Knee extensor muscle weakness is a risk factor for developing knee osteoarthritis - A systematic review and meta-analysis

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AIM

Previous studies including systematic reviews have reported that knee extensor muscle weakness is a risk factor for developing knee osteoarthritis (OA). However, systematic reviews did not aggregate the reported data into a final estimate in a meta-analysis.

The aim of this study was to estimate the impact of knee extensor muscle weakness on the risk of developing knee OA.

CONCLUSION

Knee extensor weakness increased the risk of developing knee OA with approximately 50%.

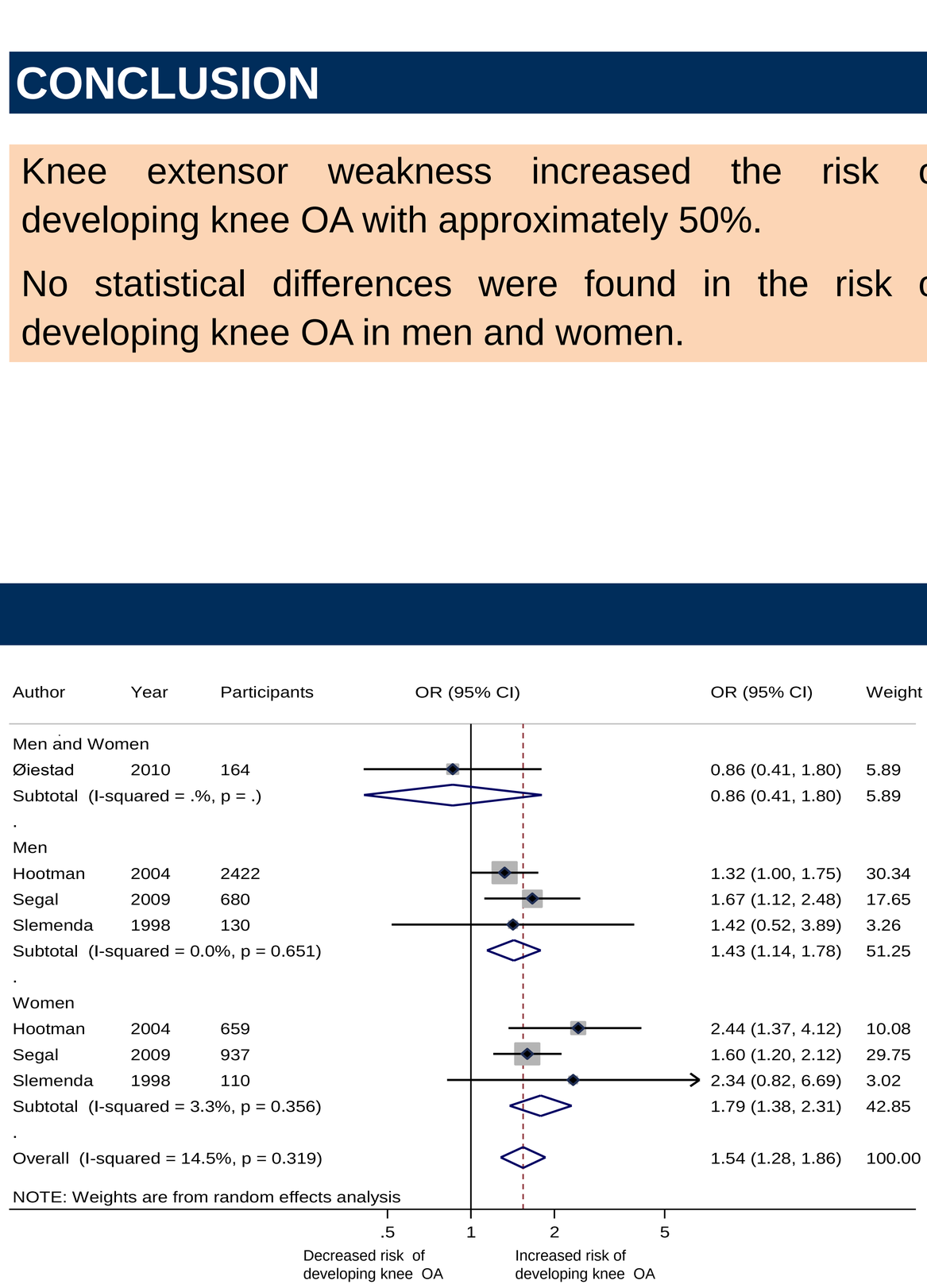
No statistical differences were found in the risk of developing knee OA in men and women.

RESULTS

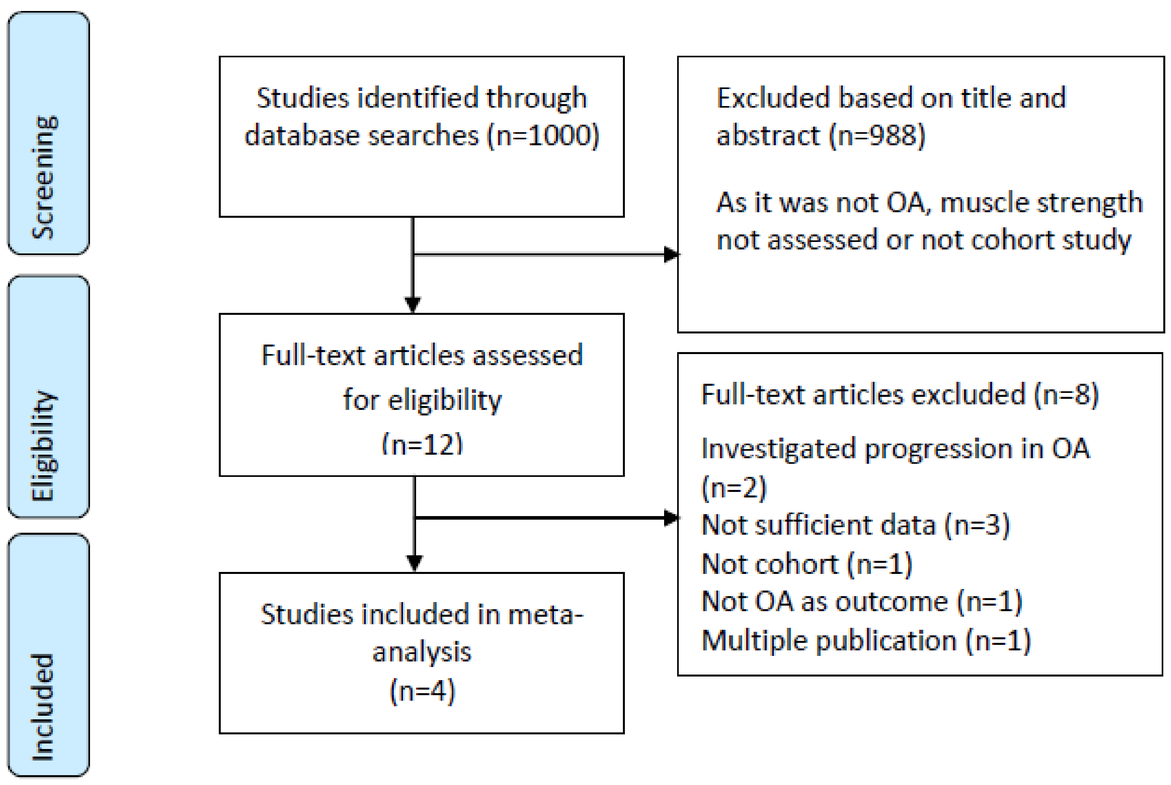
Four cohort studies with a follow-up time between 2.5 and 14 years including 5102 participants (3325 men and 1777 women) were included in the final analysis.

The meta-analysis showed an increased risk of developing knee OA in participants with knee extensor muscle weakness (OR 1.54 95% CI 1.28, 1.88; I^2 = 14.5%).

Three trials reported separate data for men and women and subgroup analysis showed increased risk in both men (OR 1.43 95% CI 1.14, 1.78; I^2 = 0%) and women (OR 1.79 95% CI 1.37, 2.31; I^2 = 3.3%), with no significant differences in risk between men and women (P = 0.200).



METHODS



Flow diagram of study selection

A systematic review and meta-analysis was conducted with literature searches in Medline, SportsDiscus, EMBASE, CINAHL, and AMED. Eligible studies had to include participants with no radiographic or symptomatic knee OA at baseline; a follow-up time of minimum 2 years, and a measure of knee extensor muscle strength.

Hierarchies for extracting data on knee OA and knee extensor muscle strength were defined. A meta-analysis (random effects model) was applied on Odds Ratio (OR) for developing OA in subjects with knee extensor muscle weakness. Symptomatic knee OA was preferred in the main analysis.

Heterogeneity between trials was calculated as the I^2 statistics measuring the proportion of variation (i.e. inconsistency) in the combined estimates due to between-study heterogeneity.

Stratified analyses were performed for men and women. Sensitivity analysis was performed exploring 1) the impact of including radiographic knee OA instead of symptomatic knee OA, and 2) excluding study using self-reported physician-diagnosed hip or knee OA.

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