

INPLASY

The Influence of Sporting Activities on Temporomandibular Disorders: A Systematic Review and Meta-analysis

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ADMINISTRATIVE INFORMATION

Support - King Khalid University.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 March 2024 and was last updated on 13 March 2024.

INTRODUCTION

Review question / Objective To identify existing literature on the association between sporting activities and Temporomandibular disorders and to critically appraise the evidence of the association through a systematic review and meta-analysis.

Rationale The main aim of this study is to critically appraise the existing evidence of the role of sporting activities on the development of signs and symptoms of TMD. This study will identify peer-reviewed literature from peer-reviewed scholarly journals investigating the influence of sports on TMD development.

Condition being studied Temporomandibular disorders significantly affect jaw movement and are associated with pain and discomfort. Sports

and physical activity significantly contribute to injury risks in the jaw and facial region. Jaw injuries may be caused by different mechanisms like direct impact, continuous stress, and sudden change of direction, which may lead to severe or minor fractures. Temporomandibular disorders.

METHODS

Search strategy The potential articles were exported to Endnote software for the study selection and screening process. A reviewer selected the studies in phases: by title and abstract screening and full-text screening. The potential articles were subjected to eligibility criteria against which a reviewer selected the studies. This study included studies meeting modified PICO criteria [14]. The PICOS criteria for eligible studies were defined as follows;

Population (P): Subjects participating in any sports, including contact, combat, and other sports.

Intervention (I): No intervention.

Comparison (C): The role of sports in TMD development among athletes compared to non-athletes.

Primary outcomes (O): TMD signs and symptoms.

Study Design (S): All study designs were considered for this study.

Participant or population Subjects participating in any sports, including contact, combat, and other sports.

Intervention No intervention.

Comparator The role of sports in TMD development among athletes compared to non-athletes.

Study designs to be included The preparation and reporting adhered to the Preferred Reporting of Items for Systematic Reviews and Meta-Analysis (PRISMA).

Eligibility criteria Studies published in English.

Information sources An all-inclusive literature search of literature published in the English language via electronic databases: PubMed, ScienceDirect, Dimensions, Google Scholar, Cochrane Library, and Education Resources Information Centre (ERIC).

Main outcome(s) This study highlights the multidisciplinary association between sporting activities and TMD among athletes. This comprehensive analysis of existing evidence highlighted various symptoms and clinical manifestations of TMD among athletes, like myofascial pain, clicking sounds, and musculoskeletal symptoms. This study established different prevalence rates among different sports. Some sports, like contact and combat sports, had higher risks of TMD development, influenced by factors like training frequency, intensity, and individual differences.

In addition, the results of this study emphasize the significance of prompt recognition, comprehensive assessment, and effective management strategies for TMD. Moreover, this study highlights the importance of using protective gear, including mouthguards and helmets, to minimize the injury severity. Nevertheless, further research will help verify the findings of this study to enhance evidence-based practice.

Data management Data from the included studies were methodically extracted and tabulated in a predesigned Microsoft Excel workbook. The extracted data included study characteristics, including study settings, design and authors, study sample characteristics, sample size, type of sports investigated, outcome measures, study purpose, and findings.

Extracted data were analyzed procedurally using a thematic approach. The outcomes of interest included TMD signs and symptoms, clinical manifestation, and overall prevalence in the included studies. In addition, quantitative data were analyzed using Review Manager software version 5.4.1. Proportion meta-analyses were conducted comparing athletes and non-athletes using different variables. Dichotomous data were used in the analyses, employing a random effects analysis model, Mantel-Haenszel statistical method, and odds ratio effect measure. Additionally, totals and sub-totals were used with a 95% confidence interval.

Quality assessment / Risk of bias analysis

Studies meeting the eligibility criteria were assessed for risk of bias and methodological quality using various criteria developed by the National Institutes of Health (NIH) for observational cohort and cross-sectional studies. The quality assessment tool evaluated aspects like clarity of the objectives, study participants selection, outcome measures definition and objective measurement, blinding of the assessors, and management of confounding factors.

Strategy of data synthesis Extracted data were analyzed procedurally using a thematic approach [16]. The outcomes of interest included TMD signs and symptoms, clinical manifestation, and overall prevalence in the included studies. In addition, quantitative data were analyzed using Review Manager software version 5.4.1. Proportion meta-analyses were conducted comparing athletes and non-athletes using different variables. Dichotomous data were used in the analyses, employing a random effects analysis model, Mantel-Haenszel statistical method, and odds ratio effect measure. Additionally, totals and sub-totals were used with a 95% confidence interval.

Subgroup analysis The data was compiled from a variety of articles:

- Author(s), year of publication, country, study design.
- Total number of patients/datasets.
- Training/validation datasets
- Test datasets
- Aim of the study.

Sensitivity analysis Not applicable.

Language restriction Only articles in English.

Country(ies) involved Saudi Arabia.

Keywords Athletes, Sports, Temporomandibular disorders.

Dissemination plans All the data will be shared after publication of the article.

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