

**SYNERGISTIC EFFECTS OF HIP AND KNEE OSTEOARTHRITIS AND COMORBIDITIES AMONG
OLDER ADULTS: ANALYSIS OF THE OXFORD PAIN, ACTIVITY AND LIFESTYLE COHORT
STUDY.**

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Purpose

Previous studies in hip and knee osteoarthritis populations have focused on the independent effects of comorbidities on patient-reported outcomes. However, hip and knee osteoarthritis may interact with comorbidities, resulting in an increased impact beyond the effects attributable to each condition alone, known as a synergistic effect. A better understanding of synergistic effects on functional activities such as mobility and self-care is important to personalise management for older adults with hip and/or knee osteoarthritis for maximal benefits.

The purpose of this study was to estimate independent and synergistic effects of hip and/or knee osteoarthritis and comorbidities on mobility and self-care limitations in a population-based cohort of older people in England (UK).

Methods

Data from community-dwelling adults aged 65 years or older who completed the Oxford Pain, Activity and Lifestyle (OPAL) Study baseline questionnaire was analysed. Participants provided demographic information, indicated if they had pain in different body areas and reported current health conditions including arthritis, health related quality of life (EQ-5D) and physical activity levels.

Participants were then classified as having hip and/or knee osteoarthritis if they reported 1) doctor-diagnosis of arthritis, and 2) the presence of hip and/or knee pain. The outcome of interest was mobility and self-care limitations, assessed using the relevant items of the EQ-

5D. Poisson regression models were used to estimate independent and combined effects of hip and/or knee osteoarthritis and comorbidities on mobility and self-care limitations. Models in all stages of the analysis were adjusted for the following covariates entered in order: age, sex, BMI, smoking status, living alone, education level, physical demands of occupation, index of multiple deprivation, number of additional musculoskeletal pain sites reported and physical activity level. We calculated three measures of synergistic effect: the relative excess risk due to interaction (RERI), attributable proportion (AP) of the risk due to interaction and the synergy index (SI).

Results

Of 4,972 participants included in this analysis, 1,532 (30.8%) had hip and/or knee osteoarthritis. Among participants with hip and/or knee osteoarthritis 42.9% reported mobility limitations, and 8.4% reported self-care limitations. Compared to participants without hip and/or knee osteoarthritis those with hip and/or knee osteoarthritis had a higher prevalence of comorbidities, including, angina or heart troubles, anxiety, depressive symptoms, diabetes, hearing limitations, high blood pressure and visual limitations.

Significant synergistic effects were observed between hip and/or knee osteoarthritis and self-reported anxiety or depressive symptoms, impacting self-care limitations. The relative risk of reporting self-care limitations was 3.0 times greater (95% CI: 2.00 – 4.78) among participants who reported both hip/knee osteoarthritis and anxiety. The RERI between the two conditions was 0.93 (95% CI: 0.01 – 1.90), indicating an additional risk of self-care

limitations, beyond that associated with each condition, when both conditions were present. Of the total relative risk, 30% was attributable to this interaction (AP: 0.30 (95% CI: 0.02 – 0.59). The relative risk of reporting self-care limitations was 2.7 times greater (95% CI: 1.75 – 4.00) among participants who reported both hip and/or knee osteoarthritis and depressive symptoms. The RERI between the two conditions was 0.58 (95% CI: 0.03 – 1.48), also indicating additional risk of self-care limitations when both conditions were present, beyond the risk associated with each condition. Of the total relative risk, 22% was attributable to this interaction (AP: 0.22 (95% CI: 0.01 – 0.52). Synergistic effects were not observed between any of the included comorbidities and hip and/or knee osteoarthritis in relation to mobility limitations.

Conclusions

This study demonstrates that synergism between hip and/or knee osteoarthritis and anxiety or depressive symptoms contribute to increased risk of self-care limitations. These findings highlight the importance of personalising management for older adults with hip and/or knee osteoarthritis for maximal benefits.