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## SCIENTIFIC ARTICLE

# The use of analgesics and risk of self-medication in an urban population sample: cross-sectional study



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## KEYWORDS

Chronic pain;  
Analgesics;  
Self-medication;  
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## Abstract

**Background and objectives:** There are few data in the literature characterizing the pattern of analgesic use in Latin American countries, including Brazil. Little is known about the under-treatment of pain and its influence on the habit of self-medication with analgesics. The aim of this study is to define the pattern of analgesic use among chronic pain patients and its potential association with self-medication with analgesics.

**Method:** Cross-sectional observational study with an urban population sample. Chronic pain was defined as a pain lasting for at least 90 days. The study was approved by the Research Ethics Committee of the institution.

**Results:** 416 subjects were included; 45.7 % ( $n=190$ ) had chronic pain, with females (72.3 %;  $p=0.04$ ) being the most affected. Self-medication with analgesics is practiced by 78.4% of patients with chronic pain. The most common current analgesic treatment consists of non-steroidal anti-inflammatory drugs (dipyrone and acetaminophen). Weak opioids are rarely used and only 2.6% of subjects with chronic pain were taking these analgesics. None of the subjects were taking potent opioids.

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**PALAVRAS-CHAVE**

Dor crônica;  
Analgésicos;  
Automedicação;  
População urbana

**Conclusions:** The practice of self-medication with analgesics is frequent among patients with chronic pain, which may be due to the underprescription of more potent analgesics, such as opioids. It can also be said that, given the data presented, there is no crisis of recreational opioid use in the studied population.

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### Uso de analgésicos e o risco da automedicação em amostra de população urbana: estudo transversal

#### Resumo

**Justificativa e objetivos:** Há poucos dados na literatura que caracterizam o padrão de uso de analgésicos na América Latina e no Brasil. Também se sabe pouco sobre o subtratamento da dor e sua influência no hábito de automedicação analgésica. O objetivo desta pesquisa é definir o padrão de uso de analgésicos entre os portadores de dor crônica (DC) e a sua potencial associação à automedicação analgésica.

**Método:** Estudo observacional transversal com amostra de população urbana. A dor crônica foi definida como aquela presente por pelo menos 90 dias. A pesquisa foi aprovada pelo Comitê de Ética em Pesquisa institucional.

**Resultados:** Foram incluídos 416 indivíduos; 45,7% (n = 190) portadores de dor crônica, sendo os do sexo feminino (72,3%;  $p = 0,04$ ) os mais acometidos. A automedicação analgésica é praticada por 78,4% dos portadores de dor crônica. O tratamento analgésico vigente mais frequente é composto pelos anti-inflamatórios não esteroides (AINES), dipirona e paracetamol. Os opioides fracos são pouco usados e apenas 2,6% dos indivíduos com dor crônica fazem uso desses analgésicos. Nenhum dos indivíduos estava em uso de opioides potentes.

**Conclusões:** A prática de automedicação analgésica é frequente entre os portadores de dor crônica, o que pode ser consequência da pouca prescrição de analgésicos mais potentes, como os opioides. Pode-se também dizer que, pelos dados apresentados, não ocorre uma crise de uso recreativo de opioides na população estudada.

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## Introduction

Studies on the prevalence of chronic pain (CP) in Brazil show a significantly higher number than that of the world average, and approximately 41% of the population has this type of pain.<sup>1,2</sup> Opioids are among the most important analgesics for treating moderate to severe pain.<sup>3</sup>

Opioid is a generic term that defines any natural or synthetic substance whose analgesic effect occurs through interaction with opioid receptors and may have its actions antagonized by naloxone. The best known among them is morphine, the most widely used and oldest analgesic in the group, with which there is a greater familiarity of prescription by most doctors.<sup>4</sup>

Since the ancient history of mankind, opium and its derivatives have been known to influence human behavior. For this reason, besides being used as medicines, they are also used as recreational drugs. Despite being among the most potent analgesics in clinical use,<sup>5</sup> universally used in the treatment of cancer pain and acute pain, there is still

resistance among clinicians in some countries to prescribe these analgesics.<sup>4-6</sup>

In Brazil, the largest Latin American nation, opioids are mainly used to treat severe acute pain (postoperative patients, for example) and chronic pain in cancer patients. However, they have been underused by health professionals in general clinical practice.

Currently, the over-prescription of opioids occurring in some developed countries results in deviation, misuse and abuse and, ultimately, is often related to the recreational use of these analgesics. For this reason, and for educational purposes, the situation should be defined as an 'opioid recreational crisis'.<sup>7</sup>

There are few data in the literature that characterize the pattern of analgesic use in Latin America. The medical community is thought to be afraid of repeating the recreational crisis that occurs in other parts of the globe. These facts justify this study, whose objective is to define, in a sample of the Brazilian population with CP, the pattern of analgesic use and its potential association with analgesic self-medication.

## Methods

A cross-sectional observational study performed between 5 and 12 March 2016 in accordance with the Strobe guidelines,<sup>8</sup> with a sample of the population living in the urban area of a Brazilian municipality with 127,328 inhabitants, according to the last population census.<sup>9</sup> The data used for this study analysis is derived from a broader research project designed to evaluate the habits of self-medication with analgesics among chronic pain patients in a population sample.

The census tracts included in the study were chosen according to the level of education of the household heads for its correlation with the family socioeconomic level, according to the standards adopted by the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística – IBGE).<sup>9–11</sup> This strategy allows for representation of all socioeconomic portions of the population studied.

Within each of these census tracts, with the representativeness of the population's socioeconomic reality of the city, the blocks to be visited were drawn. This draw proportionally considered the number of households in each sector to define the number of households to be included. Up to two individuals over the age of 18 who cohabitated the household were interviewed and agreed to participate in the study after being informed about the objectives and given written informed consent. Subjects with easily identifiable low cognitive ability were not included. These methodological approaches aimed at reducing the risk of collection bias.

The field team comprised volunteer interviewers who underwent a 2 hours training, which was planned and carried out by the university's Collective Health Research Unit, the study headquarters. This training consisted of classes on the techniques of approaching individuals in their homes and on the application of research questionnaires. This team consisted of students from the medical school, of which 24 were undergraduate students, 8 postgraduate in anesthesiology, and 2 residents of the 4th-year elective in anesthesiology.

Chronic pain (CP) was defined as a pain lasting for at least 90 days, a time considered sufficient for the acute illness resolution or pain-induced tissue healing.<sup>1</sup>

Three questionnaires were used to collect research data. The sociodemographic questionnaire, specially elaborated by the researchers for this study, had as its model the methodology used by the IBGE for the demographic census.<sup>11</sup> For pain assessment, the Brief Pain Inventory (BPI) validated for Brazilian Portuguese was used, which evaluates the pain severity and also the current treatments.<sup>12</sup> Information regarding medical follow-up by CP patients, obtained by the self-medication questionnaire, was used in the present study. During the study period, the questionnaires were completed by the interviewers, according to the answers obtained.

These questionnaires were previously tested on 25 subjects in a pilot study, and contained two phases aiming to improve the writing of the instruments produced. Responses obtained in the pilot study were not included in the results analysis.

Based on unknown prevalence screening (50%), and considering Type 1 and 2 errors of 5% and 20%, respectively, it was estimated that the number of households to be visited

was 384, assuming there was at least one person with chronic pain every two households. Thus, the sample could include approximately 192 subjects with chronic pain.

The results of the sample and comparison demographic characteristics were presented only as absolute numbers and percentages, when appropriate, or as mean and standard deviation. No other statistical analyzes were performed. Exploratory data analysis was performed, including simple and cumulative frequencies for categorical and mean variables, and standard deviation for continuous variables. The comparison tests were chi-square followed by Z tests and Student's *t*-tests, adopting a significance level of 5%.

This research was approved by the institutional Research Ethics Committee, CAAE 47169615.0.0000.5411, Review 1,168,905, of 08/03/2015. All subjects were informed that their participation would consist only in answering the questionnaires on sociodemographic aspects, pain and self-medication, and that the information obtained would be confidential. All participants gave written informed consent.

## Results

In total, 420 eligible individuals were confirmed as eligible subjects; however, four questionnaires were partially completed and therefore excluded. Thus, data from 416 individuals were included and analyzed. Sociodemographic data and their correlations with CP diagnosis are shown in [Table 1](#). It was found that 45.7% ( $n=190$ ) of the population had CP, and female (72.3%;  $p=0.04$ ) was the most affected. Self-medication with analgesics is practiced by 78.4% ( $n=149$ ) of patients with chronic pain ([Table 2](#)).

According to the interviewee's perception, the main reason for CP is related to work activity (18.4%), followed by postoperative pain or trauma (15.3%) and musculoskeletal pain (11.1%) (data not shown). However, 9.5% of subjects with CP could not pinpoint the reason for the pain. The mean and standard deviation of the highest CP severity score in the last 24 hours was  $6.23 \pm 2.81$  and the lowest severity was  $2.45 \pm 2.23$  ([Table 3](#)).

The most common current analgesic treatment, regardless of whether or not it comes from prescription, comprises NSAIDs, dipyrrone, and paracetamol, drugs used by 48.4% of CP patients. These analgesic drugs were frequently followed by muscle relaxants, used by 18.9% of the chronic pain population. Weak opioids are rarely used, and only 2.6% of CP subjects use these analgesics. None of the subjects were on potent opioids. It is noteworthy that 25.3% of CP patients are not undergoing any analgesic treatment ([Table 4](#)).

Among those who practice analgesic self-medication, the main medical specialty responsible for the care of individuals is orthopedics (47%); only one individual is attended by a pain specialist. Worryingly, 31.5% of these people have no medical follow-up ([Table 2](#)) and, according to respondents, 24% of doctors did not prescribe analgesics.

In the present study, there were no statistical differences between individuals with and without CP and the consumption of tobacco, alcohol, and illicit drugs (data not shown). Among CP subjects, 3.2% used illicit drugs. Regardless of prescription, 97.9% of CP subjects and 91.5% of non-CP subjects had used analgesics at some point in their lives.

**Table 1** Characterization of the population according to general demographic data and chronic pain presence or absence.

Demographic data	Characteristics	CP presence		CP absence		Total	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Sex	Female	140 <sup>a</sup>	72.3	134 <sup>b</sup>	59.3	272	65.4
	Male	50 <sup>a</sup>	27.4	92 <sup>b</sup>	40.7	144	34.6
Age group	18–39 years	46	24.2	71	31.4	117	28.1
	40–59 years	66	34.7	88	38.9	154	37.0
	60–69 years	43	22.6	33	14.6	76	18.3
	70–79 years	25	13.2	21	9.3	46	11.1
	> 80 years	10	5.3	11	4.9	21	5.0
	No information <sup>b</sup>	0	0.0	2	0.9	2	0.5
Self-referenced skin color	White	141	74.2	182	80.5	323	77.6
	Non-white	49	25.8	41	18.2	90	21.6
	No information <sup>b</sup>	0	0.0	3	1.3	3	0.7
Marital status	Married, cohabiting or stable union	120	63.2	125	55.3	245	58.9
	Single, separated or widowed	65	36.9	100	44.2	170	40.9
	No information <sup>b</sup>	0	0.0	1	0.4	1	0.2
Education	Never studied	6	3.2	1	0.4	7	1.7
	Up to high school	132	69.5	135	59.8	267	64.2
	Up to college	38	20.0	72	31.8	110	26.4
	Postgraduate	12	6.3	18	8.0	30	7.2
	No information <sup>b</sup>	2	1.0	0	0.0	2	0.5
Current work activity	Yes	96	50.5	122	54.0	218	52.4
	No	94	49.5	104	46.0	198	47.6
Total <sup>c</sup>		190	45.7	226	54.3	416	100

%, percentage; CP, chronic pain; *n*, frequency.

<sup>a</sup> Percentage valid for each demographic data.

<sup>b</sup> Information improperly completed on survey form or respondent refusal to report.

<sup>c</sup> Total corresponding to the population studied and not the sum of the data contained in column *n*. Different superscript letters on the same line represent  $p = 0.04$ .

**Table 2** Medical supervision of chronic pain subjects on self-medication with analgesics.

Medical supervision	PC		
	<i>n</i>	%	
Subjects under medical supervision	Medical specialty		
	Orthopedics or rheumatology	47	47.0 <sup>a</sup>
	Medical clinic	29	29.0 <sup>a</sup>
	Pain	1	1.0 <sup>a</sup>
	Others	17	17.0 <sup>a</sup>
	Do not know	6	6.0 <sup>a</sup>
Total subjects under medical supervision	100	67.1	
Subjects without medical supervision	47	31.5	
No information <sup>b</sup>	2	1.3	
Total subjects who practice or practiced self-medication	149	100.0	

%, percentage; CP, chronic pain; *n*, frequency.

<sup>a</sup> Percentage valid for the number of subjects under medical supervision.

<sup>b</sup> Information improperly completed on survey form or respondent refusal to report.

## Discussion

Studies of disease or symptom prevalence are often based on cross-sectional population samples. The choice of a 3-month timeframe for the definition of CP is in agreement with other population studies addressing the same theme.<sup>1,13–16</sup> The sample included in the study reached the expected

population representativeness. The prevalence of CP in the population (45.7%) is intermediate to those found in the American and English population studies, 64% and 38%, respectively. The maximum pain score in the last 24 hours was considered moderate.<sup>1,3,17,18</sup> In the city of Salvador, Bahia, 48.4% of women have chronic pain lasting at least six months, while in men the prevalence is 32.8%.<sup>19</sup>

**Table 3** Pain intensity measured using the numerical scale, presented as mean and standard deviation, in chronic pain subjects.

Pain intensity measured by numerical scale <sup>a</sup>	CP (n = 190) Mean ± SD
Highest intensity in last 24 hours	6.23 ± 2.81
Lowest intensity in last 24 hours	2.45 ± 2.23
Moderate intensity <sup>b</sup> in last 24 hours	4.41 ± 2.44
Intensity at the moment	2.22 ± 2.78

%, percentage; CP, chronic pain lasting > 90 days; SD, standard deviation; *n*, frequency. Only frequency and percentage calculations were made.

<sup>a</sup> Numerical scale from 0 to 10.

<sup>b</sup> Attributed by the subject himself.

There was an influence of gender, self-reported skin color, marital status, and education on the prevalence of CP in the population studied. In general, it can be stated that chronic pain is associated with worse socioeconomic indicators, including level of education,<sup>3</sup> but contradictory data can be found.<sup>2</sup> Birse & Lander (1998) found no differences between CP and non-CP subjects and level of education in Edmonton, Canada. However, Sá et al. (2009), in a study conducted with the population of Salvador, Bahia, found a relationship between these data and the presence of CP, similarly to the present study.<sup>2,14</sup>

The use of illicit drugs and alcohol has been shown to be higher in individuals with CP than in the general population.<sup>20,21</sup> None of the subjects included in

this study admitted the use of opioids, even illicit ones such as heroin, for recreational purposes. The alcohol and illicit drug consumption by individuals with CP is considered a risk factor for opioid analgesic abuse and addiction, which is why this information becomes relevant.<sup>22</sup>

According to the subjective impression, work-related activities are the main cause of pain, as they are usually related to the occurrence of injuries.<sup>23</sup> The maximum pain score found in the last 24 hours can be considered of moderate intensity, which would justify the use of opioids, according to the WHO guidelines for cancer pain management.<sup>3</sup> It is known that opioids should be used with caution in subjects with non-cancer chronic pain and only in cases where other therapeutic options have not been effective when pain negatively affects the individual functionality and/or quality of life, when the benefits outweigh the risks of its use, and after discussing the potential risks and benefits with the patient.<sup>24-26</sup>

In a study performed with an elderly population, 45.8% of the individuals presented with 'medium/moderate' pain and 27.5% 'strong/severe' pain.<sup>27</sup> It is noteworthy that many of the individuals recruited in the present study used analgesics, which probably influenced the pain scores.

The practice of self-medication with analgesics is common in the studied population. This practice is acceptable for solving minor health problems, which has been encouraged by some governments as it reduces the burden on state health systems.<sup>28</sup>

The use of analgesics is prevalent in the population studied, especially among chronic pain subjects. Working with the European population, 21% of chronic pain sufferers had never used any painkiller for their complaint, in contrast

**Table 4** Current analgesic treatment(s) of chronic pain subjects.

	Analgesic Treatment(s)	CP (n = 190)	
		<i>n</i>	%
Currently under treatment	NSAIDs, dipyron or acetaminophen	92	48.4
	Muscle relaxant	36	18.9
	Physiotherapy	7	3.7
	Complementary medicine techniques	6	3.2
	Topical medicines	5	2.6
	Weak opioid	5	2.6
	Tricyclic or dual-action antidepressant	4	2.1
	Corticoids	3	1.6
	Physical activity	2	1.1
	Anticonvulsants <sup>a</sup>	2	1.1
	Gabapentinoids	1	0.5
	Psychotherapy	0	0.0
	Strong opioid	0	0.0
	Others	35	18.4
	Total subjects under treatment	142	74.7
Not currently using		48	25.3
Total		190	100.0

%, percentage; NSAIDs, non-steroidal anti-inflammatory drugs; CP, chronic pain lasting > 90 days; *n*, frequency. Only frequency and percentage calculations were made.

Note: Concurrent treatments are possible.

<sup>a</sup> Anticonvulsants other than gabapentinoids or benzodiazepines.

to only 2.1% of this survey. Among European pain sufferers, 69% reported that their pain was somehow treated at the moment.<sup>29</sup>

Among the analgesics used, NSAIDs, dipyron or acetaminophen are the most commonly taken. This result is very similar to that found among Europeans with chronic pain, considering the use of drugs only in the last six months, in which NSAIDs and acetaminophen were, respectively, used by 55% and 43% of those with chronic pain.<sup>29</sup>

In patients with rheumatoid arthritis and osteoarthritis, situations that often lead to chronic pain, patient abuse and overuse of NSAIDs has been well documented.<sup>30</sup> In a population-based study of Michigan, USA, who experienced pain in the previous two weeks, NSAIDs and acetaminophen were used, with or without a prescription, by 10.2% of subjects during this study period.<sup>31</sup> Again, it is important to emphasize that prolonged use of this class of drugs cannot be considered safe.<sup>30,32,33</sup>

Muscle relaxants are also a class of drugs widely used in self-medication with analgesics in the studied population. These results differ from those of a study performed with the population of Michigan, USA, in which 0.4% of respondents had used this class of drugs in the previous two weeks,<sup>31</sup> and from those of a Portuguese low back pain population survey for three months, in which 2.5% of respondents were using this class of drugs without specifying the existence of a medical prescription.<sup>34</sup>

In a study of self-medication habits among elderly residents of the city of Goiânia, Goiás, simple analgesics and muscle relaxants were used by 30.8% of respondents.<sup>35</sup> This is also a worrying result, as these drugs are not safe for prolonged use in addition to losing their effectiveness, which is why they should not be used for periods longer than three weeks.<sup>30</sup>

Among opioids, those with low potency are used by only five individuals, that is, 2.6% of CP subjects in this sample; three of the individuals had a prescription. The use of potent opioids was not reported by any of the respondents in the present study. In the Michigan population, 1.9% of respondents had used weak opioids in the past two weeks and 0.7% had used potent opioids. However, this study population did not suffer from chronic pain.<sup>31</sup> In a Portuguese population survey of low back pain lasting at least three months, 1.6% of respondents used opioids, without specifying whether or not a prescription was available.<sup>34</sup> Despite bureaucratic obstacles, in a study with the population of the Federal District of Brazil, 10.3% of the drugs used by the self-medicated population were prescription drugs, such as antidepressants and anticonvulsants, drugs little used by the population investigated here.<sup>36</sup>

Most CP subjects were concurrently on medical treatment and self-medication for their complaints, which may imply a degree of ineffectiveness in the treatment prescribed by the doctor. The main specialties consulted were orthopedics or rheumatology. Only one CP subject was being followed up by a pain management specialist.

The low prescription of opioids for CP subjects in this study may be associated with the 'opiophobia' resulting from 'opioignorance' due to the lack of training in pain management in the Brazilian medical curricula.<sup>37</sup> This 'prejudice' against the use of opioid analgesics among physicians may result in inadequate treatment of CP in the present

study subjects and thus potentially induce them to practice self-medication with analgesics.

Despite the current increase in the number of deaths associated with opioid use, in line with the dramatic increase in prescriptions of opioids in some developed countries, this problem is not present in the studied reality. Opioid drug use is concentrated mainly in countries of North America, Western Europe, and Oceania. About 92% of morphine produced worldwide is consumed by only 17% of the global population.<sup>7</sup>

Over-prescription of opioids and their availability in quantities greater than those recommended for medical use in high-consumption countries result in misuse, abuse and addiction.<sup>38</sup> It has been found that the 20 countries with the highest HDI in the world have an average opioid consumption of 216.7 mg per capita, which is 30.72 times more than the calculated need to treat cancer, HIV/AIDS, and trauma pain.<sup>39</sup>

In contrast to the above mentioned, data from the International Cancer Research Agency on opioid use<sup>40</sup> show that more than half of all cancer cases (56.8%) and cancer deaths (64.9%) in 2012 occurred in low-income regions of the globe—places that should have higher per capita consumption. Similarly, with regard to AIDS, particularly in sub-Saharan Africa and Asia, palliative care needs are not met due to insufficient availability of these analgesics.<sup>39,41</sup>

A Brazilian household survey of psychotropic drug use, which included the 107 largest cities in the country with a population of over 200,000, in which 8589 people aged 12–65 were interviewed, found that non-medical use of opioids may be considered relatively uncommon. Lifetime use of codeine-based syrups was reported by only 2.0% of those interviewed, opioid use by 1.4%, and heroin use by 0.4%.<sup>42</sup>

As a limitation, we point out that the survey was carried out on two consecutive Saturdays, which are working days, so the economically active and non-CP subjects were away from their homes. This fact may represent a CP prevalence bias in the studied population. However, as the study included only CP subjects, the outcomes regarding the objectives of this study were little impacted.

## Conclusion

In this CP population, the analgesic use profile includes dipyron, paracetamol, NSAIDs, and muscle relaxants as the most commonly used drugs. The practice of self-medication with analgesics is frequent among CP subjects, which may be a consequence of the low prescription of more potent analgesics, such as opioids. It can also be said that, given the data presented, there is no crisis of recreational opioid use in the studied population.

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## Conflicts of interest

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