REUFPI
Revista de Enfermagem da UFPI
ISSN 2238-7234

Original

Medication disposal at home by nursing students

Descarte domiciliar de medicamentos por estudantes de enfermagem

Desecho domiciliario de medicamentos realizado por estudiantes de enfermería

Hernandes Flanklin Carvalho Oliveira[1]
ORCID: 0000-0003-0498-0600
Augusto Cezar Antunes de Araujo Filho[1]
ORCID: 0000-0002-3998-2334
Ana Karine da Costa Monteiro[2]
ORCID: 0000-0001-9707-5233
Priscilla Dantas Almeida[3]
ORCID: 0000-0002-6574-6335
Maria Madalena Gomes Pereira Máximo[1]
ORCID: 0000-0001-5098-5045

[1]Universidade Estadual do Piauí. Floriano, Piauí, Brasil.
[2]Hospital Getúlio Vargas. Teresina, Piauí, Brasil.
[3]Universidade Federal do Amazonas. Manaus, Amazonas, Brasil.

Corresponding author:
Augusto Cezar Antunes de Araujo Filho
E-mail:
augustoantunes@frn.uespi.br

Abstract

Objective: To analyze the practice of home disposal of medications among nursing students of a public higher education institution. **Method:** A descriptive-exploratory, quantitative study conducted through an online questionnaire with 84 nursing students. Data were collected by Google Forms and analyzed in the Statistical Package for the Social Sciences, through descriptive and inferential statistics. **Results:** The majority (90.5%) reported that they have already discarded medications, especially analgesics (71.4%), and made the incorrect disposal of the medications together with household waste. There was a lack of knowledge about the place for collection of expired medications by most students, and lack of instructions on proper disposal. It was observed that most of the research participants highlighted that they would return medications, expired or useless, to pharmacies or health establishments and that it is necessary to disposal them differently from ordinary waste. **Conclusion:** The practice of home disposal of medications among nursing students at a public higher education institution is unsafe.

Descriptors: Pharmaceutical Preparations; Nursing students; Environment; Environmental health.

Whats is already known on this?
Disposal of medications at home is predominantly carried out in an unsafe manner among the general population, which can cause serious risks to the environment and human health.

What this study adds?
Medication disposal at home among nursing students is predominantly unsafe, but they have knowledge about the damage to human health and to the environment.

How to cite this article: Oliveira HFC, Araujo Filho ACA, Monteiro AKC, Almeida PD, Máximo MMGP. Medication disposal at home by nursing students. Rev. enferm. UFPI. [internet] 2023 [Cited: ano mês abreviado dia];12: e3944. DOI: 10.26694/reufpi.v12i1.3944

Resumo

Objetivo: *Analisar a prática de descarte domiciliar de medicamentos entre estudantes de enfermagem de uma instituição de ensino superior pública.* **Método:** *Estudo descritivo-exploratório, quantitativo, realizado por meio de questionário online, com 84 estudantes de enfermagem. Os dados foram coletados pelo Google Forms e analisados no Statistical Package for the Social Sciences por meio de estatística descritiva e inferencial.* **Resultados:** *A maioria (90,5%) refere que já descartou medicamentos, sobretudo analgésicos (71,4%), e o descarte incorreto, com o lixo domiciliar. Verificou-se desconhecimento acerca de local para coleta de medicamentos vencidos pela maioria dos estudantes, bem como ausência de instruções sobre descarte adequado. Observou-se que grande parte dos participantes da pesquisa destacou que retornaria medicamentos, vencidos ou sem utilidade, para as farmácias ou estabelecimentos de saúde e que é necessário descartar de forma diferenciada do lixo comum.* **Conclusão:** *A prática domiciliar de descarte de medicamentos entre estudantes de enfermagem de uma instituição de ensino superior pública é insegura.*

Descritores: *Preparações Farmacêuticas; Estudantes de Enfermagem; Meio Ambiente; Saúde Ambiental.*

Resumén

Objetivo: *Analizar la práctica de desecho domiciliario de medicamentos realizado por estudiantes de enfermería de una institución pública de enseñanza superior.* ***Métodos:*** *Estudio descriptivo-exploratorio, cuantitativo, realizado a través de un cuestionario en línea, con 84 estudiantes de enfermería. Los datos fueron recolectados usando Google Forms y analizados usando el Paquete Estadístico para Ciencias Sociales, con estadística descriptiva e inferencial.* ***Resultados:*** *La mayoría (90,5%) relató que ya había desechado medicamentos, especialmente los analgésicos (71,4%), y la eliminación efectuada incorrectamente junto con los desechos domésticos. La mayoría de los estudiantes desconocía dónde se hacía la recolecta de medicamentos vencidos y carecían de instrucciones sobre cómo desecharlos correctamente. La mayoría de los participantes de la investigación destacaron que devolverían los medicamentos vencidos o inservibles a las farmacias o establecimientos de salud y que era necesario disponer de ellos de manera diferente a los residuos comunes.* ***Conclusión:*** *Es insegura la práctica de eliminación domiciliaria de medicamentos entre estudiantes de enfermería de una institución pública de educación superior.*

Descriptores*: Preparaciones Farmacéuticas; estudiantes de enfermería; Medio ambiente; Salud Ambiental*

INTRODUCTION

Advances in the field of technology, especially in the health area, enabled technological development in several areas, especially the mechanization of the pharmaceutical and medical industry, which increased the amount of medications available for large-scale distribution, marketing and, mainly, consumption.[1]

The use of medications is a practice that has been increasingly consolidated in contemporary times, since the culture of medicalization and the technological strengthening of the pharmaceutical industry drive, through advertising and/or marketing, people to consume these substances, often irrationally, consequently storing in their homes and despising expired or disused medications in an inappropriate place.[2]

With the improper disposal of medications, especially in common waste or in the sewage network, contamination of the soil, surface waters such as rivers, lakes and oceans and also groundwater can occur.[3-4] These chemicals, when exposed to adverse humidity conditions such as temperature and light, can turn into toxic substances, affecting the balance of the environment and altering biogeochemical cycles, as well as interfering with webs and food chains.[3]

Although there are studies on the knowledge and practice of safe disposal of medications, there is a scarcity on the knowledge and practice of disposal among health students, such as nursing students.[5] Therefore, it is important to know the practice of this group in order to assist in the elaboration of educational programs, guidelines and strategies to combat the practices of inappropriate medication disposal. In this sense, this study questions "what is the practice of home disposal of medications among students of the nursing course of a higher education institution (HEI) in Piauí?" and aims to analyze the practice of home disposal of medications among nursing students of a public higher education institution.

METHODS

This is a descriptive-exploratory research, with a quantitative approach, carried out in a medium-sized city in the State of Piauí, which had as a scenario a higher education institution (HEI). Currently the *campus* of the aforementioned HEI has ten courses, between bachelor's degree and undergraduate degree; it is noteworthy that only the Bachelor's degree in Nursing was addressed in this study. In order to ensure greater adequacy of the study, the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) cross-sectional studies of the EQUATOR Network was used to guide and develop the research.[6]

The study population consisted of all 84 nursing students enrolled in the public HEI, located in the municipality of Floriano-PI. We included only those students regularly enrolled in the course and who had regular attendance and, as an exclusion criterion, those who did not have access to the *internet*, those who answered the questionnaire incompletely and those who did not answer the questionnaire after two search attempts. The sample was a census, composed of 84 nursing students.

For data collection, the online questionnaire was sent to the Bachelor of Nursing students of the HEI, via institutional email and/or instant messaging application, with the following attachments: the invitation requesting participation in the research, the objectives of the study, purpose, in addition to the data collection instrument and other information about the research, the Informed Consent Form (ICF), in Portable Document Format (PDF), and the link to access the online questionnaire in Google Forms, the means used for data collection. It is noteworthy that the link gave access to the ICF, initially, and after agreeing to participate, the student had access to the study questionnaire, which contained questions with multiple alternatives and related to the theme of the study.

The data were exported from *Google Forms* to the *Microsoft Excel*® spreadsheet and analyzed in the *Statistical Package for the Social Sciences*, version 20.0. For data analysis, the usual descriptive statistical procedures were used, such as absolute (n) and relative (%) frequency distribution, means and standard deviation. In the bivariate analysis, *Fisher*'s exact test was used to verify the association between sociodemographic and school variables and the correct disposal of medications. The level of significance was set at $p < 0.05$.

This study complied with all ethical requirements of Brazilian resolutions on research with human beings[7] and on research procedures in a virtual environment.[8] It is noteworthy that this study was approved by the Research Ethics Committee of the State University of Piauí, with opinion number 5,294,319.

RESULTS

It was found that most students (60.7%) had already attended the environmental health course. Regarding the profile, the majority were female (77.4%), single (80.3%), brown (60.7%), had a family income of up to one minimum wage (39.3%) and a mean age of 24.9 years (SD 6.7) (Table 1).

Table 1. Characterization of nursing students from a public higher education institution in Floriano, Piauí, Brazil, 2022. (n= 84). Floriano, Piauí, Brazil, 2022.

Variables	n	%	Mean ± SD
Attended the environmental health course			
Yes	51	60.7	
No	33	39.3	
Age (years)			
Up to 20	16	19.0	24.9 ± 6.7
21 to 25	48	57.1	
26 to 30	10	11.9	
More than 30	10	11.9	
Sex			
Male	19	22.6	
Female	65	77.4	
Marital status			
Single	70	83.3	
Married/common-law married	14	16.7	
Race and/or color			
Brown	51	60.7	
Black	17	20.2	
White	16	19.0	
Family income (minimum wages)			
Up to 1	33	39.3	
1 to 2	28	33.3	
2 to 5	20	23.8	
5 to 10	3	3.6	

Source: Authors' elaboration.

Regarding the use of medications, it was identified that the majority of students: had medications at home (97.6%) and did not continuously use medication (69.0%). Regarding disposal, most reported: having discarded medications (90.5%), especially analgesics (71.4%), discarded liquid and capsule medications along with household waste (81.0%) (Table 2).

Table 2. Practices of consumption, disposal and destination of medications of nursing students from a public higher education institution in Floriano, Piauí, Brazil, 2022. (n= 84). Floriano, Piauí, Brazil, 2022.

Variables	n	%
Has medications at home		
Yes	82	97.6
No	2	2.4
Discarded medications*		
Antibiotics	30	35.7
Analgesics	60	71.4
Vitamins	31	36.9
Anti-inflammatories	37	44.0
Psychopharmaceuticals	2	2.4
Antihypertensives.	7	8.3
Others	9	10.7
Observes the aspect/appearance of the medication before using it		
Yes	74	88.1
No	10	11.9
Makes use of some continuous medication		
Yes	26	31.0
No	58	69.0
Has already discarded some medication		
Yes	76	90.5
No	8	9.5
Action taken when liquid medications are past the expiry date*		
Disposal next to household waste	68	81.0
Disposal in the sink	23	27.4
Disposal in the toilet	11	13.1
Return to pharmacy	3	3.6
Return to the basic health unit or other health establishment	2	2.4
Perform burning	-	-
Disposal in the sewer	2	2.4
Action taken when capsule/tablet medications are past the expiry date*		
Disposal next to household waste	70	83.3
Disposal in the sink	6	7.1
Disposal in the toilet	11	13.1
Return to pharmacy	3	3.6
Return to the basic health unit (BHU) or other health establishment	2	2.4
Perform burning	1	1.2
Disposal in the sewer	2	2.4

Source: Authors' elaboration.
*Multiple Response

Regarding knowledge about environmental legislation, it was observed that the majority: does not know a place that collects expired medications (97.6%), never received instructions on proper disposal (73.8%), highlights that, most probably, would return expired medications for correct disposal in pharmacies or health establishments (92.9%), and believes that it is necessary to dispose of common waste differently (84.5%), as well as that consumers (81.0%) should have greater responsibility in the correct destination of medications, and that medications can be part of logistics (69.0%) (Table 3).

Table 3. Knowledge about environmental legislation of nursing students from a public higher education institution in Floriano, Piauí, Brazil, 2022. (n= 84). Floriano, Piauí, Brazil, 2022.

Variables	n	%
Do you know a place that collects used or expired medications?		
Yes	2	2.4
No	82	97.6

If a medication receiving program were implemented in local pharmacies or health establishments, how likely would you be to return your expired or unused medications to these locations for the correct destination?		
Very likely	52	61.9
Likely	26	31.0
Unlikely	6	7.1
Have you received any instructions on the proper disposal of medications?		
Yes	22	26.2
No	62	73.8
Is it necessary to dispose of medications differently from ordinary waste?		
Yes	71	84.5
No	1	1.2
I don't know	12	14.3
Can the incorrect disposal of medications cause impacts on the health of the population?		
Yes	84	100.0
No	-	-
Can improper disposal of medications cause pollution of water, soil, air and the environment in general?		
Yes	84	100.0
No	-	-
Who has any kind of responsibility in the correct destination of medication?*		
Consumers	68	81.0
Merchants	41	48.8
Government	53	63.1
Distributors	37	44.0
Manufacturers	43	51.2
Importers	14	16.7
Knowing that Reverse Logistics consists of the return of certain types of waste to the business sector for correct disposal, in your opinion, are medications subject to this system?		
Yes	58	69.0
No	9	10.7
I don't know	17	20.2

Source: Authors' elaboration.
*Multiple Response.

Table 4 shows that the family income variable presented a statistically significant difference (p=0.036) with the correct disposal of liquid medications.

Table 4. Correct disposal of liquid medications from nursing students at a public higher education institution in Floriano, Piauí, Brazil, 2022. (n= 84). Floriano, Piauí, Brazil, 2022.

Variables	Proper disposal Liquid medications		p-value
	Yes (n=1)	No (n=83)	
	n (%)	n (%)	
Attended the environmental health course			
Yes	1 (100.0)	50 (60.2)	1.000
No	-	33 (39.8)	
Age (years)			
Up to 20	-	16 (19.3)	1.000
21 to 25	1 (100.0)	47 (56.6)	
26 to 30	-	10 (12.0)	
More than 30	-	10 (12.0)	
Sex			
Male	-	19 (22.9)	1.000
Female	1 (100.0)	64 (77.1)	
Marital status			
Married	-	7 (8.4)	1.000
Single	1 (100.0)	69 (83.1)	
Common-law marriage	-	7 (8.4)	
Race and/or color			
White	-	16 (19.3)	1.000
Black	-	17 (20.5)	
Brown	1 (100.0)	50 (60.2)	

Family income (minimum wages)			
Up to 1	-	33 (39.8)	**0.036**
1 to 2	-	28 (33.7)	
2 to 5	-	20 (24.1)	
5 to 10	1 (100.0)	2 (2.4)	

Source: Authors' elaboration.

It is verified that the family income variable presented a statistically significant difference (p=0.049) with the correct disposal of capsules/tablets (Table 5).

Table 5. Correct disposal of capsules and tablets from nursing students of a public higher education institution in Floriano, Piauí, Brazil, 2022. (n= 84). Floriano, Piauí, Brazil, 2022.

Variables	Proper disposal capsules/tablets Yes (n=3) n (%)	No (n=81) n (%)	p-value
Attended the environmental health course			
Yes	1 (33.3)	50 (61.7)	0.460
No	2 (66.7)	31 (38.3)	
Age (years)			
Up to 20	-	16 (19.8)	0.629
21 to 25	2 (66.7)	46 (56.8)	
26 to 30	1 (33.3)	9 (11.1)	
More than 30	-	10 (12.3)	
Sex			
Male	1 (33.3)	18 (22.2)	1.000
Female	2 (66.7)	63 (77.8)	
Marital status			
Married	-	7 (8.6)	1.000
Single	3 (100.0)	67 (82.7)	
Common-law marriage	-	7 (8.6)	
Race and/or color			
White	-	16 (19.8)	0.773
Black	-	17 (21.0)	
Brown	3 (100.0)	48 (59.3)	
Family income (minimum wages)			
Up to 1	2 (66.7)	31 (38.3)	**0.049**
1 to 2	-	28 (34.6)	
2 to 5	-	20 (24.7)	
5 to 10	1 (33.3)	2 (2.5)	

Source: Authors' elaboration.

DISCUSSION

Modern society has gone through great evolutionary processes and its relationship with the environment has always been guided by great challenges and problems. The unbridled population increase has caused the environment to suffer the negative impacts of a fully advanced world. In addition to the population increase, the emergence and growth of industries, which added even more to environmental degradation, especially pharmaceuticals.[9]

With the analysis of the results, it is verified that most participants have already attended the Environmental Health course, and even so, it is observed that there is irregular disposal of medications. The findings are similar to a study carried out with the academic community of the federal university of Rio Grande do Sul, in which most of the target audience, regardless of the teaching unit, degree of environmental knowledge or who have already taken courses related to the subject, reports that they discard in common waste, which allows us to infer that the lack of knowledge is not the triggering factor for the practice of disposal.[10]

In this study, with regard to family income, most students stated that they had an income of up to one minimum wage, a dissonant result from a study conducted with 682 undergraduates, in which the students' income range was between two and four minimum wages.[11] It was also observed that income was significantly statistically associated with correct disposal, as well as the finding of a study carried out

with the population of Brasília,[12] assuming the need to promote education, information and awareness of the risks of incorrect disposal.[12]

Most of the nursing students in this study had medications at home, even if they do not make continuous use, findings that corroborate with a study conducted in Saudi Arabia, which had as participants students of pharmacy and nursing,[5] in Nepal, with students of medication and dentistry,[13] and another conducted in Campo Grande (MT), with university students from various areas.[14] This practice is common in several countries of the world, in which the culture of maintaining "homemade mini-pharmacies" (household stock of medications) prevails, which promotes the irrational consumption of medications, favoring self-medication, the occurrence of accidents and the accumulation of various chemicals inside the home.[1] It is suggested to guide the population on the risks of medication without medical guidance through educational programs, enhancing the harms of self-medication.

In addition, the storage of medications, most of the time, in easily accessible places and with the lack of guidance from those responsible and those who have knowledge about medications, are factors that contribute to the high rates of intoxication and self-medication, especially in children, as many medications are sweet and colorful, which can attract the attention of the child, and promote ingestion when a responsible person is not present.[10]

In this study, the largest portion reported that they have already discarded medications, and analgesics were the most frequently reported medications. Similar result to the study carried out with individuals living in 348 households in Picos-PI,[2] in which the same medication class was predominant in the home disposal of medications. This is due to the fact that analgesics are among the most used medications worldwide, often prescribed for pain relief, common in everyday life, such as headache and myalgia.[15]

As for the place of disposal, most of them discarded medications in the domestic garbage, which was also found in a study in Saudi Arabia, in which the majority of nursing students also discarded unused and expired medications in the domestic garbage.[5] This reality was also recorded in national studies, carried out with university students from various areas[14] and with the academic community of a federal university in Rio Grande do Sul.[10] Thus, it is observed that, despite being students of health courses, in which greater awareness would be expected in relation to the disposal of medications, they have this practice that can cause damage to the environment and health, which makes it necessary to adopt further clarifications.[16]

All students in this study pointed out that the inappropriate destination of medications can cause harm to the environment, a finding that corroborates an international study by Saudi Arabia.[5] This fact corroborates the literature, since the disposal of medications in household waste directly affects the environment, mainly due to the fact that the medication has several chemicals that make it conducive to contamination of the intended place and many living beings that are around it.[14]

When discarded in inappropriate places, expired or unused medications can cause soil and water contamination. These medications dissolve and can become pollutants that reach the soil, the water table, the rivers and the atmosphere, in addition to becoming risks to the environment and health, when they come into contact with humans and animals.[16] To this end, the aforementioned risks must be well disseminated by society, and public policies must be reinforced in this regard.

Regarding the program for the return of expired or useless medications, 92.9% of students stated that they would return these medications to pharmacies or health establishments. This system, known as reverse logistics, in Brazil there is still no regulation or program that determines the collection of expired medications in homes, and, by convention, the reverse logistics system is used, which places the producer as legally responsible for the disposal of medications.[2] Therefore, educational strategies and awareness of society are essential, because regardless of the investment applied to the treatment of medication waste and its correct destination, the system will be inefficient if the population is not aware of the collection points, as well as the harms of incorrect disposal. [17].

The limitations in this research are related to the fact that there may have been some information bias, considering that participants should remember some aspects related to practices performed in the past. As for the contributions of this study, the collaboration for environmental health stands out, in view of which it was possible to identify the development of an unsafe practice of home disposal of medications by nursing students, which enables the reflection of society for the promotion of environmental awareness and also the development of educational actions on safe home disposal of medications with nursing students and the population in general.

CONCLUSION

The home practice of medication disposal among nursing students of a public higher education institution is unsafe, considering that the place most cited by students for the disposal of liquid formulas and capsules was domestic waste. It is noteworthy that, even doing the home disposal of medications inappropriately, students have knowledge about damage to human health and the environment, possibly performing this practice because they do not know a place that collects expired medications and because they have never received instructions on proper disposal.

In this sense, the importance of guiding nursing students and the general population regarding the correct way to dispose of medications is highlighted, as well as emphasizing the damage that this practice, when performed inappropriately, can entail to the environment and human health.

CONTRIBUITIONS

Conception or design of the study: Oliveira HFC, Araujo Filho ACA. Data collection: Oliveira HFC, Araujo Filho ACA. Data analysis and interpretation: Oliveira HFC, Araujo Filho ACA, Monteiro AKC, Almeida PD, Máximo MMGP. Writing of the article or critical review: Oliveira HFC, Araujo Filho ACA, Monteiro AKC, Almeida PD, Máximo MMGP. Final approval of the version to be published: Oliveira HFC, Araujo Filho ACA, Monteiro AKC, Almeida PD, Máximo MMGP.

REFERENCES

1. Constantino VM, Fregonesi BM, Tonani KAA, Zagui GS, Toninato APC, Nonose ERS, *et al*. Storage and disposal of pharmaceuticals at home: a systematic review. Cien Saude Colet. [Internet]. 2020;25:585-94. Doi: https://doi.org/10.1590/1413-81232020252.10882018

2. Pereira FGF, Sá FHM, Silva RRL, Silva RKS, Formiga LMF, Souza EC. Authorreferated knowledge and behavior on disposal of domiciliary medicines. Rev Fun Care Online. [Internet]. 2019;11(1):154-9. Doi: http://dx.doi.org/10.9789/2175-5361.2019.v11i1.154-159

3. Queiroz LL, Pontes SRL. Práticas de descarte de medicamentos entre moradores do município de Trindade-GO. Saúde (Santa Maria). [Internet]. 2021;47(1). Doi: https://doi.org/10.5902/2236583463932

4. Jha N, Kafle S, Bhandary S, Shankar PR. Assessment of knowledge, attitude, and practice of disposing and storing unused and expired medicines among the communities of Kathmandu, Nepal. PLoS ONE. [Internet]. 2022;17(8):e0272635. Doi: https://doi.org/10.1371/journal.pone.0272635

5. Bashatah A, Wajid S. Knowledge and disposal practice of leftover and expired medicine: a cross-sectional study from nursing and pharmacy students' perspectives. Int J Environ Res Public Health. [Internet]. 2020 Mar[cited 2022 oct 2022]; 17(6): 2068. Doi: https://doi.org/10.3390/ijerph17062068

6. Von Elm E, Altman DG, Egger M, Pocock SJ, Gotzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: guidelines for reporting observational studies [Internet]. 2007. [cited 2023 May 19]. Available from: https://www.equator-network.org/reporting-guidelines/strobe/

7. Ministério da Saúde (BR). Resolução nº 466 do Conselho Nacional de Saúde, de 12 de dezembro de 2012 (BR) [Internet]. Aprova as diretrizes e normas regulamentadoras de pesquisas envolvendo seres humanos. Diário Oficial da União. 12 dez 2012. [acesso em: 14 fev. 2022]. Available from: https://conselho.saude.gov.br/resolucoes/2012/Reso466.pdf.

8. Ministério da Saúde (BR). Carta Circular nº 1/2021 [Internet]. Orientações para procedimentos em pesquisas com qualquer etapa em ambiente virtual. Brasília. 03 mar. 2021 [acesso em: 14 fev. 2022]. Available from: http://conselho.saude.gov.br/images/comissoes/conep/documentos/CARTAS/Carta_Circular_01.2021.pdf

9. Silva GM, Oliveira AL. Logística reversa de medicamentos no Brasil: uma contribuição para a sustentabilidade. Interface Tecnológica. [Internet]. 2020; 17 (2): 718-30. Doi: https://doi.org/10.31510/infa.v17i2.951

10. Michelon N, Jesus PR, Oliveira DM, Zucco BS, Bayer VML, Flores LM, *et al.* (2019). Práticas e fatores associados ao armazenamento e descarte de medicamentos por comunidade acadêmica de universidade do Sul do Brasil. Saúde (Santa Maria). [Internet]. 2019;45(3). Doi: https://doi.org/10.5902/2236583439301

11. Santos VP, Coelho MTAD, Rodrigues Júnior NM. Conhecimento, renda e práticas de prevenção acerca do HIV/AIDS entre estudantes universitários. Saúde e Pesquisa.[Internet]. 2022;15(1):e-9040. Doi: https://doi.org/10.17765/2176-9206.2022v15n1.e9040

12. Ramos HMP, Cruvinel VRN, Meiners MMMA, Queiroz CA, Galato D. Descarte de medicamentos: uma reflexão sobre os possíveis riscos sanitários e ambientais. Ambient. soc. [Internet]. 2017; 20(4):149-74. Doi: https://doi.org/10.1590/1809-4422asoc0295r1v2042017

13. Jha N, Shankar PR, Palaian S. Knowledge and practice on ecopharmacovigilance and medicine storage amongst medical and dental students in Lalitpur, Nepal. Risk Manag Healthc Policy. [Internet]. 2021; 14: 793–802. Doi: https://doi.org/10.2147/RMHP.S291025

14. Gonzales GM, Ferreira E. Percepção de universitários de Campo Grande sobre o descarte de medicamentos domiciliares e seus impactos ao meio ambiente. Ensaios e Ciências. [Internte]. 2020;24(4):370-80. doi: https://doi.org/10.17921/1415-6938.2020v24n4p370-380

15. Ruiz-Pegoraro CM, Bifaroni RMS, Mareco EA, Tonizza TR, Silgueiro LI. Caracterização da prática de automedicação com analgésicos para o tratamento da dor. *Colloquium Vitae* [Internet]. 2020;11(3):85–91. Available from: https://revistas.unoeste.br/index.php/cv/article/view/2437

16. Batista Neto N, Silva VM, Azolin GB, Desuchle VCKN. Avaliação do conhecimento dos estudantes da área da saúde sobre o descarte e uso racional de medicamentos. Holos. [Internet]. 2021;1:e9523. Available from: https://www2.ifrn.edu.br/ojs/index.php/HOLOS/article/view/9523

17. Freitas RMCC, Castro, ECF. O descarte de resíduos medicamentosos no Brasil: Uma análise normativa. Research, Society and Development [Internet]. 2022; 11(9): e51011932211. Available from: file:///C:/Users/SAMSUNG/Downloads/32211-Article-363176-1-10-20220716.pdf.

Conflicts of interest: No
Submission: 2023/13/02
Revised: 2023/31/03
Accepted: 2023/24/05
Publication: 2023/28/08

Editor in Chief or Scientific: Raylane da Silva Machado
Associate Editor: Guilherme Guarino de Moura Sá