

Occupational therapy in hospital playroom for children with Fanconi anemia undergoing hematopoietic stem cell transplantation

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ABSTRACT

Introduction: Pediatric hospitalization is potentially stressful, especially when associated with rare diseases and prolonged treatments, such as Fanconi anemia (FA) and hematopoietic stem cell transplantation, which may impact children's neuropsychomotor and emotional development by restricting daily activities and reducing their occupational repertoire. **Objective:** To characterize the practice of occupational therapists with children diagnosed with FA in the hospital playroom of a bone marrow transplant service. **Methods:** A documentary, retrospective study with a quali-quantitative approach was conducted by analyzing electronic medical records and field diary notes related to occupational therapy sessions conducted from 2022 to 2024 at a university hospital in southern Brazil. **Results:** The sample consisted of 36 medical records of children aged between 6 months and 15 years, predominantly female, all accompanied by their mothers as primary caregivers. Content analysis identified six thematic categories, highlighting play as the central resource of occupational therapy intervention, promoting occupational engagement, emotional expression, maintenance of performance skills, and the reinterpretation of the hospitalization experience. **Conclusion:** Occupational therapists working in hospital playrooms play a fundamental role in the humanization of care, in coping with pediatric hospitalization, and in promoting child development and well-being in complex hospital contexts.

Keywords: Fanconi anemia; Hematopoietic stem cell transplantation; Occupational therapy; Play therapy.

INTRODUCTION

Fanconi anemia (FA) is a rare genetic syndrome characterized by chromosomal instability resulting from mutations in genes responsible for DNA repair, leading to chromosomal fragility and broad clinical heterogeneity.^{1,2} The spectrum of manifestations ranges from asymptomatic forms to severe phenotypes, potentially affecting multiple organ systems. The main alterations associated with FA include congenital malformations, progressive aplastic anemia, growth delay, renal and ophthalmologic abnormalities, skin alterations, and increased risk for solid and hematological malignancies.

The diagnosis of FA is established through laboratory tests such as complete blood count and bone marrow examination, which reveal cytopenias and bone marrow hypoplasia. Progressive bone marrow failure represents the main complication of the disease, and hematopoietic stem cell transplantation (HSCT) remains the only curative therapeutic option for its hematological manifestations.³

The HSCT process involves different phases – pre-transplantation, transplantation itself, and immediate and late post-transplantation – and requires long periods of outpatient and inpatient follow-up, including full

hospitalization and day-hospital monitoring. This process disrupts the child's and family's daily routines, leads to social withdrawal, and restricts meaningful activities.⁴

Prolonged hospitalization, particularly during childhood, constitutes a potentially stressful experience characterized by invasive procedures, pain, uncertainty, and environmental limitations, which may lead to emotional and behavioral impacts and impair neuropsychomotor development. The removal from play, educational, and social experiences contributes to a reduction in the child's occupational repertoire and occupational performance.⁵

In this context, interdisciplinary care becomes essential, addressing not only the biomedical aspects of HSCT but also functional, emotional, and occupational dimensions. Occupational therapists are part of this team, focusing their interventions on reorganizing the hospital routine, promoting occupational performance, stimulating autonomy, and facilitating children's participation in meaningful activities, especially play and leisure.

According to the World Federation of Occupational Therapists, occupational therapy is a client-centered health profession that promotes health and well-being through occupation, enabling participation in activities of daily living and adapting occupations and environments to individual needs.⁶ In pediatric hospital contexts, play represents a central therapeutic resource, enabling emotional expression, processing of illness and hospitalization experiences, and continuity of child development.⁷

Thus, this study aims to investigate the role of occupational therapists in the hospital playroom during outpatient treatment of children diagnosed with FA in a bone marrow transplant service.

METHODS

This is a retrospective documentary study employing a mixed-methods approach (qualitative-quantitative), conducted through the analysis of institutional documents, enabling a systematic evaluation of occupational therapy interventions within the hospital setting. The study was approved by the research ethics committee (protocol no. 7582348), which waived the requirement for informed consent because of the retrospective documentary design. Data collection involved the analysis of electronic medical records and occupational therapy field notes regarding sessions held in the playroom of the bone marrow transplantation outpatient clinic at a university hospital in southern Brazil. The study included records of children diagnosed with FA, aged 6 months to 15 years, who visited the playroom from 2022 to 2024. The year 2022 was selected as it marked the reopening of the playroom following the COVID-19 pandemic. Data collection took place from May to August 2025. Data were organized into spreadsheets using Microsoft Excel®. Quantitative data were analyzed using descriptive statistics. Qualitative data derived from field notes were analyzed using thematic content analysis, aiming to identify categories representative of occupational therapy practice in the hospital environment. The analysis of the occupational therapy process was based on the guidelines of the American Occupational Therapy Association (AOTA), which defines the domain of occupational therapy and provides a framework for the evaluation, intervention, and outcomes of occupational therapy practice.⁸ The framework guided the identification and categorization of the therapeutic process.

RESULTS

Thirty-six medical records and therapy session reports of children diagnosed with FA who attended the playroom of a hematopoietic stem cell transplant service from 2022 to 2024 were analyzed.

Table 1 summarizes the sociodemographic, geographic, and clinical characteristics of the study sample. Most participants were female and between 2 and 7 years of age. Nearly half of the children were from the Northeast region of Brazil. Haploidentical and unrelated donor HSCTs predominated throughout the study period, and conditioning regimens based on fludarabine combined with immunosuppressive agents were the most frequently used. Phenotypic stigmata commonly included *café-au-lait* spots and upper limb abnormalities.

Table 1. Sociodemographic, geographic, and clinical characteristics of children with FA undergoing HSCT (n = 36).

Characteristic	Category	n (%)	2022	2023	2024
Sex	Female	22 (61.1)	-	-	-
	Male	14 (38.9)	-	-	-
Age group (years)	2–7	16 (44.4)	-	-	-
	8–10	13 (36.1)	-	-	-
	11–15	7 (19.4)	-	-	-
Education	Not formally educated	6 (16.7)	-	-	-
	Early childhood education	3 (8.3)	-	-	-
	Elementary school (1st–5th grade)	18 (50.0)	-	-	-
	Elementary school (6th–8th grade)	3 (8.3)	-	-	-
	Not informed	6 (16.7)	-	-	-
Region of origin	Northeast (BA, CE, PB, PE)	16 (44.4)	-	-	-
	South (PR, SC, RS)	8 (22.2)	-	-	-
	Southeast (MG, ES, RJ)	7 (19.4)	-	-	-
	North (AM, AP, PA)	4 (11.1)	-	-	-
	Midwest (GO)	1 (2.8)	-	-	-
Type of transplant	Haploidentical	17 (47.2)	6	6	5
	Unrelated donor	15 (41.7)	4	9	2
	Matched related donor	4 (11.1)	1	2	1
Age at diagnosis (years)	≤ 5	11 (30.6)	4	2	5
	> 5	4 (11.1)	1	1	2
	Unknown	19 (52.8)	5	14	0
Conditioning regimen	Campath + fludarabine + total body irradiation	17 (47.2)	6	6	5
	Fludarabine + cyclophosphamide + anti-thymocyte globulin/thymoglobulin	13 (36.1)	4	6	3
	Cyclophosphamide + anti-thymocyte globulin	2 (5.6)	0	2	0
	Cyclophosphamide alone	1 (2.8)	1	0	0
GVHD prophylaxis	Cyclosporine + mycophenolate ± post-HSCT cyclophosphamide	19 (52.8)	5	9	5
	Cyclosporine + methotrexate	12 (33.3)	2	4	6
	Other regimens	6 (16.7)	2	4	0
Phenotypic stigmata*	Typical facial features	10 (27.8)	3	3	4
	Café-au-lait spots	16 (44.4)	4	6	6
	Upper limb abnormalities	15 (41.7)	4	6	5
	Short stature and/or low weight	7 (19.4)	3	3	1
	Renal abnormalities	3 (8.3)	3	0	0
	Not documented	12 (33.3)	4	7	1

Northeast (BA: Bahia; CE: Ceará; PB: Paraíba; PE: Pernambuco); South (PR: Paraná; SC: Santa Catarina; RS: Rio Grande do Sul); Southeast (MG: Minas Gerais; ES: Espírito Santo; RJ: Rio de Janeiro); North (AM: Amazonas; AP: Amapá; PA: Pará); Midwest (GO: Goiás). *More than one phenotypic stigma could be recorded for the same participant. Source: Elaborated by the authors.

Table 2 presents the characterization of caregivers regarding their relationship with the child and their level of education. It was observed that all children had their mother as the primary caregiver. Regarding education, a significant portion of the records did not contain this information, while the remaining records predominantly

indicated the initial years of elementary school. A high proportion of records lacked information on the caregivers' occupation. Among the available information, student caregivers predominated, while the absence of formal occupational activity and technical occupations were less frequent.

Table 2. Characterization of caregivers regarding relationship status, education level, and occupation (n = 36).

Variable	Category	n	%
Caregiver bond	Mother	36	100
	Not informed	17	47.2
Education	Incomplete elementary	10	27.8
	Completed elementary school	9	25.0
Occupation	Not mentioned	27	75.0
	Student	5	13.9
	No occupation	3	8.3
	Job analyst	1	2.8

Source: Elaborated by the authors.

Characterization of occupational therapist services

Regarding the occupational therapist's role in the hospital playroom, the sessions were predominantly conducted individually, with significant variation in the frequency of follow-up among the children, ranging from one-off interventions to prolonged follow-ups. Therapeutic actions mainly involved play in its different forms and the performance of meaningful activities, demonstrating a diversity of strategies aimed at promoting development and coping with hospitalization. Interventions directed at caregivers were also recorded, including support, guidance, and coordination with the multidisciplinary team, as shown in Table 3.

Table 3. Characterization of occupational therapist services in the hospital playroom (2022–2024).

Variable	Category	n	%
Total number of services provided	—————	250	100.0
Monitoring modality*	Individual	27	75.0
	Group	9	25.0
Interventions carried out*	Free play	29	—————
	Shared play	9	—————
	Symbolic play	5	—————
	Meaningful activity	3	—————
Caregiver support*	Welcoming	13	—————
	Multidisciplinary care	20	—————

*More than one intervention may occur in the same session. Source: Occupational therapy service records (2022–2024).

As summarized in Table 4, we observed the results demonstrated positive responses from the children to the subjects, with emphasis on engagement in activities, stimulation of functional skills, and expansion of social interactions. Emotional aspects, such as improved mood and demonstration of satisfaction, were also described, in addition to the possibility of expressing and processing the experiences lived during hospitalization. Situations of refusal of care were infrequent.

Table 4. Occupational therapy sessions per child and observed outcomes (n = 36).

Frequency of sessions per child		
Descriptive average	Value	
Average number of sessions per child	6.9	
Median	5	
Minimum–Maximum	1–52	
Results presented in children*	n	%
Engagement in play/activities	32	88.9
Stimulating performance skills	28	77.8
Social interactions with colleagues	21	58.3
Demonstration of satisfaction during the action	16	44.4
Improved mood after interventions	11	30.6
Elaboration on lived experiences	7	19.4
Refusal to service	1	2.8

*Categories are not mutually exclusive. Source: Therapeutic assessment recorded in medical record.

Thematic categories

Content analysis of field diary entries and electronic medical records allowed for the identification of six thematic categories presented in Table 5, which characterize the occupational therapist's role in the context of the hospital playroom.

Table 5. Emerging thematic categories from content analysis.

Category	Concise description
1. Occupational therapy process	A structured process guided by the framework of the AOTA. ⁸ Assessment and intervention aimed at maintaining and improving performance competencies, and promoting autonomy and active participation in daily hospital life.
2. Playing as an end in itself	Based on the Playful Model, ⁹ which allows for the expression of emotions, the stimulation of creativity, and the experience of pleasure in play. Valuing play as a central activity in childhood, even in restrictive contexts marked by painful procedures.
3. Play as a means of expression	Using play as a means of emotional and symbolic expression. It allows for the elaboration of experiences related to illness, hospitalization, and invasive procedures. It encourages children to tell stories about the body, fear, hospitalization, and hope.
4. Strengthening performance competencies for occupational engagement	Stimulating motor, process, and social interaction skills. Prevention of functional losses resulting from prolonged hospitalization. Increasing occupational engagement, promoting the continuity of neuropsychomotor development.
5. Between play and care: activities in the playroom	Therapeutic activities, in their playful, educational, humanizing, and environmental dimensions, act as mediators of care. Promoting holistic development and give new meaning to the experiences of hospitalization.
6. Interdisciplinarity	It constitutes an essential element, strengthening comprehensive care. Articulation between different fields of knowledge, with emphasis on the professions of nursing, pedagogy, and psychology. Greater collaboration was observed with psychology, especially in interventions aimed at welcoming and guiding caregivers, and in group mediation with children.

Source: Elaborated by the authors.

The categories reveal a structured occupational therapy process, in which play acts as a central occupation and therapeutic resource to promote the child's autonomy, participation, and emotional expression, while classes strengthen motor, process, and social interaction skills, minimizing the impacts of hospitalization and integrating care, playfulness, and humanization.

Interdisciplinarity emerged as a relevant element in the care context, highlighting the articulation between occupational therapy and other areas of the health team, especially nursing, psychology, and pedagogy, strengthening comprehensive care for children being followed up in the bone marrow transplant service.

DISCUSSION

This study analyzed the role of occupational therapists in the hospital playroom during the treatment of children with FA undergoing HSCT, demonstrating that therapeutic play is a central resource in the care of these patients throughout the hospitalization and outpatient follow-up process. The analyzed records indicate that the occupational therapist's intervention was predominantly focused on promoting neuropsychomotor development, organizing daily hospital routines, and coping with the disruptions imposed by treatment – aspects that are particularly relevant in a highly complex clinical setting such as pediatric HSCT.

The sociodemographic and clinical profile of the sample reinforces the complexity of the care offered to children with FA undergoing HSCT. The predominance of children between 2 and 7 years of age, a crucial stage for the development and consolidation of occupational skills, suggests greater vulnerability to the impacts of protective isolation and prolonged hospitalizations, as discussed in the literature on childhood hospitalization and occupational engagement.⁴ In the context of HSCT, these impacts tend to be intensified due to clinical unpredictability and the need for multiple invasive interventions, elements that permeate the daily experience of children undergoing this treatment. This negatively impacts the child's development, emotional state, and occupational engagement.

The concentration of cases originating from the Northeast region and the exclusive presence of mothers as primary caregivers, coupled with the frequency of low educational attainment among the available records, indicate possible socioeconomic vulnerabilities and communication barriers that may interfere with understanding the treatment and family adaptation, reinforcing the relevance of family-centered approaches.¹⁰ In the clinical setting, the predominance of transplants with alternative donors, to the detriment of compatible related donors, highlights the difficulty in identifying intrafamilial compatibility in this population, creating a scenario of high therapeutic complexity, consistent with the literature on HSCT in FA, which describes a higher risk of complications and the need for prolonged follow-up.²

The predominance of haploidentical and unrelated donor transplants reflects the inherent complexity of HSCT in children with FA. Accordingly, conditioning regimens and graft-versus-host disease (GVHD) prophylaxis were individualized according to transplant characteristics, illustrating the complexity of therapeutic management throughout the study period. These findings also underscore the clinical heterogeneity of FA and reinforce the need for individualized interdisciplinary interventions.

Prolonged hospitalization and protective isolation, characteristic of HSCT, impose significant restrictions on the daily experiences of pediatric patients, with potential repercussions on motor, cognitive, emotional, and social development. Children and adolescents undergoing HSCT experience invasive and painful procedures, as well as clinical complications that can be highly debilitating, broadly affecting their physical, psychological, and emotional well-being. This is compounded by the disruption of social and family life resulting from protective and isolation measures during hospitalization, potentially impacting the development and quality of life of these patients.¹¹ In the case of FA, these repercussions tend to be even more complex due to the chronic nature of the condition, associated comorbidities, and the need for continuous monitoring throughout childhood.² After hospital discharge, outpatient follow-up is an essential component of care for children undergoing HSCT. It is primarily in this context that the hospital playroom is included, constituting a therapeutic environment that allows for playful experiences, resocialization, and the gradual resumption of meaningful childhood activities. In Brazil, the presence of playrooms in pediatric healthcare units is supported by legal guidelines, such as Law nº 11.104/2005,¹² reinforcing its institutional recognition as a space for promoting child development in healthcare contexts.

According to Lemes et al.,¹³ the hospital playroom constitutes a privileged space for the occupational therapist's work, favoring both the investigation and application of free and exploratory play in the context of pediatric care. The authors also highlight that the interventions conducted by this professional contribute to minimizing functional deficits and stimulating neuroplasticity processes, enhancing child development even in contexts of illness. This perspective proved to be convergent with the analyzed records, which evidenced play as a central strategy in promoting occupational engagement.

The results of the present study indicate that access to the play space, mediated by the occupational therapist, favored occupational engagement, the reorganization of daily life, and coping with the disruptions imposed by illness and treatment. It was observed that the children showed signs of well-being after the interventions, as well as greater willingness to engage in activities, even in the face of fatigue related to the hospital routine. Furthermore, according to the analyzed records, children with more pronounced impairments resulting from the pathology did not experience significant impacts on their performance of activities. Evidence from the literature points out that play, in hospitalization contexts, constitutes a coping strategy that allows the child to express emotions, reduce tension, and symbolically process stressful experiences,⁷ favoring their adaptation to the hospital environment. The authors further explain that play favors communication and promotes the recovery of the child's identity, which corroborates the findings of the present study.

Through the records, it was identified that play emerged as a source of pleasure, as a means of stimulating neuropsychomotor development, symbolic expression, and emotional processing of illness, hospitalization, and invasive procedures, evidencing by spontaneous dialogues between children about access points (central venous catheter), body marks, food restrictions, and social deprivation, indicating play as a space for symbolic processing of these experiences.

The hospital playroom stood out as a relevant therapeutic space for the occupational therapist's work, enabling the construction of a more humanized environment favorable to occupational engagement. The organization of the activities carried out corroborated the classification proposed by Santos,⁴ including playful, artistic and expressive, productive, educational, welcoming, and humanizing activities. This diversity allowed the interventions to be adapted to the individual needs of the children, promoting autonomy, initiative, and active participation in the therapeutic process, aspects that are particularly important in a context marked by loss of control and predictability.

Another relevant finding concerns the occupational therapist's role with caregivers. The records showed supportive and guidance actions in response to caregivers' concerns about the risk of contamination in the play environment. Furthermore, the majority of caregivers were mothers, frequently overburdened by the responsibility of caregiving, the distance from their place of origin – many families coming from other regions of the country – and the demands related to maintaining family life outside the hospital environment. The low level of education of some caregivers also emerges as a challenge to understanding the HSCT process and its implications. The literature indicates that prolonged care of children with chronic conditions or special health needs imposes emotional, social, and physical burdens on family caregivers, suggesting the importance of family-centered approaches with support, effective communication, and continuous guidance from the healthcare team.¹⁰

Furthermore, the findings indicate that occupational therapists are significantly integrated into multidisciplinary care in the context of pediatric HSCT, contributing to a more comprehensive, humanized, and child- and family-centered approach. Evidence in the literature shows that the role of occupational therapists with children undergoing bone marrow transplantation goes beyond isolated interventions, incorporating practices that connect the patient's experience with the family, the healthcare team, and the child's different life contexts, promoting occupational participation and continuity of care. This interdisciplinary approach is widely valued in contemporary hematopoietic stem cell transplant care models, especially regarding quality of life, treatment adherence, and psychosocial adaptation.^{14,15}

CONCLUSION

It is concluded that the occupational therapist's role in the hospital playroom is a fundamental resource in the care of children with FA undergoing HSCT. The results demonstrate that systematized play by a specialized professional promotes occupational engagement, adaptation to the hospital and outpatient context, and minimizes the impacts of treatment on children's development and daily lives.

In this sense, the study points to the playroom, mediated by the occupational therapist, as a powerful way to promote comprehensive, humanized care centered on the child and their family, indicating the need for its consolidation as a therapeutic space in services that accompany children undergoing pediatric HSCT.

Despite the contributions of this study, some limitations should be acknowledged, including its retrospective documentary design, the reliance on medical records and field notes, which may be subject to variability in documentation quality and professional reporting, and the fact that the study was conducted in a single center. Nevertheless, the findings provide relevant insights for clinical practice and contribute to strengthening occupational therapy in pediatric HSCT, particularly in services caring for children with rare conditions such as FA.

Future prospective studies incorporating standardized and validated outcome measures are warranted to strengthen the evidence regarding the role of occupational therapy in pediatric HSCT. Such approaches would allow a more robust evaluation of intervention outcomes, facilitate comparisons across healthcare services, and contribute to the standardization of outcome measures in this field.

CONFLICTS OF INTEREST

Nothing to declare

AUTHOR CONTRIBUTIONS

Conceptualization: Xavier MQ, Santos DR; **Investigation:** Xavier MQ; **Methodology:** Xavier MQ, Santos DR; **Formal Analysis:** Xavier MQ, Santos DR; **Data Curation:** Xavier MQ; **Project Administration:** Xavier MQ, Santos DR; **Writing:** Xavier MQ; **Supervision:** Santos DR; **Final Approval:** Xavier MQ.

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DECLARATION OF USE OF ARTIFICIAL INTELLIGENCE TOOLS

During the preparation and revision of this manuscript, the authors used ChatGPT (OpenAI) to assist with English language editing, improve clarity and academic writing style, and support the reorganization and consolidation of tables for presentation purposes. The AI tool was not used to generate data, perform analyses, interpret findings, or draw scientific conclusions. All AI-generated suggestions were critically reviewed, revised when necessary, and approved by the authors. The authors take full responsibility for the content of the manuscript.

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