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Psoriasis, Psoriatic Arthritis, and Periodontitis: An Umbrella Review of Current Evidence

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We are still developing and optimizing this protocol

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Disclaimer

Abstract

Background: Psoriasis, psoriatic arthritis, and periodontitis are chronic inflammatory conditions. While traditionally studied as distinct diseases, a growing body of evidence suggests a strong association and potential shared inflammatory pathways, with key mediators such as TNF-α and IL-17 playing a role. However, the existing evidence remains fragmented across multiple systematic reviews and meta-analyses, preventing a comprehensive, high-level overview of their interconnections.

Objective: This umbrella review aims to systematically synthesize the existing evidence from systematic reviews and meta-analyses evaluating the association between Psoriasis and Psoriatic Arthritis and periodontitis. The goal is to assess the strength, consistency, and quality of this association, and to identify potential mechanisms and clinical implications.

Methods: A comprehensive literature search was conducted across PubMed, Embase, Scopus, Web of Science, and the Cochrane Library up to July 14, 2025, using predefined PRISMA-S compliant strategies. Additional forward and backward citation tracking was performed. Eligible studies include systematic reviews and/or meta-analyses involving human subjects with RA and/or periodontitis. Narrative reviews and primary studies were excluded. Study selection, data extraction, and quality assessment (using AMSTAR 2) will be performed by two independent reviewers.

Expected outcomes: The review will provide an overarching summary of the current evidence linking PsA or PsO and periodontitis, clarify whether consistent associations have been found, and identify methodological strengths and gaps across the existing literature. Findings will inform both clinical practice and future research on the inflammatory overlap between oral and systemic autoimmune conditions.

ADMINISTRATIVE INFORMATION

1 **Title:** Psoriasis, Psoriatic Arthritis, and Periodontitis: An Umbrella Review of Current Evidence

2 **Registration:** This umbrella review protocol follows the PRIOR (Preferred Reporting Items for Overviews of Reviews) guidelines. The protocol is registered and publicly available on protocols.io

3 **Authors:** Dr. Gianluca Poncina et al.

4 **Amendments:** Any important amendments to this protocol will be documented on protocols.io with a description, rationale, and date of change.

5 **Support:** No specific funding. Institutional support from the University of Padova – U.O.C. Reumatologia.

INTRODUCTION

6 **Rationale:** Psoriasis, psoriatic arthritis, and periodontitis are chronic inflammatory conditions with significant global prevalence. While traditionally considered distinct diseases affecting different organ systems (skin and joints, and oral cavity, respectively), a growing body of evidence suggests a strong bidirectional association and potential shared inflammatory pathways. This connection is underscored by the common involvement of pro-inflammatory cytokines, such as TNF-α and IL-17, in their pathogenesis. Despite the existence of several systematic reviews and meta-analyses investigating the links between these conditions, the evidence remains fragmented, and a comprehensive, high-level synthesis is lacking. The absence of a unified overview makes it challenging to draw robust conclusions about the nature and strength of the associations.

7 **Objectives:** This umbrella review aims to systematically summarize and critically evaluate the existing evidence from published systematic reviews and meta-analyses. By synthesizing data from these high-level studies, we will provide a comprehensive and unified perspective on the associations between psoriasis, psoriatic arthritis, and periodontitis. The findings of this review will contribute to a better understanding of their shared pathophysiology and may inform future clinical guidelines and integrated care strategies, ultimately improving the management of patients with these comorbidities.

METHODS

8 **Eligibility Criteria:**

Population: This umbrella review will include systematic reviews and meta-analyses that examined individuals of any age or sex diagnosed with Psoriasis or Psoriatic Arthritis (PsO or PsA) and/or periodontitis, as defined by the original studies included in the reviews. Both clinical and radiographic diagnostic criteria will be accepted.
Intervention/Exposure: Presence of periodontitis in individuals with PsA or PsO, or presence of PsA or PsO in individuals with periodontitis.
Comparator: This review does not have any comparator(s) or control(s)
Outcomes: Association measures (OR, RR), disease activity scores, inflammatory markers (CRP, ESR), shared mechanisms.
Study Design: Systematic reviews and meta-analyses (with or without quantitative synthesis).

Time Frame: No time restrictions. **Language:** English. **Publication Status:** Published peer-reviewed literature.

9 **Information Sources Databases to be searched:** - PubMed/MEDLINE - Embase - Scopus - Web of Science - Cochrane Library - ClinicalTrials.gov

10 **Search Strategy:** A comprehensive search strategy will be developed and adapted for each database using both controlled vocabulary (e.g., MeSH terms) and free-text terms related to “Psoriasis”, "Psoriatic Arthritis" and “periodontitis.” No date or publication status restrictions will be applied. The strategy will follow PRISMA-S guidelines. Full search strings will be provided in supplementary files.

11 **Study Records and Data Management:** Search results will be managed using a reference management software (e.g., EndNote or Zotero) and uploaded into AsReview for screening.

12 **Selection Process:** Two reviewers will independently screen titles/abstracts and full texts based on eligibility criteria. Discrepancies will be resolved through discussion or by a third reviewer. Selection will be documented using a PRISMA 2020 flow diagram.

13 **Data Collection Process:** Two reviewers will independently extract data using a piloted form. Disagreements will be resolved by consensus or a third reviewer. Authors of primary reviews may be contacted if clarifications are needed.

14 **Data Items:** Citation details; Number and type of included studies; Population and setting; Intervention/exposure and comparator; Outcomes assessed and key findings; Effect estimates (OR, RR, SMD); Review quality (as assessed by authors); Registration status of the review

15 **Outcomes and Prioritization:**

Primary outcomes: Impact of periodontal treatment on PsA or PsO disease activity
Secondary outcomes: CRP, ESR changes; Shared pathophysiological mechanisms

16 **Risk of Bias in Individual Studies:** The methodological quality of included systematic reviews will be assessed using the AMSTAR 2 tool, conducted independently by two reviewers.

17 **Data Synthesis:** No new meta-analysis will be conducted. Quantitative results from included meta-analyses will be summarized narratively. A corrected covered area (CCA) analysis will assess overlap across reviews. Data will be grouped by theme (e.g., epidemiological, mechanistic, interventional).

18 **Meta-bias(es):** Meta-biases will be assessed by checking whether included reviews reported on publication bias or selective outcome reporting.

19 **Confidence in Cumulative Evidence:** The overall strength and credibility of evidence will be discussed qualitatively. If applicable, the GRADE approach will be used to assess the quality of the body of evidence for prioritized outcomes.