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ORIGINAL ARTICLE

Prevalence of drug poisoning in the state of Bahia between 2007 and 2017

Prevalência de intoxicação por medicamentos no estado da Bahia entre 2007 e 2017

Prevalencia de intoxicación por medicamentos en el estado de Bahía entre 2007 y 2017

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ABSTRACT

Background and Objectives: Drug poisoning is becoming a public health problem. In this context, pharmaceutical care and the care of health professionals who work directly with medications are fundamental in the repair of patients' health and in the prevention of problems related to the use of these products. This study aimed to determine the prevalence of drug poisoning in the state of Bahia, Brazil, between 2007 and 2017. **Methods:** This is a quantitative, descriptive and exploratory study, which evaluated the drug poisoning notifications in the state of Bahia, recorded in DATASUS between 2007 and 2017, considering as variables of interest: age group, race, sex, circumstance, final classification, confirmation criterion and evolution, year and city of notification. **Results:** In the period, 28,412 cases of exogenous intoxication were recorded, 29.7% of which were caused by medications. The age group with the highest prevalence was 20 to 39 years old (38.5%), females presented the highest number of cases (66.7%); suicide attempt was the main cause, corresponding to 38.5% of the notifications. The highest concentration of reported cases occurred in the state capital. **Conclusion:** In the studied period, the drugs were the most responsible for cases of exogenous intoxication, and suicide attempt was the main reason. Undoubtedly, the easy access to these products predisposes self-medication – a risk factor for these cases of intoxication. In this scenario, it is necessary to implement campaigns for the rational use of medicines in the state of Bahia, as well as suicide prevention, directed mainly to young adults – the age group with the highest prevalence of cases.

Keywords: *Poisoning Prescription Drug Misuse. Suicide. Suicide attempt.*

RESUMO

Justificativa e Objetivos: As intoxicações por medicamentos estão se tornando um problema de saúde pública. Nesse contexto, a atenção farmacêutica, bem como os cuidados dos profissionais de saúde que trabalham diretamente com medicamentos, tornam-se fundamentais na reparação da saúde do paciente e na prevenção de problemas rela-

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cionados ao uso desses produtos. Objetivou-se determinar a prevalência de intoxicação por medicamentos no estado da Bahia, Brasil, entre 2007 e 2017. **Métodos:** Foi realizado um estudo quantitativo, do tipo descritivo e exploratório, que avaliou as notificações relacionadas à intoxicação por medicamentos no estado da Bahia registradas no DATASUS entre 2007 e 2017, tendo como variáveis de interesse: faixa etária, raça/cor e sexo, circunstância, classificação final, critério de confirmação e evolução, ano e município de notificação. **Resultados:** Foram registrados 28.412 casos de intoxicação exógena no período, sendo 29,7% causados por medicamentos. A faixa etária de maior prevalência foi de 20 a 39 anos (38,5%), com maior número de casos entre pessoas do sexo feminino (66,7%), tendo a tentativa de suicídio como a principal causa, correspondendo a 38,5% das notificações. A maior concentração de casos notificados ocorreu na capital do estado. **Conclusão:** No período estudado, os medicamentos foram os maiores responsáveis pelos casos de intoxicação exógena, sendo a tentativa de suicídio o maior motivo. Sem dúvidas, a facilidade de acesso a esses produtos predispõe à automedicação, sendo um fator de risco para esses casos de intoxicação. Nesse cenário, é necessária a implementação de campanhas de uso racional de medicamentos no estado da Bahia, bem como de prevenção ao suicídio, direcionadas, principalmente, aos adultos jovens, faixa etária com maior prevalência de casos.

Descritores: *Envenenamento. Uso Abusivo de Medicamentos. Suicídio. Tentativa de suicídio.*

RESUMEN

Justificación y Objetivos: La intoxicación por medicamentos se está convirtiendo en un problema de salud pública. En este contexto, la atención farmacéutica, así como los cuidados de los profesionales de la salud que trabajan direct con medicamentos, se vuelven fundamentales en la reparación de la salud del paciente y la prevención de problemas relacionados con este uso. El objetivo de este estudio fue determinar la prevalencia de intoxicación por medicamentos en el estado de Bahía entre 2007 y 2017. **Métodos:** If realizó un studio exploratorio cuantitativo, descriptivo, que evaluó las notificaciones related con la intoxicación por medicamentos en el estado de Bahía registradas en DATASUS entre 2007 y 2017, teniendo como variables de interés: grupo de edad, raza/color y sexo, circunstancia, clasificación final, criterios de confirmación y evolución, año y ciudades de notficación. **Resultados:** Hubo 28,412 cases of exogenous intoxication en el período; de los cuales el 29.7% fueron caused by medicines. El grupo de edad más prevalente fue el de 20-39 años (38.5%), con un mayor número de casos entre mujeres (66.7%), con tento de suicidio como la causa principal que correspondal al 38.5% de las notificaciones. La mayor concentración de casos reported ocurrió en la capital del estado. **Conclusión:** Se observó que en el período estudiado la mayoría de los casos de intoxicaciones exogenas se dieron por el uso de medicamentos, con el intento de suicidio como la principal razón. El fácil acceso a los medicamentos predispone a la automedicación, un factor de riesgo para casos de intoxicación. En este sentido, se hace necesario implement campañas para el uso racional de medicamentos en el estado de Bahía, así como para la prevención del suicidio, sobre todo en los adultos jóvenes, grupo de edad con una mayor prevalencia de casos.

Palabras clave: *Envenenamiento. Mal Uso de Medicamentos de Venta con Receta. Suicidio. Intento de Suicidio.*

INTRODUCTION

Intoxication results from exposure to a certain endogenous or exogenous substance that disturbs the level of consciousness or other physiological functions and responses, such as flushing, pain and itching. If exogenous and by medication, the physiological response depends mainly on the type of medication and the dosage, being influenced by the individual's level of tolerance. A drug is often administered to achieve a desired treatment, but abuse can lead to intoxication.[1,2]

Drug poisoning, for the most part, can lead to sedation, drowsiness, mental confusion, respiratory depression, hypotension, tachycardia, seizures, muscle spasms and stiffness, vertigo, headache, loss of reflexes and, occasionally, death. However, despite the risks of undue exposure, access to medicines is of paramount importance for the prevention and solution of health problems. In order to ensure the safety of its use, the participation of public agencies is indispensable, along with the private network, with the common goal of improving patient's treatment compliance and reducing the risks related to the use of medications, supporting pharmaceutical care.[3,4]

Currently, drug poisoning is becoming a public health problem. According to the National System of Toxic-Pharmacological Information (Sinitox), drugs are the number one responsible for poisoning in Brazil – and they have been in the first place since 1994. According to the Department of Information of the Unified Health System (DATASUS) – an agency linked to the Ministry of Health that provides health data in Brazil – in 2017, 61,337 drug poisoning cases were notified and of these, 607 (0.9%) were cured with sequelae and 352 (0.57%) lead to death.[5-7] In view of this scenario, the aim of this study was to determine the prevalence of drug poisoning in the state of Bahia, between 2007 and 2017.

METHODS

A descriptive, exploratory study with quantitative approach was conducted to establish a profile of notifi-

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cations (recorded at DATASUS between 2007 and 2017) related to drug poisoning in the state of Bahia. Data referring to the years 2018, 2019 and 2020 are not available in the database.

The used secondary data, from DATASUS, was directly collected from the website of the Ministry of Health. Data were collected in March 2019 with the health science descriptors tool, which located results relevant to exogenous drug intoxication.

DATASUS is an important database for public consultation within the Unified Health System (SUS), as it provides relevant information about health in Brazil. In this case, it shows the permanence of medicines in first place, between 2007 and 2017, regarding the causes of exogenous intoxication, when compared with other etiological agents, such as food, beverages or rodenticides.

Another relevant database is the voluntary notification database, Sinitox, which recorded a total of 291,745 drug intoxication reports between 2007 and 2016.[5-8] However, this database was not used in the research due to possible underreporting.

The variables of interest in this investigation were age group, race and sex, circumstance, final classification, confirmation and evolution criteria, year and city of notification. For the data presentation, the absolute and relative frequencies were calculated according to the characteristic. Microsoft Excel was the program used for formatting, tabulating and data analysis.

Considering that the information is public and does not identify collective or individual data, this research did not need to be submitted to the local Research Ethics Committee (CEP), even though it considered the ethical principles of The National Health Council Resolution 466/2012.

RESULTS

A total of 336,143 notifications of drug poisoning were recorded in Brazil between 2007 and 2017. In the state of Bahia alone, 28,412 cases of exogenous intoxication were recorded in the same period, among which 8,449 (29.7%) were caused by medications. Food and beverages stand out in second place, representing 3,758 notifications (13.2%) in the studied period. In addition to the categories of medicines, food and beverages, DATASUS exposes rodenticides and 11 other agents that caused exogenous intoxication. In the analyzed period, 5,696 notifications were not correctly filled out; they were categorized as ignored/blank and represented 20% of the poisoning cases.

Considering the studied period, 2017 recorded the highest number of notifications – 19.5% of the cases, with a total of 1,648 notifications – while 2007 presented only 94 cases. An annual increase in notifications of drug poisoning was observed between 2007 and 2017 in the state of Bahia (Figure 1).

The cities that recorded the highest numbers of drug poisoning were Salvador, Feira de Santana, Itabuna, Jequié and Juazeiro. The city with the highest number of notifications was Salvador, with 2,626 cases (31.1%), followed by Feira de Santana, with 653 notifications (7.7%); the rest of the cases – 5,170 (61.2%) – were divided between over 194 cities.

Regarding the age group, the following age groups were analyzed: 20-39 years old, with 3,251 notifications (38.5%); 40-59 years old, with 1,222 notifications(14.5%); 1-4 years old, with 1,208 notifications(14.3%); and 15-19 years old, with 1,131 notifications (13.4%). The number of notifications decreased sharply after the age of 60 and the least reported age group was 80 years old or more (Figure 2).

Individuals of white, black, yellow, brown and indigenous race represented, respectively, 541 (6.4%), 429 (5%), 47 (0.6%), 3,819 (45.2%) and 22 (0.3%) cases. The mixed race was the most prevalent in drug intoxication notifications, with 3,819 cases, representing 45.2% of the total. On the other hand, in 3,591 records, the race factor was ignored, that is, 42.5% of notifications had incomplete information. There was a predominance of females in toxicological notifications in the studied period, with 5,638 cases (66.7%), while for males, the number was 2,805 (33.2%); 0.1% of the notifications did not present

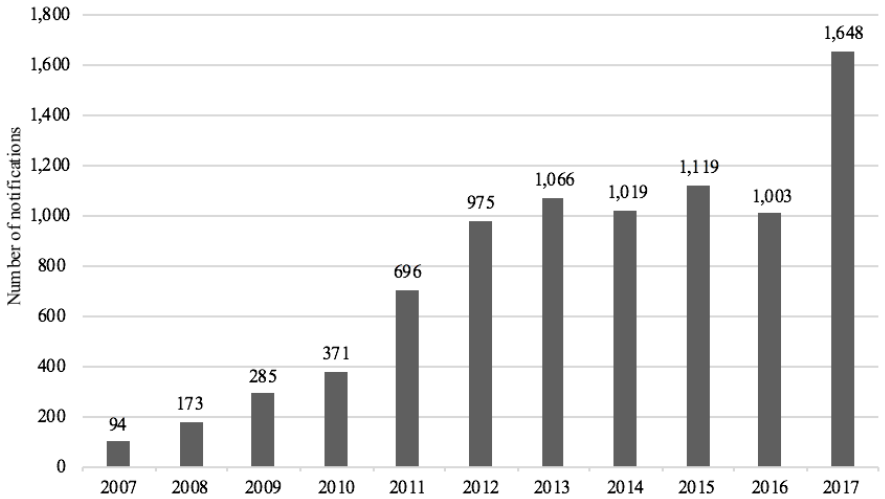

Figure 1. Notifications of drug poisoning in the state of Bahia between 2007 and 2017, by age group.

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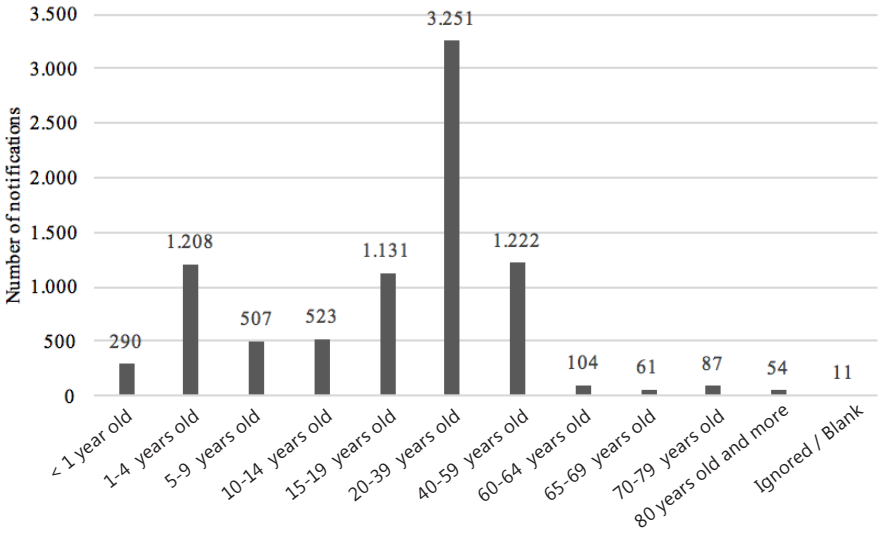

Figure 2. Notifications of drug poisoning in the state of Bahia between 2007 and 2017, by age group.

this information, so they were ignored.

Figure 3 shows the circumstances in which most poisonings occurred. They were suicide attempts, with 3,253 cases (38.5%), followed by accidental causes, with 1,537 notifications (18.2%) and self-medication (7.4%). It is worth mentioning that 1,415 (16.7%) cases were ignored because they did not present information on circumstances, which negatively affects surveys that seek reliable data on the number of intoxication cases.

Fifty-nine percent of the notifications (4,986) were confirmed as intoxication; cases in which the patient only underwent exposure were 15.3% (1,307) and cases of adverse reactions were 8.5% of the notifications (726). The number of ignored cases was relevant (1,325), which directly impacted the analysis of this study. When data are processed as 'ignored,' especially if they represent a high percentage, they generate a knowledge gap due the lack of consistent information about each omitted case.

In 5,061 cases (59.9%), the applied methodology to obtain the diagnosis was clinical knowledge, followed by clinical-epidemiological methodology, with 1,823 notifications (21.5%), and by laboratory clinic, with 353 cases (4.2%). As in the previous variables, the ignored cases represented 1,212 notifications (14.3%), which makes the data incomplete when searching for accuracy in the disclosure of notifications.

Out of the 8,449 notifications, regarding the number of cases per clinical response, it was observed that cure without sequelae predominated – 6,255 cases (74%). Still, 93 people (1%) were cured with some sequelae and the number of confirmed deaths was 61 (0.7%). However, the number of ignored cases for not presenting this information was 1,909 (22.6%), a representative number in relation to the total, which obviously hinders the correct

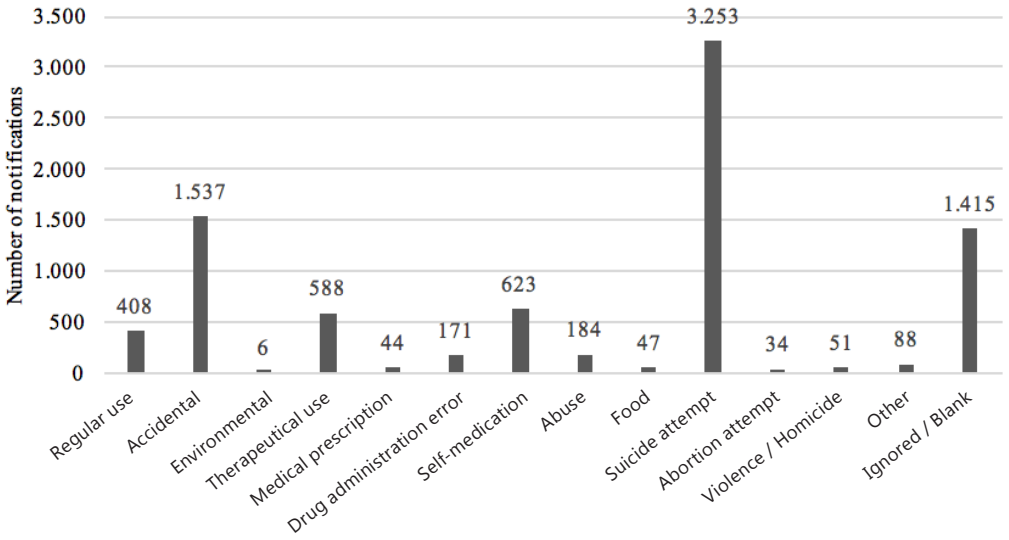

Figure 3. Notifications of drug poisoning in the state of Bahia between 2007 and 2017, according to circumstance.

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interpretation of what was, in fact, the clinical outcome of a large portion of patients whose cases were reported between 2007 and 2017.

The need for better notification is evident, in order to allow reliable analyses of the obtained data in DATASUS, which guide the development of public policies and strategies to minimize cases of drug poisoning, as well as the generated health problems.[9]

DISCUSSION

The lack of commitment in notifying intoxications results in underreporting in DATASUS, underestimating the actual number of cases. Corroborating the findings, a study exposed the relationship between hospital admissions and death from drug intoxication in São Paulo, between 1996 and 2012, through public data provided by DATASUS. As a result, it showed that, since 2005, notifications increased and, consequently, so did mortality. The highest increase was in 2009. In 2005, in every 1 million inhabitants 1.9 deaths occurred, while in 2009 this number rose to 3.7 and, in 2012, to 6.7 deaths per million inhabitants. In the state of Bahia, although only 2 deaths were reported due to drug intoxication in 2009, this number reached 19 cases in 2012. Both numbers are related to the total population in the period, which was 16,635,500 and 14,175,341, respectively, leaving room for possible underreporting.[7-9]

Regarding hospitalizations, every 4.4 days a case was registered as drug intoxication in São Paulo, with intentional intoxication as the most prevalent reason. The female sex represented 60.5% of the total hospitalized cases and the main drugs involved were benzodiazepines and antimicrobials.[7,9] In Bahia, the findings demonstrate 66.7% of female representation in cases of intoxication in the studied period.

In the state of Maranhão, a study showed that 575 drug intoxication cases were reported in the Sinitox database between 2011 and 2015 – especially in 2014, with 200 cases, representing 34.8% of the total.[5] Another study presented intoxication data collected from the Piauí Toxicological Information Center (Citox-PI) from 2007 to 2012; 459 notifications were found; 2011 had 214 notifications, representing 46.6% of the total cases.[3,10] The data found for the state of Bahia show that 2011 was the period in which notifications significantly increased – from 371 recorded cases in 2010 to 696 notifications for drug intoxication in 2011.

Data collected from Sinitox show alarming results for the Northeast region, which reported 13,718 drug poisonings between 2008 and 2013. In 2008, 24.9% of all poisonings in the period occurred, adding up to 3,416 notifications. Therefore, it is clear that medications stand out as a cause of intoxication, occupying the first place as the major cause in the states of Maranhão, Piauí and Bahia.[11]

It is known that these products are manufactured for cure, preventive and diagnostic purposes. However, its use may be harmful, causing possible intoxication or death. For intoxication, the drug must be consumed above the recommended doses, surpassing the therapeutic window. One factor that favors its position as the main cause of intoxications is the easy access to medicines. Thus, its rational use, as well as pharmaceutical attention, can reduce intoxication risks.[12,13]

Pharmaceutical care is a fundamental tool for repairing patient's health, as well as for preventing problems related to the use of medications, and it is guaranteed by the SUS. The pharmacist directly contributes to minimizing the costs of hospitalizations due to the irrational use of medicines, providing guidance to inhibit unnecessary visits, besides ensuring better treatment adherence; this care is indispensable to promote the health of the population.[14,15]

A study showed that, in the city of Salvador, 2,064 drug poisoning cases were notified between 2013 and 2017, according to data from the Notifiable Diseases Information System (Sinan). Among them, 1,872 involved residents of the capital, (90.6%), while the others concerned other cities, subordinate to Salvador, such as Camaçari, Simões Filho and Lauro de Freitas.[16]

In Campinas, in the countryside of São Paulo, a survey obtained data from records of the Centers for Poison Control (ICC), from 1998 to 2011. It found 16,774 cases of drug poisoning, representing 32.5% of the total number of hospital visits due to poisoning (51,665), corresponding to the category of greatest potential among toxic agents.[17]

A study conducted in Brazil from 2002 to 2013 determined that drugs are the main exogenous agents causing intoxication, according to data released by Sinitox. The most affected age group was from 0 to 15 years old. Some of the involved drugs are nasal decongestants, bronchodilators and painkillers. The authors suggest a review of prescribing practices in child health care and policies related to the use of medications, in order to fight the culture of self-medication.[18]

Data collected from Sinitox – between 2011 and 2015, in Rio Grande do Sul – exposed a total of 3,787 notifications among 20 to 39-year-olds, 48.8% of the total cases (7,767). Of these young adults, 26% had incomplete elementary school, which, according to the author, makes it difficult to understand campaigns related to the prevention of problems caused by medicines.[19]

Through DATASUS information, another study evaluated the prevalence of suicide attempts due to drug intoxication in the state of Rio Grande do Sul, from 2007 to 2017. They found a total of 5,530 reports of suicide attempts involving medications and the most affected age group was 20 to 39 years old – with a total of 2,705 intoxications (48.9%).[7,19] Corroborating their findings, Bahia, between 2007 and 2017, registered 3,253 suicide attempts by drug intoxication, 38.5% of all poisoning cases. The most affected age group was also 20 to 39 years old, adding up to 3,251 cases – 38.5% of the notifications.[20]

Data collected from the Health Surveillance Notification System (Notivisa) demonstrated that the white population was the most affected by adverse drug reactions in Brazil (58.1%), between 2008 and 2013, followed by brown, with 21.2%. Data suggest that the number of suicide attempts is higher among women; the attempts

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often involve exposure to an exogenous agent during self-poisoning. Medications are first, followed by pesticides, in the list of substances used in suicide attempts.[21,22]

According to data from the World Health Organization (WHO), 3,000 people die daily in the world, victims of suicide; for every confirmed death there are twenty more suicide attempts. On a global scale, suicide has an overall rate of sixteen deaths per 100,000 inhabitants, making it the thirteenth leading cause of death – the third among 15 to 34-year-olds and the second leading cause of death among 15 to 19-year-olds.[23]

Drug poisoning can happen due to different factors. The most common are accidental self-poisoning; suicide attempt; abuse; and other administration errors. The numbers of drug intoxications grow each year and it is already considered a global health problem, which forces health professionals to be even more careful during the evaluation of each case, in order to promote a diagnosis through coherent anamnesis, filling out the form in a reliable way to carry out fast and effective treatment, since the eminence of health problems is real and demands specific treatment for each confirmed case.[12-24]

Each year, there is a progressive growth of new intoxication cases. However, the number of fully cured people is favorable and the mortality rate is low. It is worth noting that some episodes generate a lot of discomfort due to toxicological severity, leaving some victims with irreversible sequelae, culminating in expensive medical care needs, in addition to promoting the suffering of victims and their families.[25]

Epidemiological data on intoxication are relevant to determine the position of this event in time and to stimulate the improvement of the quality of notifications, making professionals aware of the practice and monitoring importance. Special attention should be given to the correct and thorough completion of these data, so that the records of these events allow the development of directed prevention strategies. The incomplete information in the notification systems significantly damages the analysis and real representations of the problem, which may end up underestimated. Filling instructions, to ensure the quality of the data, need to be improved.

Bahia presented a high rate of drug poisoning, most cases were concentrated in Salvador, possibly due to the population factor, when compared with other cities with lower number of cases. The easy access to medicines predisposes self-medication, which is a risk factor for intoxication. The correct use of these products is essential for effective pharmacotherapy, to meet the clinical needs of patients, and it is directly related to the reduction of intoxication episodes. One of the major challenges of health teams, especially the pharmaceutical, is to promote the rational use of medicines, raising awareness on the risks of their indiscriminate use. This scenario emphasizes the need to implement campaigns for the rational use of medicines, not only in the state of Bahia, but throughout national territory, as well as suicide prevention, since this is the major cause of drug poisoning, prevalent in young adults aged between 20 and 39 years old.

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