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## Effects of an Intervention on Social Competence of Children Surviving Brain Tumors

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**Abstract:** Pediatric brain tumors often generate problems in social-emotional development. This study evaluated the effects of an intervention on the social competence of children surviving brain tumors through a multiple-case design. Two mother-child dyads received three home visits for the pre-intervention assessment and another three home visits two months after the intervention for the post-intervention assessment. The collection of evidence pre- and post-intervention involved the child's clinical data and semi-structured interviews with the mother and the child regarding social adjustment and social interaction components. The intervention lasted from seven to nine sessions, which mother and child attended separately. The data were subjected to logic model analysis. The results show an improvement in social competence in both cases, especially in the pattern of social interaction with peers. We discuss the implications of the sequels from the illness in terms of deficits in and promotion of social competence.

**Keywords:** psychological intervention, social skills, neoplasms, case study

## Efeitos de Intervenção na Competência Social de Crianças Sobreviventes de Tumor Cerebral

**Resumo:** Tumores cerebrais pediátricos, frequentemente, acarretam agravos ao desenvolvimento socioemocional. Este estudo objetivou avaliar os efeitos de uma intervenção sobre a competência social de crianças sobreviventes de tumor cerebral por meio do delineamento de estudo de casos múltiplos. Duas díades mãe-criança receberam três visitas domiciliares para a avaliação pré-intervenção, e outras três visitas domiciliares, dois meses após a intervenção, para a avaliação pós-intervenção. A coleta de evidências pré e pós-intervenção envolveu informações clínicas da criança e entrevistas semiestruturadas com a mãe e com a criança sobre os componentes ajustamento social e interação social. A intervenção durou de sete a nove sessões, sendo mãe e criança atendidas separadamente. Os dados foram submetidos à análise de modelos lógicos. Os resultados revelaram melhora na competência social de ambos os casos, especialmente no padrão de interação social com pares. Discutem-se as implicações das sequelas do adoecimento nos déficits e na promoção da competência social.

**Palavras-chave:** intervenção psicológica, habilidades sociais, neoplasias, estudo de caso

## Efectos de una Intervención Sobre la Competencia Social de Niños Sobrevivientes de Tumores Cerebrales

**Resumen:** Tumores cerebrales pediátricos a menudo generan problemas en el desarrollo socioemocional. Este estudio evaluó los efectos de una intervención sobre la competencia social de los niños sobrevivientes de tumores cerebrales, mediante el diseño de estudio de casos múltiples. Dos díadas madre-hijo recibieron tres visitas domiciliarias para la evaluación preintervención y tres visitas, dos meses después de la intervención, para la evaluación post-intervención. La recojida de evidencias pre y post-intervención incluyó informaciones clínicas del niño y entrevistas semiestructuradas con la madre y el niño sobre los componentes de ajuste y interacción social. La intervención duró de siete a nueve sesiones, siendo madre e hijo asistidos separadamente. Los datos fueron sometidos al análisis de modelos lógicos. Los resultados mostraron mejora en la competencia social en ambos casos, especialmente en el patrón de interacción social con los pares. Discutimos las implicaciones de las secuelas de la enfermedad en los déficits y en la promoción de la competencia social.

**Palabras clave:** intervención psicológica, habilidades sociales, neoplasmas, estudio de caso

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Brain tumors pose a serious threat to development because the compression of brain structures often involves damage to the individual's functioning in the short and long term (Frosch, Anthony, & De Girolami, 2015). These damages may vary, but they are often associated with impairments in attention, the individual's ability to initiate, monitor, and plan tasks and to control emotions, processing speed, and working memory and learning (Massimino et al., 2011).

The literature consistently notes that these cognitive deficits pose problems with regard to social competence because they compromise assertiveness and are often associated with difficulties in communication, cooperation, responsibility, empathy, and self-control (Wolfe et al., 2013). Although such types of damage are serious, the literature notes that they can be mitigated through psychological interventions directed at both the child and the parents or caregivers (Barakat et al., 2003; Choi et al., 2016; Devine et al., 2016).

To understand and assess the social competence of pediatric brain tumor survivors, Yeates et al. (2007) propose a model with three components, i.e., *social information processing*, *social interaction*, and *social adjustment*, which are sequentially related. The processing of social information involves an analysis of the situation that requires the activation of social competence, the examination of the available response alternatives, the use of social abilities and the evaluation of results. The second component, social interaction, is described as a result of the behavior classes of seeking closeness, aggressive behavior, and social withdrawal. Finally, social adjustment is defined as the result of self-perception and the perception of others regarding the social functioning product. This three-component model has been used in studies on the social competence of children surviving brain tumors and is the theoretical model adopted for this study.

In evaluating the effectiveness of a group intervention for children surviving brain tumors, Schulte, Vannatta, and Barrera (2014) found an improvement in social performance and a higher frequency of interactions, marked by social conversations. In turn, Schulte, Bartels, and Barrera (2014) performed a group intervention and used a comparison group to assess changes in social competence. They found that scores in social skills significantly improved in the intervention group, highlighting the effectiveness of the intervention, including for the maintenance of skills existing prior to the illness, through the observation that the scores for social problems did not change in the intervention group but significantly increased in the comparison group. Another intervention tested by Barakat et al. (2003) showed a significant improvement in social competence and in internalizing problems by children and adolescents surviving brain tumors. These three studies evaluated group interventions that lasted six or eight sessions.

Certain theoretical gaps have been identified in the studies on the tested interventions. The intervention programs evaluated have been predominantly based on social skills training with children (Barakat et al., 2003; Devine et al., 2016; Schulte, Bartels et al., 2014; Schulte, Vannatta et al., 2014), and only one study assessed the pattern of children's social interactions (Schulte, Vannatta et al., 2014). However, the results require caution due to certain methodological choices. In the last study, the pre-test and post-test assessments were performed immediately prior to and after the intervention, respectively (Schulte, Vannatta et al., 2014). Thus, the data pointing to an improvement in social interactions were often questionable because a re-evaluation was not possible in the follow-up and because of the possibility that the increase in

the interactions was not facilitated by the intervention but rather by the continuous contact of the participants in the intervention group. Another gap involves the fact that the three interventions neglected the parent-child interaction variables. Despite the importance of this type of treatment, only one of these interventions included parents in the procedures (Barakat et al., 2003). However, that study did not research the relationship between patterns of parent-child interactions and the results of the child's social competence.

Cognitive deficits and emotional problems resulting from illness affect social competence and are frequent in children with brain tumors (Massimino et al., 2011; Wolfe et al., 2013). In the face of these aggravations to the development of children surviving brain tumors, it is essential that research be undertaken to investigate and attempt to improve the quality of life of this population. Psychological interventions have been identified as strategies to promote the development of social competence (Barakat et al., 2003; Schulte, Bartels et al., 2014). However, findings on the effectiveness of this type of intervention are still scarce, particularly with regard to interventions involving parents. Additionally, in Brazil, no studies have proposed and evaluated these interventions for social competence.

The objective of this study was to adapt an individual intervention to promote social competence in children surviving brain tumors and to qualitatively assess the pattern of changes in social competence within the cases exposed to the intervention. Changes in the social competence of the participants were evaluated based on two of its components: social interaction and social adjustment (Yeates et al., 2007). A multiple-case study design was used, for which the following proposition for guiding the analyses of this study was defined: Social skills training and subsequent stimulation to practice the skills developed in the intervention will encourage the social competence of children surviving brain tumors.

## Method

This research adopted a multiple-case study design with an explanatory character, because it aimed to thoroughly explain a phenomenon and develop a theory (Yin, 2010). The psychological intervention was understood as the primary unit of analysis, and each evaluated case constituted a unit of integrated analysis.

## Participants

The study included two mother-child dyads who were selected due to their accessibility at an outpatient neurology clinic in the city of Salvador. The children did not show severe deficits in communication and cognition, and, according to the mothers' reports, the children showed no history of behavioral, cognitive, or emotional problems prior to the illness. The dyad in case 1 was composed of a male child, eight years old, who had not attended school, and his mother, approximately 30 years old with 12 years of schooling, had two children and worked outside the home.

The dyad in case 2 was formed by a female child with 10 years old and four years of schooling, and her mother, with approximately 30 years old and seven years of schooling, who had three children and did not work outside the home. Only the mother in the case 2 dyad reported living with the child's father. The family income of the two dyads was approximately minimum wage.

## Instruments

*Socio-Demographic Data Sheet.* This instrument gathered information such as age, education, income, and family composition.

*Child's Clinical Information Sheet.* This instrument was used to collect information on the diagnosis, treatment, and clinical condition of the child.

*Semi-Structured Interview on the Mother's Perception of the Child's Social Adaptation.* This instrument, which was developed specifically for the present study, solicited a description of social interaction situations that the child had in the past week, the behaviors that were shown by the child, and the impact of these behaviors on the interaction partners.

*Semi-Structured Interview on Self-Perception of Social Adjustment.* This instrument, which was developed specifically for the present study, solicited a description by the child of the social interaction situations experienced during the past week at school, at home, or in other environments and the impact of these behaviors on the interaction partners.

## Procedure

**Data collection.** Based on the information obtained through contact with the medical team and the medical records of the neurology clinic where recruitment was conducted, the Child's Clinical Data Sheet was completed. Based on this information, the possible implications of the disease in the physical, cognitive, and social-emotional development of each child were investigated for the initial adaptation of the intervention plan, which remained flexible to meet the child's needs. The selected families received three home visits (one per week) for the pre-intervention assessment. During the first visit, both the mother and the child consented to their participation by signing the free and informed consent form and by providing verbal consent, respectively. During this same visit, the mother completed the Socio-Demographic Data Sheet and the Semi-Structured Interview about the Mother's Perception of the Social Adjustment of the Child. The child completed the Semi-Structured Interview of the Self-Perception of Social Adjustment. In the following two weeks, the child and the mother again completed the same interview regarding social adjustment, always with reports of the previous week's events.

At the end of the evaluation period, the intervention procedure, which entailed nine (case 1) or seven (case 2) weekly home sessions, began. The intervention model adopted for this study, called the Group Social Skills Intervention Program for Survivors of Pediatric Brain

Tumors, was developed by Barrera, Fleming, and Al-Khalili (2004). The authors gave the intervention manual to the first author of this study. Through pre-intervention evaluation, it was verified that the demands identified, in both cases, would be better addressed by an individual intervention. In addition, this study made a further innovation by including the mothers in the intervention procedures. This decision required changes that would make it feasible to assist the mother and child. Thus, the intervention program was adapted for an individual household intervention to also include sessions with the mother, which occurred separately. Based on the relationship between the social competence and social abilities constructs (Yeates et al., 2007), the intervention program proposed by Barrera et al. (2004) was designed with a focus on training in the following six social skills: social interaction and new friends, cooperation, managing teasing and bullying, resolving conflicts, empathy, and assertiveness. The activities that were originally programmed for groups were adapted for an individual modality, which consisted of interaction with the psychologist who performed the intervention. For example, an activity in which the child and the psychologist made a poster sharing a magazine, glue, and scissors was performed in order to develop cooperation. After the task concluded, the psychologist had a conversation with the participant about the advantages and challenges of cooperation by recalling the situations that occurred during the task that illustrated those aspects. In addition, issues concerning the sequelae of the illness, which emerged during the intervention, were discussed.

Each session with the child involved a block of five activities: (1) *discussion of the extra activity and review* performed only after the second session, to recover the acquired skills to enhance their use and generalization; (2) *approaching the subject* to pique the participant's interest, attention, and curiosity by promoting a space to think about the social skill that was the subject of the session; (3) *presentation of the social skill* to describe the skill and specific steps to practice it and then to model the skill through role play; (4) *main activity* to consolidate the social skill learned through therapeutic techniques that varied based on the social skill under focus in the session and the specific limitations of each child; and (5) *presentation of the activity outside the intervention* to encourage the practice and generalization of the social skill learned in the participant's everyday life based on a record protocol to be completed by the child.

The sessions with the mothers were based on the subject under focus, working with the child and the demands presented by the mother regarding the care of the child. The mothers were encouraged to think about the social competence difficulties of their children and to motivate them to exercise the social abilities addressed by the program. At the end of each session, the mothers also received a structured protocol that sought to encourage them to assist their children in the use of the trained skills in the visit each week. Each session with the mother and the child lasted, on average, 50 minutes and was audio recorded and conducted by the first author of this study, a psychologist.

Two months after the intervention, three other home visits were scheduled for the post-intervention assessment, in which the mother and child again completed the Semi-Structured Interviews about Social Adjustment that were used in the pre-intervention assessment. All interviews were audio recorded. It is important to note that, during the three post-intervention sessions, the facilitator provided additional support and guidance to encourage the maintenance and the broadening of the benefits achieved.

**Data analysis.** The interviews were transcribed and their contents summarized to gain a holistic understanding of the behavioral patterns of both the mother, while interacting with the child, and the child. Then, the data were analyzed using a logic model at the individual level. This technique corresponds to the description and analysis of the course of a person's behavioral events considering certain sequential stages (Yin, 2010). This phase of the analysis considered the pre-intervention, intervention, and post-intervention assessment phases in each case. Finally, the social interaction patterns were compared before and after the intervention in both cases.

### **Ethical Considerations**

In accordance with the rules established by Resolution No. 466, the current national legislation on human studies, this study obtained approval from the Research Ethics Committee of the Professor Edgard Santos University Hospital (Opinion n° 1.233.402/CEP-HUPES). After the final evaluation, psychological assistance was given every 15 days for approximately three months for the families participating in the study with the aim of expanding the benefits achieved during the intervention. Moreover, as an alternative, to validate the presentation of the results, each participating mother conducted a review of the case study draft that involved her (Yin, 2010).

## **Results and Discussion**

This section is presented in two stages. Initially, the results of the pre- and post-intervention as well as the particularities relating to the implementation of the intervention in each of the two cases that comprise this study are shown. Then, the similarities and differences between the two integrated units of analysis (cases) are discussed based on the proposition previously defined for this study.

### **Clinical Information for Case 1**

The fictitious names Alan and Ana for the son and the mother, respectively, are used to refer to the dyad in case 1. At age five, Alan was diagnosed with suprasellar pilocytic astrocytoma, an essentially benign brain tumor located in the hypothalamic region, compromising the optical pathways. Alan underwent surgical and chemotherapy treatment that lasted three years. According to medical records, as a

consequence, Alan had a total loss of vision in his left eye and a surgical scar on his scalp. However, according to Alan and his mother's reports, Alan could see a few shadows or large objects a short distance away. Until the beginning of the intervention, Alan had not been subjected to any specific follow-up for his visual impairment and had not resumed his school activities due to his mother's choice, although the medical team stressed the importance of his return to school.

### **Pre-Intervention Assessment of Case 1**

Generally, the dyad reported that Alan's social life was very restricted. For Ana, her child's absence of social interactions was being replaced with other activities, such as playing with stuffed animals or pets: "He spends all his time waiting for a child ... but [with] the chicks, he plays as if they were his friends." However, Ana's reports also indicated that she perceived that her son would like to interact with other children and that he suffered because he did not have anyone to play with: "He had a nervous breakdown and was very sad because he had no friends." Alan reported that he liked to play with other children and lamented when he did not have company, but he emphatically rejected the possibility of returning to school, explaining that he "would not make any friends." This data point seems to reinforce the evidence of feelings of inability to make and maintain friendships and to adapt to the school environment.

During the interactions established with the intervention facilitator in the pre-intervention assessment period, no difficulties in Alan's language were observed, and he communicated well and had good clarity and fluency, with coherence in the organization of his thoughts. However, his reports indicated a certain fear of interacting with other children. For example, Alan reported that, when asked to play, he agreed to lend his toy car but kept away from other children "because Bruce Lee [one of his stuffed animals] was nervous. Because the other day I let him [Bruce Lee] play with the boy. The boy accelerated the car and threw his toy [car]. Bruce Lee almost died hitting the car." It was implicit in this report that the child fears the possibility of being injured or hurt by friends.

Ana also demonstrated restrictions when there was a chance to introduce her child to available social groups. Occasionally, she reported waiting for the intervention of someone who recognized and accepted Alan's characteristics and who was willing to interact with him or introduce him to social groups: "The children's music conductor, who is responsible for the children from the department [of the church], spoke to me: 'sister Ana, why are you not bringing Alan to the rehearsals? I would like that you come and bring him, so he can start interacting with the children.' (...) I thought this was good for him because I wanted her to take the initiative (...) She is the leader of the department [group of children]. She is asking me to bring him. I'll bring my son. From now on, he will go." She also explained the social restrictions based on Alan's health problems and the child's greatest potential vulnerability.

On the other hand, one could observe in the mother's speech an important relationship between the restrictions to Alan's social life and his visual impairment. Reports suggested that Ana perceived deficits or inadequacies in Alan's interactive skills because of his vision problem: "He touches [the other children] because he cannot see well (...). And many children do not like it, because kids want to be running around, and he can't do the same activity." Ana showed fear that Alan could be overlooked or neglected due to his disability or due to his inability to address this type of situation: "Some little boys of his age come (...) to play ball. I say, 'My son, they will throw the ball at you [throw the ball in a dangerous way].' Because the boys keep looking at him as if he were different." Given that Alan's most frequent social contact was with adults, the limited opportunities to train his social skills with children seemed to justify the dyad's fear and Alan's difficulty interacting with peers.

### Implementation of the Intervention in Case 1

The pre-intervention assessment revealed that Alan's social skills were more adapted to living with adults. Thus, intervention strategies were implemented to encourage the development of skills to interact with children, aiming for Alan's insertion in peer groups and his return to school activities. Although Alan was very engaged in activities, no significant change in the frequency of Alan's interactions with other children was observed until the third session. Alan always shied away from talking about his disability and repeatedly said he could see without restrictions. For example, when asked if he knew about a soccer ball for the visually impaired, Alan immediately introduced another subject: "No. You know what? Your voice is like Miriam's."

Ana, in turn, was encouraged to position herself actively as the facilitating agent of her son's social inclusion. However, her reports still showed passivity and difficulties with accepting and addressing her child's disability. On several occasions, Alan's visual impairment was described by Ana as a justification for the restriction of her child's social life. For example, when reporting that Alan was prevented from singing with other children because the leader of the group believed that, due to his disability, he would not be able to perform in public, Ana reported that she did not interfere, even though she was aware of her son's sadness and knew that he was able to participate: "I could not say, 'Oh, he will be sad.' I couldn't say anything. I just said, 'Ah' (...). I was shocked to the point I couldn't speak."

In this context, two additional sessions with Alan and his mother were included to address issues related to his visual impairment. By realizing the challenges that he would have to face to address his disability, Alan explained his difficulty in talking about the topic and the fantasies that encouraged him to conceal his disability, expressing his suffering when directly addressing the sequelae: "I do not see, then I'm like this, upset. (...). This is already making me a little sad, because I do not like to talk about it." Alan was welcomed and encouraged to address his limitations. The facilitator

reported examples of the visually impaired who performed different study, work and leisure activities and encouraged Alan to find a service site for the visually impaired. Thus, even with some hesitation, Alan went to ask his mother to look for assistance for the visually impaired, showing his willingness to attempt to address this difficulty.

Ana, in turn, took advantage of the additional sessions to talk about personal issues related to her child's illness. She highlighted her excessive dedication to her children at the expense of attention and care directed to herself. At the end of the sessions, she could reflect on the future that she was planning for her child and began to reconsider the investments that she should make in the present. After this session, Ana already showed a greater willingness to provide social environments for Alan: "He insisted on visiting the Institute [specific care unit for disabled people]. (...) Since he asked and is interested, I am going to take him on Tuesday."

The structured protocol was resumed, and the following sessions occurred with greater fluidity. However, Ana still overprotected her son, which limited his opportunities to be with other children. She believed that, by being a mother, she needed to correct and interfere with her child's behavior indiscriminately: "Alan has me as a mother. Alberto [the oldest son] did not have me as a mother because I always had to work." In this context, she was asked to reflect on this concept and consider the importance of ensuring her child's autonomy so that he could develop his skills, especially in contact with other children without her constant interference. At the end of the intervention, in addition to interacting with peers on a daily basis, Alan had joined a group of children who met weekly for specific activities, and the dyad had made its first visit to the institution for the visually impaired.

### Post-Intervention Assessment of Case 1

Although there were frequent reports before the intervention of constraints to Alan's social contact with other children, in this assessment, the dyad emphasized the expansion of Alan's social life and a consequent reduction in the accounts of interactions with stuffed animals. The mother said, "Now, he has contact [with other children], because he is always out in the street with other boys." The mother's reports indicated that Alan was integrated into two groups of children from the church and was receiving specific assistance for the visually impaired and that Ana was looking for a regular school in which to enroll her child.

Another change can be identified in the mother's perception of her child's development. Before the intervention, her reports suggested that she did not realize the damage resulting from her son's restricted social contact. However, after the intervention, her reports indicated that she wanted even more social interaction opportunities for Alan and realized the importance of him relating to his peers: "He goes to school now. I know he'll have a better social life by going to school." Furthermore, Ana reported observing an improvement in the behavior and emotions expressed by her son, and she said that he was more obedient and that she had

observed an improvement in Alan's skills in interacting with peers, because he was able to establish social contact without much need to touch the other children's bodies. However, she also said that, despite having improved some abilities, her son still needed to improve other skills, for example, to start an interaction and to end it when necessary: "He must also learn to respect the other child's boundaries, when they do not want things. He has to learn this."

Despite the benefits noted, Alan's entry into new social environments also generated some conflicts. The boy's reports indicated that he was having difficulties in social adaptation and was being rejected, physically assaulted, or humiliated because of the scar on his scalp and the visual impairment. When reporting these conflicts, Alan said that children "were making fun of me just because I'm blind." However, unlike the avoidance behaviors reported in the pre-intervention assessment, in this assessment, Alan showed persistence and a willingness to use the skills that he learned during the intervention to resolve such conflicts. For example, he reported looking for one of the children responsible for these conflicts to talk: "I said: 'Bro, you embarrassed me once, and I'm still upset about it.' Then, he said: 'Sorry, bro.'" Similarly, Ana reported that she encouraged her child to remain and persist in interactions, believing that doing so would be important for him to adapt to social life: "I told him, 'No my son, you will continue. Now, you will learn to tell them that you are not crazy.'"

## **Clinical Information for Case 2**

For the dyad in case 2, the fictitious names Betina and Bernadete for the daughter and mother, respectively, are used. At six years old, Betina was diagnosed with craniopharyngioma, a benign brain tumor located in the suprasellar region. According to medical records, Betina underwent surgery, chemotherapy, and radiotherapy treatments. All treatment lasted approximately four years, and as sequelae, the medical record emphasized obesity and endocrinological deficits. Since the recruitment phase of this study, the child resumed school activities as well as some recreational and social activities.

## **Pre-Intervention Assessment of Case 2**

The dyad's reports indicated that Betina maintained daily contact with peers, both at school and at home with her siblings. However, Bernadete noted that her daughter's social interactions were more commonly with adults or younger children. Bernadete and her daughter reported that, although the other children in the same age group liked rougher play, such as jumping or running, Betina was more disposed to interactions with less vigorous physical activity, such as writing or playing with dolls. In this context, Bernadete said that her daughter complained of being rejected by other children and being neglected by her sister: "She wrote in her diary, I read in the diary that she [Betina] loved her sister and that her sister [Brenda] did not like her."

On the other hand, some of the dyad's reports highlighted that Betina could establish social contacts with peers. However,

according to Bernadete, Betina did not prolong interactions and complained of headaches: "In some dynamics, such as a play in the classroom (...) she did not participate (...) because she had a headache and because she was a little hot." The analysis of this and several other similar reports indicated that Betina was used to complaining of pain in situations in which interactions were not agreeable or in which she had greater difficulty, such as in more dynamic physical activities or in schoolwork. This data point was confirmed when Bernadete said that Betina had complained of pain and returned from school before classes finished. At that time, she understood that the pain reported by Betina "was something she was already upset about because I did not let [her use] the bracelets."

Bernadete said that Betina often had tantrums or cried when upset and said that she realized that there was some exaggeration in her daughter's emotional expressions: "When you touch something without asking, she turns into a beast. She complains and fights. She cries." However, even with these reports, the mother seemed to have difficulty assuming or understanding that her daughter had emotional and behavioral difficulties. Betina's reports seemed to indicate that, in social interactions, she withdrew instead of growing closer to peers: "Sometimes, when someone wants to write, then I pick up a sheet of paper and give it to them so they can write with me." Throughout the interviews, the difficulty describing her interactions, coupled with the ease in describing the interactions of other children, seemed to suggest that Betina behaved more like a spectator than as a participant in the social environments that she attended: "Everything is good with my friends at school. But Peter has mean jokes, playing with fire and running (...)"

The obesity, a sequela of the illness, was also described by the mother as another factor that seemed to hinder the child's social interactions. Bernadete said that, on some occasions, her daughter lamented her failure to interact with peers, saying that her difficulties were because of the sequelae of her illness: "Ah, because I'm fat, because I had the surgery and such (...). Ah, I know I'm fat, some people look at me like that." She said that Betina was bothered when other children excluded her for being overweight and that, on a day-to-day basis, she suffered for not feeling good about her body. In addition to the social repercussions and losses in body image, the mother's statements suggested that Betina suffered but refused to adapt to a strict eating routine. In her reports, Betina often had complaints related to episodes at snack time, for example, when she reported feeling cheated by someone who hid his food: "He tricked us, saying he did not have a snack. He left his snack in his backpack and pretended to not have one."

Furthermore, although a neurocognitive evaluation had not been conducted with any specific instruments, based on contact with the participant, it was observable that Betina was slow at processing information. Even when talking about her everyday life, she took long pauses to start or continue her speech. Moreover, she seemed to have some memory impairment, because she repeatedly reported not remembering recent events, even after having begun describing an episode.

In attempting to protect Betina rather than encouraging her to adapt to the social environment, making her face her

own behavioral difficulties, Bernadete intervened so that the environment would adapt to her daughter. For example, instead of instructing and encouraging Betina to seek and maintain interactions, Bernadete often expected that Brenda (the youngest sister) could facilitate Betina's social contacts: "But then, when I talk to her [Brenda], she [Brenda] always calls her [Betina], and she [Betina] goes to play."

### Implementation of the Intervention in Case 2

Based on the pre-intervention assessment findings, the strategies used in the intervention with Betina were directed toward the development of skills to interact with children and the encouragement of emotional self-control to enable her to initiate and maintain social interactions with peers, even without the facilitation of her sister or an adult. Although she was willing to perform the proposed activities in the intervention sessions, Betina did not feel comfortable enough to talk about her suffering related to her illness. Since the recruitment period, when asked about her illness, she had short or evasive answers to the facilitator's questions on this subject.

In turn, from the beginning of the intervention, the mother emphasized events that suggested advances in the social-emotional aspects of the child's behavior. "She played with girls her own age. She had some little fights, but then she made up and continued playing." However, even when reporting some problems, such as when she spoke of her daughter's tantrum behavior, the mother questioned her complaints, considering that such behaviors were "normal for her." This type of positioning seemed highly compatible with the resignation expressed by Betina. In addition, Bernadete said that her main strategy for addressing the emotional imbalance of her daughter was to ignore her emotional reactions: "Every time she doesn't get something fast, she gets sulky. (...) sometimes, I do not negotiate (...). I pretend I don't understand her tantrum." These strategies, instead of promoting the child's development, seemed to intensify her aversive emotional reactions, especially because she had no opportunity to describe her feelings and relate them to events during the illness.

Throughout the intervention sessions, Betina was encouraged to talk about her illness. On the first occasion, she became emotional, cried, and was able to speak about her suffering, especially when, due to the routine of the treatment, she was far from friends and family members: "There was one day, I had a dream in which my mother was going away and my father was leaving me alone. Then, I woke up scared. (...) I missed my sister, my brother and my grandmother." As she remembered and talked about the period of her illness, Betina was supported and encouraged to continue the reports and emotional expressions. She also shared her suffering related to the sequelae of the illness and revealed that she felt limited because of her obesity: "Gossiping, saying I'm fat and I was not able to do anything. (...) I'm afraid of hurting myself if I keep running." On these occasions, specific strategies were discussed so that, instead of evading, Betina could recognize her potential and adapt to her limitations. After these reports, Betina started to behave more spontaneously when talking

about her emotions. For example, regarding the news coverage about sick people that she watched with her family, she said naturally: "I felt sorry for the sick people. (...) she [the mother] told me to forget, but I kept remembering (...). I felt sad then."

Although she was being instructed to support and encourage reports from her daughter about negative feelings and events related to her illness and to situations in her life in general as well as to promote opportunities for her to assertively express her emotions, Bernadete still believed that the best strategy was to ignore the suffering related to the illness. She said to Betina, "You should not cry about it, you should be thankful and say that you have been healed." This behavioral pattern of avoidance was repeated in various situations throughout the sessions. However, at the end of the intervention program, Bernadete was able to understand the importance of reviewing some educational strategies used in everyday life with her daughter.

### Post-Intervention Assessment of Case 2

Unlike the previous assessment, in this stage, the mother said that her daughter was favoring interactions with children in the same age group. In contrast, Betina's reports still indicated that she was often only a spectator of the interactions among other children, which was similar to reports before the intervention: "I was out there alone (...) by myself, quiet, doing nothing, just looking at my purse." However, some subtle changes were identified. The dyad's reports suggested that, rather than remaining passive without attempting to initiate interactions, Betina was seeking contact with other children and no longer depended as much on her sister's help to be inserted into social groups: "[In school], Brenda chose theater. She chose music. (...) She is not very focused on Brenda, always choosing whatever Brenda chooses."

Although she showed more autonomy, in most cases in which the mother emphasized her daughter's independence, she was referring to Betina's ability to obtain food: "She has breakfast, asks people what the snack will be, if she will buy it." Similarly, in her reports, Betina showed the greatest satisfaction when talking about interactions involving snacks: "Just that I was not playing, just them. I was just watching because the teacher had given me cake." When questioning the mother about this aspect, Bernadete confirmed that she realized that Betina had more autonomy and interest in contexts involving food than social interactions. In this context, she also said that Betina was still struggling to adjust to the dietary restrictions.

Some of the mother's reports indicated that Betina was behaving more assertively in some contexts of interaction with her parents, for example, on the occasions when she could negotiate her preferences through verbal communication, avoiding tantrums more often. However, the mother also revealed that Betina still exaggerated when expressing her emotions, especially in interactions with peers. She said that, when her daughter was upset with something, she still behaved with extreme irritation or crying: "She was upset because he [a cousin] did this [suggested a slap in the context



of the game], and she cried. She cried but *more dramatically*.” On this occasion, Bernadete’s reports suggested that she responded appropriately. When discriminating against the exaggeration of her daughter, she scolded her but did not provide as much attention for her bad behavior and thus did not reinforce this pattern of emotional expression.

Somatic complaints were also reported as one of Betina’s behavioral patterns that remained even after the intervention. However, the mother’s reports suggested that Bernadete was more alert to this type of behavioral manifestation after the intervention. She said that she was able to identify times when Betina referred to headaches to receive some type of reward or to be able to avoid some aversive context: “‘Do you want medicine?’ ‘No’. So, I know when it is a headache and when it is not.” She also said that she had been talking with the child about the risks of reporting pain just to gain benefits and the importance of clearly communicating her will and frustrations rather than mentioning physical pain. For the mother, the events marked by somatic complaints were less frequent in the post-intervention assessment period.

### Analysis of the Study’s Proposition

The proposition of this study was that training in social skills and subsequent stimulation to practice the skills developed in the intervention would favor the social competence of children surviving brain tumors. The results support this proposition, because the data from the interviews with the dyads indicated an improvement in the general standard of social competence of the two children following the intervention based on social skills training. These findings corroborate those from previous studies that highlight the effectiveness of interventions focused on social skills training (Barakat et al., 2003; Devine et al., 2016; Schulte, Vannatta et al., 2014).

Although they underwent the same intervention procedures, the two children demanded specific procedures to address the sequelae of their illness. Alan and Betina had different sequelae, but they shared the fear of being rejected because of these characteristics, which may be attributable to the fact that they did not have the skills necessary to address their own emotions and to properly address the responses of other children in the face of their peers’ reactions to their illnesses’ sequelae. Other studies on brain tumors in childhood have noted that the patients tend to be less accepted and recognized as friends by their peers, but these studies associate these prejudices only with socio-demographic characteristics, such as gender and age, during the diagnosis period or the type of tumor treatment (Salley et al., 2014). We did not find a study that related social difficulties to the repercussions of the sequelae of the illness. Denham, Bassett, and Wyatt (2008) emphasized that emotional competence, which refers to the capacity to express, understand, and regulate emotions, relates to social competence, because emotional reactions invariably have social consequences. Thus, Alan and Betina were encouraged by the facilitator to recognize their limitations, to identify their own emotions, and to assess the consequences of their behavior in interactions with peers.

The data also suggested that difficulties in addressing the sequelae were being potentiated by the mother-child interactions because the two mothers also had emotional difficulties and a restricted behavioral repertoire for addressing their children’s limitations. In the context of chronic illness, studies show that parental stress is a common emotional characteristic of parents and a predictor of children’s social, emotional, and behavioral adjustment (Choi et al., 2016; Hile, Erickson, Agee, & Annett, 2014). Alan’s and Betina’s mothers had difficulties using contingent reinforcement strategies to encourage the social experiences of their children, and they provided excessive care and protection. Excessive parental protection harms children’s development by restricting the autonomy needed to develop the ability to regulate their own emotions and behaviors (Denham et al., 2008; Yeates et al., 2007) and by limiting the opportunities for social interaction, which is essential for the acquisition of socially appropriate responses (Grusec, 2011).

Studies on the social-emotional development of children with chronic diseases emphasize that excessive care and protection tend to decrease over the years (Pinquart, 2013), perhaps because, in addressing the illness, parents develop new skills to interact with the child. However, the emotional and behavioral responses of children are continually shaped by both the strategies that parents use to regulate the behavior of their children and the social-emotional responses that they display in family interactions (Alvarenga, Weber, & Bolsoni-Silva, 2016; Bijou, 1995; Denham et al., 2008). Thus, it is possible to consider certain types of damage stemming from this pattern of interaction between parents and children, even if the excessive care and protection do not remain stable.

In both cases, the greatest changes that were observed were related to social interaction. In addition to increasing the number of interactions established in everyday life, the two children had a higher frequency of behaviors that sought involvement. However, the changes that occurred over the course of the intervention were particular to each child and were related to the difficulties presented. Alan, who had no experience with peer interaction in his everyday life, showed explicit changes in his ability to identify and interpret stimuli and to resolve conflicts with peers. An improvement in these abilities was primarily favored because social contact is the most efficient method of acquiring socially acceptable responses (Denham et al., 2008; Grusec, 2011). Perhaps due to the extreme restriction to social interactions that Alan was facing, which was also clearly perceived by his mother and the child himself, Alan and Ana were strongly committed to the intervention and all of the activities that were proposed throughout the treatment. This commitment notably influenced the results that were achieved, particularly because the dyad proved to be very willing to improve the skills necessary for the child’s social development.

Compared to case 1, the changes that were found in Betina were subtler. The main aggravating factor may have been related to the recognition of the damages shown by Betina. Unlike Alan, Betina’s main difficulties were related to emotions. Perhaps because they are not easily observed

by the social community (Bijou, 1995), emotional problems are often overlooked, which may partly explain Betina's difficulties, because the mother showed less clarity in the perception of the daughter's emotional problems. The link established with the dyad in case 2 was also fairly consistent. However, because the child's emotional injuries were not easily perceived, the mother and daughter did not show consistent motivation toward and involvement in the changes proposed during the intervention.

The results of this study highlight the importance of variables other than cognitive abilities for the development of social skills in children surviving brain tumors, such as the sequelae of the illness. However, although there are many contributions, some limitations were found. Because the pre- and post-intervention assessments were conducted by the intervention facilitator, it is possible that the participants provided biased self-reports as to not frustrate the expectations of the researcher. A second limitation was related to the implementation of the intervention. Because the intervention was at home and access to the case 2 family residence was restricted, on more than one occasion, the sessions had to be rescheduled. Because it was a short-term intervention, extending the period between one session and another may have affected the participants' contact with the issues that were being worked on.

This study, a pioneer study in Brazil, researched the effects of an intervention on social competence in children surviving brain tumors. The prediction was supported, and the findings were innovative in suggesting that losses resulting from the illness' sequelae represent an important precursor of deficits in the social competence of children surviving brain tumors. Another innovation was the mothers' inclusion in the intervention procedures. The findings support the literature, underscoring the impact of parenting behaviors in children's social-emotional development.

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