

The search settings, such as database, index, time span, literature type, and exclusion conditions for the sensitivity analysis, were consistent with the main analysis, and only comorbidity-related terms were added to the search formula. This paper used Web of Science (Core Collection) as the data source, SCI-E and SSCI as the indexes, and the search formula was TS = ((“osteoporosis” OR “OP”) AND (“osteoarthritis” OR “osteoarthrosis” OR “OA”)) AND ((“comorbidity” OR “comorbid” OR “multimorbidity” OR “co-morbidity” OR “co-occurrence” OR “coexisting” OR “concurrent” OR “simultaneous” OR “both diseases” OR “combined”) OR (“patient with both diseases”)). The search period was 2005-01-01-2025-12-31, and the literature types were Article and Review. The screening language was English, and the literature types Early Access and Proceedings Paper were excluded. A total of 306 articles were retrieved, and two articles with a publication year of 2026 were manually removed; 304 articles were finally obtained.

CiteSpace was used for keyword clustering analysis, and all parameters were consistent with the quantitative analysis of manuscripts. The results showed that the clusters generated by the restricted search no longer included stem cells and diseases, and subchondral bone no longer formed independent clusters, but generated #0 management, #1 older people, #2 articular cartilage, #3 patented crystalline glucosamine sulfate, #4 osteogenesis, and #5 frax (**Figure S1**).

The reason for the above differences is that the restrictive search prioritizes the inclusion of literature focusing on OP and OA comorbidity. Many literatures on the mechanism of stem cells and subchondral bone only study OP or OA, even if they

provide basic pathological mechanisms for OP and OA comorbidity, they may be excluded. Therefore, the main analysis of this study adopts a relatively broad search strategy, aiming to include all relevant basic mechanisms of the literature, which is particularly important to show the complete research picture in this field. This sensitivity analysis was used to evaluate the composition and potential confounding bias of the main data set.

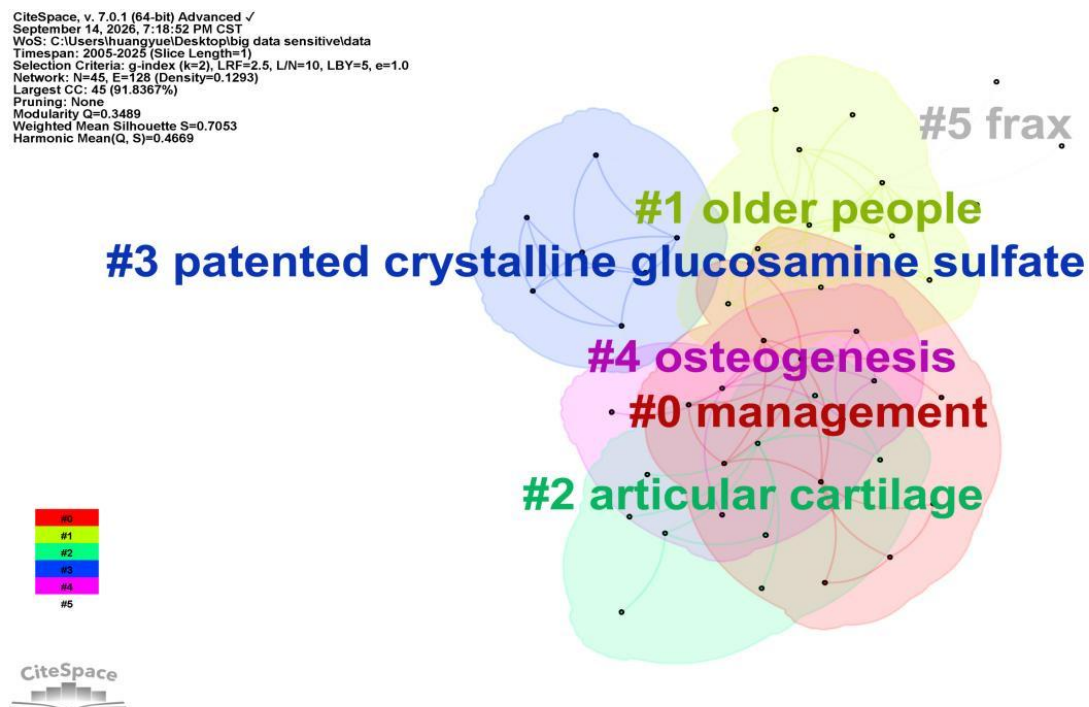


Figure S1. Keyword cluster map of the sensitivity analysis.