Medication Review in Oncology Patients in Palliative Care: Pharmacist Assurance of Reasonable and Safe Use of Medications to Control Symptoms

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Revisão da Farmacoterapia em Pacientes Oncológicos sob Cuidados Paliativos: o Farmacêutico na Garantia do Uso Racional e Seguro de Medicamentos para o Controle de Sintomas

Revisión de la Farmacoterapia en Pacientes Oncológicos en Cuidados Paliativos: el Farmacéutico en la Garantía del uso Racional y Seguro de los Medicamentos para el Control de los Síntomas

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ABSTRACT

Introduction: The medication review consists in analyzing the drugs utilized by a patient with the aim of reducing drug-related problems (DRP). Palliative treatment can cause adverse effects and contribute to polypharmacy. Therefore, the pharmacist plays a key role in ensuring the safety and reasonable use associated with pharmacological treatment. **Objective:** To analyze the medication review carried out in cancer patients undergoing exclusive palliative care at a reference hospital in Rio de Janeiro. **Method:** Observational, descriptive, retrospective quantitative approach study, involving patients admitted to the exclusive palliative care unit of the National Cancer Institute (INCA) whose pharmacological treatment was reviewed by the pharmacist from June 1, 2022 to May 31, 2023. **Results:** 171 patients, mostly females (n=114; 66.7%), aged 60 years or older (n=104; 60.8%) had their pharmacological treatment reviewed. More than half of them had at least one comorbidity (n=93; 54.4%), with predominance of those related to the circulatory system (n=68; 43.9%). The percentage of DRP and pharmaceutical interventions was similar (23.4%). The main DRP was the use of a medication the patient did not need (n=49; 53.3%) and most interventions excluded medications (n=55; 56.7%). There was acceptance of 93.5% of the interventions. **Conclusion:** The study highlights the importance of reviewing pharmacotherapy to optimize drug treatment in palliative care and reinforces the need to reduce the number of end-of-life prescribed medications.

Key words: Medication Review; Deprescriptions; Oncology; Palliative Care.

RESUMO

Introdução: A revisão farmacoterapêutica consiste na análise dos fármacos utilizados por um paciente, objetivando a diminuição de problemas relacionados a medicamentos (PRM). O tratamento paliativo pode acarretar efeitos adversos e contribuir para a polifarmácia. Portanto, o farmacêutico é de grande valia para garantir a segurança e o uso racional associado ao tratamento farmacológico. **Objetivo:** Analisar a revisão da farmacoterapia realizada em pacientes oncológicos submetidos a cuidados paliativos exclusivos em um instituto de referência no Rio de Janeiro. **Método:** Estudo observacional, descritivo, retrospectivo, com abordagem quantitativa, envolvendo pacientes internados na unidade de cuidados paliativos exclusivos do Instituto Nacional de Câncer, que tiveram seu tratamento farmacológico revisado pelo farmacêutico, no período de 1 de junho de 2022 a 31 de maio 2023. **Resultados:** O tratamento farmacológico foi revisado em 171 pacientes, a maioria do sexo feminino (n=114; 66,7%) com idade igual ou maior do que 60 anos. Mais da metade dos pacientes apresentou pelo menos uma comorbidade (n=93; 54,4%), com predomínio daquelas relacionadas ao sistema circulatório (n=68; 43,9%). A porcentagem de PRM e de intervenções farmacêuticas forneceram resultados equivalentes (23,4%). O principal PRM foi a utilização de medicamento de que o paciente não necessitava (n=49; 53,3%) e a maioria das intervenções ocorreu para a exclusão de medicamentos (n=55; 56,7%). Houve 93,5% de aceitabilidade das intervenções. **Conclusão:** O estudo sinaliza a importância da revisão da farmacoterapia na otimização do tratamento medicamentoso em cuidados paliativos e reforça a necessidade de reduzir o número de medicamentos prescritos no final da vida.

Palavras-chave: Revisão de Medicamentos; Desprescrições; Oncologia; Cuidados Paliativos.

RESUMEN

Introducción: La revisión farmacoterapéutica consiste en analizar los fármacos utilizados por un paciente, con el objetivo de reducir los problemas relacionados con los medicamentos (PRM). El tratamiento paliativo puede provocar efectos adversos y contribuir a la polifarmacia. Por lo tanto, el farmacéutico es de gran valor para garantizar la seguridad y el uso racional asociado al tratamiento farmacológico. **Objetivo:** Analizar la revisión de la farmacoterapia realizada en pacientes con cáncer sometidos a cuidados paliativos exclusivos en un instituto de referencia de Río de Janeiro. **Método:** Estudio observacional, descriptivo, retrospectivo, con enfoque cuantitativo, que involucró a pacientes ingresados en la unidad de cuidados paliativos exclusivos del Instituto Nacional do Cáncer, quienes tuvieron su tratamiento farmacológico revisado por el farmacéutico, del 1 de junio de 2022 al 31 de mayo de 2023. **Resultados:** Se revisó el tratamiento farmacológico en 171 pacientes, la mayoría de sexo femenino (n=114; 66,7%) con edad igual o superior a los 60 años (n=104; 60,8%). Más de la mitad de los pacientes presentaron al menos una comorbilidad (n=93; 54,4%), con predominio de las relacionadas con el sistema circulatorio (n=68; 43,9%). El porcentaje de PRM y el porcentaje de intervenciones farmacéuticas arrojaron resultados equivalentes (23,4%). El PRM principal fue el uso de un medicamento que el paciente no necesitaba (n=49; 53,3%) y la mayoría de las intervenciones ocurrió para excluir medicamentos (n=55; 56,7%). Hubo 93,5% de aceptabilidad de las intervenciones. **Conclusión:** El estudio destaca la importancia de revisar la farmacoterapia para optimizar el tratamiento farmacológico en cuidados paliativos y refuerza la necesidad de reducir el número de medicamentos prescritos al final de la vida.

Palabras clave: Revisión de Medicamentos; Deprescripciones; Oncología; Cuidados Paliativos.

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INTRODUCTION

Over the last decades, significant changes in the epidemiological profiles were observed around the world, characterized by an increase in life expectancy and death by chronic illnesses[1]. Such data has led to long-term pharmacological treatments, to an increased use of medications, and the occurrence of polypharmacy (the simultaneous use of four or more medications)[2,3].

The associated use of some drugs is considered beneficial from a point of view of damage minimization and improvement of patients' quality of life[4]. However, the concomitant use of different therapies when done irrationally and with no scientific evidence can cause disabling medication interactions and adverse reactions, in addition to contributing to a lower adhesion to treatment, higher financial burden, increased hospitalizations and even medication-related death[4,5].

According to the World Health Organization, about 50% of people who suffer from chronic conditions do not follow pharmacological treatments, 4% to 5% of hospitalizations are caused by preventable adverse reactions, and about 30% of emergency appointments are due to drug-related problems (DRP)[4,6]. In face of this issue, medication review has become a key element for improving the quality of prescriptions and ensuring the rational and safe use of medications[7,8].

Medication review is defined as a critical and structured analysis of the drugs used by the patient, with the objective of minimizing the occurrence of DRP, improving therapeutic results and reducing the waste of resources[9,10]. In addition, the review can be considered an educational intervention to foster knowledge and patient adhesion to treatment[11]. Through this process, it is possible to optimize the prescription, reduce polypharmacy, and help select the most appropriate medication for the patient's clinical condition[12].

This work process has been used by many organizations as a quality indicator to assess the continuous development of the service, and can be carried out in several ways, depending on the local infrastructure, access to documented clinical information, and complexity of the patient in question[10,13].

Regarding the target population, some medication review guides suggest that certain groups should be prioritized in this service. People considered susceptible to DRP include patients who use four or more medications every day; patients that intake over 12 doses in a day; patients who have been recently discharged from the hospital; patients who are being transferred to home care; patients who are frequently admitted to the hospital; patients with multiple comorbidities, and who receive medication prescriptions from more than one specialized doctor[14-16]. The described characteristics define the reality of a patient in palliative care.

This type of care is defined as integral health care provided to the person who carries a serious, progressive, and life-threatening illness, with the objective of promoting quality of life to the patient and their family members[17]. The guiding principles of palliative care are based on following up with the patient as early as possible concomitant to the disease-modifying treatments[18].

In the oncological disease approach, the early integration of palliative care associated to the modifying treatment is indicated from the moment of diagnosis, with the objective of helping the team with symptom control. That way, as the disease progresses and healing can no longer be achieved, the palliative approach tends to expand and become exclusive[19]. In advanced cancer, patients in palliative care can present debilitating signs and symptoms, such as pain, nausea, vomit, dyspnea, fatigue, constipation, anorexia, and psychosocial and spiritual issues[20]. The pharmacist is trained to interact in multidisciplinary teams, helping in symptom control and promoting the rational and safe use of medication[21]. Thus, the present article aims to analyze the medication review carried out in cancer patients submitted to palliative care in a reference institution in Rio de Janeiro.

METHOD

Observational, descriptive, retrospective quantitative approach study, involving patients admitted to the *Hospital do Câncer IV* (HCIV), an exclusive palliative care unit of the National Cancer Institute (INCA), whose pharmacological treatment was reviewed by the pharmacist from June 1, 2022, to May 31, 2023. The study included patients aged 18 years old or over, with a Karnofsky Performance Status (KPS) of 20% and 10%; and excluded patients with incomplete records in the medication review service spreadsheet. This study has been approved by the institution's Research Ethics Committee, report number 6.085.810, on June 1, 2023 (CAAE (submission for ethical review): 69503823.2.0000.5274), in compliance with ethical guidelines recommendations related to studies that involve human beings according to Resolution n. 466/2012[22] of the National Health Council.

The data were collected from physical medical records, institutional electronic systems (Absolute and Intranet), and the sector's medication review spreadsheet, tabulated in a Microsoft Excel® spreadsheet. The collected data included sociodemographic and clinical variables, such as age, sex, location of primary tumor, comorbidities, and functional capacity of the patient. In addition,

pharmacotherapeutic variables were collected, including the number of medications prescribed per day, DRP identified by the pharmacist, the types of pharmaceutical interventions performed, the acceptability of interventions by the medical team, and polypharmacy.

The age was calculated in the first day of medication review. The location of primary tumor variable considered the diagnosis registered in the medical record at the time of referral to the HCIV, being categorized according to the groups proposed by the TNM malign tumor classification[23]: Head and neck tumors; digestive tract tumors; lung and pleura tumors; bone and soft tissue tumors; skin tumors; breast tumors; gynecological tumors; urological tumors; and central nervous system tumors[24]. The comorbidities were collected from the medical records and classified according to the great groups deliberated by the 10th International Classification of Diseases and Related Health Problems (ICD-10)[25].

The assessment of the patient's functional capacity followed the clinical evaluation and nursing team records from the first medication review, according to the KPS. This scale is used to measure the activity of an ill individual, their incapacitation or recovery due to established therapeutics. It is composed of 11 performance levels that range from 0% to 100%, divided in 10% intervals, in which "0%" indicates death and "100%" the normal performance, with no changes related to the illness. In this context, a 20% KPS reflects patients with a compromised functionality, in need of support, and a 10% KPS, those who are in imminent risk of dying[26].

The daily prescribed medication variable considered the regular use drugs and those used in specific cases, including the institution's standard and non-standard medication. The DRP were classified following the second Consensus of Granada[27], and pharmaceutical interventions were classified by the clinical pharmacy service as: medication inclusion, dosage adjustment, substitution for a medication of the same therapeutic class, medication exclusion, frequency adjustment, change in pharmaceutical presentation, change in route of administration, others[28]. The acceptability of interventions was dichotomized in Yes or No. Polypharmacy was defined as the use of four or more medications by the patient[2].

The statistical analyses were conducted using the *Stata* software, version 15.0[29]. The Kolmogorov-Smirnov test was performed to assess the continuous variables distribution. This analysis method is one of the most used for assessing the symmetry of data distribution, as it allows verifying if the variables are distributed normally or not. The normal distribution variables were described in mean and standard deviation (SD) and compared using the T Student test. The non-normal variables were described in median and interquartile range (IQR, 25 and 75 percentiles), and compared using the U Mann-Whitney test. The number of observations, frequency, and Pearson chi-square test or Fisher exact test were used for the categorical variables.

RESULTS

The data of 171 patients were evaluated (Figure 1). Most patients were aged 60 years or older (n = 104; 60.8%), female (n = 114; 66.7%), and had the primary tumor site located in the gastrointestinal tract (n = 32; 18.7%), followed by the breast (n = 30; 17.5%). More than half the patients included in the study had at least one comorbidity (n = 93; 54.4%). In terms of prevalence, the most frequent comorbidities were those related to the circulatory system (n = 68; 43.9%). Based on their functional capacity assessment, most patients were classified as having a 20% KPS (n = 143; 83.6%) (Table 1).

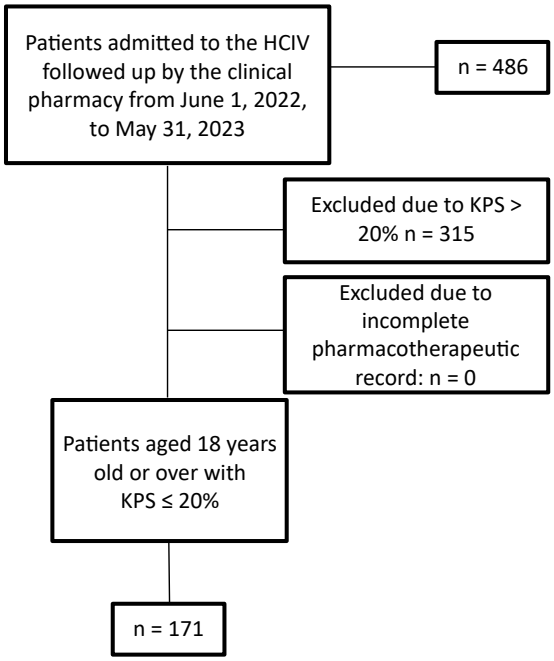

Figure 1. Flowchart of patient's selection for the study
Captions: HCIV = *Hospital do Câncer IV*; KPS = Karnofsky Performance Status.

The pharmacotherapeutic profile analysis of the studied population showed that the prevalences of DRP and pharmaceutical interventions provided equivalent results (23.4%). Most of the DRP identified are related to the use of a medication the patient does not need (n = 49; 53.3%). Thus, the pharmaceutical interventions were mainly to exclude medications (n = 55; 56.7%). According to the DRP identified for each patient, 92 pharmaceutical interventions were performed, of which 86 were accepted

Table 1. Sociodemographic and clinical profile of cancer patients in palliative care followed up by the pharmacist (n = 171)

Variables	Total n (%)
Age (years)	
< 60	67 (39.2)
≥ 60	104 (60.8)
Sex	
Male	57 (33.3)
Female	114 (66.7)
Location of primary tumor	
GIT	32 (18.7)
Breast	30 (17.5)
Gynecological	25 (14.6)
HN	19 (11.1)
Lung	16 (9.4)
Urological	16 (9.4)
Others[a]	33 (19.3)
Comorbidities*	
No	78 (45.6)
Yes	93 (54.4)
Number of comorbidities (median/min and max)	1 (0 a 5)
Endocrine, nutritional, and metabolic diseases	51 (29.8)
Circulatory system diseases	75 (43.9)
Nervous system diseases	15 (8.8)
Respiratory system diseases	8 (4.7)
Genitourinary system diseases	2 (1.2)
Musculoskeletal and connective tissue diseases	3 (1.8)
Eye and appendages diseases	3 (1.8)
Digestive system diseases	1 (0.6)
KPS (%)	
10	28 (16.4)
20	143 (83.6)

Captions: GTI = gastrointestinal tract; HN = head and neck; KPS = Karnofsky Performance Status.
(*) The same patient could have had more than one comorbidity.
(a) Central nervous system tumors (n = 14; 8.2%); skin (n = 10; 5.8%); hematological (n = 4; 2.3%); bone and soft tissue (n = 3; 1.8%); ophthalmic (n = 1; 0.6%) and unknown (n = 1; 0.6%).

by the prescriber, conferring an acceptability of 93.5%. The median and minimum and maximum values for the quantity of drugs for regular use and drugs for use as needed were 7 (3 to 19) and 2 (0 to 6), respectively (Table 2).

The prevalence of polypharmacy (≥4 medications prescribed) was 98%. According to the strata of average quantity of prescribed medications, it was found that most patients (n = 132; 77.2%) used four to nine drugs (Figure 2).

Both KPS groups presented a low frequency of prescriptions, with 3 medications or less. Patients with 10% KPS had a higher frequency of four to nine medications prescribed in comparison to the 20% KPS (89.3% *vs*. 74.8%, respectively). On the other hand, patients with 20% KPS had a higher frequency of ten or more medications prescribed in comparison to the 10% KPS (23.1% *vs*. 7.1%, respectively). A statistically significant difference was found in the strata of quantity of medications prescribed according to the KPS (p = 0,003) (Table 3).

DISCUSSION

Cancer is a disease that mostly affects the elderly population, considering that over 60% of cases occur in people aged 60 years old and over, as also observed in this study. Of all the cancer cases around the world, about 70% occur after the age of 65[30]. In Brazil, the incidence and prevalence rates for all types of cancer are three to four times greater in the elderly when compared to adults[31].

This incidence increases results mainly from the demographic and epidemiological transitions the world is currently experiencing[32]. In the demographic scenario, a reduction in fertility rates and infant mortality, and an increase in the proportion of elders in the population can be observed. As to the epidemiological perspective, deaths related to chronic diseases can be observed to be gradually replacing deaths by infectious diseases. Aging, in addition to behavioral and environmental changes, including changes in mobility, diet, and exposure to environmental pollutants, contribute to the increase of cancer incidence and mortality[33].

According to INCA, the most incidental cancer types in Brazil, disregarding non-melanoma skin cancers, are breast (10.5%), prostate (10.2%) and colon and rectum (6.5%)[34]. In a broader picture, the Global Cancer Observatory (Globocan) points lung cancer as the most frequent around the world (12.4%), followed by female breast cancer (11.6%) and colon and rectum (9.6%)[35]. However, the present study observed that the main tumoral site of cancer was the gastrointestinal tract. This is due to this tumor site encompassing different types of cancer, such as colon, rectum, stomach, and anal canal. This grouping thus contributed for a higher incidence of this tumor site in the studied population.

Regarding gender, global statistics showed the adjusted rate of cancer incidence was higher in men than in women[35]. In Brazil, this incidence rate, excluding non-

Table 2. Pharmaceutical profile of cancer patients in palliative care followed up by the pharmacist (n = 171)

Variables	Total n (%)
DRP	
No	131 (76.6)
Yes	40 (23.4)
DRP Classification*	
Uses a medication they do not need	49 (53.3)
Does not use a medication they do not need	13 (14.1)
Medication with a lower dose than needed	9 (9.8)
Medication with a higher dose than needed	7 (7.6)
Medication that is not effective for the patient	0
Medication causes adverse reactions	0
Others[a]	14 (15.2)
Number of DRP identified (count)	92
Number of medications related to DRP (median/min and max)	2 (1 a 7)
Pharmaceutical intervention	
No	131 (76.6)
Yes	40 (23.4)
Classification of the pharmaceutical intervention**	
Medication exclusion	55 (56.7)
Medication inclusion	16 (16.5)
Dosage adjustment	13 (13.4)
Frequency adjustment	5 (5.2)
Substitution for a medication of the same therapeutic class	1 (1.0)
Change in pharmaceutical presentation	1 (1.0)
Change in route of administration	1 (1.0)
Others[b]	5 (5.2)
Number of pharmaceutical interventions performed (count)	92
Number of pharmaceutical interventions accepted (count)	86
Acceptability of performed interventions (%)	93.5
Prescribed regular use medications (median/min and max)	7 (3 a 19)
Prescribed medications used as needed (median/min and max)	2 (0 a 6)

Caption: DRP = drug-related problems.
(*) The same patient could have had more than one type of DRP and each DRP could have occurred more than once.
(**) The same patient could have had more than one type of pharmaceutical intervention, and each pharmaceutical intervention could have occurred more than once.
(a) Blood glucose monitoring with no clinical benefit to patients, therapeutic duplicity, incompatible route of administration, and discrepant units of measurement.
(b) Exclusion of blood glucose monitoring due to the patients' clinical condition and request for adjustment in the prescribed units of measurement.

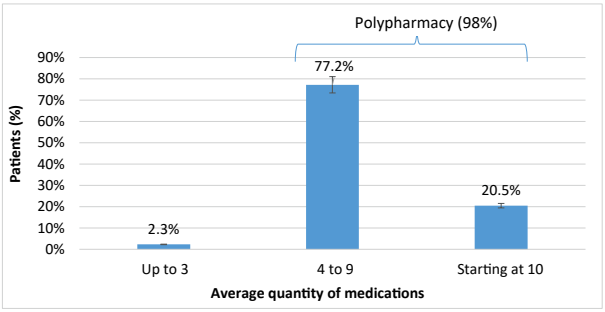

Figure 2. Strata of average quantity of medications prescribed for cancer patients in palliative care followed up by the pharmacist (n = 171)

melanoma skin cancer, was 17% higher in men (adjusted rate = 185.61) than in women (adjusted rate = 154.08), being considered intermediate and compatible with the rates presented for developing countries[34]. Such sex-related estimates were not observed in the present study, whose population is mostly female. However, national data pointed that the average ages for the first prostate and breast cancer diagnosis were 65.7 and 49.0, denoting significant differences regarding the age in which the most incidental and prevalent cancer types that affect men and women occur[36]. Thus, the prevalence of female population and the low incidence of prostate cancer shown in this study may be due to the great number of individuals aged 60 years and older.

Considering that two thirds of the studied individuals were female, the epidemiological profile with a focus on tumor site presented great similarities to the national and world estimates regarding women. In Brazil, disregarding non-melanoma skin cancers, the most frequent types of cancer in the female population are breast (20.3%); colon and rectum (6.5%) and cervix (4.7%)[34]. Such tumor sites are the main cancer types found in the population studied. In a global analysis, for countries with low or average human development index (HDI), adjusted rates of breast cancer incidence are also the highest and the second most incidental cancer is cervix[32].

In general, certain comorbidities can make the prognosis and well-being of cancer patients even more challenging and might be positively related to the diagnosis of advanced stage disease. Some studies aim to evaluate this topic, since the association of these two factors is still little understood. Among those works, a meta-analysis composed of 37 studies, including patients with different types of cancer, such as breast, lung, colorectal and prostate, is highlighted. The study obtained significant evidence that *diabetes mellitus* was positively associated to the diagnosis of advanced stage cancer[37].

Another meta-analysis obtained relevant results from the relationship between comorbidity and cancer. That second study analyzed 29 articles and over 11 thousand

Table 3. Strata of average quantity of medications prescribed for cancer patients in palliative care according to the KPS scale (n = 171)

Variables	Quantity of medications			*p**
	≤ 3 (n = 4; 2.3%)	4 a 9 (n = 132; 77.2%)	≥10 (n = 35; 20.5%)	
KPS (%)				
10	1 (3.6)	25 (89.3)	2 (7.1)	**0.003**
20	3 (2.1)	107 (74.8)	33 (23.1)	

Caption: KPS = Karnofsky Performance Status.
(*) Pearson's chi-square test or Fisher's exact test.

cases of breast cancer. In the subgroup analysis, the study found a positive association between hypertension and breast cancer incidence among women in pre-menopause[38]. Both circulatory system and metabolic disorders, which include high blood pressure and diabetes, respectively, were the main comorbidities observed in the present study.

Pharmacotherapy plays a key role in managing symptoms in palliative care and is associated to the risks that can lead to DRP[39]. Pharmacists can identify DRP and guide prescribers in optimizing the medication therapy[40]. Based on the pharmacotherapeutic profile, the present study observed that more than half of the identified DRP were related to the use of a medication the patient did not need, and the interventions carried out aimed at deprescribing said medications. Such tendencies were also verified in a similar population-based study[39] published in 2023 that analyzed the safety of the medication therapy of 284 palliative care patients in a regional university hospital.

In that context, the "unnecessary medication therapy" was also considered a quite common DRP. In terms of acceptability, the same study showed a high number of acceptances of the performed interventions (87%)[39]. Thus, it can be said that the present study obtained a quite similar acceptability rate, considering that 93.5% of interventions were accepted.

Comorbidities when combined to the patient' primary oncological diagnosis increase the risk of polypharmacy due to the number of medications prescribed to treat the underlying conditions and cancer-related symptoms. A study published in 2022 aimed to evaluate the prescription tendencies at the end of life of 115 patients admitted to a palliative care unit. In that context, the median of medications prescribed was 7, and of the medication to be used "as needed" was 3[41]. The present study showed similar prescription tendencies in the analyzed institution, since the medians for regular medication and medication used as needed were 7 and 2, respectively. Such medians also support the data obtained regarding polypharmacy, considering that most patients used four to nine medications during the hospitalization period (77.2%).

The deprescription of non-beneficial or ineffective medications can reduce polypharmacy in palliative care[42]. However, several studies show the use of limited benefit medications in the end of life despite the clinical consensus and evidence that discontinuing some of these drugs did not increase mortality or reduced quality of life. Currow et al.[43] assessed 260 Australian patients at the end-of-life and concluded that medications for some comorbidities, especially for secondary prevention, were continued for longer than clinically indicated[44]. In line with that, a Dutch study with 155 patients that had three-month or less life expectancy observed that all other non-palliative medication classes were reduced between admission and date of death, however, there were still patients dying with medications not used for symptom control[44].

The present research is in line with previous studies as it also showed that patients with close terminality receive medications considered inadequate in the context of reducing life. Such data are supported by the high polypharmacy index shown by patients, especially those that have an imminent risk of dying (10% KPS), whose medication therapy should be focused in relieving suffering and providing comfort.

The limitations to this study can be the fact that the medication review service is provided in only two floors of the institution, which has a total of four hospitalization floors. Another limitation is the low number of published works that assess the impact of medication review in the identification and resolution of DRP, as well as its contribution to reducing polypharmacy. On top of that, the acceptability of pharmaceutical interventions is a process that varies according to the hospital, the nursing ward, and the clinical team responsible for drug prescriptions. Therefore, expanding the medication review service to the whole hospital in the future could confirm the representativeness of data obtained with the present study and promote further research.

CONCLUSION

Through a structured and critical analysis of the medications used by patients admitted to the institution,

it was possible for the pharmacist to identify the drug-related problems (DRP) responsible for generating negative results associated to pharmacotherapy, such as the use of inappropriate medication for the patient's current clinical condition, unmanaged symptoms, and medication interactions. That way, the pharmacist was able to carry out preventative and corrective interventions that promoted better therapeutic results and more safety for patients in treatment, ensuring the rational use of drugs. Therefore, the present study highlights the importance of the medication review service in optimizing treatment regimens used by cancer patients in palliative care and reinforces the great need for assessing the deprescription of medications for patients in the end-of-life.

CONTRIBUTIONS

Raí Martins Melo has substantially contributed to the study design, planning, and wording. Luana do Amaral Brasileiro and Victoria Mendes de Lima have substantially contributed to the study design, planning, and critical review. Luciana Favoreto Vieira Mattos has contributed to the wording and critical review. Livia da Costa de Oliveira has contributed to the analysis and interpretation of the data. All the authors approved the final version for publication.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interest to declare.

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