

# Characteristics of Patients with Childhood Leukemia in the Hospital and the Contribution of Physiotherapy: a Retrospective Study

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*Características dos Pacientes com Leucemia Infantil no Âmbito Hospitalar e a Contribuição da Fisioterapia: um Estudo Retrospectivo*

*Características de los Pacientes con Leucemia Infantil sin Alcance Hospitalario y con la Contribución de la Fisioterapia: un Estudio Retrospectivo*

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## Abstract

**Introduction:** Leukemias are characterized by the presence of immature cells in the bloodstream derived from tumor cells in the bone marrow which replace healthy blood cells. It is possible to visualize, in children with leukemia, physical-motor and respiratory changes, such as muscle weakness, fatigue and reduced lung function. Physiotherapy prevents cancer complications, with a biopsychosocial approach provided for in the International Classification of Functioning, Disability and Health (ICF). **Objective:** Evaluate the characteristics of children diagnosed with leukemia, the contribution of physiotherapy and investigate the use of ICF. **Method:** Retrospective descriptive survey of the charts of 76 children diagnosed with acute lymphoid leukemia (ALL) and/or acute myeloid leukemia (AML) in a Tertiary Hospital in Curitiba, between 2015 and 2018. **Results:** The patient's mean age was 6.75±4.17 years; 89.5% (n=68) of the diagnostics were ALL, 5.3% (n=4), AML, and 5.3% (n=4), both. Most of the patients, 67.1% (n=51) lived in Curitiba-PR and in the metropolitan region; 63.2% (n=48) used the public health system to ensure access to the hospital and 36.8% (n=28) used other ways. Of the 76 medical charts analyzed, only 14.4% (n=11) registered physical therapy and no record of the use of the biopsychosocial model proposed by the ICF was found. **Conclusion:** Despite the availability of physiotherapy at the hospital, a standard of assessment, diagnosis and physiotherapy prescription was not identified, as well as the main neuropsychomotor disorders of children with leukemia.

**Key words:** Leukemia; Physical Therapy Modalities; International Classification of Functioning, Disability and Health; Medical Oncology; Child.

## Resumo

**Introdução:** As leucemias são caracterizadas pela presença de células imaturas na corrente sanguínea, provenientes das células tumorais na medula óssea, que substituem as células sanguíneas saudáveis. Em crianças com leucemia, é possível visualizar alterações fisicomotoras e respiratórias, como fraqueza muscular, fadiga e redução da função pulmonar. A fisioterapia previne as complicações oriundas do câncer, com uma abordagem biopsicossocial prevista na Classificação Internacional de Funcionalidade, Incapacidade e Saúde (CIF). **Objetivo:** Avaliar as características de crianças com diagnóstico de leucemia, a contribuição da fisioterapia e investigar o uso da CIF. **Método:** Trata-se de um levantamento descritivo retrospectivo de prontuários de 76 crianças com diagnóstico de leucemia linfóide aguda (LLA) e/ou leucemia mieloide aguda (LMA), em Hospital Terciário de Curitiba, com diagnóstico entre 2015 e 2018. **Resultados:** A média de idade dos pacientes foi de 6,75 ± 4,17 anos; 89,5% (n=68) dos diagnósticos eram LLA, 5,3% (n=4), LMA e 5,3% (n=4), de ambas. A maioria, 67,1% (n=51), residia em Curitiba-PR e Região Metropolitana; 63,2% (n=48) utilizaram o sistema de saúde pública como meio de acesso ao hospital e 36,8% (n=28) usaram outros. Dos 76 prontuários analisados, apenas 14,4% (n=11) registraram atendimento fisioterapêutico e o modelo biopsicossocial proposto pela CIF esteve ausente. **Conclusão:** Apesar da disponibilidade do serviço de fisioterapia no hospital, não foi identificado um padrão de avaliação, diagnóstico e prescrição fisioterapêutica, assim como os principais acometimentos neuropsicomotores de crianças com leucemia. **Palavras-chave:** Leucemia; Modalidades de Fisioterapia; Classificação Internacional de Funcionalidade, Incapacidade e Saúde; Oncologia; Crianças.

## Resumen

**Introducción:** Las leucemias se caracterizan por la presencia de células inmaduras en el torrente sanguíneo, derivadas de células tumorales en la médula ósea que reemplazan a las células sanguíneas sanas. En niños con leucemia, es posible ver cambios físicos y motores, como debilidad muscular, fatiga y función pulmonar reducida. La fisioterapia previene las complicaciones del cáncer, con un enfoque biopsicosocial previsto en la Clasificación Internacional del Funcionamiento, Discapacidad y Salud (CIF). **Objetivo:** Evaluar las características de los niños diagnosticados con leucemia, cómo la fisioterapia contribuyó e investigar el uso de la CIF. **Método:** Esta es una encuesta descriptiva retrospectiva de los registros médicos de 76 niños diagnosticados con leucemia linfóide aguda (LLA) y/o leucemia mieloide aguda (LMA) en un hospital terciario en Curitiba, con diagnóstico entre 2015 y 2018. **Resultados:** La media de la edad de los pacientes fue de 6,75±4,17 años; El 89,5% (n=68) de los diagnósticos fueron ALL, 5,3% (n=4), AML y 5,3% (n=4) de ambos. La mayoría, 67,1% (n=51) vivía en Curitiba-PR y en la Región Metropolitana; El 63,2% (n=48) utilizó el sistema de salud pública como medio de acceso al Hospital y el 36,8% (n=28) utilizó otros. De los 76 registros médicos analizados, solo el 14,4% (n=11) registró fisioterapia y el modelo biopsicosocial propuesto por la CIF estaba ausente. **Conclusión:** A pesar de la disponibilidad del servicio de fisioterapia en el hospital, no se identificó un estándar de evaluación, diagnóstico y prescripción de fisioterapia, así como los principales trastornos neuropsicomotores de los niños con leucemia.

**Palabras clave:** Leucemia; Modalidades de Fisioterapia; Clasificación Internacional del Funcionamiento, de la Discapacidad y de la Salud; Oncología Médica; Niño.

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## INTRODUCTION

Leukemia is a malignant disease of the hematopoietic system appearing due to genetic and epigenetic alterations of a bone marrow progenitor leukocyte cell<sup>1</sup>. From a clonal selection of the altered cells, the production and interference in the maturation of white blood cells reduces. Leukemia can be divided in acute and chronic and, in second plan, in lymphocytic and myelocytic, depending on the type of cell affected<sup>2</sup> predominantly. In acute leukemia, the blasts were altered, and with this, they lose their capacity of maturation. In general, acute leukemias are more aggressive because of its high replication capability while chronic are unchained by alterations of mature cells which contribute for its poor functioning and overall are slower than in acute leukemias. In lymphocytic leukemias the type of cells affected are lymphocytes with lymphoid forms or lymphatic tissue and in the myelocytic, they are of myeloid origin as non-lymphocytic white cells, red cells and megakaryocytic. Mixed types can also be found, which makes diagnosis and treatment complex<sup>4</sup>.

Leukemias correspond to the most common type of cancer in childhood and adolescence. According to data of the National Cancer Institute José Alencar Gomes da Silva (INCA)<sup>5</sup>, the estimates of incidence for each year of the triennium 2020-2022 are 5,920 new cases of leukemia in men and 4,890 in women, corresponding to an estimated risk of 5.67 new cases for 100 thousand men and 4.56 new cases for 100 thousand women. In childhood, leukemias correspond to 33% of all the malignant diseases affecting them until 14 years, being the most common worldwide<sup>6</sup>. From 30% to 40% of the children and adolescents diagnosed from 0 to 18 years, the possibility of future repercussions in their neuropsychomotor development is still bigger, needing multi-disciplinary follow up for long periods<sup>7,8</sup>.

The early diagnosis of the disease is performed through blood count and later, immunophenotyping where it is possible to distinguish the cells by its cellular markers and classify leukemias by their grades. In acute lymphoid leukemia (ALL), for instance, immunophenotyping determines whether alterations are found in lines of lymphocytes B or T according to immunophenotypic traces of lymphoblasts<sup>9,10</sup>.

Chemotherapy is the most common treatment, its action occurs on malignant and healthy organism cells and leads to symptoms as anemia, fatigue, leukopenia, apathy, nausea, vomits, alopecia, diarrhea, weight loss among other. This type of treatment causes neuromusculoskeletal complications as muscle weakness, myopathies, osteoporosis, fractures, and osteonecrosis, diminishing the levels of physical ability and bone mineral

density of the child. In general, the therapeutic processes in leukemia can cause discomfort, stress and prolonged hospitalizations<sup>11</sup>.

In the process of oncologic physiotherapy, the therapeutic-functioning objectives involve the preservation, maintenance and restoration of the kinetic functioning of the patient's integrity of organs and systems and prevent innumerable disorders caused by the treatment of the disease<sup>12,13</sup>. Children and adolescents may present disuse muscle atrophy, alteration of the motor coordination, of the muscle strength and range of movement which, associated to prolonged rest, can promote respiratory and vascular alterations. During the disease progress, the child can also suffer with the reduction of the force of gravity action in bones and tissues, possibly leading to severe postural hypotension.

It is essential that the hospital physiotherapist evaluates, utilizes and prescribes the use, for instance, of motor and pulmonary kinesiotherapy with functioning and therapeutic goals to adjust the position of bed-ridden patients, changing the positions and postures within the hospital environment, reaching active and functioning orthostatism, when possible; further to correct and ludic physiotherapeutic exercises of resistance and muscle strengthening, proprioception training, restoration of the range of articular movement and prevention of fatigue<sup>14</sup> adjusted to the child reality, who is the patient in this case of leukemia.

In the case of oncologic pediatric physiotherapy, the biopsychosocial approach whose health indicator is its functioning<sup>15</sup> and a broad perspective of the child health, considers the functioning aspects of the health status, of the function's dimensions and structure as condition of mobility of each patient, presence of pain or discomfort among other aspects which will depend of the physiotherapeutic evaluation.

Also, in the dimensions of activities and participation of the WHO International Classification of Functioning, Disability and Health (ICF)<sup>16</sup>, considering, within the physiotherapeutic process in oncology, the capacities and performance of the child with leukemia in the diversity of daily activities of playing, specific therapies among other and its level of involvement in the adherence to the treatment. In addition to environmental and personal factors specific of each child that contribute for the development and finally, meeting the objective of offering a unified and standardized language to describe the health-related status<sup>16,17</sup>.

Furthermore, in ICF contextual aspects, environmental and personal factors involve the neuropsychomotor development of the child with leukemia. The family involved in caring can be a facilitator in the family

environment or in education and leisure issues, with appropriate plays to the age range, which would help the recovery of the child who, for such, needs physiotherapy guidance for health promotion and education. The child's specific personal factors contribute for its development and depend of its psychomotor history, stimulation, nutritional involvement, and other comorbidities, whether present. Therefore, with the broad health psychosocial view it is possible to prescribe the correct physiotherapeutic treatment for leukemia in childhood, promoting health and avoiding its complications, being possible to use ICF to follow up this process of the child evolution. ICF has the objective of offering a unified and standardized language to describe the health-related status through codes that facilitate the collection and registry of the child's information as in the case of this study. After the physiotherapeutic evaluation, it was possible to indicate categories and qualifiers of the health condition of the domains Functions (b); Structures of the Body (s); Activities and Participation (d); Environmental Factors; (e) Personal Factors. Therefore, in each phase of the recovery of the evolution of the child with leukemia, aspects of the main complaint must be considered, facilitating to map and adjust the multi-professional and physiotherapeutic intervention in pediatric oncology<sup>6,17</sup>.

In this perspective, this study has the objective of analyzing the characteristics of the patients admitted at the hospital with diagnosis of childhood leukemia, identifying through clinical charts the physiotherapeutic interventions performed in children and investigate the use of the ICF biopsychosocial model characterized in different dimensions of functioning and contexts of the disease.

## METHOD

Retrospective descriptive study<sup>18</sup> whose inclusion criteria were: individuals with diagnosis of acute lymphocytic leukemia (ALL) and/or acute myeloid leukemia (AML), utilizing the codes ICD-10 – C91.0 and ICD-10 – C92.0, respectively, age between 0 and 15 years old treated at Tertiary Hospital of Curitiba-PR from 2015 to 2018. The exclusion criteria were individuals older than 15 years with hospital treatment for less than 24 hours, treated at the hospital out of the period from 2015 to 2018. Based in the codes ICD-10 – C91.0 and ICD-10 – C92.0, 150 charts of the admission book of the Oncologic Service were selected and further referred to the Statistical and Medical Files System (SAME) according to hospital routine. Of these, only 76 met the inclusion criteria: individuals with diagnosis of ALL and/or AML, aged from 0 to 15-year-old treated at the Tertiary Hospital of Curitiba-PR from 2015 to 2018.

The data collected were selected from charts listed in the admission book of the Oncology Service and referred to SAME and registered in order to maintain the confidentiality and privacy of the patients. The following information were obtained from the charts for review: date of birth, gender, date of the diagnosis, clinical diagnosis, city, means of access to the hospital (insurance coverage, private or public health system), anamnesis, blood type, blood transfusion, complementary exams, concomitant diseases, post-neoplastic treatment complications, physiotherapy treatment and follow up. The main categories were identified considering the domains of ICF biopsychosocial approach.

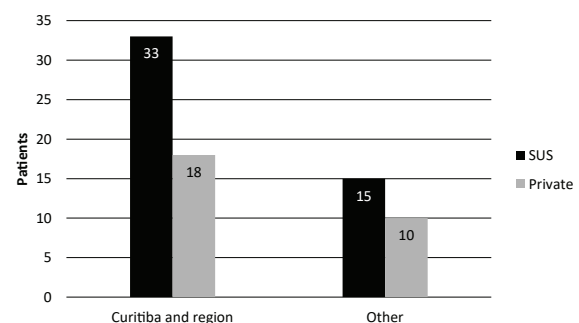
The Institutional Review Board of “*Associação Hospitalar de Proteção à Infância Dr. Raul Carneiro*” approved the study, number CAAE 80584817.5.0000.0097.

## RESULTS

150 charts were selected, of which only 76 met the inclusion criteria, the mean age of the patients was  $6.75 \pm 4.17$  years, 89.5% (n=68) were diagnosed with ALL, 5.3% (n=4) AML, and 5.3%, clinical diagnosis for both neoplasms. Of the total, (43.4%) (n=33) were females and 56.6% (n=43), males.

Of the total of children consulted at the Hospital, 67.1% (n=51) live in Curitiba-PR and Metropolitan Region and 32.9% (n=25) came from other cities for the treatment. 63.2% (n=48) accessed the Hospital through the public health system, while 36.8% (n=28) through other health insurance and private (Figure 1).

In the chart's anamnesis, fever (31.6%) and bruises (13.2%) were the most predominant in the reports, while vomits and nausea (11.8%), weight loss (9.2%) and diarrhea (5.3%) were found in smaller proportions (Table 1). The prevalent symptom after the beginning of the treatment was febrile neutropenia for 23.7% of the patients also associated to other symptomatologic



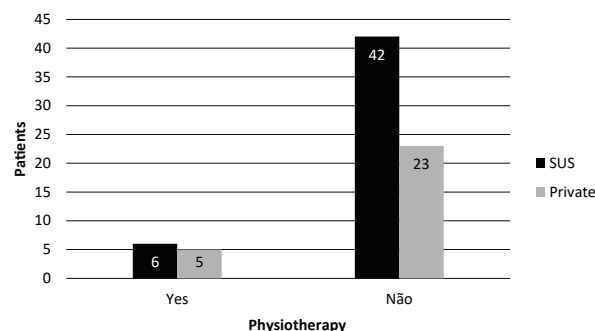
**Figure 1.** Mean of access to hospital and origin of the patients: data related to the place of residence and type of insurance utilized

conditions as anemia, and 1.3% presented pancytopenia. The most prevalent blood types were O (39.5%) and A (31.6%) and positive RH was prevalent (73.7%); of these, 72.4% underwent blood transfusion in some moment of the treatment.

Regarding the physiotherapeutic treatment, only 11 patients (14.4%) have submitted to the procedure according to their charts' report, being 7.9% respiratory, 2.6% motor and 3.9%, both interventions. If the sample was stratified in relation to the type of health insurance, only 12.5% of the patients of the public health system were submitted to any physiotherapy intervention, and 17.9% of the patients admitted through health insurance and/or private (Figure 2).

While reviewing the charts with record of physiotherapy consultation, no specific information, or notes with data of the physiotherapy evaluation and techniques physiotherapists used were encountered.

It was possible to observe that the ICF biopsychosocial model proposed was not included in the charts, being questionable the physiotherapists and healthcare

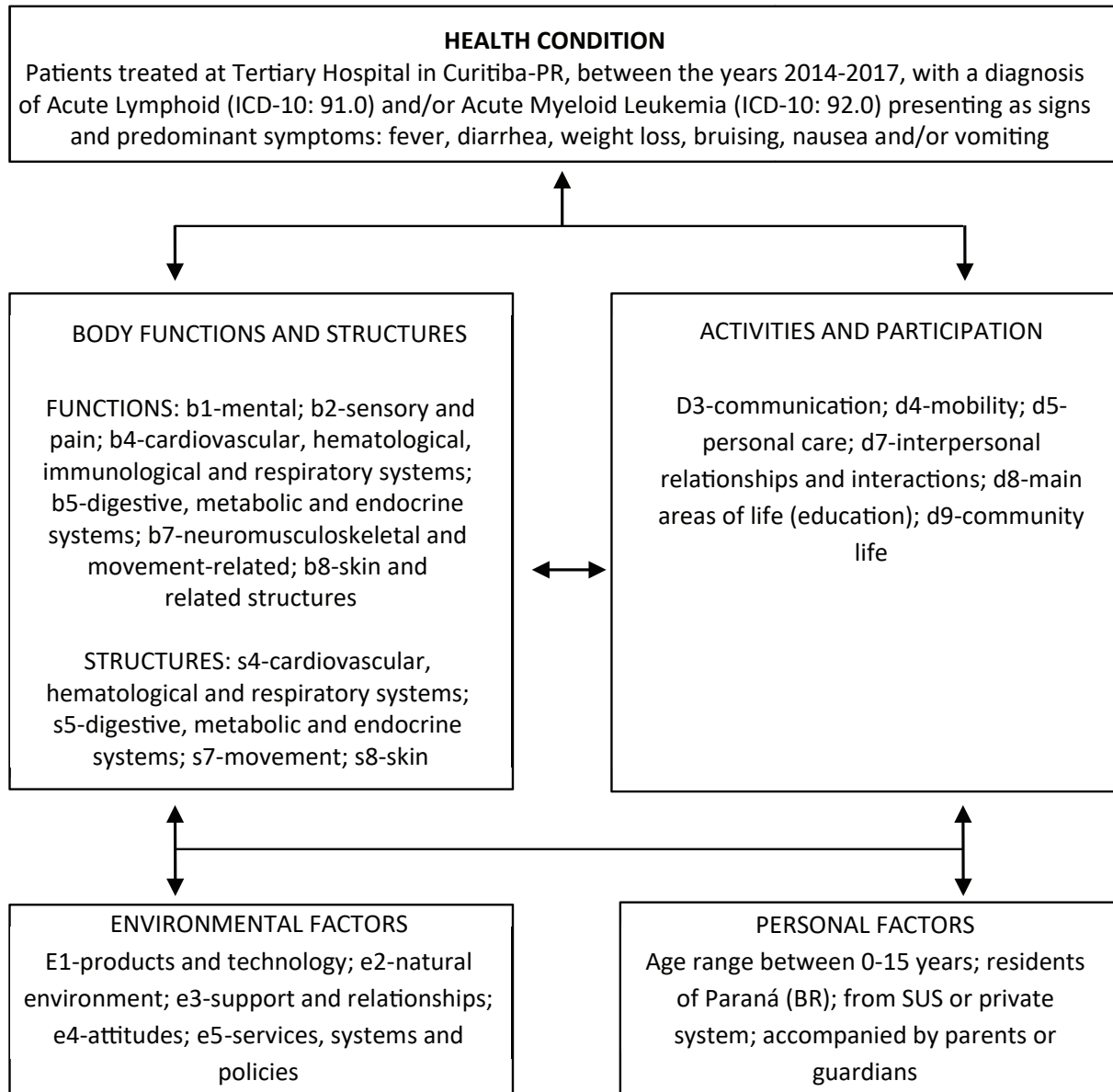


**Figure 2.** Relation between physiotherapy and health insurance: data about the quantity of physiotherapeutic consultations found in the charts and its correlation with health insurance

professionals use in the Tertiary Hospital. Based in the literature review, the ICF Functioning and Health Biopsychosocial Model was outlined in the diagram (Figure 3) of interaction between the domains of health status, functioning (functions, structures, activities and participation) and contexts (environmental and personal) of the patients with leukemia<sup>16</sup>.

**Table 1.** Characteristics of the patients

Item of the chart		Subdivision	n	%	No information
<b>Anamnesis</b>		Fever	24	31.6	57.9% (n=44)
		Diarrhea	4	5.3	
		Weight loss	7	9.2	
		Bruises	10	13.2	
		Vomit/nausea	9	11.8	
<b>Presence of other neoplasms</b>		Yes	9	11.8	
		No	67	88.2	
<b>Post-chemotherapy complications</b>	<b>Yes</b>	Febrile neutropenia and/or anemia	18	23.7	
		Pancytopenia	1	1.3	
	<b>No</b>		57	75	
<b>Blood type</b>		O	30	39.5	19.7% (n=15)
		A	24	31.6	
		B	5	6.6	
		AB	2	2.6	
		Positive	56	73.7	
		Negative	5	6.6	
<b>Transfusion</b>		Performed	55	72.4	
		Not performed	21	27.6	
<b>Physiotherapeutic Treatment</b>		Respiratory	6	7.9	85.5% (n=65)
		Motor	2	2.6	
		Both	3	3.9	
<b>Death</b>			6	7.9	



**Figure 3.** Proposal of organization of ICF biopsychosocial model: diagram of interaction among the domains of health status, functioning (functions, structures, activities, and participation) and contextual factors (environmental and personal) of the cases analyzed

## DISCUSSION

The study's retrospective methodological delimitation was utilized to analyze the clinical characteristics of the patients who were hospitalized<sup>18</sup>. Proposals as this help to establish guidelines for new therapeutic approaches, prospective studies, and controlled trial to be performed. Given this, the present study indicates, as the literature reports that leukemia and oncologic treatment can create some kinesis-functional limitations, and physiotherapy should diagnose said limitations and reclaim the integrity, although limitations were not reported in the charts, only indicated the necessity of physiotherapeutic intervention.

Daily humanized sessions were recommended still after the thorough physiotherapy evaluation in oncologic patients<sup>13,19</sup>.

In this article, prevalence of 89.5% of the patients with diagnosis of ALL was observed, a result that corroborates INCA<sup>5</sup> estimated data, being childhood neoplasms the most frequent<sup>5</sup>.

In the anamnesis, the present study reinforces the findings of Oliveira<sup>20</sup>, indicating fever, bruises, weight loss, nausea and vomits as initial symptoms of patients with acute leukemia, but differ in comparison with most prevalent findings such as pain and asthenia not evaluated or unreported in the charts. According to Torres<sup>21</sup>, 80%

of the patients with hematologic neoplasms report the occurrence of fever associated to neutropenia after at least one chemotherapy cycle, a data that does not corroborate the present study; regardless of being a prevalent symptom, febrile neutropenia was presented by only 23.7% of the patients.

The results also concur with the findings of Souza et al.<sup>22</sup>, who, through surveys of cancer diagnoses in 30 pediatric patients, found higher incidence of ALL. Similarly, the study of Beloto<sup>23</sup> indicates that the annual incidence of ALL is two-fold the rate of AML and that both occur more in women than in men. A relevant data also obtained is that the death rate for the population evaluated was of only 7.9%.

Considering the domicile, 32.9% of the patients lived in other cities (Figure 1) and needed to travel to receive oncologic treatment. As reported in Teston et al.<sup>24</sup> study, where it was attempted to understand the feelings and difficulties oncologic patients lived while traveling to be diagnosed and receive therapy, the necessity of moving to another municipality impacts the treatment directly because the travel is tiresome, influencing the patient's well-being and quality of life.

In the present study, it was observed the predominance of patients with Rh positive (Table 1), concurring with certain studies<sup>25,26</sup> which analyzed the prevalence of blood types in the Brazilian population and concluded that Rh positive is the most frequent according to data of "Santa Casa de São Paulo"<sup>27</sup> which affirms that 80.5% of the population is Rh positive and only 19.5%, Rh negative, factor that facilitates the pursue of possible compatible blood and bone marrow donors.

There is predominance of patients covered by the public health system while coping with leukemia treatment in the hospital in comparison with private health insurers (Figure 1), which can be justified by the elevated costs of oncologic procedures. The management system of public hospitals conducted by the "Empresa Brasileira de Serviços Hospitalares (EBSERH)"<sup>28</sup>, recommends the utilization of the same techniques and resources of the treatment of oncologic pediatric patients in its guide of Standard Operational Procedures: Physiotherapy in Oncologic Pediatrics, with differences in the perception of their general conditions because of particularities inherent to the treatment they are submitted to.

Although the number of physiotherapeutic referrals and consultations identified in the medical charts of the patients analyzed has been low, physiotherapy is an ally for children in oncologic treatment. Studies as of Marchese et al.<sup>29</sup> prove that, after the physiotherapeutic intervention during five sessions associated to instructions of individualized home exercises, it is possible to occur

improvements in the functions of march and quality of life of children with ALL<sup>29</sup> like in the study of Almeida et al.<sup>30</sup>, who verified that physical exercise under a physiotherapist supervision ensures reduction of fatigue, improvement of quality of life and cardiorespiratory fitness<sup>30</sup>.

Despite the paucity of information obtained in this study about the physiotherapeutic techniques adopted in the consultations (Table 1), the intervention of motor kinesiotherapy is utilized from voluntary movements, ensuring mobility, flexibility, motor coordination, increase of muscle strength and resistance to fatigue<sup>31</sup> applied to patients, corroborating the study of Cruz et al.<sup>32</sup>, who affirm that immobility, a significant factor for damages of the muscle functioning, should be avoided; with this, there was a daily reduction of the muscle strength from 1.3% to 3% and in one week of inactivity, a reduction of 10%<sup>32</sup>.

Another intervention most described in the charts was respiratory physiotherapy (Table 1) which reinforces Moraes et al.<sup>33</sup> study, its use can be justified since the patients showed more reduction of the pulmonary function and respiratory muscle strength, needing the therapy in question. Similarly, in the survey of Freitas et al.<sup>31</sup>, who indicate respiratory exercises as one of the main physiotherapeutic maneuvers in pulmonary dysfunctions as atelectasis, dyspnea, and secretion.

Physiotherapy sessions can utilize ludic procedures to ensure more humanized environment, offering biopsychosocial approach to the children, during the evaluation and treatment with various materials and equipment as ball, mirror, treadmill in addition to games, plays, making the session more attractive<sup>34</sup>. Currently, the use of videogames or game therapy has been helping the treatment of motor ability recovery, participating of the cognitive development because of the visual and auditive feedback<sup>35</sup>. And even finding benefits in physiotherapy for oncologic patients, the study of Burdos<sup>36</sup> concludes there is poor public investment for the implementation of these professionals in the hospital environment for oncologic consultation<sup>36</sup> and paucity of clinical evidence-based scientific publications proving the impacts<sup>19</sup>.

However, the data collected may not be representative of the totality of the consultations at the facility investigated because although the documental registry is a valuable tool to the physiotherapist as ruled by the Federal Council of Physiotherapy and Occupational Therapy (COFFITO)<sup>37,38</sup>, some data may have been removed from the physiotherapeutic evolutions as in the study of Teixeira et al.<sup>39</sup>. Further to medical practitioner referral, several consultation and administrative professionals need to access these documents which may cause losses along the process of registry handling. The results of Teixeira et al.<sup>39</sup> study demonstrated that many items were removed and

should be included in the physiotherapeutic evolutions, leading to misrepresentation of physiotherapy in the charts, since the documental registry is a valuable tool for the physiotherapist as ruled by COFFITO<sup>37,38</sup>.

In order to structure the description of health and its respective status, the ICF proposed biopsychosocial model can be an ally in the elaboration of a physiotherapeutic intervention involving exercises which influence the body structure and functioning and environmental adjustments and optimizations, taking the individual in its totality<sup>16,40</sup>. However, the lack of data about ICF as in the study of Ruaro et al.<sup>41</sup>, reaffirms that the clinical relevance can be considered low and the implementation potential, weak<sup>41</sup>, although the growth of ICF is high and of great utility for the public and private sectors, associating health, functioning and environment<sup>16</sup>.

Defined as a set or main items representing a selection of ICF categories, the core sets describe the characteristics of individuals with certain health condition<sup>42</sup>. ICF core sets were not found in the literature for patients with cancer, which could explain the lack of data and difficulty of implementation in the area since specific and short lists as checklists facilitate the multi-disciplinary team application of the ICF<sup>42,43</sup>. The physiotherapists develop and select health functioning aspects of the child and may apply these data in the ICF proposed flowchart, exploring the associations among them empirically and broadening the perspective of the care<sup>17</sup>.

## CONCLUSION

It is possible to affirm that physiotherapy is fundamental in pediatric patients with leukemia, but information is scarce, and the description of the consultations follows a pattern, therefore, correct reporting is relevant. The study noticed prevalence of ALL in comparison with patients with AML and among symptoms the patients presented, febrile neutropenia was the most frequent in post-chemotherapy. Although the physiotherapy facility is well structured, no data about standard procedures to treat oncologic patients were found in the authorized registries accessed and the medical referrals for physiotherapy consultations was low. The accessibility of the information may have been a factor contributing for the reduced number of cases observed in the current article, however, the goals were met.

In order to improve and/or facilitate this process, it is proposed the implementation of a physiotherapy chart and/or standard card, including functioning categories based in ICF psychosocial approach, so after the physiotherapy evaluations, the respective information and physiotherapy treatment are registered in the patient's

evolution after the consultation to help to follow up the effectiveness of the physiotherapy intervention proposed, facilitating future adjustments and innovations in physiotherapy. This would permit physiotherapy professionals to develop their practice grounded in the triad experience, objective of the patient/family and scientific evidence which will bring legal support.

At last, it is suggested to use ICF as statistic, clinical trial, social and pedagogic policy tool, broadening the use of this classification with simple measures as training of professionals and scholars and implementation of the use of ICF coding in health systems, in addition to studies utilizing ICF core sets for patients with leukemia, promoting its use in clinical practice.

## CONTRIBUTIONS

All the authors contributed for the conception and/or study design, collection, analysis and interpretation of the data, wording, critical review, and approval of the version to be published.

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## DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interests to declare.

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