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Parental perspective on the psychological adjustment of children in cancer relapse or remission

Perspectiva de pais sobre o ajustamento psicológico de crianças em recidiva e remissão de câncer

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Abstract

Objective
This article aimed to evaluate the psychological adjustment of Brazilian children experiencing cancer relapse by comparing their adjustment with cancer survivors and "healthy" children, based on the reports of their parents or caregivers.

Method
Participants were 140 caregivers of children in relapse (n = 24), remission (n = 59), and of children considered "healthy" (control group) (n = 57). The Behavior Assessment System for Children and the Family Environment Scale were applied. Data analyses were performed through Student's t-test, Chi-square, analysis of variance, and Pearson correlations.

Results
The results showed that children with cancer did not present more psychopathologies than the control group; however, they had more social and leadership skills. Protective (family cohesion) and risk factors (child´s age, number of relapses, treatment duration, caregiver's income and education level) were also observed.

Conclusion
This study proposes the screening of psychological symptoms for risk subgroups and the design of intervention strategies for this population.

Keywords: Adaptation; Cancer in children; Emotional adjustment; Psycho-Oncology; Relapse.

Resumo

Objetivo

O presente artigo visou avaliar o ajustamento psicológico de crianças brasileiras em recidiva de câncer comparando-as com sobreviventes de câncer e com crianças "saudáveis", a partir do relato de seus pais/cuidadores.

Método

Os participantes foram 140 cuidadores de crianças em recidiva (n = 24), remissão (n = 59) e controle (n = 57). Foram aplicadas a Escala de Avaliação Comportamental para Crianças e a Family Environment Scale. As análises de dados foram realizadas com t de Student, Qui-quadrado, análises de variância e correlações de Pearson.

Resultados

Os resultados mostraram que as crianças com câncer não apresentaram mais psicopatologias que o grupo controle, mas mostraram mais habilidades sociais e de liderança. Também se observaram fatores protetores (coesão familiar) e de risco (idade, número de recidivas, duração do tratamento, renda e nível educacional dos cuidadores).

Conclusão

Propõe-se o rastreio de sintomas psicológicos nos subgrupos de risco e o delineamento de estratégias interventivas para esta população.

***Palavras-chave**: Adaptação; Câncer em crianças; Ajustamento emocional; Psico-Oncologia; Recidiva.*

In Brazil, it is estimated that around 8,500 children and adolescents are diagnosed with cancer each year, according to data from the *Instituto Nacional de Câncer* (INCA, Brazil's National Cancer Institute) (Instituto Nacional de Câncer [INCA], 2020). Nonetheless, survival rates are currently high (reaching 80%, in some cases, at 10 years post-diagnosis) due to the use of more effective and less invasive therapeutic protocols (Sousa et al., 2015).

Despite considerable stressors after the end of oncological treatment, such as treatment-related physical sequelae, difficulties in school and community reintegration, frequent follow-up appointments, and fear of relapse, children who survive cancer generally tend to exhibit good psychological adjustment, comparable to children who had never had cancer (Okado et al., 2021; Okado et al., 2018; Schulte et al., 2016). In this sense, psychological adjustment is understood as several skills related to social, occupational, and educational functioning (e.g., problem-solving, self-confidence, and social skills), as well as the absence of clinically significant emotional and/or behavioral problems that may cause severe distress or impair the adaptation process (Pai et al., 2006; Seçer et al., 2020).

Several studies observe positive effects after the completion of oncological treatment, such as the recognition of the benefits of this situation, a more positive view of oneself and one's life, as well as better mental, behavioral, and social health (Michel et al., 2020; Wakefield et al., 2010). This does not mean that children with cancer do not experience psychological distress, but rather that some of them cope with the treatment and post-treatment process in an adaptive manner (Bragado-Álvarez, 2009; Kazak & Noll, 2015).

However, some authors suggest that there are risk groups among survivors (around 20% of patients) who present high rates of internalizing problems, such as depression and anxiety (Sharkey et al., 2020), poor self-image (Hsiao et al., 2018), and low self-esteem (Wakefield et al., 2010), as well as high levels of externalizing behavioral problems, such as aggression, hyperactivity, and socialization difficulties (Foster et al., 2021; Wakefield et al., 2010). These patients would require specialized psychological support, considering that their difficulties could persist into adulthood (Bashore & Hobbie, 2021; Stefanski et al., 2021).

Among risk groups, there are children who have experienced cancer relapse (Kazak & Noll, 2015). The reappearance of the primary tumor or the emergence of a second neoplasm, referred to

as relapse or recurrence, affects around 20% of previously treated children and reduces the chances of cure to 40% in leukemia patients (Cooper & Brown, 2015; INCA, 2008). This situation, involving a more imminent threat of death, higher intensity of stressors, more aggressive treatment, and exposure to stimuli that have been aversively conditioned in previous treatments, may contribute to difficulties in the psychosocial adjustment and adaptation of children (Okado et al., 2018).

Therefore, children in cancer relapse would be particularly vulnerable, given they have twice the likelihood of presenting psychological disorders compared to children undergoing treatment for the first time, and thus requiring specialized psychological attention (Eiser et al., 2000). However, some studies did not identify a higher incidence of psychopathologies in children who experienced cancer relapse (Compas et al., 2014; Grootenhuis & Last, 2001; Okado et al., 2015).

In this sense, protective mechanisms against the onset of emotional problems in children with cancer may be related, among others, to better family cohesion (Ghriwati et al., 2021; Okado et al., 2021). Conversely, risk factors involve sociodemographic variables of the children and their caregivers. Specifically, female children show higher post-traumatic stress (Michel et al., 2020), and younger ones tend to demonstrate more anxiety and stress (Raghubar et al., 2019). Caregivers' variables also play an important role in child adjustment, such that a non-partnered marital status (being single, divorced, or widowed) is associated with a poorer quality of life in children and more affective problems (Quast et al., 2018). Lower parental/caregiver educational levels, as well as low family income, are related to higher levels of anxiety, stress, psychosocial problems, and deficits in social skills (Kazak et al., 2015; Quast et al., 2018; Raghubar et al., 2019).

Medical variables can also be considered risk factors. In this sense, a shorter time frame between end of treatment and relapse is related to higher post-traumatic stress (Turner et al., 2018), a longer treatment duration is associated with more adverse health events (Hsiao et al., 2018), and having experienced a greater number of relapses is linked to poorer psychological adjustment in pediatric patients (Okado et al., 2018).

Nevertheless, publications that have investigated the psychological adjustment of children in cancer relapse are rare (Wechsler et al., 2021). Few studies that have assessed this population have done so through self-report, which can lead to some biases, such as distorted self-perception, social desirability, and lack of understanding the questionnaires (Paulhus & Vazire, 2007). Also, research show that parents/caregivers are more accurate informants for detecting internalizing and externalizing problems and adaptive skills than the children themselves (Gresham et al., 2018; Phares, 1997).

Moreover, another methodological gap in previous research is the lack of a control group composed of "healthy" children. It is also worth noting the scarcity of publications with a Brazilian population, as most of the published articles refer to North American or European samples.

Thus, the present study aims to assess the psychological adjustment of Brazilian children in cancer relapse by comparing their adjustment to those of cancer survivors and "healthy" children, based on the reports of their parents or caregivers. Additionally, the study sought to investigate possible risk and protective factors associated with the children's psychological adjustment, such as family factors (family cohesion), sociodemographic factors (child's gender and age, caregivers' education level and marital status, and family income), and medical factors (time in the current situation and in treatment, number of relapses experienced).

The hypotheses of this study were: (a) The children who had experienced a cancer relapse would display poorer psychological adjustment than children in the cancer remission group (survivors) and/or than children in the control group; (b) Children in cancer remission would have psychological adjustment comparable to that of "healthy" children (control group); (c) Greater family

cohesion would play a protective role and would be associated with better psychological adjustment in both cancer groups (relapse and remission); (d) Sociodemographic variables (female children and/or at younger age, low parental/caregiver educational level and/or income, and non-partnered parents/caregivers) would be related to poorer psychological adjustment in both cancer groups (relapse and remission); and (e) Medical variables (longer treatment duration, shorter time in the current situation, and a greater number of relapses) would be associated with poorer psychological adjustment in patients experiencing cancer relapse and in cancer remission.

Method

Participants

Thirty-four parents/caregivers of children who experienced a relapse and 64 parents/caregivers of survivors, in remission from the disease (out of treatment), were approached by the lead researcher during routine medical appointments at two public hospitals, which are references in pediatric oncology treatment. Families were approached by the researcher after having analyzed their medical records and verifying that they met the inclusion criteria. The caregivers of 380 children with no history of cancer, attending public schools in the same cities where the hospitals were located, were also invited to participate.

Among the approached individuals, 10 parents/caregivers of children in relapse and five parents/caregivers of survivors refused to participate in the study, while 323 parents/caregivers of the "healthy" schoolchildren did not respond to the invitation. The main reasons given by those who refused were lack of interest or time to participate (64%). Therefore, the final sample of this study consisted of 140 parents/caregivers of children (aged 6-11 years), divided into three groups: 24 parents/caregivers of children in cancer relapse (RG), 59 parents/caregivers of children in remission ("survivors") (RMG), and 57 parents/caregivers of "healthy" children (control) (CG).

Participants in the cancer relapse group (RG) were required to meet the following inclusion criteria: (a) be the primary caregiver of the child experiencing a relapse (recurrence of the primary tumor), or a second neoplasm (at least 12 months after the completion of treatment for the first tumor), or a tumor progression (metastasis); (b) the child had to be undergoing oncological treatment at the time of recruitment; (c) the child could not be a terminal patient; and (d) the child should be between 6 and 11 years old. Parents/caregivers of this group were contacted, on average, 5 months after the last oncological diagnosis.

The inclusion criteria for the cancer remission/"survivors" group (RMG) were: (a) being the primary caregiver of a child who had not received any type of oncologic treatment for at least two years; (b) the child not having experienced any cancer relapse; and (c) the child being between 6 and 11 years old. These participants were recruited, on average, 5 years after the tumor remission. As for the participants in the control group (CG), the criteria were to be the primary caregiver of children aged 6 to 11 years with no history of illness (history of cancer, psychiatric disorders, disabling or life-threatening illness) and, for logistical reasons, reside in the same cities as the hospitals where the groups of parents of children with cancer were recruited.

Instruments

Medical and Sociodemographic Questionnaire – The sociodemographic data were obtained through an ad-hoc questionnaire, applied during interviews with the parents/caregivers, which

collected the following information: child's age and gender, caregiver's marital status (with/without partner) and education level (elementary, middle/high school, or college education), and monthly family income (in minimum wages). The medical data of the children were collected through the participants' reports and later supplemented with data from medical records, including diagnosis, time in treatment, and time in the current situation (i.e., length of time in which the child is in relapse or remission).

Behavior Assessment System for Children (BASC-2) (Reynolds & Kamphaus, 2004) – Due to the limited availability of Brazilian psychological tests with good psychometric parameters at the time of the research, the Spanish version of the BASC scale was used. The scale was first translated from Spanish to Portuguese by two independent bilingual translators using the back translation technique. Only the raw scores of the tests were used, comparing the clinical groups with the control group, and not with the test norms. This scale was used to measure the children's psychological adjustment.

The BASC is a scale which evaluates a wide range of child behaviors through clinical and adaptive dimensions. The clinical dimensions include nine subscales: aggression, hyperactivity, conduct problems, attention problems, atypicality, depression, anxiety, withdrawal, and somatization. This instrument also measures adaptive dimensions consisting of three subscales: adaptability, social skills, and leadership. These two dimensions (clinical and adaptive) compose the general scales of the instrument, which, in turn, are divided into externalizing problems (aggression, hyperactivity, and conduct problems), internalizing problems (anxiety, depression, and somatization), behavioral symptoms index (aggression, hyperactivity, attention problems, atypicality, anxiety, and depression), and adaptive skills (adaptability, social skills, and leadership). Higher scores in the externalizing and internalizing scales are related to greater psychological maladjustment, while a higher score in the adaptive skills indicates greater psychological adjustment.

This research used the level 2 BASC scale, which comprises the age range of 6 to 11 years. This questionnaire consists of 134 items, arranged on a 4-point Likert scale, which scores the frequency of the behavior (never, sometimes, often, and almost always). The scores range from 0 to 96 on the general scales of externalizing problems, internalizing problems, and adaptive skills, and from 0 to 180 on the behavioral symptoms index. The average time for completing the entire questionnaire was estimated at 30 minutes. The internal consistency (Cronbach's alpha) of the Spanish version in the general subscales varies from 0.67 to 0.87 (Reynolds & Kamphaus, 2004). In this study, however, the internal consistency of the general subscales ranged from 0.85 to 0.90.

Family Environment Scale (FES) (Vianna et al., 2007) – This scale assesses various areas of family functioning (family cohesion, conflict, independence, expressiveness, cultural orientation, recreational orientation, religion, organization, and control). In this research, the family cohesion subscale was used, which measures the connection and support among family members. This choice is due to the specific objective of this study to verify the protective role of this variable in the psychological adjustment of children with cancer (Ghriwati et al., 2021; Okado et al., 2021). This subscale contains ten items, presented in a true/false format, and takes approximately 5 minutes to complete. The Brazilian adaptation of the scale shows internal consistency by Cronbach's alpha of 0.87, and validity was measured through factor analysis (Vianna et al., 2007).

Procedure

The parents/caregivers of the children with cancer (RG and RMG) were recruited from two public hospitals. Those who agreed to participate in the study were invited to individually enter a

room in the hospital reserved for data collection, where only the researcher and the participant were present. At that moment, the researcher presented the study, and the participant signed the Informed Consent Form. Afterwards, on a single day, the researcher read the instruments to each participant individually, as some parents/caregivers were not fully literate. Only one parent/caregiver per eligible child participated in this study (father, mother, or primary caregiver).

The control group was recruited from three public schools through an invitation letter addressed to the parents/caregivers, delivered to the children at their schools. Parents/caregivers who positively responded to the letter were scheduled a day and time at the school to sign the Informed Consent Form and individually and orally answer the instruments in an empty classroom.

In all participating groups, any eventual doubts were addressed by the researcher. The average time spent administering the instruments was 40 to 50 minutes per person. Data collection for all groups lasted approximately 1 year and 3 months (January 2018 to April 2019), conducted simultaneously with the three groups and solely by the responsible researcher.

This research was approved by the Research Ethics Committees of the participating hospitals, under CAEE No. 01576312.5.0000.

Data Analysis

The differences between the groups were analyzed using ANOVA, Student's *t*, or *Kruskal-Wallis* tests. Chi-squared tests, Pearson correlations, or Fisher's exact tests were applied to verify relationships between variables that were categorical. Normality and equality of variances were tested for each ANOVA, and if necessary, the Brown-Forsyth correction was applied. For multiple comparisons, the LSD post-hoc correction was used and the effect size calculated. To determine the association between family cohesion and child psychological adjustment variables, as well as the relationships between sociodemographic and medical variables with children's adjustment, Pearson's correlations were used (with dummy coding for categorical variables).

Results

Most caregivers were mothers (88%). The remaining caregivers were fathers (4%), uncles, grandparents, and stepfathers (8%). Among the children, 27% had experienced more than one relapse, and the most prevalent diagnoses were leukemia (45% in the RG and 30% in the RMG) and brain tumors (18% in the RG and 8% in the RMG). Other sociodemographic and medical characteristics are described in Table 1.

Significant differences between the groups were detected for children's age [F (2, 133) = 4.19; p = 0.02]; specifically, the CG had a higher age than the RG (p = 0.01; Cohen's d = 0.66), and the RMG had a higher family income than the other groups [Kruskal-Wallis (2) = 21.96; p = 0.00]. Statistically significant differences were also observed between the two cancer groups for the time in the current situation [t (78.07) = 15.35; p = 0.00; Cohen's d = -2.99] and time in treatment [t (22.91) = 4.05; p = 0.00; Cohen's d = 1.17]. The time elapsed in the current situation was longer in the RMG, and treatment duration was longer in the RG. However, considering the groups´ characteristics, these differences were expected.

Regarding the children's psychological adjustment, as reported by their parents/caregivers, Table 2 shows statistically significant differences in the subscales of atypicality, social skills, and leadership, as well as in the general scale of adaptive skills. Thus, both RG and RMG displayed

significantly less atypicality than the CG. The cancer groups (RG and RMG) also presented more social skills and leadership than the control group. In the general scales, the cancer groups showed significantly higher adaptive skills than the control group.

Table 1
Children's and parents'/caregivers' sociodemographic and medical data.

Variables	Relapse		Remission		Control	
	n	%	*n*	%	*n*	%
Child's gender - valid n	24		59		57	
Female	12	50	31	52.5	34	59.6
Male	12	50	28	47.5	23	40.4
Caregiver's Marital Status - valid n	24		59		55	
With partner	17	71	45	76	32	58
Without partner	7	29	14	24	23	42
Caregiver's Education Level - valid n	23		59		55	
Elementary	8	35	23	39	25	45
High school/higher education	15	65	36	61	30	55
Variables	**Relapse**		**Remission**		**Control**	
	M	*SD*	*M*	*SD*	*M*	*SD*
Child's age - valid n	24		59		57	
	9.1	1.1	9.5	1.4	10.1	1.5
Family income - valid n	22		59		55	
	2.1	1.5	5.3	5.6	2.3	1.7
Time in current situation (months) - valid n	24		59		–	
	6.57	7.41	61.75	25.31	–	–
Time in treatment (months) - valid n	24		59		–	
	39.59	31.03	12.20	10.85	–	–

Note: Caregiver: Child's parent or main caregiver; Family income: Number of minimum wage salaries.

Table 2
Means, standard deviations, and Analysis of Variance on the clinical, adaptive, and general scales of the Behavior Asessment System for Children

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Subscale	Relapse		Remission		Control		*F*	*p*	*Cohen's d*	η^2
	M	*SD*	*M*	*SD*	*M*	*SD*				
Clinical Scales										
Aggression	10.54	7.52	9.36	5.38	8.72	6.00	0.78			0.01
Hyperactivity	11.55	5.99	10.61	5.41	9.33	4.46	1.60			0.02
Conduct Problems	3.13	2.94	3.64	3.15	4.42	3.94	1.40			0.02
Attention Problems	11.04	3.41	10.74	2.70	9.74	2.70	2.60			0.04
Atypicality	6.88	4.28	7.12	4.50	8.68	4.45	3.60*	0.03[a] 0.03[b]	0.41[a] 0.35[b]	0.05
Depression	11.00	6.53	8.76	5.74	8.72	5.05	1.61			0.02
Anxiety	8.45	3.50	7.11	3.44	8.62	3.51	1.11			0.02
Withdrawal	8.21	3.31	6.52	2.98	6.42	3.71	2.68			0.03
Somatization	8.79	4.26	7.41	5.35	8.14	5.00	0.70			0.01
Adaptive Scales										
Adaptability	15.25	4.48	14.67	2.83	13.44	3.85	2.79			0.03
Social Skills	28.46	7.13	26.26	5.90	23.74	6.56	5.12*	0.00[a] 0.03[b]	0.69[a] 0.40[b]	0.07
Leadership	15.88	4.40	16.28	3.67	14.09	4.11	4.62*	0.00[b]	0.56[b]	0.06

Table 2

Means, standard deviations, and Analysis of Variance on the clinical, adaptive, and general scales of the Behavior Asessment System for Children

Subscale	Relapse		Remission		Control		*F*	*p*	*Cohen's d*	η^2
	M	*SD*	*M*	*SD*	*M*	*SD*				
General Scales										
Externalizing Problems	25.73	14.92	23.46	11.82	22.44	12.77	0.80			0.01
Internalizing Problems	29.14	11.69	22.93	11.03	25.02	10.06	1.45			0.02
Adaptive Skills	59.58	13.55	57.21	10.65	51.26	12.81	5.40*	0.00[a] 0.00[b]	0.63[a] 0.50[b]	0.07
Behavioral Symptoms Index	59.29	23.85	53.67	19.59	53.79	19.85	0.73			0.01

Note: *$p < 0.05$. [a]Significant differences between RG (group in cancer relapse) and CG (control group); [b]Significant differences between RMG (group in cancer remission) and CG (control group).

Table 3 shows the correlations between family cohesion and children's psychological adjustment in each analyzed group. In this table, statistically significant negative correlations can be observed in the RMG, indicating that higher family cohesion is associated with fewer externalizing problems, fewer internalizing problems, and fewer behavioral symptoms.

Table 3

Correlations between family cohesion and children's psychological adjustment on the Behavior Asessment System for Children general scales

Variables	Group	1	2	3	4	5
1. Externalizing	RG	–				
Problems	RMG	–				
	CG	–				
2. Internalizing	RG	0.70**	–			
Problems	RMG	0.69**	–			
	CG	0.60**	–			
3. Adaptive	RG	-0.01	0.04	–		
Skills	RMG	0.06	-0.11	–		
	CG	0.10	0.39**	–		
4. Behavioral symptoms Index	RG	0.92**	0.89**	-0.01	–	
	RMG	0.89**	0.87**	-0.06	–	
	CG	0.87**	0.86**	0.27*	–	
5. Family Cohesion	RG	0.01	0.12	0.38	0.04	–
	RMG	-0.34*	-0.46*	0.22	-0.37*	–
	CG	-0.18	-0.07	0.09	-0.15	–

Note: *$p < 0.05$; **$p < 0.001$. CG: Control group; RG: Group in cancer relapse; RMG: Group in cancer remission.

Correlations between sociodemographic and psychological adjustment variables can be seen in Table 4. Children in the RMG who were younger tended to exhibit fewer adaptive skills. It is also observed that a lower level of parental/caregiver education is associated with more internalizing problems. Also, lower family income is related to more externalizing problems, more internalizing problems, and more behavioral symptoms.

Regarding medical characteristics, Table 5 shows the correlations between these variables and measures of children's psychological adjustment. Children in the RG who underwent treatment for a longer duration tended to present more internalizing problems, and those who experienced more than one relapse tended to have more externalizing problems, more internalizing problems, and more behavioral symptoms.

Table 4

Correlations between sociodemographic variables and children's psychological adjustment on the Behavior Asessment System for Children general scales

Variable	Group	1	2	3	4	5	6	7	8	9
1. Externalizing	RG	–								
Problems	RMG	–								
	CG	–								
2. Internalizing	RG	0.70**	–							
Problems	RMG	0.69**	–							
	CG	0.60**	–							
3. Adaptive	RG	-0.01	0.04	–						
Skills	RMG	0.00	-0.11	–						
	CG	0.10	0.39**	–						
4. Behavior symptoms index	RG	0.92**	0.89**	-0.01	–					
	RMG	0.89**	0.87**	-0.06	–					
	CG	0.88**	0.86**	0.27*	–					
5. Child's gender	RG	0.33	0.03	-0.33	0.17	–				
	RMG	0.14	0.07	-0.19	0.19	–				
	CG	0.13	-0.18	-0.23	-0.01	–				
6. Child's age	RG	-0.35	-0.15	0.15	-0.31	-0.30	–			
	RMG	-0.09	-0.05	0.28*	-0.10	0.18	–			
	CG	-0.13	-0.07	-0.08	-0.17	-0.17	–			
7. Caregiver's Marital Status	RG	0.32	0.31	-0.18	0.39	0.08	-0.21	–		
	RMG	-0.13	-0.06	-0.14	-0.09	0.07	0.16	–		
	CG	-0.27*	-0.25	0.04	-0.27*	0.15	-0.03	–		
8. Caregiver's Educ. Lvl.	RG	0.02	-0.26	0.25	-0.20	-0.03	0.14	-0.48*	–	
	RMG	-0.17	-0.29*	0.07	-0.23	0.07	0.10	-0.10	–	
	CG	-0.31*	-0.15	-0.02	-0.19	-0.11	-0.04	-0.08	–	
9. Family income	RG	0.07	0.12	-0.06	0.12	-0.16	0.51*	-0.24	0.46*	–
	RMG	-0.26*	-0.27*	0.14	-0.26*	-0.02	0.07	-0.23	0.47**	–
	CG	-0.20	-0.11	-0.06	-0.17	-0.11	0.01	-0.16	0.37**	–

Note: *$p < 0.05$; **$p < 0.001$. Ext. Prb. = externalizing problems; Int. Prb. = internalizing problems; Caregiver's Educ. Lvl. = caregiver's education level. CG: Control group; RG: Group in cancer relapse; RMG: Group in cancer remission.

Table 5

Correlations between medical variables and the psychological adjustment of children with cancer on the Behavior Asessment System for Children general scales

Variables	Group	1	2	3	4	5	6	7
1. Externalizing	RG	–						
Problems	RMG	–						
2. Internalizing	RG	0.70**	–					
Problems	RMG	0.69**	–					
3. Adaptive	RG	-0.01	0.04	–				
Skills	RMG	0.00	-0.11	–				
4. Behavioral symptoms index	RG	0.92**	0.89**	-0.01	–			
	RMG	0.89**	0.87**	-0.06	–			
5. Time in current situation	RG	0.20	0.02	-0.20	0.09	–		
	RMG	0.08	-0.8	0.15	0.01	–		
6. Time in treatment	RG	0.26	0.45*	-0.18	0.38	0.26	–	
	RMG	-0.07	0.04	0.05	-0.01	-0.46**	–	
7. Number of relapses	RG	0.44*	0.50*	-0.09	0.46*	0.02	0.36	–

Note: *$p < 0.05$; **$p < 0.001$. Time in current situation: months in relapse or remission; RG: Group in cancer relapse; RMG: Group in cancer remission.

Discussion

This research investigated the psychological adjustment of children in cancer relapse from the perspective of their parents/caregivers, comparing their adjustment with those of children in cancer remission and children with no history of the disease. Contrary to the study's first hypothesis, which posited that children with relapsed cancer would have worse psychological adjustment than those from the survivors/remission group and the healthy/control group, the results showed that, according to the clinical scales, these patients did not significantly differ from the other groups, except in the atypicality subscale, where they scored lower than the others. Furthermore, children in cancer relapse exhibited more social skills, leadership, and adaptive abilities than the children in the control group.

This result is consistent with the literature, which did not find psychological adjustment problems in children with cancer relapse (Compas et al., 2014; Grootenhuis & Last, 2001; Okado et al., 2015). Thus, children in cancer relapse may possibly feel depressed or anxious sometimes, but they manage to overcome adversities and the majority demonstrate feelings of optimism and well-being (Bragado-Álvarez, 2009).

However, the results of this research go further, demonstrating that children with cancer relapse not only do not exhibit behavioral problems but also adapt better than children with no history of cancer. The same is true for children in cancer remission ("survivors"), who showed better psychological adjustment than the "healthy" children, presenting more adaptive abilities, leadership, and social skills, as well as less atypicality, refuting the second hypothesis of this study, which suggested that they would have similar adjustment to the children in the control group.

Therefore, it can be concluded that children who survive cancer not only do not show indications of adjustment problems but also seem to demonstrate a significant adaptive repertoire after oncological treatment, as observed in other research (Kazak & Noll, 2015; Okado et al., 2018; Wakefield et al., 2010). It can be hypothesized, therefore, that due to the skills acquired during the illness process, the treatment may not be as psychologically traumatic as expected (Phipps et al., 2006).

Thus, despite the suffering inherent to the treatment and the challenges faced in the post-treatment period (e.g., potential sequelae, readjustment to daily tasks, and returning to school), such contingencies could also teach or strengthen coping strategies that would be useful for these children to deal with other stressors in their lives; skills which perhaps "healthy" children may not have acquired due to a lack of experience with extreme situations, such as a life-threatening illness (Collins et al., 2019; Larsen et al., 2022).

Possible explanations for the fact that both cancer groups obtained higher scores in adaptive skills than the control group may be related to the learning of coping strategies during the first experience with cancer treatment, as reported by Phipps (2007). Thus, the development of adaptive resources derived from previous experiences, combined with sensitivity to changes in the context of relapse, may facilitate the acquisition of a broader behavioral repertoire and develop greater tolerance to uncontrollable and unpredictable events present in the treatment (Torres & Coelho, 2004).

Moreover, it is also possible that repeated exposure to previously conditioned aversive stimuli may produce greater habituation to the hospital context. Such habituation could fulfill an educational function, providing the child with new knowledge and experiences about the illness, which would reduce uncertainty (Szulczewski et al., 2017). Thus, it can be assumed that habituation to the constant stress in the hospital context could promote a more effective

coping response to the situation, an increase in adaptive skills, and a reduction in emotional symptoms (Bennet et al., 2018).

Other studies also suggest that the support received from the healthcare team and parents during relapse, the hospital's ludic resources, and the observation of other patients' coping strategies may help these children develop new skills, expanding their behavioral coping repertoire (Arriaga et al., 2020; Schepers et al., 2018). Therefore, according to a socio-environmental model, it seems that the tendency to develop a certain psychopathological disorder would be more related to the psychosocial and environmental context, to previous adjustment history, and to personality characteristics rather than the cancer itself as a triggering event (Kazak & Noll, 2015; Phipps, 2007).

The family environment can also contribute to a better psychological adjustment of cancer patients. Thus, as found in this study, children in cancer remission with more cohesive families tended to exhibit fewer externalizing problems, fewer internalizing problems, and fewer behavioral symptoms. A family atmosphere that is supportive, united, and that fosters sharing experience, can help the child readjust to the routine and demands of the post-treatment period (Ghriwati et al., 2021; Okado et al., 2021). However, this effect was not observed in the group of children in cancer relapse, possibly due to the stressors present in the relapse situation, which could interfere with the parents'/caregivers' perception of family cohesion. Nevertheless, this assumption requires investigation in future research.

Furthermore, certain risk groups related to demographic and medical variables were observed. Identifying risk factors is essential to offer appropriate interventions to meet the needs of this population and prevent potential adverse outcomes (Brinkman et al., 2018). In this regard, it was found that the youngest children in cancer remission tended to exhibit fewer adaptive skills, consistent with the results of Raghubar et al. (2019). Likely, the level of cognitive development in younger children may lead to greater difficulty in understanding the disease and medical recommendations during follow-up (Schepers et al., 2018).

It was also observed that lower parental/caregiver education level and lower family income were associated with more adjustment problems in cancer remission patients, corroborating other research (Kazak et al., 2015; Raghubar et al., 2019; Quast et al., 2018). Thus, some studies indicate that low-income families with lower levels of education tend to provide an environment with insufficient diversity for the child's development (Crosnoe et al., 2010; Davis-Kean et al., 2021). It is assumed that this scenario, combined with the restrictions and sequelae of oncological post-treatment, may lead to greater difficulties in psychological adjustment among cancer survivors.

More adjustment problems were also found in children who had experienced a higher number of relapses, as reported by Okado et al. (2018). This result is not surprising, given that relapse indicates a poorer prognosis, a higher level of uncertainty and uncontrollability of outcomes, as well as more aggressive treatment, which can lead to greater difficulty in adaptation (Szulczewski et al., 2017; Wechsler et al., 2021).

Finally, children in the relapse group who were undergoing treatment for a longer period showed more internalizing problems, in the same direction as the results reported by Hsiao et al. (2018). It is possible that prolonged treatment reduces stimulation and opportunities for patient´s action, not providing the necessary conditions for displaying behaviors that were previously reinforced in their natural environment (Gariépy & Howe, 2003; Nijhof et al., 2018).

This study has some limitations, such as the use of a single data source. However, some studies indicate that parents/caregivers are more reliable and accurate informants than children, not only for identifying problematic behaviors but also for pointing out adaptive skills (Gresham et

al., 2018; Phares, 1997). Nevertheless, future studies could benefit from using multiple sources of information, particularly from reports of other adults who interact with the child. Another limitation relates to the small sample size of the relapse group. However, this is an inherent problem in research with this population, which tends to have high rates of refusal (Gerhardt et al., 2007).

Despite these limitations, this study contributed to the understanding of the psychological adjustment of pediatric cancer patients. The results emphasize that not only do children in cancer relapse and remission adapt well to the demands of oncological treatment, but they also exhibit higher levels of adaptive skills (social and leadership skills) compared to children who have never had this illness.

On the other hand, the results of the present study suggest that it would be more beneficial for future research to focus on studying the coping skills of children with cancer rather than solely analyzing psychopathological problems. In this regard, several researchers question conventional psychopathological models and advocate for a model that is more focused on children's behavioral potentialities, the situational demands and the contextual factors that are specific to this population (Kazak et al., 2015; Raiff et al., 2020; Stegenga et al., 2020). Such model could potentially benefit the care of children with cancer, as the healthcare team could propose more targeted and effective interventions based on their needs, considering that behavioral potentialities can be used for modeling other behavioral repertoires (Leme et al., 2009).

Some important contributions of this research are related to the use of a comparative group composed of "healthy" children and the identification of risk factors in children in cancer relapse or remission. Clinical implications derived from the results refer to the possibility of identifying risk factors that allow an early screening of psychological symptoms, as well as the encouragement to design intervention strategies aimed at preventing future psychological problems that may arise during the course of the disease, thus ensuring a good adaptation of the children and their parents throughout the entire process (Kazak et al., 2015).

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