# Prevalence of and factors associated with long-term sick leave in working-age adults with osteoarthritis: a retrospective cohort study conducted in Germany

**Running head:** Osteoarthritis and long-term sick leave

Louis Jacob, MD-PhD (ORCID: 0000-0003-1071-1239)[a,b]; Ai Koyanagi, MD-PhD (ORCID: 0000-0002-9565-5004)[a,c]; Josep Maria Haro, MD-PhD (ORCID: 0000-0002-3984-277X)[a]; Jae Il Shin, MD-PhD (ORCID: 0000-0003-2326-1820)[d]; Lee Smith, PhD (ORCID: 0000-0002-5340-9833)[e]; Marcel Konrad, PhD (ORCID: 0000-0001-6798-5092)[f]; Karel Kostev, PhD (ORCID: 0000-0002-2124-7227)[g]

[a] Research and Development Unit, Parc Sanitari Sant Joan de Déu/CIBERSAM, ISCIII, Dr. Antoni Pujadas, 42, Sant Boi de Llobregat, Barcelona, Spain

[b] Faculty of Medicine, University of Versailles Saint-Quentin-en-Yvelines, 78180 Montigny-le-Bretonneux, France

[c] Institució Catalana de Recerca i Estudis Avançats (ICREA), Pg. Lluis Companys 23, Barcelona, Spain

[d] Department of Pediatrics, Yonsei University College of Medicine, Seoul, Republic of Korea

[e] Centre for Health, Performance, and Wellbeing, Anglia Ruskin University, Cambridge CB1 1PT, UK

[f] FOM University of Applied Sciences for Economics and Management, Frankfurt, Germany

[g] Department of epidemiology, IQVIA, Frankfurt, Germany

**Correspondence**:

Prof. Dr. rer. med. Karel Kostev

Epidemiology

IQVIA

Unterschweinstiege 2-14

60549 Frankfurt am Main

Germany

Tel.: +49-(0)69-66 04-4878

karel.kostev@iqvia.com

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## Statements and declarations

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Louis Jacob contributed to the design of the study, managed the literature searches, wrote the first draft of the manuscript, and corrected the manuscript. Ai Koyanagi,

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*Data availability*

Data are available from the corresponding author upon reasonable request.

*Ethics approval and consent to participate*

German law allows the use of anonymous electronic medical records for research purposes under certain conditions. According to this legislation, it is not necessary to obtain informed consent from patients or approval from a medical ethics committee for this type of observational study that contains no directly identifiable data.

**Abstract**

*Purpose:* Little is known about the impact of osteoarthritis on the long-term work participation of working-age adults. Therefore, the goal of this study was to investigate the prevalence of and the factors associated with long-term sick leave in people newly diagnosed with osteoarthritis from Germany.

*Methods:* This retrospective cohort study included patients aged 18-65 years diagnosed with osteoarthritis for the first time (index date) in one of 1,198 general practices in Germany between 2016 and 2019 (Disease Analyzer database, IQVIA). Patients were considered to be on long-term sick leave if they were absent from work for medical reasons for more than 42 days in the year following the index date. Independent variables included sociodemographic characteristics, type of osteoarthritis, and frequent comorbidities. The association between these variables and long-term sick leave (dependent variable) was studied using an adjusted logistic regression model.

*Results:* This study included 51,034 patients with osteoarthritis (mean [standard deviation] age 50.8 [9.2] years; 50.9% women). The prevalence of long-term sick leave was 36.2%. Younger age and male sex were positively and significantly associated with long-term sick leave compared with older age and female sex, respectively. There was also a strong relationship between several comorbidities (e.g., reaction to severe stress, and adjustment disorders, gastritis and duodenitis, and depression) with long-term sick leave.

*Conclusions:* The prevalence of long-term sick leave was high in this sample of patients newly diagnosed with osteoarthritis from Germany. In this context, interventions should

be implemented to increase the long-term working participation of people with osteoarthritis.

**Keywords:** long-term sick leave; osteoarthritis; working-age adults; retrospective cohort study; Germany

## Introduction

Osteoarthritis is a frequent degenerative disorder of the joint characterized by multiple pathological changes such as articular cartilage destruction, subchondral bone thickening, and synovial inflammation [1]. Based on the Global Burden of Disease (GBD) Study, the worldwide age-standardized annual incidence and point prevalence of osteoarthritis were 181 and 3,754 cases per 100,000 people in 2017, respectively [2]. Risk factors for osteoarthritis are multiple and include, for example, age, obesity and physically demanding occupations [3]. For the majority of patients, symptoms of osteoarthritis (e.g., pain and stiffness) are first experienced between the ages of 50 and 60 years [4–6]. In this context, understanding precisely how osteoarthritis impacts work ability and productivity is of utmost importance.

In the past decades, multiple studies have investigated the association between osteoarthritis and sick leave [7–17]. Sick leave, also known as sickness absence, corresponds to the absence of an employee from the workplace for medical reasons [18]. One study of 4,798 private-sector employees from the United States revealed that 12-month sickness-related absenteeism was higher in those with than in those without osteoarthritis (5.7 days versus 3.9 days) [7]. Another study, including 15,345 people with knee osteoarthritis and 789,366 people without knee osteoarthritis living in Sweden, found a significant association between this chronic physical condition and having at least one episode of sick leave, with the risk ratio (RR) being 1.82 for women and 2.03 for men [11]. Although the previous studies have advanced the field, these studies were conducted either in the United States or in Northern European countries (i.e., Denmark, Finland, Norway, and Sweden), and their findings may not be

generalizable to other countries with different labor policies. Moreover, there is little data on the effects of osteoarthritis on long-term sick leave, which corresponds to sick leave lasting for an extended period and is associated with a major human and economic burden [19]. Within this framework, more research is warranted on the relationship between osteoarthritis and long-term sick leave.

Therefore, the goal of this retrospective cohort study was to investigate the prevalence of and the factors associated with long-term sick leave in people newly diagnosed with osteoarthritis in a real-world setting in Germany.

## Material and methods

### *Database*

Data from the Disease Analyzer database (IQVIA) were used for the present study [20]. The Disease Analyzer database is composed of sociodemographic, diagnosis and prescription data routinely and anonymously collected from general and specialized practices in Germany. The German version of the International Classification of Diseases, 10th revision (ICD-10) is used to code diagnosis data, while the coding of prescription data relies on the Anatomical Classification of Pharmaceutical Products of the European Pharmaceutical Marketing Research Association (EphMRA). IQVIA assesses on a regular basis the quality of the data using several criteria such as completeness of documentation and linkage between diagnosis and prescription data. Practices to include in the Disease Analyzer database are selected based on several variables, including age of physician, specialty, community size category, and German federal state. Finally, around 3% of all practices

from Germany are included in the Disease Analyzer database, and previous research has found that the panel of practices included in this database is representative of all the practices of this country [20].

*Study population*

This retrospective cohort study included patients aged ≥18 years diagnosed with osteoarthritis (ICD-10: M15-M19) for the first time (index date) in one of 1,198 general practices in Germany between January 2016 and December 2019. Other inclusion criteria included: being observed at least one year prior to the index date; being observed at least one year after the index date; and having personal health insurance (not the insurance of a relative) and being aged ≤65 years at the index date. Having personal health insurance is mandatory for employed adults in Germany, and therefore all participants had employment at the index date. The selection of study patients is displayed in **Figure 1**.

*Long-term sick leave (dependent variable)*

Duration of sick leave corresponded to the total number of sick leave days within the first year after the index date. Consecutive sick leave days belonged to the same sick leave episode. When at least one working day separated two sick leave days, these sick leave days belonged to two distinct episodes. No medical reason was documented in the database for approximately 50% of sick leave episodes, and only sick leave episodes related to osteoarthritis were analyzed in this study (i.e., those linked with osteoarthritis ICD-10 codes). Patients were considered on long-term sick leave if they were absent from work for medical reasons for more than 42 days in the year following the index date. In Germany, employers are not required to pay sick leave lasting more

than 42 days, and, after this period, sick leave is paid by health insurance providers, potentially resulting in lower incomes [21,22].

*Sociodemographic variables, type of osteoarthritis and comorbidities (independent variables)*

Sociodemographic variables included age at the index date, sex, and the number of sick leave days in the year prior to the index date. In addition, there were five different types of osteoarthritis (ICD-10: M15-M19), namely polyosteoarthritis (ICD-10: M15), hip osteoarthritis (ICD-10: M16), knee osteoarthritis (ICD-10: M17), first carpometacarpal joint osteoarthritis (ICD-10: M18), and other and unspecified osteoarthritis (ICD-10: M19). Finally, physical and psychiatric comorbidities included disorders found in at least 5% of patients prior to, on, and after the index date. These comorbidities were hypertension (ICD-10: I10), depression (ICD-10: F32 and F33), disorders of lipoprotein metabolism and other lipidemias (ICD-10: E78), disorders of thyroid gland (ICD-10: E00-E07), gastritis and duodenitis (ICD-10: K29), enthesopathies (ICD-10: M76 and M77), shoulder lesions (ICD-10: M75), somatoform disorders (ICD-10: F45), reaction to severe stress, and adjustment disorders (ICD-10: F43), sleep disorders (ICD-10: F51 and G47), gastro-esophageal reflux disease (ICD-10: K21), spondylosis (ICD-10: M47), overweight and obesity (ICD-10: E66), diabetes mellitus (ICD-10: E10-E14), asthma (ICD-10: J45), anxiety disorders (ICD-10: F41), chronic obstructive pulmonary disease (ICD-10: J44), and coronary heart diseases (ICD-10: I20-I25).

*Statistical analyses*

Characteristics of patients included in the present study were described using N (%) for independent variables except for continuous age and the number of sick leave days in the year prior to the index date, assessed using mean (standard deviation). Sick leave in the year after the index date was further compared with sick leave in the year prior to the index date using five different variables (i.e., number of sick leave days, at least one sick leave day, long-term sick leave, number of sick leave episodes, and distribution of the number of sick leave episodes [i.e., 0, 1, 2, 3, and >3 episodes]). Categorical variables were compared using chi-square tests and continuous variables using Wilcoxon signed-rank tests. Besides, sick leave in the year after the index date was studied in the overall sample and by age, sex and type of osteoarthritis as a continuous and categorical variable. Continuous sick leave corresponded to the number of sick leave days and was analyzed using mean (standard deviation) and median (interquartile range). Categorical sick leave corresponded to at least one sick leave day and long-term sick leave (i.e., more than 42 days of sick leave) and was described using N (%). Finally, the relationship of sociodemographic variables, type of osteoarthritis, and comorbidities (independent variables) with long-term sick leave (dependent variable) was investigated using an adjusted logistic regression model. The results of the regression analysis are displayed as odds ratios (ORs) and 95% confidence intervals (CIs). P-values <0.050 were considered statistically significant. Analyses were performed using SAS 9.4.

## Results

### *Description of the sample*

This study included 51,034 patients with osteoarthritis. The mean (standard deviation) age was 50.8 (9.2) years, and 50.9% were women (**Table 1**). The most frequent type of osteoarthritis was knee osteoarthritis (37.4%), while the three most frequent comorbidities were hypertension (35.6%), depression (22.4%), and disorders of lipoprotein metabolism and other lipidemias (22.2%).

*Sick leave in the year prior to and after the index date*

The mean (standard deviation) number of sick leave days significantly increased from 53.3 (97.2) in the year prior to the index date to 87.2 (126.6) in the year after the index date (p-value<0.001), while there was also a significant increase in the mean (standard deviation) number of sick leave episodes (1.0 [1.5] prior to the index date versus 1.4 [1.8] after the index date, p-value<0.001; **Table 2**). Overall, 59.0% of the sample had at least one day of sick leave in the year after the index date, and the prevalence of long-term sick leave (i.e., more than 42 days of sick leave) was 36.2% (**Table 3**).

*Factors significantly associated with long-term sick leave in the year after the index date*

The results of the adjusted regression model are displayed in **Table 4**. Younger age (reference: 61-65 years; ORs ranging from 1.55 in the age group 56-60 years to 2.24 in the age group 18-40 years) and male sex (OR=1.20) were positively and significantly associated with long-term sick leave compared with older age and female sex, respectively. Moreover, the number of sick leave days in the year prior to the index date was positively and significantly associated with long-term sick leave in the year after the index date (OR=1.07). In terms of the type of osteoarthritis, compared with other and unspecified osteoarthritis, there was also a significant relationship of hip

(OR=1.20), knee (OR=1.13) and first carpometacarpal joint osteoarthritis (OR=1.11) with long-term sick leave. Finally, comorbidities most strongly associated with long-term sick leave were reaction to severe stress, and adjustment disorders (OR=1.45), gastritis and duodenitis (OR=1.25), and depression (OR=1.22).

## Discussion

### *Main findings*

In this retrospective cohort study, including more than 51,000 working-age adults with osteoarthritis from general practices in Germany, the prevalence of long-term sick leave (i.e., more than 42 days of sick leave) was approximately 36% in the year following the diagnosis of osteoarthritis. The adjusted regression analysis further found a positive and significant association between young age, male sex and long-term sick leave. Besides, there was a positive relationship between the number of sick leave days in the year prior to the diagnosis of osteoarthritis and long-term sick leave in the year after the diagnosis of this musculoskeletal disorder. Moreover, hip, knee, and first carpometacarpal joint osteoarthritis were more likely to be associated with long-term sick leave than other and unspecified osteoarthritis. Finally, there was a significant relationship between several comorbidities (e.g., reaction to severe stress, and adjustment disorders, gastritis and duodenitis, and depression) and being on sick leave for more than 42 days in the year following the diagnosis of osteoarthritis. To the best of the authors' knowledge, this is one of the largest studies on this topic, while it is one of the first studies to have identified factors associated with long-term sick leave in people with osteoarthritis.

*Interpretation of findings*

One major finding of this study is that more than one out of three patients were on long-term sick leave in the 12 months following the initial diagnosis of osteoarthritis. Some literature also suggests that the prevalence of long-term sick leave is relatively high in individuals affected by osteoarthritis. For example, a Swedish study, including 10,656 individuals on sick leave for more than two weeks due to knee osteoarthritis, estimated that 53% of sick leaves exceeded three months, while 3% of the sample was on sick leave for more than a year [10]. Another study of 675,636 women and 604,715 men aged 25-64 years from Finland showed that sick leave due to osteoarthritis was longer than sick leave due to other musculoskeletal conditions (e.g., back pain and shoulder disorder), and sick leave for osteoarthritis reached a mean of 98 days in women and 105 days in men [14]. The high prevalence of long-term sick leave in patients with osteoarthritis found in the present study may be explained by at least two hypotheses. First, common symptoms of osteoarthritis are pain and stiffness, and these symptoms may be associated with substantial functional limitations and may impair patients' ability to work. Previous research conducted in the United States found that approximately 30% of workers with osteoarthritis display work limitations attributable to this musculoskeletal disorder [23]. Second, depending on the type of osteoarthritis, the intensity of symptomatology, and the efficacy of prior conservative treatments, surgery with total joint replacement (i.e., arthroplasty) may be necessary and may require an extended sick leave. A systematic review of 14 studies for a total of 3,073 patients aged ≤65 years and undergoing primary total knee arthroplasty found that time for return to work after surgery ranged from 7.7 weeks to 16.6 weeks [24]. Interestingly, surgical options may be indicated early in the management of this disease for a high proportion of patients with osteoarthritis. Indeed, symptoms frequently last for more

than a year before the diagnosis of osteoarthritis is made [6], and disability may be severe and radiographic abnormalities at a relatively advanced stage at diagnosis, justifying surgical treatments only several months after the diagnosis in these patients.

This study has also identified several factors significantly associated with long-term sick leave. First, younger participants and men were more likely to be on long-term sick leave than their older and female counterparts, respectively. Previous literature tends to suggest that there may be important differences by age and sex in physical workload. For example, it was observed in a cohort of 5,377 adults from Sweden that physical workload decreased over eight years of ageing [25]. Another cross-sectional study, including 7,243 participants living in Denmark, showed that the amount of lifting during working life, an indirect marker of cumulative physical workload, was higher in men than in women [26]. Besides, the number of sick leave days in the year prior to the diagnosis of osteoarthritis positively predicted long-term sick leave in the year after the diagnosis of this musculoskeletal disorder, and this result is in line with the results of other studies showing a tenuous association between past and future sick leave [27,28]. Moreover, it is worth mentioning that there was a positive and significant relationship of hip, knee and first carpometacarpal joint osteoarthritis with long-term sick leave compared with other and unspecified osteoarthritis. This finding suggests that the impact of osteoarthritis on work participation likely varies by type of osteoarthritis. The hip and the knee are major joints involved when walking, and hip and knee osteoarthritis may therefore favor walking difficulties and indirectly result in an impairment of the ability to work [29]. Regarding the first carpometacarpal joint, osteoarthritis affecting this joint may lead to decreased strength [30] and decreased functional capacity of the upper limb [31]. In contrast, osteoarthritis of other joints (e.g.,

lumbar facet and acromioclavicular joints) may be less prone to have deleterious effects on work participation. Finally, this study conducted in Germany identified a positive association between several comorbidities and long-term sick leave, with the three conditions displaying the highest OR including reaction to severe stress, and adjustment disorders, gastritis and duodenitis, and depression. A large body of literature has found a strong relationship between osteoarthritis and decreased mental well-being [32], highlighting the need to assess psychiatric disorders in patients with osteoarthritis regularly and to integrate, if needed, adequate mental health care into the individualized management of these patients. Regarding gastritis and duodenitis, non-steroidal anti-inflammatory drugs (NSAIDs) are frequently prescribed to patients with osteoarthritis to alleviate acute pain, and the inhibition of the production of prostaglandin may favor the occurrence of gastritis and other gastrointestinal side effects [33]. Taking this fact into consideration, gastritis and duodenitis may have occurred more frequently in patients with higher levels of pain who potentially used NSAIDs more regularly than those with lower levels of pain. Thus, gastritis and duodenitis could be an indirect marker of the severity of osteoarthritis symptoms, and this could explain the strength of the relationship between gastritis and duodenitis and long-term sick leave.

*Public health implications and areas for future research*

Public health interventions are urgently needed to tackle the high prevalence of long-term sick leave in working-age adults with osteoarthritis in Germany. Patients on sick leave because of osteoarthritis should be regularly followed in primary care practices. In addition, individuals with a prior history of sick leave are at particular risk for long-term sick leave, and factors impairing early return to work in these patients should be

identified. Furthermore, psychiatric and physical comorbidities should be treated, and patients should be referred to specialists when needed. Interestingly, promoting physical activity in patients with osteoarthritis may help reducing the burden associated with osteoarthritis and its comorbidities [34,35]. Regular physical activity may also allow a decrease in the consumption of analgesics such as NSAIDs, and this could prevent the occurrence of gastrointestinal side effects (e.g., gastritis and duodenitis). Finally, in terms of future research, more studies are warranted to corroborate or invalidate these findings in other settings and countries. Moreover, data are needed to better characterize factors strongly associated with long-term sick leave in people with osteoarthritis.

*Strengths and limitations*

The major strengths of this study are the large sample size and the use of data obtained in general practices. However, the present study also displays several limitations that need to be considered in light of the findings. First, there was no information on the severity of osteoarthritis, and it was thus not possible to analyze the association between the severity of symptoms (e.g., pain and stiffness) and long-term sick leave. Second, sick leave episodes were frequently missing documented medical reasons, and excluding these episodes from the analyses may have biased the study results. Third, little or no data on body mass index and health behaviors such as physical activity, alcohol consumption, and diet were available in the Disease Analyzer database, despite the fact that these factors are known to be associated with sick leave [36–38]. Fourth, no specialized practices (e.g., rheumatology practices) were included in the analyses, and the findings of this study cannot be extrapolated to these settings.

*Conclusions*

In this study of more than 51,000 working-age adults with osteoarthritis from Germany, the prevalence of long-term sick leave was high, and was significantly associated with several factors such as age, sex, sick leave prior to the index date, type of osteoarthritis, and physical and psychiatric comorbidities. Based on these results, interventions are urgently warranted to mitigate the deleterious effects of osteoarthritis on work participation, while more research on this topic should be conducted in other settings and countries.

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**Tables and Figures**

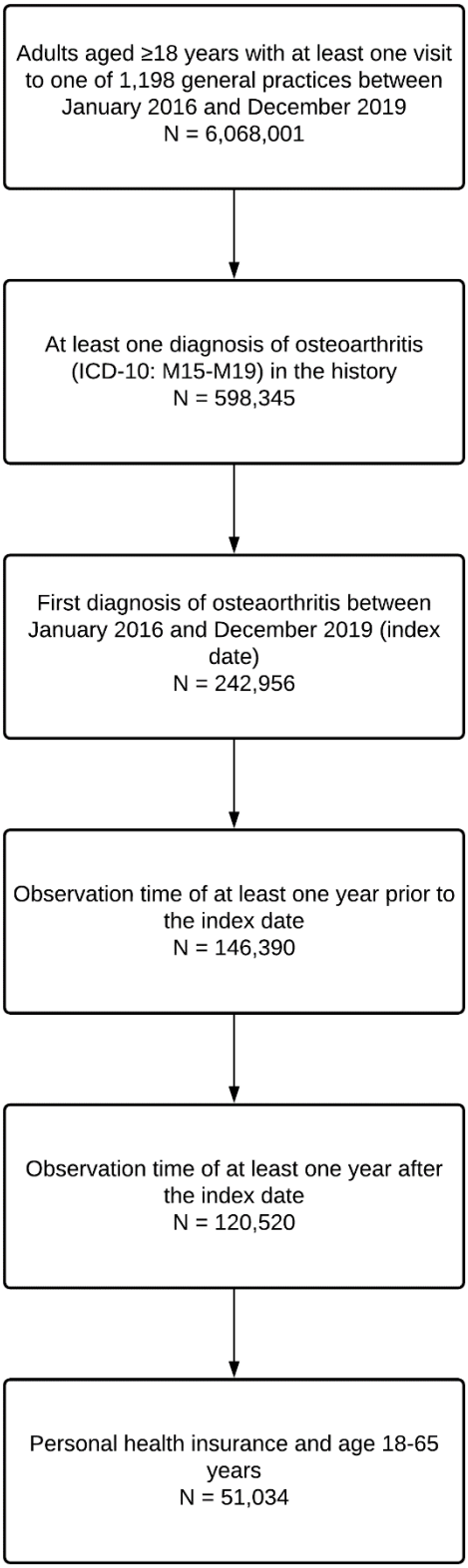


**Figure 1.** Selection of study patients

Abbreviation: ICD-10 International Classification of Diseases, 10th revision.

**Table 1.** Characteristics of the study sample (N=51,034)

| Variable | Value |
|---|---|
| *Age (in years)* | |
| Mean (SD) | 50.8 (9.2) |
| 18-40 | 7,037 (13.8) |
| 41-50 | 12,709 (24.9) |
| 51-55 | 12,953 (25.4) |
| 56-60 | 13,143 (25.8) |
| 61-65 | 5,192 (10.2) |
| *Sex* | |
| Female | 25,967 (50.9) |
| Male | 25,067 (49.1) |
| Number of sick leave days in the year prior to the index date, mean (SD) | 53.3 (97.2) |
| *Type of osteoarthritis* | |
| Polyosteoarthritis | 4,857 (9.5) |
| Hip osteoarthritis | 7,739 (15.2) |
| Knee osteoarthritis | 19,089 (37.4) |
| First carpometacarpal joint osteoarthritis | 4,123 (8.1) |
| Other and unspecified osteoarthritis | 15,226 (29.8) |
| *Comorbidities documented prior to, on, and after the index date* | |
| Hypertension | 18,160 (35.6) |
| Depression | 11,421 (22.4) |
| Disorders of lipoprotein metabolism and other lipidemias | 11,344 (22.2) |
| Disorders of thyroid gland | 11,057 (21.7) |
| Gastritis and duodenitis | 10,624 (20.8) |
| Enthesopathies | 10,499 (20.6) |
| Shoulder lesions | 9,187 (18.0) |
| Somatoform disorders | 8,117 (15.9) |
| Reaction to severe stress, and adjustment disorders | 7,987 (15.7) |
| Sleep disorders | 7,256 (14.2) |
| Gastro-esophageal reflux disease | 6,878 (13.5) |
| Spondylosis | 6,535 (12.8) |
| Overweight and obesity | 6,507 (12.8) |
| Diabetes mellitus | 5,424 (10.6) |
| Asthma | 4,935 (9.7) |
| Anxiety disorders | 3,838 (7.5) |
| Chronic obstructive pulmonary disease | 3,743 (7.3) |
| Coronary heart diseases | 3,559 (7.0) |

Abbreviation: SD standard deviation.
Data are N (%) unless otherwise specified.
Index date corresponded to the first diagnosis of osteoarthritis between January 2016 and December 2019.

**Table 2.** Sick leave in the overall sample in the year prior to and the year after the index date

| Variable | One year prior to the index date | One year after the index date | P-value[1] |
|---|---|---|---|
| Number of sick leave days, mean (SD) | 53.3 (97.2) | 87.2 (126.6) | <0.001 |
| At least one day of sick leave (%) | 49.0 | 59.0 | <0.001 |
| Long-term sick leave (%) | 25.7 | 36.2 | <0.001 |
| Number of sick leave episodes, mean (SD) | 1.0 (1.5) | 1.4 (1.8) | <0.001 |
| *Distribution of the number of sick leave episodes (%)* | | | |
| 0 | 51.0 | 41.1 | |
| 1 | 22.8 | 24.8 | |
| 2 | 12.6 | 15.3 | <0.001 |
| 3 | 6.7 | 8.7 | |
| >3 | 6.9 | 10.1 | |

Abbreviation: SD standard deviation.
[1] P-value was obtained using chi-square tests for categorical variables and Wilcoxon signed-rank tests for continuous variables.
Participants reporting more than 42 days of sick leave in the year following the diagnosis of osteoarthritis were considered to be on long-term sick leave.

**Table 3.** Sick leave in the year after the index date in the overall sample and by age, sex and type of osteoarthritis

| Group | Sick leave (days), mean (SD) | Sick leave (days), median (IQR) | At least one day of sick leave (%) | Long-term sick leave (%) |
|---|---|---|---|---|
| Overall | 87.2 (126.6) | 5 (173) | 59.0 | 36.2 |
| *Age (in years)* | | | | |
| 18-40 | 107.7 (132.7) | 14 (229) | 68.2 | 44.9 |
| 41-50 | 92.2 (128.4) | 7 (192) | 61.6 | 38.2 |
| 51-55 | 84.9 (125.0) | 5 (163) | 59.4 | 35.7 |
| 56-60 | 84.3 (125.5) | 5 (159) | 58.2 | 35.0 |
| 61-65 | 60.4 (114.0) | 0 (38) | 40.7 | 24.4 |
| *Sex* | | | | |
| Female | 82.3 (123.9) | 5 (156) | 57.0 | 34.6 |
| Male | 92.3 (129.2) | 7 (191) | 60.9 | 38.0 |
| *Type of osteoarthritis* | | | | |
| Polyosteoarthritis | 81.7 (125.2) | 4 (150) | 55.2 | 33.4 |
| Hip osteoarthritis | 92.1 (129.3) | 6 (187) | 59.1 | 38.1 |
| Knee osteoarthritis | 87.3 (126.0) | 5 (173) | 59.3 | 36.5 |
| First carpometacarpal joint osteoarthritis | 82.7 (123.4) | 5 (155) | 59.0 | 35.0 |
| Other and unspecified osteoarthritis | 87.7 (127.0) | 5 (176) | 59.6 | 36.2 |

Abbreviation: SD standard deviation; IQR interquartile range.
Participants reporting more than 42 days of sick leave in the year following the diagnosis of osteoarthritis were considered to be on long-term sick leave.

**Table 4.** Association between predefined variables and long-term sick leave in working-age adults with osteoarthritis from Germany

| Variable | OR (95% CI) | P-value |
|---|---|---|
| *Age (in years)* | | |
| 18-40 | 2.24 (2.05-2.45) | <0.001 |
| 41-50 | 1.71 (1.58-1.86) | <0.001 |
| 51-55 | 1.59 (1.47-1.72) | <0.001 |
| 56-60 | 1.55 (1.43-1.68) | <0.001 |
| 61-65 | Reference | |
| *Sex* | | |
| Female | Reference | |
| Male | 1.20 (1.15-1.26) | <0.001 |
| Number of sick leave days in the year prior to the index date (per one-day increase) | 1.07 (1.06-1.08) | <0.001 |
| *Type of osteoarthritis* | | |
| Polyosteoarthritis | 1.05 (0.97-1.13) | 0.251 |
| Hip osteoarthritis | 1.20 (1.12-1.28) | <0.001 |
| Knee osteoarthritis | 1.13 (1.07-1.19) | <0.001 |
| First carpometacarpal joint osteoarthritis | 1.11 (1.03-1.21) | 0.010 |
| Other and unspecified osteoarthritis | Reference | |
| *Comorbidities documented prior to, on, and after the index date* | | |
| Hypertension | 1.10 (1.05-1.15) | <0.001 |
| Depression | 1.22 (1.16-1.29) | <0.001 |
| Gastritis and duodenitis | 1.25 (1.19-1.32) | <0.001 |
| Enthesopathies | 1.18 (1.12-1.23) | <0.001 |
| Shoulder lesions | 1.19 (1.12-1.22) | <0.001 |
| Somatoform disorders | 1.07 (1.02-1.14) | 0.013 |
| Reaction to severe stress, and adjustment disorders | 1.45 (1.37-1.53) | <0.001 |
| Sleep disorders | 1.08 (1.02-1.15) | 0.008 |
| Spondylosis | 1.07 (1.01-1.14) | 0.023 |
| Chronic obstructive pulmonary disease | 1.11 (1.03-1.19) | 0.007 |
| Coronary heart diseases | 1.11 (1.02-1.20) | 0.012 |

Abbreviations: OR odds ratio; CI confidence interval.
Sick leave was assessed in the year following the diagnosis of osteoarthritis (i.e., index date).
Participants reporting more than 42 days of sick leave in the year following the diagnosis of osteoarthritis were considered to be on long-term sick leave.
Only comorbidities significantly associated with long-term sick leave are displayed in the table.