

Pharmaceutical Care for Patients Eligible for Oncological Treatment in a Multiprofessional Triage Service

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Cuidado Farmacêutico a Pacientes Elegíveis ao Tratamento Oncológico em um Serviço de Triagem Multiprofissional

Atención Farmacéutica a Pacientes Aptos para el Tratamiento Oncológico en un Servicio de Clasificación Multiprofesional

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ABSTRACT

Introduction: Cancer incidence and mortality are growing rapidly, with estimates of 28.4 million new cases by 2040. With the rising number of survivors, it is important to provide high-quality care to cancer patients. The pharmacist, a member of the multidisciplinary team, works to prevent, identify, correct and reduce possible therapy associated risks. **Objective:** Reflect on how pharmaceutical care to patients eligible for oncological treatment contributes to minimize drug-related problems (DRP). **Method:** Sociodemographic, clinical and pharmacological data of patients treated by the clinical pharmacist were collected through electronic charts, from September to November 2022, in a multidisciplinary screening service of a reference oncology hospital in Fortaleza, Ceará. The drugs were classified according to the Anatomical Therapeutic Chemical (ATC). DRP have been identified, and pharmaceutical interventions were analyzed. The variables were analyzed using Fisher's exact test or Pearson's chi-square test, adopting a 95% confidence level with software SPSS version 20.0 for statistical analysis. **Results:** The majority of the patients were women (53.82%), aged over 60 years (59.18%), mixed race (85.97%) living in the rural or metropolitan region (86.2%). The most reported comorbidities were high blood pressure, diabetes mellitus and cardiovascular diseases. There was an association between polypharmacy and age equal to or greater than 60 years ($p < 0.05$). 141 DRP were detected, and 161 pharmaceutical interventions were performed, most of them related to patient education. **Conclusion:** Pharmaceutical care allows the detection and resolution of DRP, minimizing negative effects arising from inappropriate use, contributing to the quality of care.

Keywords: Medical Oncology; Pharmaceutical Services; Pharmacotherapy.

RESUMO

Introdução: A incidência e a mortalidade por câncer estão crescendo rapidamente, sendo estimados 28,4 milhões de novos casos até 2040. Com o número crescente de sobreviventes, é importante fornecer assistência de qualidade ao paciente oncológico. O farmacêutico, membro da equipe multiprofissional, atua na prevenção, identificação, correção e redução de possíveis riscos associados à terapia. **Objetivo:** Refletir sobre como o cuidado farmacêutico direcionado a pacientes elegíveis ao tratamento oncológico contribui para minimizar problemas relacionados a medicamentos (PRM). **Método:** Foram coletados, por meio de prontuário eletrônico, dados sociodemográficos, clínicos e farmacológicos de pacientes atendidos pelo farmacêutico, durante setembro a novembro de 2022, em um serviço de triagem multiprofissional de um hospital oncológico localizado em Fortaleza/CE. Os medicamentos foram classificados conforme a Classificação Anatómica Terapêutica Química (ATC). Foram identificados os PRM e analisadas as intervenções farmacêuticas. As variáveis foram analisadas utilizando os testes exato de Fisher ou qui-quadrado de Pearson, adotando o intervalo de confiança de 95%, com software SPSS versão 20.0 para Windows. **Resultados:** A maioria dos pacientes era do sexo feminino (53,82%), idade igual ou superior a 60 anos (59,18%), pardos (85,97%) e procedentes do interior ou Região Metropolitana (86,2%). As principais comorbidades foram hipertensão arterial, diabetes mellitus e doenças cardiovasculares. Houve associação entre polimedicação e idade igual ou superior a 60 anos ($p < 0,05$). Identificaram-se 141 PRM, sendo realizadas 161 intervenções farmacêuticas, principalmente relacionadas à educação do paciente. **Conclusão:** O cuidado farmacêutico permite a detecção e a resolução de PRM, minimizando efeitos negativos advindos do uso inadequado, contribuindo para qualidade da assistência.

Palavras-chave: Oncologia; Assistência Farmacêutica; Tratamento Farmacológico.

RESUMEN

Introducción: La incidencia y la mortalidad por cáncer están creciendo rápidamente y se estima que habrá 28,4 millones de casos nuevos para 2040. Ante el creciente número de supervivientes, es importante brindar atención de calidad a los pacientes con cáncer. El farmacéutico, miembro del equipo multidisciplinario, trabaja para prevenir, identificar, corregir y reducir los posibles riesgos asociados a la terapia. **Objetivo:** Reflexionar sobre cómo la atención farmacéutica dirigida a pacientes elegibles para tratamiento oncológico contribuye a minimizar los problemas relacionados a los medicamentos (PRM). **Método:** Se recolectaron datos sociodemográficos, clínicos y farmacológicos a través de la historia clínica electrónica de pacientes atendidos por el farmacéutico clínico, durante los meses de setiembre a noviembre de 2022, en un servicio de tamizaje multidisciplinario de un hospital oncológico de referencia en el Norte-Nordeste, ubicado en Fortaleza/CE. Los medicamentos se clasificaron según la Clasificación Anatómica Terapéutica Química (ATC). Se identificaron los PRM y se analizaron las intervenciones farmacéuticas. Las variables fueron analizadas mediante la prueba exacta de Fisher o la de ji al cuadrado de Pearson, adoptando un intervalo de confianza del 95%, con el software SPSS versión 20.0 para Windows. **Resultados:** La mayoría de los pacientes fue de sexo femenino (53,82%), de 60 años o más (59,18%), mestizos (85,97%) y del interior o Región metropolitana (86,2%). Las comorbilidades más reportadas fueron hipertensión arterial, diabetes mellitus y enfermedades cardiovasculares. Hubo asociación entre polifarmacia y edad igual o mayor a 60 años ($p < 0,05$). Se identificaron 141 PRM reales y/o potenciales y se realizaron 161 intervenciones farmacéuticas, principalmente relacionadas con la educación del paciente. **Conclusión:** La atención farmacéutica permite la detección y resolución del PRM, minimizando los efectos negativos derivados del uso inadecuado, contribuyendo a la calidad de la atención.

Palabras clave: Oncología Médica; Servicios Farmacéuticos; Tratamiento Farmacológico.

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INTRODUCTION

A great number of deaths are caused by cancer in Brazil and worldwide. Many individuals are diagnosed daily either at initial stages or in end-of-life. For each year of the triennium 2023-2025, 704 thousand new cases including non-melanoma skin cancer¹ are anticipated.

Due to the rising incidence of cases, the National Policy for Cancer Prevention and Control (PNPCC) reinforces the necessity of offering full care to these patients involving prevention, early diagnosis and continued follow-up².

Full care should be based on well-coming, creation of bonds and accountability of the team in face of what the patient reports. The definition of actions and strategies that meet his/her needs in view of the quality of the assistance^{3,4} are based on the characterization of the social and clinical aspects.

The oncologic patient may present other comorbidities as cardiovascular and lung diseases, diabetes, bacterial and/or fungal infections and neurological and/or psychiatric disorders (depression, insomnia, seizures, anxiety)⁵. Comorbidities can be an important prognostic and therapeutic factor, associated with low global survival for some tumors and increased likelihood of post-therapeutic complications^{6,7}.

The onset of the disease and its treatment can provoke the appearance of signs and symptoms as pain, nausea, constipation, dyspepsia, cough among others and negatively affect the quality of life and adherence to the treatment⁸. Therefore, it is indispensable the early identification and availability of therapeutic approaches that meet their biological, psychological and social needs⁹.

In this context, most of the oncologic patients tend to use several therapeutic combinations to treat pre-existing chronic diseases or control the symptoms caused by the tumor and the treatment itself¹⁰.

Despite contributing to control the diseases and improvement of the quality of life, the unwise use of drugs can provoke drug interactions and adverse events¹¹. As part of the multidisciplinary team, the pharmacist works to avoid and solve pharmacotherapy-related problems as close as possible to the ideal, for instance, correct dose, route of administration and duration, effectiveness, not causing additional health problems or aggravating any existing ones^{12,13}.

The pharmacist is a key element of the care to the oncologic patient, ensuring quality and safety of the medication along the course of the disease and his/her actions go beyond dispensation or manipulation of chemotherapy¹⁴. This professional is the main instrument to enhance the quality of an individualized pharmacotherapy further to identifying difficulties to

adhere to the treatment, management of adverse events and drug related problems (DRP) and avoid damages to the patient^{15,16}.

The present study has the objective of analyzing early pharmaceutical care to eligible patients to oncologic treatment assisted at a multiprofessional screening service of an oncology reference hospital of Fortaleza, Ceará (CE) in the North-Northeast region, given the importance of knowing different aspects of a patient initiating oncologic treatment.

METHOD

Quali-quantitative, retrospective, descriptive study conducted at an oncology reference hospital in Fortaleza (CE) in the North-Northeast region.

Non-probabilistic sample by convenience with consecutive enrollment of eligible patients to oncologic treatment attended to by the pharmacist of record of the multiprofessional screening team from September to November 2022.

The assistance begins at screening were patients are clinically evaluated and tested by the nurse and the physician. Once the suspected neoplasm is confirmed, the patient proceeds to treatment at the institution. Before the first visit with the specialized physician, the patient is consulted by the multiprofessional team formed by nutritionist, pharmacist, psychologist, social worker and physiotherapist.

The visit is individual with each professional who accesses the institution's electronic form through a tablet to collect the data, following a specific checklist and standard questions. All the information is recorded on the patient's electronic chart.

The pharmacist collects information about the continuous use of medication (dose, posology, administration route), comorbidities and history of allergies and adverse events. In addition, other information the professional deems necessary during the pharmaceutical anamnesis are recorded as well, further to the conducts performed. After completing the multiprofessional visits, the patient will attend the first consultation with the specialized physician.

The study inclusion criteria were: patients in continuous use of medication, aged 18 years or older, attended to by the pharmacist and referred to the multidisciplinary team. The exclusion criteria were patients who were unable to recollect the name of the continuous use medication or who failed to respond to the questions.

The following variables were collected: sociodemographic data (sex, age-range and origin), comorbidities and pharmacotherapeutic information

(continuous use medication and history of allergy/adverse events). Continuous use medications were classified pharmacologically according to the Anatomical Therapeutic Chemical Classification (ATC)¹⁷ adopted by WHO Collaborating Centre for Drug Statistics Methodology.

DRP identified by the pharmacist at the visit and registered in the electronic chart were classified according to the Second Consensus of Granada¹⁸, which follows the principles of necessity, effectiveness and safety of pharmacotherapy.

The DRP can be classified in regard to the necessity if the patient is ill because the appropriate drug was not prescribed (DRP 1) or is receiving a drug he/she does not need (DRP 2); effectiveness, if the patient is ill because the drug was ineffective (DRP 3) or insufficient quantity of the drug (DRP 4) and safety, if the patient is ill because of non-quantitative (DRP 5) or quantitative (DRP 6)¹⁸ issues.

Pharmaceutical interventions were classified according to Sabater et al.¹⁹ in three main categories: quantitative-related interventions, pharmacologic strategy and education of the patient.

A Microsoft Excel database was created for the statistical analysis and the data were presented in absolute and percent frequency. Fisher's exact test or Pearson's chi-square test²⁰ (χ^2 , $p > 0.05$) were applied to evaluate the association between the use of medications and sociodemographic variables, with confidence level of 95% utilizing software SPSS v20.0²¹ for Windows.

The Institution's Ethics Committee approved the study, report number 6,152,780 (CAAE (submission for ethical review): 70795723.6.0000.5528) in compliance with Directive number 466, dated December 12, 2012²² and with Operational Rule 001/2013²³ of the National Health Council. The informed consent form was waived because only secondary and deidentified data have been collected.

RESULTS

During the study period, 894 patients attended pharmacy visits. Of these, 17 did not meet the inclusion criteria: 12 did not know the continuous use medication they were taking and five were younger than or aged 18 years old. In all, 877 patients have been enrolled in the study.

Most of the patients were women (53.82%), aged or older than 60 years, self-claimed as Brown color, who lived in the rural or metropolitan region of Fortaleza. They reported they had at least one and up to seven comorbidities, the most frequent were arterial hypertension, *diabetes mellitus*, dyslipidemia and cardiopathy as shown in Table 1.

Table 1. Sociodemographic and clinical profile of patients assisted by the clinical pharmacy

Sex	n	%
Male	405	46.18
Female	472	53.82
Total	877	100
Age	n	%
< 60 years	358	40.82
60 years or +	519	59.18
Total	877	100
Origin	n	%
Fortaleza	121	13.8
Rural/Metropolitan Region	756	86.2
Total	877	100
Race	n	%
White	121	13.8
Brown	754	85.97
Black	2	0.23
Total	877	100
Comorbidities	n	%
0	315	35.92
1	214	24.4
2	150	17.1
3	100	11.4
4	53	6.04
5	34	3.88
6	9	1.03
7	2	0.23
Total	877	100
Comorbidities	n	%
Systemic arterial hypertension	389	44.36
Diabetes mellitus	181	20.64
Dyslipidemia	165	18.81
Cardiopathy	90	10.26
Depression	41	4.68
Benign prostatic hyperplasia	33	3.76
Osteoporosis	29	3.31
Arthritis/Arthrosis	23	2.62
Hypothyroidism	23	2.62
Stroke	10	1.14
Others	102	11.62

Note: Absolute and percent frequency.

Most of the patients reported continuous use of at least one medication (77.5%). 165 patients were polymedicated (18.8%), using five or more medications,

with statistical relation between continuous use of five to eight medications and age equal or older than 60 years of age ($p < 0.05$) as described in Table 2.

285 medications have been identified according to the main classes: angiotensin-II receptors blockers, diuretic,

Table 2. Age of the study patients polymedicated

Quantity of the medications	< 60 years (n; %)	+ 60 years (n; %)
5	20 (5.59%)	43 (8.30%)*
6	11 (3.07%)	33 (6.37%)*
7	5 (1.40%)	14 (2.70%)*
8	6 (1.68%)	16 (3.09%)*
9	0 (0.00%)	4 (0.77%)
10	2 (0.56%)	5 (0.97%)
11	1 (0.28%)	2 (0.39%)
12	1 (0.28%)	2 (0.39%)
Total	46	119

Caption: * $p < 0.05$, Fisher exact test or Pearson's chi-square test (n, %).

Note: Absolute and percent frequency.

hypoglycemic drugs, analgesics, lipid-modifying agents and antidepressants. The most utilized medications are listed in Table 3 according to the ATC Classification.

In all, 90 patients (10.26%) reported history of allergy or adverse events related to medications.

141 potential or actual DRP identified by the pharmacist, of which 45.39% were related to safety, 29.08% to necessity and 25.53% to effectiveness, are shown in Table 4. 161 pharmaceutical interventions classified according to Sabater et al.¹⁹ were performed (Table 5).

DISCUSSION

Most of the patients screened by the pharmacist were females, similar to the study by Lorenz et al.²⁴, with 53% of females initiating oncologic treatment. According to the literature, women tend to search health services more frequently, increasing the odds of early detection, while men are more reluctant in searching for medical help and do so only when their health conditions deteriorate and tend to avoid participating in initiatives of preventive actions and health promotion²⁵.

Table 3. ATC classification of the medications utilized by the patients assisted by the pharmacist

Group	Pharmacological subgroup	n	%
Cardiovascular system	Angiotensin II receptor blockers	249	28.39
Cardiovascular system	Diuretic	190	21.66
Digestive system and metabolism	Insulins/ Hypoglycemic drugs	173	19.73
Nervous system	Analgesic (Opioids analgesics) (Non-opioid analgesics)	165 (64) (101)	18.82 (7.30) (11.52)
Cardiovascular system	Lipids modifying agents	157	17.90
Nervous system	Antidepressants	114	13.00
Cardiovascular system	Beta blockers	111	12.66
Cardiovascular system	Calcium channel blockers	80	9.12
Blood and hematopoietic organs	Antithrombotic agents	79	9.01
Digestive system and metabolism	Proton pump inhibitors	77	8.78
Cardiovascular system	Angiotensin-converting enzyme inhibitors	77	8.78
Genitourinary tract and sexual hormones	Medications for benign prostatic hyperplasia	74	8.44
Musculoskeletal system	Non-steroidal anti-inflammatory	71	8.10
Digestive tract and metabolism	Medications for gastrointestinal disorders	49	5.59
Nervous system	Anxiolytic	45	5.13
Nervous system	Antiepileptic	43	4.90
	Others	266	30.25

Note: Absolute and percent frequency.

Corroborating Silva et al.²⁶, most of the study patients were aged 60 years or older. Nearly 60% of cancer patients are older adults and present the highest mortality rate²⁷. The concentration of risk factors for some types of cancer and less effective mechanisms of cellular repair may be responsible for high incidence in this population²⁸.

The sample consisted mostly of self-claimed Brown individuals, similar to Pitas et al.²⁹ who designed the epidemiological profile of oncologic patients assisted at a Brazilian Northeastern hospital. Brown color predominates in Ceará³⁰ according to epidemiological data of the Census 2022 of the “*Instituto Brasileiro de Geografia e Estatística (IBGE)*”.

The majority of the patients claimed they lived in the rural or metropolitan regions. According to Xavier et al.³¹, high complexity hospital treatment in Brazil require patients to travel to another city different from where they live.

In view of this reality, it is necessary to understand the patients' biosocial aspects as their life history and attendance of different health facilities to best meet their demands and qualify the assistance because these factors

can impact the choice of the better therapeutic regimen and adherence to the treatment³².

Most of the patients reported pre-existing comorbidities, at least one and up to seven, the most common were arterial hypertension, diabetes, dyslipidemia, cardiopathy and depression. Arterial hypertension was the most prevalent comorbidity followed by dyslipidemia and diabetes according to Montagner et al.³³ in their study with patients with different types of cancer assisted at a high complexity oncology center.

Comorbidities in cancer patients can be an important factor to choose the treatment and its prognosis since lower global survival rate has been reported for cancer patients with multiple comorbidities³⁴. These diseases can induce changes able to modulate the tumor microenvironment, favoring the progression of cancer and therapeutic resistance as the association of diabetes with increased risk of developing some types of breast, colorectal, endometrium and gall bladder cancer³⁵.

Health primary attention (APS) is the main door into the National Health System (SUS), it organizes the flow in the network. Patients are evaluated at APS and, if needed, are referred to specialized services. It is believed that the comorbidities of the study patients have been evaluated at the APS, however, it was not possible to find the frequency.

77.5% of the patients reported they used one or more drugs continuously, quite similar to 74.1% of the patients of the study of Lorentz et al.³⁴.

The oncologic patient is more propense to use several medications to treat pre-existing comorbidities or to minimize drugs toxicity and disease associated symptoms, conditions that may negatively impact the quality of life and deserve attention for proper management by health professionals³⁶.

18.8% of the patients claimed they were using five or more medications, and association between

Table 4. Drugs related problems (DRP) identified by the clinical pharmacist from September to November 2022

Drugs related problems		n	%
Necessity	DRP 1	35	24.82
	DRP 2	6	4.26
Effectiveness	DRP 3	22	15.60
	DRP 4	14	9.93
Safety	DRP 5	61	43.26
	DRP 6	3	2.13
Total		141	100

Caption: DRP = Drugs related problems.

Note: Absolute and percent frequency.

Table 5. Profile of the interventions of the clinical pharmacist

Pharmaceutical interventions		n	%
Quantity of the medication	Quantity of the medication	3	1.86
	Change posology	11	6.83
	Change the frequency of administration	13	8.07
Pharmacologic strategies	Add medication (s)	6	3.73
	Withdraw medication (s)	1	0.62
	Replace medication (s)	0	0
Education of the patient	Instructions about the use of medication	85	52.80
	Change attitudes in relation to the medication	28	17.39
	Instruct about non-pharmacological measures	14	8.70
Total		161	100

Note: Absolute and percent frequency.



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polymedication and older than 60 years of age was noticed, similar to the study by Alves et al.³⁷. Increased use of medication for this age range can occur due to more comorbidities, quite common with ageing³⁸.

Despite the recommended use of several medications for some clinical conditions, polypharmacy can increase the risk of negative results as drugs interaction, non-adherence, therapeutic duplicity and unwanted effects that can worsen the prognosis of the patient in oncologic treatment^{39,40}. It is important to check the correct use of medications to avoid the use the therapies the patient does not need or weren't prescribed⁴¹.

18.8% of screened patients reported the use of some analgesic, of which 7.30% were using opioids. Pain is a frequent and debilitating manifestation affecting oncologic patients. Its proper management is related to improvement of quality of life and increased survival⁴².

The pharmacist is responsible for providing information about the correct use of medication and the side effects of continuous use as constipation resulting from opioids, further to pharmacological and dietary measures to minimize this effect⁴³.

10% of the study sample reported medications-related allergy or side effects. Pharmaceutical screening registered at the patient's chart contributes to the patient safety since it reduces wrong dispensation and administration of these medications.

Pharmacotherapy revision allowed the identification of actual and/or potential 141 DRP, of which 45.39% were associated with safety, 29.08% with necessity and 25.53% with effectiveness. DRP can appear due to wrong prescription, dispensation or use¹⁶.

DRP related to safety were found for patients in prolonged use of non-steroidal anti-inflammatory drugs (NSAIDs), proton pump inhibitors (PPIs) and corticoids who were not followed-up and unwise use of antibiotics.

DRP related to necessity were identified in patients with low adherence to treatment of comorbidities, as diabetes, decompensated hypertension and history of acute myocardial infarction as, for example, a patient who suspended the treatment (AAS and dapagliflozin) on his own account.

DRP related to effectiveness were found for patients using analgesics who reported uncontrolled pain and patients using enteral prolonged releasing metformin. The literature indicates incompatibility of this type of presentation because of the possible probe obstruction and fluctuation of the drug serum level⁴⁴.

DRP affect the quality of pharmacotherapy, negatively interfering on treatment expected outcomes, making the pharmacist indispensable to ensure improved assistance

and minimize these problems; they can be resolved through interventions, prevention and correction of errors with the participation of the prescriber, caretaker or patient⁴⁵.

During the study period, 161 pharmaceutical interventions have been performed, most of them related to the education of the patient (78.89%), followed by quantity of the drugs (16.76%) and pharmacological strategy (4.35%). Among them, guidelines about the risk from wrong use of medications, reasonable use of antimicrobials, importance of follow-up and adherence to the treatment of comorbidities, non-pharmacological guideline for constipation, drugs scheduling to increase efficacy and reduce drugs interactions, correct administration of enteral medications, and prescription of analgesic and insomnia medication by physicians.

Individualized follow-up that meets the necessities of the oncologic patient is important in view of the complexity of this type of patient. According to Sturaro⁴⁶, it is a critical tool to reduce drugs related errors making treatment more effective, improving adherence and the quality of life.

The majority of oncology services counts with a pharmacist whose action goes beyond management and manipulation of chemotherapy drugs who provides direct care to the oncologic patient, ensuring clinically consistent outcomes and improving the quality of the service⁴⁷.

The clinical pharmacist at screening allowed the early review of pharmacotherapy offering more safety to the patient. Actual or potential DRP were detected soon and through appropriate interventions, correct guidelines about drugs use were provided and adjustments were made by the prescriber.

One of the study limitations was the impossibility of evaluating whether all the mechanisms of continuous use were actually necessary and know if the pharmacist recommendations and interventions were in fact accepted by patients and caretakers.

CONCLUSION

The characterization of the social and clinical aspects of oncologic patients can enhance actions and strategies to meet their needs and improve the quality of the care. The presence of the clinical pharmacist at screening contributed to the care the multiprofessional team provided and that the interventions had the objective of reducing and resolving DRP.

The task of the pharmacist can potentially contribute to ensure the access and safe use of medications, optimize pharmacotherapy and promote health and well-being of patients initiating oncologic treatment.

CONTRIBUTIONS

All the authors contributed substantially to the study design, acquisition, analysis and interpretation of the data, wording and critical review. They approved the final version for publication.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interests to declare.

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