

INPLASY PROTOCOL

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Oral branched chain amino acids supplementation in trained participants: a systematic review

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Conflicts of interest:
None declared.

Review question / Objective: The present review following PICO criteria: (1) population – athletes or participants described with experience in sport; (2) intervention – oral branched chain amino acids (BCAAs) supplementation; (3) outcomes – indicators of performance, body composition, recovery, hormonal response or cellular signalling; (4) comparator – control group or placebo, and; (5) output – pre- and post-test changes. Exclusion criteria were: (1) studies that described participants as healthy or active; (2) articles classified as letter to editor or review, and; (3) BCAAs supplementation by infusion or combined with other substances.

Condition being studied: The condition to be studied is the ingestion of branched chain amino acids in participants with training experience (participants involved in organized sports or with training experience). Note, the participants classified as active or healthy were not included in this review.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 03 April 2022 and was last updated on 03 April 2022 (registration number INPLASY202240014).

INTRODUCTION

Review question / Objective: The present review following PICO criteria: (1) population – athletes or participants described with experience in sport; (2) intervention – oral branched chain amino

acids (BCAAs) supplementation; (3) outcomes – indicators of performance, body composition, recovery, hormonal response or cellular signalling; (4) comparator – control group or placebo, and; (5) output – pre- and post-test changes. Exclusion criteria were: (1)

studies that described participants as healthy or active; (2) articles classified as letter to editor or review, and; (3) BCAAs supplementation by infusion or combined with other substances.

Rationale: Decisions about the general application of sport supplements claim systematic reviews (Burke & Pulling, 2018), which were conducted, for example, on caffeine (Barreto et al., 2022), creatine (Butts et al., 2018) and carbohydrates (Henselmans et al., 2022). Apparently, the effects of BCAAs supplementation among participants involved in sport were not reviewed. Given the potential anabolic impact of BCAAs supplementation the aim of this study was to review the effects of BCAAs among trained participants.

Condition being studied: The condition to be studied is the ingestion of branched chain amino acids in participants with training experience (participants involved in organized sports or with training experience). Note, the participants classified as active or healthy were not included in this review.

METHODS

Search strategy: ("branched-chain amino acid*" OR "BCAA*" OR "branched-chain amino acid* supplementation" OR "BCAA* supplementation" OR valine OR isoleucine OR leucine) AND (strength* OR "resistance training" OR endurance* OR aerobic "intermittent sport" OR high-intensity OR "muscle soreness" OR "Delayed Onset Muscle Soreness" OR DOMS OR anabolic OR "protein synthesis" OR jump OR run OR sprint) AND (athlete* OR sport* OR train*).

Participant or population: Trained participants.

Intervention: Oral branched chain amino acids (BCAAs) supplementation.

Comparator: Placebo or control.

Study designs to be included: Randomized control trials.

Eligibility criteria: 1) population – athletes or participants described with experience in sport; (2) intervention – oral branched chain amino acids (BCAAs) supplementation; (3) outcomes – indicators of performance, body composition, recovery, hormonal response or cellular signalling; (4) comparator – control group or placebo, and; (5) output – pre-and post-test changes. Exclusion criteria were: (1) studies that described participants as healthy or active; (2) articles classified as letter to editor or review, and; (3) BCAAs supplementation by infusion or combined with other substances.

Information sources: Electronic databases (Web of Science all databases, PubMed and Scopus).

Main outcome(s): Pre and post-test measurements. The main results of each study will be described in text.

Quality assessment / Risk of bias analysis: The revised Cochrane risk of bias tool for randomized trials (RoB 2.0) will be used to analyze the risk of bias of randomized studies (Higgins, Savovic, Page, & Sterne, 2016) as suggested elsewhere (Buttner et al., 2019a; Buttner et al., 2019b). The tool is formed by five domains with different questions: (1) bias arising from the randomization process; (2) bias due to deviations from intended interventions; (3) bias due to missing outcome data; (4) bias in measurement of the outcome; (5) bias in selection of the reported result. In the present review, the effect of starting and adhering to the interventions as specified in the trial protocol option was selected in the tool since the present study examined pre-and post-test results of specific outcomes considering BCAA supplementation and exercise intervention. The questions will be signalling as: yes, probably yes, probably no, no and no information. Additionally, domains will be individually signed as: low risk of bias, some concerns and high risk of bias. Text-boxes associated with each domain will be completed when possible.

Strategy of data synthesis: The main outcomes of each study will be written and described in a Table. This table will include 6 columns (study participants, BCAA supplementation protocol, exercise protocol, objective, main results. To organize the synthesis of main results, four different parameters will be considered: performance, body composition, muscle soreness and recovery, hormonal, molecular, cellular indicators and other parameters of interest.

Subgroup analysis: Not applicable.

Sensitivity analysis: Not applicable.

Language: English.

Country(ies) involved: Portugal.

Keywords: protein intake; performance; recovery; sport.

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