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Analgesics prescription in upper limb trauma: a cross-sectional study

Prescrição de analgésicos em traumas do membro superior: um estudo transversal

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The study was approved by the Ethics Committee of the Federal University of Triângulo Mineiro (protocol number: CAAE: 45528821.6.0000.5154).

Data availability
The data that support the findings of this study are available from the corresponding author uopn reasonable request.

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ABSTRACT

BACKGROUND AND OBJECTIVES: Pain management in acute musculoskeletal trauma remains challenging, and uncertainty about how pain, psychosocial, and injury-related factors guide prescribing justifies investigation. The objective of this study was to verify if there was difference among analgesics prescription groups in hospitalized patients due to upper limb trauma regarding pain, psychosocial, sociodemographic and injury related variables. Secondly, the aim was to investigate the association among psychosocial variables.

METHODS: A cross-sectional study was conducted including 92 hospitalized adults within two weeks after acute upper limb trauma. Sociodemographic, clinical, and psychosocial data were collected. Patients were grouped according to prescribed pain drugs: dipyrone, dipyrone + tramadol, and dipyrone + morphine. Kruskal-Wallis test, Fisher's Exact test and Spearman's correlation test were used ($\alpha = 0.05$).

RESULTS: Fractures were predominant in 80.2% of the sample, mostly due to traffic and work-related accidents, affecting primarily young men (77.2%). Patients that suffered domestic accidents were more frequently treated with dipyrone alone ($p = 0.02$), and traffic or work accidents received more often opioid-based combinations. No significant differences were observed among drug groups regarding pain, psychosocial, sociodemographic and other injured related variables. Moderate correlations were found among psychosocial variables.

CONCLUSION: Analgesic prescriptions for hospitalized patients with acute upper limb trauma differed only by cause of injury, with opioids more frequently prescribed for work- or traffic-related accidents. Psychosocial factors were interrelated, suggesting that prescribing decisions may reflect contextual perceptions of trauma severity rather than objective or self-reported pain indicators.

KEYWORDS: Accidents, Analgesics, Arm trauma, Opioids, Pain, Upper extremity.

RESUMO

JUSTIFICATIVA E OBJETIVOS: O controle da dor em casos de traumas musculoesqueléticos agudos continua sendo um desafio, e a incerteza sobre como dor, fatores psicossociais e fatores relacionados à lesão orientam a prescrição justifica a investigação. O objetivo deste estudo foi verificar se há diferença entre os grupos de prescrição de fármacos para dor em pacientes hospitalizados devido a trauma no membro superior no que se refere a: dor, variáveis psicossociais e sociodemográficas e a própria lesão. Em segundo lugar, o objetivo foi investigar a associação entre as variáveis psicossociais.

MÉTODOS: Foi realizado um estudo transversal envolvendo 92 adultos hospitalizados nas duas semanas após um trauma agudo nos membros superiores. Foram coletados dados sociodemográficos, clínicos e psicossociais. Os pacientes foram agrupados de acordo com os fármacos prescritos para dor: dipirona, dipirona + tramadol e dipirona + morfina. Foram utilizados os testes de Kruskal-Wallis, exato de Fisher e correlação de Spearman ($\alpha = 0,05$).

RESULTADOS: As fraturas foram predominantes em 80,2% da amostra, principalmente devido a acidentes de trânsito e de trabalho, afetando principalmente homens jovens (77,2%). Os pacientes que sofreram acidentes domésticos receberam com maior frequência tratamentos apenas com dipirona ($p = 0,02$), enquanto os casos de acidentes de trânsito ou de trabalho receberam mais combinações à base de opioides. Não foram observadas diferenças significativas entre os grupos de fármacos em relação à dor, variáveis psicossociais, sociodemográficas e outras variáveis relacionadas aos ferimentos. Foram encontradas correlações moderadas entre as variáveis psicossociais.

CONCLUSÃO: As prescrições de analgésicos para pacientes hospitalizados com traumatismo agudo nos membros superiores diferiram apenas pela causa da lesão, com opioides prescritos com mais frequência para acidentes de trabalho ou de trânsito. Os fatores psicossociais estavam inter-relacionados, sugerindo que as decisões de prescrição podem refletir percepções contextuais da gravidade do traumatismo, em vez de indicadores objetivos ou autorrelatados de dor.

DESCRITORES: Acidentes, Analgésicos, Dor, Opioides, Extremidade superior, Traumatismo do braço.

HIGHLIGHTS

- Analgesic prescriptions varied only by cause of injury, with dipyrone used for domestic accidents
- No significant differences were found among prescription groups regarding pain intensity, psychosocial, sociodemographic, or injury related variables
- Moderate correlations were observed among psychosocial factors, especially: pain catastrophizing, anxiety, depression, kinesiophobia, and sleep quality

INTRODUCTION

Musculoskeletal disorders are among the main causes of demand for rehabilitation services, with traumatic conditions resulting in fractures showing an increase of 69% from 1990 to 2019[1]. The main causes of trauma-orthopedic injuries are traffic accidents, homicides and falls, with the most affected individuals being under 45 years of age[2]. Musculoskeletal injuries affecting the segments of the upper limb result in significant impairments of functionality, since several functions are performed by these segments[3,4]. Upper limb fractures represent a significant public health burden in the United Kingdom, with an annual incidence of 303.2 fractures per 100000. Distal radius fractures stood out as the most common, while carpal and metacarpal fractures were the least frequent[5]. In Brazil, upper limb injuries repre0sent a substantial proportion of emergency hospital visits and admissions, especially among young men exposed to traffic, domestic and occupational accidents. The wrist and hand are the most frequently affected regions, with severe cases such as open fractures, amputations, and tendon or nerve lesions carrying high risk of sequelae[6]. Pain intensity, depressive symptoms, catastrophizing, anxiety, and pain self-efficacy were factors consistently associated with greater long-term disability in patients suffering from musculoskeletal trauma involving the upper limb[4].

The use of opioids represents a serious public health problem in developed countries, with social and economic impacts[7]. In Brazil, opioid consumption increased from 8 to 44 sales per 1000 inhabitants, representing a significant increase of 465%, with codeine being the most consumed drug[7]. Distress tolerance, anxiety, depression, and pain catastrophizing were important predictors of postoperative morphine consumption in obese patients undergoing a surgical procedure (laparoscopic sleeve gastrectomy)[8]. In patients that suffered traumatic injuries, there is a high prevalence of post-traumatic stress disorder even after three months of the event with victims of crime (gunshot wounds) and pedestrians struck by motor vehicles being more likely to present this disorder[9].

Although previous studies have highlighted the clinical relevance of pain intensity, psychosocial distress, and opioid use in musculoskeletal trauma and surgical contexts[4,7-9], most available evidence focuses on long-term outcomes, elective procedures, or population-level data. There is limited information on how these factors relate to analgesics prescribing during the acute hospitalization phase following traumatic injuries. Moreover, despite the high functional and occupational relevance of upper limb injuries[3,4,6], data specifically addressing analgesic prescribing in patients hospitalized for acute upper limb trauma remain scarce.

Due to the complexity and uncertainties of the functional outcome after musculoskeletal trauma, a better understanding of how analgesic prescriptions differ considering injury cause, affected segment, patient occupation, avoidance of pain-related movements and stress related to life events can contribute to the interdisciplinary patient management in this acute phase. Unlike studies that focus on pain prevalence or opioid consumption, this study added evidence by evaluating whether prescribing decisions in acute traumatic pain in a hospital context were different when considering clinical indicators, psychosocial variables, and the context of the accident. This approach allows to advance the understanding of prescribing practice in the hospital setting.

The aim of this study was to verify if there was difference among analgesics prescription groups in hospitalized patients due to upper limb trauma regarding pain, psychosocial, sociodemographic and injured related variables. Secondly, the aim was to investigate the association among psychosocial variables.

METHODS

A cross-sectional study was conducted including 92 hospitalized adults. Participants were recruited between April 2024 and March 2025 through the local public health system at a university hospital. This hospital is responsible for approximately 73% of all medium and high complexity care and 100% of high-complexity services in the region, serving 27 municipalities.

This study consisted of patients (age over 18 years) hospitalized due to acute traumatic injuries in the upper limb in the last 14 days who had the mental capacity to provide informed consent. Patients with traumatic injuries which resulted in severe neurological, brain or central nervous system damage, pre-existing illnesses such as neurological diseases, cancer, rheumatoid arthritis, prolonged use of corticosteroids, and patients who had other impairments in addition to upper limb fracture, were excluded. This study employed an exploratory cross-sectional design, which enabled the description of associations observed in the acute post-trauma phase but did not allow causal or temporal inferences. Given the exploratory nature of the study, a priori sample size calculation was not performed. This characteristic should be considered when interpreting nonsignificant results, as the statistical power for detecting between-group differences may have been limited. All participants signed the written Free and Informed Consent Term (FICT) before data collection, and the Ethics Committee approved this study.

Variables

Data collection was conducted in a single session at a public university hospital directly to the patients during their hospitalization by two trained researchers. Sociodemographic variables such as age, gender, body mass index, occupation, and education were collected. Injury variables included: affected segment (shoulder and upper arm, elbow and forearm, and wrist and hand), side (right or left), and the cause of the injury, e.g., traffic, work, domestic, or other. Injuries were categorized as fractures or complex injuries. Complex injuries were defined as traumatic conditions involving associated soft tissue compromise, including tendon or nerve lesions, joint dislocations, or open fractures requiring specialized surgical management.

Analgesic prescriptions were collected in the day patients were evaluated. Patients were categorized according to the class of prescribed analgesic (dipyrone, dipyrone plus tramadol, or dipyrone plus morphine). The evaluation was performed predominantly in the postoperative period (78%), with an average time of 2.5 days after surgery. Information regarding prescribed dose, frequency, treatment duration, and clinical indication was not collected and, therefore, was not included in the analyses. The pain intensity was measured by the Numerical Pain Rating Scale (NPRS), ranging from 0 (no pain) to 10 (worst possible pain)[10,11]. The Pain Catastrophizing

Scale (PCS) comprises 13 items (0-4 points) assessing three domains: rumination, magnification, and hopelessness. Total scores range from 0 to 52, with higher values indicating greater catastrophizing. The validated scale shows excellent reliability (ICC=0.92)[12].

The Tampa Kinesiophobia Scale assessed the level of fear of movement through 17 questions about pain and symptom intensity. Values for each item range from 1 to 4 points (e.g., 1 point would be "completely disagree," 2 points "partially disagree," 3 points "agree," and 4 points "completely agree)". The final score can range from 17 to 68 points, with higher scores indicating higher levels of kinesiophobia. This scale has been validated and has excellent reliability (ICC of 0.93)[13].

The Impact of Event Scale (IES) was applied to evaluate subjective stress related to life events and the characteristics that involve such events. It consists of 15 items, divided into a subset related to intrusion and another focused-on avoidance, configuring a four-point Likert scale. The scale showed good reliability (ICC = 1; Cronbach's alpha ranging from 0.75 to 0.93)[14].

The Pittsburgh Sleep Quality Index (PSQI) was administered to evaluate sleep quality[13]. This 19-item self-report instrument produces a global score (0-21) derived from seven components, where elevated scores correspond to poorer sleep quality[15]. A global score >5 indicates major challenges in ≥2 components or moderate difficulties in >3 areas.

To measure anxiety and depression, the Hospital Anxiety and Depression Scale (HADS) was used. This instrument contains 14 items, equally distributed between the two dimensions[16,17]. Each subscale generates a score from 0 to 21, categorized as normal (0–7), mild (8–10), moderate (11–14) or severe (15–21). The scale has been shown to be valid and reliable, with intraclass correlation coefficients of 0.46 (anxiety) and 0.43 (depression)[16,17].

The Leeds Neuropathic Symptoms and Signs Scale (LANSS) contains 7 binary items (5 symptoms: dysesthesia, allodynia, paroxysmal pain, autonomic disturbances, burning; 2 signs: allodynia and altered needle-stick threshold). The score (0-24) classifies: <12 = low probability of neuropathic pain; ≥12 = probable neuropathic mechanisms. The scale has excellent reliability (ICC=0.97)[18].

Statistical analysis

Continuous variables were expressed as mean and standard deviation, while categorical variables were expressed as absolute and relative frequencies (percentages). Kruskal-Wallis test was used to compare the continuous variables among groups according to prescriptions for pain drugs: dipyrone, dipyrone + tramadol, dipyrone + morphine. Chi-square or Fisher's exact tests (when the expected value in any cell was < 5) was used to evaluate associations between analgesic prescriptions and categorical variables: gender, occupation, injury cause (car, work, domestic, and others) and injured segment (shoulder/arm, elbow/forearm, wrist/hand). Spearman's correlation test was also applied to investigate associations among psychosocial variables and the strength of the correlation was classified as high ($r > 0.70$), moderate ($0.40 \leq r \leq 0.70$), or low ($r < 0.40$). Statistical significance was set at $p < 0.05$. The exploratory design and sample size limited the use of multivariable models that could simultaneously account for clinical, psychosocial, and trauma-related factors. No formal correction for multiple comparisons was applied.

RESULTS

A total of 92 patients were included in this study, mostly men that suffered traffic or work injuries causing mostly fractures (Table 1).

There was no significant association between analgesic prescriptions and gender (Fisher's exact test = 0,123; Cramer's V = 0,215, df = 2) (Table 2).

There was a significant association between analgesic prescriptions and injury causes (Fisher's Exact test = 0,02; Cramer's V = 0,291, df = 6). Dipyrone was more prescribed for domestic accidents and the combination of dipyrone + morphine was less prescribed for other injury causes (Table 3).

There was no association between analgesic prescriptions and injury segments (Fisher's exact test = 0,08; Cramer's V = 0,197, df = 4) (Table 4).

There was no association between analgesic prescriptions and injury types (Fisher's exact test = 0,454; Cramer's V = 0,132, df = 2) (Table 5).

There were no statistic differences for any numeric variables among analgesic prescriptions as described in Table 6.

The present study also found moderate and positive correlations among psychosocial variables as follows: PCS and

Table 1. Sociodemographic and clinical characteristics (n = 92).

Variables	
Age (years)	42.8 (15.7)
Body mass index (kg/m²)	27.1 (6.3)
Men, n (%)	71 (77.2%)
Occupation	
Housewife	9 (9.8%)
Handyman	59 (64.1%)
Administrative worker	14 (15.2%)
Other (retired, unemployed, student)	10 (10.9%)
Injury cause	
Traffic, n (%)	41 (44.6%)
Work, n (%)	26 (28.3%)
Domestic, n (%)	18 (19.6%)
Others, n (%)	7 (7.6%)
Injury side	
Right-handed, n (%)	44 (47.8%)
Left side injury, n (%)	48 (52.2%)
Injury types	
Fracture, n (%)	73 (79.3%)
Complex injuries, n (%)	19 (20.7%)
Affected segment	
Shoulder and arm, n (%)	26 (28.3%)
Elbow and forearm, n (%)	27 (29.3%)
Wrist/hand, n (%)	39 (42.4%)
Pain drug	
Dipyrone	16 (17.4%)
Dipyrone + Tramadol	38 (41.3%)
Dipyrone + Morphine	38 (41.3%)

Values presented in mean (standard deviation) and frequency (percentage).

HADS (r = 0.53 [95%IC, 0.36 - 0.66], p <0.001), PCS and TSK (r = 0.43 [95%IC, 0.25 – 0.59], p<0.001), PCS and IES (r = 0.41 [95%IC, 0.22 – 0.58], p<0.001), and PSQI and HADS (r = 0.43 [95%IC, 0.23 – 0.59], p<0.001).

Table 2. Analgesic prescriptions and gender.

	Dipyrone (n=16)	Dipyrone + Tramadol (n=38)	Dipyrone + Morphine (n=38)
Men	10 (62.5%)	28 (73.7%)	33 (86.8%)
Woman	6 (37.5%)	10 (26.3%)	5 (13.2%)

% = Percentage.

Table 3. Analgesic prescriptions and injury causes.

	Dipyrone (n=16)	Dipyrone + Tramadol (n=38)	Dipyrone + Morphine (n=38)
Car accident	5 (31.3%)	15 (39.5%)	21 (55.3%)
Work accident	3 (18.8%)	10 (26.3%)	13 (34.2%)
Domestic accident	7 (43.8%) ¥	7 (18.4%)	4 (10.5%) ¥
Other	1 (6.3%)	6 (15.8%)	0 (0%)

% = Percentage; ¥ = Fisher's Exact test (exact sign. two-sided) significant difference for p<0.05. Standardized residual for post hoc analysis.

Table 4. Analgesic prescriptions comparisons considering injury segments.

	Dipyrone (n=16)	Dipyrone + Tramadol (n=38)	Dipyrone + Morphine (n=38)
Shoulder/arm	4 (25%)	12 (31.6%)	10 (26.3%)
Elbow/forearm	1 (6.3%)	12 (31.6%)	14 (36.8%)
Wrist/hand	11 (68.8%)	14 (36.8%)	14 (36.8%)

% = Percentage.

Table 5. Analgesic prescriptions comparisons considering injury types.

	Dipyrone (n=16)	Dipyrone + Tramadol (n=38)	Dipyrone + Morphine (n=38)
Fractures	14 (70%)	32 (84.2%)	27 (79.4%)
Complex injuries	6 (30%)	6 (15.8%)	7 (20.6%)

% = Percentage.

Table 6. Comparison of the numeric variable among analgesic prescriptions. Values presented as median (interquartile range) and [95% confidence interval (CI)].

	Dipyrone (n=16)	Dipyrone + Tramadol (n=38)	Dipyrone + Morphine (n=38)	p-value
Age (years)	43.5 (28.5-59.3),	46.0 (28-56),	38.5(25.5-52.3),	0.405
	[35.6-55.1]	[39.3-49.4]	[35.1-45.1]	
NPRS (0-10)	4 (2.8-5.3),	3 (1.25-6),	3.5 (2-5),	0.848
	[2.5-5.4]	[2.6-4.5]	[3.1-5.1]	
PCS (0-52)	10 (5.8-14.3),	9 (6-18),	13.5 (8.3-24),	0.071
	[6.5-19.2]	[8.8-14.6]	[13.0-21.0]	
TSK (0-68)	41 (33-45.5),	39 (34.3-42.8),	40 (34.3-43),	0.569
	[35.9-45.3]	[36.8-41.2]	[36.7-42.1]	
IES (0- 45)	23 (9.3-17.8),	14 (10-18),	15.5 (11-26),	0.079
	[13.5-26.9]	[11.8-17.4]	[14.9-21.1]	
PSQI (0-21)	8.5 (6-10),	8 (5-10),	8 (6-12),	0.359
	[6.1-10.5]	[6.7-9.0]	[7.8-10.3]	
HADS (0-21)	10 (7.5-15.5),	10 (6-15),	10 (7.3-15.8),	0.381
	[8.8-18.3]	[8.9-12.7]	[9.4-13.4]	
LANSS (0-24)	13 (6-21),	8 (3-11),	9 (6-13),	0.329
	[8.3-17.5]	[5.5-9.7]	[7.5-11.2]	

NPRS = Numeric Pain Rating Scale; PCS = Pain Catastrophizing Scale; TSK = Tampa Kinesiophobia Scale; IES = Impact of Event Scale; PSQI = Pittsburgh Sleep Quality Index; HADS = Hospital Anxiety and Depression; LANSS = Leeds Neuropathic Symptoms and Signs Scale.

DISCUSSION

Analgesic prescriptions in hospitalized patients due to upper limb trauma did not differ according to sociodemographic, clinical and psychosocial variables. The present findings suggest that prescribing behavior may be influenced by contextual aspects related to the trauma mechanism, although clinical decision-making processes were not directly assessed in this study. The study did not investigate physicians' reasoning, attitudes, or perceptions during prescription, and therefore no direct conclusions can be made regarding cognitive mechanisms underlying prescribing decisions. Cause of trauma was the only factor that differs among groups related to analgesic prescriptions and patients that suffered domestic accidents were more frequently treated with dipyrone alone, and traffic or work accidents received more often opioid-based combinations. Moreover, the study suggested moderate associations among psychosocial variables in hospitalized patients with acute upper limb trauma. Pain catastrophizing was moderately associated to anxiety and depression, kinesiophobia and the impact of event scale. Also, anxiety and depression and sleep quality were moderately associated.

Reference authors[19], in a stratified analysis by fracture type, showed an increased opioid consumption among women with proximal humeral and olecranon fractures, whereas men showed greater use in cases of scapular fractures, multiple finger fractures, and injuries associated with nerve or tendon damage. The correlation between fracture severity and analgesic requirements reinforces the importance of structured pain management protocols, particularly in the context of complex trauma[20]. Although the study[20] did not directly address opioids, the recommended standardized multidisciplinary approach implies the need for effective analgesic protocols in the perioperative period. Pain control, which includes the rational use of opioids, is an essential adjunct to the comprehensive management of these injuries, ensuring patient comfort during often painful surgical procedures[20]. In the present study, although this pattern was not statistically significant for injury site or injury type, the mechanism of trauma itself appeared to guide prescribing behavior. This context-driven approach likely reflects heuristic reasoning among clinicians, who associate high-energy mechanisms with greater pain and disability, even when objective pain indicators do not confirm this assumption.

The absence of differences in the pain intensity and neuropathic pain component among groups related to pain drugs contrasts with the expectation that higher pain levels correspond to stronger prescriptions. Another study[21], by using the Pain Management Index (an indicator of the adequacy between reported pain intensity and the class of prescribed analgesic) found that 68% of prescriptions were inadequate, with less potent drugs frequently prescribed than required for the patients' reported pain levels[21]. Similarly, authors[22] observed that mild pain predominated in more than 60% of postoperative patients, with anesthesia type and surgical characteristics being the main predictors of pain intensity, and greater vulnerability identified among women and in orthopedic procedures under general anesthesia. These findings reinforce that analgesic prescriptions were mainly influenced by contextual factors, such as the type of accident, rather than by pain intensity or psychosocial variables, emphasizing the need for standardized and individualized pain management protocols. Clinicians seem to rely on visual assessment of injury severity or intuitive reasoning rather than standardized pain scales when selecting analgesic regimens[21,22]. This practice can result in undertreatment of certain patients or, conversely, unnecessary opioid use. Indeed, inappropriate or prolonged opioid prescriptions after orthopedic trauma have been identified as key risk factors for misuse and dependency[23], underscoring the importance of rational and time-limited prescribing. Additionally, alterations in central pain modulation and stress-induced analgesia mechanisms may affect both pain perception and clinical decision-making[24]. Although no significant differences were observed in the present study related to pain variables, future studies employing quantitative sensory testing could better clarify the pain mechanisms in prescribing variability.

Similarly, no differences for psychosocial variables were suggested among groups related to pain prescription. Psychological distress and maladaptive coping have been linked to increased postoperative opioid consumption and pain persistence[4,8]. However, these factors are rarely assessed systematically in acute care. The absence of difference found in the present study likely reflects clinical under recognition rather than irrelevance. Implementing brief psychosocial screening could help identify individuals at risk for disproportionate pain responses and prolonged analgesic use.

Associations between psychosocial variables have been shown in several studies investigating upper limb trauma and pain outcomes. In the present study, although several psychosocial variables were moderately interrelated, these constructs did not demonstrate a measurable influence on analgesic prescription patterns. In the sample, pain catastrophizing was moderately associated to anxiety and depression, kinesiophobia and the impact of event scale, and anxiety and depression and sleep quality were also moderately associated. However, they did not differ among analgesic prescription groups, suggesting that prescribing decisions may reflect contextual rather than symptom-based factors. Patients with upper-limb injuries have been reported to experience greater disability and longer hospitalization, independent of objective severity[25]. Elevated scores of anxiety and depression measured by the HADS, pain catastrophizing measured by the PCS, together with an external locus of recovery control, have been associated with maladaptive cognitive-emotional responses to pain, reduced self-efficacy, and consequently poorer functional recovery following distal radius fracture[26]. Furthermore, poor sleep quality, measured by the PSQI, has been also strongly associated with anxiety and depression, highlighting the role of emotional distress and sleep disturbance in pain modulation[27]. Taken together, these findings indicate that psychosocial and sleep-related factors may indirectly influence clinical judgment and analgesic prescribing in acute musculoskeletal trauma.

The broad psychosocial assessment made in the current study allowed to characterize emotional distress, maladaptive pain cognitions, sleep impairment, and fear of movement during the acute hospitalization phase. The consistent associations observed among these variables are in line with previous evidence showing the interrelationship between catastrophizing, anxiety, depression, sleep disturbances and trauma related stress in musculoskeletal

injury contexts[4,8,9,26,27]. These findings help to define the psychosocial profile of patients with acute upper limb trauma and contribute to a more comprehensive interpretation of prescribing practices.

Recent literature emphasizes rational opioid use in acute pain management, recommending cautious prescribing and multimodal strategies, yet substantial variability persists in real world practice, particularly in acute trauma settings[7,20]. Under conditions of uncertainty and time pressure, prescribing decisions may be influenced not only by pain intensity but also by clinicians' appraisal of injury severity and contextual trauma related factors[20]. This tension between guideline recommendations and situational clinical judgment provides a relevant framework for interpreting the prescribing patterns observed in the present study[7,20]. From a clinical perspective, these findings highlight the importance of standardized, evidence-based pain management protocols that integrate biomedical and psychosocial factors by using clinically viable in the hospital routine. In the Brazilian context, where access to opioids has expanded rapidly[7,20], rational prescribing is crucial to balance effective pain control and prevention of misuse. Incorporating biopsychosocial assessment tools into hospital practice may enhance individualized, safe, and effective pain management.

This study had limitations. Its cross-sectional design prevented causal inference and did not address long-term outcomes such as persistent pain or opioid use after discharge. The sample was predominantly male and limited to a single hospital, restricting generalizability. Drug data were based on prescriptions rather than actual use. The drug data refer to analgesic prescriptions and do not necessarily reflect real drug consumption by patients. This restricts inferences about actual analgesic exposure and may introduce classification bias. Another limitation of the present study was the analytical strategy adopted. Only univariate procedures were performed, and multivariable models were not applied due to the exploratory nature of the research and sample size constraints. In addition, no correction for multiple comparisons was conducted.

Future research should use longitudinal and multicenter designs to explore how psychosocial distress, pain modulation, and clinician reasoning interact to influence analgesic trajectories. Including patient-reported outcome measures and neurophysiological tests may help clarify the mechanisms underlying pain management disparities in musculoskeletal trauma.

CONCLUSION

The objective of this study was to examine whether analgesic prescribing patterns in hospitalized patients with acute upper limb trauma differed according to pain, psychosocial, sociodemographic, and injury related variables, and this objective was achieved. Prescribing did not vary according to pain intensity, psychosocial status, or demographic characteristics. Trauma mechanism was the only factor associated with differences among prescription groups, with domestic injuries more often treated with dipyrone alone and work or traffic related trauma more often treated with opioid containing combinations. Limitations included cross-sectional design, single center predominantly male sample, and use of prescription records rather than actual consumption. Future multicenter longitudinal studies should assess real consumption, decision making, and integration of psychosocial indicators into acute pain management.

REFERENCES

1. Cieza A, Causey K, Kamenov K, Hanson SW, Chatterji S, Vos T. Global estimates of the need for rehabilitation based on the Global Burden of Disease study 2019: a systematic analysis for the Global Burden of Disease Study 2019. Lancet. 2020;396(10267):2006-17. https://doi.org/10.1016/S0140-6736(20)32340-0. PMid:33275908.
2. Rosenbloom BN, Khan S, McCartney C, Katz J. Systematic review of persistent pain and psychological outcomes following traumatic musculoskeletal injury. J Pain Res. 2013;6:39-51. https://doi.org/10.2147/JPR.S38878. PMid:23357964.
3. Barbosa RI, Raimundo KC, Fonseca MCR, Coelho DM, Ferreira AM, Hussein AM, Mazzer N, Barbieri CH. Profile of patients with traumatic injuries of the upper limb treated in a tertiary hospital. Acta Fisiatr. 2013;20(1):14-9. https://doi.org/10.11606/issn.2317-0190.v20i1a103738.
4. Jayakumar P, Overbeek CL, Lamb S, Williams M, Funes C, Gwilym S, Ring D, Vranceanu AM. What factors are associated with disability after upper extremity injuries? A systematic review. Clin Orthop Relat Res. 2018;476(11):2190-215. https://doi.org/10.1097/CORR.0000000000000427. PMid:30188344.
5. Zhang J, Bradshaw F, Duchniewicz M, Karamatzanis I, Fernandes FW, Krkovic M. Epidemiology and Incidence of Upper Limb Fractures: a UK Level 1 Trauma Center Perspective. Cureus. 2024;16(2):e54961. https://doi.org/10.7759/cureus.54961. PMid:38544581.
6. Ribak S, Oliveira EJN, Rosolino GP, Orru Neto P, Tietzmann A. Epidemiology of traumatic injuries of the upper limbs in a university hospital. Acta Ortop Bras. 2018;26(6):370-3. https://doi.org/10.1590/1413-785220182606180607. PMid:30774508.
7. Correia I, Meziat-Filho N, Furlan AD, Saragiotto B, Reis FJJ. Are we missing the opioid consumption in low- and middle-income countries? Scand J Pain. 2024;24(1):20230086. https://doi.org/10.1515/sjpain-2023-0086. PMid:38126164.
8. Tapar H, Özsoy Z, Balta MG, Daşıran F, Tapar GG, Karaman T. Associations between postoperative analgesic consumption and distress tolerance, anxiety, depression, and pain catastrophizing: a prospective observational study. Braz J Anesthesiol. 2022;72(5):567-73. https://doi.org/10.1016/j.bjane.2021.07.007. PMid:34363820.
9. Joseph NM, Benedick A, Flanagan CD, Breslin MA, Simpson M, Ragone C, Kalina M, Hendrickson SB, Vallier HA. Prevalence of posttraumatic stress disorder in acute trauma patients. OTA Int. 2020;3(1):e056. https://doi.org/10.1097/OI9.0000000000000056. PMid:33937681.
10. Jensen MP, McFarland CA. Increasing the reliability and validity of pain intensity measurement in chronic pain patients. Pain. 1993;55(2):195-203. https://doi.org/10.1016/0304-3959(93)90148-I. PMid:8309709.
11. Michener LA, Snyder AR, Leggin BG. Responsiveness of the numeric pain rating scale in patients with shoulder pain and the effect of surgical status. J Sport Rehabil. 2011;20(1):115-28. https://doi.org/10.1123/jsr.20.1.115. PMid:21411827.
12. Sehn F, Chachamovich E, Vidor LP, Dall-Agnol L, Custódio de Souza IC, Torres ILS, Fregni F, Caumo W. Cross-cultural adaptation and validation of the brazilian portuguese version of the pain catastrophizing scale. Pain Med. 2012;13(11):1425-35. https://doi.org/10.1111/j.1526-4637.2012.01492.x. PMid:23036076.
13. de Souza FS, da Silva Marinho C, Siqueira FB, Maher CG, Costa LOP. Psychometric testing confirms that the brazilian-portuguese adaptations, the original versions of the fear-avoidance beliefs questionnaire, and the tampa scale of kinesiophobia have similar measurement properties. Spine. 2008;33(9):1028-33. https://doi.org/10.1097/BRS.0b013e31816c8329. PMid:18427325.
14. Silva ACO, Nardi AE, Horowitz M. Versão brasileira da Impact of Event Scale (IES): tradução e adaptação transcultural. Rev Psiquiatr Rio Gd Sul. 2010;32(3):86-93. https://doi.org/10.1590/S0101-81082010000300005.

15. Buysse DJ, Reynolds CF 3rd, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh sleep quality index: a new instrument for psychiatric practice and research. Psychiatry Res. 1989;28(2):193-213. https://doi.org/10.1016/0165-1781(89)90047-4. PMid:2748771.
16. Snaith RP. The hospital anxiety and depression scale. Health Qual Life Outcomes. 2003 [cited 2026 Feb 26];1:29 http://www.hqlo.com/content/1/1/29
17. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand. 1983;67(6):361-70. https://doi.org/10.1111/j.1600-0447.1983.tb09716.x.
18. Schestatsky P, Félix-Torres V, Fagundes Chaves ML, Câmara-Ehlers B, Mucenic T, Caumo W, Nascimento O, Bennett MI. Brazilian Portuguese validation of the leeds assessment of neuropathic symptoms and signs for patients with chronic pain. Pain Med. 2011;12(10):1544-50. https://doi.org/10.1111/j.1526-4637.2011.01221.x. PMid:21883875.
19. MacDermid JC, McClure JA, Richards L, Faber KJ, Jaglal S. Opioid use for a first-incident upper extremity fracture in 220,440 patients without recent prior use in Ontario, Canada: a retrospective cohort study. OTA Int. 2022;5(3):e202. https://doi.org/10.1097/OI9.0000000000000202. PMid:36425087.
20. Mazao HDM, Carvalho WW, Oliveira SA Fo, Saab FG. Manejo atual das fraturas expostas: abordagens cirúrgicas e antibióticas baseadas em evidências. Journal Archives of Health. 2025;6(4):e3279. https://doi.org/10.46919/archv6n4espec-16268.
21. George SZ, Wallace MR, Wu SS, Moser MW, Wright TW, Farmer KW, Borsa PA, Parr JJ, Greenfield WH 3rd, Dai Y, Li H, Fillingim RB. Biopsychosocial influence on shoulder pain. Pain. 2015;156(1):148-56. https://doi.org/10.1016/j.pain.0000000000000012. PMid:25599310.
22. Ip HYV, Abrishami A, Peng PWH, Wong J, Chung F. Predictors of postoperative pain and analgesic consumption. Anesthesiology. 2009;111(3):657-77. https://doi.org/10.1097/ALN.0b013e3181aae87a. PMid:19672167.
23. Gangavalli A, Malige A, Terres G, Rehman S, Nwachuku C. Misuse of opioids in orthopaedic postoperative patients. J Orthop Trauma. 2017;31(4):e103-9. https://doi.org/10.1097/BOT.0000000000000741. PMid:28323765.
24. Chesterton LS, Sim J, Wright CC, Foster NE. Interrater reliability of algometry in measuring pressure pain thresholds in healthy humans, using multiple raters. Clin J Pain. 2007;23(9):760-6. https://doi.org/10.1097/AJP.0b013e318154b6ae. PMid:18075402.
25. Zeelenberg ML, Den Hartog D, Halvachizadeh S, Pape HC, Verhofstad MHJ, Van Lieshout EMM. The impact of upper-extremity injuries on polytrauma patients at a level 1 trauma center. J Shoulder Elbow Surg. 2022;31(5):914-22. https://doi.org/10.1016/j.jse.2021.10.005. PMid:34687916.
26. Goudie ST, Broll R, Warwick C, Dixon D, Ring D, McQueen M. The association between psychological factors and outcomes after distal radius fracture. J Hand Surg Am. 2022;47(2):190.e1-10. https://doi.org/10.1016/j.jhsa.2021.04.012. PMid:34112544.
27. Feitosa ALX, Souza FR, Brito LS, Marques LHN, Borges KK. Distúrbios do sono e a sua associação com os sintomas ansiosos e depressivos. Brazilian Journal of Development. 2022;8(1):1758-69. https://doi.org/10.34117/bjdv8n1-111.

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