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Prevalence and consequences of musculoskeletal pain in the upper and lower extremities: A cross-sectional analysis of patients with type 1 and type 2 diabetes in Denmark

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ABSTRACT

Aims: To describe the one-week and 12-month prevalence of musculoskeletal pain in the upper and lower extremities and consequences in relation to care seeking, leisure time activity, and work life in patients with type 1 and 2 diabetes.

Methods: A cross-sectional survey including adults diagnosed with type 1 and 2 diabetes from two Danish secondary care databases. Questions covered pain prevalence (shoulder, elbow, hand, hip, knee, ankle) and its consequences based on the Standardised Nordic Questionnaire. Data was presented using proportions (95 % confidence intervals).

Results: The analysis included 3767 patients. The one-week prevalence was 9.3–30.8 % and 12-month prevalence 13.9–41.8 %, highest for shoulder pain (30.8–41.8 %). The prevalence was similar between type 1 and 2 diabetes for the upper extremity, but higher in type 2 for the lower extremity. Women had a higher pain prevalence for any joint for both diabetes types, while estimates did not vary between age groups (<60 or ≥60 years). More than half of the patients had reduced their activities at work or leisure time, and more than one-third had sought care during the past year because of pain.

Conclusions: Musculoskeletal pain in the upper and lower extremities is common in patients with type 1 and 2 diabetes from Denmark, with considerable consequences for work and leisure activities.

1. Introduction

One in 10 adults, 537 million people worldwide, are living with diabetes, a chronic disease characterised by high blood glucose levels, associated with several complications and responsible for 6.7 million deaths in 2021 [1]. The burden of diabetes is growing with a predicted worldwide prevalence of 783 million by 2045 [1]. In Denmark, 4.9 % of adults live with diabetes (2018), and the prevalence is expected to almost double by 2030 [2,3]. Diabetes can be grouped according to cause into the autoimmune type 1 with absolute insulin insufficiency and type 2 with insulin resistance [4]. Type 2 diabetes accounts for 85–95 % of diabetes cases in high-income countries [1], and obesity and physical inactivity are among commonly known risk factors [5,6].

Diabetes is associated with comorbidities and medical complications that increase the risks of morbidity and mortality [7], which in turn negatively impact the patient's quality of life [8]. Pain in muscles and joints is more common in patients with diabetes compared with the general population [9–11]. Diabetes is associated with a range of common musculoskeletal (MSK) conditions such as osteoarthritis, osteoporosis, neuropathy, and rheumatoid arthritis [12–15]. Known less

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common rheumatologic disorders associated with diabetes are stiff hand syndrome, Dupuytren's contracture, adhesive capsulitis, trigger finger, carpal tunnel syndrome, diffuse idiopathic skeletal hyperostosis, Charcot arthropathy, and generally reduced joint mobility [16]. Less known, however, is whether patients with diabetes also suffer from more common non-specific and regional pain syndromes that are endemic in the population. In Denmark, 56.4–57.3 % of the general population report MSK pain during the past 14 days, and patients with diabetes report MSK pain more frequently [9,12,17]. However, these previous studies reporting on MSK pain in patients with diabetes are either small, do not differentiate between diabetes types, or do not report on specific pain sites [9,12]. Preliminary evidence suggests that MSK pain is not a trivial complaint in patients with diabetes because it may complicate the patient's progress and translates into a higher healthcare load and treatment burden [18], possibly because patients with diabetes have several barriers to being physically active, among them MSK pain [19]. The complications may be reduced by identifying MSK problems early to promote physical activity [11,12,20].

Therefore, this study aims to describe the prevalence and characteristics of pain in the upper extremity (shoulder, elbow, hand) and lower extremity (hip, knee, ankle) in patients with type 1 and 2 diabetes from two diabetes care centres in the Region of Southern Denmark. Secondly, describe the consequences of MSK pain on care-seeking and physical activity at work and during leisure time.

2. Method

2.1. Study design

This is a cross-sectional survey based on two large clinical diabetes cohorts in the Region of Southern Denmark, Denmark. The reporting adheres to the Strengthening the Reporting of Observational Studies in Epidemiology guidelines for cross-sectional studies (STROBE).

2.2. Population

Patients ≥ 18 years of age diagnosed with type 1 and 2 diabetes and registered in two large Danish hospitals (Hospital South West Jutland and Odense University Hospital) were invited to participate. This cohort has been described in detail elsewhere [21].

2.3. Procedure/Data collection

A survey was distributed through Odense Patient Exploratory Network (OPEN) via the official Danish electronic mail distribution system (e-Boks), established in 2014 and used by 91.7 % of Danish residents for their secured digital mail. Responses were captured using a REDCap database. The questionnaire consisted of the Standardised Nordic Questionnaire [22] and questions about education, occupation, physical job exposures, and physical activity at work and during leisure time. The Standardised Nordic Questionnaire has two sections [22]. Section 1 has 40 items identifying body regions causing MSK problems. Completion is aided by a body map illustrating the nine symptom sites, i.e. neck, shoulders, upper back, elbows, low back, wrist/hands, hips, knees and ankles/feet. Respondents are asked if they have had any pain/trouble at the specific sites during the past 12 months and the past seven days which has interfered with their normal activity [22]. Section 2 consists of 25 questions that elicit any accidents affecting each area, functional impact at home and work (change of job or duties), duration of the problem, and seeking care (assessments and treatments by a health professional) [22]. Additional information was collected from the diabetes registries, including diabetes type, gender, age, and BMI. Further details about the data collection have been described elsewhere [21].

The Danish Board of Health and the Danish Patient Safety Authority approved access to the two clinical cohorts (file 3–30132031/1). All participants provided informed consent to participate in the study. The study was conducted according to the Declaration of Helsinki.

2.4. Variables

Age and gender: Statistics Denmark generated the age and sex of everyone in the sample frame before scrambling the CPR number.

Type of diabetes: The Danish National Patient Register records all hospital, emergency room, and ambulatory secondary care clinic encounters. Using the last discharge diagnosis recorded in the register, the diabetes type was determined using the ICD10 codes: E10.XX for type 1 diabetes, E.11.XX for type 2, E13.XX for secondary diabetes and E14.XX for unspecified diabetes. The quality of the register is high, and the level of incorrect discharge diagnosis is below 3 % [23].

2.5. Statistical analysis

Participant characteristics were presented using n (proportion). The prevalence of MSK pain was presented using n (proportion) with a 95 % Confidence Interval (CI). The prevalence of pain in the six different body regions (shoulder, elbow, hand, hip, knee, ankle) was estimated separately for type 1 and 2 diabetes and presented by gender (men or women) and age (< 60 or ≥ 60 years). Type 1 Diabetes and secondary diabetes were pooled, and unspecified diabetes was excluded from this analysis. The consequences of pain in the six body regions were estimated using n (proportion) with a 95 % CI and presented separately for diabetes type 1 and 2 and combined. Non-response for questions (i.e., empty cells) was considered a negative answer (i.e. not having pain). Stata (StataCorp LLC, Texas, USA) version 17.0 was used for the statistical analyses.

3. Results

The questionnaire was distributed to 10582 patients with diabetes with a 36.0 % response rate, and data from 3767 patients were included in the analysis (Fig. 1). Men accounted for 59.8 % of the patients, and most of the patients were between 51 and 70 years (Table 1) [21].

3.1. Prevalence of musculoskeletal pain in the upper and lower extremities

Musculoskeletal pain in the upper and lower extremities was common in patients with diabetes, with the only major difference between those with type 1 and type 2 diabetes being a generally higher

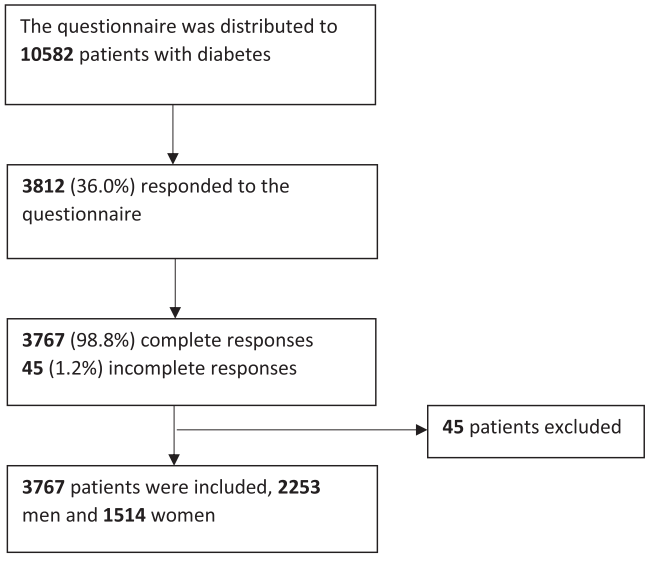

Fig. 1. Flow chart of the patient inclusion process.

Table 1
Characteristics of study population (number (%)).

Characteristic	All patients n = 3767	Diabetes type 1 n = 1626	Diabetes type 2 n = 2141
Gender			
Men	2253 (59.81)	889 (54.67)	1364 (63.71)
Women	1514 (40.19)	737 (45.33)	777(36.29)
Age group			
18–30	249 (6.61)	216 (13.28)	33 (1.54)
31–40	292 (7.75)	219 (13.47)	73 (3.41)
41–50	586 (15.56)	339 (20.85)	247 (11.54)
51–60	957 (25.40)	387 (23.80)	570 (26.62)
61–70	1065 (28.27)	325 (19.99)	740 (34.56)
70+	618 (16.41)	140 (8.61)	478 (22.33)
BMI			
Underweight (<18.5)	29 (0.77)	20 (1.23)	9 (0.42)
Normal or healthy weight (18.5–24.99)	898 (23.84)	668 (41.08)	230 (10.74)
Overweight (25 to <30)	1223 (32.47)	566 (34.81)	657 (30.69)
Obese (≥ 30)	1351 (35.86)	298 (18.33)	1053 (49.18)
Not reported	266 (7.06)	74 (4.55)	192 (8.97)
Smoking			
Never smoked	1530 (40.62)	770 (47.36)	760 (35.50)
Ex-smoker	1334 (35.41)	494 (30.38)	840 (39.23)
Smoker	523 (13.88)	242 (14.88)	281 (13.12)
Not reported	380 (10.09)	120 (7.38)	260 (12.14)
Education			
Primary and lower secondary	661 (17.55)	203 (12.48)	458 (21.39)
Secondary or vocational education	651 (17.28)	311 (19.13)	340 (15.88)
Short-term higher education	1151 (30.55)	494 (30.38)	657 (30.69)
Medium-term higher education	691 (18.34)	358 (22.02)	333 (15.55)
Long-term higher education	225 (5.97)	134 (8.24)	91 (4.25)
Not reported	388 (10.30)	126 (7.75)	262 (12.24)
Physical activity minutes/ week			
0 min/no activity	606 (16.09)	220 (13.53)	386 (18.03)
< 30	937 (24.87)	382 (23.49)	555 (25.92)
30–59	664 (17.63)	285 (17.53)	379 (17.70)
60–89	378 (10.03)	192 (11.81)	186 (8.69)
90–120	331 (8.79)	171 (10.52)	160 (7.47)
> 120	459 (12.18)	245 (15.07)	214 (10.00)
Not reported	392 (10.41)	131 (8.06)	261 (12.19)

Abbreviations: n, number; BMI, body mass index.

prevalence of lower extremity pain in type 2 diabetes (Table 2). The one-week prevalence ranged from 9.3 % (elbow) to 30.8 % (shoulder) (type 1) and 9.9 % (elbow) to 30.5 % (shoulder) (type 2), while 41.8 % and 40.5 % of patients with type 1 and type 2 diabetes reported shoulder pain the past year, respectively (Table 2). The prevalence was consistently higher in women than men for all body regions (Table 2). Minor differences between age groups were found, with prevalence in type 1 being somewhat lower in patients ≥ 60 years for the elbow (past 12 months 11.6 % vs 14.9 %) and higher for the hip (past 12 months 25.1 % vs 19.6 %) and ankle (past seven days 29.9 % vs 20.7 %, and past 12 months 33.1 % vs 28.0 %) (Table 2). The prevalence of pain in type 2 was lower for the upper extremity in patients ≥ 60 years except for the hand (past seven days), while for the lower extremity, it was higher for the hip (past 12 months) and hand (past seven days), and lower for the knee (past 12 months) (Table 2). The prevalence of pain was generally higher in type 2 diabetes compared with type 1 for age subgroups (< 60 years or ≥ 60 years) (Table 2), but only for the lower extremity proportions for the total group (Table 2). Of all patients, 56.3–71.6 % reported having pain for more than 30 days within the past year, and slightly more patients with type 2 diabetes reported more than 30 days of MSK pain in the upper and lower extremities compared to those with type 1 (Table 3).

3.2. Consequences of pain

Musculoskeletal pain in the upper and lower extremities considerably impacted leisure time, work, and care-seeking behaviour (Table 3). Approximately one-third of all patients reported having sought care within the past year, with the highest prevalence for the shoulder (44.4 %) and lowest for the knee (25.7 %). One of four reported change of work tasks because of pain, and the same proportion reported being unable to work due to pain for more than 30 days in the past year (Table 3). Further, the prevalence of reduced leisure activity the past year was higher for type 2 compared to type 1 for the lower extremity (62.5–68.3 % vs 56.5–58.9 %) and for seeking care for the knee (27.5 % vs 22.9 %) (Table 3). Change of work tasks was higher for type 1 for the hand and type 2 for the knee. Generally, more patients with type 2 reported being unable to work the past year for more than 30 days across all body regions.

4. Discussion

MSK pain was common in patients with type 1 and 2 diabetes from two diabetes centres in the Region of Southern Denmark, with shoulder pain having the highest prevalence, and lower extremity pain being more common in diabetes type 2 as compared to type 1. More women than men reported pain, but age had relatively little influence. MSK pain considerably impacted patients´leisure time and work life. A slightly larger proportion of patients with type 2 diabetes experienced consequences of pain in daily activity, care-seeking, and work life.

Patients with diabetes report a considerably higher prevalence of MSK pain in the upper and lower extremities than the general Danish population. In a nationally representative sample of the Danish population aged 16 and older, the overall pain prevalence during the past 14 days ranged between 2.8 % and 12.8 % for the upper extremity versus 9.3–30.8 % in our study and 5.4–9.8 for the lower extremity vs 14.8–29.8 % in our study [24,25]. Similar to our findings, the shoulder had the highest pain prevalence in the extremities in the general population, and a higher proportion of women reported MSK pain compared with men [9,24]. The higher prevalence of pain in women compared to men is in line with results from other studies of the general populations [26,27]. Another Danish survey study (n = 951) using a different questionnaire (Danish Health and Morbidity Survey 2005 Questionnaire) and pain definition (Yes, very bothered; Yes, bothered a little; or No) also found that MSK pain (pain in the shoulder and neck; pain in the arm, hand, knee and/or hip) in type 2 diabetes was significantly higher compared with age, gender, and region matched controls [9]. However, the association between diabetes and MSK pain seems inconsistent across MSK pain sites. Carvalho- E-Silva et al [28] found the association between type 2 diabetes and back pain was non-significant after adjusting for MSK risk factors but remained for hip and neck/shoulder pain. Despite different methodologies and patient selection, our findings add to the growing evidence that patients with diabetes have high prevalence of MSK pain, highlighting a significant clinical problem that needs to be addressed - because being physically active is a cornerstone in the treatment of diabetes, but MSK pain may be an obstacle that needs assessment and adequate treatment to improve the possibility for being physically active [29].

A relatively high proportion of patients in our study reported that pain in the extremities influenced their ability to be physically active at work (ranging from 27.0 % to 33.9 % across body regions for the total group) and during leisure time (55.2–64.9 %), and many sought care (25.7–44.4 %), which is of concern. To our knowledge, few studies report the consequences of MSK pain in the upper and lower extremities in the general population. In a large Dutch study, approximately half of the patients with MSK pain reported care-seeking within the last 12 months, which is higher than the proportions found in this study [30]. On the other hand, 4.0–7.5 % of the population reported work leave > 30 days compared to our findings, where 18.2–26.7 % were prevented

Table 2
Prevalence of pain in the upper and lower extremities in patients with type 1 and 2 diabetes by gender and age.

Body region	Men n (%, 95 % CI)	Women n (%, 95 % CI)	< 60 years n (%, 95 % CI)	60 years or above n (%, 95 % CI)	Total n (%, 95 % CI)
Diabetes type 1	(n = 889)	(n = 737)	(n = 1125)	(n = 501)	(n = 1626)
Shoulder					
Past 12 months	335 (37.7, 34.6; 40.9)	345 (46.8, 43.2; 50.4)	475 (42.2, 39.4; 45.1)	205 (40.9, 36.7; 45.23)	680 (41.8, 39.4; 44.2)
Past seven days	237 (26.7, 23.9; 29.7)	263 (35.7, 32.3; 39.2)	345 (30.7, 28.0; 33.4)	155 (30.9, 27.0; 35.1)	500 (30.8, 28.6; 33.0)
Elbow					
Past 12 months	103 (11.6, 9,6; 13.9)	123 (16.7, 14.2; 19.6)	168 (14.9, 13.0; 17.1)	58 (11.6, 9.1; 14.7)	226 (13.9, 12.3; 15.7)
Past seven days	69 (7.8, 6.2; 9.7)	83 (11.2, 9.1; 13.7)	109 (9.7, 8.1; 11.6)	43 (8.6, 6.4; 11.4)	152 (9.3, 8.0; 10.9)
Hand					
Past 12 months	222 (25.0, 22.2; 28.0)	301 (40.8, 37.3; 44.4)	359 (31.9, 29.2; 34.7)	164 (32.7, 28.8; 37.0)	523 (32.2, 29.9; 34.5)
Past seven days	155 (17.4, 15.1; 20.1)	219 (29.7, 26.5; 33.1)	255 (22.7, 20.3; 25.2)	119 (23.8, 20.2; 27.7)	374 (23.0, 21.0; 25.1)
Hip					
Past 12 months	149 (16.8, 14.4; 19.3)	197 (26.7, 23.7; 30.0)	220 (19.6, 17.3; 22,0)	126 (25.1, 21.5; 29.1)	346 (21.3, 19.4; 23.3)
Past seven days	106 (11.9, 10,0; 14.2)	134 (18.2, 15.6; 21.1)	159 (14.1, 12.2; 16.3)	81 (16.1, 13.2; 19.7)	240 (14.8, 13.1; 16.5)
Knee					
Past 12 months	261 (29.4, 26.5; 32.4)	262 (35.5, 32.12; 39.1)	352 (31.2, 28.6; 34.0)	171 (34.1, 30.1; 38.4)	523 (32.2, 29.9; 34.5)
Past seven days	176 (19.8, 17.3; 22.5)	166 (22.5, 19.6; 25.7)	229 (20.3, 18.1; 22.8)	113 (22.6, 19.1; 26.4)	342 (21.0, 19.1; 23.1)
Ankle					
Past 12 months	234 (26.3, 23.5; 29.3)	247 (33.5, 30.2; 37.0)	315 (28.0, 25.5; 30.7)	166 (33.1, 29.1; 37.4)	481 (29.6, 27.4; 31.8)
Past seven days	171 (19.2, 16.8; 22,0)	197 (26.7, 23.7; 30.0)	233 (20.7, 18.4; 23.2)	135 (26.9, 23.2; 31.0)	368 (22.6, 20.7; 24.7)
Diabetes type 2	(n = 1364)	(n = 777)	(n = 859)	(n = 1282)	(n = 2141)
Shoulder					
Past 12 months	510 (37.4, 34.9; 40.0)	357 (45.9, 42.5; 49.5)	397 (46.2, 43,0; 49.6)	470 (36.7, 34.0; 39.3)	867 (40.5, 38.4; 42.6)
Past seven days	378 (27.7, 25.4; 30.2)	275 (35.4, 32.1; 38.8)	287 (33.4, 30.3; 36.6)	366 (28.5, 26.1; 31.0)	653 (30.5, 28.6; 32.5)
Elbow					
Past 12 months	159 (11.7, 10.0; 13.5)	143 (18.4, 15.8; 21.3)	154 (17.9, 15.5; 20.6)	148 (11.5, 9.9; 13.4)	302 (14.1, 12.7; 15.6)
Past seven days	108 (7.9, 6.6; 9.5)	104 (13.4, 11.2; 16.0)	109 (12.7, 10.6; 15.1)	103 (8.0, 6.7; 9.7)	212 (9.9, 8.7; 11.2)
Hand					
Past 12 months	342 (25.1, 22.8; 27.4)	292 (37.6, 34.2; 41.0)	279 (32.5, 29.4; 35.7)	355 (27.7, 25.3; 30.2)	634 (29.6, 27.7; 31.6)
Past seven days	253 (18.5, 16.6; 20.7)	217 (27.9, 24.8; 31.1)	194 (22.6, 20.0; 25.5)	276 (21.5, 19.4; 23.9)	470 (22.0, 20.2; 23.8)
Hip					
Past 12 months	342 (25.1, 22.8; 27.4)	276 (35.6, 32.2; 39.0)	232 (27.0, 24.1; 30.0)	386 (30.1, 27.7; 32.7)	618 (28.9, 27,0; 30.8)
Past seven days	252 (18.4, 16.5; 20.6)	210 (27.0, 24.0; 30.2)	168 (19.6, 17.0; 22.3)	294 (22.9, 20.7; 25.3)	462 (21.6, 19.9; 23.4)
Knee					
Past 12 months	505 (37.0, 34.5; 39.6)	357 (45.9, 42.5; 49.5)	366 (42.6, 39.3; 45.9)	496 (38.6, 36.1; 41.4)	862 (40.3, 38.2; 42.4)
Past seven days	358 (26.2, 24.0; 28.6)	245 (31.5, 28.3; 34.8)	251 (29.2, 26.3; 32.4)	352 (27.5, 25.1; 30.0)	603 (28.2, 26.3; 30.1)
Ankle					
Past 12 months	485 (35.6, 33.1; 38.1)	331 (42.6, 39.2; 46.1)	325 (37.8, 34,6; 41.1)	491 (38.3, 35.7; 41,1)	816 (38.1, 36.0; 40.2)
Past seven days	385 (28.2, 25.9; 30.7)	254 (32.7, 29.5; 36.1)	238 (27.7, 24.8; 30.8)	401 (31.3, 28.8; 33.9)	639 (29.8, 28,0; 31.8)

Abbreviations: n, number of patients; CI, Confidence Interval. In Table, non-response was considered as no pain.

from working > 30 days during the last 12 months. Besides being a potential obstacle to physical activity, MSK pain can negatively impact multiple aspects of patient health, including sleep, cognitive processes and brain function, mood/mental health, cardiovascular health, and overall quality of life [31]. A patient with both diabetes and MSK pain (i.e. multimorbidity) has a greater risk of premature death, poorer function and quality of life, and increased healthcare utilisation [18]. Multimorbidity requires person-centred care, but there is still limited evidence to support any approach [18]. However, recent promising initiatives for the global treatment of multimorbidity have the potential to benefit patients with diabetes and MSK pain in order to improve the self-care behaviours [18,32].

4.1. Limitations

This study has some limitations. The response rate was 36.0 %, which is low but comparable with participation rates in surveys that have solely used e-Boks as their means of recruitment [33,34]. Since all patients were included from existing diabetes cohorts and not from the general population, we did not expect the proportion of type 1 and type 2 to represent the proportion of each type of diabetes in the general population (i.e., 85–95 % with type 2 and 5–15 % with type 1). Furthermore, a recent analysis on the same cohort [21] found non-responder bias (i.e., related to age, diabetes type, comorbidity burden, and socioeconomic status), meaning that our findings may be non-representative of Danish patients with diabetes. Non-response to questions was considered as no pain, a common and accepted approach in other Danish register-based studies such as the Danish Twin registry [35,36]. However, this is an important bias that could result in an underestimation of MSK pain in the current study. Furthermore, the patients were included from two of many Danish diabetes centres. However, our findings are important to determine the prevalence and consequences of MSK conditions in a secondary care diabetes population.

5. Conclusion

Pain in the upper and lower extremities is common in Danish patients with type 1 and 2 diabetes, with considerable impact on daily activity, care-seeking, and work life. A larger proportion of patients with type 2 diabetes than type 1 is affected by the consequences of pain. Future studies should investigate mechanisms behind the high co-occurrence of diabetes and MSK pain in the upper and lower extremities. Clinicians should be aware that patients with both diabetes and MSK may suffer from comorbidities that could benefit from adequate clinical management.

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Table 3
Consequences of upper and lower extremity pain in diabetes type 1, type 2, and for all patients.

Type of consequence	Shoulder n (%, 95 % CI)	Elbow n (%, 95 % CI)	Hand n (%, 95 % CI)	Hip n (%, 95 % CI)	Knee n (%, 95 % CI)	Ankle n (%, 95 % CI)
Type 1 diabetes						
Days with pain the past year						
0–7 days	100 (14.7, 12.3; 17.6)	42 (18.7, 14.1; 24.3)	93 (17.8, 14.8; 21.3)	83 (24.0, 19.8; 28.8)	132 (25.4, 21.8; 29.3)	68 (14.1, 11.3; 17.6)
8–30 days	115 (17.0, 14.3; 20.0)	55 (24.4, 19.2; 30.5)	105 (20.1, 16.9; 23.8)	71 (20.5, 16.6; 25.1)	114 (21.9, 18.6; 25.7)	87 (18.1, 14.9; 21.8)
> 30 days	463 (68.3, 64.7; 71.7)	128 (56.9, 50.3; 63.2)	324 (62.1, 57.8; 66.1)	192 (55.5, 50.2; 60.7)	274 (52.7, 48.4; 57.0)	326 (67.8, 63.5; 71.8)
Reduced activity in the past year						
Leisure time	364 (56.5, 52.7; 60.3)	129 (58.9, 52.2; 65.3)	273 (55.0, 50.6; 59.4)	195 (58.9, 53.5; 64.1)	283 (56.5, 52.1; 60.8)	260 (57.1, 52.5; 61.6)
At work	196 (32.7, 29.0; 36.5)	68 (33.8, 27.6; 40.7)	156 (34.2, 30.0; 38.7)	82 (28.1, 23.2; 33.5)	114 (24.9, 21.2; 29.1)	112 (27.0, 22.9; 31,5)
Care-seeking the past year	312 (46.0, 42.3; 49.8)	83 (37.4,31.2; 44.0)	168 (32.2, 28.4; 36.4)	114 (33.2, 28.4; 38.4)	119 (22.9, 19.5; 26.7)	186 (38.9, 34.6; 43.4)
Change of work tasks	227 (25.4, 22.6; 28.3)	80 (23.8, 19.5; 28.7)	208 (31.3, 27.9; 34.9)	85 (21.7, 17.9; 26.1)	120 (18.5,15.7; 21.7)	96 (16.5, 13.7; 19.8)
Prevented from working the past year						
1–7 days	104 (15.6, 13.0; 18.6)	37 (16.6, 12.2; 22.1)	71 (14.0, 11.3; 17.3)	45 (13.3, 10.1; 17.4)	85 (16.7, 13.7; 20.2)	61 (13.1, 10.3; 16.4)
8–30 days	87 (13.1, 10.7; 15.8)	30 (13.5, 9.6; 18.6)	71 (14.0, 11.3; 17.3)	48 (14.2, 10.9; 18.4)	56 (11.0, 8.6; 14.1)	56 (12.0, 9.3; 15.3)
> 30 days	139 (20.9, 17.9; 24.1)	44 (19.7, 15.0; 25.5)	121 (24.0, 20.4; 27.8)	56 (16.6, 13.0; 20.9)	60 (11.8, 9.3, 14.9)	88 (18.8, 15.5; 22.7)
Type 2 diabetes						
Days with pain the past year						
0–7 days	105 (12.2, 10.2; 14.5)	53 (17.5, 13.6; 22.3)	82 (13.0, 10.6; 15.8)	97 (15.8, 13.1; 18.9)	146 (17.0, 14.6; 19.7)	90 (11.1, 9.1; 13.4)
8–30 days	175 (20.3, 17.7; 23.1)	70 (23.2, 18.7; 28.3)	135 (21.4, 18,3; 24.7)	138 (22.4, 19.3; 25.9)	211 (24.6, 21.8; 27.6)	123 (15.1, 12.8; 17.7)
> 30 days	582 (67.5, 64.3; 70.6)	179 (59.3, 53.6; 64.7)	415 (65.7, 61.9; 69.3)	380 (61.8, 57.9; 65.6)	502 (58.4, 55.1; 61.7)	601 (73.8, 70.7; 76.7)
Reduced activity in the past year						
Leisure time	471 (57.8, 54.4; 61.1)	178 (61.4, 55.6; 66.8)	331 (55.3, 51.2; 59.2)	402 (68.3, 64.4; 71.9)	525 (64.7, 61.3; 67.9)	486 (62.5, 59.0; 65.8)
At work	219 (29.4, 26.2; 32.8)	86 (34.0, 28.4; 40.1)	165 (30.4, 26.7; 34.5)	147(30.6, 26.6; 34.8)	204 (28.4, 25.2;31.8)	169 (29.7, 26.4; 33.4)
Care-seeking the past year	371 (43.1, 39.8; 46.4)	96 (31.9, 26.9; 37.4)	187 (29.6, 26.2; 33.3)	222 (36.3, 32.6; 40.2)	235 (27.5, 24.6; 30.6)	315 (38.7, 35.4; 42.1)
Change of work tasks	258 (23.6, 21.2; 26,2)	106 (26.5, 22.4; 31.1)	199 (24.8, 21.9; 27.9)	157 (23.0, 19.9; 26.3)	240 (23.9, 21.4; 26.7)	167 (17.6, 15.3; 20.2)
Prevented from working the past year						
1–7 days	114 (13.5, 11.4; 16.0)	50 (17.1, 13.2; 21.8)	78 (12.6, 10.2; 15.4)	81 (13.6, 11.0; 16.6)	143 (17.2, 14.8; 19.9)	92 (11.6, 9.5; 14.0)
8–30 days	126 (15.0, 12.7; 17.5)	54 (18.4, 14.4; 23.3)	87 (14.0, 11.5; 17.0)	104 (17.4, 14.6; 20.7)	119 (14.3, 12.1; 16.9)	120 (15.1, 12.8; 17.8)
> 30 days	219 (26.0, 23.2; 29.1)	82 (28.0, 23.1; 33.4)	172 (27.7, 24.4; 31.4)	174 (29.1, 25.6; 32.9)	184 (22.1, 19.4; 25.1)	248 (31.3, 28.1; 34.6)
All patients						
Days with pain the past year						
0–7 days	205 (13.3, 11.7; 15.1)	95 (18.0, 15.0; 21.6)	175 (15.2, 13.2; 17.4)	180 (18.7, 16.4; 21.3)	278 (20.2, 18.1; 22.4)	158 (12.2, 10.5; 14.1)
8–30 days	290 (18.8, 17.0; 20.9)	125 (23.7, 20.3; 27.5)	240 (20.8, 18.6; 23.2)	209 (21.7, 19.2; 24.5)	325 (23.6, 21.4; 25.9)	210 (16.2, 14.3; 18.3)
> 30 days	1045 (67.9, 65.5; 70.1)	307 (58.3, 54.0; 62.4)	739 (64.0, 61.2; 66.8)	572 (59.5, 56.4; 62.6)	776 (56.3, 53.6; 58.9)	927 (71.6, 69.1; 74.0)
Reduced activity in the past year						
Leisure time	835 (57.2, 54.7; 59.8)	307 (60.3, 56.0; 64.5)	604 (55.2, 52.2; 58.1)	597 (64.9, 61.7; 67.9)	808 (61.5,58.9; 64.1)	746 (60.5, 57.7; 63.2)
At work	415 (30.9, 28.4; 33.4)	154 (33.9, 29.7; 38.4)	321 (32.2, 29.3; 35.1)	229 (29.6, 26.5; 32.9)	318 (27.0, 24.6; 29.7)	308 (28.7, 26.0; 31.5)
Seeking care	683 (44.4, 41.9; 46.9)	179 (34.2, 30.3; 38.4)	355 (30.8, 28.2; 33.5)	336 (35.2, 32.2; 38.3)	354 (25.7, 23.5; 28.1)	501 (38.8, 36.2; 41.5)
Change of work tasks	485 (24.4, 22.6; 26.3)	186 (25.3, 22.3; 28.5)	407 (27.7, 25.5; 30.1)	242 (22.5, 20.1; 25.1)	360 (21.8, 19.9; 23.9)	263 (17.2, 15.4; 19.2)
Prevented from working the past year						
1–7 days	218 (14.5, 12.8; 16.3)	87 (16.9, 13.9; 20.4)	149 (13.2, 11.4: 15.3)	126 (13.5, 11.4; 15.8)	228 (17.0, 15.1; 19.1)	153 (12.1, 10.5; 14.1)
8–30 days	213 (14.1, 12.5; 16.0)	84 (16.3, 13.3; 19.7)	158 (14.0, 12.1; 16.2)	152 (16.3, 14.0; 18.8)	175 (13.1, 11.4; 15.0)	176 (14.0, 12.2; 16.0)
> 30 days	358 (23.7, 21.7; 26.0)	126 (24.4, 20.9; 28.3)	293 (26.0, 23.5; 28.7)	230 (24.6, 21.9; 27.5)	244 (18.2, 16.2; 20.4)	336 (26.7, 24.3; 29.2)

Abbreviations; CI, Confidence Interval.

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Competing interest

The authors declare no conflicts of interest related to this work.

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