Studies of high or moderate quality used for results and conclusions in the present report

| First author Pub. Year Reference Country | Design Time to follow-up Setting Performed (yrs) | Participants Women/men | Exposure | Outcome | Association between occupational factor and osteoarthritis; least adjusted model | Association between occupational factor and osteoarthritis; most adjusted model |
|---|---|---------------------------|------------------|--------------------------------|--|---|
| Allen et al | Cohort with | Participants | Several factors | Knee and hip | Associations of occupational tasks with | - |
| 2010 | exposure data | were individuals | Physical factors | osteoarthritis | radiographic and symptomatic osteoarthritis. | |
| [1] | collected | enrolled in a | were assessed | | OR (95% CI) adjusted for age, gender, race, | |
| USA | retrospectively | community- | by questions | Radiographic | body mass index, smoking, prior knee injury | |
| | | based study of | developed by | All radiographs | and household tasks | |
| | Description of | the occurrence | the authors | were read for | | |
| | exposure at jobs | of knee and hip | | Kellgren- | Клее | |
| | held 1-year or | osteoarthritis in | | Lawrence grade | Radiographic | |
| | longer | a rural region of | | by a single bone | Task performed at longest job | |
| | | the state of | | and joint | Walk: 1.01 (0.80; 1.27) | |
| | General working | North Carolina, | | radiologist | Lift>10 lbs: 1.06 (0.86; 1.31) | |
| | population | USA. The study | | without regard | Sit: 0.86 (0.70; 1.05) | |
| | | involved | | of the | Stand: 1.00 (0.81; 1.23) | |
| | 1999–2004 | civilian, non- | | participant's | Bend, twist, reach: 0.91 (0.74; 1.12) | |
| | | institutionalized | | clinical status or | Squat: 1.13 (0.88; 1.45) | |
| | | adults age 45 | | occupational | Climb stairs: 0.80 (0.63; 1.03) | |
| | | years and older | | activates. | Crawl: 1.15 (0.78; 1.71) | |
| | | (mean age 70 | | Radiographic | Crouch or kneel: 0.81 (0.59; 1.11) | |
| | | years) | | knee and hip osteoarthritis | Heavy work, standing: 1.11 (0.81; 1.51) | |
| | | n=2 729 | | were defined as | Lifetime exposure | |
| | | - | | a Kellgren- | Light work while standing: 0.97 (0.78; 1.21) | |
| | | 1 796 women | | Lawrence grade | Heavy work while standing: 1.13 (0.88; 1.44) | |
| | | and 933 men | | of at least two | Sitting: 0.86 (0.71; 1.05) | |
| | | | | in at least one | Kneeling: 0.98 (0.73; 1.33) | |
| | | | | knee or hip, | Walking: 1.00 (0.82; 1.23) | |
| | | | | respectively | Lifting 10 kg ≥10 ×/week: 1.18 (0.95; 1.46) | |
| | | | | . , | Lifting 20 kg ≥10 ×/week: 0.94 (0.73; 1.22) | |
| | | | | Symptomatic | Lifting 50 kg ≥10 ×/week: 0.82 (0.58; 1.15) | |
| | | | | Symptomatic | | |
| | | | | knee and hip | Symptomatic | |
| | | | | osteoarthritis is | Task performed at longest job | |
| | | | | defined as the | Walk: 1.46 (1.12; 1.90) | |
| | | | | presence of | Lift>10 lbs: 1.42 (1.13; 1.80) | |
| | | | | both | Sit: 0.72 (0.57; 0.90) | |
| | | | | radiographic | Stand: 1.38 (1.08; 1.77) | |
| | | | | osteoarthritis | Bend, twist, reach: 1.26 (0.99; 1.60) | |

| | [] | and aumatance | $S_{aux} = 1.27 (0.07, 1.09)$ | |
|---|----|------------------|--|--|
| | | and symptoms | Squat: 1.27 (0.97; 1.68) | |
| | | in the same | Climb stairs: 0.96 (0.73; 1.26) | |
| | | joint. To assess | Crawl: 1.59 (1.05; 2.41) | |
| | | joint symptoms, | Crouch or kneel: 0.95 (0.67; 1.36) | |
| | | participants | Heavy work, standing: 1.44 (1.03; 2.02) | |
| | | were asked | | |
| | | questions, | Lifetime exposure | |
| | | which are | Light work while standing: 1.06 (0.83; 1.35) | |
| | | stated in the | Heavy work while standing: 1.32 (1.02; 1.72) | |
| | | article. Note | Sitting: 0.73 (0.59; 0.92) | |
| | | that | Kneeling: 1.03 (0.74; 1.44) | |
| | | symptomatic | Walking: 1.24 (0.99; 1.55) | |
| | | OA also include | Lifting 10 kg ≥10 ×/week: 1.13 (0.89; 1.44) | |
| | | radiographic | Lifting 20 kg ≥10 ×/week: 1.05 (0.79; 1.39) | |
| | | defined OA | Lifting 50 kg ≥10 ×/week: 0.98 (0.67; 1.43) | |
| | | | | |
| | | | Нір | |
| | | | Radiographic | |
| | | | Task performed at longest job | |
| | | | Walk: 1.15 (0.92; 1.43) | |
| | | | Lift>10 lbs: 1.20 (0.98; 1.46) | |
| | | | Sit: 0.94 (0.77; 1.14) | |
| | | | Stand: 1.15 (0.94; 1.42) | |
| | | | Bend, twist, reach: 1.21 (0.98; 1.48) | |
| | | | Squat: 1.03 (0.81; 1.30) | |
| | | | Climb stairs: 1.01 (0.80; 1.28) | |
| | | | Crawl: 1.35 (0.93; 2.00) | |
| | | | Crouch or kneel: 1.15 (0.84; 1.56) | |
| | | | Heavy work, standing: 1.20 (0.88; 1.63) | |
| | | | | |
| | | | Lifetime exposure | |
| | | | Light work while standing: 1.05 (0.85; 1.29) | |
| | | | Heavy work while standing: 1.04 (0.82; 1.32) | |
| | | | Sitting: 0.96 (0.79; 1.16) | |
| | | | Kneeling: 0.84 (0.62; 1.14) | |
| | | | Walking: 1.15 (0.95; 1.40) | |
| | | | Lifting 10 kg ≥10 ×/week: 1.10 (0.90; 1.36) | |
| | | | Lifting 20 kg \geq 10 ×/week: 1.03 (0.80; 1.32) | |
| | | | Lifting 50 kg $\ge 10 \times$ /week: 1.02 (0.73; 1.43) | |
| | | | | |
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| | | | | | Symptomatic | |
|------------|------------------|--------------------|------------------|------------------|--|---|
| | | | | | Task performed at longest job | |
| | | | | | Walk: 1.38 (1.00; 1.91) | |
| | | | | | Lift>10 lbs: 1.67 (1.26; 2.23) | |
| | | | | | Sit: 0.81 (0.61; 1.07) | |
| | | | | | Stand: 1.30 (0.97; 1.75) | |
| | | | | | Bend, twist, reach: 1.60 (1.18; 2.17) | |
| | | | | | Squat: 1.11 (0.79; 1.57) | |
| | | | | | Climb stairs: 1.17 (0.84; 1.62) | |
| | | | | | Crawl: 2.28 (1.43; 3.65) | |
| | | | | | Crouch or kneel: 1.45 (0.95; 2.21) | |
| | | | | | Heavy work, standing: 1.75 (1.17; 2.61) | |
| | | | | | Lifetime exposure | |
| | | | | | Light work standing: 0.74 (0.54; 1.01) | |
| | | | | | Heavy work while standing: 1.39 (1.01; 1.91) | |
| | | | | | Sitting: 0.80 (0.61; 1.04) | |
| | | | | | Kneeling: 1.15 (0.76; 1.73) | |
| | | | | | Walking: 1.19 (0.90; 1.56) | |
| | | | | | Lifting 10 kg ≥10 ×/week: 1.71 (1.28; 2.29) | |
| | | | | | Lifting 20 kg \geq 10 ×/week: 1.63 (1.15; 2.30) | |
| | | | | | Lifting 50 kg \geq 10 ×/week): 1.88 (1.20; 2.92) | |
| Amin et al | Cohort with | Participants | Manual | Knee | Risk for worse cartilage morphology scores at | Risk for worse cartilage morphology |
| 2008 | exposure data | were men with | handling and | osteoarthritis | the medial and lateral tibiofemoral joint and | scores at the medial and lateral |
| [2] | collected | symptomatic | posture | Cartilage | the patellofemoral joint in men with knee | tibiofemoral joint and the |
| USA | retrospectively | knee | Physical factors | morphology | osteoarthritis by occupational exposure. Crude | patellofemoral joint in men with knee |
| - | | osteoarthritis | were assessed | scoring at the | OR (95% CI) | osteoarthritis by occupational |
| | Description of | from the Boston | by questions | tibiofermoral | . , | exposure. OR (95% CI) adjusted for age, |
| | exposure of past | Osteoarthritis | developed by | and patella- | Medial tibiofemoral joint | body mass index and history or surgery |
| | employment | of the Knee | the authors. | fermoral joint | Heavy lifting: 1.2 (0.6; 2.3) | to the imaged knee |
| | activity | Study. Mean | Questions are | was assessed | Squatting, kneeling, heavy lifting: 1.2 (0.7; 2.2) | 5 |
| | , | , age: 69 years | stated in the | using the Whole | | Medial tibiofemoral joint |
| | Patients with | old | article | Organ MRI | Lateral tibiofemoral joint | Heavy lifting: 1.4 (0.7; 2.6) |
| | arthritis | | | Score, semi- | Heavy lifting: 1.2 (0.5; 2.8) | Squatting, kneeling, heavy lifting: 1.6 |
| | | n=192 | Heavy lifting | quantitative | Squatting, kneeling, heavy lifting: 0.8 (0.4; 1.7) | (0.9; 3.0) |
| | Time when study | | was defined as | method for | | |
| | was performed | All participants | lifting and | knee osteo- | Patellofemoral joint | Lateral tibiofemoral joint |
| | not stated | were men | moving objects | arthritis | Heavy lifting: 1.5 (0.8; 2.6) | Heavy lifting: 1.2 (0.5; 2.7) |
| | | | weighing 25 lbs | (Peterfy et al., | Squatting, kneeling, heavy lifting: 1.6 (1.0; 2.7) | Squatting, kneeling, heavy lifting: 0.8 |
| | | | (11.36 kg) or | 2004) | | (0.4; 1.8) |
| | | | | | | |

| Apold et al 2014 [3] Norway | Prospective cohort 12 years General population 1985–1994 1994–2006 | Participants were living in 19 counties of Norway. They were listed in the arthroplasty registry. The mean age was 43 years n=315 495 161 700 women and 153 795 men Participants | more every day at work Squatting and kneeling was registered if it was performed for 30 min or more nearly every day at work Data was collected for the job or the occupation the participants did for the longest time Work load The questions used to evaluate physical activity were first introduced in Sweden (Saltin et al., 1968), and similar questions have been used by the World Health Organization | The three trained readers who scored all magnetic resonance imaging (MRI) data were blinded to occupational status of subjects | Multivariate adjusted relative risk of knee replacement due to primary osteoarthritis. RR (95% Cl) adjusted for age at screening, height, smoking, habits, body mass index and physical activity at work and at leisure time Women Physical activity at work Sedentary: 1 Moderate: 1.18 (1.00; 1.40) Intermediate: 1.30 (1.05; 1.61) Intensive: 2.29 (1.65; 3.18) Men Physical activity at work Sedentary: 1 Moderate: 1.51 (1.18; 1.95) Intermediate: 1.64 (1.24; 2.17) Intensive: 2.41 (1.83; 3.18) Association of knee osteoarthritis with | Patellofemoral joint Heavy lifting: 1.5 (0.8; 2.7) Squatting, kneeling, heavy lifting: 1.8 (1.1; 3.2) |
|--------------------------------------|--|---|---|--|---|--|
| Coggon et al 2000 | Case-control study | Participants were persons | Several factors Data were | Knee osteoarthritis | Association of knee osteoarthritis with duration of exposure to selected occupational | - |
| [4] | General population | living in three English health | collected by interviews, | The clinical records and | activities. OR (95% CI) adjusted for body mass | |

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|------------|-----------------|-------------------|------------------|--------------------------|--|--|
| United | | districts placed | using a | radiographs of | index, Heberden's nodes, and previous knee | |
| Kingdom | Time when study | on a waiting list | structured | each patient | injury | |
| | was performed | for knee surgery | questionnaire | were reviewed. | | |
| | not stated | because of | | The | Both sexes | |
| | | osteoarthritis | For each job | radiographic | Lifting ≥25 kg ≥10 times/week | |
| | | during a 2-year | information was | severity of | <1.0 year: 1.00 | |
| | | period. They | collected about | osteoarthritis in | 1.0–9.9 years: 1.7 (1.0; 2.9) | |
| | | were identified | the weekly | the tibiofemoral | 10.0–19.9 years: 1.4 (0.7; 2.8) | |
| | | by orthopedic | frequency of | compartment of | ≥20.0 years: 1.9 (1.1; 3.5) | |
| | | surgeons and | different levels | the knee listed | | |
| | | their staffs | of lifting. Data | for surgery was | Kneeling or squatting>1 hour/day | |
| | | | was also | graded | <1.0 year: 1.00 | |
| | | Patients who | collected on | according to the | 1.0–9.9 years: 2.6 (1.6; 4.2) | |
| | | had injured | whether an | Kellgren- | 10.0–19.9 years: 1.1 (0.6; 2.1) | |
| | | their knee | average | Lawrence grade | ≥20.0 years: 1.7 (0.9; 3.4) | |
| | | within the | working day | | | |
| | | previous year or | involved any of | | Getting up from kneeling or | |
| | | fulfilled | 8 specified | | squatting>30 times/day | |
| | | diagnostic | occupational | | <1.0 year: 1.00 | |
| | | criteria for | activities | | 1.0–9.9 years: 1.8 (1.1; 3.0) | |
| | | rheumatoid | including | | 10.0–19.9 years: 1.2 (0.6; 2.3) | |
| | | arthritis or | kneeling and | | ≥20.0 years: 2.3 (1.2; 4.6) | |
| | | ankylosing | squatting | | | |
| | | spondylitis were | | | Walking>2 miles/day | |
| | | excluded | | | <1.0 year:1.00 | |
| | | | | | 1.0–9.9 years: 1.9 (1.2; 2.9) | |
| | | For each case a | | | 10.0–19.9 years: 1.9 (1.2; 3.1) | |
| | | control of the | | | ≥20.0 years: 2.0 (1.3; 3.0) | |
| | | same sex and | | | | |
| | | date of birth | | | Climbing ladder or stairs>30 times/day | |
| | | who was | | | <1.0 year: 1.00 | |
| | | registered with | | | 1.0–9.9 years: 1.2 (0.7; 2.2) | |
| | | the same | | | 10.0–19.9 years: 1.7 (0.8; 3.8) | |
| | | general | | | ≥20.0 years: 1.8 (1.0; 3.2) | |
| | | practitioner was | | | | |
| | | chosen. | | | Combination of exposures (defined above) | |
| | | Controls had | | | No kneeling/squatting or heavy lifting: 1.00 | |
| | | not undergone | | | Kneeling/squatting but no heavy lifting: | |
| | | previous knee | | | 1.7 (1.1; 2.7) | |
| | | surgery for | | | Heavy lifting but no kneeling/squatting: | |
| | | osteoarthritis | | | 1.5 (0.9; 2.4) | |

| | Both kneeling/squatting and heavy lifting: |
|----------------|--|
| n=1 036 | 3.0 (1.7; 5.4) |
| | |
| 518 cases (313 | Women |
| women and 205 | Lifting ≥25 kg ≥10 times/week |
| men) and 518 | <1.0 year: 1.00 |
| controls (313 | 1.0–9.9 years: 2.4 (1.1; 5.0) |
| women and 205 | 10.0–19.9 years: 0.7 (0.3; 1.8) |
| | |
| men) | ≥20.0 years: 3.1 (0.8; 12.4) |
| 626 women and | Standing or walking>2 hours/day |
| 410 men | <1.0 year: 1.00 |
| | 1.0–9.9 years: 0.9 (0.4; 1.9) |
| | 10.0–19.9 years: 1.7 (0.8; 3.7) |
| | ≥20.0 years: 1.7 (0.9; 3.6) |
| | |
| | Kneeling or squatting>1 hour/day |
| | <1.0 year: 1.00 |
| | 1.0–9.9 years: 2.8 (1.4; 5.5) |
| | 10.0–19.9 years: 0.8 (0.3; 2.0) |
| | ≥20.0 years: 3.2 (0.8; 13.0) |
| | 220.0 years. 5.2 (0.8, 15.0) |
| | Getting up from kneeling or |
| | squatting>30 times/day |
| | <1.0 year: 1.00 |
| | |
| | 1.0–9.9 years: 2.00 (1.0; 3.9) |
| | 10.0–19.9 years: 0.9 (0.3; 2.6) |
| | ≥20.0 years: 3.9 (0.8; 18.8) |
| | Walking>2 miles/day |
| | <1.0 year:1.00 |
| | 1.0–9.9 years: 2.3 (1.3; 3.9) |
| | 1.0–9.9 years: 1.7 (0.9; 3.0) |
| | |
| | ≥20.0 years: 2.2 (1.3; 4.0) |
| | Climbing ladder stairs>30 times/day |
| | <1.0 year: 1.00 |
| | 1.0–9.9 years: 0.7 (0.3; 1.7) |
| | 10.0–19.9 years: 0.7 (0.1; 3.9) |
| | ≥20.0 years: 1.0 (0.2; 6.1) |
| | 20.0 years. 1.0 (0.2, 0.1) |
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| | | | | Combination of exposures (defined above) | |
| | | | | No kneeling/squatting or heavy lifting: 1.00 | |
| | | | | Kneeling/squatting but no heavy lifting: | |
| | | | | 1.6 (0.9; 3.0) | |
| | | | | Heavy lifting but no kneeling/squatting: | |
| | | | | 1.2 (0.6; 2.3) | |
| | | | | Both kneeling/squatting and heavy lifting: | |
| | | | | 4.2 (1.5; 12.1) | |
| | | | | | |
| | | | | Men | |
| | | | | Lifting ≥25 kg ≥10 times/week | |
| | | | | <1.0 year: 1.00 | |
| | | | | 1.0–9.9 years: 1.2 (0.6; 2.7) | |
| | | | | 10.0–19.9 years: 2.6 (0.9; 7.5) | |
| | | | | ≥20.0 years: 1.8 (0.9; 3.7) | |
| | | | | , , , , , | |
| | | | | Standing or walking>2 hours/day | |
| | | | | <1.0 year: 1.00 | |
| | | | | 1.0–9.9 years: 3.8 (0.2; 83.6) | |
| | | | | 10.0–19.9 years: 5.7 (0.3; 107.3) | |
| | | | | ≥20.0 years: 4.1 (0.3; 65.6) | |
| | | | | | |
| | | | | Kneeling or squatting>1 hour/day | |
| | | | | <1.0 year: 1.00 | |
| | | | | 1.0–9.9 years: 3.0 (1.4; 6.1) | |
| | | | | 10.0–19.9 years: 1.3 (0.5; 3.2) | |
| | | | | ≥20.0 years: 1.7 (0.7; 4.0) | |
| | | | | , , , , , | |
| | | | | Getting up from kneeling or squatting>30 | |
| | | | | times/day | |
| | | | | <1.0 year: 1.00 | |
| | | | | 1.0–9.9 years: 2.1 (1.0; 4.3) | |
| | | | | 10.0–19.9 years: 1.3 (0.6; 3.2) | |
| | | | | ≥20.0 years: 2.3 (1.0; 5.3) | |
| | | | | , , , -, | |
| | | | | Walking>2 miles/day | |
| | | | | <1.0 year:1.00 | |
| | | | | 1.0–9.9 years: 1.4 (0.6; 3.3) | |
| | | | | 10.0–19.9 years: 2.9 (1.1; 7.7) | |
| | | | | ≥20.0 years 1.7 (0.8; 3.8) | |
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| | | | | | Climbing a ladder or flight of stairs | |
| | | | | | >30 times/day | |
| | | | | | <1.0 year: 1.00 | |
| | | | | | 1.0–9.9 years: 2.1 (0.9; 5.0) | |
| | | | | | 10.0–19.9 years: 2.5 (1.0; 6.4) | |
| | | | | | ≥20.0 years: 2.2 (1.1; 4.5) | |
| | | | | | Combination of exposures (defined above) | |
| | | | | | No kneeling/squatting or heavy lifting: 1.00 | |
| | | | | | Kneeling/squatting but no heavy lifting: 2.0 | |
| | | | | | (0.9; 4.4) | |
| | | | | | Heavy lifting but no kneeling/squatting: 1.6 | |
| | | | | | (0.8; 3.5) | |
| | | | | | Both kneeling/squatting and heavy lifting: 2.9 | |
| | | | | | (1.3; 6.6) | |
| Coggon et al | Case-control study | Participants | Several factors | Нір | Association of hip osteoarthritis with | - |
| 1998 | - | were patients | Information | osteoarthritis | occupational exposure. OR (95% CI) adjusted | |
| [5] | General | listed for hip | about | The cases | for body mass index, the presence of | |
| United | population | replacement | suspected risk | comprises | Heberden's nodes and history of hip injury | |
| Kingdom | | because of | factors was | patients who | | |
| | 1993–1995 | osteoarthritis | obtained by a | were placed on | Both sexes | |
| | | over an 18– | questionnaire | the waiting list | Lifting-Duration (≥10 kg) | |
| | | month period | developed by | for total hip | Up to age 30 years (ref: 0 years) | |
| | | (cases) and an | the authors | replacement for | 0.1–4.9: 0.8 (0.5; 1.3) | |
| | | equal number | | osteoarthritis | 5.0–9.9: 1.0 (0.6; 1.7) | |
| | | of controls | | over an 18- | ≥10.0: 1.9 (1.2; 3.0) | |
| | | selected from | | month period | | |
| | | the general | | and who did not | Up to 10 years before entry | |
| | | population | | have a history | into study (ref: 0 years) | |
| | | | | of lower limb | 0.1–9.9: 0.9 (0.6; 1.4) | |
| | | Cases did not | | fracture in the | 10.0–19.9: 1.2 (0.7; 2.2) | |
| | | have a history | | past year, | ≥20.0: 1.5 (1.0; 2.3) | |
| | | of lower limb | | rheumatoid | | |
| | | fracture in the | | arthritis, | Lifting-Prolonged (max level of lifting (kg) for | |
| | | past year, | | ankylosing | at least 10 years) | |
| | | rheumatoid | | spondylitis, or | Up to age 30 years (ref: <10 years) | |
| | | arthritis, | | other | 10–24: 1.2 (0.8; 1.9) | |
| | | ankylosing | | documented | 25–49: 1.9 (1.1; 3.4) | |
| | | spondylitis, or | | causes of | ≥50: 2.1 (1.1; 3.9) | |
| | | other | | secondary | · · · · · · | |
| | | documented | | osteoarthritis | Up to 10 years before entry | |
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| causes of | into study (ref: <10 years) |
| secondary | 10–24: 1.0 (0.7; 1.4) |
| osteoarthritis | 25–49: 1.1 (0.7; 1.8) |
| | ≥50: 1.8 (1.1; 2.9) |
| Controls were | |
| individually | Other exposures |
| matched to | Sitting-Duration of exposure (ref: 0 years) |
| cases (patients) | Up to 10 years: 1.0 (0.7; 1.4) |
| | |
| for age, sex, and | 10-20: 1.2 (0.9; 1.8) |
| general | >20: 0.9 (0.6; 1.2) |
| practice. | |
| Controls who | Standing-Duration of exposure (ref: 0 years) |
| had undergone | Up to 10 years: 1.0 (0.6; 1.7) |
| previous hip | 10–20: 1.0 (0.6; 1.7) |
| surgery for | >20: 1.2 (0.7; 1.9) |
| osteoarthritis | |
| were excluded, | Kneeling-Duration of exposure (ref: 0 years) |
| as were those | Up to 10 years: 0.9 (0.6; 1.2) |
| who declined to | 10–20: 1.0 (0.6; 1.7) |
| participate in | >20: 1.1 (0.7; 1.7) |
| the study | |
| the study | Squatting-Duration of exposure (ref: 0 years) |
| The mean age | |
| - | Up to 10 years: 1.0 (0.7; 1.5) |
| was 70 years | 10–20: 1.5 (0.8; 2.7) |
| old | >20: 0.9 (0.6; 1.4) |
| n=1 222 | Driving-Duration of exposure (ref: 0 years) |
| | Up to 10 years: 1.8 (1.0; 3.1) |
| 611 cases (401 | 10–20: 0.7 (0.3; 1.5) |
| women and 210 | >20: 1.0 (0.5; 1.9) |
| men) and 611 | |
| controls (401 | Walking-Duration of exposure (ref: 0 years) |
| women and 210 | Up to 10 years: 1.3 (0.9; 1.9) |
| men) | 10–20: 1.4 (0.9; 2.0) |
| | >20: 1.3 (0.9; 1.8) |
| 802 women and | |
| 420 men | Climbing-Duration of exposure (ref: 0 years) |
| | |
| | Up to 10 years: 1.3 (0.9; 1.9) |
| | 10-20: 1.7 (1.0; 3.1) |
| | >20: 1.7 (1.0; 2.8) |
| | |

| Women |
|--|
| Lifting-Duration (≥10 kg) |
| Up to age 30 years (ref: 0 years) |
| 0.1–4.9: 1.0 (0.5; 2.0) |
| 5.0-9.9: 0.8 (0.4; 1.7) |
| ≥10.0: 1.2 (0.5; 2.6) |
| |
| Up to 10 years before entry |
| into study (ref: 0 years) |
| 0.1–9.9: 1.1 (0.6; 1.7) |
| |
| 10.0–19.9: 1.4 (0.7; 2.9) |
| ≥20.0: 0.8 (0.4; 1.5) |
| |
| Lifting-Prolonged (max level of lifting (kg) for |
| at least 10 years) |
| Up to age 30 years |
| <10: 1.0 |
| 10–24: 1.0 (0.6; 1.8) |
| 25–49: 0.8 (0.3; 2.5) |
| ≥50: 1.7 (0.5; 6.1) |
| |
| Up to 10 years before entry into study |
| <10: 1.0 |
| 10–24: 0.9 (0.6; 1.3) |
| 25–49: 0.9 (0.5; 1.7) |
| ≥50: 1.1 (0.5; 2.5) |
| |
| Other exposure |
| Sitting-Duration of exposure (ref: 0 years) |
| Up to 10 years: 0.9 (0.6; 1.3) |
| 10-20: 1.2 (0.8; 1.8) |
| >20: 0.9 (0.6; 1.3) |
| ~20. 0.9 (0.0, 1.5) |
| Standing-Duration of exposure (ref: 0 years) |
| |
| Up to 10 years: 1.1 (0.6; 2.0) |
| 10-20: 1.1 (0.6; 1.9) |
| >20: 1.3 (0.7; 2.1) |
| |
| Kneeling-Duration of exposure (ref: 0 years) |
| Up to 10 years: 0.9 (0.6; 1.4) |
| 10–20: 0.7 (0.4; 1.3) |

| | >20: 1.2 (0.5; 3.0) | |
|--|--|--|
| | | |
| | Squatting-Duration of exposure (ref: 0 years) | |
| | Up to 10 years: 1.1 (0.6; 1.9) | |
| | 10–20: 1.5 (0.6; 3.4) | |
| | | |
| | >20: 0.7 (0.3; 1.8) | |
| | | |
| | Driving-Duration of exposure (ref: 0 years) | |
| | Up to 10 years: 4.0 (1.2; 13.7) | |
| | 10–20: 2.7 (0.3; 26.5) | |
| | >20: - | |
| | | |
| | Walking-Duration of exposure (ref: 0 years) | |
| | Up to 10 years: 1.5 (1.0; 2.3) | |
| | 10-20: 1.5 (1.0; 2.3) | |
| | >20: 1.3 (0.8; 2.0) | |
| | ~20. 1.3 (0.0, 2.0) | |
| | Climbing Duration of ownoruus (rof: Quagra) | |
| | Climbing-Duration of exposure (ref: 0 years) | |
| | Up to 10 years: 1.4 (0.8; 2.2) | |
| | 10–20: 1.3 (0.4; 4.0) | |
| | >20: 2.3 (0.8; 6.3) | |
| | | |
| | Men | |
| | Lifting-Duration (≥10 kg) | |
| | Up to age 30 years (ref: 0 years) | |
| | 0.1–4.9: 0.6 (0.2; 1.3) | |
| | 5.0–9.9: 1.6 (0.7; 3.7) | |
| | ≥10.0: 2.7 (1.4; 5.1) | |
| | | |
| | Up to 10 years before entry into study (ref: 0 | |
| | years) | |
| | | |
| | 0.1–9.9: 0.8 (0.4; 1.7) | |
| | 10.0–19.9: 1.5 (0.6; 3.8) | |
| | ≥20.0: 2.3 (1.3; 4.4) | |
| | | |
| | Lifting-Prolonged (max level of lifting (kg) for | |
| | at least 10 years) | |
| | Up to age 30 years | |
| | <10: 1.0 | |
| | 10–24: 1.7 (0.9; 3.4) | |
| | 25–49: 3.0 (1.5; 6.3) | |
| | | |

| ≥50: 2.9 (1.3; 6.4) |
|--|
| |
| Up to 10 years before entry into study |
| <10: 1.0 |
| 10-24: 1.4 (0.7; 3.0) |
| |
| 25–49: 1.9 (0.9; 3.9) |
| ≥50: 3.2 (1.6; 6.5) |
| |
| Other exposure |
| Sitting-Duration of exposure (ref: 0 years) |
| |
| Up to 10 years: 1.8 (0.9; 3.7) |
| 10–20: 1.7 (0.7; 3.9) |
| >20: 1.0 (0.6; 1.7) |
| |
| Standing-Duration of exposure (ref: 0 years) |
| Up to 10 years: 0.2 (0.0; 1.4) |
| 10-20: 0.4 (0.1; 2.4) |
| |
| >20: 0.5 (0.1; 2.3) |
| |
| Kneeling-Duration of exposure (ref: 0 years) |
| Up to 10 years: 0.8 (0.4; 1.4) |
| 10–20: 2.0 (0.8; 4.7) |
| >20: 1.0 (0.6; 1.7) |
| · 20. 1.0 (0.0, 1.7) |
| Countries Direction of Supervise (and Supervise) |
| Squatting-Duration of exposure (ref: 0 years) |
| Up to 10 years: 0.9 (0.5; 1.6) |
| 10–20: 1.4 (0.5; 3.6) |
| >20: 0.9 (0.5; 1.6) |
| |
| Driving-Duration of exposure (ref: 0 years) |
| Up to 10 years: 1.3 (0.7; 2.6) |
| |
| 10–20: 0.5 (0.2; 1.3) |
| >20: 0.9 (0.4; 1.8) |
| |
| Walking-Duration of exposure (ref: 0 years) |
| Up to 10 years: 0.8 (0.4; 1.9) |
| 10–20: 1.1 (0.4; 2.5) |
| >20: 1.2 (0.6; 2.5) |
| ~20. 1.2 (0.0, 2.3) |
| |
| Climbing-Duration of exposure (ref: 0 years) |
| Up to 10 years: 1.3 (0.7; 2.5) |

| | 1 | | | | | Г |
|--------------|--------------------|-----------------------------------|-------------------|------------------|---|---|
| | | | | | 10–20: 2.3 (1.1; 4.9) | |
| | | | | | >20: 1.8 (0.9; 3.4) | |
| Cooper et al | Case-control study | Participants | Several factors | Knee | Associations between knee osteoarthritis and | - |
| 1994 | | were men and | Data were | osteoarthritis | reported occupational activities in main job. | |
| [6] | General | women aged 55 | collected by | Interview and | OR (95% CI) adjusted for body mass index and | |
| United | population | years and over | interviewers | knee radio- | the presence or absence of Heberden's nodes. | |
| Kingdom | | who were | who were blind | graphy were | | |
| | Time when study | registered with | to case-control | assessed to | Squatting (>30 min/day): 6.9 (1.8; 26.4) | |
| | was performed | a large general | status. The | confirm knee | Kneeling (>30 min/day): 3.4 (1.3; 9.1) | |
| | not stated | practice in | information | osteoarthritis. | Climbing stairs (>10 flights/day): 2.7 (1.2; 6.1) | |
| | | Bristol. Each | sought included | Moderate or | Lifting>25 kg in average working day): | |
| | | member of the | a lifetime | severe osteo- | 1.4 (0.5; 3.7) | |
| | | study | occupational | arthritis was | Walking (>2 miles/day): 0.9 (0.5; 1.5) | |
| | | population was | history with | defined as | Standing (>2 hours/day): 0.8 (0.4; 1.4) | |
| | | sent a postal | details of | changes in a | Sitting (>2 hours/day): 1.2 (0.7; 2.1) | |
| | | questionnaire | whether the | tibiofemoral | Driving (>4 hours/day): 1.4 (0.3; 5.8) | |
| | | asking about | main job | compartment | | |
| | | knee pain | entailed eight | graded 3 or 4 | | |
| | | | specific physical | on the Kellgren | | |
| | | Cases had | activities: | and Lawrence | | |
| | | radiographic | squatting, | scale or a grade | | |
| | | evidence of | kneeling, stair- | of 3 for both | | |
| | | moderate or | climbing, heavy | joint space | | |
| | | severe | lifting, walking, | narrowing and | | |
| | | osteoarthritis. | standing, | osteophyte | | |
| | | This was | sitting, and | formation in a | | |
| | | defined as | driving | patella-femoral | | |
| | | changes in a | | joint according | | |
| | | tibiofemoral | | to the | | |
| | | compartment | | Radiographic | | |
| | | graded 3 or 4 | | Atlas of Knee | | |
| | | on the Kellgren and Lawrence | | Osteoarthritis | | |
| | | | | | | |
| | | scale or a grade of 3 for both | | | | |
| | | joint space | | | | |
| | | narrowing and | | | | |
| | | osteophyte | | | | |
| | | formation in a | | | | |
| | | patellofemoral | | | | |
| | | joint according | | | | |
| | 1 | joint according | | | | |

| to the | |
|---|--|
| Radiographic | |
| Atlas of Knee | |
| Osteoarthritis. | |
| These 109 | |
| individuals (30 | |
| men and 79 | |
| women) were | |
| classed as cases | |
| | |
| Controls were | |
| selected from | |
| questionnaire | |
| respondents | |
| who reported | |
| no knee pain, | |
| and who had | |
| minimal or no | |
| features of | |
| osteoarthritis in | |
| either knee on | |
| | |
| X-ray. Two | |
| controls were | |
| selected for | |
| each case, | |
| individually | |
| matched by sex | |
| and age to | |
| within two | |
| years | |
| | |
| n=327 | |
| | |
| 109 cases and | |
| 218 control | |
| | |
| 237 women and | |
| 90 men | |
| Croft et al Case-control study Participants Several factors Hip Associations between hip osteoarthritis and – | |
| 1992 were 60–75 Data were osteoarthritis lifetime duration of exposure to occupational | |
| [7] years old men collected by | |

| L Lucita e al | Conoral | | interviewe | The second | activities OD (OE0/ CI) adjusted for any and |
|----------------|------------------|------------------|-------------------|-------------------|--|
| United | General | who had | interviewers | The cases | activities. OR (95% CI) adjusted for age and |
| Kingdom | population | undergone | who were blind | comprises | hospital group |
| In fam | The state of the | intravenous | to case-control | patients who | Citizen fam Di Alex |
| Information | Time when study | urography of | status. The | had a hip | Sitting for>2h/day |
| on severe | was performed | the North | subjects' | replacement for | All cases |
| cases are | not stated | Staffordshire | occupations | osteoarthritis or | <1 year: 1.0 |
| included in | | and Shrewsbury | were coded | a joint space of | 1–19 years: 1.1 (0.7; 1.7) |
| the table. | | hospitals during | according to the | ≤2.5 mm at | ≥20 years: 1.2 (0.8; 1.8) |
| Note that that | | 1982–1987 | 1970 | least one hip | Severe cases (n=14; 16; 18) |
| severe cases | | | classification of | | <1 year: 1.0 |
| include few | | The cases and | the Office of | Control subjects | 1–19 years: 1.0 (0.4; 2.2) |
| participants | | referents were | Population | had a joint | ≥20 years: 0.8 (0.3; 1.7) |
| | | approached | Censuses and | space ≥3.5 mm | |
| | | through their | Surveys | in both hips and | Standing for>2h/day |
| | | general | | who showed no | All cases |
| | | practitioners to | | other | <20 year: 1.0 |
| | | exclude those | | radiographic | 20–39 years: 1.8 (1.0; 3.1) |
| | | who had died | | evidence of | ≥40 years: 1.7 (1.0; 2.8) |
| | | since | | osteoarthritis | Severe cases |
| | | radiograph | | (no | <20 year: 1.0 |
| | | examination | | osteophytes, no | 20–39 years: 1.5 (0.5; 4.8) |
| | | and those who | | cysts, and no | ≥40 years: 2.7 (1.0; 7.3) |
| | | were too ill to | | subchondral | |
| | | be seen | | sclerosis of | Bending for>2h/day |
| | | | | more than 5 | All cases |
| | | n=539 | | mm in | <1 year: 1.0 |
| | | | | thickness) | 1–19 years: 0.7 (0.4; 1.1) |
| | | 245 cases and | | | ≥20 years: 1.2 (0.7; 1.9) |
| | | 294 control | | | Severe cases |
| | | | | | <1 year: 1.0 |
| | | All participants | | | 1–19 years: 0.8 (0.3; 2.0) |
| | | were men | | | ≥20 years: 1.9 (0.8; 4.5) |
| | | | | | |
| | | | | | Kneeling for>2h/day |
| | | | | | All cases |
| | | | | | <1 year: 1.0 |
| | | | | | 1–19 years: 0.6 (0.4; 1.0) |
| | | | | | ≥20 years: 0.7 (0.4; 1.3) |
| | | | | | Severe cases |
| | | | | | <1 year: 1.0 |
| | | | | | 1–19 years: 0.5 (0.2; 1.4) |
| | | I | 1 | 1 | |

| ≥20 years: 1.0 (0.3; 3.2) |
|--|
| |
| Squatting for>30 min/day |
| All cases |
| <1 year: 1.0 |
| ≥1 years: 0.7 (0.4; 1.4) |
| Severe cases |
| <1 year: 1.0 |
| ≥1 years: 1.3 (0.4; 3.6) |
| 21 years. 1.5 (0.4, 5.0) |
| Walking for>3.2 km/day |
| All cases |
| <1 year: 1.0 |
| 1–19 years: 0.8 (0.5; 1.5) |
| |
| ≥20 years: 0.8 (0.5; 1.5) |
| Severe cases |
| <1 year: 1.0 |
| 1–19 years: 1.4 (0.4; 4.6) |
| ≥20 years: 1.6 (0.5; 5.1) |
| Climbing ladders |
| All cases |
| |
| <1 year: 1.0 |
| 1–19 years: 0.9 (0.6; 1.4) |
| ≥20 years: 0.8 (0.5; 1.5) |
| Severe cases |
| <1 year: 1.0 |
| 1–19 years: 0.8 (0.3; 1.8) |
| ≥20 years: 1.6 (0.7; 3.8) |
| Climbing>30 flights of stairs/day |
| All cases |
| |
| <1 year: 1.0 |
| ≥1 years: 1.0 (0.6; 1.5) |
| Severe cases |
| <1 year: 1.0 |
| ≥1 years: 1.2 (0.6; 2.5) |
| Lifting on maning unighter 25.4 kg by hand |
| Lifting or moving weights>25.4 kg by hand |
| All cases |
| <1 year: 1.0 |

| | | | | | 1–19 years: 0.9 (0.6; 1.4) | |
|---------------|-------------------|-------------------|------------------|----------------|--|---|
| | | | | | ≥20 years: 1.2 (0.7; 1.9) | |
| | | | | | Severe cases (n=14; 16; 18) | |
| | | | | | <1 year: 1.0 | |
| | | | | | 1–19 years: 1.2 (0.5; 2.9) | |
| | | | | | ≥20 years: 2.5 (1.1; 5.7) | |
| | | | | | | |
| | | | | | Driving for>4 h/day | |
| | | | | | All cases | |
| | | | | | <1 year: 1.0 | |
| | | | | | ≥1 years: 0.8 (0.5; 1.2) | |
| | | | | | Severe cases | |
| | | | | | <1 year: 1.0 | |
| | | | | | ≥1 years: 0.9 (0.4; 1.8) | |
| D'Souza et al | Cohort with | Participants | Several factors | Knee | Association of mean occupational ratings and | Adjusted OR of knee osteoarthritis |
| 2008 | exposure data | were civilian, | Occupational | osteoarthritis | knee osteoarthritis. Unadjusted analyses of OR | associated with occupational activity |
| [8] | collected | non- | physical | Symptomatic | (95% CI) | (Exposure Quartiles). OR (95% CI) |
| USA | retrospectively | institutionalized | exposures were | knee | | adjusted for age, gender, body mass |
| | | persons who | assessed using | osteoarthritis | Both sexes | index, smoking, Heberden's nodes, |
| | Description of | had knee X-rays | expert | was defined as | Sitting: 0.83 (0.75; 0.92) | current sports/activities, occupational |
| | exposure in each | , | consensus | Kellgren | Standing: 1.34 (1.10; 1.63) | activities |
| | subjects longest | The analysis | ratings. Five | Lawrence grade | Walking: 1.43 (1.15; 1.77) | |
| | held job (in | was restricted | ergonomic | ≥2 in at least | Kneeling: 1.29 (1.10; 1.51) | Both sexes |
| | average 26 years) | to subjects who | experts were | one knee and | Heavy lifting: 1.25 (1.12; 1.39) | Symptomatic knee osteoarthritis |
| | | were in their | invited to rate | self-reported | Working in a cramped space: 1.21 (0.99; 1.48) | Sitting (% of work day) |
| | General | longest held job | job categories | knee | | <22: 1.0 |
| | population | for at least five | with regards to | symptom(s) in | | 22≤–≤32: 0.68 (0.39; 1.18) |
| | | years. Persons | the percent of | the | | 32<-≤54: 0.74 (0.34; 1.60) |
| | Time when study | who reported | the work day | corresponding | | 54<: 0.50 (0.20; 1.25) |
| | was performed | physician- | spent in | knee; or knee | | |
| | not stated | diagnosed | different | replacement | | Standing (% of work day) |
| | | rheumatoid | activities. The | surgery | | <26: 1.0 |
| | | arthritis, had a | experts rated | 0 / | | 26≤–≤30: 1.42 (0.88; 2.31) |
| | | Kellgren and | these activities | Severe | | 30<-≤36: 1.92 (1.06; 3.46) |
| | | Lawrence grade | on an 11-point | symptomatic | | 36<: 1.36 (0.73; 2.54) |
| | | in at least one | scale ranging | knee osteo- | | · · · · · · · · · · · · · · · · · · · |
| | | knee, or knee | from 0–100, | arthritis was | | Walking (% of work day) |
| | | replacement | with 10 unit | defined as: | | <16: 1.0 |
| | | surgery were | intervals. Each | Kellgren | | 16≤−≤20: 1.41 (0.74; 2.71) |
| | | excluded. Only | unit | Lawrence grade | | 20<−≤30: 1.49 (0.67; 3.29) |
| | | | | - | | |
| | | exposures from | represented | ≥3 in at least | | 30<: 1.83 (0.83; 4.07) |

| <u>г</u> | | | | 1 | 1 |
|----------|------------------|-------------------|---------------|---|---------------------------------------|
| | the subjects' | 10% of the work | one knee and | | |
| | longest held job | day | self-reported | | Kneeling (% of work day) |
| | were | | knee | | <4: 1.0 |
| | considered | Two ergonomic | symptom(s) in | | 4≤–≤8: 1.09 (0.58; 2.06) |
| | | experts rated | the | | 8<−≤14: 1.23 (0.81; 1.87) |
| | The mean age | the job titles | corresponding | | 14<: 2.37 (1.27; 4.45) |
| | was 70 years | using a reduced | knee; or knee | | |
| | - | rating scale (5- | replacement | | Heavy lifting (% of work day) |
| | n=1 970 | point scale) that | surgery | | <4: 1.0 |
| | | could be cross- | 0, | | 4≤–≤8: 1.30 (0.73; 2.29) |
| | 916 women and | walked to the | | | 8<−≤14: 1.45 (0.87; 2.43) |
| | 1 054 men | 11-point scale | | | 14<: 2.00 (1.02; 3.93) |
| | 1001111011 | 11 point scale | | | 114 2.00 (1.02) 5.55) |
| | | | | | Working in a cramped space (% of work |
| | | | | | day) |
| | | | | | 0: 1.0 |
| | | | | | 0<-<6: 0.84(0.46; 1.55) |
| | | | | | 6<−≤16: 1.19 (0.64; 2.23) |
| | | | | | 16<: 1.41 (0.72; 2.74) |
| | | | | | 10<. 1.41 (0.72; 2.74) |
| | | | | | Severe symptomatic knee |
| | | | | | osteoarthritis |
| | | | | | |
| | | | | | Sitting (% of work day) |
| | | | | | <22: 1.0 |
| | | | | | 22≤−≤32: 0.69 (0.36; 1.33) |
| | | | | | 32<−≤54: 0.75 (0.25; 2.22) |
| | | | | | 54<: 0.51 (0.17; 1.58) |
| | | | | | Changeling (0) a famoula day) |
| | | | | | Standing (% of work day) |
| | | | | | <26: 1.0 |
| | | | | | 26≤−≤30: 1.68 (0.81; 3.52) |
| | | | | | 30<−≤36: 2.08 (0.94; 4.58) |
| | | | | | 36<: 0.89 (0.31; 2.55) |
| | | | | | |
| | | | | | Walking (% of work day) |
| | | | | | <16: 1.0 |
| | | | | | 16≤−≤20: 0.99 (0.46; 2.12) |
| | | | | | 20<-≤30: 1.02 (0.37; 2.81) |
| | | | | | 30<: 1.42 (0.48; 4.20) |
| | | | | | |
| | | | | | Kneeling (% of work day) |

| | | <4: 1.0 |
|--|--|---------------------------------------|
| | | 4≤−≤8: 0.61 (0.28; 1.33) |
| | | 8<−≤14: 1.32 (0.74; 2.34) |
| | | 14<: 2.34 (1.07; 5.12) |
| | | - (-) -) |
| | | Heavy lifting (% of work day) |
| | | <4: 1.0 |
| | | 4≤−≤8: 2.04 (1.04; 3.99) |
| | | 8<-≤14: 2.03 (1.06; 3.91) |
| | | |
| | | 14<: 2.45 (1.17; 5.16) |
| | | |
| | | Working in a cramped space (% of work |
| | | day) |
| | | 0: 1.0 |
| | | 0<-<6: 1.41(0.57; 3.49) |
| | | 6<−≤16: 1.89 (0.79; 4.52) |
| | | 16<: 2.21 (1.08; 4.51) |
| | | |
| | | Women |
| | | Symptomatic knee osteoarthritis |
| | | Sitting (% of work day) |
| | | <22: 1.0 |
| | | 22≤−≤32: 1.10 (0.46; 2.59) |
| | | 32<−≤54: 1.11 (0.46; 3.04) |
| | | 54<: 0.60 (0.19; 1.93) |
| | | 54. 0.00 (0.15, 1.55) |
| | | Standing (% of work day) |
| | | <26: 1.0 |
| | | 26≤−≤30: 1.78 (0.99; 3.19) |
| | | 30<-≤36: 2.28 (1.09; 4.77) |
| | | |
| | | 36<: 1.44 (0.66; 3.14) |
| | | Malling (0) of work down |
| | | Walking (% of work day) |
| | | <16: 1.0 |
| | | 16≤−≤20: 1.52 (0.64; 3.61) |
| | | 20<–≤30: 1.42 (0.57; 3.52) |
| | | 30<: 2.00 (0.84; 4.75) |
| | | |
| | | Kneeling (% of work day) |
| | | <4: 1.0 |
| | | 4≤–≤8: 0.99 (0.50; 1.96) |

| • | | • | |
|-------|--|---|--|
| | | | 8<–≤14: 1.15 (0.69; 1.90) |
| | | | 14<: 1.31 (0.56; 3.07) |
| | | | |
| | | | Heavy lifting (% of work day) |
| | | | <4: 1.0 |
| | | | 4≤−≤8: 1.14 (0.63; 2.07) |
| | | | 8<-≤14: 1.57 (0.77; 3.21) |
| | | | 14<: 1.40 (0.51; 3.82) |
| | | | |
| | | | Working in a cramped space (% of work |
| | | | day) |
| | | | 0: 1.0 |
| | | | 0<-<6: 0.86(0.49; 1.89) |
| | | | 6<−≤16: 1.19 (0.52; 2.69) |
| | | | 16<: 1.01 (0.42; 2.43) |
| | | | |
| | | | Severe symptomatic knee |
| | | | osteoarthritis |
| | | | Sitting (% of work day) |
| | | | <22: 1.0 |
| | | | 22≤–≤32: 1.24 (0.67; 2.32) |
| | | | 32<−≤54: 1.13 (0.36; 3.52) |
| | | | 54<: 0.52 (0.17; 1.59) |
| | | | |
| | | | Standing (% of work day) |
| | | | <26: 1.0 |
| | | | 26≤−≤30: 2.84 (1.35; 5.95) |
| | | | 30<−≤36: 3.33 (1.51; 7.36) |
| | | | 36<: 1.44 (0.52; 3.88) |
| | | | 000, 11, 17(0.02, 0.00) |
| | | | Walking (% of work day) |
| | | | <16: 1.0 |
| | | | 16≤−≤20: 1.79 (0.86; 3.74) |
| | | | 20<−≤20: 1.79 (0.86; 3.74) 20<−≤30: 1.86 (0.59; 5.81) |
| | | | |
| | | | 30<: 2.72 (0.91; 8.16) |
| | | | Knooling (% of work day) |
| | | | Kneeling (% of work day) |
| | | | <4: 1.0 |
| | | | 4≤−≤8: 0.67 (0.25; 1.82) |
| | | | 8<−≤14: 1.18 (0.64; 2.18) |
| | | | 14<: 1.30 (0.46; 3.68) |
| | | | |

| 1 | | | | |
|-------|---|---|--|---------------------------------------|
| | | | | Heavy lifting (% of work day) |
| | | | | <4: 1.0 |
| | | | | 4≤−≤8: 1.84(1.03; 3.20) |
| | | | | 8<–≤14: 2.06 (1.05; 4.06) |
| | | | | 14<: 1.18 (0.54; 2.59) |
| | | | | |
| | | | | Working in a cramped space (% of work |
| | | | | day) |
| | | | | 0: 1.0 |
| | | | | 0<-<6: 1.34(0.44; 4.06) |
| | | | | 6<−≤16: 1.72 (0.74; 3.99) |
| | | | | |
| | | | | 16<: 2.46 (1.16; 5.21) |
| | | | | |
| | | | | Men |
| | | | | Symptomatic knee osteoarthritis |
| | | | | Sitting (% of work day) |
| | | | | <22: 1.0 |
| | | | | 22≤–≤32: 0.42 (0.18; 0.96) |
| | | | | 32<–≤54: 0.50 (0.16; 1.54) |
| | | | | 54<: 0.46 (0.17; 1.22) |
| | | | | |
| | | | | Standing (% of work day) |
| | | | | <26: 1.0 |
| | | | | 26≤−≤30: 1.15 (0.49; 2.71) |
| | | | | 30<−≤36: 1.53 (0.66; 3.55) |
| | | | | 36<: 1.37 (0.68; 2.77) |
| | | | | 50<. 1.57 (0.08, 2.77) |
| | | | | Malling (0) of work day) |
| | | | | Walking (% of work day) |
| | | | | <16: 1.0 |
| | | | | 16≤−≤20: 1.19 (0.55; 2.58) |
| | | | | 20<−≤30: 1.56 (0.58; 4.19) |
| | | | | 30<: 1.59 (0.48; 5.23) |
| | | | | |
| | | | | Kneeling (% of work day) |
| | | | | <4: 1.0 |
| | | | | 4≤–≤8: 1.37 (0.39; 4.87) |
| | | | | 8<−≤14: 1.47 (0.80; 2.73) |
| | | | | 14<: 3.08 (1.31; 7.21) |
| | | | | ,, |
| | | | | Heavy lifting (% of work day) |
| | | | | <4: 1.0 |
| 1 | l | 1 | | N4. 1.U |

| 4≤−≤8: 1.78(0.54; 5.87) |
|---------------------------------------|
| 8<-≤14: 1.50 (0.57; 3.93) |
| 14<: 2.72 (1.14; 6.50) |
| Working in a cramped space (% of work |
| day) |
| 0:1.0 |
| 0<-<6: 0.86(0.26; 2.87) |
| 6<−≤16: 1.34 (0.42; 4.24) |
| 16<: 1.79 (0.64; 5.01) |
| Severe symptomatic knee |
| osteoarthritis |
| Sitting (% of work day) |
| <22: 1.0 |
| 22≤−≤32: 0.25 (0.08; 0.72) |
| 32<-≤54: 0.41 (0.09; 2.53) |
| 54<: 0.56 (0.19; 1.64) |
| |
| Standing (% of work day) |
| <26: 1.0 |
| 26≤−≤30: 0.95 (0.30; 3.01) |
| 30<−≤36: 1.01 (0.35; 2.91) |
| 36<: 0.43 (0.09; 1.96) |
| |
| Walking (% of work day) |
| <16: 1.0 |
| 16≤−≤20: 0.35 (0.13; 0.91) |
| 20<−≤30: 0.50 (0.16; 1.61) |
| 30<: 0.50 (1.12; 2.18) |
| |
| Kneeling (% of work day) |
| <4: 1.0 |
| 4≤−≤8: 0.42 (0.03; 6.38) |
| 8<-≤14: 1.72 (0.6; 4.92) |
| 14<: 3.04 (0.94; 9.87) |
| Heavy lifting (% of work day) |
| <4: 1.0 |
| 4≤–≤8: 3.47(0.52; 23.07) |
| 8<-≤14: 2.46 (0.52; 11.66) |

| | | | | | | 14<: 4.94 (0.99; 24.48) |
|-------------|-------------------|---------------------------|-------------------------------------|-----------------------|--|--|
| | | | | | | Working in a cramped space (% of work day) 0: 1.0 0<-<6: 1.54(0.34; 7.0) |
| | | | | | | 6<−≤16: 2.57 (0.50; 13.19) |
| | | | | | | 16<: 2.15 (0.55; 8.32) |
| Ezzat et al | Cohort with | The participants | Work load | Knee | Multivariable logistic regression models for | Multivariable logistic regression models |
| 2013 | exposure data | were from two | Exposure data | osteoarthritis | radiographic osteoarthritis, symptomatic | for radiographic osteoarthritis, |
| [9] | collected | different | was collected | Three | osteoarthritis and magnetic resonance | symptomatic osteoarthritis and |
| Canada | retrospectively | cohorts, | with a | definitions of | imaging-osteoarthritis. Crude OR (95% CI) | magnetic resonance imaging- |
| | | recruited from | standardized | osteoarthritis | | osteoarthritis. OR (95% CI) adjusted for |
| | General | the greater | questionnaire | were applied | Radiographic osteoarthritis | age, sex, and body mass index |
| | population | Vancouver area, | | | Cumulative occupational physical load | |
| | | Canada | Cumulative | Radiographic | 2 nd quartile: 2.43 (0.93; 6.35) | Radiographic osteoarthritis |
| | Description of | | occupational | osteoarthritis | 3 rd quartile: 5.47 (2.17; 13.81) | Cumulative occupational physical load |
| | exposer in each | The first | physical load | was chosen if | 4 th quartile: 3.80 (1.34; 10.79) | 2 nd quartile: 2.35 (0.86; 6.36) |
| | subjects longest | population- | was categorized | the knee | | 3 rd quartile: 4.19 (1.55; 11.34) |
| | held job (in | based cohort | into quarters | radiograph | Symptomatic osteoarthritis | 4 th quartile: 3.15 (1.02; 9.70) |
| | average 26 years) | tries to identify | . | received a | Cumulative occupational physical load | |
| | 2002 2000 | early knee | Data was listed | Kellgren/Lawre | 2 nd quartile: 3.16 (0.74; 13.52) | Symptomatic osteoarthritis |
| | 2002–2009 | osteoarthritis | on occupations held for at least | nce grade ≥2 | 3 rd quartile:: 7.12 (1.78; 24.44) 4 th quartile: 10.56 (2.58; 43.21) | <i>Cumulative occupational physical load</i> 2 nd quartile: 3.06 (0.70; 13.39) |
| | | using a combination of | 12 months after | Symptomatic | 4 ^w quartile: 10.56 (2.58; 43.21) | 3^{rd} quartile: 5.73 (1.36; 24.12) |
| | | clinical tests, | age 18 years, | osteoarthritis | Magnetic resonance imaging-osteoarthritis | 4 th quartile: 8.16 (1.89; 35.27) |
| | | imaging | including | was defined as | Cumulative occupational physical load | 4 th qualitie: 8.10 (1.85, 55.27) |
| | | techniques, and | occupations | having a | 2 nd quartile: 7.49 (2.29; 24.49) | Magnetic resonance imaging- |
| | | biomarkers. The | such as | Kellgren/Lawre | 3 rd quartile: 10.88 (3.30; 35.88) | osteoarthritis |
| | | second cohort | homemaker, | nce grade ≥ 2 in | 4 th guartile: 12.01 (3.46; 41.71) | Cumulative occupational physical load |
| | | consisted of a | student, or | addition to knee | | 2 nd quartile: 7.18 (2.17; 23.70) |
| | | population- | retiree | pain | | 3 rd quartile: 9.04 (2.65; 30.88) |
| | | based sample of | | | | 4 th quartile: 9.54 (2.65; 34.27) |
| | | people without | | Magnetic | | |
| | | knee pain | | resonance | | |
| | | | | imaging- | | |
| | | Age: 40–79 | | osteoarthritis | | |
| | | years old | | was based on | | |
| | | | | the definition | | |
| | | n=328 | | by Hunter et al., | | |
| | | | | 2011, excluding | | |

| | | 167 women and | | the bone | | |
|----------------|--------------------|--------------------------|-------------------|-----------------|---|---|
| | | 167 women and 161 men | | attrition | | |
| | | 101 men | | | | |
| Element et al | Duran estina | Deuticiacasta | Work load | criterion | | Deletion viele for testal bio reals are not |
| Flugsrud et al | Prospective | Participants | | Total hip | Relative risks for total hip replacement due to | Relative risks for total hip replacement |
| 2008 | cohort | were persons | Exposure data | replacement | primary osteoarthritis in a middle-age | due to primary osteoarthritis at |
| [10] | | born between | was collected | due to primary | population attending a cardiovascular | different levels of body mass index and |
| Norway | Average of 9 years | 1925 and 1942, | with a | osteoarthritis | screening in three Norwegian counties. RR | physical activity at work in a middle-age |
| | | in the county of | standardized | The data on hip | (95% CI) adjusted for age at screening, body | population attending a cardiovascular |
| | General | Finnmark | questionnaire | replacements | height, body mass index (not for body weight), | screening in three Norwegian counties. |
| | population | | | due to | physical activity at work, physical activity in | RR (95% CI) adjusted for age at |
| | | Those who did | The question | osteoarthritis | leisure, marital status, and smoking habits | screening, body height, physical activity |
| | 1977–1998 | not attend the | concerning | were collected | | in leisure, marital status and smoking |
| | | screening; died | physical activity | from the | Women | habits |
| | | or emigrated | during work has | Norwegian | Sedentary: 1.0 | |
| | | before the start | been validated | arthroplasty | Moderate physical activity: 1.1 (0.8; 1.6) | Women |
| | | of follow-up or | against a 7-day | register | Intermediate physical activity: 1.4 (0.9; 2.0) | Sedentary |
| | | already had a | diary (Stender | | Intense physical activity: 2.1 (1.3; 3.3) | Body mass index |
| | | total hip | et al., 1991) | For every total | | ≤22.2: 1.0 |
| | | replacement at | | hip replacement | Men | 22.3–24.2: 1.4 (0.5; 3.7) |
| | | the start of | | (and hip | Sedentary: 1.0 | 24.3–27.0: 1.3 (0.5; 3.5) |
| | | follow-up | | implant | Moderate physical activity: 1.5 (1.0; 2.2) | ≥27.1: 2.6 (1.0; 6.6) |
| | | according to the | | revision) done | Intermediate physical activity: 1.7 (1.1; 2.4) | |
| | | Norwegian | | in Norwegian | Intense physical activity: 2.1 (1.5; 3.0) | Moderate physical activity |
| | | arthroplasty | | hospitals, a | | Body mass index |
| | | register were | | form was | | ≤22.2: 1.0 (0.4; 2.3) |
| | | excluded from | | completed to | | 22.3–24.2: 1.1 (0.5; 2.6) |
| | | the analysis | | record previous | | 24.3–27.0: 1.8 (0.8; 3.9) |
| | | | | hip surgery in | | ≥27.1: 3.1 (1.4; 6.8) |
| | | The median age | | either hip, the | | |
| | | at screening | | indication for | | Intermediate physical activity |
| | | was 47 years | | surgery, the | | Body mass index |
| | | (range 34–59 | | implants used, | | ≤22.2: 1.2 (0.4; 3.1) |
| | | years) | | and other | | 22.3–24.2: 1.7 (0.7; 4.2) |
| | | | | parameters | | 24.3–27.0: 2.2 (0.9; 5.0) |
| | | n=50 034 | | related to the | | ≥27.1: 3.6 (1.6; 8.1) |
| | | | | operation | | |
| | | 25 037 women | | | | Intense physical activity |
| | | and 24 997 men | | | | Body mass index |
| | | | | | | ≤22.2: 1.6 (0.4; 6.4) |
| l | | | | | | 22.3–24.2: 2.2 (0.7; 6.6) |
| | | | | | | 24.3–27.0: 4.8 (1.9; 11.8) |
| | | I | | 1 | | = =/.01 110 (113) 11:0) |

| | | | | | | ≥27.1: 4.6 (1.1; 11.2) |
|---------------|--------------------|----------------|-------------------|-------------------|--|---|
| | | | | | | |
| | | | | | | Men |
| | | | | | | Sedentary |
| | | | | | | Body mass index |
| | | | | | | ≤23.4: 1.0 |
| | | | | | | 23.5–25.2: 1.4(0.5; 3.7) |
| | | | | | | 25.3–27.3: 1.3 (0.5; 3.5) |
| | | | | | | ≥27.4: 2.6 (1.0; 6.6) |
| | | | | | | Moderate physical activity |
| | | | | | | Body mass index |
| | | | | | | ≤23.4: 1.1 (0.5; 2.7) |
| | | | | | | 23.5-25.2: 0.9(0.4; 2.1) |
| | | | | | | 25.3–27.3: 1.3 (0.6; 2.9) |
| | | | | | | ≥27.4: 2.7 (1.3; 0.6)* |
| | | | | | | Intermediate physical activity |
| | | | | | | Body mass index |
| | | | | | | ≤23.4: 1.2 (0.5; 2.8) |
| | | | | | | 23.5–25.2: 2.0(0.9; 4.3) |
| | | | | | | 25.3–27.3: 1.4 (0.6; 3.1) |
| | | | | | | ≥27.4: 2.0 (1.0; 4.3) |
| | | | | | | Intensive physical activity |
| | | | | | | Body mass index |
| | | | | | | ≤23.4: 1.0 (0.4; 2.4) |
| | | | | | | 23.5–25.2: 2.3(1.1; 4.9) |
| | | | | | | 25.3–27.3: 2.5 (1.2; 5.2) |
| | | | | | | ≥27.4: 2.5 (1.2; 5.1) |
| | | | | | | (,) |
| | | | | | | *Data appears to be mistyped in article |
| Fontana et al | Case-control study | Participants | Time for rest | Carpo- | Association of occupational factors carpo- | - |
| 2007 | | were patients | A questionnaire | metacarpal | metacarpal osteoarthritis. Unadjusted analyses | |
| [11] | Patients with and | with and | developed by | osteoarthritis | of OR (95% CI) | |
| France | without carpo- | without carpo- | the author was | Medical history | | |
| | metacarpal | metacarpal | used to collect | data were | Repetitive thumb use | |
| | osteoarthritis | osteoarthritis | information | collected for the | 11.91 (3.65; 38.86) | |
| | | from two | about all | case subjects up | | |
| | | institutions | occupations | to the date of | | |
| | | located in the | held for at least | the first | | |

| · | | | | | |
|-----------------|-------------------|------------------|-------------------|---|--|
| Time when study | same urban | 6 months since | diagnosis with | Jobs perceived by subjects as having "Not | |
| was performed | area, and case | leaving school. | special | enough rest breaks during a day" | |
| not stated | and control | The questions | emphasis on | 5.95 (1.66; 21.28) | |
| | subjects were | are stated in | factors known | | |
| | drawn from the | the article | or supposed to | Data on repetitive thumb use is based on 26 | |
| | same district | | contribute to | cases and 10 control subjects | |
| | area in France | All case and | the | | |
| | | control subjects | development of | Data on rests is based on 50 cases and 70 | |
| | The case | were | hand | control subjects | |
| | subjects were | interviewed | osteoarthritis or | | |
| | 61 white | face to face by | carpo- | | |
| | women who | the same | metacarpal | | |
| | were surgically | interviewer | osteoarthritis, | | |
| | treated for | using a detailed | assessed as | | |
| | advanced | structured and | yes/no, such as | | |
| | primary carpo- | standardized | family history of | | |
| | metacarpal | interview | carpo- | | |
| | osteoarthritis in | | metacarpal | | |
| | a specialty hand | | osteoarthritis or | | |
| | surgery center. | | at least one | | |
| | Control subjects | | relative with | | |
| | were matched | | carpo- | | |
| | by ethnicity and | | metacarpal | | |
| | 5-year age | | osteoarthritis or | | |
| | interval and | | thumb trauma | | |
| | were | | history | | |
| | consecutively | | | | |
| | recruited in a | | | | |
| | department of | | | | |
| | orthopedic | | | | |
| | surgery | | | | |
| | | | | | |
| | None of the | | | | |
| | control subjects | | | | |
| | had a history or | | | | |
| | showed | | | | |
| | features of | | | | |
| | carpo- | | | | |
| | metacarpal | | | | |
| | osteoarthritis | | | | |
| | | | | | |

| | | | | | | [] |
|----------------|--------------------|----------------------|-------------------|-------------------|---|----|
| | | 3 509 women | mentioned | classify the | 4: 1.81 (0.90; 3.62) | |
| | | and 2 335 men | exposures they | osteoarthritis | 5: 1.46 (0.33; 6.51) | |
| | | | answered yes | | | |
| | | | (dichotomous | | Men | |
| | | | answer yes or | | Osteoarthritis in any finger joint | |
| | | | no). The total | | History of workload | |
| | | | number of | | 0: 1.00 | |
| | | | these risk | | 1: 1.30 (0.87; 1.96) | |
| | | | factors was | | 2: 1.18 (0.81; 1.72) | |
| | | | designated "the | | 3: 1.23 (0.82; 1.84) | |
| | | | sum index of | | 4: 1.41 (0.81; 2.46) | |
| | | | physical stress | | 5: 1.75 (0.78; 3.91) | |
| | | | at work" | | | |
| | | | | | Osteoarthritis symmetrically in at least two | |
| | | | | | distal interphalangeal joints | |
| | | | | | History of workload | |
| | | | | | 0: 1.00 | |
| | | | | | 1: 1.53 (0.82; 2.84) | |
| | | | | | 2: 0.95 (0.51; 1.76) | |
| | | | | | 3: 1.40 (0.73; 2.70) | |
| | | | | | 4: 1.71 (0.68; 4.33) | |
| | | | | | 5: 2.72 (0.86; 8.58) | |
| Jarvholm et al | Case-control study | Participants | Vibration | Joint | Risk of joint replacement due to osteoarthritis | _ |
| 2004 | | were workers in | Exposure data | replacement | in the hip among operators of heavy vehicles | |
| [13] | Construction | the Swedish | on whole-body | due to | with high or moderate whole-body vibration. | |
| Sweden | workers | construction | vibration was | osteoarthritis in | RR (95% CI) adjusted for age, smoking and | |
| | | industry who | estimated and | the hip | body mass index | |
| | 1987–1988 | , participated in | classified into | The data on | | |
| | | health checks | four grades | joint | Construction workers vs office workers | |
| | | on regular | (none or very | replacements | Vibration: 0.82 (0.51; 1.24) | |
| | | basis, from the | low, low, | due to | | |
| | | late 1960s until | medium and | osteoarthritis in | Construction workers vs painters and | |
| | | 1993 in a | high) by an | the hip were | electricians | |
| | | nationwide | experienced | collected from | Vibration: 0.84 (0.53; 1.28) | |
| | | occupational | occupational | the Swedish | | |
| | | health project | hygienist | Hospital | | |
| | | (Bygghälsan) | 10 | Discharge | | |
| | | (-,00,00000) | The | Register | | |
| | | The analysis | classification of | | | |
| | | was restricted | whole-body | To be classified | | |
| | | to men with a | vibration was | as a case the | | |
| | | | vioration was | | | l |

| · · · · · · · · · · · · · · · · · · · | | T | |
|---------------------------------------|----------------|-------------------|--|
| | | person should | |
| | | have a diagnosis | |
| | | of osteoarthritis | |
| | /m² and | (ICD 9: 71.5B; | |
| | own smoking | ICD 10: M16.0, | |
| hat | abits | M16.1) and a | |
| | | hip replacement | |
| Cor | onstruction | (register codes | |
| | orkers were | 1987–1996: | |
| | posed to | 8410, 8414; | |
| | hole-body | codes 1997- | |
| | bration from | 1998: NFB29, | |
| hea | eavy vehicles | NFB39, NFB49, | |
| | | NFB99) | |
| Off | ffice workers, | | |
| pai | ainters and | Patients | |
| ele | ectricians | classified with | |
| | ere selected | traumatic or | |
| | reference | osteoarthritis | |
| | oups. They | secondary to | |
| | ad no or non- | other diseases | |
| sigr | gnificant | such as | |
| exp | posure to | rheumatoid | |
| wh | hole-body | arthritis and | |
| vib | bration and, | patients treated | |
| on | n average, a | for a secondary | |
| low | w physical | hip replacement | |
| | ad compared | were excluded | |
| | construction | | |
| wo | orkers | | |
| | | | |
| | ersons with | | |
| | nknown or | | |
| unc | nclassified | | |
| 000 | cupations | | |
| | ere excluded | | |
| fro | om the | | |
| ana | nalysis | | |
| | | | |
| Age | ge:20–84 | | |
| yea | ars old | | |

| | | n=69 868 | | | | |
|--------------------|--------------------------|--------------------------------|------------------------------------|---------------------|---|---|
| | | All participants | | | | |
| | | were men | | | | |
| Jensen et al | Cohort with | Participants | Posture | Knee | Risk of radiographic tibiofemoral knee | - |
| 2012 | exposure data | were floor | Duration of | osteoarthritis | osteoarthritis by year in the trade. OR (95% CI) | |
| [14] Decrements | collected | layers and | employment for | Radiologically | adjusted for body mass index, previous knee | |
| Denmark | retrospectively | graphic | floor layers has been used as a | assessment was | traumas, knee straining sports activities and | |
| | Floor layers | designers who | proxy for the | done to detected | age | |
| | | were randomly | | tibiofemoral | ≤20 years of exposure | |
| | and graphic designers | selected among participants | exposure to knee straining | osteoarthritis. | 0.70 (0.07; 7.42) | |
| | uesigners | | - | Usteudi tiintis. | | |
| | Duration of | from a clinical and | work positions in the analyses | Knee | 21–30 years of exposure 1.89 (0.29; 12.3) | |
| | employment year | radiographic | of the study and | osteoarthritis | >30 years of exposure | |
| | were | study | categorized into | was defined as | 4.82 (1.38; 17.0) | |
| | approximately 20– | population of | three groups | joint space | 4.82 (1.58, 17.0) | |
| | 40 years | 156 floor layers | (≤20, 21–30, | narrowing ≥25% | | |
| | 40 years | and 152 graphic | \geq 30 years). | in at least one | | |
| | 1994–2004 | designers who | Results for each | knee and | | |
| | 1554 2004 | were living in | of the three | patterns of | | |
| | | the | groups were | involvement | | |
| | | geographical | compared with | categorized into | | |
| | | area of | the group of | medial or | | |
| | | Copenhagen or | graphic | lateral | | |
| | | Aarhus. | designers in | tibiofemoral | | |
| | | Variations in | total with no | osteoarthritis | | |
| | | the degree of | exposure to | oscourtinitis | | |
| | | knee straining | kneeling work | | | |
| | | work activities | activities | | | |
| | | among the | | | | |
| | | different tasks | | | | |
| | | in floor layers | | | | |
| | | had been | | | | |
| | | published | | | | |
| | | earlier (Jensen | | | | |
| | | et al., 2010; | | | | |
| | | Jensen et al., | | | | |
| | | 2000). Graphic | | | | |
| | | designers, all | | | | |

| Juhakoski et al 2009 [15] Finland | Prospective cohort 22 years General population 1978–2001 | from Copenhagen, were included as a group of non-exposed, controls. Their work tasks involved no knee demands Aged: 42–70 years n=141 (92 floor layers and 49 graphic designers) All participants were men Participants were representative of the Finnish population aged 30 years or over at baseline. Participants were drawn from a national population register and invited to participate in a health survey The mean age was 42 years | Manual handling and posture Exposure data was collected with questionnaires and interviews conducted by trained nurses Physical workload was classified into six categories: Group 1: light sedentary work Group 2: mainly sedentary, but involves | Hip osteoarthritis Subjects were asked to attend a clinical examination if they had experienced any difficulties in walking due to hip pain during the previous month, or if they had difficulty in performing function tests Specially trained | Adjusted odds ratios for risk factors of hip osteoarthritis. OR (95% Cl) adjusted separately for age and sex Physical work load Light sedentary: 1.0 Other sedentary: 0.9 (0.1; 7.2) Light standing/movement: 1.0 (0.3; 2.7) Fairly light/medium heavy: 2.4 (1.0; 5.7) Heavy manual: 4.6 (1.8; 11.5) Very heavy manual: no data | Adjusted odds ratios for risk factors of hip osteoarthritis. OR (95% Cl) adjusted separately for age and sex, and for all covariates (education, smoking, alcohol intake, leisure time physical activity, injury) Physical work load Light sedentary: 1.0 Other sedentary: 1.1 (0.1; 10.0) Light standing/movement: 1.2 (0.4; 3.4) Fairly light/medium heavy: 3.1 (1.2; 8.0) Heavy manual: 6.7 (2.3; 19.5) Very heavy manual: no data |
|---|---|---|--|--|---|--|
|---|---|---|--|--|---|--|

| | | | | | | ГП |
|-----------------|------------------|-----------------------------------|--------------------------------|------------------------------------|--|----|
| | | baseline were | handling fairly | physicians | | |
| | | excluded from | heavy objects | carried out | | |
| | | the analysis in | | clinical | | |
| | | the follow-up | Group 3: | examinations | | |
| | | study | physically light | and diagnosed | | |
| | | | standing work | hip osteo- | | |
| | | n=909 | or light work | arthritis | | |
| | | | involving | according to a | | |
| | | 523 women and | movement | standardized | | |
| | | 386 men | • • • • • • | written protocol | | |
| | | | Group 4: fairly | | | |
| | | | light or medium | | | |
| | | | heavy work | | | |
| | | | involving | | | |
| | | | movement | | | |
| | | | | | | |
| | | | Group 5: heavy | | | |
| | | | manual work | | | |
| | | | C | | | |
| | | | Group 6: very | | | |
| | | | heavy manual | | | |
| Kaila Kanasa | Detre er e etime | Deuticinente | work | 11km | Associations of monucl bondling of loads 20 kg | _ |
| Kaila-Kangas | Retrospective | Participants | Manual handling | Hip osteoarthritis | Associations of manual handling of loads>20 kg | - |
| et al | cohort | were a | - | | according to years of exposure, with clinically | |
| 2011 [16] | General | nationally | The history of work-related | Diagnosis of hip osteoarthritis | verified hip osteoarthritis. OR (95% CI) adjusted for age, body mass index, smoking | |
| [10] Finland | population | representative population | physical loading | was based on | and traumatic fractures | |
| Fillidilu | μοραιατιστι | | was assessed | standardized | | |
| | Duration of | sample. Finland was stratified | through | clinical | All | |
| | employment year | into 20 sections | interviews. The | examination | Manual handling of loads >20 kg, overall | |
| | were 0 to more | consisting of | interviewers | (disease history, | No: 1.00 | |
| | than 24 years | the 15 largest | asked the | symptoms and | Yes: 1.8 (1.2; 2.7) | |
| | than 24 years | cities and five | respondents | clinical findings) | 103. 1.0 (1.2, 2.7) | |
| | 2000–2001 | university | whether they | by trained | Manual handling of loads >20 kg, in years | |
| | 2000 2001 | hospital | had been | physicians. The | 0: 1.00 | |
| | | districts to | exposed daily to | examining | 1–12: 1.4 (0.7; 2.6) | |
| | | achieve an | different work- | physicians | 13–24:2.8 (1.5; 5.0) | |
| | | overall view of | related factors | categorized the | >24: 1.8 (1.1; 2.4) | |
| | | the population's | either in their | diagnosis as | | |
| | | health | current job or in | either probable | Women | |
| | | | their five | or definite. Only | Manual handling of loads >20 kg, overall | |
| | | | | of actinice. Only | manaa mananing oj louas - zo kg, overali | |

| г <u> </u> | | A === 20, 07 | La constat la stila | definition of the | No. 1.00 | |
|--------------|---------------|----------------|---------------------|-------------------|--|---|
| | | Age: 30–97 | longest lasting | definite cases | No: 1.00 | |
| | | (mean age 53 | previous jobs. | were included | Yes: 1.8 (1.1; 2.8) | |
| | | years) | They also | in the present | | |
| | | | enquired about | study | Manual handling of loads >20 kg, in years | |
| | | n=6 556 | job duration (in | | 0: 1.00 | |
| | | | years) | | 1–12: 1.6 (0.7; 3.5) | |
| | | 3 446 women | | | 13–24: 3.8 (1.7; 8.1) | |
| | | and 3 110 men | Information on | | >24: 1.2 (0.7; 2.1) | |
| | | | manual | | | |
| | | | handling of | | Men | |
| | | | heavy loads was | | Manual handling of loads >20 kg, overall | |
| | | | elicited by | | No: 1.00 | |
| | | | asking: "Did | | Yes: 2.0 (1.0; 4.0) | |
| | | | your work | | | |
| | | | involve the | | Manual handling of loads >20 kg, in years | |
| | | | manual | | 0: 1.00 | |
| | | | handling of | | 1–12: 1.1 (0.4; 3.2) | |
| | | | heavy objects, | | 13–24: 2.2 (0.8; 5.9) | |
| | | | such as lifting, | | >24: 2.3 (1.2; 4.3) | |
| | | | carrying or | | | |
| | | | pushing loads | | | |
| | | | over 20 kg an | | | |
| | | | average of at | | | |
| | | | least 10 times | | | |
| | | | per working | | | |
| | | | day?" | | | |
| Klussmann et | Case-control | Participants | Several factors | Knee osteo- | Conditional logistic regression model: most | - |
| al | | were 25–75 | Data on | arthritis | parsimonious model. A description of the | |
| 2010 | General | years old and | exposure was | Osteoarthritis | analysis procedure, including how adjustment | |
| [17] | population | resided in the | assessed by a | was confirmed | for confounders were made in steps, is | |
| Germany | | vicinity of a | standardized | by either | presented in the article. OR (95% CI) | |
| | Time when the | number of | questionnaire | radiological | | |
| | study was | university | developed by | diagnostics | Occupational kneeling or squatting | |
| | performed not | teaching | the authors | (≥grade II on | Women | |
| | stated | hospitals, | | the Kellgren and | <3 542 hours/life: 1.50 (0.83; 2.69) | |
| | | chosen to | A partially | Lawrence scale) | 3 542–8 934 hours/life: 1.36 (0.78; 2.37) | |
| | | include a | standardized | or findings from | >8 934 hours/life: 2.52 (1.35; 4.68) | |
| | | balanced and | telephone | arthroscopy or | | |
| | | representative | interview | open surgery | Men | |
| | | town-country | assessed the | (≥grade III on | <3 574 hours/life: 1.70 (0.96; 3.00) | |
| | | relationship. | frequency and | , | 3 574–12 244 hours/life: 2.16 (1.24; 3.77) | |
| | | relationship. | inequency and | | 5 57 T IE ETT HOUIS/ IIIC: 2.10 (1.27, 5.77) | |

| <u>г г г</u> | Deutisiaeute | dunation of | the Outenhuid | 12 2 4 4 h (1:5 2 4 7 / 4 4 4 2 2) | |
|--------------|--------------------|--------------|-------------------|---|--|
| | Participants | duration of | the Outerbridge | >12 244 hours/life: 2.47 (1.41; 4.32) | |
| | were eg. | lifting and | scale) | | |
| | industrial | carrying for | | Occupational sitting | |
| | workers, | every | The patients' | Women | |
| | craftspeople, | occupational | history and a | <16 032 hours/life: 0.72 (0.37; 1.40) | |
| | office workers, | employment | physicians' | 16 032–33 119 hours/life: 0.51 (0.26; 0.99) | |
| | managers and | | findings were | >33 119 hours/life: 0.39 (0.20; 0.76) | |
| | farmers | | documented in | | |
| | | | a patient record | Men | |
| | Cases were | | including | No data | |
| | recruited from | | information on | | |
| | the surgical- | | general health | Occupation lifting and carrying | |
| | orthopedic | | status, as well | Women | |
| | wards and from | | as the condition | Sometimes: 0.88 (0.44; 1.77) | |
| | outpatient | | of knee | <1 088 tons/life: 0.69 (0.38; 1.24) | |
| | clinics; controls | | cartilage, | ≥1 088 tons/life: 2.13 (1.14; 3.98) | |
| | were recruited | | meniscus, and | | |
| | from the | | ligaments | Men | |
| | accident | | (according to | No data | |
| | surgery services | | the Inter- | | |
| | and were | | national | | |
| | matched | | Cartilage Repair | | |
| | according to | | Society | | |
| | age and place of | | standard). The | | |
| | residence | | patient record | | |
| | | | was filled out by | | |
| | Cases were | | the orthopaedic | | |
| | diagnosed with | | surgeon | | |
| | knee osteo- | | treating the | | |
| | arthritis for no | | patient (cases | | |
| | longer than 10 | | only) | | |
| | years, had no | | - 11 | | |
| | previous | | | | |
| | fractures | | | | |
| | involving knee | | | | |
| | joints or injuries | | | | |
| | of the knee and | | | | |
| | no | | | | |
| | inflammatory or | | | | |
| | reactive knee | | | | |
| | joint illnesses | | | | |
| | joint innesses | | | | |

| | | Controls had | | | | |
|-----------|--------------|----------------------------------|-------------------------------|--------------------------|---|---|
| | | treatment for | | | | |
| | | an accident due | | | | |
| | | to an external | | | | |
| | | (not work- | | | | |
| | | related) cause, | | | | |
| | | and no | | | | |
| | | diagnosis of | | | | |
| | | knee osteo- | | | | |
| | | arthritis | | | | |
| | | n=1 310 (739 | | | | |
| | | cases and 571 | | | | |
| | | controls) | | | | |
| | | 741 women and | | | | |
| | | 569 men | | | | |
| Lau et al | Case-control | Participants | Several factors | Knee and hip | Association of various factors (occupational | Association of various factors |
| 2000 | | were recruited | Data on | osteoarthritis | exposures in longest occupation) with the risk | (occupational exposures in longest |
| [18] | General | from | exposure was | The medical | of osteoarthritis of the hip and knee. OR (95% | occupation) with the risk of |
| China | population | orthopedic | assessed by | records of all | CI) by conditional logistic regression, without | osteoarthritis of the hip and knee. OR |
| | | clinics at | interviews, | subjects were | adjustment | (95% CI) by conditional logistic |
| | 1998 | hospitals in | using a | reviewed. | | regression; only variables that were |
| | | Hong Kong. The | standardized | Patients were | Osteoarthritis of the knee (with knee-injury in | found to be significantly associated |
| | | age of the | questionnaire | excluded if they | both patient and control group) | with osteoarthritis in univariate analysis |
| | | participants is | | had sustained a | Women and men | were included in each model |
| | | not stated in | In defining the | hip fracture; | Climbing stairs ≥15 flights/d: 34.0 (4.7; 248.4) | |
| | | the article, but | main job, only | fulfilled criteria | Lifting $\geq 10 \text{ kg} \leq 10 \text{ times/week: } 25.9 (8.1; 82.4)$ | Osteoarthritis of the knee |
| | | cases and | paid | for rheumatoid | Lifting ≥10 kg >10 times/week: 8.9 (2.6; 30.1) | Women |
| | | controls were matched for age | employment was considered, | arthritis, ankylosing | Osteoarthritis of the knee (no injury) | Walking ≥2 hours/day: 0.8 (0.5; 1.1) Stairs ≥15 flights/day: 5.1 (2.5; 10.2) |
| | | matched for age | excluding | spondylitis or | Women | Lifting $\geq 10 \text{ kg} \leq 10/\text{week}$: 1.2 (0.7; 2.0) |
| | | Cases had | unpaid | secondary | Wollking ≥2 hours/day: 1.4 (1.1; 1.8) | Lifting $\geq 10 \text{ kg} \geq 10/\text{week}$: 1.2 (0.7, 2.0) Lifting $\geq 10 \text{ kg} > 10/\text{week}$: 2.0 (1.2; 3.1) |
| | | primary osteo- | housework | osteoarthritis | Squatting ≥ 1 hour/day: 1.4 (1.1, 1.8) | Use of vibration tools: 3.7 (0.7; 20.1) |
| | | arthritis grade 3 | Housework | | Squatting ≥ 1 hour/day: 1.1 (0.6, 1.3) Kneeling ≥ 1 hour/day: 0.9 (0.6; 1.3) | |
| | | or 4 of the hip | For cases, the | The orthopedic | Climbing stairs ≥15 flights/day: 6.1 (3.5; 10.8) | Men |
| | | or knee | main job was | surgeons in | Digging ≥ 1 hour/day: 0.9 (0.5; 1.3) | Wen Walking ≥2 hours/day: 1.0 (0.5; 2.1) |
| | | | defined as the | charge of the | Driving ≥4 hours/day: no data | Stairs \geq 15 flights/day: 2.5 (1.0; 6.4) |
| | | Controls were | occupation that | patients graded | Lifting ≥10 kg 1–10 times/week: 1.5 (1.0: 2.2) | Lifting $\geq 10 \text{ kg} \leq 10/\text{week}$: 1.5 (0.6; 3.5) |
| | | consecutive | had been held | the osteo- | Lifting ≥10 kg >10 times/week: 3.0 (2.2; 4.1) | |

| subjects | for the longest | arthritis | Lifting ≥50 kg 1–10 times/week: 0.9 (0.5; 1.7) | Lifting ≥10 kg >10/week: 5.4 (2.4; 12.4) |
|------------------|-----------------|------------------|---|---|
| without | time before the | patients | Lifting ≥50 kg >10 times/week: 2.9 (1.9; 4.5) | Use of vibration tools: 2.8 (0.8; 10.0) |
| osteoarthritis | | according to the | Use of vibration tools: 5.3 (1.6; 18.3) | |
| who attended | | Kellgren and | | |
| general practi | | Lawrence scale, | Men | Osteoarthritis of the hip |
| clinics located | | using | Walking ≥2 hours/day: 2.2 (1.4; 3.5) | Women |
| in the same | been held for | radiographs of | Squatting ≥ 1 hour/day: 1.2 (0.7; 2.0) | Squatting ≥1 hour/day: 1.2 (0.5; 3.0) |
| regions as the | | the hip or knee | Squatting ≥ 1 hour/day: 1.2 (0.7; 3.0) Kneeling ≥ 1 hour/day: 1.4 (0.7; 3.0) | Stairs ≥15 flights/day: 2.3 (0.6; 8.1) |
| study hospital | _ | the hip of knee | Climbing stairs \geq 15 flights/day: 4.1 (2.1: 8.2) | Digging ≥1 hour/day: 2.2 (0.8; 6.5) |
| during the stu | | | Digging ≥ 1 hour/day: 0.9 (0.3; 2.6) | Lifting $\geq 10 \text{ kg} \leq 10/\text{week}$: 0.7 (0.3; 1.7) |
| period. Contro | | | Digging ≥ 1 hour/day: 0.5 (0.2; 1.4) | Lifting $\geq 10 \text{ kg} > 10/\text{week}$: 2.4 (1.1; 5.3) |
| were | | | Lifting ≥ 10 kg 1–10 times/week: 1.7 (0.9; 3.2) | Use of vibration tools: 7.9 (0.8; 77.8) |
| individually | Only data | | Lifting $\geq 10 \text{ kg}$ s $= 10 \text{ times/week: } 1.7 (0.9, 5.2)$ Lifting $\geq 10 \text{ kg}$ s $> 10 \text{ times/week: } 5.8 (3.1; 10.8)$ | |
| matched to | relating to the | | Lifting $\geq 50 \text{ kg}$ 1–10 times/week: 3.8 (3.1, 10.8) Lifting $\geq 50 \text{ kg}$ 1–10 times/week: 3.5 (1.4; 8.8) | Men |
| cases by sex | main job are | | Lifting $\geq 50 \text{ kg} > 10 \text{ times/week: } 5.3 (1.4, 8.8)$ Lifting $\geq 50 \text{ kg} > 10 \text{ times/week: } 7.1 (3.1; 16.2)$ | Walking ≥2 hours/day: 1.3 (0.3; 6.7) |
| and age. | presented | | Use of vibration tools: 3.3 (1.3; 8.3) | Kneeling ≥1 hour/day: 7.4 (0.7; 76.9) |
| Matches were | | | 036 01 VIDI 81011 (0013: 5.5 (1.5, 8.5) | Stairs ≥15 flights/day: 12.5 (1.5; 104.3) |
| made one to | | | Osteoarthritis of the hip | Lifting ≥10 kg ≤10/week: 1.8 (0.4; 8.1) |
| one for osteo | | | Women | Lifting ≥10 kg >10/week: 3.1 (0.7; 14.3) |
| arthritis of the | | | Wolking ≥ 2 hours/day: 1.4 (0.9; 2.3) | |
| knee, and three | | | Squatting ≥ 1 hour/day: 1.6 (1.0; 2.8) | |
| to one for | | | Squaring ≥ 1 hour/day: 1.3 (0.7; 2.5) Kneeling ≥ 1 hour/day: 1.3 (0.7; 2.5) | |
| osteoarthritis | of | | Climbing stairs \geq 15 flights/day: 2.5 (1.0; 5.9) | |
| the hip | | | Digging ≥1 hour/day: 2.7 (1.4; 5.2) | |
| | | | Driving \geq 4 hours/day: no data | |
| Subjects who | | | Lifting $\geq 10 \text{ kg } 1-10 \text{ times/week: } 0.7 (0.4; 1.5)$ | |
| had musculo- | | | Lifting ≥ 10 kg >10 times/week: 3.0 (1.8; 5.1) | |
| skeletal | | | Lifting $\geq 50 \text{ kg}$ 1–10 times/week: 2.0 (0.9; 4.6) | |
| disorders wer | e | | Lifting \geq 50 kg >10 times/week: 2.9 (0.5, 4.0) | |
| excluded | ~ | | Use of vibration tools: 5.0 (1.2; 20.9) | |
| | | | | |
| n=1 778 | | | Men | |
| participants. | | | Walking ≥2 hours/day: 3.9 (1.3; 12.1) | |
| 796 cases (13 | 8 | | Squatting ≥ 1 hour/day: 1.3 (0.5; 3.2) | |
| hip and 658 | | | Kneeling ≥ 1 hour/day: 3.9 (1.1; 14.2) | |
| knee osteo- | | | Climbing stairs \geq 15 flights/day: 8.7 (1.8; 42.7) | |
| arthritis) and | | | Digging ≥1 hour/day: 2.0 (1.3; 12.0) | |
| 982 controls | | | Driving ≥ 4 hours/day: 0.4 (0.04; 3.0) | |
| | | | Lifting $\geq 10 \text{ kg } 1-10 \text{ times/week: } 1.9 (0.6; 6.6)$ | |
| 1 326 women | | | Lifting $\geq 10 \text{ kg} > 10 \text{ times/week: 5.3 (1.8; 15.8)}$ | |
| and 452 men | | | Lifting ≥50 kg 1–10 times/week: 8.5 (1.6; 45.3) | |

| r | r | | | r | | |
|-------------|--------------------|-------------------|------------------|-------------------|--|--------------------------------------|
| | | | | | Lifting ≥50 kg >10 times/week: 9.6 (2.2; 42.2) | |
| | | | | | Use of vibration tools: 0.7 (0.2; 2.3) | |
| Lehto et al | Case-control study | Participants | Static work | Arthrosis of the | Comparison between drill and mirror hands | - |
| 1990 | | were members | Data on static | hand | There were no statistical differences in the | |
| [19] | Dentists | of Turku Dental | work was | A person was | prevalence, extent or distribution of arthrosis | |
| Finland | | Society who | assessed by | classified as | observed between the drill and mirror hands | |
| | Time when the | had been | comparing the | having arthrosis | (data not shown) | |
| | study was | practicing | mirror and drill | of the hands if | | |
| | performed not | dentistry for a | hands of | any one of the | | |
| | stated | minimum of 10 | dentists. The | 30 joints | | |
| | | years | work performed | classified fell | | |
| | | | by the drill and | into classes 2–4 | | |
| | | Age: 33–69 | mirror hands | of the | | |
| | | years | differs in the | Kellergren and | | |
| | | | proportion of | Lawrence grade | | |
| | | n=134 | static versus | | | |
| | | | dynamic work; | The X-ray | | |
| | | 91 women and | the mirror hand | pictures of the | | |
| | | 43 men | is engaged in | dentists were all | | |
| | | | somewhat more | evaluated by | | |
| | | | static work than | one | | |
| | | | the drill hand | roentgenologis, | | |
| | | | | without | | |
| | | | | knowledge of | | |
| | | | | the age and sex | | |
| | | | | of the | | |
| | | | | examinee. The | | |
| | | | | X-ray pictures of | | |
| | | | | the controls had | | |
| | | | | been evaluated | | |
| | | | | by another | | |
| | | | | roentgenologist | | |
| Manninen et | Case-control study | Participants | Several factors | Knee | Crude association of severe knee osteoarthritis | Association of severe knee |
| al | | were patients | Information on | osteoarthritis | with the level of occupational exposures | osteoarthritis with the level of |
| 2002 | Patients with knee | who had | explanatory | The knee | before the age of 49 years – logistic regression | occupational exposure before the age |
| [20] | osteoarthritis | undergone their | variables was | osteoarthritis | modeling. OR (95% CI) | of 49 years – logistic regression |
| Finland | | first knee | obtained by a | was identified | | modeling. OR (95% Cl) adjusted for |
| | The study was | arthroplasty | computer- | by a physician | All | body mass index, knee injury and |
| | initiated in 1994 | operation for | assisted | | Physical workload (low: 1.00) | physical exercise |
| | | primary knee | telephone | | Medium: 1.93 (1.18; 3.16) | |
| | | osteoarthritis in | interview. | | High: 2.19 (1.32; 3.64) | All |

| the Kuopio | Exposure was | | Physical workload (low: 1.00) |
|---------------|-----------------|-------------------------------------|-------------------------------------|
| University | assessed up to | Standing (low: 1.00) | Medium: 1.74 (0.98; 3.09) |
| Hospital in | 49 years of age | Medium: 0.68 (0.42; 1.09) | High: 2.02 (1.11; 3.65) |
| Finland | , . | High: 0.74 (0.50; 1.07) | o () , |
| | Work history | | Standing (low: 1.00) |
| Age: 55–75 | was requested | Kneeling and squatting (none: 1.00) | Low: 1.00 |
| years old | retrospectively | <2 hours/day: 0.95 (0.65; 1.39) | Medium: 0.57 (0.33; 0.99) |
| - | in detail, and | ≥2 hours/day: 1.69 (1.17; 2.44) | High: 0.62 (0.40; 0.95) |
| n=805 | exposure to | | |
| | physical load | Climbing (low: 1.00) | Kneeling and squatting (none: 1.00) |
| 281 cases and | factors in each | Medium: 1.36 (0.99; 1.87) | <2 hours/day: 0.85 (0.55; 1.32) |
| 524 referents | job was | High: 1.47 (0.94; 2.32) | \geq hours/day: 1.73 (1.13; 2.66) |
| | inquired about | | 22 110015/0dy. 1.75 (1.13; 2.00) |
| 610 women and | separately | Walking (low: 1.00) | |
| 195 men | | Medium: 0.89 (0.61; 1.28) | Climbing (low: 1.00) |
| | Questions used | High: 1.01 (0.97; 1.43) | Medium: 1.31 (0.91; 1.90) |
| | to assess the | | High: 1.61 (0.96; 2.71) |
| | different | Lifting (low: 1.00) | |
| | exposure | Medium: 1.01(0.68; 1.51) | Walking (low: 1.00) |
| | factors are | High: 1.17 (0.83; 1.64) | Medium: 1.00 (0.65; 1.53) |
| | stated in the | | High: 1.06 (0.68; 1.64) |
| | article | Driving (low: 1.00) | (0.08, 1.04) |
| | | Medium: 0.73 (0.40; 1.33) | |
| | | High: 1.35 (0.77; 2.37) | Lifting (low: 1.00) |
| | | | Medium: 0.99 (0.63; 1.56) |
| | | Women | High: 1.04 (0.70; 1.55) |
| | | Physical workload (low: 1.00) | |
| | | Medium: 1.64 (0.94; 2.87) | Driving (low: 1.00) |
| | | High: 2.17 (1.21; 3.88) | Medium: 0.95 (0.49; 1.82) |
| | | | High: 1.23 (0.64; 2.35) |
| | | Standing (low: 1.00) | Warran |
| | | Medium: 0.78 (0.45; 1.35) | Women |
| | | High: 0.88 (0.56; 1.37) | Physical workload (low: 1.00) |
| | | | Medium: 1.60 (0.83; 3.06) |
| | | Kneeling and squatting (none: 1.00) | High: 2.03 (1.03; 3.99) |
| | | <2 hours/day: 0.98 (0.64; 1.51) | Standing (Journ 1 00) |
| | | ≥2 hours/day: 1.71 (1.13; 2.60) | Standing (low: 1.00) |
| | | | Medium: 0.55 (0.29; 1.04) |
| | | Climbing (low: 1.00) | High: 0.70 (0.42; 1.16) |
| | | Medium: 1.20 (0.84; 1.71) | Knooling and quanting (nones 1.00) |
| | | High: 1.36 (0.80; 2.31) | Kneeling and squatting (none: 1.00) |

| | <2 hours/day: 0.97 (0.59; 1.59) |
|--------------------------------------|-------------------------------------|
| Walking (low: 1.00) | ≥2 hours/day: 1.81 (1.11; 2.95) |
| Medium: 0.78 (0.52; 1.17) | |
| High: 0.95 (0.60; 1.49) | Climbing (low: 1.00) |
| | Medium: 1.08 (0.71; 1.63) |
| Lifting (low: 1.00) | High: 1.50 (0.81; 2.77) |
| Medium: 0.95 (0.61; 1.48) | |
| High: 1.17 (0.79; 1.72) | Walking (low: 1.00) |
| | Medium: 0.89 (0.56;1.42) |
| Driving (low: 1.00) | High: 1.06 (0.64; 1.76) |
| Medium: 0.93 (0.42; 2.05) | ingin 1.00 (0.0 i) 1.70 |
| High: 1.00 (0.36; 2.81) | Lifting (low: 1.00) |
| Man | Medium: 0.90 (0.55; 1.50) |
| Men Physical workload (low: 1.00) | High: 1.11 (0.71; 1.75) |
| Medium: 3.00 (1.05; 8.57) | 111g11. 1.11 (0./1, 1./3) |
| High: 2.21 (0.75; 6.47) | Driving (low: 1.00) |
| (0.75, 0.47) | Medium: 1.19 (0.49; 2.85) |
| Standing (low: 1.00) | High: 0.98 (0.31; 3.10) |
| Medium: 0.52 (0.20; 1.33) | mgn. 0.50 (0.51, 5.10) |
| High: 0.46 (0.22; 0.95) | Men |
| mgn. 0.40 (0.22, 0.93) | Physical workload (low: 1.00) |
| Kneeling and squatting (none: 1.00) | Medium: 2.23 (0.64; 7.72) |
| <2 hours/day: 0.81 (0.34; 1.91) | High: 1.53 (0.42; 5.56) |
| ≥2 hours/day: 0.01 (0.03) (0.01) | |
| | Standing (low: 1.00) |
| Climbing (low: 1.00) | Medium: 0.57 (0.18; 1.73) |
| Medium: 2.28 (1.12; 4.64) | High: 0.36 (0.15; 0.90) |
| High: 2.02 (0.82; 4.95) | |
| | Kneeling and squatting (none: 1.00) |
| Walking (low: 1.00) | <2 hours/day: 0.58 (0.21; 1.64) |
| Medium: 1.56 (0.67; 3.66) | ≥2 hours/day: 1.68 (0.66; 4.28) |
| High: 1.20 (0.54; 2.64) | |
| | Climbing (low: 1.00) |
| Lifting (low: 1.00) | Medium: 3.06 (1.25; 7.46) |
| Medium: 1.33 (0.52; 3.41) | High: 2.79 (0.96; 8.16) |
| High: 1.18 (0.57; 2.43) | 11g1. 2.79 (0.90, 6.10) |
| Driving (low: 1.00) | Walking (low: 1.00) |
| Medium: 0.95 (0.49; 1.82) | Medium: 2.07 (0.73; 5.89) |
| High: 1.23 (0.64; 2.35) | High: 1.47 (0.55; 3.89) |

| | | | | | | Lifting (low: 1.00) |
|--------|------------------|------------------|-------------------|------------------|---|---------------------------|
| | | | | | | Medium: 1.35 (0.57; 4.16) |
| | | | | | | High: 0.92 (0.50; 2.39) |
| | | | | | | Driving (low: 1.00) |
| | | | | | | Medium: 0.81 (0.28; 2.30) |
| | | | | | | High: 1.35 (0.59; 3.43) |
| Muraki | Cohort with | Participants | Several factors | Knee | Association of Kellgren/Lawrence grade >2 | - |
| 2009 | exposure data | were 50 years | The article does | osteoarthritis | knee osteoarthritis with occupational activity. | |
| [21] | collected | and older | not specify | Knee pain was | OR (95% CI) adjusted for age, sex, and body | |
| Japan | retrospectively | (mean age 68 | which | assessed by | mass index in the overall population, and for | |
| | | years), | instrument the | interview | age and body mass index in both sexes | |
| | Description of | recruited from | authors used to | | | |
| | exposure in the | listings of | assess data on | Radiographic | Occupational activities | |
| | longest held job | resident | exposure | examination | Women and men | |
| | | registrations in | | was conducted | Sitting on a chair ≥2 h/day: 0.73 (0.57; 0.92) | |
| | General | three Japanese | Information was | of both knees | Kneeling ≥1 hour/day: 1.11 (0.83; 1.48) | |
| | population | communities. | collected about | | Squatting ≥1 hour/day: 1.23 (0.94; 1.61) | |
| | | Participants | job title and | Radiographs | Standing ≥2 hours/day: 1.97 (1.43; 2.72) | |
| | The time when | were living in | occupational | were read by an | Walking ≥3 km/day: 1.80 (1.42; 2.29) | |
| | the study was | mountainous | activity | orthopedist | Climbing ≥1 hour/day: 2.24 (1.65; 3.04) | |
| | performed is not | and seacoast | including a | using the | Lifting weights: 1.90 (1.50; 2.42) | |
| | stated | areas | lifetime | Kellgren/Lawre | | |
| | | | occupational | nce | Women | |
| | | The most | history with | radiographic | Sitting on a chair ≥2 h/day: 0.80 (0.60; 1.09) | |
| | | common work | details of 7 | atlas, and the | Kneeling ≥1 hour/day: 1.36 (0.93; 1.97) | |
| | | was clerical or | types of specific | severity was | Squatting ≥1 hour/day: 1.50 (1.06; 2.13) | |
| | | technical work, | work place | determined by | Standing ≥2 hours/day: 1.78 (1.21; 2.63) | |
| | | followed by | physical | Kellgren/Lawre | Walking ≥3 km/day: 1.59 (1.17; 2.16) | |
| | | agricultural, | activities | nce grading. | Climbing ≥1 hour/day: 1.85 (1.19; 2.96) | |
| | | forestry or | | Knee | Lifting weights: 1.68 (1.24; 2.26) | |
| | | fishery and | Data on lifting | osteoarthritis | | |
| | | factory or | weights ≥10 kg | was defined as | Men | |
| | | construction | at least once a | a grade ≥2 in at | Sitting on a chair ≥2 h/day: 0.63 (0.44; 0.92) | |
| | | work | week is listed in | least one knee | Kneeling ≥1 hour/day: 0.79 (0.49; 1.26) | |
| | | | the article | | Squatting ≥1 hour/day: 0.89 (0.58; 1.35) | |
| | | n=1 471 | | | Standing ≥2 hours/day: 2.31 (1.32; 4.17) | |
| | | | | | Walking ≥3 km/day: 2.17 (1.49; 3.16) | |
| | | | | | Climbing ≥1 hour/day: 2.43 (1.64; 3.60) | |

| Bits Bits Ithing weights: 2.26 (1.52; 3.40) Olse rel al 1994 Case-control study The participants invert in the stochome Manual handling and performal s sorted Hip opulation Association of hip obscent/trisis with physical was obtained by was obtained by means of an interview and a performe ls not stated | , | | · · · | | | | 1 |
|---|-------------|--------------------|------------------|-----------------|----------------|---|------------------------------------|
| Olsen et al 1994 Case-control study Ferefaral areas of population Manual lived in the participants index interview and aperformed is not stated Manual herefaral areas of four large body mass index, smoking, and sports activities body mass index, smoking, and sports activities - Sweden The time when the study was performed is not stated Stockholm, 1984-1928 Hip costcoarthrosis was obtained by astate work performed is not stated Hip costcoarthrosis Association of work loads. RR adjusted for adjusted for adjusted for adjusted in patients who in the view and a questionnaire Hip costcoarthrosis State The cases were men who received a first- time prosthesis of the hip joint as a result of idepathic ostcoarthrosis Hip costcoarthrosis Association of work loads. RR adjusted for inpatients who a state work load and of the hip joint as a result of idepathic ostcoarthrosis - The cances were randomly selected population The cases were men who received a first- the cumulative as result of idepathic general population Association of the hip joint as a result of idepathic sotcoarthrosis Number of lints (-A0kg) Low exposure: 1.00 Medium exposure: 1.00 Medium exposure: 1.33 High exposure: 1.33 High exposure: 1.33 High exposure: 1.33 High exposure: 1.52 Roach et al 1994 Case-control study Participants were men Manual Manual Hip ostcoarthrosis The relationship between work load and ostcoarthrosis of the hip. OR (55% Cl) The relationship between work load and ostcoarthrosis of the hip. OR (55% Cl) <td></td> <td></td> <td></td> <td></td> <td></td> <td>Lifting weights: 2.26 (1.52; 3.40)</td> <td></td> | | | | | | Lifting weights: 2.26 (1.52; 3.40) | |
| 1994 General Ived in the population handling and hospitals in stated handling and hospitals in stated handling and hospitals in stated handling and hospitals in stated work loads four large hospitals in stated work loads four large hospitals in stated handling and hospitals in stated work loads four large hospitals in interview and a uniterview and a stated work loads four large hospital 1994 The time when the study was stated Four large four large four large for the hip joint as a result of idiopathic of the hip joint as a result of idiopathic osteoarthrosis a result of idiopathic osteoarthrosis s result of idiopathic osteoarthrosis Tos lifted Low exposure: 1.00 Medlum exposure: 1.38 High exposure: 1.38 High exposure: 1.38 High exposure: 1.32 High exposure: 1.32 H | | | | | | | |
| [22] Sweden General population referral areas of four large hospitals in stated referral areas of hospitals in state static work the population Hip body mass index, smoking, and sports activities The time when the study was performed is not stated Stockholin, 1984–1988 static work means of an upstime was diamined in patients who received a first- time prosthesis of the hip joint as a result of indiopathic osteoarthrosis Hip body mass index, smoking, and sports activities Static and dynamic work Low exposure: 1.82 Wellow Hip body means of an upstime prosthesis of the hip joint as a result of indiopathic osteoarthrosis The cases were mean who received a first- time prosthesis of the hip joint as a result of indiopathic osteoarthrosis Hip hysical work indiopathic osteoarthrosis Hip hysical work indiopathic osteoarthrosis Hip hysical work indiopathic osteoarthrosis Hip hysical work indiopathic osteoarthrosis Hip hysical work indiopathic osteoarthrosis Hip hysical work indiopathic indiopathic participathic from the general population Hip hysical work indiopathic indiopathic participathic from the general population Hip hysical work indiopathic indiopathic participathic from the general population Hip hysical work indiopathic participathic from the general population Hip hysical work indiopathic participathic from the general population Hip hysical work indiopathic hysical wo | | Case-control study | | | • | | - |
| Sweden population four large hospitals in the study was stated Four large hospitals in the study was stated Exposure data bits view nears of an interview and stated exposure data hospitals in the cive of an interview and stated exposure data hospitals in the cive of an interview and stated so tating day hospitals in the cive of an interview and stated State and dynamic work bits in the protive of the hip joint as a result of the hip joint as a result of idiopathic osteoarthrosis State and dynamic work high exposure: 1.00 Medium exposure: 1.82 The case were men who is determine as a result of the hip joint as a result of the population secore and population Exposure to physical work idiopathic osteoarthrosis State and dynamic work high exposure: 1.00 Medium exposure: 1.00 Medium exposure: 1.58 Number of hours of the controls were randomly selected population The controls measured as resposure up to 49 years of age from the general population Number of hours of age selected participants from the general population The age was 50-70 years The age was 50-70 years The age was 50-70 years The age was 50-70 years in-541 239 cases and 302 controls were men Nanual measured Hip osteoarthrosis The relationship between work load and osteoarthrosis The relationship between work load and osteoarthrosis | | | | - | osteoarthrosis | | |
| Rochet al Case-controls Manual Manual Was obtained by was obtained by mains of an inplained with a sa result of inplained with a sa result of ind he hip joint as a result of ind he hip of the hip joint as a result of ind he hip of the hip joint as a result of ind he hip of the hip joint as a result of ind he hip of the hip joint as a result of ind he hip of the hip joint as a result of ind he hip of the hip joint as a result of ind he hip of the hip joint as a result of ind he hip of the hip joint as a result of ind he hip of the hip joint as a result of ind he hip of the hip joint as a result of ind he hip of the hip joint as a result of ind he hip of the hip joint as a result of ind he hip of the hip | | | | | | body mass index, smoking, and sports activities | |
| The time when be study was performed is not stated Stockholm, 1984-1988 means of an interview and an interview and interview a | Sweden | population | 0 | | | | |
| Roach at 1 Case-control is ont stated 1984–1988 interview and a questionnaire receive da first- time prosthesis of the hip joint as a result of interview as a result of receive da first- time prosthesis Medium exposure: 1.82 Number of infination as a result of interview as a result of othe hip joint as a result of othe hip joint as a result of othe hip joint as a result of othe system: 1.00 Tos ilfed Tos exposure: 1.00 Number of infination as a result of othe system other as a result of other hip joint as a result of other prosthesis idiopathic other othe | | | | , | | - | |
| performed is not stated The cases were men who received a first time prosthesis of the hip joint High exposure 2.42 kip exposure 1.00 Tons lifted load was of the hip joint Tons lifted load was of the hip joint as a result of idopatic of the hip joint Indo avas measured as a a result of load was Tons lifted load was of the hip joint Medium exposure: 1.52 Medium exposure: 1.58 High exposure: 1.00 Medium exposure: 1.84 High exposure: 1.00 Medium exposure: 1.38 High exposure: 1.00 Medium exposure: 1.38 High exposure: 1.00 Medium exposure: 1.38 High exposure: 1.30 High exposure: 1.00 Medium exposure: 1.31 High exposure: 1.32 High exposure: 1.33 High exposure: 1.52 Number of jumps Low exposure: 1.52 Not Jag 2 ases and 1994 All participants were ment High <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> | | | | | | | |
| statedThe cases were men who received a first- time prosthesis of the hip joint as a result of idiopathic osteoarthrosisTons lifed Low exposure: 1.00 Medium exposure: 1.58 High exposure: 1.38 Number of lifts (>40kg) Low exposure: 1.38 High exposure: 1.52Tone lifts (>40kg) Low exposure: 1.38 High exposure: 1.52Number of imps Low exposure: 1.00 Medium exposure: 1.52Tone state Posure: 1.52Number of imps Low exposure: 1.52Number of imps Low exposure: 1.52Tone state Posure: 1.52Number of imps Low exposure: 1.52Number of imps Low exposure: 1.52Tone state Posure: 1.52Number of imps Low exposure: 1.52Number of imps Low exposure: 1.52Tone state Posure: 1.52Number of imps Low exposure: 1.52Number of imps Low exposure: 1.52Tone state Posure: 1.52Tone state Posure: 1.52Nume of imps Low exposure: 1.52Tone state Posure: 1.52Tone state Posure: 1.52Number of imps Low exposure: 1.52Tone state Posure: 1.52Tone state Posure: 1.52Nume of imps Low exposure: 1.52 </td <td></td> <td></td> <td>1984–1988</td> <td></td> <td></td> <td></td> <td></td> | | | 1984–1988 | | | | |
| Roach etal Case-control study Manual Exposure to a sa result of physical work i ph | | • | | questionnaire | | High exposure: 2.42 | |
| Roach et al Case-control study Participants were mean Manual Manua | | stated | | | | | |
| Roach et al Case-control stand Manual Manual Medium exposure: 1.58 High exposure: 1.84 High exposure: 1.84 High exposure: 1.84 High exposure: 1.84 Number of lifts (-40kg) Low exposure: 1.00 Number of lifts (-40kg) Low exposure: 1.38 High exposure: 1.38 High exposure: 1.38 Medium exposure: 1.38 High exposure: 1.38 High exposure: 1.00 Low exposure: 1.00 Number of Jumps Low exposure: 1.38 High exposure: 1.38 High exposure: 1.38 High exposure: 1.39 High exposure: 1.38 High exposure: 1.39 High exposure: 1.38 High exposure: 1.39 High exposure: 1.39 | | | | | | | |
| Roach et al Case-control study of the hip joint as a result of indignathic osteo arthrosis measured as the cumulative investor of osteo arthrosis High exposure: 1.84 High exposure: 1.00 Number of lifts (>40kg) Low exposure: 1.00 Were randomly selected 49 years of age Were randomly selected High exposure: 1.38 High exposure: 1.00 Medium exposure: 1.01 Number of jumps general population The age was 50-70 years S0-70 years Jall participants were mem All participants were mem All participants were mem All participants were mem Jose 1994 | | | | | | | |
| Roach et al Case-control study Participants integrate Manual Manua Manual Manu Manual Manu Manual Manu Manu Manu Manun Man | | | | | osteoarthrosis | | |
| Roach et alCase-control studyIdiopathic osteoarthrosisnumber of hours of exposure up to 49 years of ageNumber of lifts (>40kg) Low exposure: 1.00 Medium exposure: 1.38 High exposure: 2.48Number of jumps participants from the general populationNumber of jumps Low exposure: 1.00 Medium exposure: 1.00 Medium exposure: 1.38 High exposure: 1.00 Medium exposure: 1.38 High exposure: 1.00 Medium exposure: 1.00 Medium exposure: 1.00 Medium exposure: 1.00 Medium exposure: 1.52The age was 50-70 yearsI-he age was 50-70 years239 cases and 302 controlsI-he age was 100All participants were menI-he age was 100Poach et al 1994Case-control studyManual handing andHip osteoarthrossThe relationship between work load and osteoarthritis of the hip. 0R (95% CI)The relationship of the hip. 0R (95% CI) | | | | | | High exposure: 1.84 | |
| Roach et al Case-control study Participants were man Manual handling and Hip pop Low exposure: 1.00 Medium exposure: 2.48 High exposure: 2.48 Number of jumps Low exposure: 1.00 Medium exposure: 1.00 Medium exposure: 1.33 High exposure: 1.00 Medium exposure: 1.00 Medium exposure: 1.33 The age was 50-70 years Form the general population Form the general population Form the general population Form the general population Number of jumps Low exposure: 1.00 The age was 50-70 years Form the general population Form the general population Form the general population Form the general population Number of jumps Low exposure: 1.02 The age was 50-70 years Form the general population Form the gen | | | | | | | |
| Roach et alCase-control studyParticipants were manManual ManualHip ManualMedium exposure: 1.38 High exposure: 2.48Number of jumps Low exposure: 1.00 Medium exposure: 1.03 High exposure: 1.52Low exposure: 1.00 Medium exposure: 1.52The age was 50-70 yearsThe age was 50-70 yearsLow exposure: 1.521111239 cases and 302 controlsLow exposure: 1.5211< | | | | | | | |
| Roach et alCase-control studyParticipants harding and boxHip handing andThe relationship between work load and osteoarthroisisHigh exposure: 2.48 Number of jumps Low exposure: 1.00 Medium exposure: 1.00 Medium exposure: 1.00 Medium exposure: 1.83 High exposure: 1.52High exposure: 1.00 Medium exposure: 1.52The age was 50-70 years | | | osteoarthrosis | | | | |
| were randomly selected participants from the general populationwere randomly selected participants from the general populationNumber of jumps Low exposure: 1.00 Medium exposure: 1.83 High exposure: 1.52The age was 50-70 years | | | | | | | |
| selected participants from the general population selected participants from the general population Number of jumps Low exposure: 1.00 Medium exposure: 1.83 High exposure: 1.52 The age was 50-70 years The age was 50-70 years Form the general population Form the general population n=541 1 Form the general population Form the general population Form the general population 239 cases and 302 controls 239 cases and 302 controls Form the general population Form the general population Form the general population Roach et all 1994 Case-control study (both cases and bandling and Hip osteoarthrois poteoarthrois The relationship between work load and osteoarthritis of the hip. OR (95% CI) The relationship between work load and osteoarthritis of the hip. OR (95% CI) | | | | 49 years of age | | High exposure: 2.48 | |
| Roach et al Case-control study Participants from the general population Manual handling and Hip osteoarthroiss The relationship between work load and osteoarthritis of the hip. OR (95% CI) The relationship between work load and and osteoarthritis of the hip. OR (95% CI) | | | | | | | |
| Roach et alCase-control studyParticipants (both cases and bandling andManual handling andMedium exposure: 1.83 High exposure: 1.52Medium exposure: 1.52Medium exposure: 1.52The age was 50-70 yearsThe age was 50-70 yearsFor age was 50-70 yearsFor age was For age was <br< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></br<> | | | | | | | |
| Roach et al Case-control study Participants (both cases and 1994 Manual Analing and banding and ba | | | | | | | |
| Roach et al Case-control study Participants Manual Hip The relationship between work load and osteoarthrritis of the hip. OR (95% CI) The relationship between work load and osteoarthritis of the hip. OR (95% CI) | | | | | | | |
| Roach et al Case-control study Participants (both cases and 302 Manual handling and Hip osteoarthrosis The relationship between work load and osteoarthritis of the hip. OR (95% CI) The relationship between work load and osteoarthritis of the hip. OR (95% CI) | | | 0 | | | High exposure: 1.52 | |
| For 20 years 50-70 years Image: Solution of the s | | | population | | | | |
| For 20 years 50-70 years Image: Solution of the s | | | The age was | | | | |
| Roach et al Case-control study Participants (both cases and both cases and bandling and Manual handling and Hip osteoarthroisis The relationship between work load and osteoarthritis of the hip. OR (95% Cl) The relationship between work load and and osteoarthritis of the hip. OR (95% Cl) | | | - | | | | |
| Roach et al 1994Case-control studyParticipants (both cases and bandling andManual handling andHip osteoarthroisisThe relationship between work load and osteoarthritis of the hip. OR (95% CI)The relationship between work load and and osteoarthritis of the hip. OR (95% CI) | | | so vo yeurs | | | | |
| Roach et al 1994 Case-control study (both cases and bandling and bandling and bandling and Hip batter ba batter batter batter batter batter batter batt | | | n=541 | | | | |
| Roach et al 1994 Case-control study (both cases and bandling and Manual handling and Hip osteoarthroisis The relationship between work load and osteoarthritis of the hip. OR (95% CI) The relationship between work load and and osteoarthritis of the hip. OR (95% CI) | | | 239 cases and | | | | |
| Roach et al 1994 Case-control study (both cases and bandling and Manual handling and Hip osteoarthroisis The relationship between work load and osteoarthritis of the hip. OR (95% CI) The relationship between work load and and osteoarthritis of the hip. OR (95% CI) | | | | | | | |
| Noach et alCase-control studyParticipantsManualHipThe relationship between work load and osteoarthritis of the hip. OR (95% CI)The relationship between work load and and osteoarthritis of the hip. OR (95% CI) | | | | | | | |
| Noach et alCase-control studyParticipantsManualHipThe relationship between work load and osteoarthritis of the hip. OR (95% CI)The relationship between work load and and osteoarthritis of the hip. OR (95% CI) | | | All participants | | | | |
| Roach et al 1994Case-control study (both cases and (both cases and handling andManual Hip osteoarthrosisHip osteoarthrosisThe relationship between work load and osteoarthritis of the hip. OR (95% CI)The relationship between work load and osteoarthritis of the hip. OR (95% CI) | | | | | | | |
| 1994 (both cases and handling and osteoarthrosis osteoarthritis of the hip. OR (95% Cl) and osteoarthritis of the hip. OR (95% | Roach et al | Case-control study | | Manual | Нір | The relationship between work load and | The relationship between work load |
| | | - / | | | | | |
| | | Patients | | - | Data on hip | · 、 / | |
| Canada drawn from the Participants osteoarthrosis Work load age 40 | | | | | | Work load | |

| Time when study | population of | were mailed a | was defined by | Light work: 1.00 | |
|-----------------|-------------------|-------------------|------------------|-------------------------------------|--------------------------------|
| was performed | male patients | questionnaire. | medical | Intermediate work: 1.9 (1.0; 3.8) | Work load |
| not stated | attending | They reported | records, | Heavy work: 2.4 (1.3; 4.3) | (also adjusted for running) |
| | outpatient | the number of | including | | Heavy work: 2.5 (1.5; 5.0) |
| | clinics of a | years they had | postoperative | Heavy work | |
| | Department of | worked at jobs | reports. This | No heavy work, only light work: 1.0 | Heavy work |
| | Veterans Affairs | in each of 5 | data was used | 15–24 years: 2.5 | (also adjusted for football) |
| | Hospital in the | occupational | to determine | 25–34 years: 2.8 | No heavy work: 1.0 |
| | metropolitan | categories: (1) | whether | >34 years: 2.0 | 15–24 years: 2.2 |
| | Chicago area | light work | subjects met | | 25–34 years: 3.0 |
| | - | standing, (2) | clinical | Test for trend, p-value: 0.047 | >34 years: 2.2 |
| | Both cases and | work sitting, (3) | classification | | |
| | controls were | heavy work | criteria for hip | | Test for trend, p-value: 0.035 |
| | excluded if they | standing, (4) | osteoarthritis, | | |
| | had a history of | work kneeling | which include | | |
| | a service | or crouching, or | age greater | | |
| | related injury | (5) work | than 40, | | |
| | which would | walking | complaint of | | |
| | have limited the | | weight bearing | | |
| | possibility of | Participants | hip pain and | | |
| | exposure to | reported the | radiographic | | |
| | heavy physical | number of years | evidence of | | |
| | labor | they had | grade 3 or 4 hip | | |
| | | performed jobs | osteoarthritis | | |
| | Cases were | in these | | | |
| | identified via | categories only | | | |
| | the | if they spent | | | |
| | computerized | more than half | | | |
| | radiology | of their work | | | |
| | database of all | day performing | | | |
| | patients who | that physical | | | |
| | received an | activity | | | |
| | outpatient hip | | | | |
| | radiograph for | Participants had | | | |
| | complaint of hip | to report at | | | |
| | pain or | least 15 years of | | | |
| | following a total | exposure to any | | | |
| | hip arthroplasty | combination of | | | |
| | from January 1, | these activities | | | |
| | 1989 to June | to be classified | | | |
| | 30, 1990 | | | | |

| | | 1 | I . | | | |
|-------------|-----------------|------------------|-----------------|----------------|--|--|
| | | | as exposed to | | | |
| | | Possible | heavy work | | | |
| | | controls were | | | | |
| | | identified from | | | | |
| | | a radiology | | | | |
| | | database. | | | | |
| | | Controls were | | | | |
| | | excluded if they | | | | |
| | | demonstrated a | | | | |
| | | minimal hip | | | | |
| | | joint space of | | | | |
| | | 1.5 mm or less | | | | |
| | | with minimal | | | | |
| | | joint space | | | | |
| | | defined as the | | | | |
| | | shortest | | | | |
| | | distance from | | | | |
| | | the margin of | | | | |
| | | the femoral | | | | |
| | | head to the | | | | |
| | | acetabulum. | | | | |
| | | Controls who | | | | |
| | | reported hip | | | | |
| | | pain without | | | | |
| | | radiologic | | | | |
| | | findings were | | | | |
| | | not excluded | | | | |
| | | n=332 | | | | |
| | | | | | | |
| | | 99 cases and | | | | |
| | | 233 controls | | | | |
| | | All participants | | | | |
| | | were men | | | | |
| Rubak et al | Register-based | Participants | Physical | Total hip | Risk estimate for hip replacement due to | Risk estimate for hip replacement due |
| 2013 | cohort study | were born in | workload | replacement | primary osteoarthritis. OR (95% CI) adjusted | to primary osteoarthritis. OR (95% CI) |
| [24] | , | Denmark | Cumulative | due to primary | for age | adjusted for age, cumulative physical |
| Denmark | General working | between 1925 | physical was | osteoarthritis | | workload, calendar year, county of |
| | population | and 1964 | assessed by | Information on | Cumulative physical workload | residence and socioeconomic status |
| | | | combining year- | type and date | (point-years)* | |
| L | 1 | | U U U U | | | L |

| Data extracted from registers | Persons were excluded if they | by-year register information on | of surgery was collected from | Women | Cumulative physical workload (point-years)* |
|----------------------------------|----------------------------------|------------------------------------|----------------------------------|---|--|
| 2007 | had not reached | employment | the a national | Never worked in industry with intermediate or | |
| | ten years of full- | with an industry | register | high physical workload (reference): 1.0 | Women |
| | lime | exposure matrix | | >0-<5: 0.97 | Never worked In industry with |
| | employment | that provided | Until 1994, | 5-<15: 0.97 | intermediate or high physical workload |
| | between 1964 | point scores of | diagnosis was | 15-<25: 0.94 | (reference): 1.0 |
| | and 2006, if | physical | based on ICD-8 | 25-<35: 0.98 | |
| | they lived in | workload. | codes (713.00) | 35–86: 1.00 | >0-<5: 0.96 (0.80; 1.06) |
| | Greenland, had | Cumulative | and thereafter | Continuous with 5-point-year increments: 1.0 | 5-<15: 0.96 (0.87; 1.05) |
| | emigrated or | physical | on ICD-10 codes | | 15-<25: 0.94 (0.85; 1.04) |
| | died, and those | workload was | (MI6.0, MI6.1, | Men | 25-<35: 0.99 (0.88; 1.10) |
| | had a hospital | expressed as | MI6.9). From | Never worked In industry with intermediate or | 35–86: 1.00 (0.88; 1.16) |
| | diagnosis of | point-years | 1996 and | high physical workload (reference): 1.0 | Continuous with 5-point-year |
| | primary hip | | onwards, | >0-<5: 1.25 | increments: 1.00 (0.99; 1.01) |
| | osteoarthritis | Information on | operations were | 5-<15: 1.33 | |
| | between 1977– | industry and | registered in | 15-<25: 1.38 | Men |
| | 1995 | degree of | accordance with | 25–<35: 1.44 | Never worked In industry with |
| | | employment | the NOMESCO | 35–86: 1.60 | intermediate or high physical workload |
| | n=1 910 493 | (part-, full-, or | Classification of | | (reference): 1.0 |
| | | over-time) was | Surgical | Continuous with 5-point-year increments: 1.03 | >0-<5: 1.13 (0.98; 1.31) |
| | 899 549 women | retrieved from a | Procedures (hip | | 5-<15: 1.14 (1.00; 1.31) |
| | and 1 010 944 | national | replacement | *)Years of full-time employment weighted by | 15–<25: 1.19 (1.04; 1.36) |
| | men | pension register | surgery: | score of physical workload in employment | 25-<35: 1.27 (1.11: 1.48) |
| | | | KNFB20, | industry | 35–86: 1.33 (1.17; 1.53) |
| | | An industry | KNFB30, | | |
| | | exposure matrix | KNFB40, | | Continuous with 5-point-year |
| | | was developed | KNFB99) | | increments: 1.02 (1.02; 1.03) |
| | | for the purpose | | | |
| | | of this study. | | | |
| | | Three of the | | | |
| | | authors | | | |
| | | independently | | | |
| | | rated the | | | |
| | | overall physical | | | |
| | | workload to the | | | |
| | | hip in each | | | |
| | | industry. | | | |
| | | Exposures taken | | | |
| | | into | | | |
| | | consideration | | | |

| | | | were primarily | | | |
|-------------|-----------------|-------------------|--------------------------|-----------------|---|--|
| | | | total load lifted | | | |
| | | | per day, | | | |
| | | | frequency of | | | |
| | | | lifting ≥ 20 kg, | | | |
| | | | whole body | | | |
| | | | vibration, and | | | |
| | | | standing/walkin | | | |
| | | | | | | |
| | | | g | | | |
| | | | Point-years was | | | |
| | | | calculated as | | | |
| | | | number of | | | |
| | | | employment | | | |
| | | | years (adjusted | | | |
| | | | to full time | | | |
| | | | employment) in | | | |
| | | | a specific | | | |
| | | | industry x the | | | |
| | | | corresponding | | | |
| | | | score of | | | |
| | | | physical | | | |
| | | | workload from | | | |
| | | | the exposure | | | |
| | | | matrix and | | | |
| | | | summarized across all | | | |
| | | | registered | | | |
| | | | employments | | | |
| Rubak et al | Nested case- | The cohort was | Several factors | Total hip | Conditional logistic regression analyses of total | Conditional logistic regression analyses |
| 2014 | control study | identified by | Data on | replacement | hip replacement due to primary osteoarthritis | of total hip replacement due to primary |
| [25] | control study | linking data | exposure was | due to primary | in relation to cumulative occupational | osteoarthritis in relation to cumulative |
| Denmark | General working | from national | assessed by | osteoarthritis | mechanical exposures. OR (95% CI) | occupational mechanical exposures. OR |
| | population | registers. It | postal | Cases of first- | | (95% CI). One occupational exposure at |
| | F - F 0.0000 | included all | questionnaire | time total hip | Women | a time adjusted for body mass index at |
| | 2005-2009 | Danish men and | on main job | replacement | Lifting (no lifting=reference) | age 25 years, change in body mass |
| | | women born | titles in specific | due to primary | <10 ton-years: 1.22 (0.96; 1.57) | index, pack-years of smoking, previous |
| | | between 1935 | periods from | osteoarthritis | 10-<20 ton-years: 0.96 (0.75; 1.24) | fracture of a lower extremity, familial |
| | | and 1964 with | 2008 going back | were identified | 20–86 ton-years: 1.12 (0.83; 1.50) | predisposition, endurance and contact |
| | | at least 10 years | to 1980 | by ICD-10 codes | | sport at age 25 years, and region of |
| | | | | M16.0, M16.1, | Standing (no standing=reference) | residence |

| of full-time | Self-reported | or M16.9 | <10 years: 0.94 (0.61; 1.43) | |
|---------------------|-------------------|-------------------|-------------------------------------|--|
| employment | job titles were | combined with | 10–<20 years: 1.13 (0.90; 1.41) | Women |
| | transformed | a surgical | 20–29 years: 1.10 (0.86; 1.40) | Lifting (no lifting=reference) |
| The mean age | into | procedure code | | <10 ton-years: 1.15 (0.87; 1.53) |
| was 65 years | occupational | of the Nordic | Whole-body vibration | 10-<20 ton-years: 0.81 (0.61; 1.09) |
| , (women) and 64 | titles using the | Medico- | Vibration: 0.91 (0.56; 1.49) | 20–86 ton-years: 1.00 (0.72; 1.41) |
| years (men) | International | Statistical | | |
| ,, | Classification of | Committee | Men | Standing (no standing=reference) |
| A total of 4 410 | Occupations (D- | Classification of | Lifting (no lifting=reference) | <10 years: 0.91 (0.56; 1.48) |
| case–control | ISCO 88). | Surgical | <10 ton-years: 1.01 (0.79; 1.30) | 10-<20 years: 0.99 (0.74; 1.25) |
| sets were | Occupational | Procedures | 10-<20 ton-years: 0.95 (0.73; 1.23) | 20–29 years: 1.03 (0.78; 1.35) |
| generated. | titles were | codes KNFB20, | 20–115 ton-years: 1.50 (1.19; 1.87) | 20 20 yearst 1:00 (01/0, 1:00) |
| Among these, | linked to a | KNFB30, | 20 115 ton years. 1.50 (1.15, 1.07) | Whole-body vibration |
| 2 500 sets were | newly | KNFB40, or | Standing (no standing=reference) | Vibration: 0.64 (0.35; 1.15) |
| randomly | developed 2- | KNFB99 | <10 years: 1.27 (0.99; 1.63) | |
| drawn for the | dimensional job | | 10–<20 years: 1.17 (0.93; 1.48) | Men |
| study. For each | exposure matrix | | 20–29 years: 1.09 (0.86; 1.38) | Lifting (no lifting=reference) |
| case, two age- | exposure matrix | | 20-25 years. 1.05 (0.80, 1.38) | <pre><10 ton-years: 0.99 (0.75; 1.30)</pre> |
| and sex- | Cumulative | | Whole-body vibration | 10–<20 ton-years: 0.89 (0.73, 1.30) |
| matched | occupational | | Vibration: 1.30 (1.03; 1.65) | 20–115 ton-years: 1.35 (1.05; 1.74) |
| controls were | mechanical | | Vibration. 1.50 (1.05, 1.05) | 20–115 ton-years. 1.55 (1.05, 1.74) |
| | | | | (the diag (as standing - reference) |
| drawn | exposures were | | | Standing (no standing=reference) |
| E 40E (4.0E0 | estimated for | | | <10 years: 1.13 (0.85; 1.50) |
| n=5 495 (1 950 | 20 years up to | | | 10-<20 years: 1.14 (0.87; 1.48) |
| cases and 3 545 | and including | | | 20–29 years: 0.99 (0.77; 1.28) |
| controls) | the third year | | | |
| | before the | | | Whole-body vibration |
| 861 sets (at | index year, | | | Vibration: 1.26 (0.97; 1.64) |
| least 1 case and | disregarding | | | |
| 1 control) for | exposure in the | | | |
| women and 915 | index year and | | | |
| sets for men | the 2 years | | | |
| | prior. Recent | | | |
| | exposures were | | | |
| | disregarded | | | |
| | | | | |
| | Occupational | | | |
| | mechanical | | | |
| | exposures were | | | |
| | cumulated for | | | |
| | 20 consecutive | | | |

| | | | years up to and including the | | | |
|-------------|------------------|-------------------------------|-------------------------------|---------------------------|---|---|
| | | | third year | | | |
| | | | before the | | | |
| | | | index year, | | | |
| | | | being the hip | | | |
| | | | replacement | | | |
| | | | year of the | | | |
| | | | case. Exposure | | | |
| | | | to whole-body | | | |
| | | | vibration was | | | |
| | | | categorized as | | | |
| | | | never/ever. | | | |
| | | | Ton-years were | | | |
| | | | standardized to | | | |
| | | | lifting 1 ton per | | | |
| | | | day for 1 year | | | |
| Sandmark et | Population-based | The study base | Several factors | Knee | Relationship between knee osteoarthritis and | Multivariate logistic regression analysis |
| al | case-referent | were men and | Exposure data | replacement | several factors. For heavy jobs, >10 years in the | of the relationship between knee |
| 2000 | study | women born | was assessed by | due to primary | job are compared to subjects who had never | osteoarthritis and different variables. |
| [26] | | 1921–1938 and | professional | osteoarthrosis | had any such jobs. For physical load variables, | Comparisons are between the high and |
| Sweden | General | living in 14 | interviewers by | Data on | the multivariate logistic regression analyses | no/low exposure. OR (95% Cl) adjusted |
| | population | counties in | telephone | prosthetic knee | included one physical load variable at a time. | for age, body mass index, and smoking. |
| | | Sweden | interview and | replacement | Comparisons are between the medium or high | There are three different models (here |
| | 1991–1995 | | by postal | because of | exposure class and the no or low exposure | the first one is listed) that |
| | | The cases had | questionnaire. | clinically | class. OR (95% CI) controlled for potential | demonstrated different ways due to |
| | | undergone | The questions | significant | confounding from age, body mass index, | the covariation between the variables |
| | | prosthetic knee | are described in the article | primary osteoarthrosis | sports, smoking, and, for the women, hormone substitution | kneeling and squatting or knee bending |
| | | replacement and were 55–70 | the article | were collected | substitution | Women |
| | | vears at the | All the reported | through a | Women | Standing: 1.2 (0.6; 2.2) |
| | | time of the | occupational | nationwide | >10 years in physically heavy jobs: 2.5 (1.6; 3.9) | Climbing stairs: 1.2 (0.6; 2.2) |
| | | surgery. Cases | titles were | knee | >10 years in physically neavy jobs. 2.5 (1.0, 5.5) | Lifts at work, model 1: 1.3 (0.7; 2.3) |
| | | with symptoms | classified | arthroplasties | Standing (hours) | Ents at work, model 1. 1.5 (0.7, 2.5) |
| | | of the knee | according to the | register | Medium: 1.2 (0.7; 1.9) | Men |
| | | before 50 years | Nordic Standard | 0.000 | High: 1.6 (1.0; 2.8) | Standing: 1.3 (0.7; 2.3) |
| | | of age were | Occupational | | 0 1 1 1 1 1 1 1 1 1 1 | Climbing stairs: 1.0 (0.5; 1.6) |
| | | excluded | Classification. | | Sitting (hours) | Lifts at work, model 1: 1.9 (0.9; 3.8) |
| | | - | Subjects who | | Medium: 1.1 (0.7; 1.7) | Jumps: 2.0 (1.2; 3.3) |
| | | Referents were | had worked in | | High: 0.9 (0.5; 1.5) | Kneeling: 1.6 (1.0; 2.6) |
| | | randomly | occupations | | | |

| selected from | considered to | Lifts at work (kg) | |
|------------------|-------------------|--|--|
| | | | |
| the study base, | involve the | Medium: 1.2 (0.7; 1.9) | |
| through a | highest physical | High: 1.7 (1.0; 2.9) | |
| national | load to the | Countries on loss from the object of | |
| population | knees | Squatting or knee bending (number) | |
| register. Age in | (according to a | Medium: 1.2 (0.7; 1.9) | |
| 5-year intervals | score | High: 1.1 (0.6; 1.9) | |
| and gender was | developed by | | |
| taken into | Vingård et al | Kneeling (min) | |
| account. | 1992) were | Medium: 1.5 (1.0; 2.3) | |
| Referents who | identified | High: 1.5 (0.9; 2.4) | |
| reported osteo- | | | |
| arthrosis of the | The criterion for | Climbing stairs (number of steps) | |
| knee or who | being exposed | Medium: 1.7 (1.1; 2.5) | |
| had | was ten years of | High: 1.4 (0.8; 2.3) | |
| experienced | exposure to | | |
| severe pain or | occupations | Men | |
| dysfunction of | with high | >10 years in physically heavy jobs: 2.5 (1.7; 3.6) | |
| the knee were | physical load. | | |
| excluded | Subjects who | Standing (hours) | |
| | had never had | Medium: 1.5 (0.9; 2.4) | |
| Subjects were | any of these | High: 1.7 (1.0; 2.9) | |
| excluded if they | physically | | |
| reported earlier | demanding jobs | Sitting (hours) | |
| trauma or | were | Medium: 1.0 (0.7; 1.6) | |
| surgery to the | considered | High: 0.7 (0.4; 1.2) | |
| knee or the | unexposed | | |
| surrounding | | Lifts at work (kg) | |
| tissues, | | Medium: 2.5 (1.5; 4.4) | |
| rheumatoid | | High: 3.0 (1.6; 5.5) | |
| arthritis, or | | | |
| systemic | | Squatting or knee bending (number) | |
| disease | | Medium: 1.3 (0.8; 2.2) | |
| involving the | | High: 2.9 (1.7; 4.9) | |
| joints or had | | | |
| musculo- | | Kneeling (min) | |
| skeletal | | Medium: 1.4 (0.9; 2.2) | |
| malformation | | High: 2.1 (1.4; 3.3) | |
| | | Climbing stairs (number of steps) | |
| | | Medium: 1.2 (0.8; 1.9) | |

| | | 4 470 /005 | | 1 | | |
|---------------|------------------|------------------|------------------|-------------------|--|--|
| | | n=1 173 (625 | | | High: 1.2 (0.7; 2.1) | |
| | | cases and 548 | | | | |
| | | controls) | | | Vibration (hours) | |
| | | | | | Medium: 1.0 (0.6; 1.7) | |
| | | 584 (300/284) | | | High: 1.3 (0.9; 2.1) | |
| | | women and 589 | | | | |
| | | (325/264) men | | | Jumps (number) | |
| | | | | | Medium: 1.4 (0.9; 2.4) | |
| | | | | | High: 2.7 (1.7; 4.1) | |
| Seidler et al | Case-control | Participants | Manual | Symptomatic | Occupational exposure and symptomatic knee | Occupational exposure and |
| 2008 | | were aged 25– | handling and | knee osteo- | osteoarthritis. OR (95% CI) adjusted for age | symptomatic knee osteoarthritis. OR |
| [27] | General | 70 years | posture | arthritis | and region | (95% CI) adjusted for age, region, body |
| Germany | population | | Data were | Participating | | mass index, jogging/athletics, |
| | | Cases were | gathered in a | physicians | Kneeling and squatting combined | kneeling/squatting, and lifting/carrying |
| | The time when | patients at | structured | identified | No kneeling/squatting: 1.0 | (without considered variable) |
| | the study was | orthopedic | personal | patients with | <870 h: 0.7 (0.3; 1.5) | |
| | performed is not | clinics and | interview using | knee osteo- | 870–4 757 h: 1.4 (0.8; 2.5) | Kneeling and squatting combined |
| | stated | practices with | a questionnaire | arthritis | 4 757–10 800 h: 2.8 (1.5; 5.4) | No kneeling/squatting: 1.0 |
| | | radiographically | developed by | associated with | ≥10 800 h: 4.0 (2.1; 7.6) | <870 h: 0.5 (0.2; 1.2) |
| | | confirmed knee | the authors | chronic | | 870–4 757 h: 0.8 (0.4; 1.5) |
| | | osteoarthritis | | complaints | Cumulated lifting and carrying combined | 4 757–10 800 h: 1.6 (0.8; 3.4) |
| | | associated with | To calculate | | No lifting/carrying: 1.0 | ≥10 800 h: 2.4 (1.1; 5.0) |
| | | chronic | cumulative | Patients were | <630 kg*hrs: 1.3 (0.7; 2.4) | |
| | | complaints. | exposure, the | not eligible for | 630–5 120 kg*hrs: 2.0 (1.2; 3.4) | Cumulated lifting and carrying |
| | | Practices from | self-reported | the study if the | 5 120–37 000 kg*hrs: 3.6 (2.1; 6.0) | combined |
| | | which cases | duration of | initial diagnosis | ≥37 000 kg*hrs: 3.5 (1.7; 7.2) | No lifting/carrying: 1.0 |
| | | were drawn | kneeling and | of knee | | <630 kg*hrs: 1.2 (0.6; 2.3) |
| | | were not | squatting as | osteoarthritis | Kneeling/squatting and lifting/carrying | 630–5 120 kg*hrs: 2.0 (1.1; 3.6) |
| | | specialized in | well as the | had been made | No kneeling/squatting or lifting/carrying: 1.0 | 5 120–37 000 kg*hrs: 2.0 (1.1; 3.9) |
| | | workers' | duration of | more than five | Kneeling/squatting <870 hrs. or lifting/carrying | ≥37 000 kg*hrs: 2.6 (1.1; 6.1) |
| | | compensation | lifting and | years earlier | <630 kg*hrs: 1.2 (0.7; 2.3) | 237 000 kg m3. 2.0 (1.1, 0.1) |
| | | cases or certain | carrying of | years carrier | | Kneeling/squatting and lifting/carrying |
| | | industries | loads were | Knee X-rays | Kneeling/squatting 870–4 757 hrs. or | No kneeling/squatting or |
| | | industries | summed up | were re- | lifting/carrying <5 120 kg*hrs: 1.3 (0.8; 2.4) | lifting/carrying: 1.0 |
| | | Control subjects | over the entire | assessed by a | mmg, carrying \5 120 kg m3. 1.5 (0.0, 2.4) | in this, carl ying. 1.0 |
| | | were randomly | working life | reference | Kneeling/squatting 4 757–10 800 hrs. or | Kneeling/squatting <870 hrs. or |
| | | selected from a | working inc | radiologist | lifting/carrying 5 120–37 000 kg*hrs: 3.5 (2.0; | lifting/carrying <630 kg*hrs: 1.1 (0.5; |
| | | one percent | Cumulative | according to the | 6.0) | 2.1) |
| | | random sample | | criteria defined | 0.0 | 2.1) |
| | | of male | exposure was | | Either kneeling/squatting >10 800 hrs. or | Kneeling/squatting 870–4 757 hrs. or |
| | | | calculated up to | by Kellgren | | |
| | | residents aged | the year of | | lifting/carrying >37 000 kg*hrs: 3.8 (2.1; 6.8) | lifting/carrying <5,120 kg*hrs: |

| | | 25–70 years in | diagnosis (in | To finally qualify | | 1 2 (0 7: 2 2) |
|----------------|------------------|------------------|---------------------|--------------------|--|--|
| | | | | | Bath Impaling (accetting > 10,000 hm and | 1.2 (0.7; 2.2) |
| | | the same region | cases) or to the | as cases, | Both kneeling/squatting >10 800 hrs. and | |
| | | as the patients | year of | patients had to | lifting/carrying >37 000 kg*hrs: 7.8 (2.1; 28.3) | Kneeling/squatting 4 757–10 800 hrs. or |
| | | | interview (in | have at least | | lifting/carrying 5 120–37 000 kg*hrs: |
| | | n=622 (295 | control | grade 2 | | 2.7 (1.5; 4.8) |
| | | cases and 327 | subjects) | osteoarthritis | | |
| | | controls) | | according to the | | Either kneeling/squatting >10 800 hrs. |
| | | | To calculate | reference | | or lifting/carrying >37 000 kg*hrs: |
| | | All participants | cumulative | radiologist's | | 3.4 (1.8; 6.3) |
| | | were men | exposure to | assessment | | |
| | | | lifting/carrying, | | | Both kneeling/squatting >10 800 hrs. |
| | | | all weights >5 | | | and lifting/carrying >37 000 kg*hrs: |
| | | | kg lifted or | | | 7.9 (2.0; 31.5) |
| | | | carried at work | | | |
| | | | were multiplied | | | |
| | | | by the | | | |
| | | | corresponding | | | |
| | | | durations | | | |
| | | | (assuming 2.5 | | | |
| | | | seconds | | | |
| | | | duration per | | | |
| | | | single lifting act) | | | |
| | | | and summed | | | |
| Stenlund et al | Cohort with | Participants | Manual | Osteoarthrosis | Risk factor analysis for osteoarthrosis of the | Unconditional multiple logistic |
| 1992 | exposure data | were | handling and | in the acromio- | acromioclavicular joint in relation to exposure | regression of osteoarthrosis of the left |
| [28] | collected | construction | vibration | clavicular joint | variables. OR (95% CI) standardized for age | and right acromioclavicular joint. OR |
| Sweden | retrospectively | industry | Exposure was | Radiographic | | (95% CI) adjusted for age, smoking |
| Sweden | retrospectively | representatives, | assessed by | anteroposterior | Right hand | habits and dexterity. There are five |
| | Construction | randomly | interview by a | views of the | Years of manual work | different models presented in study. |
| | industry | selected from | trained nurse | right and left | >28 years vs <10 years: 2.91 (1.15; 7.35) | The lowest number to the greatest |
| | muustiy | the local union | using a protocol | acromio- | 10–28 years vs <10 years: 2.23 (1.13, 7.33) | number are listed |
| | The time when | files to make up | developed by | clavicular joints | 10-28 years vs <10 years. 2.23 (1.00, 4.09) | number are listed |
| | | 54 bricklayers | the authors. | were obtained. | Load lifted (tonnes) | Right hand |
| | the study was | | | The films were | | Right hand |
| | performed is not | (mean age 50 | The items are | | 710–25 999 vs <710: 2.28 (0.97; 5.39) | Vibration: 1.27 (0.90: 1.79) |
| | stated | years), 55 rock | stated in the | viewed and | >25 000 vs <710: 3.18 (1.09; 9.24) | (also adjusted for lifted load): 1.05 |
| | | blasters (mean | article | approved by a | | (0.69; 1.59) |
| | | age 52 years), | | radiologist. The | Vibration (hours) | |
| | | and 98 foremen | Load lifted was | radiographs | 9001–255 200 vs <9001: 1.13 (0.53; 2.40) | Lifted load: 1.55 (1.03; 2.34) |
| | | (mean age 46 | categorized in | were then | >255 200 vs <9001: 2.18 (1.04; 4.56) | (also adjusted for vibration): 1.51 (0.92; |
| | | years) | three classes. | categorized by | | 2.47) |
| | | | The value of | the radiologist | Left hand | |

| | | Around 80% of | 710 tonnes | and an | Years of manual work | Manual work adjusted for vibration and |
|----------------|--------------|-------------------|-----------------------|------------------|---|--|
| | | the participants | corresponds to | orthopedic | >28 years vs <10 years: 2.46 (1.01; 5.97) | lifted load: 1.58 (1.09; 2.30) |
| | | were right | about 19.7 kg | surgeon into | 10–28 years vs <10 years: 2.32 (1.02; 5.25) | inted 1000. 1.50 (1.05, 2.50) |
| | | handed, | per working day | one of five | 10-20 years vs <10 years. 2.32 (1.02, 3.23) | Left hand |
| | | depending on | for a person | grades of | Load lifted (tonnes) | Vibration: 1.79 (1.24; 2.59) |
| | | | who has | osteoarthrosis | 710–25 999 vs <710: 7.29 (2.49; 21.34) | |
| | | sub-group | who has worked 225 | | | (also adjusted for lifted load): 1.36 |
| | | | | according to | >25 000 vs <710: 10.34 (3.10; 34.46) | (0.90; 2.09) |
| | | n=207 | days a year for | Collins (1950) | Athensis (harra) | |
| | | The second second | 20 years at | | Vibration (hours) | Lifted load: 2.55 (1.50; 4.35) |
| | | The gender of | eight hours a | | 9001–255 200 vs <9001: 2.16 (1.00; 4.68) | (also adjusted for vibration): 2.08 (1.14; |
| | | the participants | day | | >255 200 vs <9001: 3.13 (1.40; 6.99) | 3.78) |
| | | is not stated | | | | |
| | | | | | | Manual work adjusted for vibration and |
| | | | - | | | lifted load: 1.93 (1.28; 2.90) |
| Toivanen et al | Prospective | Participants | Manual | Knee | Association of physical work load and knee | Association of physical work load and |
| 2010 | cohort | were | handling | osteoarthritis | osteoarthritis. OR (95% CI) adjusted for gender | knee osteoarthritis. OR (95% CI) |
| [29] | | representative | Exposure data | Specially | and age | adjusted for gender and age, tobacco |
| Finland | General | of the Finnish | was collected | trained | | smoking and regular physical activity |
| | population | population aged | with | physicians | 1 (mildest): 1.0 | during leisure time |
| | | 30 years or over | questionnaires | carried out | 2: 1.6 (0.6; 4.8) | |
| | Follow-up 22 | at baseline. | and interviews | clinical | 3: 1.1 (0.6; 2.1) | 1 (mildest): 1.0 |
| | years, ie | Participants | conducted by | examinations | 4: 1.4 (0.8; 2.7) | 2: 1.6 (0.5; 4.9) |
| | | were drawn | trained nurses | and diagnosed | 5: 1.8 (0.8; 3.8) | 3: 1.1 (0.6; 2.1) |
| | 1978–1980 to | from a national | | osteoarthritis | 6 (heaviest): 11.5 (2.9; 45.8) | 4: 1.3 (0.7; 2.6) 0.02 |
| | 2000–2001 | population | Physical | according to a | | 5: 1.7 (0.8; 3.9) |
| | | register and | workload was | standardized | | 6 (heaviest): 18.3 (4.2; 79.4) |
| | | invited to | classified into | written protocol | | |
| | | participate in a | six categories: | | | |
| | | health survey | Group 1: light | This | | |
| | | | sedentary work | standardized | | |
| | | The mean age | | clinical | | |
| | | was 42 years | Group 2: mainly | examination | | |
| | | | sedentary, but | included | | |
| | | Persons with | involves | estimations of | | |
| | | osteoarthritis at | handling fairly | limitations in | | |
| | | baseline were | heavy objects | the range of | | |
| | | excluded from | | motion, | | |
| | | the analysis in | Group 3: | tenderness, | | |
| | | the follow-up | physically light | deformations, | | |
| | | study | standing work | joint effusion | | |
| | | | or light work | and stability of | | |

| r | | | | | | |
|---------------|---------------|-----------------|------------------|--------------------|---|---|
| | | n=823 | involving | the knee joint. | | |
| | | 369 women and | movement | The physicians | | |
| | | 454 men | | made their final | | |
| | | | Group 4: fairly | diagnoses on | | |
| | | Of which 94 | light or medium | the basis of | | |
| | | cases occurred | heavy work | clinical findings, | | |
| | | during the | involving | knee symptoms | | |
| | | follow-up | movement | (pain and | | |
| | | | | stiffness), | | |
| | | | Group 5: heavy | disease | | |
| | | | manual work | histories and | | |
| | | | | related | | |
| | | | Group 6: very | documentation | | |
| | | | heavy manual | applying | | |
| | | | work | uniform | | |
| | | | | diagnostic | | |
| | | | | criteria | | |
| Vingard et al | Case referent | The study base | Several factors | Нір | Developing osteoarthrosis's in women exposed | - |
| 1997 | study | comprised all | Exposure data | replacement | to high to medium physical loads of various | |
| [30] | | women of ages | was assessed by | due to primary | kinds, compared with those with low exposure. | |
| Sweden | General | 50–70 years, | professional | osteoarthrosis | RR (95% CI) adjusted for age, body mass index, | |
| | population | living in five | interviewers by | Cases who had | smoking, sports activities, number of children, | |
| | | counties and | telephone | under-gone | and hormone therapy | |
| | 1991–1994 | four towns in | interview and | total hip | | |
| | | Sweden | by postal | replacement for | Sitting (h) | |
| | | | questionnaire. | primary | Medium exposure: 0.8 (0.5; 1.2) | |
| | | Cases had | The questions | osteoarthrosis | High exposure: 0.8 (0.4; 1.3) | |
| | | under-gone | are described in | of the hip were | | |
| | | total hip | the article | identified by | Standing (h) | |
| | | replacement | | means of the | Medium exposure: 1.4 (0.8; 2.2) | |
| | | | Exposure | Swedish | High exposure: 1.6 (0.9; 2.8) | |
| | | Referents were | information was | National | | |
| | | women without | collected from | Register of Total | Heavy lifting (n) | |
| | | hip problems | the age of 16 to | Нір | Medium exposure: 1.1 (0.7; 1.7) | |
| | | randomly | the age of 50. | Replacements | High exposure: 1.5 (0.9; 2.5) | |
| | | selected from | Each exposure | | | |
| | | the study base | was aggregated | | Twisted position (h) | |
| | | | throughout life | | Medium exposure: 1.1 (0.7; 1.8) | |
| | | the mean age at | | | High exposure: 1.6 (0.9; 2.6) | |
| | | interview was | | | | |
| | | | | | | |

| | | co / | | | | |
|---------------|--------------------|-------------------|------------------|-------------------|---|---|
| | | 63 years (range | | | Medium exposure: 1.0 (0.5; 2.0) | |
| | | 50–75) | | | High exposure: 2.1 (1.1; 4.2) | |
| | | | | | | |
| | | n=503 (230 | | | Stairs climbed (n) | |
| | | cases and 273 | | | Medium exposure: 1.3 (0.8; 2.0) | |
| | | referents) | | | High exposure: 2.1 (1.2; 3.6) | |
| | | | | | | |
| | | All participants | | | | |
| | | were women | | | | |
| Vingard et al | Case-control | The study | Physical work | Prosthesis of | Relative risks (CI) for developing osteoarthrosis | - |
| 1993 | | population | load | the hip joint as | of the hip with different combinations of high | |
| [31] | Individuals with | comprised all | The work load | a result of | and low exposure to physical load from | |
| Sweden | severe idiopathic | Swedish men | was assessed | idiopathic | occupation and sport adjusted for age and | |
| | osteoarthrosis and | between the | through an | osteoarthrosis | body mass index, for men | |
| | general | ages of 50 and | interview and a | Cases were | | |
| | population | 70 years who | self- | those men in | Physical load from work- Low | |
| | | lived in the | administered | the study | Exposure to sports | |
| | 1984–1988 | referral areas of | questionnaire | population who | Low: 1.0 | |
| | | four large | on the men's | received a first- | Medium: 1.6 (0.6; 3.7) | |
| | | hospitals in | specific work | time prosthesis | High: 2.1 (0.9; 4.9) | |
| | | Stockholm | periods | of the hip joint | | |
| | | | | as a result of | Physical load from work- Medium | |
| | | The cases were | The | idiopathic | Exposure to sports | |
| | | recipients of a | questionnaire | osteoarthrosis. | Low: 2.1 (0.9; 4.8) | |
| | | hip prosthesis | items are | The orthopaedic | Medium: 3.9 (1.6; 10.1) | |
| | | as a result of | described in the | clinics involved | High: 6.0 (2.7; 13.0) | |
| | | severe | article | were contacted | | |
| | | idiopathlc | | each week; they | Physical load from work- High | |
| | | coxarthrosis | Information | delivered the | Exposure to sports | |
| | | | regarding | names and | Low: 3.3 (1.4; 7.7) | |
| | | Referents were | exposure was | addresses of | Medium: 4.0 (1.7; 9.6) | |
| | | randomly | collected from | new patients | High: 8.5 (4.0; 17.9) | |
| | | selected from | the start of the | new putients | | |
| | | the study | occupational | Information | | |
| | | population | career to the | regarding the | | |
| | | Population | year of the | occurrence of | | |
| | | Men in both | diagnosis for | disorders was | | |
| | | groups with | the cases and to | obtained from | | |
| | | malformations, | the year of the | the files of the | | |
| | | sequelae after | interview for | hospital or | | |
| | | poliomyelitis, | the referents. | through | | |
| | | ponomyenus, | the reference. | unougn | | |

| | | | - | | | 1 |
|---------------|--------------|-------------------|------------------|------------------|--|---|
| | | rickets, or | Exposure was | personal | | |
| | | trauma to the | then | interviews | | |
| | | trunk or lower | aggregated for | | | |
| | | extremities | the men's work | | | |
| | | were excluded | life up to 49 | | | |
| | | | years of age | | | |
| | | n=541 (239 | | | | |
| | | cases and 302 | | | | |
| | | referents) | | | | |
| | | All participants | | | | |
| | | were men | | | | |
| Vingard et al | Case-control | The study | Physical work | Prosthesis of | Relative risk for developing osteoarthrosis of | _ |
| 1998 | | population | load | the hip joint as | the hip for women with different degrees of | |
| [32] | General | comprised all | The work load | a result of | exposure to physical load from work and | |
| Sweden | population | Swedish women | was assessed | idiopathic | sports activities aggregated to the age of 50. | |
| Sweden | population | between the | through an | osteoarthrosis | RR (95% CI) adjusted for age and body mass | |
| | 1991–1994 | ages of 50 and | interview and a | Cases were | index | |
| | 1551 1554 | 70 years who | self- | those women in | index | |
| | | lived in five | administered | the study | Physical load from work- Low | |
| | | counties in west | questionnaire | population who | Exposure to sports | |
| | | Sweden | on the women's | have had | Low: 1.0 | |
| | | (Halland, | specific work | clinical and | Medium: 1.1 (0.3; 3.4) | |
| | | | • | | | |
| | | Göteborg- and | periods | radiographic | High: 2.0 (0.7; 5.2) | |
| | | Bohus, | T h | preoperative | Discrimination of framework and address | |
| | | Älvsborg, | The | examinations | Physical load from work- Medium | |
| | | Skaraborg and | questionnaire | according to a | Exposure to sports | |
| | | Värmland) and | items are | well-defined | Low: 1.1 (0.5; 2.0) | |
| | | referral areas of | described in the | protocol, and | Medium: 1.8 (0.8; 4.1) | |
| | | five hospitals | article | only the | High: 2.7 (1.2; 5.9) | |
| | | (Gävle, | | patients with | Physical load from work- High | |
| | | Linköping, | Information | primary | | |
| | | Norrköping, | regarding | osteoarthrosis | Exposure to sports | |
| | | Malmö, and | exposure was | of the hip were | Low: 1.7 (0.8; 3.5) | |
| | | Huddinge) | collected from | included | Medium: 2.7 (1.1; 7.0) | |
| | | during the the | the start of the | | High: 4.3 (1. 7; 11.0) | |
| | | period 1991- | occupational | Information | | |
| | | 1994 | career to the | regarding the | | |
| | | | year of the | occurrence of | | |
| | | Cases were | diagnosis for | disorders was | | |
| | | women with | the cases and to | obtained from | | |

| 1 | | 1 | 1 | |
|---|-------------------|-----------------|-------------------|--|
| | primary | the year of the | the Swedish | |
| | osteoarthrosis | interview for | National | |
| | of the hip. All | the referents. | Registry of total | |
| | patients had | Exposure was | hip | |
| | clinical and | then | replacements | |
| | radiographic | aggregated for | | |
| | preoperative | the women's | | |
| | examinations | work life up to | | |
| | according to a | 50 years of age | | |
| | well-defined | | | |
| | protocol, and | | | |
| | only patients | | | |
| | with primary | | | |
| | osteoarthrosis | | | |
| | of the hip were | | | |
| | included | | | |
| | | | | |
| | The control | | | |
| | subjects were | | | |
| | randomly | | | |
| | selected from | | | |
| | the study base | | | |
| | by means of | | | |
| | local population | | | |
| | registers. The | | | |
| | control subjects | | | |
| | were matched | | | |
| | for age (1-year | | | |
| | interval) and | | | |
| | county or | | | |
| | hospital referral | | | |
| | area | | | |
| | | | | |
| | Women from | | | |
| | the study base | | | |
| | with known hip | | | |
| | disorders were | | | |
| | excluded | | | |
| | | | | |
| | | | | |

| | | n=503 (230 | | | | |
|---------------|--------------|--------------------|------------------|-------------------|---|---|
| | | cases and 273 | | | | |
| | | referents) | | | | |
| | | | | | | |
| | | All participants | | | | |
| | | were women | | | | |
| Vingard et al | Case-control | The study | Manual | Prosthesis of | Risk for developing coxarthrosis from medium | - |
| 1991 | | population | handling and | the hip joint as | or high exposure before the age of 49 years as | |
| [33] | General | comprised all | static work | a result of | compared with low exposure of different | |
| Sweden | population | Swedish men | The work load | idiopathic | types. RR (95% CI) adjusted for age, body mass | |
| | | between the | was assessed | osteoarthrosis | Index, smoking, and sports activities up to the | |
| | 1984–1988 | ages of 50 and | through an | Cases were | age of 29 years | |
| | | 70 years who | interview and a | those men in | | |
| | | lived in the | self- | the study | Static+dynamic exposure | |
| | | referral areas of | administered | population who | Medium exposure | |
| | | four large | questionnaire | received a first- | Total: 1.82 (1.02; 3.24) | |
| | | hospitals in | on the men's | time prosthesis | ≤29 years exposure: 1.74 (1.06; 2.87) | |
| | | Stockholm | specific work | of the hip joint | >30 years exposure: 2.25 (1.35; 3.76) | |
| | | | periods | as a result of | | |
| | | The cases were | • | idiopathic | High exposure | |
| | | recipients of a | The | osteoarthrosis. | Total: 2.42 (1.45;4.04) | |
| | | hip prosthesis | questionnaire | The orthopaedic | ≤29 years exposure: 1.97 (1.22; 3.18) | |
| | | as a result of | items are | clinics involved | >30 years exposure: 2.87 (1.79; 4.62) | |
| | | severe | described in the | were contacted | | |
| | | idiopathic | article | each week; they | Only static | |
| | | coxarthrosis | | delivered the | Medium exposure | |
| | | | Information | names and | Total: 1.21 (0.64; 2.31) | |
| | | Referents were | regarding | addresses of | ≤29 years exposure: 1.91 (1.06; 3.44) | |
| | | randomly | exposure was | new patients | >30 years exposure: 1.13 (0.68; 1.86) | |
| | | , selected from | collected from | | | |
| | | the study | the start of the | Information | High exposure | |
| | | population | occupational | regarding the | Total: 2.92 (1.69;5.05) | |
| | | | career to the | occurrence of | ≤29 years exposure: 2.29 (1.36; 3.81) | |
| | | Men in both | year of the | disorders was | >30 years exposure: 2.12 (1.32; 3.41) | |
| | | groups with | diagnosis for | obtained from | | |
| | | malformations, | the cases and to | the files of the | Only dynamic | |
| | | sequelae after | the year of the | hospital or | Medium exposure | |
| | | poliomyelitis, | interview for | through | Total: 1.92 (1.11; 3.32) | |
| | | rickets, or | the referents. | personal | ≤29 years exposure: 2.09 (1.27; 3.48) | |
| | | trauma to the | Exposure was | interviews | >30 years exposure: 1.50 (0.90; 2.49) | |
| | | trunk or lower | then | | , | |
| | | | then | | | |

| | 1 | Г | | | | |
|------------------|----------|------------------|----------------|-------------|---|--|
| | | extremities | aggregated for | | High exposure | |
| | | were excluded | the men's work | | Total: 2.17 (1.27; 3.73) | |
| | | | life up to 49 | | ≤29 years exposure: 1.83 (1.09; 3.06) | |
| | | n=541 (239 | years of age | | >30 years exposure: 2.36 (1.46; 3.82) | |
| | | cases and 302 | | | | |
| | | referents) | | | Lifted tons | |
| | | | | | Medium exposure | |
| | | All participants | | | Total: 1.58 (0.93; 2.66) | |
| | | were men | | | ≤29 years exposure: 1.73 (1.06; 2.63) | |
| | | | | | >30 years exposure: 1.63 (0.98; 2.73) | |
| | | | | | High exposure | |
| | | | | | Total: 1.84 (1.12; 3.03) | |
| | | | | | ≤29 years exposure: 1.95 (1.23; 3.09) | |
| | | | | | >30 years exposure: 2.74 (1.70; 4.43) | |
| | | | | | | |
| | | | | | Number of lifts (>40 kg) | |
| | | | | | Medium exposure | |
| | | | | | Total: 1.38 (0.81; 2.36) | |
| | | | | | ≤29 years exposure: 1.73 (1.06; 2.82) | |
| | | | | | >30 years exposure: 1.60 (0.81; 3.15) | |
| | | | | | High exposure | |
| | | | | | Total: 2.40 (1.50; 3.83) | |
| | | | | | ≤29 years exposure: 2.35 (1.47; 3.74) | |
| | | | | | >30 years exposure: 3.31 (1.97; 5.57) | |
| | | | | | >50 years exposure. 5.51 (1.97, 5.57) | |
| | | | | | Number of jumps | |
| | | | | | Medium exposure | |
| | | | | | Total: 1.82 (1.06; 3.14) | |
| | | | | | ≤29 years exposure: 1.80 (1.09; 3.04) | |
| | | | | | >30 years exposure: 1.92 (1.07; 3.46) | |
| | | | | | High exposure | |
| | | | | | Total: 1.52 (0.91; 2.53) | |
| | | | | | ≤29 years exposure: 1.39 (0.85; 2.26) | |
| | | | | | >30 years exposure: 1.38 (0.77; 2.46) | |
| Vrezas et al Cas | | Participants | Manual | Symptomatic | Interaction of body mass index and _ physical | Interaction of body mass index and_ |
| 2010 | | were aged 25– | handling and | knee osteo- | workload (kneeling/squatting; lifting or | physical workload (kneeling/squatting; |
| [34] Ge | eneral | 70 years | posture | arthritis | carrying of loads) and the risk of knee | lifting or carrying of loads) and the risk |
| | pulation | | | | | of knee osteoarthritis. OR (95% CI) |

| | Cases were | Data were | Participating | osteoarthritis. OR (95% CI) adjusted for age | adjusted for age, region, body mass |
|---------------|-----------------------|--------------------|--------------------|---|--|
| Time when the | patients at | gathered in a | physicians | and region | index, jogging/athletics, |
| study was | orthopedic | structured | identified | | kneeling/squatting, and lifting/carrying |
| performed not | clinics and | personal | patients with | Kneeling/squatting | (without considered variable) |
| stated | practices with | interview using | , knee | BMI not stated | , |
| | , radiographically | a questionnaire | osteoarthritis | Kneeling/squatting <4 757 h: 1.7 (1.0; 2.9) | Kneeling/squatting |
| | confirmed knee | developed by | associated with | | BMI not stated |
| | osteoarthritis | the authors | chronic | BMI<24.92 kg/m ² | Knee-/squatting <4 757 h: 1.2 (0.7; 2.2) |
| | associated with | | complaints | No kneeling/squatting: 1.0 | |
| | chronic | To calculate | | Kneeling/squatting ≥4 757 h: 3.0 (1.5; 6.0) | BMI<24.92 kg/m ² |
| | complaints. | cumulative | Patients were | | No kneeling/squatting: 1.0 |
| | Practices from | exposure, the | not eligible for | BMI≥24.92 kg/m² | Knee-/squatting ≥ 4757 h: 1.8 (0.8; 3.9) |
| | which cases | self-reported | the study if the | No kneeling/squatting: 2.7 (1.6; 4.6)* | |
| | were drawn | duration of | initial diagnosis | Kneeling/squatting ≥ 4 757 h: 8.9 (4.4; 17.9)* | BMI≥24.92 kg/m² |
| | were not | kneeling and | of knee | *vs BMI <24.92 and no kneeling/squatting | No kneeling/squatting: 2.5 (1.5; 4.3) |
| | specialized in | squatting as | osteoarthritis | | Knee-/squatting ≥4757 h: 5.3 (2.4; 11.5) |
| | workers' | well as the | had been made | Lifting/carrying | |
| | compensation | duration of | more than five | BMI not stated | Lifting/carrying |
| | cases or certain | lifting and | years earlier | Lifting/carrying <5 120h: 2.6 (1.5; 4.6) | BMI not stated |
| | industries | carrying of | , | | Lifting/carrying <5 120h: 2.4 (1.3; 4.3) |
| | | loads were | Knee X-rays | BMI<24.92 kg/m² | |
| | Control subjects | summed up | were re- | No lifting/carrying: 1.0 | BMI<24.92 kg/m ² |
| | were randomly | over the entire | assessed by a | Lifting/carrying ≥5 120h: 3.9 (1.9; 7.9) | No lifting/carrying: 1.0 |
| | , selected from a | working life | reference | | Lifting/carrying ≥5 120h: 2.4 (1.2; 4.7) |
| | one percent | 0 | radiologist | BMI≥24.92 kg/m² | |
| | random sample | Cumulative | according to the | No lifting/carrying: 2.7 (1.4; 5.1) | BMI≥24.92 kg/m² |
| | of male | exposure was | criteria defined | Lifting/carrying ≥5 120h: 6.8 (3.6; 12.9) | No lifting/carrying: 2.4 (1.2; 4.7) |
| | residents aged | calculated up to | by Kellgren | | Lifting/carrying ≥5 120h: 5.0 (2.4; 10.5) |
| | 25–70 years in | the year of | | | |
| | , the same region | , diagnosis (in | To finally qualify | | |
| | as the patients | cases) or to the | as cases, | | |
| | | year of | patients had to | | |
| | n=622 (295 | , interview (in | have at least | | |
| | cases and 327 | control | grade 2 | | |
| | controls) | subjects) | osteoarthritis | | |
| | | | according to the | | |
| | All participants | To calculate | reference | | |
| | were men | cumulative | radiologist's | | |
| | | exposure to | assessment | | |
| | | lifting/carrying, | | | |
| | | all weights >5 | | | |

| | [| | | | | |
|--------------|--------------------|------------------|---------------------|-------------------|---|--|
| | | | kg lifted or | | | |
| | | | carried at work | | | |
| | | | were multiplied | | | |
| | | | by the | | | |
| | | | corresponding | | | |
| | | | durations | | | |
| | | | (assuming 2.5 | | | |
| | | | seconds | | | |
| | | | duration per | | | |
| | | | single lifting act) | | | |
| | | | and summed | | | |
| Yoshimura et | Case-control study | The participants | Several factors | Нір | Association between hip osteoarthritis and | Association between hip osteoarthritis |
| al | | were from two | Physical factors | arthroplasty | occupational lifting of the first and main job. | and occupational lifting and activities of |
| 2000 | Patients and | health districts | were assessed | due to | Unadjusted OR (95% CI) | the first and main job. OR (95% CI) |
| [35] | general | in Wakayama | by a structured | osteoarthritis | | adjusted for history of knee pain and |
| Japan | population | Prefecture, | questionnaire | Нір | First job | age left school |
| | | Japan | | osteoarthrosis | Lifting +10 kg: 1.4 (0.8; 2.7) | |
| | The time when | | | was identified | Lifting +25 kg: 3.6 (1.3; 9.7) | First job |
| | the study was | Cases were | | in patients who | Lifting +50 kg: 5.4 (1.2; 25.4) | Lifting +10 kg: 1.2 (0.6; 2.4) |
| | performed is not | women and | | were listed for | Sitting ≥2h: 0.5 (0.3; 0.9 | Lifting +25 kg: 3.5 (1.3; 9.7) |
| | stated | men aged ≥45 | | total hip | Standing ≥2 h: 1.4 (0.7; 2.6) | Lifting +50 kg: – |
| | | years listed for | | arthroplasty | Kneeling ≥1 h: 0.8 (0.1; 1.6) | Sitting ≥2h: 0.6 (0.3; 1.0) |
| | | total hip | | | Squatting ≥1 h: 1.2 (0.5; 2.4) | Standing ≥2 h:1.4 (0.7; 2.8) |
| | | arthroplasty | | The radiographs | Driving ≥4h: 1.0 (0.1; 7.1) | Kneeling ≥1 h: 0.7 (0.4; 1.4) |
| | | due to | | of all cases | Walking ≥3 km: 1.1 (0.5; 2.4) | Squatting ≥1 h: 1.0 (0.5; 2.2) |
| | | osteoarthritis | | were assessed | Climbing ≥30 flights of stairs: 0.8 (0.4; 1.6) | Driving ≥4h: 1.1 (0.1; 7.6) |
| | | over one year | | by a single | | Walking ≥3 km: 1.0 (0.4; 2.2) |
| | | who did not | | trained | Main job | Climbing ≥30 flights of stairs: 0.9 (0.4; |
| | | have an | | observer using | Lifting +10 kg: 1.4 (0.8; 2.4) | 2.0) |
| | | established | | the Kellgren | Lifting +25 kg: 1.6 (0.8; 3.2) | |
| | | cause of | | Lawrence | Lifting +50 kg: 4.0 (1.1; 14.2) | Main job |
| | | secondary | | grading system | Sitting ≥2h: 0.8 (0.5; 1.4) | Lifting +10 kg: 1.2 (0.6; 2.1) |
| | | osteoarthritis | | for | Standing ≥2 h: 1.1 (0.6; 2.1) | Lifting +25 kg: 1.5 (0.7; 3.0) |
| | | | | osteoarthritis in | Kneeling ≥1 h: 1.1 (0.6; 2.2) | Lifting +50 kg: 4.1 (1.1; 15.2) |
| | | For each case, a | | each hip | Squatting ≥1 h: 1.5 (0.7; 3.1) | Sitting ≥2h: 0.8 (0.4; 1.4) |
| | | control was | | | Driving ≥4h: 1.5 (0.4; 5.3) | Standing ≥2 h: 1.1 (0.6; 2.3) |
| | | selected | | | Walking ≥3 km: 1.2. (0.6; 2.3) | Kneeling ≥1 h: 1.0 (0.5; 2.1) |
| | | randomly from | | | Climbing ≥30 flights of stairs: 1.0 (0.5; 1.9) | Squatting ≥1 h: 1.3 (0.6; 2.8) |
| | | the general | | | | Driving ≥4h: 1.4 (0.4; 5.4) |
| | | population. | | | | Walking ≥3 km: 1.2 (0.6; 2.4) |
| | | Each control | | | | Climbing ≥30 flights of stairs: |

| was individually | 1.1 (0.5; 2.1) |
|------------------|----------------|
| matched to a | |
| case according | |
| to age, sex and | |
| district of | |
| residence | |
| | |
| The mean age | |
| was 64 years | |
| | |
| n=103 | |
| | |
| 92 women and | |
| 11 men | |

CI=Confidence interval; ICD=The International Classification of Diseases; KNFB20=operational procedure codes, total hip arthroplasty –cemented prostheses; KNFB30=operational procedure codes, total hip arthroplasty –cemented prostheses; KNFB40=operational procedure codes, total hip arthroplasty; KNFB99=operational procedure codes, total hip arthroplasty; MI6.0=ICD-10 codes; MI6.1=ICD-10 codes; MI6.9=ICD-10 codes; MI6.9=ICD-

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