobic power. The **purpose of the study** is to conduct a systematic search and generalization of randomized controlled trials assessing the effect of caffeine dietary supplements on performance variables of martial artists.

Methods. A systematic search of randomized controlled trials in PubMed, Cochrane Library, Epistemonikos, Elibrary databases was conducted in accordance with PRISMA, the methodological quality will be assessed using the Cochrane Risk of Bias 2 tool. A meta-analysis will be performed using random effects models.

Expected results. The review is expected to include 16 RCTs.

Guidelines

The study will be conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (**PRISMA**) statement. The Preferred Reporting Items for Systematic Review and Meta-Analyses Protocols (**PRISMA-P**) statement. The study protocol will be written before the search begins and will not be changed during or after the search.

Inclusion criteria were based on the **PICOS** system.

Search strategy:

	A	B
	PubMed	"caffeine"[MeSH Terms] AND "martial arts"[MeSH Terms] AND "athletic performance"[MeSH Terms]
	Cochrane Library	caffeine in Title Abstract Keyword AND martial arts in Title Abstract Keyword
	Epistemonikos	(title:(caffeine) OR abstract:(caffeine)) AND (title:(combat sports) OR abstract:(combat sports))
	Elibrary	кофеин, кофе, единоборства, работоспособность, эргогенная помощь

Safety warnings

 This systematic review could potentially include RCTs authored by one/more than one of the review authors.



Original language title

- 1 In Russian: **Влияние биологически активных добавок кофеина на работоспособность единоборцев: систематический обзор и мета-анализ**

Anticipated or actual start date

- 2 13.11.2024

Anticipated completion date

- 3 12.12.2024

Stage of review at time of this registration

- 4 Pilot screening completed

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PICOS

- 9 P – Healthy, qualified male combat athletes, aged 18 years and older; I – Intake of caffeine supplements; C – Intake of placebo; O – Tests assessing performance indicators; S – Randomized controlled trial (RCT).
Exclusion criteria: concomitant intake of caffeine with other dietary supplements; intake of anabolic androgenic steroids; experimental doses of caffeine were consumed by participants from food products (coffee, energy drinks, chewing gum, etc.); studies conducted during/after religious fasting

Review question

- 10 Effects of caffeine supplementation on performance of martial artists

Risk of bias (quality) assessment

- 11 Cochrane risk of bias tool 2. In parallel and independently by two authors

Searches

- 12 The literature search was carried out according to PRESS (Peer Review of Electronic Search Strategies) in the databases (without restrictions on the date and language of publication): PubMed, Epistemonikos and Elibrary.

Study selection. Initially, two review authors (PD Rybakova and AG Antonov) independently and in parallel screened article titles, abstracts, and, where appropriate, full texts from database records according to the eligibility criteria. Duplicates and articles that did not meet the criteria were excluded from the search. Any discrepancies were resolved by consensus discussion, and any disagreements were resolved by another reviewer (AB Miroshnikov).

Study extraction. Following the search, two review authors (PD Rybakova and AG Antonov) independently and in parallel screened the full texts according to the inclusion criteria. Duplicates and articles that did not meet the criteria were removed. Whenever disagreements arose between the assessments of the two researchers, consensus was reached either by discussion or with the help of a third reviewer (AB Miroshnikov). Inter-

rater (kappa) agreement ranged from 0.53 (weak) to 1.00 (almost perfect), as recommended by McHugh.

If the article was not publicly available, we contacted the authors and waited for a response within 14 days.

Data recording tool - Microsoft Excel

Strategy for data synthesis

- 13 The meta-analysis will be conducted using Cochrane's Review Manager software (version 5.4, UK) using standardized mean differences (SMD) as summary statistics for continuous data. The effects of caffeine supplementation on performance indicators will be estimated as 95% confidence intervals (CI) and weighted mean differences (WMD) for summary changes in study outcomes from baseline to endpoints in the experimental and control groups. The random effects model [DerSimonian] will be used for the analysis. Heterogeneity among RCTs will be assessed using the I^2 statistical method and the Cochrane Q-test. I^2 values of 25–50%, < 25%, 50–75% and > 75% will be considered as moderate, low, high and very high heterogeneity between RCTs, respectively. Subgroup sensitivity analysis will be used to identify potential sources of heterogeneity among included RCTs.

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