The prevalence, correlates and treatment of pain in Spain

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Original article
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Abstract

Objectives:
The aims of this paper are to report on the prevalence, correlates and treatment of pain in the adult Spanish population. The analysis also explores the association between the experience of pain and health-related quality of life (HRQoL), employment and productivity, and healthcare resource utilization.

Methods:
Data are from the internet-based, 2010 National Health and Wellness Survey (NHWS) Spain. The sample was weighted by age and sex to correspond to the 2010 adult Spanish population. All respondents to the NHWS reported on socio-demographic and economic characteristics, medication adherence and major health conditions. They also reported on their HRQoL (the SF-12), their employment status and workplace productivity experience (WPAI instrument) and their healthcare resource utilization. Persons reporting experiencing pain gave details on conditions causing pain, prescription and over the counter (OTC) medication utilization, duration of utilization and satisfaction with medications. A supplementary analysis evaluated the population prevalence of pain for the five most populous Spanish autonomous communities (regions).

Results:
An estimated 6.10 million (17.25%) of the adult population of Spain reported experiencing pain in the last month. Of these 11.69% experienced severe pain, 64.17% moderate pain and 24.14% mild pain. Daily pain was experienced by 6.95% of the population The major conditions causing pain are back pain (60.53%) followed by joint pain (40.21%). Sleep difficulties (42.24%) and anxiety (40.62%) were most commonly cited as comorbidities. Prescription medication utilization was most important in the severe and moderate pain categories, with 71.62% reporting they were satisfied with their prescription pain medications. Adherence to pain medications was high with an overall Morisky score of 0.99 (range 0–4). Pain had a major negative effect on labor force participation for those reporting moderate and severe pain with a participation rate of only 42.62% for those with severe pain. Pain was associated with substantial health-related quality of life deficits as measured by the physical and mental score components of the SF-12. In the case of SF-6D utilities, the utility score for the pain population was markedly below that for the no-pain population (0.65 vs. 0.75; $p < 0.05$). The experience of pain also negatively impacted rates of absenteeism and presenteeism, as well as being associated with greater healthcare resource utilization. Finally, for the five most populous autonomous communities of Spain estimated pain prevalence ranged from 14.80% for Madrid to 18.79% for Comunidad Valenciana. The are a number of limitations which should be noted. First, this is an internet-based sample study and the respondent population may not be representative of the Spanish adult population. Second, respondents are asked to report their experience of pain with no independent clinical conformation. Finally, while a number of obvious acute pain categories are exclude, there is no attempt to arbitrarily define a chronic pain population or to identify pain categories such as neuropathic pain.

Conclusions:
The experience of pain represents a substantial burden on both individuals and the Spanish economy. The experience of pain is associated with a substantial reduction in both the PCS component of the SF-12 and SF-6D absolute utilities – most notably in respect of severe pain. The experience of pain is also

associated, not only with reduced labor force participation and increased absenteeism and presenteeism, but with substantially higher patterns of healthcare resource utilization.

Introduction

Relatively little is known in Spain about the prevalence, correlates and treatment of pain at the national level. While Spain is not unusual in this regard, compared to other countries in the European Union, the absence of such data means that it is impossible to assess the overall societal burden of pain in Spain. There are no quantitative assessments of the impact of pain on health-related quality of life (HRQoL), healthcare resource utilization, employment status and workplace productivity. Studies which do exist are either restricted in their coverage or the questions asked. The most comprehensive of these studies, Català et al. is restricted to persons experiencing recent pain[1]. Although population prevalence estimates and the correlates of pain are described together with the degree of activity limitations imposed, the study does not attempt to quantify the societal burden of pain. Other studies are limited by region and by demographic group[2,3].

At the European level the picture is somewhat different from that found in Spain. Apart from disease-specific pan-national assessments of the correlates and burden of pain, there are two studies which have presented a comprehensive overview of chronic pain[4,5]. While the Breivik et al. study is limited by the absence of a control group, the Langley study, reporting on the UK, France, Spain, Germany and Italy as a group, contrasts the experience of those experiencing pain with no-pain controls[4,5]. After excluding a number of acute-pain categories, the study found that, in 2008, 22.47% of the adult population in these five countries experienced pain in the last month. The presence of a control group means that it is possible to undertake a comparative multivariate analysis to assess the impact of pain on HRQoL and healthcare resource utilization and employment status, absenteeism and presenteeism[6,7].

The aim of the present study is to report on the prevalence, correlates and treatment of pain in Spain. Data are from the 2010 National Health and Wellness Survey (NHWS). The results reported here parallel those reported by Langley which, utilizing data from the 2008 NHWS, report on the aggregate experience of the prevalence, correlates and treatment of pain for five countries: UK, France, Spain, Germany, and Italy[5].

Methods

National Health and Wellness Survey

The NHWS is an internet-based, cross-section survey of the healthcare attitudes, behaviors and characteristics of adult populations in seven countries – the United States (US), the United Kingdom (UK), France, Spain, Germany, Italy, Japan, and Urban China. Since its inception in 1998 over 650,000 survey responses across over 140 health conditions have been collected. The present analysis is based on the 2010 NHWS results for Spain. Overall, 5039 responses were received and analyzed. These were weighted by age and gender to give an estimated total population of 35.39 million persons 18 years of age and over. It is these frequency-weighted responses that are analyzed here.

Compared to the other five countries in the NHWS 2010 survey, Spain occupies an intermediate position in estimated population prevalence of pain along with France (17.14%). The lowest prevalence is reported for Italy (11.45%), with Germany at 23.96% and the United Kingdom at 30.19%. Estimates of the prevalence of pain reported for the 2010 NHWS for Spain are virtually the same as the corresponding estimate of 17.64% from the 2008 NHWS survey.

Dimensions of pain reported

The dimensions of pain identified in the NHWS include:
- Pain population: pain experienced in the past month
- Frequency with which pain is experienced
- Pain type and associated health status
- Medication utilization
- Duration of medication utilization

The pain population

All persons responding to the 2010 NHWS were asked if they had experienced pain or fibromyalgia in the last 12 months. If they indicated that they had, they were then asked if they had experience pain in the last 30 days and, if they had, the condition or conditions associated with that pain (to include fibromyalgia). Persons who reported pain being associated with only one or more of: (1) migraine; (2) menstrual pain; (3) headache; or (4) dental pain, were excluded from the pain population. If, however, they indicated that they had experienced another pain condition (e.g., back pain) along with one or more of these four pain types, they were retained in the pain population and the prevalence of these associated pain conditions reported on in the analysis. Overall, an estimated 877 respondents met the pain population criteria. These represent an estimated 6.10 million adults in Spain or 17.25% of the adult population.

Frequency of pain experienced

Respondents to the NHWS were also asked to report the frequency with which they had problems with pain.

Options ranged from daily problems to those experienced once a month or less. For the purposes of this analysis the six categories identified in the NHWS have been collapsed to four: 'daily', '2–3 times a week', '4–6 times a week', and 'weekly or less'. These responses can be combined with pain severity to yield ranked combinations from 'severe pain and daily frequency' to 'mild pain experience weekly or less'

Pain type and associated health status

The NHWS asks respondents which of a list of 16 conditions had caused them to feel pain in the last month (together with the option of a written response). These include the most frequently reported pain conditions – back problems, joint pain, neck pain – as well as neuropathic and post-herpetic pain. Multiple responses were allowed. At the same time all respondents are also asked, as part of their personal health history, which of a list of 41 conditions they had been diagnosed with in the last 12 months. These include conditions often associated with pain – depression, anxiety, generalized anxiety disorder and sleep difficulties.

Satisfaction with prescription pain medications

Respondents were asked if they used prescription or over the counter (OTC) medications to treat their pain. If the response is yes, then for the prescription medications, they were asked to identify from a pre-assigned list of prescription pain medications marketed in Spain which they were currently using. It is not possible, given the sample size, to report on specific brands. The analysis here is restricted to reporting on opioid use, other prescription pain medications and OTC medications as broad groups.

For each of the prescription and OTC pain medications identified, respondents were asked to indicate how satisfied they were with the product. Responses (seven in all) ranged from 'extremely dissatisfied' through 'neither dissatisfied nor satisfied' to 'extremely satisfied'. Although the majority of respondents were on one prescription medication, it was decided to collapse the responses to allow the following categories:
- Extremely dissatisfied, very dissatisfied or somewhat dissatisfied with all prescription/OTC medications
- Extremely satisfied, very satisfied or somewhat satisfied with all prescription/OTC medications
- Neither dissatisfied nor satisfied with all prescription/OTC medications
- Mixed response for those taking more than one prescription/OTC medication

Because of the small samples involved in the medication utilization and satisfaction categories, these data are only presented for those reporting prescription pain medications (with or without an OTC medication) and for those who are satisfied with *all* their prescription pain medications.

Duration of medication utilization

Respondents were also asked, for each of the prescription and OTC medications used, to indicate for how many months/years they had been using prescription medication. As respondents could reply to this question for each medication reported, the responses are collapsed to capture the longest time (in months) that a prescription or OTC medication had been taken. Rather than include the actual number of months, the responses were categorized into those who had taken one or more prescription medications for less than 3 months and those who had taken medications for 3 or more months.

Medication adherence

Adherence to prescription medications is captured through the application of the Morisky scale[8]. The four items in the scale focus on barriers to medication taking. The items are:
- Have you ever forgotten to take your medication?
- Are you careless at times about taking your medication?
- When you feel better do you sometimes stop taking your medication?
- Sometimes if you feel worse when you take the medicine, do you stop taking it?

As a 'yes' response is scored as one and no is scored as zero, the scale can take values from zero (no 'yes' responses) to 4 for the least adherent. These results are presented (1) as the number of respondents with a score category (0 through 4), and (2) as averages of the integer valued respondent Morisky score in each of the pain and medication groups.

Outcomes and pain experience

Three outcomes are identified within the 2010 NHWS which can be linked both to the pain experience of the pain population as well as to the experience of pain of those who do not meet the pain population definition. This latter group is important because it acts as a control on the impact of pain at the societal level. These outcomes are:
- Health-related quality of life
- Employment status, absenteeism and presenteeism
- Healthcare resource utilization

Health-related quality of life

The instrument selected to measure HRQoL in the 2010 NHWS is the SF-12 (version 2)[9]. The SF-12 is a multi-purpose short-form version of the SF-36 with 12 questions. These questions are all selected from the SF-36 health survey[10,11]. The SF-12 is a generic measure. A key objective in developing the SF-12 in the early 1990s was to construct the shortest possible form that would replicate the physical and mental health summary scores generated from the SF-36 with at least 90% accuracy. To support this, a further objective was to replicate each of the eight SF-36 health concepts with at least one questionnaire item to set the stage for scoring an eight-scale profile from SF-12 responses. The eight health concepts common to both the SF-36 and SF-12 are:

- Physical functioning
- Role physical (accomplishment)
- Bodily pain
- General health
- Vitality (energy level)
- Social functioning
- Role emotional (accomplishment)
- Mental health (feeling)

It is worth noting that the SF-12 bodily pain item does not ask respondents to indicate either the severity or the frequency with which pain is experienced. Rather the question asks respondents 'How much did pain interfere with your normal work (including both work outside the home and housework)' with the response choice (five items) from 'not at all' to 'extremely'.

While it is possible to develop a health profile utilizing the item responses corresponding to these eight concepts, the focus here is on the two summary scores that can be generated from the respective item responses. These are (1) the physical component summary (PCS), and (2) mental component summary (MCS). The former captures the first four elements in the bullet point above, the latter the last four elements. Details of how the links are established and the scoring algorithms are given in Ware et al.[9].

For the purpose of the present analysis the PCS and MCS summary scores are utilized as normed scores. This is achieved by transforming the raw scores for the items to achieve a mean of 50 and a standard deviation of 10 for the US population. Normed scores can be calculated for both the eight SF-12 scales as well as for the PCS and MCS summary scores. Although country-specific scoring algorithms are available outside the US, the argument has been that it is more appropriate to use a standard scoring algorithm as scores can then be compared across countries. The appropriateness of using the US as a standard benchmark has been demonstrated for nine European countries (including the five countries in the NHWS)[9].

As well as generating profile and summary PCS and MCS scores, the SF-12 can also be used to generate

health state utilities. This is achieved through application of the SF-6D. The SF-6D provides a means for using the SF-36 and SF-12 in economic evaluation by estimating a preference-based single index measure for health from these data using general population values[12,13]. Any patient who completes the SF-36 or the SF-12 can be uniquely classified according to the SF-6D. The SF-6D describes 18,000 health states in all. It comes with a set of preference weights obtained from a sample of the general population using the recognized valuation technique of standard gamble. The SF-6D allows the analyst to obtain quality adjusted life-years (QALYs) from the SF-36 or SF-12 for use in cost-utility analysis. The index has interval scoring properties and yields summary scores on a 0–100 scale. The preference weights, which have recently been revised, are those for a UK population[14].

Labor force participation, absenteeism and presenteeism

The NHWS asks individuals to state their current employment status. Four employment status categories are identified, together with job seeking and reasons for not working. In the present analysis a total of five categories are used to assess the impact of pain. These are:

- Employed full time
- Employed part time
- Self-employed
- Unemployed (actively looking for work)
- Not in the labor force

The NHWS uses the Workplace Productivity and Activity Impairment Scale (WPAI) to measure the impact of health status on employment related activities. The WPAI questionnaire measures work time missed and work and activity impairment because of a specified health problem during the past 7 days[15]. The validity and accuracy of the instrument has been established in a number of disease states (e.g., irritable bowel syndrome, asthma, dermatitis, Crohn's disease)[16,17]. The instrument has been validated in Spanish[18].

The WPAI absenteeism and workplace questions are only relevant to those in employment – where the NHWS identifies persons who are currently employed full-time, employed party- time or self-employed. Respondents are asked to indicate:

- During the past 7 days, how many hours did you miss from work because of your health problems? (Range 0 to 112 hours)
- During the past 7 days, how many hours did you miss from work because of any other reason such as vacation, holidays, time off to participate in this study? (Range 0 to 112 hours)
- During the past 7 days, how many hours did you actually work? (Range 0 to 112 hours)

- During the past 7 days how much did your health problems affect your productivity while you were working? (Response on a 0–10 scale from 'health problems had no effect on work' to 'health problems completely prevented me from working)
- During the past 7 days, how much did your health problems affect your ability to do your regular daily activities, other than work at a job? (Response on a 0–10 scale from 'health problems had no effect on my daily activities' to 'health problems completely prevented me from doing my daily activities)

Two measures of employment impact are presented for persons reporting pain versus the no-pain control group. These are:

(1) Absenteeism: percentage of work time missed in the past 7 days
(2) Presenteeism: percentage of hours worked impacted by impaired productivity

Provider visits, emergency room visits and hospitalizations

Respondents are asked to recall their use of healthcare resources. Resource utilization is considered in terms of visits or events as they relate to:

- Emergency room visits in the last 6 months
- Number of times hospitalized in the last 6 months
- Number of visits in the last 6 months to traditional healthcare providers

The number of visits for each type of traditional healthcare provider is also identified, but this level of detail is not considered in the present analysis. Traditional healthcare providers include general practitioner/family practitioner, nurse practitioner/physician assistant as well as medical specialists. Non-traditional or excluded providers include acupuncturist, chiropractor, herbalist, physical therapist, nutritionist, massage therapist and occupational therapist.

Regional dimensions of pain experience

Unlike earlier NHWS surveys, the 2010 survey records respondent region (autonomous community) of residence. Given the limitations of the sample size at regional levels it was only possible to report on the overall pain prevalence for the five most populous autonomous communities: Andalucia, Catalonia, Comunidad Valencia, Galicia and Madrid. Age and sex weights were re-estimated from the regional population projections for 1 April 2010 and these were applied to generate weighted estimates. Due to the limited number of observations the results are only given for the overall population prevalence of pain.

Estimates

All results presented here, apart from those for the autonomous communities, are weighted at the national level by age and sex. Estimates are not reported where the corresponding sample size is <30. These would result in estimates with an unacceptable standard error. Standard errors are not reported but are available on request.

Results

Prevalence and frequency of pain experience

The estimated prevalence of pain among Spanish adults for 2010 is 17.25% (Table 1). Among those reporting pain (6.10 million), 64.17% report moderate pain, 24.14% report mild pain and 11.69% severe pain. In population prevalence terms the corresponding estimates are 2.02%, 11.07% and 4.16%, for those 18 years of age and over, Overall, 6.99% of Spanish adults experience pain on a daily basis, with a further 5.15% experiencing pain on a weekly or less basis (the majority of these experiencing mild pain).

Correlates of pain: socio-economic characteristics

The population prevalence of pain experienced in the last month by age, gender, education and household income are detailed in Table 2. Overall, the prevalence of pain is greatest in the 40–59 years-of-age group (8.18%). Women report more pain than men (population prevalence 10.47% vs. 6.78%). The population prevalence of pain is greatest for those with at least a university undergraduate qualification (8.19%) Pain has the greatest prevalence in the €20,000–39,999 household income group.

Regardless of socio-economic characteristic, the distribution of pain by severity level is similar across the socio-economic characteristics identified (Table 3). The only exceptions are that females tend to report more severe pain than males (13.95 vs. 8.20%) and that those with a lower household income report a higher proportion of persons with severe pain.

Conditions causing pain

Conditions causing pain are detailed in Table 4. The most frequently reported condition was back pain (60.53% of respondents), followed by joint pain (40.21%), headache (34.72%) and neck pain (28.62%). The distribution of pain severity across the condition causing pain is similar with under 15% reporting severe pain and two-thirds reporting moderate pain. Exceptions are the number

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Table 1. Population prevalence of pain by severity and frequency, NHWS 2010, Spain.

Frequency of pain reported	Severe pain (%)	Moderate pain (%)	Mild pain (%)	Total pain population (%)
Daily	1.63	4.90	—	6.95
4–6 times a week	—	1.57	—	2.20
2–3 times a week	—	2.21	—	3.06
Weekly or less	—	2.39	2.49	5.04
Total pain population (million)	2.02 (0.71)	11.07 (3.92)	4.16 (1.47)	17.25 (6.10)
Distribution within the pain population	11.69	64.17	24.14	100.00

—, Sample size too small to project to total population ($n < 30$).
Source: NHWS 2010.

Table 2. Population prevalence of pain by severity, age, gender, education and income, NHWS 2010, Spain.

Socio-economic characteristic	Severe pain (%)	Moderate pain (%)	Mild pain (%)	Total pain population (%)
Age				
18–39 years of age	—	2.36	1.51	4.18
40–59 years of age	1.07	5.50	1.60	8.18
60 years of age and over	—	3.20	—	4.89
Gender				
Males	0.56	4.10	2.12	6.78
Females	1.46	6.97	2.04	10.47
Education				
High School	0.82	4.63	1.54	6.98
University and above	0.88	4.97	2.34	8.19
Other	—	1.47	—	2.07
Household income				
Under €20,000	0.75	3.21	0.98	4.95
€20,000–39,999	0.65	4.34	1.67	6.66
€40,000 and above	—	2.03	1.07	3.40
Declined to answer	—	1.49	—	2.24

—, Sample size too small to project to total population ($n < 30$).
Source: NHWS 2010.

Table 3. Distribution of pain by severity, age, gender, education and household income, NHWS 2010, Spain.

Socio-economic characteristic	Severe pain (%)	Moderate pain (%)	Mild pain (%)	Total pain population (%)
Age				
18–39 years of age	—	56.48	36.04	31.10
40–59 years of age	13.09	67.29	19.61	36.64
60 years of age and over	—	65.52	21.54	32.26
Gender				
Males	8.20	60.45	31.35	48.47
Females	13.95	66.58	19.48	51.53
Education				
High School	11.76	66.23	22.01	37.48
University and above	10.72	60.72	28.54	51.37
Other	—	70.85	—	11.15
Household income				
Under €20,000	15.21	64.99	19.81	28.96
€20,000 to €39,999	9.78	65.16	25.07	36.17
€40,000 and above	—	59.68	31.56	19.44
Declined to answer	—	66.23	19.70	15.43

—, Sample size too small to project to total population ($n < 30$).
Source: NHWS 2010.

Table 4. Pain population, prevalence of conditions causing pain by pain severity, NHWS 2010, Spain.

Pain condition experienced	Persons experiencing severe pain (%)	Persons experiencing moderate pain (%)	Persons experiencing mild pain (%)	Prevalence of pain experienced in pain population (%)
Back pain	13.25	67.40	19.36	60.53
Joint pain	14.64	66.20	19.16	40.21
Neck pain	14.90	65.95	19.15	28.62
Headache	12.48	63.86	23.66	34.72
Arthritis pain	17.28	66.32	16.41	16.61
Migraine	27.95	56.88	15.17	11.67
Dental pain	14.58	71.23	14.18	10.01
Sprains or strains	12.70	56.72	30.58	10.01
Shoulder pain/stiffness	15.53	67.33	17.14	23.27
Surgery or medical procedure pain	28.80	62.79	8.23	6.62

Source: NHWS, 2010.

reporting severe migraine (27.95%) and surgery or medical procedure pain (28.80%).

Health conditions and pain severity

The major health conditions reported by those experiencing pain by pain severity are detailed in Table 5. Because of the small numbers involved, only seven major health conditions are identified. The most prevalent condition is sleep difficulties (reported by 42.24%). Others conditions worth noting are anxiety (40.62%), headache (40.62%), migraine (24.28%) and depression (24.43%).

Medication utilization and pain severity

The utilization of prescription and OTC pain medications are shown in Tables 6 and 7. Among those only taking prescription medications, 15.26% report experiencing severe pain and 68.62% moderate pain. Only 16.11% of those taking only prescription medications are in the mild pain category, a figure which increases to 40.99% for those only taking OTC products. Respondents taking both prescription and OTC medications dominate the moderate pain category.

Table 7 details the distribution of medication utilization by pain severity category. Within the pain population, 48.78% of them report only taking prescription pain medications. A further 21.95 report only OTC medications with 11.85% experiencing both prescription and OTC medications. Just fewer than 1 in 5 respondents report no-pain medication at all. For persons experiencing severe pain, 63.67% report only taking prescription medications. This drops to 52.17% in the moderate pain category and 32.55% in the mild pain category. Overall, 17.42% report no-pain medications. Excluding those reporting no-pain medications, 80.48% of those with severe pain only report prescription medication use. The corresponding figures for moderate and mild pain are 79.91% and 87.14%

respectively. As far as experience with opioids is concerned, 48.60% of those with severe pain report having used opioids. This figure falls to 34.15% for those experiencing moderate pain and 21.67% for those with mild pain.

Although not reported on it detail here, as far as satisfaction with prescription pain medications are concerned, overall 71.62% reported they were satisfied with all their prescription pain medications. In the severe pain category 67.19% were satisfied with all prescription medications with 73.88% in the moderate pain category.

Duration of medication utilization

The overwhelming majority of those reporting prescription and/or OTC medication utilization have taken at least one of their medications for 3 months or more (Table 8). In the case of those reporting severe pain who only report prescription pain medications, 88.06% have been taking these for 3 months or more. The figure for those only taking prescriptions and OTC medications for their severe pain for 3 months or more is 78.74%. The picture for moderate pain is little different with 86.26% of those only taking prescription medications taking them for 3 months or more. The corresponding figure for mild pain is 78.61%.

Adherence to prescription medications

The distribution of respondents by pain severity and Morisky score are given in Table 9. The data would suggest that adherence increases with pain severity. Among those experiencing severe pain, 60.19% are fully adherent to their treatment regimen. In terms of the average Morisky score, this ranges from 0.58 for those experiencing severe pain to 1.25 for those experiencing mild pain. The overall score is 0.99, indicating a relatively high adherence rate.

Table 5. Pain population, pain severity distribution by major health conditions experienced and population health condition prevalence in past 12 months, NHWS 2010, Spain.

Health condition experienced in past 12 months	Persons experiencing severe pain (%)	Persons experiencing moderate pain (%)	Persons experiencing mild pain (%)	Health condition prevalence in pain population (%)
Sleep difficulties	16.47	65.40	18.41	42.24
Headache	13.41	64.31	22.27	40.62
Anxiety	18.31	62.36	19.33	40.62
Insomnia	19.88	62.70	17.41	29.87
Migraine	17.33	61.21	21.46	24.28
Depression	23.65	63.01	13.34	24.43
Abdominal pain	—	64.91	—	16.24

Major is defined as where 100 or more respondents indicated the health condition.
—, Sample size too small to project to total population ($n < 30$).
Source: NHWS 2010.

Table 6. Pain population, distribution of pain severity by medication utilization, NHWS 2010, Spain.

Medication status	Persons experiencing severe pain (%)	Persons experiencing moderate pain (%)	Persons experiencing mild pain (%)
Only prescription pain medications	15.26	68.62	16.11
Only OTC pain medications	—	52.97	40.99
Prescription and OTC pain medications	—	74.94	—
No pain medications/no response	—	58.47	35.15

—, Sample size too small to project to total population ($n < 30$).
Source: NHWS 2010.

Table 7. Pain population, distribution of medication utilization by pain severity, NHWS 2010, Spain.

Medication status	Persons experiencing severe pain (%)	Persons experiencing moderate pain (%)	Persons experiencing mild pain (%)	Total pain population (%)
Only prescription pain medications	63.67	52.17	32.55	48.78
Persons reporting prescription medications only with opioid use	*48.60*	*34.15*	*21.67*	*34.38*
Only OTC pain medications	—	18.12	37.28	21.95
Prescription and OTC pain medications	—	13.83	—	11.85
No pain medications/no response	—	15.87	25.36	17.42

—, Sample size too small to project to total population ($n < 30$).
Source: NHWS 2010.

Table 8. Pain population, duration of pain medication utilization by pain severity, NHWS 2010, Spain.

Pain severity experienced	Les than 3 months (%)	3 months or more (%)
Severe pain with Rx medication only	—	88.06
Severe pain with Rx and OTC medication	—	78.74
Severe pain total	—	82.95
Moderate pain with Rx medication only	13.74	86.26
Moderate pain with Rx and OTC medication	—	85.42
Moderate pain total	15.54	84.46
Mild pain with Rx medication only	21.39	78.61
Mild pain with Rx and OTC medication	—	—
Mild pain total	23.88	76.12

—, Sample size too small to project to total population ($n < 30$).
Source: NHWS 2010.

Health-related quality of life

Summary HRQoL scores are presented for both the pain and no-pain populations in Table 10. The summary SF-12 PCS show a marked negative association with pain severity. For persons reporting severe pain the PCS is 28.93 increasing to 48.28 ($p < 0.05$) for those with mild pain. The average PCS for the pain population is 41.49 vs. 49.83 ($p < 0.05$) for the no-pain population. The impact of pain on the MCS is more subdued. For those reporting severe pain MCS is 37.72 increasing to 45.80 ($p < 0.05$) for those with mild pain. The average MCS for the pain population is 43.68 compared to 48.14 ($p < 0.05$) for the no-pain population. The presence of severe pain has a substantial impact on SF-6D utilities. Compared to a utility

Table 9. Adherence to prescription pain medications by pain severity, NHWS 2010, Spain.

Morisky score	Persons experiencing severe pain (%)	Persons experiencing moderate pain (%)	Persons experiencing mild pain (%)	Total pain population (%)
0	60.19	43.61	—	45.34
1	—	28.58	—	27.54
2	—	15.42	—	14.97
3	—	—	—	7.09
4	—	—	—	—
Average Morisky score (SD)	0.58 (0.93)	1.02 (1.17)	1.25 (1.19)	0.99 (1.16)

SD = standard deviation.
Morisky adherence score is zero for fully adherent; the range is 0–4.
—, Sample size too small to project to total population ($n < 30$).
Source: NHWS 2010.

Table 10. Health-related quality of life by pain severity, NHWS 2010, Spain.

Health-related quality of life measure	Persons experiencing severe pain (SD)	Persons experiencing moderate pain (SD)	Persons experiencing mild pain (SD)	Pain population (SD)	No pain population (SD)
SF-12 Physical Component score	28.93 (9.93)	41.23 (10.02)	48.28 (6.78)	41.49 (10.80)	49.83 (8.35)
SF-12 Mental Component score	37.72 (12.41)	43.97 (10.70)	45.80 (10.21)	43.68 (11.04)	48.14 (10.17)
SF-6D Utility score	0.52 (0.10)	0.65 (0.11)	0.72 (0.12)	0.65 (0.13)	0.75 (0.13)

SD = standard deviation.
Source: NHWS 2010.

score of 0.72 for those with mild pain, those with severe pain have a utility score of 0.52 ($p < 0.05$). Overall, the utility score for the pain population (0.65) is well below that reported for the no-pain population 0.75 ($p < 0.05$).

Labor force participation

The impact of pain experience on labor force participation is most clearly seen in the context of severe pain (Table 11). Labor force participation for those experiencing severe pain is 42.62%. This stands in contrast to 59.96% reported for those with moderate pain and 71.80% ($p < 0.05$) for those with mild pain. However, the overall participation rate is virtually the same between the pain and no-pain populations.

Absenteeism and presenteeism

For those who are employed (an estimated 17.2 million), the impact of pain on reported absenteeism and presenteeism over 7 days are given in Table 12. For the control 'no-pain' group the impact on absenteeism is minimal (3.35%); for the severe pain group the figure is 38.39% falling to 12.23% for the moderate pain group and 5.56% for those with mild pain (all differences significant at 0.05%). In the case of presenteeism, a similar pattern is found. For the control 'no-pain' group the presenteeism reduced productivity estimate is 15.55%. This is in marked contrast to the figure for severe pain (42.92%),

moderate pain (26.01%) and mild pain 21.53% (all differences significant at 0.05%).

Healthcare resource utilization

The impact of pain experience on healthcare resource utilization is detailed in Table 13. The average number of traditional provider visits reported by those with severe pain is some three times greater than those reporting mild pain (16.07 vs. 5.33; $p < 0.05$) and over three times as many as those reported for the no-pain population (4.58). A similar pattern is shown in the case of the average number of emergency room visits (1.90 vs. 0.64; $p < 0.05$).

Regional dimensions of pain

The overall prevalence of pain is reported for the five most populous autonomous communities for which the sample size was appropriate ($N > 50$) in Table 14. Population pain prevalence estimates vary from 14.80% for Madrid to 18.79% for Comunidad Valenciana.

Discussion

Prevalence of pain

The overall prevalence of pain in Spain in the population 18 years and over is 17.25%. This estimate for 2010 is

Table 11. Labor force participation by pain severity, NHWS 2010, Spain.

Labor force status	Persons experiencing severe pain (%)	Persons experiencing moderate pain (%)	Persons experiencing mild pain (%)	Pain population (%)	No pain population (%)
Employed full-time	—	32.96	44.99	34.35	37.48
Employed part-time	—	7.45	—	7.87	6.25
Self-employed	—	8.22	—	6.95	6.11
Unemployed	—	11.33	—	11.62	10.67
In the labor force	42.62	59.96	71.80	60.79	60.51
Not in the labor force	57.38	40.04	28.20	39.21	39.49

—, Sample size too small to project to total population ($n < 30$).
Source: NHWS 2010.

Table 12. Employed population, percentage of work hours lost due to absenteeism and presenteeism by pain severity, NHWS 2010, Spain.

Percent of work hours lost or with reduced productivity in last 7 days	Persons experiencing severe pain (%) (SD)	Persons experiencing moderate pain (%) (SD)	Persons experiencing mild pain (%) (SD)	Pain population (%) (SD)	No pain population (%) (SD)
Absenteeism	39.39 (46.51)	12.23 (28.80)	5.56 (16.14)	12.13 (28.57)	3.35 (13.49)
Presenteeism	42.92 (32.45)	26.01 (26.58)	21.53 (25.91)	25.39 (26.75)	15.55 (23.38)

SD = standard deviation.
Source: NHWS 2010.

Table 13. Healthcare resource utilization by pain severity, NHWS 2010, Spain.

Healthcare resource utilization	Persons experiencing severe pain (SD)	Persons experiencing moderate pain (SD)	Persons experiencing mild pain (SD)	Total pain population (SD)	No pain population (SD)
Average number of traditional provider visits	16.07 (13.53)	8.83 (9.44)	5.33 (5.35)	8.82 (9.74)	4.58 (6.28)
Average number of emergency room visits	1.90 (2.49)	0.57 (1.16)	0.64 (1.97)	0.73 (1.65)	0.40 (1.32)
Average number of hospitalizations	0.58 (1.42)	0.17 (0.68)	0.15 (0.60)	0.21 (0.80)	0.13 (0.72)

SD = standard deviation.
Source: NHWS 2010.

Table 14. Population prevalence of persons experiencing pain by selected region, NHWS 2010, Spain.

Province	Population experiencing pain (18 years of age and over)	Total population (18 years of age and over)	Population prevalence of pain experienced in the last month (%)
Andalusia	1,209,965	6,596,052	18.34
Cataluna	1,050,654	5,965,129	17.61
Comunidad Valenciana	769,105	4,093,600	18.79
Galicia	432,514	2,353,174	18.38
Madrid	765,791	5,173,485	14.80

Source: NHWS 2010.

consistent with an earlier estimate of pain prevalence from the 2008 NHWS for Spain of 17.64%. The prevalence of pain in Spain is, in fact, slightly lower than that estimated for the big five EU countries (UK, France, Spain, Germany and Italy) overall of 20.47% in 2010. Although not analyzed in the present study it is of interest to note a considerable range in the population prevalence of pain reported, ranging from a relatively low prevalence in Italy of 11.45% to a much higher prevalence of 30.19% in the UK. The fact that there is considerable variability in the estimated prevalence of pain should come as no surprise as this has been shown to be the case in a number of previous pan-European pain studies[4].

It is also important to note that, under the definition of pain used in this study, the population prevalence of pain is little different across the five regions of Spain for which estimates are sufficiently robust.

It is also of interest to compare the NHWS estimates of population pain prevalence with earlier studies of the epidemiology of pain in Spain. The most comprehensive of these studies, a telephone-based survey by Català et al.[1] of persons 18 years of age and over, reported a prevalence of 29.6% of pain experienced during the previous day and an estimate of 43.2% of those reporting pain during the past week. Estimated chronic pain prevalence, defined as experiencing pain for 3 months or more, was estimated to be 23.4%. To the extent that this study included persons with migraine/headache and menstrual pain (and pain associated with acute conditions such as influenza and cold) the prevalence would be expected to be greater than that reported here. The only other comprehensive study of pain in Spain, a Catalonia telephone survey[2] reports on adults experiencing pain in the past 6 months. Although this timeframe is not consistent with either the one employed in the NHWS survey or the Català study, the reported experience of pain, at 78.6%, is extremely (and improbably) high.

The issue, at the national level, of pain severity and frequency of pain experience has not been addressed before in Spain. In the present study, of the 6.1 million adults experiencing pain, just over 0.7 million reported experiencing severe pain and 3.9 million moderate pain (population prevalence of 2.02% and 11.07%, respectively). Of those persons experiencing severe or moderate pain, 2.3 million reported experiencing pain on a daily basis. Over three-quarters of those experiencing severe pain did so on a daily basis. It is worth noting that this profile of pain severity and frequency mirrors that found in the 2008 NHWS survey of Spain. The profile also mirrors that for the recent five country study reported by Langley[5]. Indeed, putting aside the lower prevalence for Spain, the results for this five country study mirror the distributions reported for Spain as well as in the impact of pain on HRQoL measures, employment, absenteeism and presenteeism and healthcare resource utilization.

If a quantitative assessment of the burden of pain is the focus, then it is critical that both the severity and frequency of pain experienced are captured. This is shown in the pain severity/frequency cascade effect captured in the two recent NHWS-based multivariate studies reported by Langley et al. for HRQoL and healthcare resource utilization and Langley et al. for employment status, absenteeism and presenteeism[6,7]. The more severe and the more frequent is pain reported the greater the HRQoL deficits, the fewer persons report being in the labor force and the greater is reported absenteeism and presenteeism.

Correlates of pain

The association of pain prevalence with age is not as clear-cut as previous studies would suggest (Tables 2 and 3). In the 2010 NHWS survey, just over 50% of those experiencing pain are in the 40–59 years-of-age group (with a population prevalence of 8.18%). In older age groups the population prevalence drops to 4.89%.

The impact of gender on the reporting and experience of pain has been well documented[19]. Studies have shown quite consistently that the population prevalence of pain is higher in females. At the same time women report more severe and persistent pain, with more body regions affected. General population studies have shown statistically significant gender differences. In the present study the population prevalence of pain in females is substantially greater than for males with 13.95% reporting severe pain and 19.48% mild pain. The corresponding estimates for males are 8.20% and 31.35%. At the same time, the distribution of pain for females is skewed towards more severe pain experience. In Spain, Bassols et al. point to the significantly lower prevalence of pain in men in the population of Catalonia, with women (and older populations) reporting greater pain intensity[2]. Vallano et al. point to the higher prevalence of pain in female hospital admissions, again in Catalonia[20]. Català et al. also point to a substantial gender difference in pain (women 37.6 vs. men 20.9%)[1].

There is some evidence in the literature regarding a 'social gradient' of pain with the population prevalence of pain falling with higher educational achievement and with greater household income[21]. There is no evidence from this survey that this is the case. The association between educational attainment and pain prevalence is not clear cut, nor is the association between population pain prevalence and household income.

Conditions causing pain

The two conditions most frequently associated with pain are back pain (60.53% of respondents) and joint pain (40.21% of respondents) (Table 4). Apart from these, headache and neck pain are the most frequently reported conditions. The distribution of pain severity experience by condition causing pain is relatively uniform. Typically, some 2/3 of respondents classify themselves into the moderate pain category the major exceptions being migraine and dental pain associated with other pain conditions. These results mirror those for the five country studies utilizing 2008 NHWS data by Langley[5].

Pain comorbidities

While there is a growing literature on pain comorbidities and health states associated with pain, there is no

consensus as to an appropriate classification or those comorbidities associated with pain. Conditions reported tend to be heterogeneous which combine both direct pain experience in that disease state as well as those linked to the experience of pain – psychiatric conditions being prime examples. At the same time there is now a growing acceptance of chronic pain as a disease in its own right. Persistent pain becomes independent of the initial trigger and takes on a life of its own[22]. While association does not imply causality, it is of interest to note that in the ranking of conditions associated with pain sleep difficulties, insomnia, anxiety and depression are among the most frequently cited by the pain population.

Medication utilization

The assessment of medication utilization in the 2010 NHWS is focused primarily on prescription pain medication. As might be expected, exclusive reliance of prescription declines with pain severity, with a shift towards OTC medications. At the same, as demonstrated by the data presented, the extent to which there are no prescription or OTC medications increases with the declining severity of pain experience. These patterns of medication utilization have not been reported before for Spain, but are certainly not unexpected. At the same time, a characteristic that does stand out is the emphasis on prescription medication utilization. Opioid use appears to be relatively common with just over 1/3 of the pain population reporting opioids only with prescription medication use (almost 50% in the severe pain group). Even so, it is worth noting that just over 1/5 of the pain population use OTC medications only and a further 17.42% report either not taking any medication or not responding.

Medication adherence

A common view in the pain literature is that a substantial proportion of patients are not adherent to their pain therapy. A recent review by Broekmans et al.[23] found that lack of adherence is common, to include medication overuse as well as underuse. Tzeng et al.[24], in a recent Taiwanese study, found that in evaluating Morisky responses as a measure of adherence that in chronic cancer pain just over 50% of patients were non-adherent. The picture presented for Spain is somewhat different. Overall, 45.34% of the pain population have a Morisky score of zero, a figure that increases to 60.19% for the severe pain group.

The burden of pain

In this analysis the societal burden of pain has focused on three dimensions of pain experience: the association of pain with HRQoL, employment, absenteeism and

presenteeism, and healthcare resource utilization. Two aspects are of interest: (1) to what extent does the experience of the pain population differ from that of the no-pain population and (2) to what extent does the severity of pain experience modify the outcomes of the pain population.

Health-related quality of life

A major advantage of the present study is the use of a validated instrument to assess HRQoL – in this case the SF-12. This allows estimates of the mental and physical components of the instrument as well as the absolute utilities. At the same time, with the benchmark of the no-pain population, direct estimates can be made of the deficits in MCS, PCS and absolute utilities as well as the potential impact of pain severity. From the estimates presented, there is no doubt that the experience of pain not only accounts for substantial deficits in all HRQoL dimensions – notably for the PCS and utility measures – but also more dramatically in respect of those experiencing severe and moderate pain. These results mirror those for the 2008 NHWS for the five countries covered[5]. Severe pain is associated with the greatest deficit – in particular severe daily pain – followed by moderate pain (in particular moderate daily pain). The magnitude of the PCS deficit may be partly attributable to the bodily pain item that comprises part of the scoring algorithm.

Labor force participation

The impact of pain, notably severe chronic pain, on labor force participation, absenteeism and presenteeism is a recurring theme in the pain literature. It is now commonly accepted that health status is a major predictor of labor supply. Deteriorating health and the presence of chronic disease and associated comorbidities, together with symptoms such as severe, frequent and chronic pain would be expected to be associated with reduced labor supply[25]. There is ample empirical data to support this expectation, notably in respect of chronic disease states[26,27]. Breivik et al., in their pan-European pain assessment report that one in four respondents had indicated that pain impacted their employment status, 19% had lost their job because of pain, 16% had changed their job responsibilities and 13% had changed jobs entirely[4]. Spain appears, at least in respect of severe pain, to be no exception. Although the issue of the impact of pain on labor force participation has not been addressed before for Spain at the national level, the results of the 2010 NHWS would suggest that there is a substantial deficit associated with those experiencing severe pain. What is less clear-cut – and may possibly have to await a more comprehensive multivariate analysis – is the minimal impact of moderate pain and the high labor force participation exhibited by those with mild pain. This stands in contrast to other

assessments of the relationship between pain severity and labor force participation where the negative impact of moderate pain is more noticeable[5,7].

Absenteeism and presenteeism

The impact of pain on absenteeism, and presenteeism has not been assessed before for Spain at the national level. The evidence would suggest it is substantial. Compared to the no-pain reference group, persons experiencing pain in the last month show substantially higher recall estimates of the percentage of time lost through absenteeism and the percentage of time impacted by presenteeism. Once again, the experience of severe pain is associated with the greatest deficits. These results support the consensus view in the literature that pain experience is associated negatively on productivity in the workplace, in terms of both absenteeism and presenteeism[28,29].

Healthcare resource utilization

The impact of chronic disease conditions on healthcare resource utilization and the costs of care, including those where pain is a major component of disease experienced, is well documented[6]. In the present analysis the data point unequivocally to the resource implications of the experience of pain. Against the no-pain control group, persons experiencing severe pain report over three times as many provider visits as those in the no-pain group; persons experiencing moderate pain report almost twice as many. A similar pattern is seen for both emergency room visits (notably for those with severe pain) and hospitalizations (again, notably for those with severe pain).

Pain by region

There is little to choose between the five most populous autonomous communities in Spain as to the population prevalence of pain. Of the five regions for whom the sample size is adequate, the weighted frequency of the population prevalence of pain in the last month varies from 14.80% (Madrid) to 18.79% (Comunidad Valenciana) (Table 14). While relatively small, it is difficult to account for this variation, a situation which is not helped by the absence of other prevalence studies of pain at the regional level.

Limitations of the analysis

While the results presented here represent a critical new perspective on the experience of pain and the burden of pain in Spain, there are a number of limitations that need to be noted. First, the NHWS is an internet based survey and may not be representative of the Spanish population – particularly if there are potential biases in the extent to which internet access is available. Even so, over 50% of the Spanish population has internet access. Second, respondents are asked to report their experience of pain. There is no separate clinical confirmation of the presence of pain and reported conditions and attributes that may be associated with pain experience. Third, apart from excluding a number of obvious acute pain categories, there is no attempt to apply an arbitrary distinction between acute and chronic pain or between, for example, primarily neuropathic and primarily nociceptive pain. Nor is it possible to assess pain chronicity. Finally, the study is sample based and the nature of the sample is such that it proved difficult to consider in more detail the association of outcomes with daily pain experience or to detail patterns of prescription drug utilization (e.g., opioids) and patient satisfaction with treatment regimens.

Conclusions

Although the overall prevalence of pain in the Spanish adult population is somewhat lower than the average for the five EU countries covered by the NHWS, the fact remains that 17.25% of the adult population report experiencing pain in the last month – an estimated 6.10 million persons in 2010. Of these, 0.71 million experience severe pain and 3.92 million moderate pain. Equally importantly, 2.31 million experience severe or moderate pain on a daily basis. This represents a substantial burden on both individuals and the Spanish economy. The experience of pain is associated with a substantial reduction in both the PCS component of the SF-12 and SF-6D absolute utilities, most notably in respect of severe pain. The experience of pain is also associated, not only with reduced labor force participation and increased absenteeism and presenteeism, but is substantially higher patterns of healthcare resource utilization. Once again this is most apparent in the case of severe pain.

Transparency

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