

Workload linked with an increased risk of knee osteoarthritis

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Researchers from the Universities of Oxford, Sydney and Southampton have shown that increasing levels of workload are associated with an increased risk of incident knee OA; particularly among men.

The largest observational cohort study of its kind into [knee](#) OA and total

knee replacement (TKR) utilized data from three large observational studies of knee OA from the UK and the US: the Chingford 1000 Women Study, the Osteoarthritis Initiative (OAI), and the Multicentre Osteoarthritis Study (MOST).

Professor David Hunter, of the University of Sydney's Florance and Cope Chair of Rheumatology, Institute of Bone and Joint Research in the Kolling Institute, said: "Osteoarthritis is one of the leading causes of premature retirement and identifying occupational factors that could have some activity modification to reduce this risk, is critically important."

Lead author from the University of Oxford, Dr. Thomas Perry, said: "Our primary objective was to better understand the relationship between occupational exposures and knee OA in the broadest sense and, to identify occupations that may carry an increased risk of knee joint deterioration and surgery. This would help focus our efforts in developing work-place protective equipment and, to reduce the OA burden," said Dr. Perry, a postdoctoral researcher at the Nuffield Department of Orthopedics, Rheumatology and Musculoskeletal Sciences.

"Knee OA is a leading cause of work-absence and global disability and, with the amount of time spent at work increasing, there is a real need to identify and prevent risk exposure. In order to best evaluate the effects of occupational knee load on knee OA, we looked at whether job titles (i.e. farming, sales etc) and specific work-place physical activities (i.e. lifting >50lbs) were associated with knee OA."

To examine whether occupational exposures were associated with both structural joint damage and the development of knee symptoms, occupations were mapped against four possible outcomes; i) the incidence of knee OA (as radiographic knee OA (RKOA), ii)

symptomatic RKOA (knee symptoms with RKOA), iii) incident [total knee replacement](#) (TKR)) and iv) progression of knee OA (time to primary TKR). These outcomes were selected based on their importance to both patients and the OA research community.

Men were two times more likely to suffer from knee OA compared to sedentary workers, however no associations were observed among women across any of the data sets.

"While these increased risks were not seen in women, it's not to say they weren't there," said Professor Cyrus Cooper, director of the MRC Lifecourse Epidemiology Unit, University's of Southampton and Oxford "Though it was a surprise to see the difference in sexes, our findings are in agreement with previous studies and we were able to confirm these findings across three global datasets giving confidence to our results. Patterns of physical activity in the work-place are known to vary between sexes even within the same job title, and the reporting of these activities is known to vary between sexes. These factors likely contributed to the observed differences."

There was some evidence to suggest that 'light' workload may be protective towards the need for a TKR. "Unlike most studies which tend to exclusively examine a single occupational exposure at either end of the workload spectrum, i.e. construction workers at the high end of loading or sedentary workers at the low end, our focus was on all workload levels including light and moderate workload levels. We observed that some work-place physical activity behaviors such as 'sedentary with occasional exercise' provided some protection towards the need for a TKR," said Thomas. "Whilst physical activity is widely recommended for OA management to help reduce pain and improve function, this data suggests that there is a potential threshold where the degree of workload transitions from protective to detrimental (or vice-versa). This threshold is likely influenced by the duration, intensity,

frequency and pattern of daily, work-place [physical activities](#)."

OA is a global health burden and with aging populations, combined with growing levels of obesity, it's likely to rise substantially in the next 50 years. Without a known cure, attention has turned towards identifying modifiable risk factors. "Job titles per se are perhaps no longer suitably descriptive to determine which workers are at risk from OA. Our findings highlight that it is the physical activity performed at work that is key to driving this relationship," concluded Thomas.

More information: Thomas A Perry et al. Occupation and Risk of Knee Osteoarthritis and Knee Replacement: a longitudinal, multiple-cohort study, *Seminars in Arthritis and Rheumatism* (2020). [DOI: 10.1016/j.semarthrit.2020.08.003](#)

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