



Health personnel and knee osteoarthritis: April as a reminder of a neglected risk

Zdravstveni radnici i osteoarthritis kolena: april kao podsetnik na zanemareni rizik

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Abstract

Although often viewed as a condition of the general population, clinical observations indicate that a substantial proportion of knee-pain consultations due to osteoarthritis involve healthcare workers, suggesting a potential burden that exceeds expectations for age-matched adults. Existing research reports a high incidence of knee symptoms among healthcare workers, including a 47% prevalence of work-related knee musculoskeletal disorders in perioperative nurses. However, these studies focus on symptoms rather than diagnosed osteoarthritis, leaving the true burden of structural disease in this population understudied. Occupational demands such as prolonged standing, extensive walking, frequent pivoting, kneeling, squatting, and physically intensive patient handling impose ongoing stress that may accelerate joint degeneration. Increasing retirement age further extends years of exposure, increasing the risk of chronic musculoskeletal conditions. Despite this, knee osteoarthritis remains largely absent from occupational health and safety policies. Low-cost workplace interventions, such as structured movement breaks, brief strength exercises, and consistent access to assistive devices, represent promising approaches, even though current evidence remains limited, and further research is needed to confirm their preventive effect. Legislative measures, such as reduced working hours for older employees, may help mitigate cumulative strain. Emerging technologies, including robot-assisted patient handling, show the potential to reduce high-force exposures. Recognizing knee osteoarthritis as a preventable occupational health issue is essential for protecting the mobility, well-being, and professional longevity of the healthcare workforce.

Keywords:

age factors; health personnel; musculoskeletal diseases; occupational exposure; osteoarthritis, knee; risk assessment.

Apstrakt

Iako se često posmatra kao oboljenje opšte populacije, klinička zapažanja ukazuju na to da značajan deo pregleda zbog bola u kolenu usled osteoartritisa obuhvata upravo zaposlene u zdravstvu, što upućuje na moguće opterećenje koje prevazilazi očekivani nivo za odrasle osobe istog životnog doba. U postojećim istraživanjima navodi se visoka učestalost simptoma oboljenja kolena kod zdravstvenih radnika, uključujući prevalenciju od 47% za mišićno-skeletne poremećaje kolena povezanih sa poslom kod perioperativnih medicinskih sestara. Međutim, ova istraživanja se bave simptomima, a ne dijagnostikovanim osteoartritisom, ostavljajući nedovoljno ispitan stvarni teret strukturnog oboljenja u toj populaciji. Radne obaveze koje uključuju dugotrajno stajanje, intenzivno hodanje, često okretanje, klečanje, čučanje i fizički zahtevno zbrinjavanje bolesnika, nameću trajno opterećenje koje može ubrzati degeneraciju zgloba. Povećanje starosne granice za penzionisanje dodatno produžava godine izloženosti, povećavajući rizik od hroničnih mišićno-skeletnih oboljenja. Uprkos tome, osteoarthritis kolena ostaje uglavnom odsutan iz politika zaštite na radu. Intervencije na radnom mestu čiji troškovi nisu veliki, poput strukturiranih pauza za kretanje, kratkih vežbi snage i dosledne upotrebe pomagala, predstavljaju obećavajuće pristupe, iako su trenutni dokazi ograničeni i potrebna su dalja istraživanja radi potvrde njihovog preventivnog efekta. Zakonom regulisane mere, poput skraćenog radnog vremena za starije radnike, mogu dodatno smanjiti kumulativno opterećenje. Nova tehnološka rešenja, uključujući pomoć robota u zbrinjavanju bolesnika, pokazuju potencijal za smanjenje izloženosti velikim silama. Prepoznavanje osteoartritisa kolena kao problema profesionalnog rizika koji se može sprečiti, ključno je za očuvanje pokretljivosti, dobrobiti i dugoročne radne sposobnosti zdravstvenog kadra.

Ključne reči:

životno doba, faktor; zdravstveno osoblje; mišićno-skeletne bolesti; profesionalna izloženost; osteoarthritis, koleno; rizik, procena.

Introduction

Knee osteoarthritis (OA) – KOA is rarely acknowledged as an occupational hazard, yet clinical practice shows that healthcare workers (HCWs) experience knee problems at rates that exceed expectations for their age and activity level¹⁻⁵. A significant proportion of consultations for KOA involve hospital employees, revealing a burden that remains largely invisible in discussions about workforce wellbeing. Against this backdrop, April 7 – traditionally observed as World Health Day⁶ – offers a timely opportunity to draw attention to overlooked occupational risks and to reconsider how health systems protect the musculoskeletal health of those who care for others.

The burden of knee osteoarthritis in medical personnel

KOA is often described as a condition of the general population⁷, typically attributed to aging, obesity, or recreational overuse⁸⁻¹⁰. Yet, our clinical experience suggests a different pattern: among thousands of HCWs, knee pain is a frequent complaint, and the fact that so many affected individuals are themselves medical personnel indicates that occupational exposures may play a more substantial role than commonly assumed. The most common cause of chronic knee pain in people in their 50s is OA¹¹, and individuals with early KOA often report broader and more diffuse pain areas than those with normal knees or progressive disease¹². Radiographic OA and its individual features are strongly associated with knee pain, reinforcing the clinical relevance of structural changes¹³. Despite these observations, current research does not yet clarify the true prevalence of KOA across healthcare settings.

Existing studies on musculoskeletal disorders in HCWs consistently report high rates of knee symptoms²⁻⁵. Hospital nurses experience knee complaints in nearly one quarter of cases¹⁴, and nursing-home staff reports persistent knee pain even after the introduction of safe resident-handling programs intended to reduce physical strain¹⁵. A systematic review and meta-analysis of perioperative nurses found a 47% prevalence of work-related knee musculoskeletal disorders, underscoring the substantial biomechanical demands in surgical environments¹⁶. However, these investigations primarily address pain and symptoms rather than diagnosed OA, leaving the true burden of structural joint disease in healthcare personnel largely unexamined. Given the high physical demands and cumulative joint loading characteristic of healthcare work, this knowledge gap represents a significant and timely concern.

Occupational risk factors in health workers

Occupational physical activity is a modifiable risk factor for both radiographic and symptomatic KOA^{17, 18}. The physical demands of healthcare work create a unique and potent combination of exposures that accelerate knee joint degeneration. Long periods of standing during rounds, proce-

dures, and patient care increase compressive forces across the joint, while extensive walking on hard flooring adds repetitive impact. Frequent pivoting and directional changes introduce rotational stress, and tasks such as kneeling, squatting, and working in low positions are routine in nursing, physiotherapy, emergency care, and operating rooms. Performed repeatedly over the years, these activities contribute to cumulative joint loading that accelerates cartilage wear and increases the likelihood of OA¹⁹.

Patient handling remains one of the most physically demanding aspects of healthcare work. Lifting, repositioning, and transferring patients often occur under time pressure, with limited staffing or inconsistent access to assistive devices. Even when equipment is available, workflow constraints may discourage its use. These conditions increase the likelihood of suboptimal mechanics, uneven load distribution, and sudden high-force movements that strain the knee joint. Over time, repeated exposures create a biomechanical environment conducive to joint degeneration.

At the opposite end of the occupational spectrum, administrative and diagnostic roles present a different but equally relevant risk pattern. Prolonged sitting²⁰, low step counts, and minimal movement variability – conditions also associated with OA risk²¹ – reduce joint nutrition, promote muscle deconditioning, and impair neuromuscular control. Whether overloaded or under-moved, the knee joint pays the price.

Movement behavior in HCWs is paradoxical. Shifts demand high levels of occupational activity, yet off-hours are often marked by profound sedentary behavior driven by fatigue. This imbalance – intense loading without restorative movement – exacerbates symptoms and undermines long-term joint health^{22, 23}.

Retirement age and cumulative exposure: a structural challenge

The increasing retirement age further intensifies the long-term physical demands placed on HCWs. According to the Law on Pension and Disability Insurance of the Republic of Serbia²⁴, retirement conditions have changed substantially over the past decade. In 2015, women could retire at age 55 with 36 years and 4 months of insurance service, while men qualified at 55 with 40 years of service. These thresholds have progressively increased. In 2026, the full retirement age reaches 64 years for women and 65 for men, with a minimum of 15 years of insurance service. Alternatively, retirement is possible after completing 45 years of insurance service, regardless of age, while early retirement requires at least 40 years of service and a minimum age of 60.

For HCWs, these changes translate into additional years of cumulative exposure to physically demanding tasks. Prolonged exposure to standing, walking, lifting, kneeling, and performing repetitive patient-handling activities over such extended working lives substantially increases the risk of chronic musculoskeletal conditions²⁵, including KOA. The mismatch between the increasing retirement age and unchanged physical workload creates a structural vulnerability:

workers are expected to remain fully functional in roles that impose continuous biomechanical stress well into their 60s²⁶.

Epidemiological evidence shows that women bear a higher burden of KOA, with incidence peaking in their 50s and disability burden reaching its highest levels in later decades²⁷. Under Serbia's current retirement policy, women remain in physically demanding roles precisely during years of the greatest KOA vulnerability, amplifying their occupational health risk.

This legal context underscores the urgency of recognizing KOA as an occupational health issue. As working life extends, cumulative joint load increases, making prevention, early detection, and workplace adaptation essential for sustaining the healthcare workforce.

Why this issue demands attention now

The consequences of KOA extend far beyond individual discomfort. Pain, reduced mobility, and functional limitations directly impair work ability, productivity, and career longevity. In already strained health systems, where staffing shortages and burnout are widespread, musculoskeletal conditions contribute to absenteeism, presenteeism²⁸, and premature exit from the workforce. These outcomes disrupt patient flow, increase the workload for remaining staff, and compromise continuity of care. Protecting the musculoskeletal health of HCWs is therefore not only a clinical priority but a strategic requirement for maintaining a resilient and sustainable workforce.

Despite the magnitude of the problem, KOA remains largely absent from occupational health policies and institutional well-being programs. Many hospitals prioritize back injuries, needlestick prevention, or psychosocial stress, while joint health receives comparatively little attention. This gap reflects a broader tendency to view OA as an inevitable consequence of aging rather than a preventable occupational condition. Yet, available evidence demonstrates that workplace factors substantially shape risk and that targeted interventions can meaningfully reduce joint strain^{29,30}.

Strategies to reduce knee joint load and preserve work ability

Low-cost, workplace-based strategies have positive effects on improving employee health status³¹ and offer practical opportunities for prevention and symptom management. Ergonomic improvements can reduce mechanical stressors³², while structured movement breaks integrated into shifts can counteract prolonged standing and reduce cumulative load³³. Brief strength³⁴ or mobility sessions – even as short as five minutes – can improve neuromuscular control, enhance joint stability, and reduce pain. Still, the broader evidence base for workplace-based prevention and management of knee pain remains insufficient, leaving institutions without clear guidance for effective preventive practice or policy design³⁵. Supportive footwear can decrease impact forces during walking, while consistent access to assistive devices for patient handling can reduce high-force exposures³⁶. These interventions

require minimal resources and can be implemented within existing workflows, making them particularly relevant for health systems operating under budgetary constraints.

Although robotics is not a low-cost solution, findings by Brinkmann et al.³⁷ demonstrate the feasibility of collaborative robot-assisted patient handling and highlight the need for future individualized intervention programs aimed at reducing physical burden in care.

Early screening for knee symptoms and functional limitations can help identify workers at risk before structural damage progresses. Simple assessments of strength, balance, and movement patterns can guide individualized recommendations and prevent further deterioration. Educational initiatives that promote joint-friendly movement strategies, ergonomic awareness, and recovery practices can empower HCWs to protect their own musculoskeletal health. Importantly, these efforts should not place responsibility solely on individuals; institutional policies must support and reinforce healthy practices.

Research consistently shows that reduced working hours can help preserve work ability across a range of occupations^{38–40}. A qualitative study by Gyllensten et al.³⁸ found that nurses working shorter shifts reported less fatigue, greater energy, and improved patient interaction. These findings are supported by a randomized controlled trial by Schiller et al.³⁹ which demonstrated that work-time reduction enhances recovery and sleep quality without increasing total workload. A systematic review by Voglino et al.⁴⁰ further confirms that shorter working hours improve health outcomes and reduce sickness absence across diverse occupational groups. These scientific insights align with recent policy developments in Slovenia, where the 2026 “80–90–100” model enables workers aged 58+ or with at least 35 years of service to reduce working hours while maintaining full pension contributions⁴¹. This combination of scientific evidence and implemented policy demonstrates that structured work-time reduction is a viable strategy to preserve the functional capacity of older workers, particularly in physically demanding sectors such as healthcare.

A call for recognition and action

World Health Day, observed on April 7, provides a timely public health context for advancing this discussion. While global health observances often highlight broad themes such as universal health coverage or chronic disease prevention, they also remind us to reflect on the well-being of the healthcare workforce itself. KOA may not be a headline topic, but it is a daily reality for many health professionals. Recognizing it as a legitimate occupational risk is a necessary step toward addressing the physical demands of healthcare work and ensuring that those who provide care can continue to do so safely and sustainably.

The path forward requires a shift in perspective. KOA should not be viewed as an unavoidable consequence of aging or personal lifestyle choices. In many cases, it is a preventable and modifiable occupational health issue. By acknowledging the role of workplace exposures, implementing practical interventions, and integrating evidence-based strategies such as reduced working hours for older workers, healthcare systems

can meaningfully reduce joint strain and support the long-term well-being of their workforce.

Conclusion

Healthcare workers dedicate their careers to improving the health of others. Ensuring that their own joint health is

protected is both an ethical responsibility and a strategic investment in the future of healthcare. Every occasion should serve as a reminder that this issue can no longer be overlooked. Recognizing and addressing knee osteoarthritis as a neglected occupational risk is essential for safeguarding the mobility, well-being, and professional longevity of those who sustain the health of our communities.

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