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Evaluation of Patients Presenting to the Emergency Department With Chronic Pain: An Observational Clinical Study

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Abstract

Background: Overcrowding of emergency departments (EDs), which are not suitable places to treat chronic pain and are responsible for managing acute disorders, leads to prolonged waiting times, delays in treating conditions requiring rapid intervention, patient dissatisfaction, and chaos and exhaustion in the ED.

Objectives: Examine the characteristics of patients who presented to the ED with non-malignant chronic pain to determine the frequency of use and factors that caused ED use.

Methods: This cross-sectional study was conducted in an ED. Three hundred ninety-two patients with chronic pain were included.

Results: The mean age of the patients was 48.1 ± 15.3 years, 62.2% were female, and 37.8% were male. Of the patients, 59.2% were married, 42.6% had elementary school education, and 56.1% were unemployed. The most common cause of ED admission was low back pain (LBP), the 32.7% used non-steroidal anti-inflammatory drugs, 16.3% used opioid analgesics, 15.8% used anticonvulsants, 13.2% used anticonvulsants antidepressant drugs, 22% did not use any medication. The reasons for presenting to the ED for chronic pain were 13.3% for medication prescription, 74.5% for receiving analgesics, and 12.2% for a diagnosis. The mean Patient Health Questionnaire-9 (PHQ-9) scale score of the participants was 12.82 ± 3.98, which indicated moderate depressive symptoms. The mean Generalized Anxiety Disorder-7 scale score was 9.84 ± 3.23, which indicated mild generalized anxiety disorder.

Conclusion: Instead of trying to suppress pain, emphasis should be put on preventing overcrowding in EDs, which are intended to manage acute conditions rather than chronic pain, informing patients about the methods of coping with pain, increasing their quality of life, and integrating them into social life.

Keywords: Chronic Pain, Emergency Department, Hospitals, Pain Management, Quality of Life

1. Background

Chronic pain is described as difficult-to-describe, continuous or intermittent pain that lasts longer than three months does not involve the protective physiological mechanisms of acute pain, and adversely affects a person's quality of life.[1] The central sensitization and increased neuronal excitability in the central nervous system against peripheral stimuli, reduced or absent descending inhibitor control, autonomic nervous system changes, neurotransmitter changes, and stress response plays a role in developing chronic pain.[1,2] Chronic pain caused by musculoskeletal system disorders causes loss of workforce and disability. Chronic pain accompanies psychiatric disorders such as depression and anxiety disorders and harms sleep quality and memory.[3] Fibromyalgia syndrome, myofascial pain, rheumatoid arthritis, osteoarthritis, back and low back pain (LBP), neck pain, headache, and pelvic pain are among the various causes of chronic pain. Adverse effects on daily life, inadequate strategies for coping with pain, opioid addiction, loss of labor, stress, anxiety, and despair can cause patients with chronic pain to present to emergency departments (EDs) and seek solutions in those facilities. Studies reported that 10%-16% of patients with chronic pain present to EDs.[4] Similar to other countries, patients with chronic pain continue to receive medical assistance from EDs where uninterrupted service is provided in our country. Overcrowding of EDs, which are not suitable for treating chronic pain and are responsible for managing acute disorders, leads to prolonged waiting times, treatment delays for conditions requiring rapid intervention, patient dissatisfaction, and chaos and exhaustion in ED.[5,6]

2. Objectives

We aimed to examine patients' clinical and demographic characteristics presenting chronic non-malignant pain to

the ED. Also, to determine the frequency of use and factors that caused ED use.

3. Methods

3.1. Study Design

This cross-sectional study was conducted in our ED between July 2020 and September 2020. All procedures performed in studies involving human participants were conducted following the ethical standards of the institutional research committee and the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Before the evaluation, the patients, as appropriate, were given verbal and written information on the nature of the study. Informed consent forms were signed upon admission to the trial.

3.2. Patient Selection

Fourteen thousand two hundred forty-eight patients were admitted to the ED during the study period, and 468 patients had chronic pain. Thus, a total of 392 patients with chronic pain were included in our study. The inclusion criteria for the study were as follows: (*i*) having intermittent or persistent pain more than three months, (*ii*) presenting to the ED for chronic pain, (*iii*) age 18 years and over, (*iv*) literate. The exclusion criteria were as follows: (*i*) age under 18 years, (*ii*) pain for less than three months, (*iii*) chronic pain due to any malignancy, (*iv*) pregnant women, (*v*) prisoners, (*vi*) patients with communication problems who were unable to answer questions. Therefore, according to the inclusion criteria, 76 patients could not be included in the study.

Patients who met the inclusion criteria were questioned using an evaluation form that questions about the patient's age, sex, marital status, education level, profession, pain region (lower back, abdomen, headache, joint, knee, hip-pelvis, leg, chest, neck, shoulder), medication use for chronic pain [non-steroidal anti-inflammatory drug (NSAID), opioids, anticonvulsant, antidepressant], presentation to a family physician or a specialist (algology, physical medicine, and rehabilitation, psychiatry). In addition, before presenting to the ED, the presence of a comorbid disorder, the route of ED presentation (by ambulance or outpatient presentation), and the reason for choosing the ED for chronic pain treatment.

The sample size was calculated using the G*Power (V3.1.9.4) program.[7] Accordingly, the minimum number of individuals sampled with 95% power, an effect size of 0.5 and 5% type 1 error, was determined as 210. The simple random sampling method was performed for the sample selection.

3.3. Evaluation Scales

Pain intensity was evaluated using the Brief Pain Inventory. The pain felt by the individuals is scored on a 0-10 scale, where 10 represents the worst pain. Pain in the last week was questioned as "current pain," "the most severe pain," and "mildest pain," and "average pain" because the severity of chronic pain changes during the day, as well as the rate of improvement of pain with the treatments used.[8,9]

The Patient Health Questionnaire-9 (PHQ-9) was used to screen for depression, which often accompanies chronic pain. The PHQ, developed to determine patients' mental difficulties, is a self-coded scale with proven validity and reliability in the Turkish language. It evaluates how often a patient was disturbed by depressive symptoms in the last 2 weeks. Each item is scored from 0 to 3. The PHQ-9 scale score ranges from 0 to 27. Depression severity was graded as minimal (0-4 points), mild (5-9 points), moderate (10-14 points), moderately severe (15-19 points), and severe (20-27 points).[10,11]

Patients with chronic pain can use anxiety to suppress somatic sensations and thus may provide the basis for the development of anxiety disorder. We used the Generalized Anxiety Disorder-7 (GAD-7) screening test, a 7-item scale developed by Spitzer et al. to rate anxiety. Each item is scored from 0 to 3, the GAD-7 scale score ranges from 0 to 21. Accordingly, anxiety was rated as minimal (0-4 points), mild (5-9), moderate (10-14 points), and severe (14-21 points).[12,13]

3.4. Statistical Analysis

The compliance of the data to normal distribution was tested using the Kolmogorov Smirnov test. In addition, the Mann-Whitney U test was used to compare non-normally distributed features in two independent groups. Descriptive statistics give the mean ± standard deviation for numerical variables and categorical variables' min-max and number and percentage (%) values. The data were analyzed using the IBM SPSS version 23 and $P < 0.05$ were considered statistically significant.

4. Results

Three hundred ninety-two patients who met the inclusion criteria were included in the study. This study accounts for approximately 2.8% of all patients registered in the ED during the study period. The mean age of the patients was 48.1 ± 15.3 years; 62.2% were female (n = 244), and 37.8% (n = 148) were male. Of the patients who presented with chronic pain, 59.2% (n = 232) were married, 42.6% (n = 167) had elementary school education and 56.1% (n = 220) unemployed. Chronic painful conditions included a primary symptom of LBP (27.5%), abdominal pain (18.1%), headache (11.2%), joint pain (10.2%), knee pain (9.2%), hip-pelvic pain (8.7%), leg pain (5.6%), chest pain (3.6%), neck pain (3.1%), and shoulder pain (2.8%).

Among the patients who presented to the ED for chronic pain, 32.7% (n = 128) were using NSAIDs, 16.3% (n = 64) opioid analgesics, 15.8% (n = 62) anticonvulsants, and 13.2% (n = 52) antidepressant drugs; 22% (n = 86) were not using any medication. The presentation rate to a family physician was 18.6% (n = 73) and to a specialist 20.4% (n = 80) before the ED presentation. Three hundred twenty-four (82.7%) of patients had comorbid disorders. Twenty-four (6.1%) were transported to the hospital by

ambulance, and 368 (93.9%) presented to the hospital by their means. Questioning of the reason for choosing the ED for chronic pain revealed that 13.3% of the patients (n = 52) presented to have their medications prescribed, 74.5% (n = 292) to receive analgesics, and 12.2% (n = 48) for a diagnosis of their symptoms. The characteristics of the patients who presented to the ED for chronic pain are given in Table 1 and Table 2.

The pain severity of patients who presented to the ED with chronic pain was evaluated using the Brief Pain Inventory. The most severe pain score over the past week was 6.76 ± 1.12; the mildest pain score was 3.67 ± 0.98; the mean pain scores 5.71 ± 1.11, and the mean worst current pain score was 6.67 ± 1.09. The mean percentage of pain reduction achieved with the medication or treatment administered in the last week was 41.63 ± 12.19% (Table 3).

The mean PHQ-9 scale score of the participants was 12.82 ± 3.98, which indicated moderate depressive symptoms. The mean GAD-7 scale score was 9.84 ± 3.23, which indicated mild generalized anxiety disorder (Table 3).

When the BPI, GAD-7, and PHQ-9 scales were compared according to the sexes, no statistically significant correlation was found ($P > 0.05$) (Table 3).

Table 1. Characteristics of Patients Who Presented to the Emergency Department for Chronic Pain

Characteristic		
Age (y), Mean ± SD		48.1 ± 15.3
Gender, No. (%)	Female	244 (62.2)
	Male	148 (37.8)
	Married	232 (59.2)
Marital status, No. (%)	Single/nevermarried	116 (29.6)
	Separated/divorced/widowed	44 (11.2)
	Illiterate	20 (5.1)
	≤ Elementary school	86 (21.9)
	Elementary school	167 (42.6)
Educational status, No. (%)	Middle school	99 (25.3)
	High school	20 (5.1)
Occupational status, No. (%)	Employed	172 (43.9)
	Unemployed	220 (56.1)
	Lower back	108 (27.5)
	Abdomen	71 (18.1)
	Headache	44 (11.2)
Location, No. (%)	Joint pain	40 (10.2)
	Knee	36 (9.2)
	Hip-pelvic	34 (8.7)
	Leg	22 (5.6)
	Chest	14 (3.6)
	Neck	12 (3.1)
	Shoulder	11 (2.8)
	Non-steroidal anti-inflammatory drug	128 (32.7)
Use of drug for chronic pain, No. (%)	Opioids	64 (16.3)
	Anticonvulsant	62 (15.8)
	Antidepressant	52 (13.2)
	None	86 (22)

SD: Standard deviation

5. Discussion

Chronic pain management requires physical, cognitive, behavioral, and psychosocial assessments. Rather than simply trying to suppress pain, one should aim to teach patients the methods of coping with pain, to increase their quality of life, and to integrate them into social life. Interdisciplinary cooperation is needed in the treatment of every patient.[1,6] There is a growing domestic and a global trend of seeking solutions for symptoms in EDs among patients with chronic pain, who have already been seen by various physicians, undergone various diagnostic tests, and received a wide spectrum of treatments. Therefore, determining the characteristics of patients with chronic pain presenting to the ED. Also, the reasons for choosing EDs for this purpose may allow planning health services, referring this seemingly difficult patient group to appropriate units, developing country-specific clinical guidelines, and developing a systematic approach within the ED.[16] Therefore, our study aimed to examine the clinical and demographic characteristics of patients who presented with chronic pain and determine the frequency and reasons for ED use for this purpose.

Our study, which included patients who presented to the ED with chronic pain, demonstrated that 2.8% of all emergency presentations were due to chronic pain. In the literature, the rate of presentations EDs with chronic pain has been reported as 10-55%[4,14]; Poulin et al[15] reported a corresponding rate of 2.5%. Varying rates of presentation to the ED for chronic pain treatment have been reported in the literature. It can be explained by the differences in

Table 2. Characteristics of Patients Who Applied to the Emergency Department for Chronic Pain

Characteristic		No.	%
Presenting to the family doctor before going to the emergency department	Yes	73	18.6
	No	319	81.4
Applying to the specialist physician before presenting to the emergency department	Yes	80	20.4
	No	312	79.6
Comorbidities	Yes	324	82.7
	No	68	17.3
How patients arrived to the emergency department	Outpatient presentation	368	93.9
	Ambulance service	24	6.1
Reason for choosing the emergency department for the chronic pain	Having medications prescribed	52	13.3
	Receiving analgesics	292	74.5
	Having a diagnosis	48	12.2

Table 3. Comparison of Outcome Measures in Terms of Gender

Outcome measure		All Patients	Females	Males	*P**
		Mean ± SD	Mean ± SD	Mean ± SD	
BPI	Pain worst	6.76 ± 1.12	6.38 ± 1.04	7.14 ± 1.2	0.634
	Pain least	3.67 ± 0.98	3.52 ± 0.87	3.82 ± 1.09	0.876
	Pain on avarage	5.71 ± 1.11	5.43 ± 0.97	5.99 ± 1.25	0.746
	Pain now	6.67 ± 1.09	6.39 ± 0.98	6.95 ± 1.2	0.785
	Posttreatment reduction rate	41.63 ± 12.19	40.23 ± 10.76	43.03 ± 13.62	0.597
GAD-7		9.84 ± 3.23	8.97 ± 2.85	10.71 ± 3.61	0.778
PHQ-9		12.82 ± 3.98	11.74 ± 3.43	13.9 ± 4.53	0.972

Abbreviations: SD, Standard deviation; BPI, Brief Pain Inventory; GAD-7, Generalized Anxiety Disorder-7; PHQ-9, Patient Health Questionnaire-9;
* Comparison within groups (Mann-Whitney U tests).

socio-cultural and economic characteristics of the countries where the studies were performed and by variable rates of public access to health services and variable policies for the delivery of health services. In our study, following the literature, the mean age of patients with chronic pain was 48.1 years, and the proportion of females was higher than males.[15,16] Also, in line with previous studies, 82.7% of our patients had comorbid diseases.[15] Our study revealed that the lower back region was the body region most commonly caused pain symptoms, followed by abdominal pain and headache. In a study examining the characteristics and reasons for ED presentations of patients with chronic pain who presented to EDs, LBP was the most common type of chronic pain, followed by abdominal and joint pain; neck pain was the least common type of chronic pain.[15] By contrast, Olsen et al. reported that the most common types of chronic pain that caused ED presentations were abdominal pain and headache, and toothache was a minor common pain type.[16]

Repeated hospital admissions, multiple drug trials, choosing opioids as the first-line treatment, or simply trying to eliminate pain symptoms may cause patients to experience treatment failure. Patient education and a positive patient-physician relationship can strengthen a patient's trust in treatment success. In our study, 32.7% of the patients who presented to the ED for chronic pain were using NSAIDs, 16.3% used opioid analgesics, 15.8% used anticonvulsants, and 13.2% used anticonvulsants antidepressants. 22% were not using any medication. Although NSAIDs are the most preferred analgesic medications and mostly provide symptomatic treatment, there is evidence that they have limited efficacy in central pain control.[14] There is no evidence suggesting beneficial effects of opioids as a preference for the treatment of chronic pain,[14,17] they may even be detrimental for health; it has also been stressed that, due to their potential for addiction, opioids should not be chosen for rapid relief of symptoms, particularly in ED.[14]

In our study, where we questioned the reasons for choosing the ED for chronic pain treatment, we found that 13.3% of the patients who presented had their medications prescribed, 74.5% received analgesics, and 12.2% received a diagnosis for their symptoms. The desire to eliminate pain and the hope of finding a fast and effective treatment in the ED may be among the factors that increase the rate of ED presentations among patients with chronic pain. The widespread use of opioid analgesics in treating chronic pain and easier access to these drugs in the ED leads to drug abuse and increased patient presentations to EDs. Therefore, it should educate patients with chronic pain, inform them about non-pharmacological treatment methods, and not use EDs for providing symptomatic treatment.[18]

Before presenting to the ED, the presentation rates to family physicians and specialists were 18.6% and 20.4%, respectively. Thus, the presentation rate to the family physician was lower in our study than in the literature.[15,19] In countries with a developed patient referral system, patients must present to their family physician first. In countries with an underdeveloped referral system, on the other hand, health services can be obtained from all health institutions without a referral chain. In addition, family physicians may not participate in chronic pain management because they may feel unqualified for chronic pain management and be reluctant to take part in the management of chronic pain.

Furthermore, patients may not trust their family physicians in their treatment. Previous studies have reported that people with chronic pain more commonly develop mental illness than people without pain, and particularly depression and anxiety disorders accompany chronic pain.[8,15,20] It has been found that patients treated in pain clinics show depressive symptoms, and physical pain complicates the diagnosis of depression; depression has also been reported to affect the treatment and prognosis of chronic pain negatively.[13,15,21]

Patients with chronic pain can use anxiety to reduce somatic sensations, thereby facilitating the development of generalized anxiety disorder.[13] In agreement with the literature, our study found that depression and anxiety accompanied chronic pain. Thus, we believe that the treatment of coexisting mental disorders in patients with chronic pain can alleviate pain and mitigate its adverse consequences.

5.1. Limitations

The limited number of patients with chronic pain and the

Research Highlights

What Is Already Known?

- Chronic pain is described as difficult-to-describe and adversely affects a person's quality of life.
- One should aim to teach a patient coping with pain, increase the quality of life, and integrate into social life.

What Does This Study Add?

- Determining the characteristics of patients with chronic pain presenting to the ED and their reasons for choosing EDs for this purpose may allow planning health services. Furthermore, referring this seemingly difficult patient group to appropriate units, developing country-specific clinical guidelines, and creating a systematic approach within the ED.

fact that the study was conducted in a single-center are limitations of our study.

6. Conclusion

Instead of trying simply to suppress pain, emphasis should be put on preventing overcrowding in EDs, which are intended for managing acute conditions rather than chronic pain, informing patients about the methods of coping with pain, increasing their quality of life, and integrating them into social life. We believe that opioid analgesics should not be preferred for the rapid treatment of symptoms in EDs. Family physicians should be involved in treating chronic pain, and patients should be followed up in pain clinics as part of an advanced referral system.

Authors' Contributions

TES and HS developed the study concept. All authors contributed to the study design. HS and TES performed testing and data collection. Data analysis and interpretation were performed by TES and HS. All authors approved the final version of the manuscript for submission.

Conflict of Interest Disclosures

The authors declared no conflicts of interest concerning this article's authorship and/or publication.

Ethics Approval

The Clinical Research Ethics Committee approved the study protocol of our university (Decision number: 2020/128, Date: 15.06.2020). All procedures performed in studies involving human participants were conducted by the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from each participant.

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References

1. Merskey H. Classification of Chronic Pain: Descriptions of Chronic Pain Syndromes and Definitions of Pain Terms. 2nd ed. Seattle: International Association for the Study of Pain (IASP); 2002.
2. Turk DC, Okifuji A. Psychological factors in chronic pain: evolution and revolution. J Consult Clin Psychol. 2002;70(3):678-690. doi:10.1037//0022-006x.70.3.678.
3. Keefe FJ, Rumble ME, Scipio CD, Giordano LA, Perri LM. Psychological aspects of persistent pain: current state of the science. J Pain. 2004;5(4):195-211. doi:10.1016/j.jpain.2004.02.576.
4. Todd KH, Cowan P, Kelly N, Homel P. Chronic or recurrent pain in the emergency department: national telephone survey of patient experience. West J Emerg Med. 2010;11(5):408-415. doi:10.1016/j.annemergmed.2007.06.146.
5. Dépelteau A, Racine-Hemmings F, Lagueux É, Hudon C. Chronic pain and frequent use of emergency department: a systematic review. Am J Emerg Med. 2020;38(2):358-363. doi:10.1016/j.ajem.2019.158492.
6. Romanelli RJ, Shah SN, Ikeda L, et al. Patient characteristics and healthcare utilization of a chronic pain population within an integrated healthcare system. Am J Manag Care. 2017;23(2):e50-e56.
7. Faul F, Erdfelder E, Buchner A, Lang AG. Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. Behav Res Methods. 2009;41(4):1149-1160. doi:10.3758/brm.41.4.1149.
8. Daut RL, Cleeland CS, Flanery RC. Development of the Wisconsin Brief Pain Questionnaire to assess pain in cancer and other diseases. Pain. 1983;17(2):197-210. doi:10.1016/0304-3959(83)90143-4.
9. Tan G, Jensen MP, Thornby JI, Shanti BF. Validation of the Brief Pain Inventory for chronic nonmalignant pain. J Pain. 2004;5(2):133-137. doi:10.1016/j.jpain.2003.12.005.
10. Spitzer RL, Kroenke K, Williams JB. Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. Primary Care Evaluation of Mental Disorders. Patient Health Questionnaire. JAMA. 1999;282(18):1737-1744. doi:10.1001/jama.282.18.1737.
11. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med. 2001;16(9):606-613. doi:10.1046/j.1525-1497.2001.016009606.x.
12. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch Intern Med. 2006;166(10):1092-1097. doi:10.1001/archinte.166.10.1092.
13. McWilliams LA, Goodwin RD, Cox BJ. Depression and anxiety associated with three pain conditions: results from a nationally representative sample. Pain. 2004;111(1-2):77-83. doi:10.1016/j.pain.2004.06.002.
14. Schneiderhan J, Clauw D, Schwenk TL. Primary care of patients with chronic pain. JAMA. 2017;317(23):2367-2368. doi:10.1001/jama.2017.5787.
15. Poulin PA, Nelli J, Tremblay S, et al. Chronic pain in the emergency department: a pilot mixed-methods cross-sectional study examining patient characteristics and reasons for presentations. Pain Res Manag. 2016;2016:3092391. doi:10.1155/2016/3092391.
16. Olsen JC, Ogarek JL, Goldenberg EJ, Sulo S. Impact

of a chronic pain protocol on emergency department utilization. Acad Emerg Med. 2016;23(4):424-432. doi:10.1111/acem.12942.
17. Reinecke H, Weber C, Lange K, Simon M, Stein C, Sorgatz H. Analgesic efficacy of opioids in chronic pain: recent meta-analyses. Br J Pharmacol. 2015;172(2):324-333. doi:10.1111/bph.12634.
18. Geneen LJ, Moore RA, Clarke C, Martin D, Colvin LA, Smith BH. Physical activity and exercise for chronic pain in adults: an overview of Cochrane reviews. Cochrane Database Syst Rev. 2017;1(1):CD011279. doi:10.1002/14651858.CD011279.pub2.
19. Johnson M, Collett B, Castro-Lopes JM. The challenges of pain management in primary care: a pan-European survey. J Pain Res. 2013;6:393-401. doi:10.2147/jpr.s41883.
20. Sandner-Kiesling A, Schöpfer A. [A chronic pain patient: modern diagnosis and concept of therapy]. Psychiatr Danub. 2010;22(3):459-464. [German].
21. Cheatle MD. Depression, chronic pain, and suicide by overdose: on the edge. Pain Med. 2011;12 Suppl 2(Suppl 2):S43-48. doi:10.1111/j.1526-4637.2011.01131.x.