

## Original article

# Understanding the pain status of the patient: a survey of pain status and pain treatment in an orthopedic outpatient department

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**Background:** Pain assessments help clinicians to evaluate their patients' symptoms. However, patients' satisfaction with pain management is difficult to interpret and may mislead the clinician into being satisfied with inadequate pain management.

**Objective:** We described and explored patients' pain status, patients' satisfaction with their pain management, the impact of pain on sleep habit and routine activities of daily living (ADLs), and the proportion of patients who had undertreatment of pain in the Orthopaedic Outpatient Department, Ramathibodi Hospital.

**Methods:** A prospective, cross-sectional survey study of pain characteristics and pain management of Orthopaedic outpatients aged over 18 years in the Orthopaedics Department, Ramathibodi Hospital using two parts of a verified questionnaire.

**Results:** In all, 863 patients were studied. Numbers of patients with acute or chronic pain were in similar proportions and mainly diagnosed as nociceptive pain (83.7%). Most of them suffered from moderate or severe pain (42.6% vs. 39.1%). Severity of symptoms was correlated with sleep disturbance and disturbance in ADLs. However, no correlation was revealed between satisfaction with pain management and the intensity of pain and there was also no correlation between satisfaction with pain management and sleep disturbance or disturbance in ADLs. Most commonly prescribed medications were nonsteroidal antiinflammatory drugs (NSAIDs) (58.8%). However, 93.4% of returning patients who suffered from severe pain were still treated with nonopioid analgesics.

**Conclusion:** Patients suffered from moderate to severe pain and had disturbances in their sleep habit and ADLs. Most of them were satisfied with previous pain management, which was usually with nonopioid analgesics including NSAIDs and muscle relaxants. This group included some patients who experienced a high intensity of pain. We recommend clinicians pay more attention to the pain intensity of individual patients and justify appropriate medication by using a step-up approach and multimodal analgesics.

**Keywords:** Activities of daily living disturbance, pain intensity, satisfaction with pain management, sleep disturbance, undertreatment

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Pain is one of the most common reasons for people seeking medical care [1]. It is estimated that 30% of the world's population deal with chronic pain and it affects one fifth of adults. Studies have shown that patients with pain use health services up to five times more frequently than the rest of the population and the cost for chronic pain imposes a greater economic burden than any other disease, with annual costs

estimated to be 100 billion US dollars in the USA alone [2, 3].

Pain is also associated with multiple negative consequences, such as sleep disturbance [4] and disturbances in routine activities of daily living (ADLs) [5], which can lead to a lower quality of life [6] and may predispose the sufferer to psychiatric and social problems [7]. Unfortunately, pain is a subjective sensation that the patient expresses in different ways, influenced by ethnicity, genetics, and sex. Nevertheless, pain assessment is still essential and institutions such as the American Pain Society (APS), the Joint Commission on Accreditation of Healthcare

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Organizations (JCAHO), and the Veterans Health Administration (VHA) are actively engaged in this field.

Measuring pain intensity is essential for pain assessment, which can help clinicians to evaluate their patients' pain status. There are many available tools to assess pain intensity including unidimensional scales and multidimensional questionnaires. In general, unidimensional pain scales such as the numerical rating scale (NRS), visual analog scale (VAS), and face pain scale are commonly used to measure pain relief after treatment. By contrast with pain intensity, satisfaction with pain management is a subjective assessment of pain treatment, which is difficult to interpret because of various associated factors and clinicians often assume that if the patient is satisfied, the pain must have been well controlled [8, 9]. In other words, it may be hypothesized that discrepancies between patients' and clinicians' understanding of patients' pain status may result in inadequate pain management. Undertreatment of pain is a major health issue in the Asia-Pacific region, including Thailand [10].

Therefore, objectives of this study are to describe patients' pain status and their level of satisfaction with their pain management and to explore the impact of pain on sleep habits and routine ADLs. In addition, the extent of undertreatment of pain in patients with severe pain is investigated. This information may be useful for informing clinicians about developing their own appropriate pain management strategies.

## Materials and methods

This prospective, cross-sectional survey study of pain characteristics and satisfaction with pain management in the Orthopaedic Outpatient Department, Ramathibodi Hospital was conducted from June to November 2010.

Eligibility criteria of patients in the study were: male or female aged over 18 years old who visited the Orthopaedics Department, Ramathibodi Hospital; had a disease with accompanying pain; were able to communicate well enough to understand the explanation of the staff; were able to answer the questions in the survey questionnaire.

After the objectives of the study had been fully explained and written consent had been obtained, the survey staff collected the data of the patients who visited the Orthopaedic Outpatient Department by using two parts of the questionnaire. Data collected by the survey staff included patients' demographic

profiles, duration of pain, pain intensity, during the 24-hour period before completing the questionnaire, as measured by the 11-point NRS, impact of pain on sleep disturbance, and routine activities of daily living. In addition, patients who had previously visited a clinician because of pain were asked about satisfaction with the current pain treatment. After completion of the first part of the questionnaire by the survey staff, the patients then went on to the clinician's clinic. The clinician then filled in the second part of the questionnaire including information about pain characteristics, comorbidity, and medication for pain management. This study was approved by the ethics committees of the Faculty of Medicine, Ramathibodi Hospital, Mahidol University and was conducted in accordance with the ethical principles of the Declaration of Helsinki and the International Conference on Harmonisation—Good Clinical Practice (ICH-GCP) guidelines.

The results are reported as mean  $\pm$  standard deviation. Descriptive and explorative statistical analyses with PASW statistics software version 18.0 (SPSS Inc, Chicago, IL, USA) have been used. For categorical variables, absolute and percentage frequencies are presented and the correlation of variables is assessed using a Chi-squared test. For continuous variables, the mean and the standard deviation range has been calculated using a one-way analysis of variance (ANOVA). A  $p < 0.05$  was considered statistically significant.

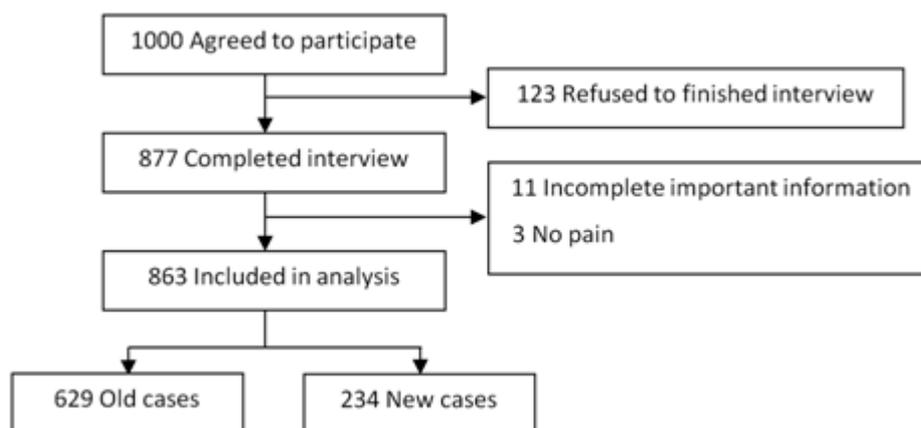
## Results

A total of 1000 patients were recruited to the survey study; however, of these patients, 123 refused to finish the interview, 11 provided incomplete important information, and 3 did not complain of significant pain. Therefore, 863 patients completed the interview. Of these 863 patients, 629 were returning patients who had come back with pain, while the other 234 patients were on their first visit (**Figure 1**).

Patient demographics and characteristics of pain are shown in **Table 1**. The proportion of female patients was higher than that of male patients (76.6% and 23.4% respectively). The average age of the patients was 58.2 years. The numbers of patients with acute pain and chronic pain were in similar proportions. Most patients were diagnosed with nociceptive pain (83.7%) while 6.5% were diagnosed with neuropathic pain and 9.7% were diagnosed with mixed pain. The mean pain intensity as measured by NRS was 5.9.

The pain intensity was then classified into 3 groups according to the scale as mild pain (NRS 1–3), moderate pain (NRS 4–6), and severe pain (7–10). According to this subclassification, 18.3% of patients had mild pain, while 42.6% had moderate pain and 39.1% had severe pain. Clinical diagnoses were osteoarthritis (40.0%), myofascial pain syndrome (20.2%), low back pain (19.7%), traumatic pain (3.4%), postoperative pain (1.6%), cancer pain

(0.7%), rheumatoid arthritis (0.5%), burns pain (0.2%), and other types of pain (25.5%). Common comorbidities were in the cardiovascular system (20.1%) and the endocrine system (11.5%). Additionally, returning patients were asked about satisfaction with prior therapy and this revealed that a high proportion of them were satisfied (51.4%) or very satisfied (41.2%).



**Figure 1.** Patient recruitment and analysis set

**Table 1.** Patient demographics and characteristics of pain (n = 863)

Characteristics	Value
Sex	
Male	202 (23.4%)
Female	661 (76.6%)
Age (years)	
Mean ± SD	58.2 ± 13.2
Min/Max	18.2/92.1
Pain classification	
Acute pain	401 (46.5%)
Chronic pain	460 (53.3%)
Type of pain	
Nociceptive pain	722 (83.7%)
Neuropathic pain	56 (6.5%)
Mixed pain	84 (9.7%)
Pain intensity (NRS 0–10)	
Mean ± SD	5.9 ± 2.5
Pain intensity	
Mild (NRS 1–3)	158 (18.3%)
Moderate (NRS 4–6)	368 (42.6%)
Severe (NRS 7–10)	337 (39.1%)
Patient diagnosis (≥3% of patients)	
Osteoarthritis	345 (40.0%)
Myofascial pain syndrome	174 (20.2%)
Low back pain	170 (19.7%)
Traumatic pain	29 (3.4%)

**Table 1.** Patient demographics and characteristics of pain (n = 863) (Continue)

Characteristics	Value
Medical comorbidities ( $\geq 3\%$ of patients)	
Cardiovascular	173 (20.1%)
Endocrine	99 (11.5%)
Gastrointestinal	30 (3.5%)
Allergic/immunology	28 (3.2%)
Eyes	28 (3.2%)
Satisfaction with prior therapy (n = 629)	
Very satisfied	259 (41.2%)
Satisfied	323 (51.4%)
Neutral	40 (6.4%)
Dissatisfied	7 (1.1%)
Very dissatisfied	0 (0.0%)

**Table 2** shows the impact of pain on sleep and ADLs. These were classified into four categories: no impact, mild impact (awakened 1 to 2 times/night), moderate impact (awakened more than 2 times/night), and severe impact (unable to sleep). Subjective self-assessment of sleep disturbance from pain revealed the proportion of no impact, mild impact, moderate impact, and severe impact to be 52.8%, 17.0%, 10.1%, and 20.1% respectively and 11.6%, 24.1%, 39.2%, and 25.1% for disturbance in ADLs

Mean pain intensity in returning patients as assessed by the NRS was analyzed in terms of satisfaction with prior therapy. This revealed that the NRS in each group of patients was between 5.4 and 5.9 regardless of the level of satisfaction. In addition, when the pain intensity NRS results were subclassified into the three levels as mild, moderate, and severe (**Table 3**), no correlation was demonstrated between level of satisfaction and pain intensity ( $p = 0.207$ ).

**Table 2.** Impact of pain on sleep disturbance and activities of daily living disturbance (n = 863)

Characteristics	n (%)
Sleep disturbance	
No impact	456 (52.8%)
Mild impact	147 (17.0%)
Moderate impact	87 (10.1%)
Severe impact	173 (20.1%)
Disturbance in ADLs	
No impact	100 (11.6%)
Mild impact	208 (24.1%)
Moderate impact	338 (39.2%)
Severe impact	217 (25.1%)

**Table 3.** Satisfaction with pain management and pain severity in returning patients with pain (Chi-squared test)

Satisfaction	n (%) for each pain severity			p
	Mild	Moderate	Severe	
Very satisfied	69 (11.0)	102 (16.2)	88 (14.0)	0.207
Satisfied	56 (8.9)	151 (24.0)	116 (18.4)	
Neutral	8 (1.3)	17 (2.7)	15 (2.4)	
Dissatisfied	1 (0.2)	4 (0.6)	2 (0.3)	
Very dissatisfied	0 (0.0)	0 (0.0)	0 (0.0)	

Correlation between pain intensity and sleep disturbance in patients on their first visit was evaluated (Table 4). Only few patients with mild pain had sleep disturbance, while patients with moderate and severe pain demonstrated problems with sleep disturbance in higher proportion. The correlation between pain intensity and sleep disturbance was statistically significant. The correlation between pain intensity and disturbance in ADLs was demonstrated in the same manner (Table 5). Patients with mild pain tended to experience only a low impact on ADLs, while those with severe pain had a higher impact.

To assess the correlation between the satisfaction with prior management and sleep disturbance (Table 6), the levels of satisfaction were reclassified into two categories: satisfied (very satisfied, satisfied, and neutral) and dissatisfied (dissatisfied and very dissatisfied). According to this, most of the patients were satisfied with their pain management. However, sleep disturbance was not correlated with the satisfaction ( $p = 0.449$ ). Similarly, correlation between satisfaction with pain management and disturbance in ADLs was evaluated but no correlation between satisfaction and disturbance in ADLs was revealed ( $p = 0.233$ ) (Table 7).

**Table 4.** Pain severity and level of sleep disturbance in newly diagnosed pain patients (Chi-squared test)

Pain severity	Sleep disturbance, n (%)				<i>p</i>
	No impact	Mild impact	Moderate impact	Severe impact	
Mild	19 (8.1)	3 (1.3)	1 (0.4)	1 (0.4)	0.001
Moderate	58 (24.8)	17 (7.3)	8 (3.4)	11 (4.7)	
Severe	50 (21.4)	12 (5.1)	12 (5.1)	42 (18.0)	

**Table 5.** Pain severity and level of disturbance in ADLs in newly diagnosed pain patients (Chi-squared test)

Pain severity	Disturbance in ADLs, n (%)				<i>p</i>
	No impact	Mild impact	Moderate impact	Severe impact	
Mild	3 (1.3)	14 (6.0)	5 (2.1)	2 (0.9)	0.001
Moderate	8 (3.4)	22 (9.4)	43 (18.4)	21 (9.0)	
Severe	6 (2.6)	5 (2.1)	45 (19.2)	60 (25.6)	

**Table 6.** Satisfaction with pain management and level of sleep disturbance in returning patients with pain (Chi-squared test)

Satisfaction	Sleep disturbance, n (%)		<i>p</i>
	No	Yes	
Satisfied	326 (51.8)	296 (47.1)	0.449
Dissatisfied	3 (0.5)	4 (0.6)	

**Table 7.** Satisfaction with pain management and level of disturbance in ADLs in returning patients with pain (Chi-squared test)

Satisfaction	Daily activity disturbance, n (%)		<i>p</i>
	No	Yes	
Satisfied	81 (12.9)	541 (86.0)	0.233
Dissatisfied	2 (0.3)	5 (0.8)	

Among patients who received analgesic medication, the prescription for pain management in returning patients is shown in **Table 8**. Previously, most commonly prescribed medications were nonsteroidal antiinflammatory drugs (NSAIDs) (50.2%), followed by muscle relaxants (26.2%), weak opioids (9.4%), and adjuvants (9.2%). The prescription of conventional NSAIDs was less than COX-2 inhibitors (20.8% and 29.4% respectively). In addition, weak opioid analgesics (9.4%) were more frequently used than strong opioids (0.5%). In the same manner, patterns for current prescription reveal that NSAIDs (58.8%) were still the most frequently prescribed. Muscle relaxants (35.6%) were the second preferred treatment followed by adjuvants (13.4%) and weak opioids (11.1%).

To evaluate the appropriateness of pain management, the authors have assessed types of prescribed medication broken down by pain intensity at the follow-up visit of returning patients who had taken nonopioid medication previously. Of 629 returning patients, 62 patients had received opioids previously, so 567 patients were evaluated. Pain intensity was categorized into mild, moderate, and severe, while prescribed drugs were categorized as nonopioids and opioids (**Table 9**). This analysis shows that 34.6% of patients still suffered from severe pain while 43.2% suffered from moderate pain. In patients with severe pain, most of them were prescribed nonopioids (32.3%) while only 2.3% of the patients were prescribed opioid analgesics.

**Table 8.** Medications for pain management in returning patients

Medications	Returning patients(n = 629)	
	Currently taking	Previously taking
Nonopioid Analgesics—total	n (%)	n (%)
<b>Acetaminophen</b>	<b>33 (5.3)</b>	<b>37 (5.9)</b>
NSAIDs	<b>370 (58.8)</b>	<b>316 (50.2)</b>
Conventional NSAIDs	165 (26.2)	131(20.8)
COX-2 inhibitors	205 (32.6)	185 (29.4)
<b>Muscle Relaxants</b>	<b>224 (35.6)</b>	<b>165 (26.2)</b>
<b>Adjuvants</b>	<b>84 (13.4)</b>	<b>58 (9.2)</b>
Antidepressants	42 (6.7)	27 (4.3)
Anticonvulsants	42 (6.7)	31 (4.9)
Opioid Analgesics—total	n (%)	n (%)
<b>Weak opioids</b>	<b>70 (11.1)</b>	<b>59 (9.4)</b>
<b>Strong opioids</b>	<b>5 (0.8)</b>	<b>3 (0.5)</b>

**Table 9.** Pain management and pain intensity in returning patients with pain who previously received nonopioid treatment (n = 567)

Prescribing	n (%) for each pain severity		
	Mild	Moderate	Severe
Nonopioids	120(21.2)	230(40.6)	183(32.3)
Opioids	6(1.1)	15(2.7)	13(2.3)
Total	126(22.2)	245(43.2)	196(34.6)

## Discussion

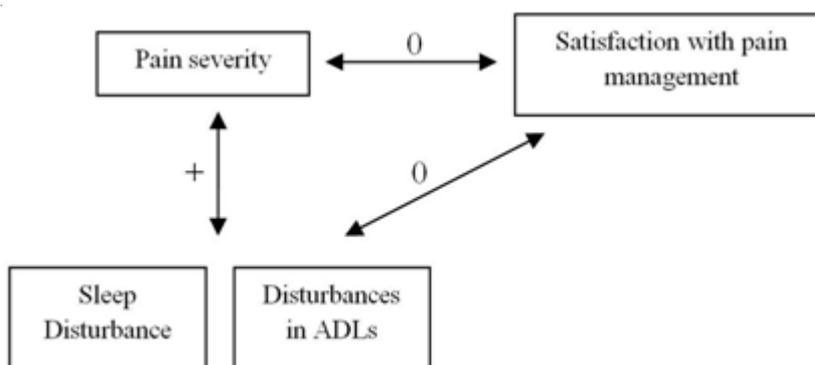
Before evaluating the impact of pain and the pattern of pain management, the authors would like to clarify the relationships of four main factors: pain severity, satisfaction to pain management, sleep disturbance, and daily activity disturbance. The relationship between sleep disturbance and pain is likely to be characterized as a reciprocal vicious cycle, pain contributing to disturb the sleep habit and disturbed sleep also contributing to enhance pain sensitivity [4]. This vicious cycle was reflected by the correlation between pain intensity and sleep disturbance in the present study. By contrast with sleep disturbance, which has been well-studied [4, 11-13], disturbances in ADLs have been studied less rigorously because daily activities lack a standard method of evaluation [12]. Assessment can be performed by questionnaires, diaries, and instruments based on movement registration. In the present study, the authors evaluated disturbances in ADLs by using a questionnaire that consumes less time, and is inexpensive. The results have shown a significant correlation between pain intensity and disturbances in ADLs.

The present study describes the pain status of patients that were treated in an ambulatory setting at an outpatient orthopedic clinic in Thailand. In addition, the levels of satisfaction with pain management and the impact of pain on sleep and ADLs were explored. The results show that satisfaction with pain management did not correlate with pain intensity. This is not surprising because pain relief and patient satisfaction differ in several ways. Although both are subjective assessments, which depend on myriad factors, and are measured with similar scales, they are quite different in a number of respects. Satisfaction with pain management does not necessarily imply that the patient has experienced pain relief [13, 14].

Satisfaction is related to many factors such as the attention of the clinicians to the patient's concern about their problems, and also to there being a good relationship between the clinician and the patient. In addition, satisfaction depends on the patient's expectation of pain relief after receiving pain treatment [8].

There were also no correlations between the satisfaction with pain management and either sleep disturbance or disturbances in ADLs (**Figure 2**). From this, it may be assumed that while pain is a direct consequence of the disease, satisfaction, which encompasses various aspects, does not directly interact with any specific factors as mentioned previously.

Following the pain guidelines issued by the World Health Organization [15] and modified by the Thai Association for the Study of Pain (TASP) [16], pain medication should be stepped up until pain relief is achieved with nonopioids, weak opioids, and then strong opioids respectively. To assess the appropriate use of medication in pain management, this study shows that whatever the severity of the symptoms, most drugs prescribed were nonopioids, especially NSAIDs (58.8%). Nonopioid analgesics were used to treat 183 of 196 patients (93.4%) who still suffered from severe pain according to the pain intensity score, although the appropriate prescription should be stepped up to weak opioids or strong opioids. This leads to undertreatment of pain. Moreover, the long term use of these drugs leads to a higher risk of adverse events than with opioid treatment [17, 18]. Although the side effects of opioids are quite low, opioid usage is still limited in many countries including Thailand [19]. This phenomenon may be caused by the unfamiliarity of physicians with using opioid analgesics, practical difficulties in issuing the drug prescriptions or the fear of opioid addiction.



**Figure 2.** Correlation between pain severity, sleep disturbance, disturbances in ADLs, and satisfaction with pain management; +: with correlation, 0: without correlation

The undertreatment of pain is potentially caused by inappropriate indicators for clinicians to justify their treatment. Most clinicians do not assess pain intensity using the pain assessment tools, such as the NRS, verbal rating scale, VAS, or face pain scale. Rather, they merely ask about satisfaction with the previous treatment. It is considered impolite for Thai patients to inform their clinicians about ineffective pain management. This seems to be borne out in this study, which demonstrates a high degree of satisfaction by the patients, while there is still a high proportion of patients with severe pain. Furthermore, opioid-phobia, including the fear of opioid addiction, dependence, and tolerance, impedes a pain management approach that would bring about adequate pain treatment, so education and training in appropriate pain management is essential for clinicians. Additionally, pain assessment tools should be employed at the nurse station before visiting the clinician. The most crucial part of treatment is that the clinician must use the patient's pain score to justify appropriate medication, according to the pain guidelines [15, 16] by using the step-up approach and multimodal analgesics to achieve adequate pain relief and few adverse events.

The primary limitation of the present study is that the patients were recruited from only one tertiary hospital. This may not represent the general population. Therefore, future surveys should be conducted in several hospitals in order to represent a wider patient population, including specialties other than orthopedics.

## Conclusion

In conclusion, this study reveals that patients who visited our orthopedic outpatient department suffered from moderate to severe pain and had sleep disturbance and disturbances in ADLs. Although most patients were satisfied with previous pain management using nonopioid analgesics, including NSAIDs and muscle relaxants, a high intensity of pain still existed. We recommend clinicians pay more attention to the pain intensity of individual patients and justify appropriate medication by using a step-up approach and multimodal analgesics including opioids.

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