



Ambiente & Sociedade

ISSN: 1414-753X

revistaambientesociedade@gmail.com

Associação Nacional de Pós-Graduação
e Pesquisa em Ambiente e Sociedade
Brasil

MORAES PINTEL RAMOS, HAYSSA; RESENDE NOGUEIRA CRUVINEL, VANESSA;
MILWARD DE AZEVEDO MEINERS, MICHELINE MARIE; ARAÚJO QUEIROZ, CAMILA;
GALATO, DAYANI

MEDICATION DISPOSAL: A REFLECTION ABOUT POSSIBLE SANITARY AND
ENVIRONMENTAL RISKS

Ambiente & Sociedade, vol. XX, núm. 4, outubro-diciembre, 2017, pp. 145-168
Associação Nacional de Pós-Graduação e Pesquisa em Ambiente e Sociedade
Campinas, Brasil

Available in: <http://www.redalyc.org/articulo.oa?id=31754711009>

- How to cite
- Complete issue
- More information about this article
- Journal's homepage in redalyc.org

redalyc.org

Scientific Information System

Network of Scientific Journals from Latin America, the Caribbean, Spain and Portugal

Non-profit academic project, developed under the open access initiative

MEDICATION DISPOSAL: A REFLECTION ABOUT POSSIBLE SANITARY AND ENVIRONMENTAL RISKS

HAYSSA MORAES PINTEL RAMOS¹

VANESSA RESENDE NOGUEIRA CRUVINEL²

MICHELINE MARIE MILWARD DE AZEVEDO MEINERS³

CAMILA ARAÚJO QUEIROZ⁴

DAYANI GALATO⁵

Introduction

Scientific advancements in the healthcare field and research on new treatments have brought unquestionable benefits to the population's health, fact that also led to a considerable increase in the manufacturing of new formulas, as well as in the amount of medication available for trade and consumption (PINTO *et al.*, 2014).

If, on the one hand, the scientific advancements brought great contributions to improve the quality of life, to combat illnesses and to reduce morbidity and mortality rates, on the other hand, it contributed to self-medication practices defined by Vilarino *et al.* (1998) as the use of medications without previous medical prescription, i.e., patient decides the drug to take themselves.

According to the World Health Organization (WHO), self-medication can be beneficial for public healthcare systems since, in many cases, it avoids the collapse of the system due to the assistance to transitory cases or to less emergency ones (CASTRO *et al.*, 2006). However, when self-medication is irrationally practiced it can lead to effects related to increased mistakes in disease diagnosis, to the use of insufficient or excessive dosage, and to the emergence of adverse events (OMS, 2016; CASTRO *et al.*, 2006).

In addition to the aforementioned issues, the irrational use of medication, lack of fractioned sales, free sample distribution by laboratories, and the media, which encourages self-medication and treatment abandonment, significantly help accumulating a

1. Sanitation Specialist, Master in Health Sciences and Technologies, Brasília University (UnB). Email: hayssaramos@hotmail.com

2. Professor of the Collective Health Department at Ceilândia Faculty, Brasília University (UnB). Email: vanessarcruvinel@gmail.com

3. Professor of the Pharmacy Department at Ceilândia Faculty, Brasília University (UnB). Email: michelinemeiners@gmail.com

4. Pharmacy Department of Ceilândia Faculty, Brasília University (UnB). Email: camilaqueiroz01@gmail.com

5. Professor of the Post-Graduation Program in Health Sciences and Technologies at Brasília University (UnB). Email: dayanigalato@gmail.com

large amount of useless medication in people's residences. These medications can then be further disposed in inappropriate areas (ALENCAR *et al.*, 2014; BUENO, WEBER & OLIVEIRA, 2009). Such situation can be worsened in the country due to lack of programs to recall expired medication from residences (SOUZA & FALQUETO, 2015).

Solid residues (SR) are any material, substance, object or good, resulting from human activities in society, discarded in their solid and semi-solid state (BRASIL, 2010). The different SR types are categorized as residential, commercial, street and free fairs, healthcare services, harbors, airports, bus and train stations, industrial, agricultural and construction debris residues (BRASIL, 2006). Healthcare Services Residues (HSR) produced in any establishment providing human or animal healthcare assistance demand different attention, because they represent sanitary and environmental risks (BRASIL, 2010).

Nowadays, HSRs are regulated by the RDC Resolution n. 306/ 2004 of the National Sanitation Surveillance Agency (Agência Nacional de Vigilância Sanitária - ANVISA) and by Resolution n. 358/ 2005 of the National Environment Council (Conselho Nacional do Meio Ambiente - CONAMA), which address the technical and legal guidelines for HSR management, treatment and final disposal in Brazil. According to these resolutions, HSRs are categorized in five groups: A (biological), B (chemical), C (radio-active waste), D (common) and E (sharp). Drugs are categorized as group B residues, which holds chemical substances capable of representing risk for public health or for the environment depending on their flammability, corrosivity, reactivity and toxicity (Brasil, 2006). The Federal District (Distrito Federal - DF) also counts on District Law n. 4.352/2009, which addresses HSRs and on Law n. 5092/ 2013 that discusses drug stores' duty to recall expired medication for proper disposal.

In 2012, Brazil witnessed a great advancement in the SR field after Law n. 12.305/ 2010 was sanctioned. This law created the Solid Residues National Policy (Política Nacional de Resíduos Sólidos - PNRS) and has been boosting important debates even about the reversed logistics, in face of the responsibility held by all the actors involved in products' life cycle.

Based on data from the Brazilian Geography and Statistics Institute (Instituto Brasileiro de Geografia e Estatística - IBGE), back in 2008, approximately 50.8% of all Brazilian counties were using open dumps (landfills) as the final destination for residues. Such reality remains in the DF, which houses the popularly known "structural landfill"; more precisely describing: the biggest landfill in Latin America. The practice of disposing medications in containers developed for common or residential residues (Group D), as well as in the public sewage network, is common in the population and it has been triggering the interest of the scientific community, since these residues can contaminate the soil, water, rivers, lakes, oceans and groundwater (PINTO *et al.*, 2014; BILA & DEZOTTI, 2003; ZAPARROLI *et al.*, 2011). According to Borges *et al.* (2016), drugs diluted in the water used in water treatment stations currently represent a challenge to sanitation companies.

Besides the environmental risks caused by inappropriate disposal, different authors have been weighing about waste collectors' exposure to medications discarded as common residues (Group D), i.e., they are discarded without any previous treatment. Based on Pinto *et al.* (2014), the inappropriate disposal of medications enables waste collectors' to inadequately absorb these residues from the soil by reusing their packages.

Nowadays, still there is no consolidated policy about the disposal of medication from residences. Accordingly, the aim of the present investigation was to analyze the way DF population disposes medications and to reflect about the possible sanitary and environmental risks from the exposure to such discarded medications. Moreover, it aimed at listing some of the actions pointed out by the interviewees in order to sensitize the population about the need of an appropriate discard.

Study design, population and sampling

The sample counted on 393 subjects selected by convenience. Participants in the research were approached in public places such as malls, free fairs, squares and parks in the seven different Territorial Planning Units (Unidades de Planejamento Territorial - UPT) in order to gather residents from different administrative regions and, consequently, to hold individuals from different schooling and income levels (Figure 1).

Mapa de localização dos municípios do Estado do Rio Grande do Sul, com as regiões de planejamento destacadas em cores. A legenda indica:

- I - Central** (verde): Plano Piloto, Chuvis, Candangápolis, Lago Norte
- II - Central adjacente 1** (azul): São José, São José do Sul, São José do Norte
- II - Central adjacente 2** (laranja): São José, São José do Sul, São José do Norte
- IV - Oeste** (verde): São José, São José do Sul, São José do Norte
- V - Norte** (azul): Sobradinha I e II, Planaltina
- VI - Leste** (amarelo): Planaltina, São José do Sul, São José do Norte
- VII - Sul** (verde): São José, São José do Sul, São José do Norte
- VIII - Sul** (verde): São José, São José do Sul, São José do Norte

The inclusion criteria consisted of being over 18 years old and of living in one of the seven UPTs. The exclusion criteria were based on not-finishing the interview schedule.

Data collection and research variables

Data collection was performed through interviews guided by a structured script comprising closed questions. The interviews were conducted from June to September 2016 with the help of volunteer students from the academic extension projects called “Stop, Think, Discard” (Pare, Pense, Descarte - PPD) and “Access to and Use of Medication” (Acesso e Uso de Medicamentos - AMUR) of Brasília University, Ceilândia Faculty (UNB – Fce). The volunteers were previously instructed through a handbook about how to conduct data collection. The handbook comprised questions related to the aims of the research, about the inclusion and exclusion criteria, as well as information about how to approach interviewees, the reading, about the signing of the Informed Free Consent Form (Consentimento Livre e Esclarecido - TCLE) and relevant information about the interview script. Meetings were periodically conducted in order to guide and clarify doubts with the researchers. A pre-test was performed with 10% of the total sample in order to adjust the questionnaire.

The interview script was divided in three parts: 1) interviewees’ socio-demographic aspects (sex, age, schooling, marital status, occupation, residence location, economic and race/color classification [The Brazilian Economic Classification Criterion (Critério de Classificação Econômica Brasil - CCEB) by the Survey Companies Association (Associação de Empresas de Pesquisaⁱⁱ -) was used to set the economic classification; 2) health and drug treatment conditions of people in their houses: use of medications (by the family and by the interviewee), frequency of use, the presence of somebody in the house with any chronic disease, the presence of home pharmacy (family stock), variation in the expiring dates, medication storage, the presence of children in the house, medication in the reach of children (when the height from the floor to the medication in the house was shorter than 150 centimeters) and report of intoxication with medication; 3) questions related to medication disposal in the house such as: discard occurrence, reasons for the discard, places used for the discard, last place where the discard was done, information about proper discard (it was taken into consideration whether the local institutions that received medication residues gave them adequate final environmental destination “healthcare units and drug stores), risks related to inappropriate disposal (according to the interviewee’s viewpoint) and important actions to sensitize the general population about proper disposal (also according to the interviewee’s viewpoint). Answers were written in the interview script itself.

Moreover, the class of the already disposed medications was also investigated, and the *Anatomical Therapeutic Chemical* (ATC) was adopted to identify the anatomic group (http://www.whocc.no/atc_ddd_index/). Theoretical references from other studies were herein used to define the variables (BUENO, WEBER & OLIVEIRA, 2009; VAZ, FREITAS & CIRQUEIRA, 2011; PINTO *et al.*, 2014; ROCHA *et al.*, 2009; GASPARINI, GASPARINI & FRIGIERI, 2011).

Data organization and analysis

Data collected through the interviews were tabulated and analyzed in the Epidata® 3.0 software, which created a data entrance frame based on the interview script. The *Statistical Package of Social Science* (SPSS) 20.0 software was also used and the descriptive statistics was applied to assess the results. The normal variables were presented in absolute numbers and proportions, and the numerical variables were expressed in central tendency (mean and median) and dispersion means (standard and multiple deviation). The chi-square test was adopted to identify factors associated with inappropriate disposal, as well as Fisher's exact test at 5% significance ($p \leq 0.05$), whenever necessary.

The present research was approved by the Research and Ethics Committee of the Health School of Brasília University under Opinion n. 1.517.670/2016; interviewees had to sign the TCLE in order to participate in the research.

Results

The total of 639 individuals were approached, but 244 of them did not live in the Federal District or did not accept to participate in the research; two individuals did not complete the interview; thus, the final sample counted on 393 interviewees. Residence locations were divided according to the seven UPTs.

Table 1 depicts the prevalence of women; most interviewees had completed high school. The mean age of the participants was 35.2 years (± 14.1) and the median was 32 years, 18 was the minimum age and 89 the maximum one. When it comes to marital status, 49% of the interviewees declared themselves single and 45.8% lived in Western UTPs. Economic classification showed 23.4% of participants living with mean income R\$ 2.409,00 according to the Brazilian Economic Classification Criterion (ABEP, 2014); 38% of the subjects in the sample declared themselves brown.

Table 1: Socio-demographic characteristics and residence locations according to the seven Territorial Planning Units of the Federal District's interviewees, 2016.

Variables	N	%
Sex		
Female	254	64.6
Male	139	35.4
Age (in years)		
18-29	142	36.1
30-39	83	21.1
40-49	61	15.6
50-59	27	6.9
60 or older	28	7.1

Non-informed	52	13.2
Schooling		
Complete elementary school	12	3.0
Incomplete elementary school	32	8.1
High School degree	159	40.4
Incomplete High school	34	8.7
College Degree	93	23.7
Incomplete higher education	62	15.8
Non-declared	1	0.3
Marital status		
Single	195	49.6
Married	146	37.2
Widow/widower	9	2.3
Divorced	22	5.6
Common law marriage	16	4.0
Non-declared	5	1.3
Occupation		
Assistant/sales person	143	36.4
Student	64	16.3
Education professional	27	6.9
Public server	20	5.0
housewife / retired	45	11.5
Healthcare professional	16	4.0
Other professions	18	4.6
Unemployed	39	10.0
Non-informed	21	5.3
Residence location		
Downtown	15	3.8
Central neighborhoods 1	16	4.0
Central neighborhoods 2	64	16.3
West side	180	45.8
South	52	13.3
East side	24	6.1
North	42	10.7
Economic classification *		
A	32	8.1

B1	42	10.7
B2	92	23.4
C1	84	21.3
C2	63	16.0
D-E	26	6.7
Non-declared	54	13.8
Color/race		
White	130	33.1
Black	63	16.0
Yellow	34	8.7
Brown	149	38.0
Indigenous	9	2.2
Non-declared	8	2.0

* The Brazilian Classification Criterion was used in this variable.

Thirty percent (30% / n=118) of the 393 interviewees reported to have or to live with someone who has some type of chronic disease; hypertension 30.5% (n=36) and diabetes 16.9% (n=20) stood out among them.

Table 2 presents the medication use by the interviewees, which corresponded to 61.8%, the frequency of daily use was 46.3%. With regard to the home medication stock, 73.8% of interviewees reported to have a home stock and the check on the expiring dates is performed by 75.2% of them – 66.5% at the time to take the medication - and 43.1% of the interviewees reported to store the medications in the kitchen. There were children in the homes of 56.7% of the interviewees, 85.7% of them stated that medications are not stored at the children's reach and 38.6% used to keep them between 1m and 1.5m from the floor. Of the 23 reports on intoxication (5.95 of the sample), there were children (0-12 years old) involved in 17.3% of them.

Table 2: Medication use by the interviewee or a family member, frequency of use, home pharmacy, checking on the expiring date, storage and children living in the house (data collected from the Federal District population in 2016).

Variables	N	%
Medication use (Family members)		
Yes	299	76.1
No	89	22.6
Does not know	5	1.3
Medication use (interviewee)		

Yes	243	61.8
No	150	38.2
Frequency of use (interviewee / n= 243)		
Sometimes	70	28.8
Regularly	19	7.8
Everyday	115	47.3
Every once in a while	36	14.8
Did not answer	03	1.3
Home pharmacy (n= 393)		
Yes	290	73.8
No	103	26.2
Checking on the expiring data (n=290)		
Yes	218	75.2
No	72	24.8
Time checking on the expiring date * (n= 218)		
At purchase	92	42.2
At the time to take it	145	66.5
When the home pharmacy is checked	36	16.5
Others	1	0.4
Storage * (n=290)		
Kitchen	125	43.1
Bedroom	116	40
Bathroom	35	12.0
Living room	13	4.5
Laundry area	9	3.1
Other	3	1.0
Children living in the house		
Yes	223	56.7
No	170	43.3
Medications on children's reach (**) (n=223)		
Yes	32	14.3
No	191	85.7
Storage height (n=223)		
Shorter than 1 meter	17	7.6
Between 1 and 1.5 meters	86	38.6
between 1.6 and 2 meters	20	8.9

Higher than 2 meters	46	20.7
Did not answer	54	24.2
Report on intoxication with medication (n=393)		
Yes	23	5.9
No	365	92.9
Does not know	5	1.2

* The answer for this variable was of multiple choice nature and it led to a percentage higher than 100%;

**estimated through the height from the floor chosen to store the medications.

Table 3 shows that 78.9% of the interviewees used to dispose medications mainly due to expired dates (62.9%). The most often discarded medications were anti-inflammatory and antibiotics for systemic use (26.3%), and medication for the respiratory tract (24.2%). Most interviewees declared to have never received any information about proper medication disposal (80.7%). Regarding the variable 'local to discard the medications', 34.8% of them reported to not use proper disposal procedures and 45.0% had never thought about such issue. Medication disposal followed the discard of common residues (73.65) and some other interviewees stated to have disposed them in the sink (8.7%) or in the toilet (7%).

Table 3: Medication disposal according to the interviewees' practices, as well as motives, anatomic group, information and disposal places used by residents in the seven Federal District Territorial Planning Units, 2016.

Variables	N	%
Medication disposal (n=393)		
Yes	310	78.9
No	83	21.1
Motive to discard* (n=310)		
Was not using them	67	21.6
Expired date	195	62.9
Leftovers	57	18.3
Abandoned the treatment	13	4.1
All options above	9	2.9
Anatomic groups of the discarded medications * (n=310)		
Eating tract and metabolism	27	8.7
Blood and blood production organs	19	6.1
Cardiovascular system	51	16.5
H- Hormonal system and preparations	51	16.5

J- Anti-inflammatory and antibiotics for systemic use	81	26.3
N- Nervous system,	29	9.4
R- respiratory tract	75	24.2
Others	9	2.9
Report to have received information about discard (n=393)		
Yes	76	19.3
No	317	80.7
Where did the information come from* (n=76)		
Healthcare unit	4	5.3
Media	9	11.8
College/university	9	11.8
Lecture	6	7.8
Supermarket	1	1.3
Does not remember	49	64.4
How the discard was done* (n=310)		
Garbage can for common residues	221	71.3
Sink	38	12.3
Toilet	25	8.0
Healthcare unit	13	4.2
Drug stores	8	2.6
University	4	1.3
Supermarket	1	0.3
Last form of discard* (n=310)		
Garbage can for common residues	228	73.6
Sink	27	8.7
Toilet	22	7.0
Healthcare unit	11	3.6
Drug stores	9	2.9
University	4	1.3
Supermarket	1	0.3
Did not answer	8	2.6

* the answer for this variable was of multiple choice nature and it led to a percentage higher than 100% on the answers.

Table 4 depicts the associations between the interviewees profile and the report about proper disposal, i.e., when the disposal was done in healthcare units and drug stores. It is worth mentioning that the number of subjects in this table refers to those who have answered to the item 'last form of discard', which was shown in the table above.

Table 4: Association between the interviewees' profile and the proper discard done by residents in the seven federal District Territorial Planning Units, 2016.

Exposure variable	Proper disposal – n (%)	Inappropriate disposal – n (%)	p (*) value
<i>Sex (n=302)</i>			0.006
Female	8 (3.9)	197 (96.1)	
Male	12 (12.4)	85 (87.5)	
<i>Age (n=273)</i>			0.757
Up to 32 years	8 (5.9)	127 (94.1)	
Older than 32 years	7 (5.1)	131 (94.9)	
<i>Schooling (n=301)</i>			0.027
High school	7 (4.0)	169 (96.0)	
Higher education	13 (10.4)	112 (89.6)	
<i>Marital Status (n=289)</i>			0.478
Single	8 (5.6)	134 (94.4)	
Others	12 (7.7)	144 (92.3)	
<i>Residence location (n=302)</i>			0.496
Downtown areas	5 (8.6)	53 (91.4)	
Others	15 (6.1)	229 (93.9)	
<i>Economic classification (n=302)</i>			0.005
A and B	15 (11.0)	121 (89.0)	
C, D and E	5 (3.0)	161 (97.0)	
<i>Skin color (n=302)</i>			0.731
White	8 (7.3)	102 (92.7)	
Non-white	12 (6.2)	180 (93.8)	
<i>Performs selective collection (n=266)</i>			0.971
Yes	13 (7.2)	168 (92.8)	
No	6 (7.1)	79 (92.9)	
<i>Information about disposal (n=302)</i>			<0.001(**)
Yes	17 (29.3)	41 (70.7)	
No	3 (1.2)	241 (98.8)	

*values were significant when $p \leq 0.05$; **the p value was found through Fisher's exact test.

The total of 53.9% of the interviewees reported to be aware of the risks associated with medication disposal and the following risks stood out among them: environment contamination (20.6%), damage to the public health and to the population in general (17.8%), water and soil contamination (14.3%), waste collectors' intoxication (14.0%), microorganisms' resistance and food contamination (2.4%); more than one item could have been cited by the interviewees.

With regard to the actions taken to solve problems generated by this type of residue, 23.2% of the interviewees considered that the fractioned sales of medications based on the needs of the prescribed treatment would be crucial to reduce medication leftovers since it would avoid expired dates and unnecessary disposals. Information in the media about proper disposal was pointed by the interviewees as a strategic point, 22.4% of them reported that such medium would be ideal. When it comes to the awareness about and addressment of this topic in teaching institutions, 17.5% of them stated that it is important taking actions like these and 37.9% said that combined actions are feasible to be taken, besides being more effective to sensitize the population.

Discussion

Medications are essential for health maintenance; however, the access to them, the way they are used and discarded have become a complex problem to public health. Although the scientific community is interest in proper medication disposal, little has been done in order to inform and sensitize the population and managers about the good practices of medication use and disposal. According to data of the Federal Pharmacy (Council Conselho Federal de Farmácia - CFF), Brazil ranks the sixth position among the biggest medication consumption markets in the world. There is the expectation that up to 2018 the country will reach the fourth position, behind the United States, china and Japan (CFF, 2017). Estimates show that 10.3 to 19.8 thousand tons of medications will be discarded, approximately 6.7 thousand tons every year, by counties holding more than 100,000 inhabitants (CFF, 2013). Such reality is even more concerning in the Federal District since it has the biggest landfill in Latin America, the so called "structural landfill", and because it is the capital of the country.

The sampling group was mostly composed of women and it may be justified by the fact that women are more prone to answer to interview scripts. Interviewees' age group varied from 18 to 89 years; 36.1% of them were in the age group between 18 and 39 years; 40.5% of the interviewees finished high school, 34.4% were working as assistants or sales person; most of them (36.4%) lived in Western UPTs (Ceilândia, which is the Administrative Region presenting the highest urban density in the DF, approximately 600 thousand inhabitants) (ANUÁRIO DE, 2017).

Medication use was reported by 61.8% of the interviewees, and such data corroborate the research by São Paulo State Regional Pharmacy Council and by CFF from 2013, which approaches the massive expansion of the drugs and medications market in Brazil in the last few years (CFF, 2013). Hypertension (30.5%) was the most prevalent chronic disease among the interviewees, or among people living in their houses, which

was followed by diabetes (16.9%). Similar results were found by Bueno, Weber & Oliveira (2009) in Ijuí County, RS, where approximately 41.1% of the interviewees reported these health issues. Based on results of the 2013 National Health Research, the prevalence of medications used to treat chronic disease is high in Brazil, about 80% is used to treat hypertension, diabetes and asthma (TAVARES *et al.*, 2015). The present results evidence that 47.3% of the interviewees declared to make daily use of medications, and it meets the prevalence of the reported chronic conditions, hypertension 30.5% (n=360) followed by diabetes 16.9% (n=20), which suggests continuous medication use.

Home medication stocks were pointed out by 73.8% of the interviewees, and this number is lower than that recorded by Bueno, Weber & Oliveira (2009), who had 91.6% of their interviewees reporting to have a home stock. Vaz, Freitas & Cirqueira (2011), in a study conducted in Brasília, in Vicente Pires Administrative Region, which is also located in the DF, had 97% of their interviewees stating to have medications in their home stock, also known as home pharmacy.

Medications must be in perfect conditions and in the correct expiring date in order to have effective action. These aspects are relevant for treatment efficiency and for the user's safety. After the date has expired, medications must be properly discarded in order to avoid problems such as lack of effectiveness, adverse reactions, among others (ROCHA *et al.*, 2009). Accordingly, checking the expiring date is extremely important and, as for the current study, it was reported by 75.2% of the interviewees; most of them said that they check on the expiring date at the time to take the medicine.

The main storage places pointed out by the interviewees were the kitchen (43.15%) and the bedroom (40%). Similar results were found in the studies by Bueno, Weber & Oliveira (2009) and Ribeiro and Heinichk (2010). According to Fernandes & Petrovick (2004), it is recommended to avoid storing medications in hot and humid places; therefore, it is necessary paying close attention to the storage places, due to the risk of contamination and of temperature variations in the environment. It is important highlighting that lack of care with the home pharmacy can change the effectiveness and the safety of medication use. The storage place must be protected from light, heat and humidity in order to avoid possible product degradation (BUENO, WEBER & OLIVEIRA, 2009). Yet, based on Ribeiro and Heineck (2010), when medication storage is not appropriate, the pharmaceutical formula loses its stability and it turns the medication inappropriate to use. Accordingly, the authors suggest the need of implementing education processes in families that make use of medication. At this point, it is necessary emphasizing the role played by community health agents and by health professionals in sensitizing and encouraging families to make rational use and proper storage of their medications.

Although approximately 85% of the interviewees had reported that medication storage is not at children's reach, the prevalent height was at most 1.5 meters from the floor. Schenkel (1996) reinforces that the easy access to medication is a risk factor for child intoxication. It is possible inferring that the height reported by the responsible caregivers is of easy access to children who often climb chairs and benches or other places to play; therefore, it poses high risk of accidents due to possible intoxication by accidental use. Similar results were pointed out by Gasparini, Gasparini & Frigieri (2011), Beckhauser,

Valgas & Galato (2012) and Bueno, Weber & Oliveira (2009). According to Schenkel *et al.* (2005), it is common recording child intoxication with medication stored in inappropriate places, or in places of easy access (unlocked), in Brazil. Data of the National System of Toxic-pharmacologic Information (Sistema Nacional de Informações Tóxico Farmacológicas - SINITOX) from 2013 recorded 63,841,008 cases of intoxication with medication, of which 255 resulted in the patient's death, thus drawing lethality index 0.40% (SINITOX, 2017).

The reason declared for medication disposal was, in most cases, expired dates (62.9%). The main medication disposal form was the disposal with common residues. These data corroborate data recorded in other studies (BUENO, WEBER & OLIVEIRA, 2009; PINTO *et al.*, 2014; GASPARINI, GASPARINI & FRIGIERI, 2011; ROCHA *et al.*, 2009; MAIA & GIORDANO, 2012). A previous study conducted in Brasília, in Vicente Pires Administrative Region by Vaz, Freitas & Cirqueira (2011) showed that 78% of the interviewees living in this region disposed of medications along with common residues, i.e., they discarded medications as they did with residues that do not represent biological, chemical or radiological risk. According to Pinto *et al.* (2014), such inappropriate disposal puts waste collectors in contact with these medical residues, since they can absorb them from contaminated soil.

Anti-inflammatory and antibiotic medications were the most discarded therapeutic class of medication among the interviewees, which were followed by drugs that act in the respiratory tract. These results corroborate the study by Pinto *et al.* (2014), which was conducted in Paulínia County, São Paulo State. The occurrence of residual drugs in the aquatic and terrestrial environments has been the subject of interest among many environmental concerns resulting from inadequate medication disposal (BILLA & DEZOTTI, 2003; DAUGHTON, 2003; GHISELLI, 2007; MARTINEZ, 2009). Although the hypothesis about the changes in the functioning of the endocrine system of some species exposed to environmental contamination due to inappropriate medication disposal has been around since the XX century (GHISELLI, 2007), the emission of pharmaceutical products in the environment remains a shortly discussed subject in face of its international relevance (DAUGHTON, 2003). Few researchers work with this research line in Brazil, namely: environmental contamination with drugs (GHISELLI, 2007; MEDEIROS, MOREIRA & LOPES, 2014).

The concern with these products lies on their possible effects on human health and on the environment, including on animal species. Chemical substances suspect of causing changes in the endocrine system are potentially associated with diseases such as testicle, breast and prostate cancer, with low sperm rates, with physical deformities and disfunction in reproductive organs, with thyroid disfunction and with changes related to the neurological system (CARVALHO *et al.*, 2009). Studies also point out the adverse effects on the physiology of animal species, for example, the feminization of fish related to the exposure to the substances, mainly to hormones like those found in contraceptives (GHISELLI, 2007). Besides the endocrine influences, the antibiotics group is another concern of scientists, since it is the most prevalent class discarded, according to the present results. The uncontrolled use of antibiotics leads to two important environmental

issues: one of them regards the water resources and the other one lies on the fact that some microorganisms create resistance to these drugs and promote the development of resistant bacteria (GHISELLI, 2007). This situation gains importance since, according to interviews, they are the medications more often disposed by the interviewees.

The locations seen as adequate for the delivery or destination of these residues are the drug store networks prepared for medical residue collection, healthcare units, hospitals and supermarkets that have agreements with companies responsible for medication residue collection. Based on Medeiros, Moreira & Lopes (2014), places that make residue management systems available - through which the population can safely discard their non-used or expired medication - avoid these medications to be thrown in the common garbage, in the sewage network or to accumulate in patients' houses.

According to the legislation in effect in the country, the proper final disposal forms for these residues are their discard in landfills (when the residue is sealed or inactivated through previous treatment), in landfills with sewage and groundwater protection, through incineration and through chemical decomposition (EICKHOFF, HEINECK & SEIXAS, 2009). It is important emphasizing that the collection of medication residues generated in residences in Brasília can be performed by some drug stores, as well as by the public healthcare units.

Although the Federal District can count on Law n. 5092/2013, which addresses the duty of drug stores to receive expired medication in order to dispose it, such law was never actually followed. In order to mitigate the problem, the DF State Health Bureau (Secretaria de Estado de Saúde do DF - SES/DF) recommends health units to receive expired medications from the population in order to give them the adequate destination. Therefore, medication residues received by the DF Healthcare units are sent to the outsource company responsible for treating and disposing them. Information about the flows set on discard, treatment and final disposal is essential for the environmental awareness of the population. Thus, SES/DF defined a flowchart describing the route between the medication collection in these locations and its final disposal (OLIVEIRA *et al.*, 2016). It is worth mentioning that the process adopted to manage these residues is not simple, since it involves human, physical, logistic and financial resources (OLIVEIRA *et al.*, 2016).

According to Souza & Falqueto (2015), the rational use of medications and their proper disposal is not an isolated attitude but a combined action that must be put in place by the Government, patients, caregivers, family members, health professionals, policy-makers, industries and sellers. Each one of these actors must properly perform their roles and competences within the global process. Data in the current study allowed verifying that most of the interviewees never had any information about the appropriate disposal of their medications, although some of them reported to have seen discussions about the topic in the media or in lectures in teaching institutions.

Habit changing regarding disposal forms already in practice and the final disposal procedures have shown a small change (92.4% and 91.7%, respectively) in comparison to previously adopted procedures. Results show significant association among sex (male), higher schooling levels (higher education) and better economic classifications (A and

B classes), besides the report that interviewees had already received information about proper disposal forms. Chaves *et al.* (2015) identified significant difference between schooling level and inappropriate medication disposal and it corroborates data in the present study. These associations reinforce the importance of informing, educating and sensitizing the population about the risks of inadequate disposal. It is necessary to further investigate the variable 'sex' in order to better understand the association between the male gender and proper disposal.

Less than half of the interviewees (53.9%) reported to know the risks of inappropriate disposal, although many of them referred to the risks and damages it could represent to public health, to the environment and to waste collectors. Risks of medication residues to the environment depend, in the first place, on the degree of toxicity, and in the second place, on their concentration range in ecosystems (environmental persistence), which is related to residue permanence time in the environment due to its resistance to chemical and biological degradation associated with natural processes (VAZ, FREITAS & CIRQUEIRA, 2011). Besides factors related to the environment and to public health, waste collectors' contact with these residues also represent potential risk to health. It is worth highlighting that there are traces showing that these professionals may reuse these products for their own consumption or for their kin (RAMOS, 2015a).

Estimates predict that there are approximately 398,348 people living as waste collectors in Brazil. Southeastern states concentrate the largest number of waste collectors in the country (42%), which is followed by the Northeastern states (30%) (DAGNINO & JOHANSEN, 2017). The Federal District has approximately 33 institutions working with recyclable materials, and they count on the cooperation of approximately 2,362 collectors. In 2015, these cooperatives were responsible for recovering approximately 75,000 tons of SR through selective collection or through organic matter composting processes (RDRS, 2015). Although these professionals have their register in the Brazilian Occupation Classification (Classificação Brasileira de Ocupação - CBO) since 2002, they face great vulnerability in their work routine (CBO, 2002).

Information in the media was the most prevalent proposal among the actions suggested by the interviewees. According to Bueno, Weber & Oliveira (2009), lack of information, mainly lack of attitude, can contribute to people perform inappropriate disposal. Yet, based on Jacobi (2005), the population's lack of responsibility mainly results from disinformation, from lack of environmental awareness and from deficits in the community practices based on citizens' participation and involvement. Accordingly, it is necessary reinforcing the role played by information in the outspreading of the importance of adequate disposals.

Another important point highlighted by the interviewees concerned the fractioned sale of medications. Although Decree n. 5.775/2006 (BRASIL, 2006), which addresses medication fractioning, is already in effect, many industries still did not fit to the changes.

Well succeeded experiences have been recorded in Canada, Mexico, Portugal and Colombia. These actions aim at sensitizing the population about the importance of proper final medication disposal (CFF, 2013). Therefore, it is possible saying that such situation can be reversed as long as there is more information available to the society and more

interest of all political spheres in the relevance of the herein addressed issue, fact that could improve the current scenario.

There are manifestations of state legislation in the entire Brazilian territory. Torres (2015) listed all the juridical rules concerning medication disposal in Brazil; eighteen federal units had 28 rules, all together. Bahia, Goiás, Mato Grosso, Minas Gerais, Rio de Janeiro, Rio Grande do Norte, São Paulo and Tocantins are the states that still do not have rules (TORRES, 2015). However, most of them count on the voluntary participation of private companies that perform post-consumption disposal. In São Paulo, for instance, there are projects such as the proper medication disposal; the conscient disposal developed by BHS, known as Ecomed; and the medication safe devolution promoted by the Medical School of São Paulo University. All these projects aim at receiving expired medications in order to give them an appropriate environmental destination. Besides these initiatives, different states such as Rio Grande do Sul, Santa Catarina and Paraná already have companies that aim at promoting appropriate medication disposal (MEDEIROS, MOREIRA & LOPES, 2014).

According to the aforementioned, it is possible seeing that inappropriate medication disposal practices can harm the environment and the population's health. Many interviewees are aware of the risks. The lack of legislation to define the practices at residences remains a challenge and deserves attention, given the complexity of the problem.

The present research aimed at understanding how medication disposal is performed by the population, as well as at verifying the action interviewees would think necessary to make feasible strategies to sensitize the public sphere and the population about the discard and final disposal of residues, so that they will be environmentally disposed in order to avoid risks for the public health, for the environment and for waste collectors.

There is no doubt that information in the media is a relevant strategy; however, teaching institutions are essential since they allow the construction of enrichment and learning spaces (RAMOS *et al*, 2015b). Therefore, Jacobi (2005) takes into account the role played by educators and teachers, which is crucial to boost the changes capable of creating an education system committed with the formation of critical views about values and with ethics, in order to build an environmentally sustainable society.

It is worth highlighting that the appropriate HSR also evidences the need of sensitizing health professionals (BENTO & COSTA, 2015) who are responsible for prescribing and stopping medications, besides the residues they generate in the healthcare units assisting the general population (ALLEVATO, 2014). Therefore, it is possible inferring that these professionals play an important role in the HSR management process.

An integrative review performed by Bento & Costa (2015) showed that, although professionals acknowledge the importance and relevance of the subject, most health professionals do not know the HSR disposal and management phases. According to the results shown in the aforementioned review, it becomes essential reflecting about the importance of inserting the topic in the curriculum matrix of professional formation in health-field majors.

It is known that nowadays subjects related to residues are of great relevance; mainly when it comes to residues with contamination potential. Many studies (BUENO, WEBER

& OLIVEIRA, 2009; PINTO *et al.*, 2014; GASPARINI, GASPARINI & FRIGIERI, 2011; ROCHA *et al.*, 2009; UEDA *et al.*, 2009; EICKHOFF, HEINECK & SEIXAS, 2009) have been pointing out these challenges, mainly the ones related to the need of laws that also address the responsibility of the general population, besides the intense supervision of laws already in effect.

Although the study is successful in its aims and results, it is necessary mentioning that it presented methodological limitations. One of them concerns the interviewees' memory bias due to the recalling period. Moreover, there may be limitations linked to the sampling process, which was based on convenient choices. The study was performed in crowded places at day light time, and it may have impaired the participation of some working-class representatives in the research. Another limitation was the number of refusals, mainly in high-class DF neighborhoods, that can explain why the survey was conducted in public places on business hours. Therefore, many people were looking forward to meeting their appointments (school, work, among others) or to go back home.

Conclusion

Results allowed concluding that medication disposal remains inappropriate according to more than half of the interviewees, and it proves the need of providing information and of sensitizing society as a whole, given the high risk placed by these residues, which can compromise people's quality of life.

Some strategies have been weighed in order to minimize the problem, but the lack of a specific policy to the destination given to medication of home use contribute to the bad practices. Most of the interviewees declared not to know the risks related to these residues. Even those who knew the importance of the subject, said that they did not know the importance of and the best way to promote a safe disposal.

Results also showed that the variable 'to have received information' was the most associated with proper disposal, as well as variables 'schooling level' and 'economic classification'. Such result reinforces the importance of education actions in the mass communication means in order to sensitize the population and change the current reality.

Successful projects concerning medication collection must be encouraged due to the benefits they bring to human health and to the environment. These programs are crucial, since they help diminishing the amount of medication inappropriately disposed and give the population the opportunity to discard them in an environmentally safe way.

Besides, educating patients about proper destinations is one of the most important steps. Health professionals involved in caregiving must encourage their patients to practice the rational use and disposal of their medications and of all HSRs that place sanitary and environmental risks.

Notes

i (www.openepi.com).

ii <http://www.abep.org/criterio-brasil>

References

- ABEP. Associação Brasileira de Empresas de Pesquisa. **Critério de Classificação Econômica Brasil**, 2014.
- ABNT. Associação Brasileira de Normas Técnicas. **NBR. 10.04 Resíduos sólidos: Classificação**. São Paulo, 2004
- ANUÁRIO DF. Anuário do Distrito Federal. **Ceilândia é reduto da nova classe média**. Disponível em: < <http://www.anuariododf.com.br/regioes-administrativas/ra-ix-ceilandia/>>. Acesso em: 20 de jul. 2017.
- ALENCAR, T.O.S. et al. Descarte de medicamentos: uma análise da prática no Programa Saúde da Família. **Ciência & Saúde Coletiva**, v. 19, n. 7, p. 2157-2166, 2014.
- ALLEVATO, C.G. **Resíduos de Serviços de Saúde: o conhecimento dos profissionais que atuam no contexto hospitalar**. Dissertação de mestrado, 2014.
- BECKHAUSER, G.C.; VALGAS, C.; GALATO, D. Perfil do estoque domiciliar de medicamentos em residências com crianças. **Revista Ciências Farmacêuticas Básica e Aplicada**, v. 33, n. 4, p. 583-589, 2012.
- BENTO, D.G.; COSTA, R. Estado da arte acerca dos resíduos de serviço de saúde. **Revista Eletrônica Estácio Saúde**, v. 4, n. 2, 2015.
- BILA, D.M.; DEZOTTI, M. Fármacos no meio ambiente. **Química Nova**, v. 26, n. 4, p. 523-530, 2003.
- BORGES, R.M. et al. Uso de filtros de carvão ativado granular associado a microrganismos para remoção de fármacos no tratamento de água de abastecimento. **Revista Engenharia Sanitária e Ambiental**, v 21, p.1-13, 2016.
- BRASIL. **Lei nº 12.305**, de 2 de agosto de 2010. Institui a Política Nacional de Resíduos Sólidos; altera a Lei nº 9.605, de 12 de fevereiro de 1998; e dá outras providências. Diário Oficial da República Federativa do Brasil, Brasília, 2010.
- _____. Ministério do Trabalho e Emprego. **Classificação Brasileira de Ocupação – CBO**. Brasília-DF, 2002.
- _____. Ministério da Saúde. Agência Nacional de Vigilância Sanitária. **Manual de Gerenciamento de resíduos de serviços de saúde**. Brasília: Ministério da Saúde, 2006.
- _____. **Decreto nº 5.775**, de 10 de maio de 2006. Dispõe sobre o fracionamento de medicamentos, dá nova redação aos arts. 2º e 9º do Decreto nº 74.170, de 10 de junho de 1974, e dá outras providências. Diário Oficial da República Federativa do Brasil. Brasília, 2006.
- _____. **Lei Distrital nº 4.352**, de 30 de Junho de 2009. Dispõe sobre o tratamento e a disposição final dos resíduos dos serviços de saúde. Distrito Federal, 2009.
- _____. **Resolução nº 306**, de 07 de dezembro de 2004. Dispõe sobre o Regulamento Técnico para o gerenciamento de resíduos de serviços de saúde. Agência Nacional de Vigilância Sanitária. Diário Oficial da República Federativa do Brasil, Brasília, 2004.

_____. **Resolução nº 358**, de 29 de abril de 2005. Dispõe sobre a destinação final dos resíduos de serviços de saúde e dá outras providências. Conselho Nacional do Meio Ambiente. Diário Oficial da República Federativa do Brasil, Brasília, 2005.

_____. **Lei Distrital nº 5.092**, 04 de maio de 2013. Dispõe sobre a obrigatoriedade de farmácias e drogarias receberem medicamentos com prazo de validade vencido para descarte. Distrito Federal, 2013.

BUENO, C.S.; WEBER, D.; OLIVEIRA, K.R. Farmácia caseira e descarte de medicamentos no bairro Luiz Fogliatto do município de Ijuí – RS. **Revista Ciências Farmacêutica Básica Aplicada**, v. 30, n. 2, p. 203-210, 2009.

CARVALHO, E.V.; FERREIRA, E.M.L.; SANTOS, C. Aspectos legais e Toxicológicos do descarte de medicamentos. **Revista Brasileira Toxicologia**, n. 22, p. 1-8, 2009.

CASTRO, H.C. et al. Automedicação: entendemos o risco? **Infarma**, v.18, n. 9-10, 2006.

CFF. Conselho Federal de Farmácia. Logística Reversa: Brasil busca solução para descarte inadequado de medicamentos. **Farmácia Brasileira**. n. 87. 2013.

CFF. Conselho Federal de Farmácia. **Farmácias de elite**. Disponível em: <<http://www.cff.org.br/noticia.php?id=3879>>. Acesso em: 20 de jul. 2017.

CHAVES, G.L.D. et al. Descarte de medicamentos vencidos e em desuso: um levantamento do comportamento dos consumidores em São Mateus/ES. **Revista eletrônica em gestão, educação e tecnologia ambiental**, v. 2, p.1083-1096, 2015.

DAGNINI, R.S.; JOHANSEN, I.C. Os catadores no Brasil: características demográficas e socioeconômicas dos coletores de material reciclável, classificadores de resíduos e varredores a partir do censo demográfico de 2010. **Economia solidária e políticas públicas**. Mercado de trabalho, v 62, 2017.

DAUGHTON, C.G. Cradle-to-cradle stewardship of drugs for minimizing their environmental disposition while promoting human health. I. Rationale for and Avenues toward a Green Pharmacy. **Environ Health Perspect.** v.111, p.757-774, 2003.

EICKHOFF, P.; HEINECK, I.; SEIXAS, L.J. Gerenciamento e destinação final de medicamentos: uma discussão sobre o problema. **Revista Brasileira Farmácia**, v.90, n.1, p.64-68, 2009.

FALQUETO, E.; KLIGERMAN, D.C.; ASSUMPÇÃO, R.F. Como realizar o correto descarte de resíduos de medicamentos? **Ciência & Saúde Coletiva**, v. 15, n. Supl. 2, p. 3283-3293, 2010.

FERNANDES. L.C, PETROVICK, P.R. Os medicamentos na farmácia caseira. In: SCHENKEL EP. **Cuidados com os medicamentos**. 4. ed. Porto Alegre- UFRGS, p. 39-42, 2004.

GASPARINI, J.C.; GASPARINI, A.R.; FRIGIERI, M.C. Estudo do descarte de medicamentos e consciência ambiental no município de Catanduva-SP. **Revista Ciências e Tecnologias**, v. 2, n. 1, p. 38-51, 2011.

GHISELLI, G.; JARDIM, W.F. Interferentes endócrinos no ambiente. **Química Nova**, v.30, n.3, 2007.

IBGE. Instituto Brasileiro de Geografia e Estatística. **Síntese de Indicadores 2008**. Disponível em: < <https://ww2.ibge.gov.br/home/estatistica/populacao/trabalhoerendimento/pnad2008/>>. Acesso em: 20 Jul. 2017.

JACOBI, P.R. Educação Ambiental: o desafio da construção de um pensamento crítico, complexo e reflexivo. **Educação e Pesquisa**, São Paulo, v. 31, n. 2, p. 233-250, 2005.

MAIA, M.; GIORDANO, F. Estudo da situação atual de conscientização da população de Santos a respeito do descarte de medicamentos. **Revista Ceciliana**. v. 4, p. 24-28, 2012.

OLIVEIRA, W.L. Descarte correto de medicamentos: uma responsabilidade dos farmacêuticos que atuam na atenção primária. Experiências exitosas de farmacêuticos no SUS. **Conselho Federal de Farmácia**, n° 4, p. 16-24, 2016.

OMS. Organização Mundial de Saúde. **The role of Pharmacist in self care-medication**. Disponível em: <<http://apps.who.int/medicinedocs/pdf/whozip32e/whozip32e.pdf>>. Acesso em: 10 nov. 2016.

PDOT. **Plano de Ordenamento Territorial do Distrito Federal**. Secretaria de Estado de Gestão do Território e Habitação. Disponível em: <http://www.segeth.df.gov.br/images/pdot/doc_tecnicos/documento_tecnico_pdot_adin_plc172011.pdf>. Acesso em 11 de nov. 2016.

PINTO, G. M. F. et al. Estudo do descarte residencial de medicamentos vencidos na região de Paulínia (SP), Brasil. **Revista Engenharia Sanitária e Ambiental**, v.19, n.3, p. 219-224, 2014.

MEDEIROS, M. S. G.; MOREIRA, L. M. F.; LOPES C. C. G. O. Descarte de medicamentos: programas de recolhimento e novos desafios. **Revista de Ciências Farmacêuticas Básica e Aplicada**, v. 35, n. 4, 2014.

RAMOS, H.M.P. **O impacto do descarte inadequado dos resíduos de saúde aos catadores de materiais recicláveis de Ceilândia-DF**. Trabalho de conclusão de curso - Universidade de Brasília. UnB, 2015a.

RAMOS, H.M.P. et al. Educação ambiental em uma cooperativa de catadores de resíduos sólidos – Ceilândia-DF. In: **7º Encontro Nacional da Associação Nacional de Pós-Graduação e Pesquisa em Ambiente e Sociedade**. Brasília. 2015b.

RIBEIRO, M. A.; HEINECK, I. Estoque domiciliar de medicamentos na comunidade ibiaense acompanhada pelo Programa Saúde da Família, em Ibiá-MG, Brasil. **Revista Saúde e Sociedade**, v.19 n.3, 2010.

ROCHA, B.S. et al. Caracterização dos medicamentos descartados por usuários da farmácia popular do Brasil/farmácia escola da Universidade Federal do Rio Grande do Sul (UFRGS). In: **9º Salão de Extensão da Universidade Federal do Rio Grande do Sul**. Porto Alegre, 2009.

SCHENKEL, E. P. **Cuidados com os medicamentos**. Porto Alegre: Editora da Universidade Federal do Rio Grande do Sul, 1996.

SCHENKEL, E.P.; FERNANDES, L.C.; MENGUE, S.S. Como são armazenados medicamentos nos domicílios. **Acta farmacêutica Bonaerense**, v.24, n.2, p.266-270, 2005.

SINITOX. **Sistema Nacional de Informações Tóxico Farmacológicas**. Disponível em: < <https://sinitoxdados.iciet.fiocruz.br/>> Acesso em: 20 de jul. 2017.

SOUZA, C.D.E.A.; FALQUETO, E. Descarte de Medicamentos no Meio Ambiente no Brasil. **Revista Brasileira Farmácia**, v. 96 n.2, p.1142-1158, 2015.

TAVARES, N.U.L. et al. Uso de medicamentos para tratamento de doenças crônicas não transmissíveis no Brasil: resultados da Pesquisa Nacional de Saúde, 2013. **Epidemiologia e Serviços de Saúde**, Brasília, v.24, n.2, p. 315-323, 2015.

TORRES, A.C.G. Pertinência da normativa estadual e distrital sobre logística reversa aplicada ao setor de medicamentos no Brasil. **Caderno Ibero Americano de Direito Sanitário**. Brasília, v.5, p. 41-59, 2016.

UEDA, J, et al. Impacto ambiental do descarte de fármacos e estudo da conscientização da população a respeito do problema. **Revista Ciências do ambiente**, v.5, n.1, p. 1-6, 2009.

VAZ, K.V.; FREITAS, M.M.; CIRQUEIRA, J.Z. Investigação sobre a forma de descarte de medicamentos vencidos. **Cenarium Farmacêutico**, v.4, n.4, 2011.

VILARINO, J.F. et al. Perfil da automedicação em município do Sul do Brasil. **Revista Saúde Pública**, v. 32 n.1, p 43-49. 1998.

ZAPARROLI, I.D.; CAMARA, M.R.G.; BECK, C. Medidas mitigadoras para a indústria de fármacos **Comarca de Londrina-PR**. Brasil: impacto ambiental do despejo de resíduos em corpos hídricos. In: **3ºInternational Workshop Advanced in Cleaner Production**. Cleaner Production Initiatives and Challenges for a Sustainable World. São Paulo, 2011.

Submitted: 23/12/2016

Accepted: 01/12/2017

<http://dx.doi.org/10.1590/1809-4422asoc0295r1v2042017>

MEDICATION DISPOSAL: A REFLECTION ABOUT POSSIBLE SANITARY AND ENVIRONMENTAL RISKS

HAYSSA MORAES PINTEL RAMOS
VANESSA RESENDE NOGUEIRA CRUVINEL
MICHELINE MARIE MILWARD DE AZEVEDO MEINERS
CAMILA ARAÚJO QUEIROZ
DAYANI GALATO

Resumo: O presente artigo analisou a forma de descarte de medicamentos pela população do Distrito Federal (DF), refletindo sobre seus possíveis riscos sanitários e ambientais. Para tanto se realizou um estudo exploratório de corte transversal baseado em entrevistas com moradores das sete Unidades de Planejamento Territorial (UTP) do DF. Dentre os 393 entrevistados, 73,8% referiram possuir estoque de medicamentos no seu domicílio, 78,9% afirmaram já ter realizado o descarte de medicamentos sendo feitos pela maioria, juntamente com os resíduos do tipo comum (73,6%). O descarte adequado esteve fortemente associado a maior escolaridade ($p=0,027$), maior classificação econômica ($p=0,005$), sexo masculino ($p=0,006$) e ao fato de ter recebido informação sobre o tema ($p<0,001$). Foi possível observar que o descarte inadequado de medicamentos é uma prática comum. Suscita a necessidade da incorporação do tema em políticas específicas e em meios de comunicação.

Palavras-chave: Resíduos de Medicamentos, Saúde Pública, Saúde Ambiental e Resíduos de Serviços de Saúde.

Abstract: This article has analyzed the drug disposal form by the population of Distrito Federal (DF), reflecting about its possible health and environmental risks. For that, an exploratory cross-sectional study was conducted based on interviews with residents of all Territorial Planning Units in DF. Among the 393 interviewees, 73.8% had a stock of medicines at home, 78.9% had already discarded drugs, which were mostly done in the common waste (73,6%). Adequate discharge was strongly associated with greater schooling ($p = 0,027$), higher economic classification ($p = 0,005$), male sex ($p = 0,006$) and with receiving information about the subject ($p < 0,001$). It is noted that the inappropriate disposal of drugs is common. It presents the need to incorporate the theme into specific policies and media.

Keywords: Drug Residues, Public Health, Environmental Health, Medical Waste

Resumen: Este artículo muestra cómo la población del Distrito Federal (DF) se deshace de los medicamentos, teniendo en cuenta sus posibles riesgos medioambientales y de salud. Por lo tanto, llevamos a cabo un estudio exploratorio transversal basado en entrevistas con residentes de todas las Unidades de Planificación Territorial del Distrito Federal. Entre los 393 encuestados el 73,8% tenían un stock de medicamentos en sus hogares, el 78,9% realizó la eliminación de los medicamentos y el 73,6% lo hizo por medio de la basura. La eliminación adecuada está fuertemente asociada a la educación superior ($p = 0,027$), mayor estatus económico ($p = 0,005$), el sexo masculino ($p = 0,006$) y el hecho de haber recibido información sobre el tema ($p < 0,001$). Se observa que la eliminación inadecuada de medicamentos es común. Suscita la necesidad de incorporar el tema de las políticas específicas y los medios de comunicación.

Palabras-clave: Residuos de Medicamentos; Salud Pública, Salud Ambiental, Residuos Sanitarios
