 <https://doi.org/10.56238/emerrelcovid19-046>

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**ABSTRACT**

Objectives: To map the scientific production related to the repercussion of COVID-19 on the health of oncological children and to identify the challenges

related to this public in the current context of the pandemic. Methodology: this is an integrative review of the literature, consisting of a bibliographic survey and a review of relevant studies published on the CAPES journal portal from January 2020 to October 2021. Six methodological steps were followed and the research strategy with the acronym PICO was used to construct the guiding question. Of the material collected, only 17 works were eligible, according to the objective of the research. Results: In the analyzed works, the main findings were: the relationship between the clinical course of COVID-19 disease in pediatric cancer patients and the challenges related to this public in the current context of the pandemic. Conclusion: This study allows us to conclude that in general, the SARS-COV-2 infection did not have a significant impact on the clinical picture of children and adolescents with cancer, and the treatment presented challenges in times of pandemic.

**Keywords:** Child, Pediatric Cancer, COVID-19 pandemic.

## 1 INTRODUCTION

In the global context, one in six deaths has cancer as the main cause, responsible, 2018, for 9.6 million deaths. This disease has a higher frequency in the adult population, however, children and adolescents (0-19 years) have an average incidence of approximately 0.5% to 4.6% of all malignant tumors, occurring mainly in countries with low human development index (HDI) with deficient access to health care.<sup>1,2</sup>

According to the American Cancer Society, in 2019, leukemia (28%), central nervous system (26%), and lymphomas (8%) stood out as the main types of pediatric cancers included in the age group of 0 to 19 years. In Brazil, it is estimated that for each year of the 2020-2022 triennium, 8,460 new cases in the child and adolescent population, with 4,310 referring to males and 4,150 to females, with a higher incidence, respectively, in the Southeast and South regions.<sup>3,4</sup>

In December 2019, in China, the first outbreaks of viral pneumonia by a new strain (SARS-Cov-2) of the Coronaviridae family were traced, which spread rapidly to all continents due to its high

transmissibility. On March 11, 2020, the World Health Organization (WHO) elevated the SARS-CoV-2 infection status to the COVID-19 pandemic, a state of international public health emergency.<sup>5</sup>

The course of the pandemic has led to severe and strict government interventions to contain the rapid transmission of the new viral strain under the population. Measures such as the use of masks, *lockdown*, social distancing, an increase of beds, construction of emergency care for infected and other actions contributed to an impact on the social, economic, political, and cultural spheres of the country directly interfering in the daily lives of citizens.<sup>6,7</sup>

Given the current pandemic scenario, it is of fundamental importance to address this theme and care for cancer patients, with the focus of the study on the pediatric population, since about 2% of this group has the prevalence of the virus. It is known that some studies defend the possibility of a higher risk for SARS-CoV-2 infection and future complications, with the population affected by cancer, due to the clinical picture and their routines of comings and goings to the hospital, with greater exposure to the contagion of the disease. However, research aimed at the spread of the virus, early diagnosis, prognosis, and treatments concerning COVID-19 and its impact on the routine care of the pediatric oncology population, are still rare.<sup>8</sup>

In this perspective, with emphasis on the current global public health crisis due to COVID-19, it is relevant to approach the subject related to the theme of pediatric oncology, from the questioning about the possible existing productions about children with cancer in a pandemic period.

Given the above, the present study was aimed at the scientific production about the care of children with cancer during a period of the COVID-19 pandemic with the objectives of mapping the scientific production related to the repercussion of COVID-19 on the health of children with cancer and identifying the challenges related to this public in the current context of the pandemic.

## **2 METHODOLOGY**

### **2.1 TYPE OF STUDY**

The study is an integrative review of the literature, consisting of a bibliographic survey and a review of relevant studies published, to contribute assertively to the construction of new scientific studies. In addition to facilitating the implementation of effective interventions in care and identifying possible gaps in knowledge that need to be filled with further investigations.<sup>9,10</sup>

During the course, six methodological steps were followed, which are: (1) elaboration of the guiding question; (2) research or sampling in the literature; (3) data collection; (4) critical analysis of the included studies; (5) discussion of the results; (6) production of the review related to learning.<sup>11th</sup>

In this sense, the research strategy with the acronym PICo was used to construct the guiding question: how does the disease of COVID-19 affect the health of cancer children? Once the

composition of the fundamental elements is well constructed and organized, a greater degree of reliability about the evidence necessary for the resolution of the clinical research question is possible and avoids unnecessary searches.<sup>12</sup> Thus, P (child AND NOT adult) was defined;

o I (Pediatric Cancer); the Co (covid-19 pandemic).

## 2.2 STUDY LOCATION

The collection of literary materials, carried out from August to October 2021, was carried out in the following databases: Latin American and Caribbean Literature in Health Sciences (LILACS), Web of Science (WoS), Público/publisher MEDLINE (PubMed), SCOPUS and Cumulative Index to Nursing and Allied Health Literature (CINAHL).

## 2.3 INCLUSION AND EXCLUSION CRITERIA

The inclusion and exclusion criteria, being included: studies comprised in the time frame from 2020 to 2021, referring to the period officially declared a pandemic by the WHO, full texts and free access that have as main target: the child and adolescent public (0-19 years), the line of cancer care and the pandemic scenario. On the other hand, studies tangent to the target audience and with duplicity were excluded, considering only once for the analysis.

## 2.4 DATA COLLECTION

The descriptors defined and applied were selected from the register of the Descriptors in Health Sciences (DeCS), from the LILACS and PubMed databases, and the Medical Subject Headings (MeSH) of the Web of Science portal, SCOPUS, and from the CINAHL thesaurus of the CINAHL database.

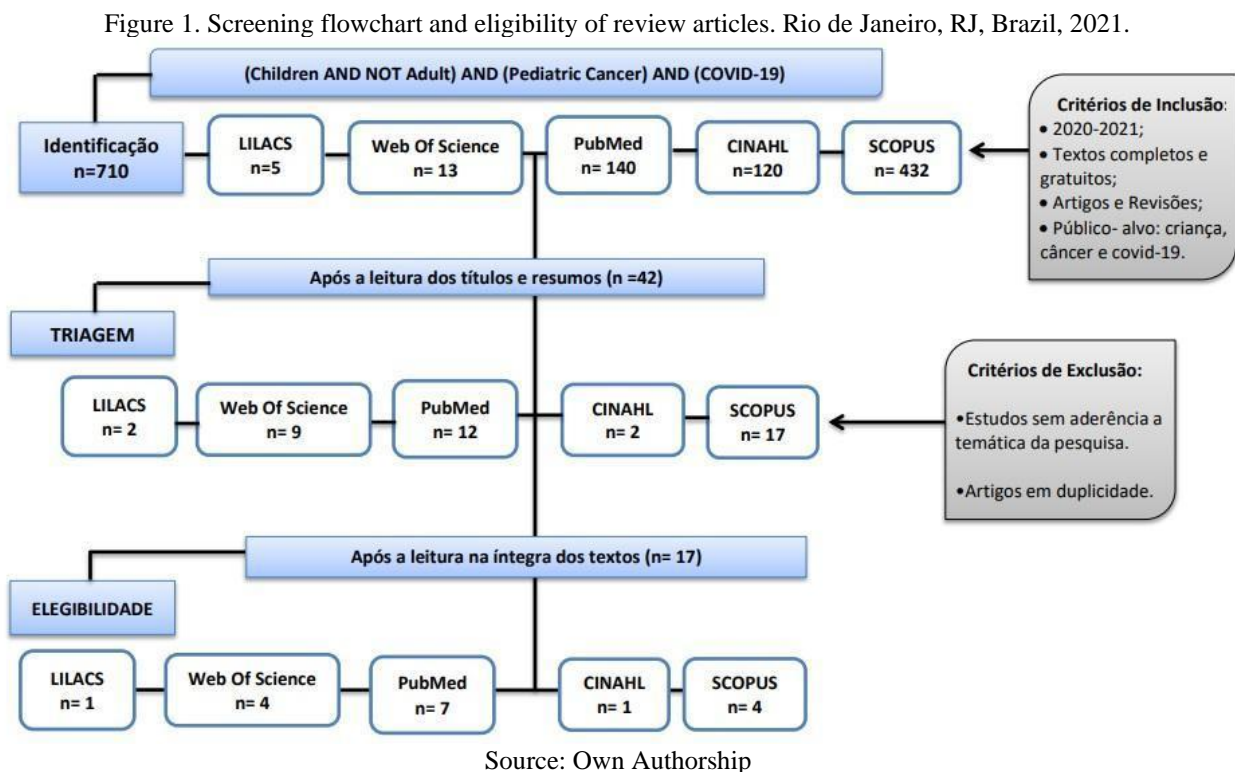
In addition, the choice of descriptors and their synonyms were constructed to capture as many available articles as possible, choosing to use the Boolean AND NOT among the terms referring to the participants, to increase the specification of the research according to the objective of the study, and AND between each term, allowing the combination of them. Thus, the following trifecta of keywords was used in the English language: (("Children" AND NOT "Adult") AND ("Pediatric Cancer") AND ("Covid-19"))).

## 2.5 DATA ANALYSIS PROCEDURES

The collected literary materials were submitted to a screening process for better identification and eligibility of the articles according to the objective of the research, as described in Figure 1 based

on the PRISMA recommendation (Main Items for Reporting Systematic Reviews and Meta-analyses).

13th



In this line, at first, 710 scientific productions were identified in the databases selected for the study. The first stage of the screening was characterized by the filtering of the articles after the analysis of the title, followed by the abstract, according to the inclusion and exclusion criteria. At the end of the first stage, 668 scientific productions were excluded, leaving only 42 for the next stage. From this quantity, the second filtering was performed through a more detailed and careful analysis of the texts in full, obtaining as the final result of the screening 17 articles that were within all the inclusion and exclusion criteria and were in agreement with the guiding question and objectives of the research.

Of the potential studies, an evaluation was performed using an instrument containing a database, title, author, year, journal, objective, and conclusion of the research. Finally, the consistency of the information and data found for the elaboration of the results and presentation of the review was analyzed.

## 2.6 ETHICAL ASPECTS

In addition, it is of fundamental importance to mention the absence of participants and scenario for the construction of IR, since it was a collection of literary materials in a database, for this reason, it was not necessary to forward a research protocol for evaluation by the Ethics and Research

Committee (CEP) by the Norms and Regulatory Guidelines for Research Involving Human Beings - Resolution CNS 510/2016.

### 3 RESULTS

Chart 2, below, comprises the final sample of 17 scientific productions, with a larger quantity in the PubMed database. Regarding the place of origin of the study that composed the sample, we have Europe (07), Asia (02), Africa (01), and America (06), being the United States of America (USA) responsible for three works, accompanied by Mexico, Cuba, and Brazil with only one work each. Regarding the language of publication, 90% correspond to English and 10% to Spanish.

Table 2 – Organization of the articles included in the review, according to base, title, authors, year, journal, objective, and conclusion, 2020-2021.

Code	BASE	TITLE/ AUTHORS	YEAR/ NEWSPA PER	TYPE OF STUDY/L EVEL OF EVIDEN CE	OBJECTIVES	MAIN RESULTS
A 01	LILACS	<i>COVID-19 in pediatric cancer patients.</i> <sup>8</sup>  Lopez EM <i>et al.</i>	2020/ Cuban Journal of Pediatrics.	Opinion Piece. Level of Evidence- 7	To characterize from a clinical- epidemiological point of view of pediatric patients infected with SARS- CoV-2.	COVID-19 in the pediatric population of eastern Cuba, mainly in the province of Santiago de Cuba, is not a health problem in terms of morbidity and mortality, but it is a source of contagion for adults.
A 02	Web of Science	<i>Delayed diagnosis and treatment of children with cancer during the COVID-19 pandemic.</i> 14  Dvori M, <i>etal.</i>	2021/ Internatio nal Journal of Clinical Oncology	Quantitati ve article/ retrospective document ary analysis. Level of Evidence- 4	Alert experts and general pediatricians to the need for prudence in diagnosing and treating children with cancer promptly, despite the ongoing COVID- 19 pandemic.	Late diagnosis of cancer is primarily related to fear of exposure to COVID-19. In addition to cases of co-infection with SARS-CoV-2 and the attribution of oncological symptoms to infection. In addition, patients already diagnosed with cancer, due to COVID-19 infection detected in the patient, family member, or bone marrow donor, contributes to the delay in treatments.

<p><b>A 03</b></p>	<p><b>Web of Science</b></p>	<p><i>Survival in pediatric patients with cancer during the COVID-19 pandemic: scoping systematic review.</i> <sup>15</sup></p> <p>Dorantes-acosta E, et al.</p>	<p>2020/ Medical Bulletin of the Children's Hospital of Mexico</p>	<p>Article of systematic exploratory review of the literature. Level of evidence- 1</p>	<p>Discover the available data on COVID-19 and mortality in pediatric cancer patients, and provide useful information for planning and developing strategies in this group.</p>	<p>Given the nature of the preliminary reports, COVID-19 appears to be less severe in children than in adults and does not appear to be a cause of mortality in pediatric cancer patients.</p>
<p><b>A 04</b></p>	<p><b>Web of Science</b></p>	<p><i>Caring for Children with Cancer in Africa during the COVID-19 Crisis: Implications and Opportunities.</i> <sup>16</sup></p> <p>Slone, JS, Ozuah N, Wasswa P.</p>	<p>2020/ Pediatric Hematology and Oncology</p>	<p>Article Expert commentary. Level of evidence- 7</p>	<p>To point out the main challenges faced in Africa during the pandemic for the treatment of children with oncology and blood disorders.</p>	<p>The emergence of positive long-term implications for the African health system, from the momentum created in response to COVID-19.</p>
<p><b>A 05</b></p>	<p><b>Web of Science</b></p>	<p><i>Survival and Complications in Pediatric Patients With Cancer and COVID-19: A Meta-Analysis.</i> <sup>17</sup></p> <p>Dorantes-</p>	<p>2021/ Frontiers in Oncology- Pediatric Oncology</p>	<p>An exploratory systematic review of the literature: Meta-Analysis. Level of evidence- 1.</p>	<p>To determine survival and associated complications in pediatric cancer patients during the pandemic.</p>	<p>In the literature analyzed, survival in the studied group of patients with COVID-19 was very high. Being a carrier of hematologic malignancy or other solid tumors and COVID-19 was not a risk factor in children with cancer for the outcomes analyzed.</p>

		Acosta E, <i>et al.</i>				
<b>A 06</b>	<b>PubMed</b>	<i>COVID-19 in pediatric oncology from French pediatric oncology and hematology centers: High risk of severe forms?</i> <sup>18</sup>  André N, Rouger-gaudichon J, Brethon B, <i>et al.</i>	2020/ Pediatric Blood & Cancer.	Letter to the editor. There is no evidence.	Learn more about the impact of COVID-19 on pediatric cancer patients from the cases identified in France's leading pediatric oncology centers.	At first, COVID-19 in pediatric cancer patients appears to be rare. However, the greater possibility of severe forms of the infection compared with immunocompetent children cannot be ruled out
<b>A 07</b>	<b>PubMed</b>	<i>Flash survey on severe acute respiratory syndrome coronavirus -2 infections in pediatric patients on anticancer treatment.</i> <sup>19</sup>  Hrusak O, Kalina T, Wolf J, <i>et al.</i>	2020/ <u>European Journal of Cancer</u>	The Flash search was used to obtain data on the incidence and severity of COVID-19.  Level of evidence-4	Identify the incidence and severity of COVID-19 in children on anticancer treatment.	This quick research, while providing a very early picture of COVID-19, shows that the disease can have a mild course even in children receiving anticancer chemotherapy.
<b>A 08</b>	<b>PubMed</b>	<i>COVID-19 disease in New York City pediatric hematology and oncology patients.</i> <sup>20</sup>	2020/Pediatric Blood &	Letter to the editor. There is no evidence.	Describe the impact of COVID-19 on New York's pediatric population	The study data reinforce the impression that pediatric patients have a lower burden of COVID-19 disease compared to adults. In addition to adding the delays and postponements in cancer treatment during the pandemic as one of the

		Gampel B, <i>et al.</i>	Cancer		hematology and oncology.	main challenges facing pediatric oncologists.
A 09	PubMed	<i>Impact of the First Wave of COVID-19 on Pediatric Oncology and Hematology : A Report from the French Society of Pediatric Oncology.</i> 21  Rouger-gaudichon J, <i>et al.</i>	2020/Cancers	This is a quantitative, retrospective study with clinical data analysis.  Level of evidence- 3	To better describe the presentation and evolution of COVID-19 in patients followed in French pediatric oncology and hematology wards. Identify those who may be at the highest risk of severe COVID and establish specific recommendations.	Relatively few pediatric cancer patients have shown clinical signs of COVID-19 or tested positive for the virus. However, some highly immunocompromised patients are at risk of developing severe forms of the viral infection.  In addition, cancer treatment was delayed in nearly half of the cases, indicating that COVID-19 impacted patient care, even though most cases were mild.
A 10	PubMed	<i>Severity of COVID-19 in children with cancer: Report from the United Kingdom Paediatric Coronavirus Cancer Monitoring Project.</i> 22  Millen GC, <i>et al.</i>	2021/ <u>British Journal of Cancer</u>	Observational study retrospective.  Level of evidence- 4	To produce evidence of the incidence and outcomes of SARS-CoV-2 in children with cancer seen in all hospitals treating this population across the UK.	Children with cancer with SARS-CoV-2 infection are not at increased risk of severe infection compared to the general pediatric population.
		<i>A collateral effect of the COVID-19 pandemic:</i>		Letter to	To examine the delay in the diagnosis of patients arriving at	The study suggests as a possible side effect of the COVID



A 11	PubMed	<i>Delayed diagnosis in pediatric solid tumors.</i> <sup>23</sup>  Chiaravalli S, <i>et al.</i>	2020/ Pediatric Blood & Cancer	the editor. There is no evidence.	the Pediatric Oncology Unit of the Istituto Nazionale Tumori, Milan, a referral center for pediatric solid tumors.	pandemic the reduction in access to referral centers for pediatric cancer patients and their consequent worse chances of a timely diagnosis.
A 12	PubMed	<i>Clinical Characteristics and Outcome of Severe Acute Respiratory Syndrome Coronavirus 2 Infection in Italian Pediatric Oncology Patients: A Study From the Infectious Diseases Working Group of the Associazione Italiana di Oncologia e Ematologia Pediatrica.</i>  24  Need G, <i>etal.</i>	2020/ <u>Journal of the Pediatric Infectious Diseases Society</u>	Cohort study, prospective with clinical data analysis. Level of evidence- 4	To prospectively evaluate clinical features and outcomes in pediatric patients infected with SARS- CoV-2 during chemotherapy or after stem cell transplantation, during the pandemic in Italy.	SARS-CoV-2 infection appears to have a milder clinical course in children than in adults with cancer. In addition, the data indicate that it may not be necessary to modify or delay your cancer treatment program, especially for patients who remain asymptomatic or have only mild symptoms of the viral disease.
A 13	CINA HL	<i>A Child with Acute Lymphoblastic Leukemia in Institutional Isolation during the COVID Pandemic:</i> A	2020/ <u>Indian Journal of</u>	Case Report. Level of evidence- 5.	Discuss the concerns and reflect on the problems of a 10-year-old boy with COVID	The report reinforces the need for holistic care for patients and their families during anticancer treatment, especially regarding psychological issues and concerns

		<i>Multifaceted Responsibility.</i> 25  Rathore P, <i>et al.</i>	<u>Palliative Care</u>		during the evaluation and treatment of leukemia.	that have intensified during the pandemic.
A 14	SCOPUS	<i>Prevalence and course of sars-cov-2 infection among immunocompromised children hospitalized in the tertiary referral hospital in Poland.</i> 26  Kuczbourska K, Ksiazek J.	2021/ <i>Journal of Clinical Medicine</i>	Study Quantitative Retrospective. Level of evidence- 4	To evaluate the prevalence, clinical features, and comparison of the course of SARS-CoV-2 infection in children with and without immunodeficiency admitted to the COVID-19 subunit of the tertiary referral hospital in Warsaw, Poland.	Concerning the comparison of the groups of children with and without immunodeficiency the course of infection was similar. Both were mostly asymptomatic or had a mild stroke of COVID-19.
A 15	SCOPUS	<i>Impact of the COVID-19 pandemic on pediatric patients with cancer in low-income, middle-income, and high-income countries: Protocol for a multicentre, international, observational cohort</i>	2021/ <i>British Medical Journal</i>	Study observational multicenter international cohort. Level of evidence- 4.	To determine all-cause mortality rates of 30 days, 90 days, and 12 months in children with pediatric cancer during the COVID-19 pandemic in countries with low,	This study limited its focus to nine of the most common pediatric cancers globally identified by the WHO and therefore does not capture the effects of the pandemic on rarer cancers.

		<i>study.</i> <sup>27</sup> Peter N, Bandyopadhyay S, Lakhoo K.			medium, and high Human Development Indices.	
<b>A 16</b>	<b>SCOPUS</b>	<i>The global effect of the COVID-19 pandemic on pediatric cancer care: a cross-sectional study.</i> <sup>28</sup> Graetz D, <i>etal.</i>	2021/ <i>The Lancet Child and Adolescent Health</i>	A cross-sectional quantitative study. Level of evidence- 4	To assess the effect of the COVID-19 pandemic on the treatment of childhood cancer worldwide.	This study emphasizes the urgency of a robust and equitably distributed global response to support pediatric cancer care during this pandemic and future public health emergencies.
<b>A 17</b>	<b>SCOPUS</b>	<i>SARS-CoV-2 in children with cancer in Brazil: Results of a multicenter national registry.</i> <sup>29</sup> MCM course, <i>et al.</i>	2021/ Pediatric Blood & Cancer	Multicenter observational cohort study. Level of evidence- 4	Address the impact of COVID-19 on pediatric cancer patients in low- and middle-income countries.	In children with cancer and COVID-19, lower BMI was associated with a worse prognosis. Mortality in this group of patients (12.3%) was significantly higher than that described in the general pediatric population (~1%).

As for the main findings evidenced in the code works: A01, A03, A05, A06, A07, A08, A09, A10, A12, A14, A15, and A17, there is mainly the relationship of the clinical course of COVID-19 disease in pediatric cancer patients. With emphasis on the signs and symptoms presented, the low impact on the infant mortality rate and the favorable evolution of the prognosis without sequelae.  
8,15,17,18,19,20,21,22,24,26,27,29

Study A01 describes fever and dry cough as the most frequent respiratory manifestations accompanied by other symptoms, less frequently, such as: runny nose, dyspnea and headache, in addition to, in some cases, the presence of bacterial pneumonia. <sup>8</sup> According to works A05 and A10, COVID-19 infection does not represent a higher risk in the pediatric population with cancer, and a mortality rate <1% is identified as the final result of the analysis of the articles, in which the cause of

death occurs by the progressive disease and not by contact with the new SARS-COV-2 viral strain.

17,22

In addition, the low incidence of hospitalizations and the presence of a favorable prognosis without sequelae accompanied by health professionals are highlighted, according to A01.<sup>8</sup> Although mild or asymptomatic development by children and adolescents with cancer predominates in most studies, scientific studies A09, A10 and A14 point out the importance of careful clinical monitoring of these patients considered potential to develop a severe form of COVID-19.<sup>21,22,26</sup>

On the other hand, the studies whose codes are: A02, A04, A11, A13 and A16 focus on the challenges related to this public in the current context of the pandemic, with notes on late diagnosis, delay or postponement of treatments and the socioeconomic implications on health.<sup>14,16,23,25,28</sup>

The fear of exposure to COVID-19, evidenced in A02, A11 and A13 is the main reason for the late diagnosis of cancer in the pediatric population, since the hospital previously seen as a place of treatment becomes synonymous with a possible place of contagion. In addition, we highlight the cancellation of some laboratory and imaging tests presumed to be non-essential in the context of the pandemic, the replacement of face-to-face consultations by the excessive use of telemedicine, the suspension of consultations as a preventive measure to protect the team of health professionals and other patients.<sup>14,23,25</sup>

As a result, article code A02 highlights the delay or postponement of treatments linked to COVID-19 infection of caregivers and relatives of children and adolescents or with pediatric patients with cancer and the attribution of oncological symptoms to SARS-COV-2 infection.<sup>14th</sup>

In the scientific productions A04 and A16, corresponding respectively to the African continent and the USA, the precariousness of health services were identified, especially in middle- and low-income countries that already have an overload in the health system and with the context of the pandemic the already existing socioeconomic implications were accentuated, with emphasis on the lack of inputs and infrastructure to deal with COVID-19 positive patients, Even more so about the pediatric oncology public.<sup>16, 28</sup>

According to A16, some health centers such as pediatric hematology-oncology have reported complete closure during the pandemic. Others reported the scarcity of blood products, the unavailability of chemotherapeutic agents due to logistical difficulties at the border and interruptions in radiotherapy due to the absence of supplies, directly corroborating the abandonment of treatment and delay in the care plan of these patients.<sup>28th</sup>

It is also worth mentioning article A17, unique in the study sample for being a national reference, contemplating the complexity of the unified health system (SUS) during the pandemic, for

the access of children and adolescents with cancer to treatment centers, which are mainly concentrated in the metropolises, where the focus of COVID-19 infection was high. <sup>29th</sup>

In addition, SARS-COV-2 infection at the time of study presentation and the nutritional status of the pediatric patient were related as possible risk factors for a favorable prognosis or not. In which the data of the work evidenced higher mortality in the groups of children classified as seriously ill when compared to those who were asymptomatic or with mild/moderate symptoms of COVID-19. <sup>29th</sup>

In addition, the article also provides notes on the impact of nutritional status on the survival of children and adolescents with COVID-19, about a BMI lower or higher than what is considered appropriate for the age group being a potentially significant lethal risk factor in the clinical response and prognosis related to acute SARS-CoV-2 infection. <sup>29th</sup>

#### **4 DISCUSSION**

The analysis of the articles selected for the sample within the time frame, January 2020 to October 2021, resulted in 17 studies, all published in foreign journals and none in a specific nursing journal, nor did they present direct nursing interventions in the construction and execution of a care plan for the target audience of IR.

The study showed two broad categories of scientific production, one related to the clinical picture of pediatric patients with cancer and the other to the challenges faced mainly to the current treatment of this public during the pandemic.

In this context, it is of fundamental relevance to mention that the trifecta: child, cancer and COVID-19 is still little addressed and discussed, focusing the studies, mainly, on the changes in the clinical course of SARS-CoV-2 infection in children and adolescents with cancer, which characterizes a greater concern about the effects of COVID-19 contagion in this group and the path to be taken during treatment.

Therefore, a greater number of publications linked to the European continent is notorious, one of the precursors in the practice of rigorous government interventions to contain the rapid contagion by SARS-CoV-2, being a possible reason to be the main pioneers in the scientific productions of this theme.

In this perspective, the detailed reading of the works and the identification of the main findings, previously mentioned, lead to the suggestion that the scientific effort for the development of research on this theme, in the short term, refers to a need for the part of health professionals to develop guidelines and management protocols for the clinical monitoring and treatment of cancer in the current context of the pandemic. <sup>15th</sup>

Of these, it is important to highlight the absence of works highlighting the direct action of nursing and its main interventions in the care of these patients in the current scenario of COVID-19. A greater relevance is visible in the body of studies to(s): signs and symptoms presented, use of the main medications (hydroxychloroquine, ritonavir and lapinavir), number of hospitalizations and percentage of mortality during treatment.<sup>8,22,24</sup>

Given the reduced number of scientific productions on this theme, the few data highlighted in the literature corroborated the convergence of the isolated opinions of different authors about the milder clinical course in the age group studied, even if they are immunocompromised patients. However, some questions are still evident during the in-depth reading of the articles. For example, whether or not to postpone chemotherapy when the infection is detected, what parameters to follow for a proper recovery from COVID-19 in a pediatric cancer patient, and among other open questions.  
15th

Regarding the category of challenges faced in this pandemic scenario, it is extremely relevant to mention that in pediatric cancer patients, care is not limited to the possibility of increased infection by SARS-Cov-2 or the risk of greater severity of the clinical outcome, but also to the challenges for the reorganization in the management and care of these patients, especially about their current treatments.<sup>8,30</sup>

Linked to this, the implications of socioeconomic precariousness are evidenced, as a fundamental factor of prominence in the overload of health systems in certain regions,<sup>31</sup> especially in countries with low human development index (HDI), reflecting in the delays in consultations and/or modifications in treatment regimens, and decrease in pediatric onco-hematology teams.<sup>32nd</sup>

At the time of the present study, no article has been identified that addressed as a target of the research actions that are being adopted to mitigate the advance of COVID-19 in children undergoing cancer treatment.

In addition, the interaction of research groups and health professionals is evidenced to gather and make available recommendations that facilitate the implementation of oncology services in a pandemic scenario so that protection transcends the patient and accompanies their families and team in cancer care.<sup>33,34</sup>

## **5 STUDY LIMITATIONS**

The present study has limitations regarding the fact that SARS-CoV-2 infection is recent, evidenced in the time frame of the research, contributing directly to comprehensive and methodologically robust studies on the subject.

## **6 CONTRIBUTIONS TO PRACTICE**

From this study, it is expected to identify gaps in the literature that interfere in the care of this child and adolescent population in a context of the COVID-19 pandemic, to contribute to the discussion of the results obtained in care and teaching to expand the knowledge regarding the theme addressed. In addition to encouraging new studies, of medium and long-term follow-up, to elucidate with a greater degree of evidence the effects of SARS-CoV-2 infections in the pediatric oncology group and possible changes in the treatment of this group, especially in the face of the care of a nursing scientifically based on the care of patients with cancer.

## **7 FINAL CONSIDERATIONS**

Given the vulnerability exposed by children and adolescents, affected by cancer, the involvement of this group immunosuppressed by SARS-CoV-2 infection becomes a concern, since the signs and symptoms related to COVID-19 can be camouflaged by the recurrent effects of cancer treatment.

Thus, this study allows us to conclude the relevance of the scientific productions selected to highlight the main unanswered questions regarding the dynamics of health care for the target audience in times of pandemic. In addition to pointing out the main challenges faced in the therapeutic routine of the underlying disease.

In addition, it is worth mentioning the fundamental position of research for health professionals, especially nursing, resulting in the updating of protocols and guidelines, in addition to the construction of critical thinking and development of skills and competencies in situations such as the one recently witnessed, and it is up to them to train to form new plans to provide the necessary changes regarding a better care plan.

## **AUTHORS' CONTRIBUTION**

The authors: Karina de Avellar Silva and Luciana de Souza Castro, were responsible for the elaboration of all stages of construction of the article from the elaboration of the project, literature review, definition of the methodology, data collection and filtering, results, discussion, and final considerations.

The author Laura Johanson da Silva acted as advisor of the dissertation that gave rise to the article, responsible for the orientations and corrections of all the steps carried out until the approval of the final version to be published.

The authors: Sônia Regina de Souza, Wânia Priscila Melo de Carvalho, and Roberta Dantas Breia de Noronha participated in the critical review of the manuscript.



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