



## Effect of the use of the mouthguard on athletic performance: a systematic review and meta-analysis

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Although authors demonstrate that the use of mouthguard (MG) can prevent the occurrence of orofacial traumas during sports practice, the influence of this device on athletic performance was little systematically quantified through meta-analysis. However, research on athletic performance has shown controversial results, in part when the energy system used is not considered. Investigate the acute effect of using MG on athletic performance in tests that use different types of energy metabolism (anaerobic and aerobic metabolism). A structured search was carried out following the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) guidelines in the Medline/PubMed and Web of Science, Scopus, and Bireme/Lilacs/BVS databases until August 2020. Fifteen published studies were included in the meta-analysis. A final meta-analysis was performed using the random-effects model and pooled standardized mean differences (SMD). This revealed that the use of MG had beneficial effects on anaerobic performance tests (SMD, 0.45; 95% confidence interval (CI), 0.05 to 0.86;  $p = 0.02$ ). However, the use of MG did not impact aerobic performance tests (SMD, -0.06; 95% CI, -0.56 to 0.44;  $p = 0.80$ ). The subgroup analysis data revealed the use of the two types (3 and 5) of MGs improved anaerobic performance (Overall: SMD, 0.38; 95% CI, 0.01 to 0.75;  $p = 0.04$ ). It is concluded that the findings of the present study indicate that the use of personalized MG does not impair performance and provide evidence for sports professionals to defend the use in athletes, to avoid injuries. Also, the use of MG (regardless of type 3 or 5) can help improve athletic performance in activities that involve anaerobic metabolism. These findings must be interpreted carefully, as most of the selected studies did not present important methodological details, such as the sample calculation.

**Keywords:** Mouthguard. Performance. Athletes.

**Supported by:** ISECENSA.