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SYSTEMATIC REVIEW

Financial toxicity of cancer in Latin America and the Caribbean. A systematic review

La toxicidad financiera del cáncer en Latinoamérica y el Caribe. Una revisión sistemática

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ABSTRACT

Introduction: as the incidence of cancer increases worldwide, the costs associated with cancer care and management also increase, generating a heavy financial burden on the economies of nations, affecting the quality of life of patients and negatively impacting the economic well-being of families.
Objective: to analyze the impact of financial toxicity during oncological care in Latin America and the Caribbean.
Method: this systematic review was carried out between December 2024 and December 2025, the documentation was obtained from the databases contained in the academic search engines PubMed, Google Scholar, Dialnet, BVS, and Redalyc.
Results: fourteen studies were identified that address the financial burden of cancer, highlighting those direct costs represent between 4 % and 7 % of GDP in many countries in the region. Indirect costs, such as loss of labor productivity, and intangible costs are also significant, further exacerbating stress and anxiety. Inequalities in access to health care, obsolescence of health infrastructure and lack of specialized personnel contribute to this reality.
Conclusions: this systematic review clearly show how financial toxicity during cancer care negatively impacts the budgets of Latin American and Caribbean nations, as well as patients and families, in addition to resulting in a long-term economic burden that can lead to financial bankruptcy for the family group.

Keywords: Cancer; Financial Toxicity; Medical Costs; Latin America and the Caribbean; Oncology Care.

RESUMEN

Introducción: a medida que la incidencia de cáncer aumenta en el mundo, los costos asociados con la atención y manejo del mismo también se incrementan, lo que genera una fuerte carga financiera a las economías de las naciones, afecta la calidad de vida de los pacientes e impacta negativamente el bienestar económico de las familias.
Objetivo: analizar el impacto de la toxicidad financiera durante la atención oncológica en Latinoamérica y el Caribe.
Método: está revisión sistemática se realizó entre diciembre 2024 y Enero 2025, la documentación se obtuvo de las bases de datos contenidas en los buscadores académicos PubMed, Google Scholar, Dialnet, BVS, y Redalyc.
Resultados: se identificaron 14 estudios que abordan la carga financiera del cáncer, destacando que los costos directos, representan entre el 4 % y el 7 % del PIB en muchos países de la región. Los costos indirectos,

como la pérdida de productividad laboral, y los costos intangibles también son significativos, exacerbando, aún más, el estrés y la ansiedad. Las desigualdades en el acceso a la atención médica, la obsolescencia de la infraestructura sanitaria y la falta de personal especializado contribuyen con esta realidad.
Conclusiones: esta revisión sistemática muestra claramente como la toxicidad financiera durante la atención oncológica impacta negativamente las arcas presupuestarias de las naciones Latinoamericanas y del Caribe, así como a los pacientes y familias, además de resultar en una carga económica a largo plazo que puede llevar a la quiebra económica al grupo familiar.

Palabras clave: Cáncer; Toxicidad Financiera; Costos Médicos; Latinoamérica y Caribe; Atención Oncológica.

INTRODUCTION

According to the World Health Organisation (WHO)[1], cancer has become a serious public health problem during this century, not only because of the economic impact it has on the budgets of the families affected[2] but also because it is one of the leading causes of morbidity worldwide, as well as being the leading cause of mortality.[2] The International Agency for Research on Cancer (IARC)[3] reported that during the year 2022, in Latin America and the Caribbean, where, according to the World Bank (WB)[4], 13,6 % of the world's population resides, there were 1,5 million new cases and nearly 750 000 deaths from cancer[2] and indicated that more than 50 % of the incidence and mortality was observed in Brazil and Mexico alone. According to the WB[4], Venezuela had a population of just over 28 million inhabitants that year. It accounted for 4,1 % of all new cases and 4,2 % of all cancer deaths in Latin America and the Caribbean.[2,3]

The rapid and progressive increase in the number of people diagnosed with oncological pathologies obliges governments to provide adequate and easily accessible medical care. An enormous economic cost accompanies this growing incidence of cancer worldwide. A 2008 study by the American Cancer Society highlighted the global economic impact of cancer on society. This study showed that the total cost related to deaths and disabilities amounted to $895 billion, excluding direct medical expenses, which represented 1,5 % of global GDP.[5]

This is evidence that cancer has a devastating economic impact on any country, clearly indicating its financial burden.[5] In 2015, the monetary expenditure for cancer care in the United States reached $183 billion, not including out-of-pocket costs and patient time.[6] By 2019, direct medical costs to patients exceeded $21 billion, divided into just over $16 billion in out-of-pocket expenses and nearly $5 billion in patient time-related costs, reflecting the value of time spent by patients traveling to and from healthcare services, as well as waiting for and receiving care.[7]

In Europe, one study found that the total cost of cancer in 2018 in that continent was USD 294 billion.[8] In Latin America, although the region includes high-, middle- and low-income countries, the financial impact of cancer is significant in all economies. A 2017 study that included 12 countries in Central and South America - Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Panama, Paraguay, Peru, and Uruguay - concluded that cancer carries an annual cost of US$4,2 billion to the economies of these nations.[9]

A recently published meta-analysis,[10] which aimed to determine the prevalence, determinants, and how financial toxicity has been measured among cancer patients in low- and middle-income countries, selected nations from Asia, the Middle East, Africa, but only included one from Latin America, and concluded that cancer diagnosis, treatment, and care impose high financial toxicity on cancer patients in these countries.

Since the medical literature lacks up-to-date information on the problem in Latin America and the Caribbean, this study aims to analyze the impact of financial toxicity during cancer care in these regions.

METHOD

The research was conducted using a systematic review between December 2024 and January 2025. The PICO (Population, Intervention, Comparison, and Outcome) methodology was used to generate the research question: What is the impact of financial toxicity during cancer care in Latin America and the Caribbean (table 1)?

Table 1. Components of the PICO methodology

Population	Cancer care in Latin America and the Caribbean
Intervention	Financial toxicity
Comparison	Not applicable for this review
Results (Outcome)	Research analysing the impact of financial toxicity during cancer care in Latin America and the Caribbean.

Table 2. Search Equation and Boolean Operators

Language	Search Equation
Español	"Toxicidad financiera" OR "Impacto económico" OR "Costos médicos" OR "Costos" AND "Cáncer" OR "Atención oncológica" OR "Atención del cáncer" AND "Latinoamérica" OR "América" OR "El Caribe"
Ingles	"Financial toxicity" OR "Economic impact" OR "medical costs" OR "Costs" AND "Cancer" OR Oncology care" OR "Cancer care" AND "Latin America" OR "America" OR "The Caribbean"

A literature search was conducted using primary and secondary documentary sources on the Internet to obtain the documentation. The thesauri DeCS and MeSH were used as descriptors in Health Sciences to facilitate the process of linguistic transformation and, in this way, collect the keywords. Table 2 shows the terms used in the search equation in English and Spanish and how the Boolean operators 'OR,'' AND,' and 'AND NOT' were used (table 2).

Inclusion and exclusion criteria were then established for the screening phase, which made it possible to determine which research would provide the necessary information for the study. Inclusion criteria were language, years of publication, full access to the article, keywords, and containing the framework under study; exclusion criteria were non-compliance with any of the inclusion criteria (table 3).

Table 3. Inclusion and exclusion criteria

Aspect	Inclusion criteria	Exclusion criteria
Language	English, Portuguese and Spanish	Different language
Years of Publication	January 2015 to January 2025	Publications prior to 2015
Type of study	Any type of study	Degree works, Thesis, Books or book chapters
Access to text	Full access	Partial access
Keywords	Financial toxicity, Economic impact, Cancer. Present in the text	Absent in the text

Open-access academic search engines such as PubMed, Google Scholar, Dialnet, BVS, and Redalyc were used, which allowed us to access digital databases. Google Scholar was the most competent tool for identifying grey literature.[11] In addition, a review of the bibliographic citations mentioned in the selected studies was carried out.

In the first phase of the search, 694 records were obtained, broken down as follows: PubMed (177), Google Scholar (243), Dialnet (60), BVS (91), and Redalyc (121), and other sources, such as the review of bibliographic citations of some articles of interest.[2]

In the screening stage, or second phase, the titles and abstracts of all the articles obtained in the first phase were carefully studied, and research that met the inclusion criteria was selected. At this stage of the systematic review, Zotero was used as a bibliographic reference manager. A total of 33 articles were eliminated for duplication, in addition to 522 records that did not meet the inclusion criteria, leaving 139 items for further review.

In the third phase, the full texts of the 139 studies selected in the previous stage were thoroughly analyzed; 124 were removed because they failed to meet any inclusion criteria.

Finally, 15 articles were selected for the systematic review, which was carefully analysed to achieve its objective. The different phases of the systematic review are shown in the flow chart (figure 1**).**

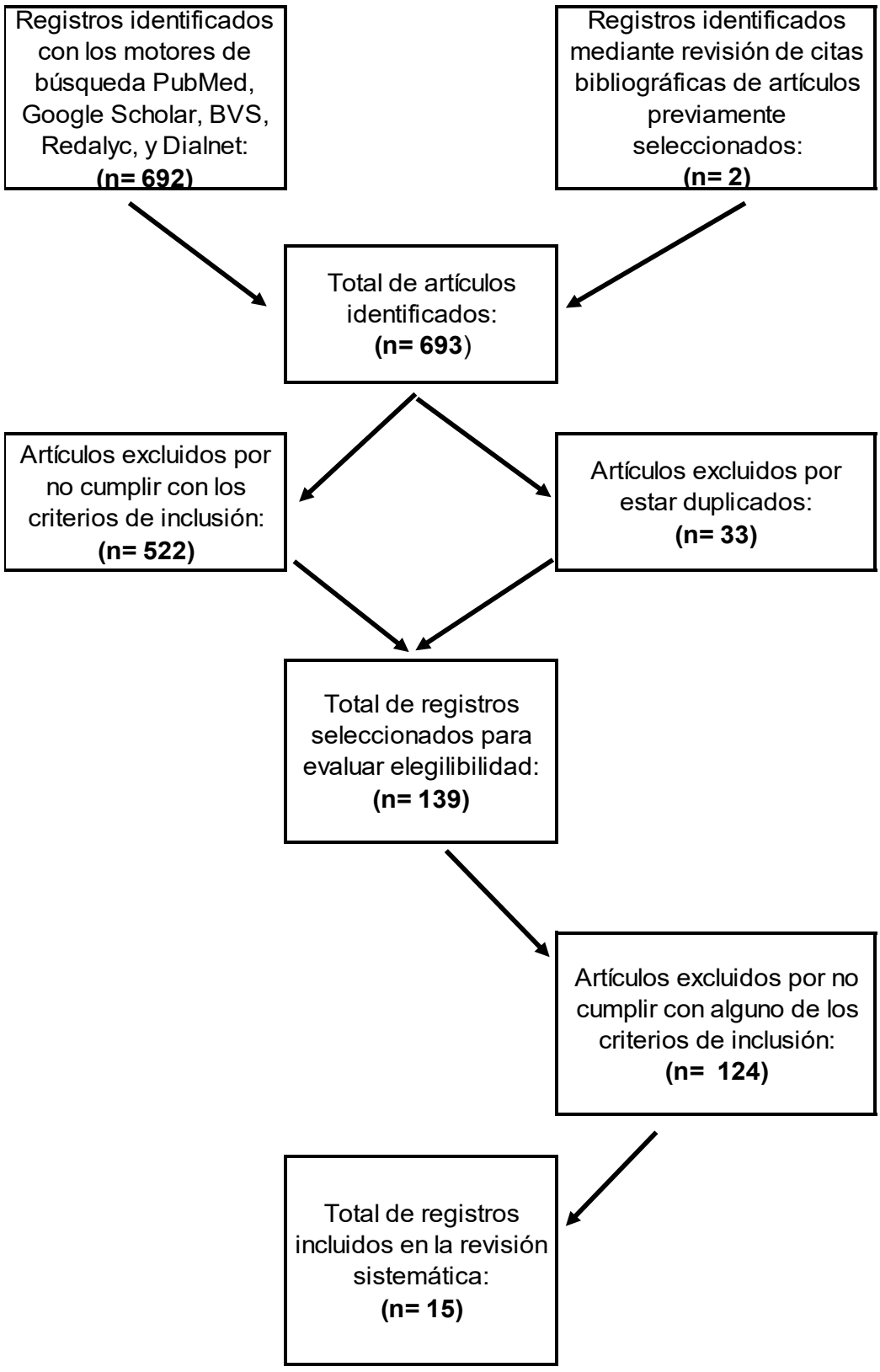

Figure 1. PRISMA Flow Diagram of the Literature Search Strategy

RESULTS

Fifteen manuscripts were retrieved that met all inclusion criteria[12-26] (table 4). Most of the studies were conducted in countries with high middle incomes, according to the WB[27].

Table 4. Description of selected articles

Author/year	Type of research	Objectives	Conclusive aspects
Nogueira et al.[12]	Observational, Cross-sectional and Correlational.	Correlating financial toxicity with health-related quality of life in adults with cancer.	The lower the financial toxicity, the better the quality of life and the greater the adherence to treatment.
Nieto et al.[13]	Qualitative exploratory, snowball sampling, in-depth interviews with cancer patients.	To describe the perception of the economic impact on Bolivian cancer patients.	The perception of economic impact is multidimensional. Economic impact depends on the stage and the social context.
Korkes et al.[14]	Retrospective cohort study.	Collect information on the economic impact of penile cancer in Brazil.	Penile cancer causes a very high economic and social burden in Brazil.
Santos et al.[15]	Descriptive.	Estimate the annual per-patient costs of cervical cancer treatment.	High economic impact, especially on less favoured sectors. Direct medical costs accounted for 81,2 % of the total value, with outpatient radiotherapy and chemotherapy accounting for the largest share. With an annual cost per patient of USD 2219,73.
Bloom et al.[16]	Descriptive.	Estimate the economic impact of non-communicable diseases in Costa Rica, Peru and Jamaica.	Cancer in Costa Rica, Peru and Jamaica has substantial costs. The loss of gross domestic product (GDP) due to cancer is 11,21 % for Costa Rica, 14,35 % for Jamaica, and 16,44 % for Peru. The economic impact on the economic growth of these three countries is significant.
Cid et al.[17]	Descriptive.	Determine the economic impact of cancer in Chile. Estimate the proportion of the total cost attributable to the main types of cancer.	The economic impact of cancer in Chile is more than 2 billion dollars a year, representing almost 1 % of the country's gross domestic product. Indirect costs were 1,92 times higher than direct costs. The types of cancer that generate most of the costs are stomach, breast, lung and prostate. And when discriminating by sex, men spent 30,33 % more than women. Chile can be ranked below the average cancer costs of some EU countries.
Rascón et al.[18]	Descriptive.	To analyse the economic impact of lung cancer incidence and mortality on IMSS.	The direct medical cost increases proportionally with the clinical stage at diagnosis.
de la Cruz et al.[19]	Retrospective cohort study.	Determine the direct medical costs of breast cancer treatment and the factors associated with these costs.	Direct medical costs increase significantly in more advanced stages of the disease. Factors associated with this type of cost were age, stages II, III and progression of breast cancer.
Gálvez et al.[21]	Documentary review.	Conduct an economic analysis of cervical cancer costs in the country to assess the feasibility of using an HPV test.	Treatment with chemotherapy and radiotherapy, as well as diagnostic tests, increase the medical costs of cervical cancer care.
Robles[22]	Prospective cross-sectional study.	To analyse costs in a comparison of 3D versus IMRT versus VMAT based on clinical staging.	The direct cost increases with clinical stage. Treatment regimens for advanced stages are the most costly.
Robles[23]	Prospective cross-sectional study.	To know the costs related to the transfer of the radiotherapy outpatient.	The expense associated with transport for treatment is high, exceeding the patient's average monthly income, and therefore has a worse therapeutic outcome, which can cause financial toxicity in cancer patients.

Restrepo[24]	Critical analysis.	To highlight the importance of economic factors in the care of cancer patients.	Financial concerns also affect caregivers, as they have to move, delay school or travel plans, and even postpone treatments for their own health in order to cover the costs of caring for their family member with cancer.
García et al.[25]	Critical analysis.	Identify factors that delay the start of cancer treatment.	Insufficient financial resources play an important role in the delay of cancer treatment. This delay in starting treatment is one of the main factors in the increase in cancer mortality.
Rozman et al.[26]	Retrospective Study	To describe resource utilisation and costs per patient and per cancer site in Brazil.	The study provided information on the direct medical costs associated with palliative care for Brazilian patients with end-stage cancer. The average of these costs is in the order of USD 12 335 per patient.
Montiel et al.[20]	Observational, Cross-sectional and Correlational.	To analyse the direct costs of breast cancer care at the third level of care in the Mexican Social Security Institute (IMSS).	The cost of medical care for early stage breast cancer is lower than for advanced stage breast cancer.

According to the annual dissemination scheme of these studies, the year with the highest number of publications was 2023, with five articles,[13,20,21,22,23] followed by 2024, 2020, 2022, and 2018 with two studies each;[12,14,16,18,24,25,26] 2019 and 2016 only contributed one study.[15,17] No articles were published in 2020. About language, only one study was retrieved in Portuguese,[12] eight in Spanish,[13,17,18,19,20,21,24,25] and six trials in English.[14,15,16,22,22,23,26]

Examining the geographic distribution pattern of the selected articles, we found that Brazil and Mexico provided four manuscripts,[12,14,15,18,19,20,25,26] Peru provided two investigations,[22,23] and Bolivia participated in a trial that included two more nations, Costa Rica and Jamaica.[16] Additionally, one article was obtained from Bolivia, one from Chile, one from Colombia, and one from Cuba.[13,17,21,24]

All of the retrieved research analyzed the impact of financial toxicity during cancer care in nine Latin American and Caribbean countries. One of the trials included three countries, Costa Rica, Peru, and Jamaica, with no comparisons between them, which took an economics-based approach to estimating the cost of chronic diseases, including cancer, ultimately reporting lost work days and lost productivity costs.[16]

Moreover, ten manuscripts reported the direct cost of managing cancer care;[14,15,17,18,19,20,21,22,23,26] one investigation reported the intangible costs of cancer disease on caregivers and family members;[24] one study assessed the relationship between financial toxicity and quality of life;[12] and another described patients' perceptions of the economic impact of cancer care.[13]

DISCUSSION

Globally, cancer care is taking a heavy financial toll, affecting the economies of nations as well as the pockets of patients and their families, in many cases depleting scarce household budgets. This systematic review found that Latin American and Caribbean countries do not escape this problem. Most of these countries are middle-income and spend between 4 % and 7 % of their gross domestic product (GDP) on health.[19,28] However, some, if not all, governments in this region find it difficult to achieve high-quality services to prevent, detect, diagnose, treat, and provide palliative care for cancer patients, as well as to support and care for those who have survived this catastrophic disease.

This is primarily due to multiple factors that directly influence inequalities in patient care and access to care, which are observed between and within countries: the difficulty for cancer patients to access care promptly and promptly, the shortage of trained health care personnel, the outdated health care infrastructure in many countries, especially in lower-middle income countries, the absence of new technologies, inconsistent public policies, and especially the steadily rising costs associated with cancer treatment.[28,29,30,31,32,33,34,35,36]

In the articles retrieved in this systematic review, several researchers agree that the economic impact of the financial toxicity of cancer, as it has been called when compared to the toxic effects of cancer drugs,[37] is multifactorial.[13,15,17,19,24,25] Two authors [17,19] agree that the high costs of hospitalization, chemotherapy, and radiotherapy strongly affect the care of cancer patients, mainly in vulnerable sectors, which causes a low rate of treatment adherence. Two studies [20,25], while indicating that the problem is multifactorial, state that inconsistencies in the design of public policies play a fundamental role in the high cost of cancer care. Another article emphasizes that the most critical factor in the genesis of the problem is social inequalities.[20]

On the other hand, ten studies strongly linked financial toxicity to direct costs during cancer care.[14,15,17,18,19,20,21,22,23,26] Korkes et al.[14], in their research on the economic burden of penile cancer, reveal that for urological malignancies alone in Brazil, the financial impact is just over USD 44 million, with prostate cancer accounting for USD 27,1 million in direct costs and testicular and penile malignancies accounting for USD 1,92 million.

Santos et al.[15] report that the total annual cost of treatment for cervical cancer in Brazil ranges from USD 26 million to USD 36 million. This discrepancy may be due to the large economic disparities between regions in Brazil. Direct medical costs accounted for 81,2 % of the total value, of which radiotherapy expenditure accounted for the largest share of total costs at 38,2 %, followed by outpatient chemotherapy at 27,4 %. Similarly, the author states that the higher the stage, the higher the price.

In contrast, Rozman et al.[26] show that the cost of palliative care for Brazilian patients with terminal cancer was USD 12 335 per patient, which makes it possible to estimate a financial impact of close to USD 3 billion.

According to Cid et al.[17], the economic impact of cancer in Chile is just over USD 2 billion per year, representing about 1 % of the country's GDP. Indirect costs were higher than direct costs, 1,9 times more. The types of cancer that generate most of the expenses are stomach, breast, lung, and prostate. And when discriminating by sex, men spent 30,33 % more than women. Chile is below the average cancer costs of some industrialized countries.

In Mexico, the cost of comprehensive care for lung cancer is just over USD 660 million per year and ranks first;[18] in second place is breast cancer, with an approximate cost of USD 348 million.[19] Rascón et al.[18], de la Cruz et al.[19], and Montiel et al.[20] concluded in their respective studies that costs increase directly and proportionally with the clinical stage at diagnosis. However, de la Cruz[19] was a little more specific in indicating that these costs are a product of chemotherapy, radiotherapy, and patient hospitalizations.

Gálvez et al.[21], in their paper analyzing the costs of cervical cancer, highlighted how treatment with chemotherapy and radiotherapy, as well as diagnostic studies, increase the direct medical costs of cervical cancer care in Cuba.

On the other hand, Robles[22], in his research, in which he analyses the cost of radiotherapy for cervical cancer in Peru when evaluating the economic cost of treating this type of cancer, concludes that the direct expenses increase with the clinical stage. Furthermore, treatment regimens for advanced stages are those with the highest costs. This is in agreement, regardless of the type of cancer, with the findings of Santos in Brazil[15] and the results of the Mexicans Rascón[18], Montiel[20], and de la Cruz[19], as well as those of Gálvez in Cuba.[21]

Another study by Robles[23], in which he evaluates the cost of transporting patients to radiotherapy, concludes that the cost associated with transport is higher than the patient's average monthly income and is a significant causal factor of financial toxicity in Peru. It warns that patients who experience economic hardship are less likely to adhere to treatment, resulting in higher rates of cancer recurrence and death.

These findings are consistent with those reported in the medical literature, where multiple investigations[38,39,40,41,42,43,44] have provided valuable information regarding the phenomenon of financial toxicity during cancer care and how it affects cancer patients, families, and survivors. At the same time, it has shown how direct costs, both medical and non-medical, directly impact the increase in financial toxicity. In addition, cancer patients have a higher risk of economic bankruptcy, and the problem of financial toxicity can persist even after the end of treatment.[45,46,47,48,49,50]

It is important to note that there are three types of costs during cancer patient care. Firstly, there are the direct costs, which are subdivided into direct medical costs and are those resources provided by the State through the public health system, such as hospitalizations, surgeries, diagnostic procedures, oncological treatments, hospital services, as well as other goods and supplies; the direct non-medical costs, or out-of-pocket expenses of the patient or their relative, are equivalent to the costs of transport, accommodation, food, pharmacy, among others. Secondly, we have the indirect costs, constituted by the loss of the patient's work productivity, either due to rest or permanent disability. Thirdly, there are intangible costs that affect the quality of life and mental health of the patient and their relatives.[19,31,39,51,52]

Our research did not find, for Latin America and the Caribbean manuscripts linking the financial toxicity of cancer care to health insurance. However, there is sufficient evidence in the scientific literature describing the association of financial toxicity with types of insurance, low coverage, high policy costs, little or no coverage for catastrophic diseases, and very high co-payments and deductibles.[31,53,54,55,56] This correlation is found in industrialized nations, with a purely private type of health care, where private insurance is essential to guarantee health care, in contrast to Latin America, where public and private health care coexist.

CONCLUSIONS

The fifteen articles selected for this systematic review clearly show how financial toxicity during cancer care in Latin America and the Caribbean negatively impacts the health and economic well-being of patients and their families, as well as representing a significant challenge for health systems in these nations.

The retrieved studies confirm that the direct medical costs of hospitalization, chemotherapy, radiotherapy, and palliative care are prohibitive for many patients and often beyond the financial capabilities of many families. Expenses can reach up to 70 % of a patient's annual income, pushing those affected to make difficult decisions, such as resorting to debt or liquidating savings, which can consequently lead to the financial bankruptcy of the family group.

Similarly, the impact on the economies of these States is high: USD 3 billion for Brazil, USD 2 billion for Chile, and just over USD 1 billion for Mexico, which only provided figures for the direct medical costs of lung and breast cancer. These are very high costs that will seriously and negatively impact the budget coffers of these nations.

In addition to direct costs, the financial toxicity is compounded by indirect costs, such as loss of income due to the inability to work during treatment. We found that indirect costs in these countries are high due to reduced labor productivity, not to mention caregivers, who often must devote significant time and resources to caring for their loved ones.

In terms of intangible costs, the psychosocial consequences of financial stress can lead to mental health problems such as anxiety and depression, compounding the suffering associated with a cancer diagnosis. This is of particular concern in a region where access to mental health services is quite limited.

Another critical factor contributing to the financial toxicity of cancer in this region is unequal access to care. It is observed that patients in vulnerable sectors, due to economic and geographic barriers, face severe difficulties in obtaining timely diagnosis and treatment. This situation is compounded by poor infrastructure and a shortage of trained medical personnel in many of these nations, which will further drive up hospitalization and treatment costs, creating a vicious cycle of debt and financial stress for patients and their families.

These dimensions of financial toxicity create a cascading effect that not only aggravates the economic situation of patients but also affects their ability to adhere to treatment, increasing vulnerability and decreasing the likelihood of success in the fight against cancer. It is, therefore, imperative to move towards more equitable health systems and to develop public policies designed to reduce the financial toxicity present during cancer care, which ensure prompt and timely access to quality health services, especially in low-income regions. These policies should include improving existing infrastructure, incorporating appropriate medical technologies to diagnose and effectively treat cancer, and training and recruiting specialized personnel. Similarly, it is essential to promote psychological and financial support programs for patients and their caregivers that provide them with guidance and resources to cope with the economic pressures associated with the disease and improve their quality of life.

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CONFLICT OF INTEREST

Authors declare that there is no conflict of interest.

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