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Original article

Analgesic consumption in a large sample of people in musculoskeletal rehabilitation: A descriptive study

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ABSTRACT

Background: Consumption of opioids is increasing worldwide in people with chronic non-cancer pain, although their effectiveness is debated.
Objectives: The aim of the current study was to evaluate analgesic consumption and its association with different variables (demographic variables, pain, anxiety/depression, catastrophism, and kinesiophobia), in the field of musculoskeletal rehabilitation, where no data are available.
Methods: This was a retrospective study over a period of 8 years on people hospitalised for rehabilitation after injury. Participants were classified into 3 categories: no analgesics (NA), non-opioid analgesics (NOA), and opioid analgesics (OPA). ANOVA or chi-squared tests were used to compare the 3 groups.
Results: A total of 4,350 people (84% men; mean [SD] age, 44 [11] years) were included. In total, 20% were taking OPA, 40% NOA and 40% NA. In the OPA group, tramadol was mainly used, and the morphine equivalent median dose was 8.3 mg/day. In the NOA group, paracetamol and ibuprofen were mostly used. Symptoms increased progressively across the 3 groups (NA/NOA/OPA), with increased levels of pain severity/interference, anxiety/depression and catastrophizing, and a higher prevalence of neuropathic pain in the OPA group versus the others.
Conclusions: These results are consistent with those found in groups of people with chronic pain taking larger doses of opioids and following opioid reduction or cessation programs. Opioid prescription did not increase over the 8 years, which was reassuring. These factors are important to emphasise because they can be modified in the rehabilitation setting with interdisciplinary management.
Registration: Our database was registered on Mendeley Data.

Introduction

Consumption of analgesics, particularly opioids, is increasing worldwide in people with chronic pain. In the United States and Europe, opioid consumption is a major public health problem that causes deaths, addiction, and misuse [1–3]. Switzerland is the seventh largest consumer of opioids worldwide, with 421 mg/year/inhabitant of morphine consumption [4]. Thus, between 2006 and 2013, the insurance claims for prescriptions of strong opioids have increased by 110% [5], mainly for methadone and oxycodone, and by 13% for weak opioids.

In the treatment of chronic non-cancer pain, the use of opioids is questionable because its efficacy is not better than that of usual analgesics or non-steroidal anti-inflammatory drugs (NSAIDs) [6,7].

Abbreviations: AIS, Abbreviated Injury Scale; ANOVA, Analysis of Variance; ATC, Anatomical Therapeutic Chemical; BMI, Body Mass Index; BPI, Brief Pain Inventory; CBT, cognitive behavorial therapy; CIRS, Cumulative Illness Rating Scale; DN4, Douleur Neuropathique 4; HADS, Hospital Anxiety and Depression Scale; IQR, Interquartile Range; MEDs, Morphine Equivalent Doses; NA, No Analgesics; NOA, Non-Opioids Analgesics; NSAIDs, non-steroidal anti-inflammatory drugs; OPA, Opioid Analgesics; OTC, over the counter; PCS, Pain Catastrophinzing Scale; SD, Standard Deviation; STROBE, Strengthening the Reporting of Observational Studies in Epidemiology; Suva, Swiss accident insurance fund; TSK, Tampa Scale of Kinesiophobia

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Recent guidelines for reasonable opioid prescription exist but do not seem to be strictly followed [8].

The costs of chronic pain comprise both direct costs (physicians, therapies, and hospitalisation) and indirect costs (daily allowances, loss of productivity, and rent). The indirect costs are largely predominant. In Switzerland, the cost of musculoskeletal injuries represents 13% of total health costs [9]. For chronic pain in the United States [10], opioid use is associated with high healthcare expenditures compared to non-opioid use.

A prospective study [11] of 1226 people with chronic, disabling, occupational musculoskeletal disorders admitted for a functional rehabilitation program compared socioeconomic outcomes between people taking opioids or not at admission. A high level of opioid use was significantly related to low rates of return-to-work and work retention and high healthcare system consumption 1 year after the end of the program. The group reporting the highest level of opioid use was 11.6 times more likely to receive Social Security Disability Income/Supplemental Security Income than the group reporting no opioid use.

In the field of musculoskeletal rehabilitation, no clinical data are available on the consumption of analgesics, particularly opioids. Studies mainly focused on people with very long-lasting pain. The aim of the current study was to evaluate analgesic consumption (opioids vs non-opioids) at the beginning of a vocational rehabilitation program and to monitor the change in this consumption during the hospitalisation, using an in-out comparison. The opioid group was compared with people not taking opioids to search for potential associations with a panel of biopsychosocial variables. Our prespecified hypotheses were that opioid users are different from non-opioid users in terms of pain (more pain), psychological distress (more distress), catastrophism (more catastrophism) and kinesiophobia (more kinesiophobia).

Methods

This study took place in a tertiary rehabilitation centre in the French-speaking part of Switzerland, which depends on the Swiss Accident Insurance Fund (Suva), the main insurance company for accidents in Switzerland. The rehabilitation program is based on the fear–avoidance model. It uses a multidisciplinary biopsychosocial approach and its aim is to manage pain, and to improve function, activity, and participation, including return to work (usual or adapted). This program is composed of physical components (physiotherapy and occupational therapy account for nearly 80% of all therapies), with individual and group sessions including graded exercise (strength and endurance training, stretching, balance, walking, and adapted physical activities such as ball games, badminton etc.) and psychological components. The program includes on average 4 psychological Cognitive-Behavioural Therapy (CBT) sessions (pain and physical activity education). When necessary, vocational aspects are dealt with, including workshops, social advice, and orientation to another type of work if the person's function is too limited. After determining the baseline physical capacity of the person, therapies are determined by the therapists and then adjusted after a weekly multidisciplinary meeting. The length of stay is 4 to 5 weeks with at least 3 to 4 h of daily therapy (excluding weekends).

The sample included mainly men, blue-collar workers, with mean (SD) age of 44 [10] years. This was a retrospective study, but all data were collected prospectively. The retrospective use of these data was approved by the local ethics committee (*Commission cantonale d'éthique de la recherche sur l'être humain* CER-VD Lausanne, Project-ID 2022-00366). The research was conducted in accordance with the declaration of the World Medical Association. The study is reported according to the STROBE guidelines for cross-sectional studies.

Inclusion criteria

We included people aged from 18 to 65 years old who were hospitalised in the musculoskeletal rehabilitation department for vocational rehabilitation from May 2014 to December 2021 for any injury of the upper limbs, lower limbs, or spine. In case of 2 injury locations, the main painful and problematic was used in the analysis.

Exclusion criteria

We excluded people with acute pain (< 3 months), multiple traumas, burns, or amputations. In case of multiple stays during the inclusion period, only the first stay was considered.

Outcomes

The outcome was analgesic consumption. On the day of admission in the clinic, people were asked about their use of analgesic medication, and the medication was recorded in the electronic medical file. Medication intake and prescription during the hospitalisation were also recorded in the file. Stockpiled medications were also considered. The following analgesic medications were recorded using the Anatomical Therapeutic Chemical (ATC) classification: paracetamol, metamizole, NSAIDs, opioids (mainly tramadol, codeine, and oxycodone), antiepileptics (gabapentin, pregabalin) and some antidepressants (duloxetine, amitriptyline, venlafaxine, clomipramine). We classified participants on admission according to the highest level of medication used in 3 categories: no analgesics (NA), non-opioid analgesics (NOA), and opioid analgesics (OPA). Participants were reclassified at the end of the rehabilitation using the prescriptions at discharge, and during the whole stay by computing all medication taken during the hospitalisation. The NOA group consumed paracetamol, metamizole, NSAIDs, antiepileptics and antidepressants.

The total consumption of analgesics during the hospitalisation was computed for the most common drugs (paracetamol, ibuprofen, and opioids). For each type of medication, the number of pills and dosage was available, which allowed us to compute an average daily dose by summing the total consumption and dividing it by the duration of the stay. For each opioid, the dose was converted into morphine-equivalent doses (MEDs), as described [8] We also compared the drug composition of the 3 groups during the 8 years of inclusion.

Independent variables

On admission, the following variables were collected:

Sociodemographic variables: age, sex, body mass index (BMI), marital status, full-time or part-time work, work or leisure injury, time between injury and hospitalisation, trauma location (upper limb, lower limb, or spine) and number of surgeries.

Clinical variables: The severity of injury was evaluated using the Abbreviated Injury Scale (AIS) [12], from 1 to 6 (1=minor, 2=moderate, 3=serious, 4=severe, 5=critical and 6=fatal). Comorbidities were assessed with the Cumulative Illness Rating Scale (CIRS) [13], from 0 to 56. Pain was assessed with the Brief Pain Inventory (BPI) [14]. We used 2 subscales of the BPI: pain severity and pain interference; both subscales range from 0 to 10. To determine the presence of neuropathic pain, we used the Douleur Neuropathique 4 (DN4) questionnaire [15], which is rated from 0 to 10. A score ≥4 indicates a neuropathic component of pain. Three other questionnaires were administered at admission: the Hospital Anxiety and Depression Scale (HADS) [16], the Tampa Scale of Kinesiophobia (TSK) [17] and the Pain Catastrophizing Scale (PCS) [18].

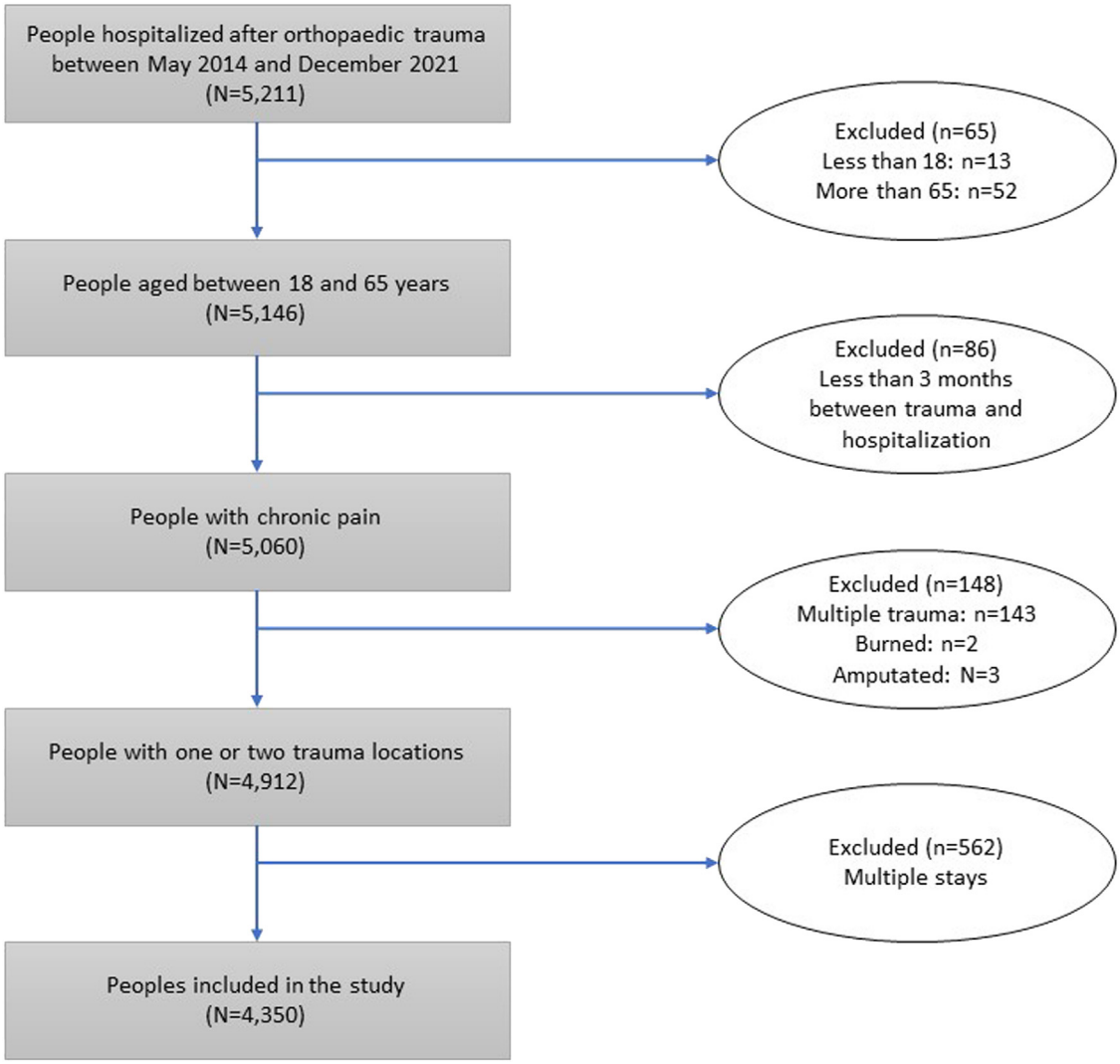

Fig. 1. Flow of study participants.

Statistical analysis

We present descriptive statistics as means (Standard Deviation [SD]) for continuous variables, except for the time before hospitalisation, which is given as median (interquartile range [IQR]). Categorical variables are described by number (percentage).

To compare independent variables between the 3 groups, one-way ANOVA or a test of differences in medians were used for continuous variables and chi-squared tests for categorical variables. The normality assumption of the distributions was checked visually with histograms.

Because the study is mainly descriptive, sample size was not calculated beforehand. For each variable, the number of missing observations is shown in the tables. Because less than 2% of the data were missing, no specific procedures were applied to deal with it.

All statistical analyses were performed using Stata 17.0 (Stata Corp, College Station, TX, USA). Given the large sample size, statistical significance would not bring much information, so we mainly focused on absolute differences between the 3 groups.

Results

Fig. 1 shows the flow of participants through the study. We included 4350 people; 84% were men, and the mean (SD) age was 44.4 (10.8) years. Overall, 85% of participants were working full-time before the accident, and in 56% of the cases, the injuries occurred in the professional setting. The trauma occurred in the lower limb (42%), upper limb (44%) and spine (14%). In total, 68% of the persons had surgery, 85% had minor or moderate injury (AIS) (Table 1). Mean BPI severity and interference scores were 4.8 and 4.9, 29% of participants had a neuropathic component of pain (DN4) and the mean CIRS score at assessment was low (Table 2). The mean HADS score was above the cut-off (8 points) for anxiety but just below the cut-off (8 points) for depression. The TSK results indicated light to moderate kinesiophobia. The PCS mean score showed moderate catastrophism.

All participants were evaluated and categorised into 1 of 3 groups according to their highest-level analgesic consumption at admission: 1723 (40%) participants did not take analgesics (NA), 1754 (40%) consumed NOA and 873 (20%) consumed OPA (Tables 1 and 2). Paracetamol (41%) and NSAIDs (20%) (mostly ibuprofen: 64%) were the most-used drugs. Antiepileptics and antidepressants represented 9% (pregabalin 7%, gabapentin 1%, others 1%) and 4% of consumption, respectively. Many participants combined several medications, such as NSAIDs and paracetamol. Few were taking strong opioids (2%) as compared with “weak” opioids (18%), the latter mainly tramadol (70%).

The OPA group contained more women, more people with spinal trauma and more people who had not undergone surgery than other groups (Table 1). Overall, scores progressed across the 3 groups. Differences were greater between the NA and OPA groups, with the

Table 1
Demographic variables at admission.

Variable	Whole sample (*N* = 4350)	NA (*n* = 1723)	NOA (*n* = 1754)	OPA (*n* = 873)	p-value
Age (years) (*n* = 4350)					
mean (SD)	44.38 (10.82)	43.87 (11.34)	44.59 (10.50)	44.96 (10.34)	0.031
Sex (*n* = 4350)					<0.001
Men	3643 (84%)	1523 (88%)	1440 (82%)	680 (78%)	
Women	707 (16%)	200 (12%)	314 (18%)	193 (22%)	
BMI (kg/m^2) (*n* = 4318)					
mean (SD)	28.50 (5.18)	28.19 (5.17)	28.83 (5.14)	28.47 (5.25)	0.001
Marital status (*n* = 4330)					0.063
Living alone	1532 (35%)	642 (37%)	591 (34%)	299 (34%)	
Living in a partnership	2798 (65%)	1071 (63%)	1156 (66%)	571 (66%)	
Professional situation before the injury (*n* = 4329)					0.001
Full time	3677 (85%)	1458 (85%)	1517 (87%)	702 (81%)	
Other	652 (15%)	259 (15%)	200 (13%)	163 (19%)	
Injury (*n* = 4283)					0.004
During work	2413 (56%)	914 (53%)	1022 (59%)	477 (56%)	
During leisure or at home	1870 (44%)	795 (46%)	708 (41%)	367 (44%)	
Time between injury and hospitalization (days) (*n* = 3804), median (IQR)	390 (258–650)	389 (263–635)	390 (253–656)	391 (252–667)	0.992
Trauma location (*n* = 4350)					<0.001
Lower limb	1848 (42%)	802 (47%)	761 (43%)	285 (33%)	
Upper limb	1894 (44%)	748 (43%)	782 (45%)	364 (42%)	
Spine	608 (14%)	173 (10%)	211 (12%)	224 (26%)	
Surgery (*n* = 4297)					<0.001
Yes	2903 (68%)	1225 (72%)	1158 (67%)	520 (61%)	
No	1394 (32%)	477 (28%)	579 (33%)	338 (39%)	

BMI= body mass index, IQR= interquartile range, NA= no analgesics, NOA= non-opioid analgesics, OPA= opioid analgesics, SD= standard deviation.

Table 2
Clinical variables at admission.

VARIABLE	Possible values	Whole sample (*N* = 4350)	NA (*n* = 1723)	NOA (*n* = 1754)	OPA (*n* = 873)	p-value
AIS (*n* = 4253)	1–6					0.010
Minor (1)		1332 (31%)	513 (30%)	523 (30%)	296 (35%)	
Moderate (2)		2283 (53%)	906 (54%)	962 (56%)	415 (49%)	
Serious or more (3 to 6)		638 (15%)	268 (16%)	234 (14%)	136 (16%)	
CIRS (*n* = 4290), mean (SD)	0–56	4.02 (2.58)	3.90 (2.46)	3.97 (2.57)	4.36 (2.79)	<0.001
BPI severity (*n* = 4287), mean (SD)	0–10	4.83 (1.97)	4.04 (1.96)	5.16 (1.85)	5.71 (1.66)	<0.001
BPI interference (*n* = 4288), mean (SD)	0–10	4.90 (2.23)	4.08 (2.20)	5.24 (2.11)	5.82 (1.96)	<0.001
DN4 ≥ 4/10 (*n* = 4237)	0–10	1212 (29%)	355 (21%)	545 (32%)	312 (37%)	<0.001
HADS anxiety (*n* = 4008), mean (SD)	0–21	9.98 (4.47)	9.00 (4.33)	10.43 (4.44)	11.06 (4.39)	<0.001
HADS depression (*n* = 4010), mean (SD)	0 –21	7.75 (4.30)	6.74 (4.13)	8.13 (4.23)	9.02 (4.33)	<0.001
TSK (*n* = 4058), mean (SD)	17–68	45.60 (7.89)	44.48 (7.71)	46.09 (7.91)	46.86 (7.91)	<0.001
PCS (*n* = 4059), mean (SD)	0–52	25.12 (12.32)	21.92 (11.93)	26.51 (12.00)	28.77 (12.20)	<0.001

AIS= Abbreviated Injury Scale, BPI= Brief Pain Inventory, CIRS= Cumulative Illness Rating Scale, DN4= Douleur Neuropathique 4, HADS= Hospital Anxiety Depression Scale, NA= no analgesics, NOA= non-opioid analgesics, OPA= opioid analgesics, PCS= Pain Catastrophizing Scale, SD= standard deviation, TSK= Tampa Scale of Kinesiophobia.

NOA group in between. Not surprisingly, those who took opioids reported higher levels of pain, almost 2 points more on the BPI than the NA group for both severity and interference, but they also felt more anxious and depressed. The most pronounced difference between the OPA and NA groups was for catastrophism, with a difference of nearly 7 points on the PCS scale. Those with a neuropathic component of pain also more frequently consumed opioids (Table 2 and Figs. 2a and 2b).

During the hospitalisation, the proportion of participants not taking any analgesics decreased to 14%, whereas consumption for the other groups increased to 51% for the NOA group and 35% for the OPA group (Fig. 3a). Thus, 1534 participants were prescribed opioids at least once during their stay. For these participants, the median MED (IQR) was 8.3 (2.8–13.9) mg/day. For the NOA group, paracetamol was the most common drug prescribed: 3064 (70%) participants received a prescription, with a median dose of 1200.0 (295.9 –2800.0) mg/day. Ibuprofen was also prescribed to 1488 (34%) participants, with a median dose of 379.0 (128.6–822.9) mg/day.

As compared with consumption at admission, at discharge, consumption classification had not changed for most participants (70%). Of note, 21% of the participants who were taking opioids at admission had stopped by discharge. However, 352 (10%) participants received their first prescription for opioids during the stay. Figs. 3a and 3b summarize these data.

During the 8 years of follow-up, opioid prescription did not increase (Fig. 4a). The prescription of pregabalin reduced by almost 50% and prescription of gabapentin increased slightly. For other drugs like paracetamol (results not shown), ibuprofen and tramadol, the doses were stable (Fig. 4b).

Discussion

To our knowledge, this is the first study in musculoskeletal rehabilitation to focus on analgesic consumption and the clinical characteristics of the individuals undergoing rehabilitation. Our large cohort of 4350 persons strengthens the results of this descriptive study. In the literature, data on analgesic consumption remain scarce, usually involve small series, and mainly focus on opioid withdrawal in people with very long-lasting pain [19,20].

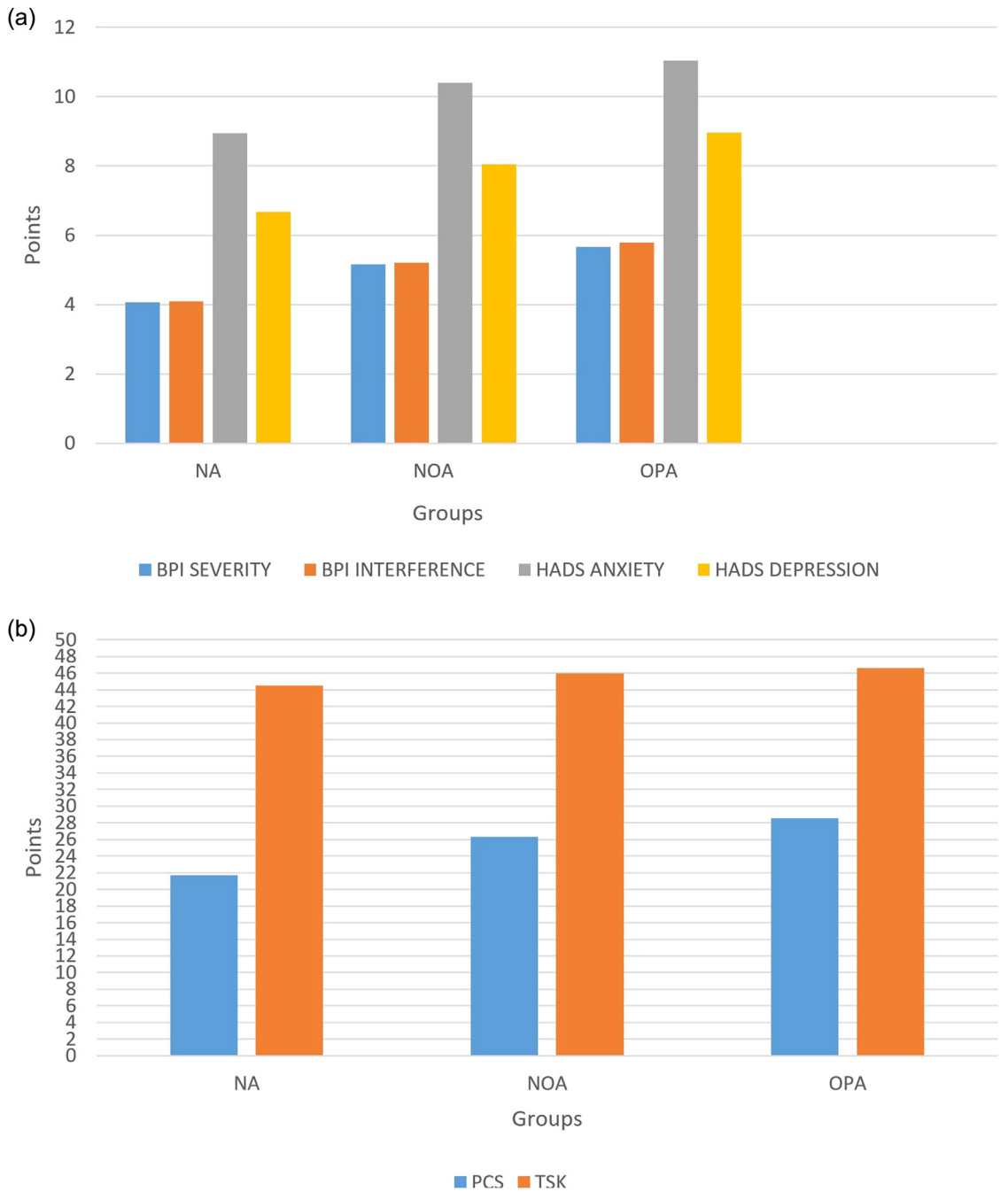

Fig. 2. BPI, HADS, PCS and TSK scores between groups. a) BPI and HADS scores.
b) PCS and TSK scores.
BPI: Brief Pain Inventory, HADS: Hospital Anxiety and Depression Scale, NA= no analgesics, NOA= non-opioid analgesics, OPA= opioid analgesics, PCS= Pain Catastrophizing Scale, TSK= Tampa Scale of Kinesiophobia.

Our first observation was that 20% of the sample were taking opioids on admission to our centre. These were mainly "weak" opioids such as tramadol. These data agree with reports in the literature on persons with chronic pain [21]. This percentage is relatively high: in the general population, the use of opioids for all types of chronic pain is 2% in Switzerland [22]. A possible explanation is that our sample included people who did not return to work 1 year after an accident and experienced persistent functional limitations and pain, which needed long-term analgesia. In Switzerland, tramadol does not require a counterfoil prescription and is not limited in time, which could lead to long-term use and abuse. For other morphine drugs, prescriptions must be made in a counterfoil booklet, with a maximum of 2 opioids per prescription, and the prescription is renewable every month. Importantly, the distinction between weak and strong opioids is now obsolete. Indeed, the side effects of this medication have been well described [23]. The risk of dependence and misuse is now considered to be at least similar between strong opioids and tramadol or codeine, maybe even higher for the "weak" opioids [24]. The use of opioids must be carefully weighed, especially because their effectiveness on chronic pain is being questioned [6]. The early prescription of opioids after an injury is known to be associated with long-term disability [25].

Overall, 40% of participants did not take any analgesics on admission. An explanation for this might be that they had tried many

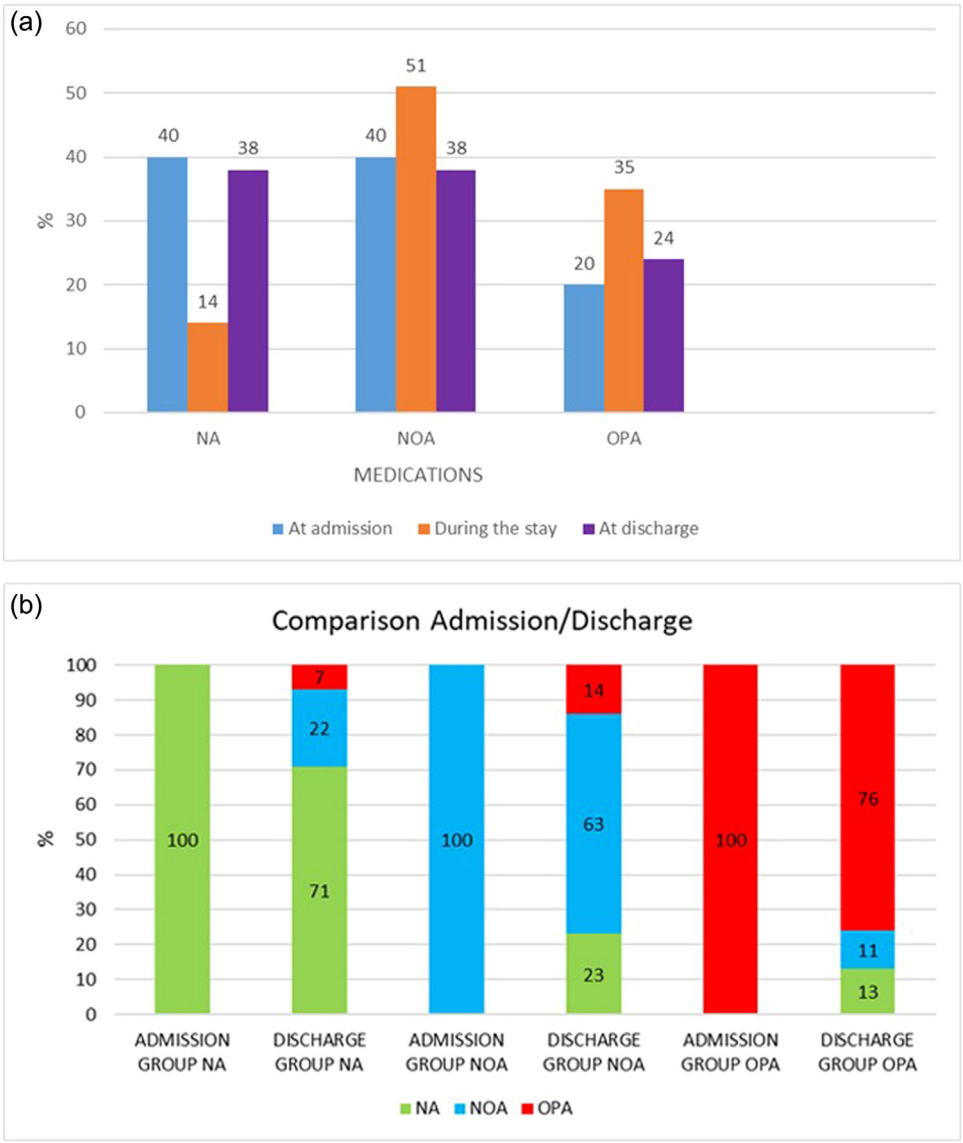

Fig. 3. Change in medication during the stay.
a) Medications at admission, during the stay and at discharge.
b) Change in medication within the 3 groups with a comparison between admission and discharge.
NA= no analgesics, NOA= non-opioid analgesics, OPA= opioid analgesics.

analgesics before coming to the hospital, and if the pain reduction was not satisfactory, they decided to stop. Another explanation is that this group of reported a mean pain level of 4/10, which generally requires low medications [26]. The literature on this topic and specifically in the field of physical and rehabilitation medicine is scarce. Data are from epidemiological studies about all types of chronic pain. In a survey of chronic pain in Europe, Breivik et al. [27] found that 21% of people had never taken medication for their pain and 33% were taking no medication at the time of the interview. Various studies in different countries have reported percentages between 22% and 44% of persons taking no analgesics [26,28].

Concerning the NOA group (40% of persons), paracetamol and NSAIDs (mostly ibuprofen) were the most-taken medications, as previously described in the literature [29]. For both medications, the median doses were far from the maximum daily doses. NSAIDs and paracetamol are prescribed widely for chronic pain [30]. However, an increased risk of side effects in both the short- and long-term has been described [31,32]. The effectiveness of paracetamol on chronic pain is also debated [33].

In our sample, only 9% were taking antiepileptics (mostly pregabalin) on admission (11% at the end of the stay), whereas 29% had a DN4 score ≥4/10, which suggests a neuropathic component. One explanation could be that they had already tried numerous treatments before hospitalisation and since antiepileptics are often poorly tolerated, they were stopped. We did not record medications taken before the hospitalisation, and we do not know how many participants had a real nerve lesion.

The use of pregabalin and gabapentin can also lead to problems of dependence, particularly in association with opioids [34]. The drugs are widely prescribed for chronic pain regardless of neuropathic pain diagnosis. In a German study, 75% of people taking pregabalin/gabapentin had not received a diagnosis of neuropathic pain or did not show a neuropathic component of pain. The authors explained this fact by a second-line prescription in people with chronic pain by the physician and possibly a marketing strategy of the pharmaceutical industry [35].

Most of these drugs used can be associated with overuse and have deleterious side effects. Fortunately, in our population, comorbidities

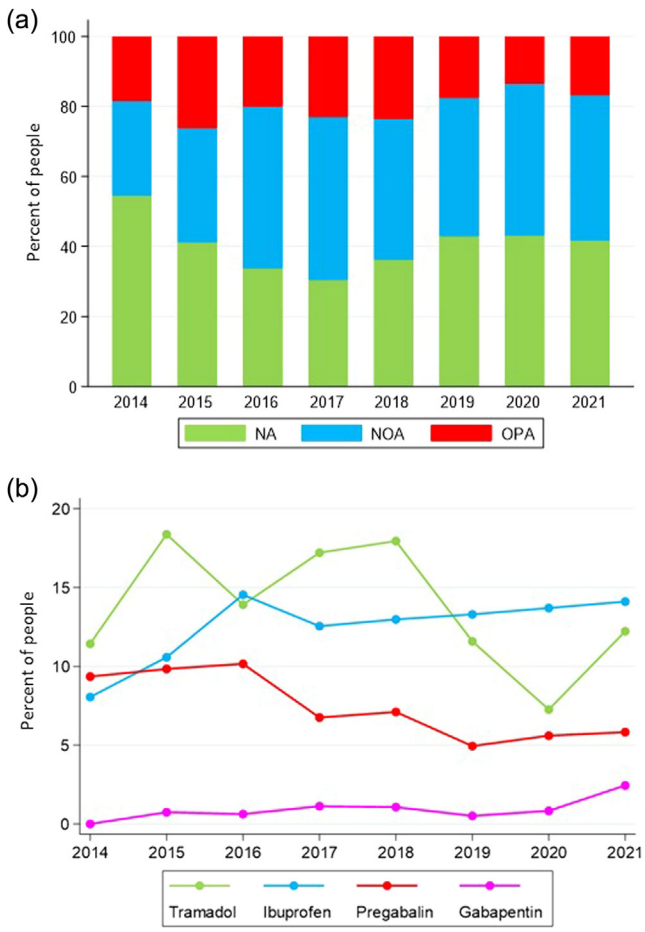

Fig. 4. Change in analgesic groups during the period 2014–2021. a) Overall change in analgesic groups during the period 2014–2021. b) Change in analgesic molecules (Pregabalin, Gabapentin, Tramadol, Ibuprofen) during the period 2014–2021.

evaluated by the CIRS were low (mean 4/56). Our sample was young, and cardiovascular, liver, gastrointestinal and renal comorbidities were rare, which limits the risk of side effects. In our study, we did not specifically monitor the side effects. In our daily practice, we are very careful about medication consumption through the person's computerized file, during the delivery of medication and medical visits, and serious side effects are rarely observed.

Despite all the precautions taken when dispensing medication, we cannot guarantee that people actually take them or if they are also taking over the counter (OTC) medications without informing the health care professionals. This is especially true when they are at home during the weekend. All the process of medication is based on a relationship of trust between the health professionals and the person.

For one third of the participants, the medication was changed during their stay: 23% started with NOA and 6% received a new opioid prescription. During the rehabilitation process, people are more active, with 4 to 5 hr of therapies per day, so an increase in pain is not surprising. Also, some participants were on insufficient medication at admission; therefore, their analgesics had to be adapted. The indication for the appropriateness of opioid therapy is reviewed for each person and discontinued or started as appropriate. Literature about the withdrawal of opioids in opioid abusers [36] is extensive, but in our population, the MED was lower than in comparable studies [11,37], which suggests that few were opioid abusers, far from the 35% found by Chang et al. [38].

During the 8 years of the study (2014–2021), opioid consumption was stable. These data are reassuring because between 2006 and 2013, the consumption of opioids in Switzerland, evaluated by reimbursement claims, increased by 13% for weak opioids and by 131% for strong opioids [5].

Pain, catastrophism, kinesiophobia and distress (anxiety/depression) were associated with consumption of stronger analgesics, which is consistent with the results found in people with chronic pain taking larger doses of opioids and following opioid reduction or cessation programs [39–47].

Although pain levels were higher in the OPA than the other groups, it was the only group that exceeded the cut-off for depression symptoms (8 points) [16]. Other studies have shown anxiety and depression associated with problematic opioid use, more severe opioid craving, poor opioid treatment outcome [46], and greater odds of receiving strong opioid doses [42]. Catastrophism was much higher in the OPA group than the other 2 groups, close to the cut-off for severe catastrophism (30 points) [18]. Many studies found catastrophism associated with opioid misuse [40] and increased odds of expecting opioids [39]. In a study of 119 people with chronic pain, the PCS questionnaire was found to discriminate well between people with a high and a low risk of opioid misuse, with an area under the receiver operating characteristic curve of 0.85 [43]. Some studies failed to find associations between catastrophism or depression and opioid use [44,45,47,48].

Kinesiophobia evaluated by the TSK questionnaire [17] was light to moderate in all groups, and the difference between groups was small. These results agree with the literature [41,44,45].

Physicians need to question their opioid prescriptions. People who express more pain, more catastrophism and anxiety probably receive more opioid prescriptions from their physicians [39,43].

We also observed that the OPA group included more women, more people with spine trauma, and more people who had not undergone surgery than the other groups. The literature is controversial about those aspects. Some studies found that women are more likely to take opioids than men [49], but others found no difference [50]. Nevertheless, all these factors were inter-related in our study. Most participants were male blue-collar workers. Women differ from men in many aspects: they more often experience spinal injuries than men, which are less frequently surgically treated. Therefore, knowing which of these factors were responsible for higher opioid consumption is difficult.

Strengths and limitations

The strengths of our study are the number of people analysed, the sample of mainly young male workers in a vocational and musculoskeletal rehabilitation centre and the prospective data collection. The limitations are the retrospective evaluation of the data, the impossibility of generalizing our results because of the specific sample, and the fact that we cannot make causal links between analgesic consumption and psychological factors.

Conclusions

Our results are in line with those of the literature. Opioid and analgesic use are associated with increased pain (severity and interference), catastrophism, anxiety, and depression but not kinesiophobia, even if analgesic consumption in our sample was not particularly high. These factors are important to emphasize because they can be modified in the rehabilitation setting with interdisciplinary management. The next step will be to set up a program focused on the optimal use of analgesics in the field of rehabilitation and to evaluate its results after the hospital stay.

Data availability

Data will be made available on request.

Declaration of Competing Interest

None.

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