

Dose-Response Relationship Between Mediterranean Diet Adherence And Hip Fracture Risk: A Systematic Review And Meta-Analysis

General Topics / Miscellaneous

Manel Fa-Binefa¹, Claudia Lamas¹, Albert Clará Velasco², Roberto Elosua Llanos³

1. Hospital de la Santa Creu i Sant Pau, Barcelona, Spain
2. Parc de Salut Mar, Barcelona, Spain
3. Instituto Hospital del Mar de Investigaciones Médicas (IMIM), Barcelona, Spain

Keywords: Mediterranean Diet, Hip Fracture Risk, Systematic Review, Meta-Analysis, Bone Health, Cardiovascular Disease

Background

Cardiovascular disease is associated with increased risks of reduced bone mass density and fractures, including hip fractures. The Mediterranean diet, recognized for its cardiovascular benefits, has also been linked to improved bone health. However, the impact of adherence to the Mediterranean diet on fracture risk is not fully understood. This study conducts a systematic review and meta-analysis to assess the effect of the Mediterranean diet on hip fracture risk.

Objectives

The primary objective is to evaluate the influence of adherence to the Mediterranean diet on the risk of hip fractures.

Study Design & Methods

A comprehensive literature search was carried out in PubMed, Scopus, and Web of Science up to September 31, 2022. We focused on prospective studies that examined the relationship between adherence to the Mediterranean diet and fracture risk. Inclusion criteria were studies with relative risks (RR), hazard ratios (HR), or odds ratios (OR) with 95% confidence intervals (CI), sample sizes above 1,000, and no duplicated data. Statistical analyses were performed using R Studio Software.

Results

The analysis included 10 studies, comprising 7 cohorts from 12 countries with a total of 503,174 participants (71.7% women, 60.0% from Europe). The average score for adherence to the Mediterranean diet was 4.48 out of 8 over an average follow-up period of 14.6 years, during which 10,103 hip fractures were reported. High adherence to the Mediterranean diet correlated with a significant reduction in hip fracture risk, with relative risks ranging from 0.71 to 0.83. Moderate adherence also showed reduced risks, with relative risks from 0.78 to 0.84. This association was particularly pronounced among men and European populations. A linear dose-response reduction in hip fracture risk was evident, showing up to a 5.25% risk decrease for each increase in adherence point.

Conclusions

Adherence to the Mediterranean diet is significantly protective against hip fractures, displaying a linear

dose-response trend. These findings emphasize the Mediterranean diet's potential as a preventive strategy in reducing the risk of hip fractures, highlighting the importance of dietary patterns in maintaining bone health.