RHEUMATOLOGY

Original article

Osteoarthritis in Europe: impact on health status, work productivity and use of pharmacotherapies in five European countries

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Abstract

Objectives. The aims of this study were to examine the impact of peripheral joint OA across five large European countries and how people with OA use pharmacotherapies.

Methods. People with self-reported peripheral joint OA were selected from the 2011 five European countries (5EU) National Health and Wellness Survey (NHWS), which included 57 512 respondents from France, Germany, Italy, Spain and the UK. Information was recorded on symptoms, health status, health care utilization, work productivity and medication usage. All variables were analysed descriptively for the total population and individual countries.

Results. A total of 3750 respondents met the inclusion criteria: 1635 (43.6%) UK, 961 (25.6%) France, 570 (15.2%) Germany, 316 (8.4%) Spain and 268 (7.1%) Italy. The majority were ages 55–74 years and most were overweight or obese. Health status [12-item Short Form version 2 (SF12v2)] was similar across all countries, with a mean (S.D.) of 40.53 (10.99); 21.5% self-reported experiencing depression. Most had visited a health care provider in the previous 6 months ($n = 3537$; 94.3%). One third were employed: 7% reported absenteeism and 24% presenteeism. The use of prescription medication for OA was reported by 46.9% of patients, over-the-counter (OTC) medication by 26.5%, and both by 9.4%. Medication use increased with pain severity. NSAIDs were the most commonly used medication. Opioid use varied from 1.8% in Italy to 54.5% in France. Fifty per cent reported full adherence (4-point Morisky Medication Adherence Scale), but only 30% reported satisfaction with their OA medication. Most used medication for half the days of the month.

Conclusion. Despite some wide variations in pharmacotherapy for OA treatment, the impact of OA on health status and work productivity is substantial and looks largely similar across major European countries.

Key words: osteoarthritis, medication, health utility, work productivity.

Introduction

OA, the most common type of arthritis, is estimated to affect >40 million people across Europe [1] and has a lifetime risk of 45% for knee OA and 25% for hip OA [2, 3]. OA is the fastest growing cause of disability worldwide, [4, 5] and with increased life expectancy and rising levels of obesity across Europe, OA is predicted to become the fourth leading cause of disability worldwide by 2020 [6].

OA is characterized by joint pain and functional impairment, resulting in considerable difficulties with everyday activities and profoundly impacting quality of life [7–9]. It is also associated with considerable economic cost, reflecting the cumulative cost of work absence, medical costs and community and social services, estimated to be as high as 1% of the gross national product, although there are limited data on its impact on work productivity [10, 11].

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Treatment guidelines for OA management uniformly recommend a range of pharmacological therapies, including paracetamol, NSAIDs and opioids, together with non-pharmacological therapies [12–16]. However, such therapies are restricted by considerable side effects and limited efficacy, as well as country-specific restrictions on prescriptions (e.g. on opioid use). Previous research suggests that people with chronic diseases such as OA often do not take medication as prescribed, particularly pain medications, which may be taken less frequently and at lower doses [17, 18]. While there have been studies examining medication use in OA populations in the USA, there is limited information about how medication is used by people with OA in Europe.

The aims of this study were to examine the impact of peripheral joint OA in five large European countries (France, Germany, Italy, Spain and the UK) and how people with OA use both prescription and over-the-counter (OTC) pharmaceutical medications for this condition.

Methods

Data source and population

Data were derived from the 2011 five European countries (5EU) National Health and Wellness Survey (NHWS), a cross-sectional survey that captures information directly from respondents [19]. The 2011 EU NHWS included information on 57 512 adults aged ⩾18 years in five EU countries (France: $n = 15\,000$; Germany: $n = 15\,001$; Italy: $n = 7500$; Spain: $n = 5011$; UK: $n = 15\,000$) collected between September and December 2011.

The survey sample was drawn from the general population using the Internet panel maintained by Lightspeed Research (Warren, NJ, USA), which includes >2 million members in the USA and 5EU countries who agreed to participate in survey research. Panel members complete in-depth demographic registration profiles that are used to randomly sample panel members for a survey in order to ensure a representative sample. In this study the sample was stratified according to age and gender in each country. To ensure a representative sample, particularly in the ⩾65-year-old population, online recruitment was supported by computer-assisted web interviews (CAWIs), where respondents were recruited on the telephone and had the choice to complete the interview on the phone or were emailed a link to the survey to complete on their own. Institutional review board (IRB) approval was granted by the Essex IRB (Lebanon, NJ, USA) and the study was conducted in compliance with the Declaration of Helsinki [20]. All respondents took part voluntarily and provided informed consent. All information was self-reported and no attempt was made to validate the respondents' answers with their medical records or through discussion with their physician.

The analysis was performed using data provided by respondents who self-reported a physician diagnosis of OA based on two criteria: firstly, whether their arthritis had been diagnosed by a physician (response yes/no) and

second, the type of arthritis, with options of OA, RA, PsA, AS, and not sure. Respondents were only included in the current study if they answered OA. In addition, respondents were excluded if they (i) self-reported any other type of arthritis (including not sure), gout, or lupus; (ii) indicated the spine to be their only joint site with arthritis or (iii) reported currently using MTX, SSZ, dexamethasone or a biologic agent for their condition.

Outcomes evaluated and statistical methods

Data were analysed across the total population and separately for the five individual EU countries. Summary statistics are presented for continuous variables as arithmetic mean (S.D.) or medians as appropriate, and categorical variables as frequency and percentage. Demographic and health characteristics examined included age, gender, BMI, self-reported pain severity (defined by the respondent as mild, moderate or severe), number of joints involved and Charlson Comorbidity Index (CCI) [21]. The CCI calculates the co-morbid burden by weighting several co-morbidities by severity and summing the result. Health-related quality of life was assessed using the physical and mental component summary scores from the self-reported 12-item Short Form version 2 (SF12v2) [22]. Health utility scores were calculated using SF-6D [23]. Work productivity was analysed using the Work Productivity and Activity Impairment (WPAI) questionnaire [24]. Work productivity impairment was calculated for all employed respondents, while activity impairment was calculated for all respondents. Health care utilization was measured by the type and number of resources used within the past 6 months for any condition, including the number of visits to a health care provider, general practitioner (GP) or orthopaedic surgeon, hospitalization and visits to the emergency room (ER).

To assess medication usage, respondents were asked whether they currently use prescription or OTC medication to treat their arthritis; if yes, they were asked to indicate what they were currently using. All medications were compared between countries and according to pain severity and age. Combinations of prescription and/or OTC medications, duration of use (total months used), days per month used and satisfaction with individual medication classes were analysed descriptively. Satisfaction was captured using a 7-point Likert scale, with 1 being extremely dissatisfied and 7 being extremely satisfied. Adherence was assessed using the 4-point Morisky Medication Adherence Scale (4-MMAS) [25]. Respondents were asked a series of questions relating to their compliance attitudes and to identify any cost-saving strategies used in relation to their medication.

Results

Characteristics and impact

The characteristics of the study population are summarized in Table 1. A total of 3750 respondents met the inclusion criteria: 961 (25.6%) from France, 570 (15.2%) from Germany, 1635 (43.6%) from the UK, 268 (7.1%) from Italy

TABLE 1 Demographic and health characteristics of the study population

	France (n = 961)	Germany (n = 570)	UK (n = 1635)	Italy (n = 268)	Spain (n = 316)	5EU (n = 3750)
Gender						
Male	331 (34.4)	255 (44.7)	75 (46.2)	126 (47.0)	116 (36.7)	1583 (42.2)
Female	630 (65.6)	315 (55.3)	880 (53.8)	142 (53.0)	200 (63.3)	2167 (57.8)
Age, mean (s.d.), years	58.02 (11.44)	58.28 (12.18)	59.94 (11.72)	56.95 (12.97)	59.14 (12.88)	58.91 (11.95)
<55	323 (33.6)	207 (36.3)	454 (27.8)	102 (38.1)	112 (35.4)	1198 (31.9)
55–64	295 (30.7)	149 (26.1)	467 (28.6)	63 (23.5)	72 (22.8)	1046 (27.9)
65–74	305 (31.7)	176 (30.9)	616 (37.7)	93 (34.7)	94 (29.7)	1284 (34.2)
⩾75	38 (4.0)	38 (6.7)	98 (6.0)	10 (3.7)	38 (12.0)	222 (5.9)
BMI, mean (s.d.)	27.30 (5.81)	28.28 (6.06)	29.16 (5.97)	26.27 (4.85)	27.01 (4.33)	28.15 (5.83)
Underweight, <18.5	17 (1.8)	4 (0.7)	15 (1.0)	3 (1.1)	2 (0.6)	41 (1.1)
Normal, 18.5 to <25	338 (35.7)	171 (30.2)	381 (24.2)	104 (39.4)	106 (33.9)	1100 (30.0)
Overweight, 25 to <30	361 (38.1)	234 (41.3)	581 (36.9)	117 (44.3)	142 (45.4)	1435 (39.1)
Obese, ⩾30	232 (24.5)	157 (27.7)	598 (38.0)	401 (5.2)	63 (20.1)	1090 (29.7)
Exercise						
Doesn't exercise	425 (44.2)	237 (41.6)	793 (48.5)	114 (42.5)	147 (46.5)	1716 (45.8)
Exercises at least once per month	536 (55.8)	333 (58.4)	842 (51.5)	154 (57.5)	169 (53.5)	2034 (54.2)
CCI, mean (s.d.)	0.46 (1.01)	0.65 (1.12)	0.49 (0.91)	0.49 (0.98)	0.58 (1.10)	0.51 (0.99)
Self-reported depression	156 (16.2)	103 (18.1)	449 (27.5)	53 (19.8)	46 (14.6)	807 (21.5)
Pain severity						
Mild	282 (29.3)	282 (49.5)	678 (41.5)	155 (57.8)	139 (44.0)	1536 (41.0)
Moderate	544 (56.6)	242 (42.5)	737 (45.1)	109 (40.7)	148 (46.8)	1780 (47.5)
Severe	135 (14.0)	46 (8.1)	220 (13.5)	4 (1.5)	29 (9.2)	434 (11.6)
Median joints affected, n	3	2	3	2	2	2
Number of joints affected						
1	237 (24.7)	261 (45.8)	478 (29.2)	109 (40.7)	121 (38.3)	1206 (32.2)
2–3	378 (39.3)	197 (34.6)	571 (34.9)	107 (39.9)	128 (40.5)	1381 (36.8)
⩾4	346 (36.0)	112 (19.6)	586 (35.8)	52 (19.4)	67 (21.2)	1163 (31.0)
⩾2 joints with spine	382 (39.8)	107 (18.8)	395 (24.2)	67 (25.0)	85 (26.9)	1036 (27.6)
Top 3 affected joints						
Knees	471 (49.0)	315 (55.3)	1001 (61.2)	96 (35.8)	167 (52.8)	2050 (54.7)
Fingers	348 (36.2)	154 (27.0)	639 (39.1)	79 (29.5)	81 (25.6)	1301 (34.7)
Hips	269 (28.0)	126 (22.1)	602 (36.8)	39 (14.6)	94 (29.7)	1130 (30.1)

Values are n (%) unless stated otherwise.

and 316 (8.4%) from Spain. There were slightly more female than male respondents, with most aged 55–74 years, and 62.6% were either overweight or obese (BMI ⩾25). Approximately half of the respondents in all countries reported exercising vigorously for ⩾20 min at least once per month. In all countries self-reported depression was higher in the OA population (mean 21.5%) compared with the total 5EU population (13.4%). The median number of joints affected was two in Germany, Italy and Spain and three in France and the UK (Table 1). Knees were most commonly affected, followed by fingers and then hips.

SF12v2 health status was similar across all countries, with a mean of 40.53 (s.d. 10.99), and was reduced compared with values across the total 5EU population [mean 48.78 (s.d. 9.71); Table 2]. Subscale scores were also reduced, most notably impact of health on activity, bodily pain, general health and emotional state. Health utility was comparable across the five EU countries (Table 2).

Approximately one third to half of respondents were in employment at the time the questionnaire was conducted. Work impairment was observed across all countries and was comparable to reported community averages for OA patients (Table 2) [24]. Similar findings were seen for activity impairment. Respondents with OA reported approximately 7% absenteeism, which was particularly high in Italy and France and low in Spain. Rates of presenteeism were almost four times greater than absenteeism, with an average of 24% (Table 2).

The large majority of respondents in all countries had visited a health care provider for any condition in the previous 6 months [*n* = 3537 (94.3%); Table 2]. Most had visited their primary care physician. Visits to an orthopaedic surgeon were high in Germany, Italy and Spain, but considerably lower in France and the UK. Hospitalization was approximately equivalent across all countries, although ER attendance was higher in Spain compared with the other four countries (Table 2).

Medication use

Across all countries, just under half of respondents reported currently using prescription medication for their OA pain (Table 3). Respondents from Germany reported the lowest use (33.0%) and respondents from Spain the highest (53.2%). The median number of prescription medications used was one in all countries except for France (median two). Approximately one quarter of respondents reported current use of an OTC medication, although this was considerably lower in Spain (14.6%). Overall, 37.5% of respondents used prescription medications alone, 17.1% used only OTC medications and 9.4% used both. Combination use of prescription and OTC medications was particularly high in France (15.6%) and low in Germany (4.7%). Respondents from Germany were more likely to report not using medication for their OA compared with respondents from the other four countries.

Of those not currently using a prescription medication, most had used a prescription medication at some point previously [43.8%; lowest in the UK (34.0%) and highest in France (61.5%)], while of those who had never used a prescription medication, only a small minority had been recommended a prescription medication by their doctor [12.4%; lowest in the UK (8.9%) and highest in Italy (28.0%)].

The most common classes of prescription medication across all countries were NSAIDs (58.9%) and opioids (35.6%), with a small number of respondents using COX-2 inhibitors (6.6%), paracetamol (4.2%), NSAID/gastroprotection combination medications (4.3%) and glucosamine or chondroitin (4.1%) (Table 4). Patterns of paracetamol, opioid and glucosamine/chondroitin varied more widely. There was little reported use of paracetamol in Germany (0%) or Italy (0.9%), while opioid use was very low in Italy (1.8%), Germany (10.6%) and Spain (13.1%) and high in France (54.5%) and the UK (39.4%). Glucosamine or chondroitin use was mainly reported by respondents from France (8.8%) and Spain (14.3%). Notably, one fifth of respondents aged >75 reported the use of prescription NSAIDs (21.2%), and this figure was particularly high in Germany, where 28.9% of those aged >75 years reported prescription NSAID use (data not shown).

Across all prescription medications, respondents reported using their medication for approximately 20 days/month, ranging from 15.81 days (s.d. 11.71) for NSAIDs to 26.47 days (s.d. 8.82) for glucosamine/chondroitin. In general, respondents from the UK reported the use of medications for more days each month [22.09 (s.d. 10.96)] than respondents from the other four countries, particularly Italy [10.16 (s.d. 8.85)], where use was consistently lower for all classes of medication. The length of time respondents had been using their prescription medications was also fairly consistent across medication classes and for individual medications. In general, respondents had been using paracetamol for the longest duration [83.72 months (s.d. 84.92); Table 4].

The use of prescription medication increased with self-reported severity of pain, with 29.6% of respondents reporting mild pain using a prescription medication compared with 54.4% of respondents reporting moderate pain and 77.6% of those with severe pain (supplementary Table S1, available at *Rheumatology* Online). In contrast, OTC use was lower in those reporting severe pain (17.3%) compared with those with mild (27.6%) or moderate (27.9%) pain. The use of all classes of prescription medication, with the exception of glucosamine/chondroitin, increased with pain severity. The most notable change was seen in opioid use, which increased from 6.0% in those reporting mild pain to 19.8% in those with moderate pain and 41.7% in those with severe pain. The increase in NSAID use was more marked between respondents with mild (22.5%) and moderate (38.1%) pain, with only a slight increase in those with severe pain (46.5%).

Satisfaction, adherence and compliance

Across all classes of prescription medications, approximately one third of users reported being very or extremely satisfied with their current medication (supplementary Table S2, available at *Rheumatology* Online). The mean

TABLE 2 Impact of OA

	France (n = 961)	Germany (n = 570)	UK (n = 1635)	Italy (n = 268)	Spain (n = 316)	5EU (all OA) (n = 3750)	5EU (total) (n = 57 512)
Health-related quality of life: SF-12v2, mean (S.D.)							
Physical component summary	41.55 (9.87)	40.39 (10.12)	39.43 (12.15)	41.44 (8.97)	42.55 (10.31)	40.53 (10.99)	48.74 (9.71)
Mental component summary	45.31 (10.64)	45.60 (11.14)	46.82 (12.11)	43.52 (9.69)	47.73 (11.14)	46.09 (11.40)	46.77 (10.57)
Subscores, mean (S.D.)							
Physical functioning scale, norm-based scores	44.96 (10.74)	44.75 (10.73)	41.59 (12.07)	41.79 (11.02)	45.95 (10.70)	43.31 (11.48)	50.18 (9.70)
Role physical scale, norm-based scores	40.74 (9.19)	40.71 (9.88)	41.46 (11.85)	40.69 (8.80)	45.38 (10.52)	41.44 (10.68)	47.26 (10.03)
Bodily pain scale, norm-based scores	38.23 (11.22)	37.22 (10.58)	39.51 (12.44)	41.28 (9.64)	42.64 (11.54)	39.22 (11.69)	46.98 (10.83)
General health scale, norm-based scores	40.43 (10.63)	39.20 (10.46)	39.94 (12.29)	39.54 (11.03)	37.35 (11.99)	39.71 (11.53)	46.41 (11.08)
Vitality scale, norm-based scores	50.31 (9.35)	48.31 (9.77)	43.95 (10.63)	49.59 (9.18)	48.90 (10.96)	47.06 (10.49)	50.98 (9.85)
Social functioning scale, norm-based scores	44.01 (10.74)	42.96 (11.13)	44.33 (12.86)	40.48 (10.39)	45.06 (11.52)	43.83 (11.85)	46.66 (10.95)
Role emotional scale, norm-based scores	40.06 (11.29)	42.11 (12.60)	44.21 (13.51)	38.11 (11.20)	44.47 (12.08)	42.41 (12.73)	45.55 (11.58)
Mental health scale, norm-based scores	44.99 (10.92)	44.95 (10.63)	46.12 (11.77)	44.41 (9.79)	48.57 (10.75)	45.73 (11.21)	47.36 (10.47)
Health utility score, SF-6D	0.65 (0.12)	0.66 (0.13)	0.67 (0.15)	0.64 (0.11)	0.70 (0.14)	0.67 (0.14)	0.73 (0.14)
WPAI							
Employed (full time, part time or self), n (%)	319 (33.2)	250 (43.9)	472 (28.9)	120 (44.8)	102 (32.3)	1263 (33.7)	—
Percentage of work missed due to health (absenteeism), mean (S.D.)	9.52 (26.61)	6.77 (20.53)	6.57 (21.29)	8.65 (22.24)	4.58 (16.34)	7.40 (22.39)	—
Percentage impairment while working due to health (presenteeism), mean (S.D.)	22.82 (24.96)	23.36 (26.41)	24.20 (26.90)	30.96 (27.43)	22.14 (28.11)	24.18 (26.55)	—
Percentage overall work impairment due to health, mean (S.D.)	29.08 (31.72)	26.89 (30.26)	28.17 (31.03)	35.44 (31.56)	24.52 (30.68)	28.55 (31.14)	—
Percentage activity impairment due to health, mean (S.D.)	39.13 (28.84)	38.68 (29.34)	41.68 (31.87)	38.54 (28.01)	35.38 (32.12)	39.82 (30.54)	—
Health care resource utilization (past 6 months)							
Visited any traditional health care provider, n (%)	935 (97.3)	541 (94.9)	1517 (92.8)	245 (91.4)	299 (94.6)	3537 (94.3)	—
(If yes) Number of visits to any traditional health care provider (past 6 months), mean (S.D.)	7.90 (8.75)	9.74 (9.18)	5.89 (5.61)	7.94 (10.53)	7.46 (6.52)	7.27 (7.71)	—
Visited GP, n (%)	879 (91.5)	441 (77.4)	1302 (79.6)	192 (71.6)	263 (83.2)	3077 (82.1)	—
Visited orthopaedist, n (%)	45 (4.7)	221 (38.8)	154 (9.4)	56 (20.9)	85 (26.9)	561 (15.0)	—
Been hospitalized, n (%)	137 (14.3)	71 (12.5)	183 (11.2)	37 (13.8)	32 (10.1)	460 (12.3)	—
Been to ER, n (%)	104 (10.8)	66 (11.6)	243 (14.9)	47 (17.5)	85 (26.9)	545 (14.5)	—

SF-12v2: 12-item Short Form version 2; GP: general practitioner; ER: emergency room.

TABLE 3 Overall use of prescription and OTC medication

Sample size	France (n = 961)	Germany (n = 570)	UK (n = 1635)	Italy (n = 268)	Spain (n = 316)	5EU (n = 3750)
Use prescription medication	488 (50.8)	188 (33.0)	802 (49.1)	114 (42.5)	168 (53.2)	1760 (46.9)
Number of prescription medications used						
1	243/488 (49.7)	126/188 (67.0)	570/802 (71.1)	63/114 (55.3)	111/168 (66.1)	1113/1760 (63.2)
≥2	245/488 (50.2)	62/188 (33.0)	232/802 (28.9)	51/114 (44.7)	57/168 (33.9)	647/1760 (36.8)
Mean (S.D.)	1.90 (1.26)	1.49 (0.85)	1.41 (0.81)	1.91 (1.43)	1.44 (0.71)	1.59 (1.02)
Median	2	1	1	1	1	1
Use OTC medication	279 (29.0)	139 (24.4)	451 (27.6)	80 (29.9)	46 (14.6)	995 (26.5)
Use prescription medication only	338 (35.2)	161 (28.2)	679 (41.5)	85 (31.7)	144 (45.5)	1407 (37.5)
Use OTC only	129 (13.4)	112 (19.6)	328 (20.1)	51 (19.0)	22 (7.0)	642 (17.1)
Use both prescription and OTC medication	150 (15.6)	27 (4.7)	123 (7.5)	29 (10.8)	24 (7.6)	353 (9.4)
Use neither prescription or OTC medication	344 (35.8)	270 (47.4)	505 (30.9)	103 (38.4)	126 (39.9)	1348 (35.9)
Ever used prescription medication						
Sample size (those not currently using prescription medication)	473	382	833	154	148	1990
Yes	291 (61.5)	155 (40.6)	283 (34.0)	79 (51.3)	64 (43.2)	872 (43.8)
Doctor ever recommended prescription medication						
Sample size (those never having used prescription medication)	182	227	550	75	84	1118
Yes	25 (13.7)	30 (13.2)	49 (8.9)	21 (28.0)	14 (16.7)	139 (12.4)

Values are n (%) unless otherwise indicated.

satisfaction level was similar across all classes of prescription medication and across all EU countries.

One half of respondents (50.0%) reported being fully adherent to their medication regime using the 4-MMAS (Table 5). Stopping medication when feeling better was the most commonly reported reason for not being fully adherent in all countries [34.3%; lowest in Spain (29.8%) and highest in Italy (49.1%)], followed by forgetting to take their medication (22.7%). Most respondents (81.0%) reported taking exactly the amount prescribed by their doctor, although respondents from Italy were more likely to vary the amount of medication taken (28.1% compared with an average of 19.0% across all countries).

When considering respondents' overall attitudes to taking their medication for any condition, most respondents (71.9%) reported that they would continue taking their medication as they currently do unless there was a good reason to change. The majority reported taking their medication at the same time every day as much as possible (77.6%); however, only 29.7% reported to be more likely to remember their medication in the morning than at night and 32.6% found it much more difficult to take medication on schedule if it had to be taken with food. A large majority of respondents from Spain reported that they would prefer their medication to be combined into fewer pills (65.2%), although this was not so commonly reported in the other four countries.

Cost-saving strategies

Approximately one quarter of respondents across all countries reported using a cost-saving strategy in relation to their medication use for any condition over the past 6 months [28.6%; lowest in the UK (8.4%) and highest in Italy (59.0%); supplementary Table S3], available at *Rheumatology* Online. Cost-saving strategies varied between countries, although the most commonly reported cost-saving strategy in all countries except the UK was asking the doctor or pharmacist for generic alternatives. Other common strategies included buying prescriptions less often than directed, taking less medication than described, buying prescriptions for multiple months at a time through mail order, using an OTC alternative because it is less expensive and cutting tablets in half.

Discussion

This unique study of 3750 people with OA across five major EU countries captured a large amount of information on the impact of OA and its contemporary treatment. As per recent reports, most respondents reported OA-related pain in more than one joint [26, 27], with knees, fingers and/or hips most commonly affected. Respondents had considerably reduced health status and health utility compared with reported population norms, and higher levels of depression, supporting data in previous studies [28–32]. Of those in employment, people with OA reported impaired work productivity due to both absenteeism and presenteeism. The majority of respondents were using at least one type of prescription or OTC medication for their OA, and of the third of people

TABLE 4 Use of classes of prescription medication and satisfaction associated with use

Sample size, n using prescription medication	France (n = 488)	Germany (n = 188)	UK (n = 802)	Italy (n = 114)	Spain (n = 168)	5EU (n = 1760)
Paracetamol	17 (3.5)	0 (0.0)	46 (5.7)	1 (0.9)	10 (6.0)	74 (4.2)
As monotherapy	8/17 (47.1)	0/0 (0.0)	31/46 (67.4)	1/1 (100.0)	7/10 (70.0)	47/74 (63.5)
Mean months using paracetamol (S.D.)	74.53 (92.09)	—	88.22 (81.28)	24.00 (0.00)	84.60 (98.64)	83.72 (84.92)
Mean days using paracetamol in the past month (S.D.)	17.47 (11.18)	—	22.76 (10.58)	30.00 (0.00)	19.90 (10.70)	21.26 (10.80)
NSAID	227 (46.5)	154 (81.9)	462 (57.6)	92 (80.7)	101 (60.1)	1036 (58.9)
As monotherapy	90/227 (39.6)	132/154 (83.5)	325/462 (70.3)	77/92 (83.7)	874/101 (73.3)	698/1036 (67.4)
Mean months using NSAIDs (S.D.)	64.02 (67.67)	70.22 (62.32)	69.85 (73.12)	64.89 (60.05)	57.60 (59.79)	66.99 (68.07)
Mean days using NSAIDs in the past month (S.D.)	11.32 (10.58)	14.64 (10.58)	20.23 (11.62)	8.29 (8.03)	14.33 (11.01)	15.81 (11.71)
FDC NSAID/GPA	12 (2.5)	10 (5.3)	38 (4.7)	8 (7.0)	7 (4.2)	75 (4.3)
As monotherapy	0/12 (0.0)	1/10 (10.0)	0/38 (0.0)	0/8 (0.0)	0/7 (0.0)	1/75 (1.3)
Mean months using NSAID/GPA (S.D.)	31.42 (29.09)	45.50 (39.69)	74.26 (53.50)	41.50 (58.40)	66.86 (43.33)	59.39 (50.30)
Mean days using NSAID/GPA in the past month (S.D.)	9.42 (11.95)	14.90 (11.46)	19.55 (13.14)	13.50 (8.38)	23.57 (9.45)	17.04 (12.49)
COX-2 inhibitor	44 (9.0)	12 (6.4)	33 (4.1)	16 (14.0)	11 (6.5)	116 (6.6)
As monotherapy	15/44 (34.1)	8/12 (66.7)	18/33 (54.5)	9/16 (56.3)	4/11 (36.4)	54/116 (46.6)
Mean months using COX-2 inhibitor (S.D.)	53.93 (57.79)	31.42 (33.84)	53.09 (41.25)	38.06 (32.56)	15.82 (18.49)	45.56 (46.43)
Mean days using COX-2 inhibitor in the past month (S.D.)	14.07 (11.96)	16.58 (12.69)	24.76 (10.00)	6.56 (5.23)	15.73 (14.27)	16.49 (12.40)
Opioid	266 (54.5)	20 (10.6)	316 (39.4)	2 (1.8)	22 (13.1)	626 (35.6)
As monotherapy	124/266 (46.6)	6/20 (30.0)	180/316 (57.0)	0/0 (0.0)	11/22 (50.0)	321/626 (51.3)
Mean months using opioid (S.D.)	66.68 (74.17)	65.00 (64.80)	70.69 (69.02)	33.00 (12.73)	25.00 (30.74)	67.08 (70.47)
Mean days using opioid in the past month (S.D.)	15.90 (11.78)	18.95 (12.81)	22.73 (10.46)	2.50 (3.54)	17.64 (12.50)	19.46 (11.67)
Glucosamine/chondroitin prescription	43 (8.8)	1 (0.5)	3 (0.4)	1 (0.9)	24 (14.3)	72 (4.1)
As monotherapy	24/43 (55.8)	1/1 (100.0)	2/3 (66.70)	1/1 (0.0)	14/58.3 (80.0)	41/72 (46.9)
Mean months using glucosamine/chondroitin (S.D.)	72.14 (55.63)	2.00 (0.00)	42.00 (28.00)	60.00 (0.00)	28.58 (34.28)	55.22 (51.91)
Mean days using glucosamine/chondroitin in the past month (S.D.)	28.74 (5.52)	30.00 (0.00)	30.00 (0.00)	8.00 (0.00)	22.58 (11.93)	26.47 (8.82)

Values are n (%) unless otherwise indicated. FDC NSAID/GPA: fixed-dose combination non-steroidal anti-inflammatory drug and gastroprotective agent.

TABLE 5 Adherence and compliance attitudes

	France (n = 961)	Germany (n = 570)	UK (n = 1635)	Italy (n = 268)	Spain (n = 316)	5EU (n = 3750)
Adherence						
Completely adherent	218 (44.7)	87 (46.3)	444 (55.4)	42 (36.8)	89 (53.0)	880 (50.0)
Non-adherent	270 (55.3)	101 (53.7)	358 (44.6)	72 (63.2)	79 (47.0)	880 (50.0)
Adherence subscores						
Forget to take medication	111 (22.7)	47 (25.0)	165 (20.6)	38 (33.3)	39 (23.2)	400 (22.7)
Careless about taking medication	88 (18.0)	36 (19.1)	112 (14.0)	42 (36.8)	29 (17.3)	307 (17.4)
Stop medication when feel better	181 (37.1)	76 (40.4)	240 (29.9)	56 (49.1)	50 (29.8)	603 (34.3)
Stop medication when feel worse	142 (29.1)	42 (22.3)	90 (11.2)	38 (33.3)	32 (19.0)	344 (19.5)
Compliance						
I take exactly the amount prescribed by my doctor	414 (84.8)	154 (81.9)	634 (79.1)	82 (71.9)	142 (84.5)	1426 (81.0)
I take less than the amount prescribed by my doctor	66 (13.5)	30 (16.0)	154 (19.2)	27 (23.7)	22 (13.1)	299 (17.0)
I take more than the amount prescribed by my doctor	8 (1.6)	4 (2.1)	14 (1.7)	5 (4.4)	4 (2.4)	35 (2.0)
Compliance attitudes (agree or strongly agree)						
Unless there is a good reason to change my medication, I think it is best to continue taking my medication as I currently do	675 (70.2)	405 (71.1)	1205 (73.7)	177 (66.0)	233 (73.7)	2695 (71.9)
I stop taking medication when I feel better	244 (25.4)	167 (29.3)	438 (26.8)	100 (37.3)	52 (16.5)	1001 (26.7)
It is much more difficult to take medication on schedule if it has to be taken with food	343 (35.7)	139 (24.4)	580 (35.5)	65 (24.3)	94 (29.7)	1221 (32.6)
I would prefer if my medications were combined into fewer pills	469 (48.8)	204 (35.8)	651 (39.8)	98 (36.6)	206 (65.2)	1628 (43.4)
I am more likely to remember to take my medications in the morning than at night	239 (24.9)	174 (30.5)	542 (33.1)	76 (28.4)	83 (26.3)	1114 (29.7)
Sometimes I take other people's medication even though it is not prescribed for me	86 (8.9)	25 (4.4)	84 (5.1)	33 (12.3)	30 (9.5)	258 (6.9)
I try to take my medication at the same time every day	708 (73.7)	428 (75.1)	1338 (81.8)	181 (67.5)	255 (80.7)	2910 (77.6)

Values are *n* (%).

who were not currently using medication, most had either tried medications in the past or their doctor had recommended medication use. Overall, almost 70% of prescription medication users reported use of an NSAID-type medication. There was considerable variation between countries in drugs used, most likely as a result of country-specific factors, including national prescribing guidelines. The majority of respondents reported that they used their medications as directed by their doctor. Only one third of respondents reported being satisfied with their OA medication.

This study confirms the substantial impact of OA on both health status and on workplace productivity [33–35]. The health utility score in our population supports previous publications, suggesting reduced health utility in people with OA compared with the general population [29]. The mean SF-6 health utility score for the OA population in our study lies within the range suggested by previous OA studies [29–32, 36] and is lower than that reported for 55–74 year olds in the general population [37]. Similarly, both physical and mental functioning scores were reduced in people with OA compared with the overall 5EU population and the magnitude of this reduction was similar to that reported in a recent meta-analysis of previous OA studies [38]. According to a meta-analysis of quality of life scores across a range of chronic diseases, a reduction of >0.5 s.d. of the population norm would be considered clinically significant [39]. The overall health utility score, physical component score and the physical function, pain and general health subscores for the OA population in this study meet this criteria for clinical significance, although the mental component scores did not reach this threshold. While only one third of respondents were still working full time, this study demonstrates the impact of OA on younger people. Notably, while respondents with OA experienced absenteeism (i.e. absence from work), they also reported presenteeism (i.e. impairment while at work).

The findings of this study are generally in line with recognized care pathways; e.g. in Germany many more people with OA will see an orthopaedic surgeon than in other countries. Considerable variation in prescription medication use was found across countries. Opioid use was not reported in Italy, supporting previous reports that despite changes to the law surrounding opioid use in Italy in 2006, opioid use remains low [40]. Opioid use was also low in Germany and Spain, whereas in France it was the most commonly used prescription medication. Factors that may result in low use of opioids include lack of education among doctors, poor public awareness of using opioids to treat non-cancer pain, cultural prejudices about opioids and restrictive prescription regulations [41]. In all the 5EU countries, the limit for the number of days of opioid prescription that a clinician may prescribe is the same (30 days); however, there are considerable variations in the length of time for which a prescription is valid and the rules for completion of prescriptions. In Germany, for example, opioid prescription forms are only valid for 1 week and must be completed by the

physician in triplicate, while in Italy, physicians must travel in person to collect prescription forms. It is notable that while there are marked variations in the use of some prescription medications across the five countries, this is not reflected in quality of life scores, which remain fairly consistently reduced across nations.

Although the >75 age group in our population was fairly small (5.9%), one fifth reported currently using prescription NSAIDs (21.2%) for their OA. This is in line with a recent study in a US cohort that demonstrated a worrying trend of NSAID use being sustained in patients aged >75 years, despite guidelines suggesting their use be contraindicated in this population [42]. Similarly, a recent community study in the USA showed NSAID use was not reduced in the elderly [43]. Notably, NSAID use by the >75-year-old population in Germany was even higher, perhaps reflecting the lack of paracetamol and opioid alternative usage.

A number of studies have previously reported that higher levels of OA pain are associated with increased use of both prescription and OTC medications [17, 42]. The current study found an increased use of prescription medication in respondents self-reporting severe OA pain compared with those with moderate and mild pain. However, OTC medication use was reduced in respondents with severe pain compared with those with moderate and mild pain. Opioid use was notably high in respondents with severe pain, as may be expected.

Our data showed that half of respondents considered themselves to be fully adherent to their medication regime using MMAS, which is in line with previous reports both for OA and other chronic diseases [18, 44]. Interestingly, while the majority of respondents stated that they took their medication as directed by their doctors, medications were taken on average for only 15–21 days/month. It has been suggested previously that people have a different attitude towards pain medication than towards other medications, often focusing on the take as required instruction on the prescription and consequently taking lower than the suggested dose or using it less frequently than prescribed [17, 18]. Moreover, studies suggest that people do not perceive taking too little medication as non-adherence [18]. It is interesting that the countries with lower medication adherence (Italy, France and Germany) also reported lower mental functioning and overall health utility scores compared with the countries reporting higher medication adherence rates (Spain and the UK).

Although the strengths of this study include a large sample size and population-level analysis based on data that is stratified to reflect the demographic composition across the 5EU countries studied, thereby enhancing its generalizability, there are limitations that should be considered. The data used in the analyses are based on patient self-report and a clinical diagnosis of OA was not confirmed. In addition, we are unable to attribute linked causality between OA and reported outcomes, since it is possible that co-morbid conditions and other factors may have contributed in part to the differences described. The use of different classes of OTC medication could not be

reliably determined due to a high proportion of respondents not stating the class of medication used [336/995 (33.8%)]. Although demographically representative of the population overall, the survey may not be representative of OA specifically. In addition, due to the survey methodology, there are a lower number of respondents aged ⩾75 years in the NHWS sample. Since both the incidence of OA and contraindications to many OA pharmaceutical medications increases with age, consideration of this population is particularly important.

With the exception of NSAID use, which appears to be fairly consistent, there is wide variation in the use of pharmacotherapy for OA across these five major countries in Europe, most likely driven by national prescribing guidelines. This variation may have implications for OA management, although within this study the impact of OA looked largely similar despite the national variations in prescribing.

> ### Rheumatology key messages
>
> - OA significantly impacts health status and work productivity.
> - OA pharmacotherapy varies across France, Italy, Spain, Germany and the UK.

Acknowledgements

Supplementary data

Supplementary data are available at *Rheumatology* Online.

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