



UNIVERSITY OF LEEDS

This is a repository copy of *Osteoarthritis in Europe: impact on health status, work productivity and use of pharmacotherapies in five European countries.*

White Rose Research Online URL for this paper:  
<http://eprints.whiterose.ac.uk/86958/>

Version: Accepted Version

---

**Article:**

Kingsbury, SR, Gross, HJ, Isherwood, G et al. (1 more author) (2014) Osteoarthritis in Europe: impact on health status, work productivity and use of pharmacotherapies in five European countries. *Rheumatology*, 53 (5). 937 - 947. ISSN 1462-0324

<https://doi.org/10.1093/rheumatology/ket463>

---

**Reuse**

Unless indicated otherwise, fulltext items are protected by copyright with all rights reserved. The copyright exception in section 29 of the Copyright, Designs and Patents Act 1988 allows the making of a single copy solely for the purpose of non-commercial research or private study within the limits of fair dealing. The publisher or other rights-holder may allow further reproduction and re-use of this version - refer to the White Rose Research Online record for this item. Where records identify the publisher as the copyright holder, users can verify any specific terms of use on the publisher's website.

**Takedown**

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing [eprints@whiterose.ac.uk](mailto:eprints@whiterose.ac.uk) including the URL of the record and the reason for the withdrawal request.



[eprints@whiterose.ac.uk](mailto:eprints@whiterose.ac.uk)  
<https://eprints.whiterose.ac.uk/>

**Title: Osteoarthritis in Europe: impact on health status, work productivity, and use of pharmacotherapies in 5 European countries**

Sarah R. Kingsbury<sup>1</sup>, Hillary J. Gross<sup>2</sup>, Gina Isherwood<sup>2,3</sup> and Philip G. Conaghan<sup>1</sup>

<sup>1</sup>Leeds Institute of Rheumatic and Musculoskeletal Medicine, University of Leeds and NIHR Leeds Musculoskeletal Biomedical Research Unit, Leeds, UK

<sup>2</sup>Kantar Health, New York, NY, USA

<sup>3</sup>Kantar Health, Epsom, Surrey, UK

Correspondence to: Philip G. Conaghan, Leeds Institute of Rheumatic and Musculoskeletal Medicine, Chapel Allerton Hospital, Chapeltown Road, Leeds, LS7 4SA, UK

email: [p.conaghan@leeds.ac.uk](mailto:p.conaghan@leeds.ac.uk)

telephone: 0113 392 4884

fax: 0113 392 4991,

**Running Title:** Osteoarthritis impact and medication use in 5 EU

**Abstract**

**Objectives:** The aims of this study were to examine the impact of peripheral-joint osteoarthritis (OA) across 5 large European countries and how people with OA use pharmacotherapies.

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

**Results:** A total of 3,750 respondents met inclusion criteria: 1,635 (43.6%) UK, 961 (25.6%) France, 570 (15.2%) Germany, 316 (8.4%) Spain, 268 (7.1%) Italy. The majority were aged

55-74 years; most were overweight or obese. Health status (SF12v2) was similar across all countries, with a mean (SD) of 40.53(10.99); 21.5% self-reported experiencing depression. Most had visited a healthcare provider in the previous six months (n=3,537; 94.3%). One third were employed; 7% reported absenteeism, 24% presenteeism. Use of prescription medication for OA was reported by 46.9%, over-the-counter (OTC) medication by 26.5%, 9.4% reported both. 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 percent 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: ~~OA significantly impacts health status and work productivity. Allowing for national variations in prescribing, the impact of OA and its current pharmacotherapy looks largely similar across these European countries.~~

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

Osteoarthritis (OA), the most common type of arthritis, is estimated to affect over 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 characterised 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% gross national product, although there is limited data on its impact on work productivity.[10, 11]

Treatment guidelines for OA management uniformly recommend a range of pharmacological therapies, including paracetamol, non-steroidal anti-inflammatory drugs (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 prescription (for example, 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] Whilst there have been studies examining medication use in OA populations in the US, there is limited information about how medication is used by people with OA in Europe.

The aims of this study were therefore to examine the impact of peripheral-joint OA in 5 large European countries (France, Germany, Italy, Spain and the United Kingdom [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 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 n=57,512 adults aged 18 and over in five European countries (France: n=15,000; Germany: n=15,001; Italy: n=7,500; Spain: n=5,011; and 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, which includes over 2 million members in the US and 5 European countries (5EU) who have agreed to participate in survey research. Panel members complete in-depth demographic registration profiles which 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+ population, on-line 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 Essex IRB (Lebanon, NJ), 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 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 questions: firstly, whether their arthritis had been diagnosed by a physician (response yes/no) and secondly, the type of arthritis, with options of OA, rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, 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 methotrexate, sulfasalazine, dexamethasone or a biologic agent for their condition.

## **Outcomes evaluated and statistical methods**

Data were analysed across the total population and separately for the 5 individual EU countries. Summary statistics are presented for continuous variables as arithmetic means and standard deviations or medians as appropriate, and categorical variables as frequencies and percentages. Demographic and health characteristics examined included age, gender, body mass index (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 comorbid burden by weighting several comorbidities 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 Short Form-12v2 (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 conducted for all respondents. Healthcare utilisation was measured by type and number of resources used within the past six months for any condition, including number of visits to a healthcare provider, general practitioner (GP), 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 seven-point Likert scale with one being extremely dissatisfied and seven 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 summarised in Table 1. A total of 3,750 respondents met inclusion criteria; 961 (25.6%) from France, 570 (15.2%) from Germany, 1635 (43.6%) from UK, 268 (7.1%) from Italy, and 316 (8.4%) from Spain. There were slightly more female than male respondents, with most aged 55-74 years, and 62.6% either overweight or obese (BMI  $\geq 25$ ). Approximately half of respondents in all countries reported exercising vigorously for 20 minutes or more at least once per month. In all countries self-reported depression was higher in the OA population (mean 21.5%) compared to the total 5EU population. One fifth (21.5%) of participants self-reported experiencing depression, (13.4%), with the lowest levels in Spain and the highest in UK. The median number of joints affected was two in Germany, Italy and Spain, and three in France and 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 (SD) of 40.53 (10.99), and reduced compared to values across the total 5EU population (mean 48.78, SD 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% of absenteeism, which was particularly high in Italy and France, and low in Spain. Rates of presenteeism were almost 4 times greater than absenteeism, with an average of 24% (Table 2).

The large majority of respondents in all countries had visited a healthcare 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 UK. Hospitalization was approximately equivalent across all countries, although ER attendance was higher in Spain compared to 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 to 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 UK [34.0%], highest in France [61.5%]), whilst 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 UK [8.9%], 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%), whilst opioid use was very low in Italy (1.8%), Germany (10.6%) and Spain (13.1%), and high in France (54.5%) and UK (39.4%). Glucosamine or chondroitin use was mainly reported by respondents from France (8.8%) or Spain (14.3%). Notably, one fifth of respondents aged over 75 reported use of prescription NSAIDs (21.2%), and this figure was particularly high in Germany where 28.9% of those over 75 years reported prescription NSAID use (data not shown).

Across all prescription medications, respondents reported using their medication for approximately 20 days per month, ranging from  $15.81 \pm 11.71$  days for NSAIDs to  $26.47 \pm 8.82$  days for glucosamine/chondroitin. In general, respondents from the UK reported use of medications for more days each month ( $22.09 \pm 10.96$ ) than respondents from the other four countries, particularly Italy ( $10.16 \pm 8.85$ ), 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 ( $83.72 \pm 84.92$  months; 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 1). In contrast, OTC use was lower in those reporting severe pain (17.3%) compared to those with mild (27.6%) and moderate (27.9%) pain. 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 to being very or extremely satisfied with their current medication (Supplementary Table 2). The mean 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%], 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 to an average of 19.0% across all countries).

When considering respondents' overall attitudes to taking their medications 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 medications 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 medications 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 six months (28.6%; lowest in UK [8.4%], highest in Italy [59.0%]; Supplementary Table 3). 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 3,750 people with OA across 5 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 to reported population norms, and higher levels of depression.—supporting data in previous studies.[28-32][26-28] 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 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 to 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 Mean SF-6 health utility scores reported for 55-74 year olds for in the general population, have been reported as 0.78 for 55-74 year olds [37], whilst previous studies have suggested health utility in people with OA to be reduced to 0.66-0.74. (31, 33-36) The mean overall health utility score of the OA population in our study was 0.67, whilst the mean score for the total 5EU population was 0.73. Similarly, both physical and mental functioning scores were reduced in people with OA compared to 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 more than half a standard-deviation 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 sub-scores for the OA population in this study meet this criteria for clinical significance, although the mental component scores did not reach this threshold.(38),- Although Whilst only approximately 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 recognised care pathways; for example, 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 which may result in low use of opioids include lack of education amongst doctors, poor public awareness of using opioids to treat non-cancer pain, cultural

prejudices about opioids and restrictive prescription regulations.[41] In all five EU 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 one week and must be completed by the physician in triplicate, whilst in Italy, physicians must travel in person to collect prescription forms. It is notable, that whilst there are marked variations in 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 over 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 which demonstrated a worrying trend of NSAID use being sustained in patients over 75 years, despite guidelines suggesting their use to be contraindicated in this population.[42] Similarly, a recent community study in the US showed NSAID use was not reduced in the elderly.[43] Notably, NSAID use by the over 75 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 to those with moderate and mild pain. However OTC medication use was reduced in respondents with severe pain, compared to 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, whilst the majority of respondents stated that they

took their medication as directed by their doctors; medications were on average only taken for 15-21 days per month. It has been suggested previously that people have a different attitude to pain medication than to other medications, often focusing on the 'take as required' instruction on the prescription and consequently taking lower than the suggested dose or using 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, Germany) also reported lower mental functioning and overall health utility scores, compared to the countries reporting higher medication adherence rates (Spain and UK).

Although strengths of this study include a large sample size and population-level analysis based on data which is stratified to reflect the demographic composition across the five European countries studied, thereby enhancing its generalisability, there are limitations that should be considered. The data used in the analyses is 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 attributed in part to the differences described. 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 age 75 and older 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 allowing for national variations in prescribing, the impact of OA and its current pharmacotherapy looks largely similar across the five major markets in Europe and is related to pain severity.~~

## **Key Messages**

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

## **Acknowledgements**

The authors would like to thank Professors J. Braun, A. Iagnocco, D. Loeuille and E. Naredo for their helpful comments on the manuscript.

## **Funding statement**

This study has been part funded by the National Institute for Health Research (NIHR) through the Leeds Musculoskeletal Biomedical Research Unit. This article/paper/report presents independent research funded by the NIHR. The views expressed are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health.

## **Conflict of interest statement**

SRK, HJG, GI: no conflicts of interest; PCG: speaker or advisory boards for Janssen, Merck, Pfizer and Napp.

## **References**

1. World, Health, Organisation. The burden of musculoskeletal conditions at the start of the new millennium. Geneva: World Health Organization 2003.
2. Murphy L, Schwartz TA, Helmick CG, et al. Lifetime risk of symptomatic knee osteoarthritis. *Arthritis Rheum* 2008; 59:1207-13.

3. Murphy LB, Helmick CG, Schwartz TA, et al. One in four people may develop symptomatic hip osteoarthritis in his or her lifetime. *Osteoarthritis Cartilage* 2010; 18:1372-9.
4. Murray CJ, Vos T, Lozano R, et al. Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet* 2012; 380:2197-223.
5. Vos T, Flaxman AD, Naghavi M, et al. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet* 2012; 380:2163-96.
6. Woolf AD. The bone and joint decade. strategies to reduce the burden of disease: the Bone and Joint Monitor Project. *J Rheumatol Suppl* 2003; 67:6-9.
7. McWilliams LA, Goodwin RD, Cox BJ. Depression and anxiety associated with three pain conditions: results from a nationally representative sample. *Pain* 2004; 111:77-83.
8. Soares JJ, Jablonska B. Psychosocial experiences among primary care patients with and without musculoskeletal pain. *European Journal of Pain* 2004; 8:79-89.
9. Keenan A, Mckenna S, Doward L, Conaghan P, Emery P, Tennant A. Development and validation of a needs-based quality of life instrument for osteoarthritis *Arthritis Care Res* 2008; 59:841-8.
10. Stewart WF, Ricci JA, Chee E, Morganstein D, Lipton R. Lost productive time and cost due to common pain conditions in the US workforce. *JAMA* 2003; 290:2443-54.
11. Yelin E, Sonneborn D, Trupin L. The prevalence and impact of accommodations on the employment of persons 51-61 years of age with musculoskeletal conditions. *Arthritis Care Res* 2000; 13:168-76.
12. Zhang W, Doherty M, Arden N, et al. EULAR evidence based recommendations for the management of hip osteoarthritis: report of a task force of the EULAR Standing Committee for International Clinical Studies Including Therapeutics (ESCISIT). *Ann Rheum Dis* 2005; 64:669-81.
13. Zhang W, Doherty M, Leeb BF, et al. EULAR evidence based recommendations for the management of hand osteoarthritis: report of a Task Force of the EULAR Standing Committee for International Clinical Studies Including Therapeutics (ESCISIT). *Ann Rheum Dis* 2007; 66:377-88.
14. Fernandes L, Hagen KB, Bijlsma JW, et al. EULAR recommendations for the non-pharmacological core management of hip and knee osteoarthritis. *Ann Rheum Dis* 2013; 72:1125-35.
15. Zhang W, Nuki G, Moskowitz RW, et al. OARSI recommendations for the management of hip and knee osteoarthritis: part III: Changes in evidence following systematic cumulative update of research published through January 2009. *Osteoarthritis Cartilage* 2010; 18:476-99.
16. Conaghan PG, Dickson J, Grant RL. Care and management of osteoarthritis in adults: summary of NICE guidance. *BMJ* 2008; 336:502-3.
17. Blamey R, Jolly K, Greenfield S, Jobanputra P. Patterns of analgesic use, pain and self-efficacy: a cross-sectional study of patients attending a hospital rheumatology clinic. *BMC Musculoskelet Disord* 2009; 10:137.
18. Sale JE, Gignac M, Hawker G. How "bad" does the pain have to be? A qualitative study examining adherence to pain medication in older adults with osteoarthritis. *Arthritis Rheum* 2006; 55:272-8.
19. Kantar Health, February 2012. National Health and Wellness Survey, 2011 [EU Big 5]. Princeton, NJ.
20. Anonymous. World Medical Association Declaration of Helsinki. Ethical Principles for Medical Research Involving Human Subjects. *Bulletin of the World Health Organization*. 2001; 79:373-4.
21. Charlson ME, Pompei P, Ales KL, MacKenzie CR. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. *J Chronic Dis* 1987; 40:373-83.

22. Ware JJ, Kosinski M, Turner-Bowker D. User's manual for the SF-12v2™ health survey with a supplement documenting SF-12® health survey. Lincoln: QualityMetric Incorporated; 2001.
23. Brazier J, Roberts J, Deverill M. The estimation of a preference-based measure of health from the SF-36. *J Health Econ* 2002; 21:271-92.
24. Reilly MC, Zbrozek AS, Dukes EM. The validity and reproducibility of a work productivity and activity impairment instrument. *Pharmacoeconomics* 1993; 4:353-65.
25. Morisky DE, Green LW, Levine DM. Concurrent and predictive validity of a self-reported measure of medication adherence. *Med Care* 1986; 24:67-74.
26. Keenan AM, Tennant A, Fear J, Emery P, Conaghan PG. Impact of multiple joint problems on daily living tasks in people in the community over age fifty-five. *Arthritis Rheum* 2006; 55:757-64.
27. Carnes D, Parsons S, Ashby D, et al. Chronic musculoskeletal pain rarely presents in a single body site: results from a UK population study. *Rheumatology (Oxford)* 2007; 46:1168-70.
28. Sale JE, Gignac M, Hawker G. The relationship between disease symptoms, life events, coping and treatment, and depression among older adults with osteoarthritis. *J Rheumatol* 2008; 35:335-42.
29. Manheim LM, Dunlop D, Song J, Semanik P, Lee J, Chang RW. Relationship between physical activity and health-related utility among knee osteoarthritis patients. *Arthritis Care Res* 2012; 64:1094-8.
30. Salaffi F, Carotti M, Grassi W. Health-related quality of life in patients with hip or knee osteoarthritis: comparison of generic and disease-specific instruments. *Clin Rheumatol* 2005; 24:29-37.
31. Salaffi F, Carotti M, Stancati A, Grassi W. Health-related quality of life in older adults with symptomatic hip and knee osteoarthritis: a comparison with matched healthy controls. *Aging Clinical and Experimental Research* 2005; 17:255-63.
32. Salaffi F, De Angelis R, Stancati A, Grassi W. Health-related quality of life in multiple musculoskeletal conditions: a cross-sectional population based epidemiological study. II. The MAPPING study. *Clin Exp Rheumatol* 2005; 23:829-39.
33. Kotlarz H, Gunnarsson CL, Fang H, Rizzo JA. Osteoarthritis and absenteeism costs: evidence from US National Survey Data. *J Occup Environ Med* 2010; 52:263-8.
34. Maetzel A, Li LC, Pencharz J, Tomlinson G, Bombardier C. The economic burden associated with osteoarthritis, rheumatoid arthritis, and hypertension: a comparative study. *Ann Rheum Dis* 2004; 63:395-401.
35. White AG, Birnbaum HG, Janagap C, Buteau S, Schein J. Direct and indirect costs of pain therapy for osteoarthritis in an insured population in the United States. *J Occup Environ Med* 2008; 50:998-1005.
36. Dibonaventura M, Gupta S, McDonald M, Sadosky A. Evaluating the health and economic impact of osteoarthritis pain in the workforce: results from the National Health and Wellness Survey. *BMC Musculoskelet Disord* 2011; 12:83.
37. Fryback DG, Dunham NC, Palta M, et al. US norms for six generic health-related quality-of-life indexes from the National Health Measurement study. *Med Care* 2007; 45:1162-70.
38. van der Waal JM, Terwee CB, van der Windt DA, Bouter LM, Dekker J. The impact of non-traumatic hip and knee disorders on health-related quality of life as measured with the SF-36 or SF-12. A systematic review. *Qual Life Res* 2005; 14:1141-55.
39. Norman GR, Sloan JA, Wyrwich KW. Interpretation of changes in health-related quality of life: the remarkable universality of half a standard deviation. *Med Care* 2003; 41:582-92.
40. Bandieri E, Chiarolanza A, Luppi M, Magrini N, Marata AM, Ripamonti C. Prescription of opioids in Italy: everything, but the morphine. *Ann Oncol* 2009; 20:961-2.
41. Galvez R. Variable use of opioid pharmacotherapy for chronic noncancer pain in Europe: causes and consequences. *Journal of pain & palliative care pharmacotherapy* 2009; 23:346-56.

42. Kingsbury SR, Hensor EMA, Walsh CEA, Hochberg MC, Conaghan PG. How do people with knee osteoarthritis use osteoarthritis pain medications and does this change over time? Data from the Osteoarthritis Initiative. *Arthritis Research & Therapy* 2013; 15:R106 [Epub ahead of print].
43. Rosenwald K, Ertl K, Fletcher KE, Whittle J. Patterns of arthritis medication use in a community sample. *J Prim Care Community Health* 2012; 3:272-7.
44. Dunbar-Jacob J, Erlen JA, Schlenk EA, Ryan CM, Sereika SM, Doswell WM. Adherence in chronic disease. *Annu Rev Nurs Res* 2000; 18:48-90.

**Table 1: Demographic and health characteristics of study population**

	<b>France*</b> n=961	<b>Germany*</b> n=570	<b>UK*</b> n=1635	<b>Italy*</b> n=268	<b>Spain*</b> n=316	<b>5EU*</b> n=3,750
<b>Gender</b>						
<b>Male</b>	331 (34.4)	255 (44.7)	75 (46.2)	126 (47.0)	116 (36.7)	1583 (42.2)
<b>Female</b>	630 (65.6)	315 (55.3)	880 (53.8)	142 (53.0)	200 (63.3)	2167 (57.8)
<b>Age</b> Mean ± SD	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)
<b>BMI</b> Mean ± SD	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-<25	338 (35.7)	171 (30.2)	381 (24.2)	104 (39.4)	106 (33.9)	1100 (30.0)
Overweight 25-<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)
<b>Exercise</b>						
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)
<b>CCI</b> Mean ± SD	0.46 ± 1.01	0.65 ± 1.12	0.49 ± 0.91	0.49 ± 0.98	0.58 ± 1.10	0.51 ± 0.99
<b>Self-reported depression</b>	156 (16.2)	103 (18.1)	449 (27.5)	53 (19.8)	46 (14.6)	807 (21.5)
<b>Pain Severity</b>						
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)
<b>Median number of joints affected</b>	3	2	3	2	2	2
<b>Number of joints affected</b>						
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)
<b>Top 3 affected joints</b>						
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)

\*n (%) unless stated. BMI – body mass index; CCI – Charlson Co-morbidity index

**Table 2: Impact of OA**

	<b>France*</b> n=961	<b>Germany*</b> n=570	<b>UK*</b> n=1635	<b>Italy*</b> n=268	<b>Spain*</b> n=316	<b>5EU (all OA)*</b> n=3,750	<b>5EU (total)*</b> n=57,512
<b>Health-Related Quality of Life: SF-12v2</b>							
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
<b>Sub-scores</b>							
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 ± .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
<b>Work productivity and activity impairment (WPAI)</b>							
<b>Employed (full-time, part-time, or self)</b>	319 (33.2%)	250 (43.9%)	472 (28.9%)	120 (44.8%)	102 (32.3%)	1263 (33.7%)	-
Percent work missed due to health (absenteeism)	9.52 ± 26.61	6.77 ± 20.53	6.57 ± 21.29	8.65 ± 22.24	4.58 ± 16.34	7.40 ± 22.39	-
Percent impairment while working due to health (presenteeism)	22.82 ± 24.96	23.36 ± 26.41	24.20 ± 26.90	30.96 ± 27.43	22.14 ± 28.11	24.18 ± 26.55	-
Percent overall work impairment due to health	29.08 ± 31.72	26.89 ± 30.26	28.17 ± 31.03	35.44 ± 31.56	24.52 ± 30.68	28.55 ± 31.14	-
Percent activity impairment due to health	39.13 ± 28.84	38.68 ± 29.34	41.68 ± 31.87	38.54 ± 28.01	35.38 ± 32.12	39.82 ± 30.54	-
<b>Healthcare resource utilization (past 6 months)</b>							
Visited any traditional healthcare provider	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 healthcare provider (past six months)	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	879 (91.5)	441 (77.4)	1302 (79.6)	192 (71.6)	263 (83.2)	3077 (82.1)	-
Visited Orthopaedist	45 (4.7)	221 (38.8)	154 (9.4)	56 (20.9)	85 (26.9)	561 (15.0)	-
Been hospitalized	137 (14.3)	71 (12.5)	183 (11.2)	37 (13.8)	32 (10.1)	460 (12.3)	-
Been to ER	104 (10.8)	66 (11.6)	243 (14.9)	47 (17.5)	85 (26.9)	545 (14.5)	-

\*mean ± SD or n (%); ER – emergency room; GP – general practitioner.

**Table 3: Overall use of prescription and over-the-counter medication**

	<b>France*</b> n=961	<b>Germany*</b> n=570	<b>UK*</b> n=1635	<b>Italy*</b> n=268	<b>Spain*</b> n=316	<b>5EU*</b> n=3,750
<b>Sample size</b>						
<b>Use prescription medication</b>	488 (50.8)	188 (33.0)	802 (49.1)	114 (42.5)	168 (53.2)	1760 (46.9)
<b>Number of prescription medications used</b>						
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 ± SD	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
<b>Use OTC medication</b>	279 (29.0)	139 (24.4)	451 (27.6)	80 (29.9)	46 (14.6)	995 (26.5)
<b>Use prescription medication only</b>	338 (35.2)	161 (28.2)	679 (41.5)	85 (31.7)	144 (45.5)	1407 (37.5)
<b>Use OTC only</b>	129 (13.4)	112 (19.6)	328 (20.1)	51 (19.0)	22 (7.0)	642 (17.1)
<b>Use both prescription and OTC medication</b>	150 (15.6)	27 (4.7)	123 (7.5)	29 (10.8)	24 (7.6)	353 (9.4)
<b>Use neither prescription or OTC medication</b>	344 (35.8)	270 (47.4)	505 (30.9)	103 (38.4)	126 (39.9)	1348 (35.9)
<b>Ever used prescription medication</b>						
<b>Sample size (those not currently using prescription medication)</b>	473	382	833	154	148	1990
<b>Yes</b>	291 (61.5)	155 (40.6)	283 (34.0)	79 (51.3)	64 (43.2)	872 (43.8)
<b>Doctor ever recommended prescription medication</b>						
<b>Sample size (those never having used prescription medication)</b>	182	227	550	75	84	1118
<b>Yes</b>	25 (13.7)	30 (13.2)	49 (8.9)	21 (28.0)	14 (16.7)	139 (12.4)

\* n (%) unless indicated OTC – over the counter. .

**Table 4: Use of classes of prescription medication and satisfaction associated with use**

<b>Sample size (no. using prescription medication)</b>	<b>France* n=488</b>	<b>Germany* n=188</b>	<b>UK* n=802</b>	<b>Italy* n=114</b>	<b>Spain* n=168</b>	<b>5EU* n=1760</b>
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 ± SD	74.53 ± 92.09	-	88.22 ± 81.28	24.00 ± 0.00	84.60 ± 98.64	83.72 ± 84.92
Mean days used paracetamol in past month ± SD	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 ± SD	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 used NSAIDs in past month ± SD	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 ± SD	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 used NSAID/GPA in past month ± SD	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 ± SD	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 used cox-2 inhibitor in past month ± SD	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 ± SD	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 used opioid in past month ± SD	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	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 ± SD	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 used glucosamine/chondroitin in past month ± SD	28.74 ± 5.52	30.00 ± 0.00	30.00 ± 0.00	8.00 ± 0.00	22.58 ± 11.93	26.47 ± 8.82

\*n (%) unless indicated. FDC NSAID/GPA – fixed-dose combination non-steroidal anti-inflammatory drug and gastroprotective agent; NSAID – non-steroidal anti-inflammatory drug.

**Table 5: Adherence and compliance attitudes**

	<b>France*</b> n=961	<b>Germany*</b> n=570	<b>UK*</b> n=1635	<b>Italy*</b> n=268	<b>Spain*</b> n=316	<b>5EU*</b> n=3,750
<b>Adherence</b>						
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)
<b>Adherence subscores</b>						
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)
<b>Compliance</b>						
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)
<b>Compliance Attitudes (% agree/strongly agree)</b>						
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)

\*n (%) unless indicated.