# PAPER

# Outcomes of an enhancement study with additional psychoeducational sessions for healthy siblings of a child with cancer during inpatient family-oriented rehabilitation

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#### Abstract

**Objective:** Chronic illness of a child puts healthy children of the family at risk of distress. Previous studies have demonstrated that healthy children's psychological symptoms can be reduced when the child knows more about the disease. So far, there is limited evidence of the effectiveness of psychoeducational interventions for healthy children.

**Aims:** To compare the effectiveness of an inpatient family-oriented rehabilitation program with vs without additional psychoeducational sessions for healthy children of families with children with cancer.

**Patients and methods:** We performed a controlled study in 4 German family-oriented rehabilitation clinics. The outcomes of n = 73 healthy children (mean age: M = 9.55; SD = 3.14; range: 4–18), who participated in 5 additional psychoeducational sessions, were compared with the outcomes of n = 111 healthy children (mean age: M = 8.85; SD = 3.28; range: 4–17), who underwent the usual inpatient rehabilitation program. Primary outcomes were the healthy children's cancer-specific knowledge and their emotional symptoms. Secondary outcomes were family satisfaction and quality of life.

**Results:** Intention-to-treat analyses showed that both groups improved significantly from preintervention to postintervention. Improvements comprised knowledge about cancer (F(1,174) = 11.03, p < 0.001), self-reported emotional symptoms (F(1,135) = 31.68, p < 0.001), and parent-proxy-reported emotional symptoms (F(1,179) = 37.07, p < 0.001). The additional psycho-educational program did not significantly enhance the outcomes. The same pattern of significant improvement in both conditions emerged for all secondary outcomes. The immediate effects of the intervention persisted until 2 months after discharge from the rehabilitation program.

**Conclusions:** Inpatient family-oriented rehabilitation is effective in improving multiple psychosocial outcomes of healthy children in families which have a child with cancer. Additional psycho-educational sessions did not show any substantial additional improvement.

### KEYWORDS

childhood cancer, evaluation, family-oriented rehabilitation, healthy siblings, psycho-education

# 1 | INTRODUCTION

When a child is diagnosed with cancer, the entire family is affected by the demands of the illness and its treatment. The collective experience of the life-threatening disease and the unpredictable course of the

Abbreviations: FOR, Family-Oriented Rehabilitation; QoL, Quality of Life

illness place a burden not only on the child with cancer and his/her parents, but also on healthy children who do not suffer from cancer, in the family.<sup>1</sup> Healthy children face multiple challenges, such as witnessing the emotional and physical pain of the child with cancer,<sup>2</sup> his or her physical changes due to the therapy, parental distress, loss of parental attention, changes in family life and routines, and separation from the child with cancer and parents during hospitalization of the child with cancer.<sup>3,4</sup> Family activities are reduced as a consequence of the treatment protocol.<sup>5</sup> Conversations in the family are dominated by illness and treatment.<sup>5</sup> For all these reasons, healthy children of families with a child suffering from cancer are considered as "forgotten children."<sup>6</sup>

There is strong evidence that healthy children are prone to psychosocial problems.<sup>3,4,7</sup> As a result, they experience significantly more emotional distress and behavioral problems<sup>8</sup> such as fear, grief, anger, helplessness, and impaired quality of life,<sup>1,3,4,7</sup> but typically not at clinical levels.<sup>7,8</sup> Due to the diverse burdens on healthy children, national German guidelines<sup>9</sup> and international recommendations<sup>10,11</sup> recommend to specifically address the emotional distress of the siblings. They therefore propose that the psychosocial care of children with cancer should include the healthy children of the families. Therefore, healthy children should be given age-appropriate information about the disease and cancer-specific treatment of their brother or sister with cancer.<sup>9,11</sup> It is recommended that all healthy children should be supported in developing effective coping strategies with their brother's or sister's cancer disease.

A review on psychological interventions with healthy children of families with children diagnosed with cancer concludes that psychosocial problems can be effectively reduced and medical knowledge about cancer improved.<sup>12</sup> Inconsistent results were found regarding fear, behavioral problems, social adaptation, self-esteem, and post-traumatic stress symptoms. Houzager and colleagues (2001) evaluated a group intervention for healthy siblings which was designed to reduce anxiety. This program was effective, as healthy children showed less anxiety after participation.<sup>13</sup> Sidhu et al (2006) evaluated a peer support camp for healthy children of families with children diagnosed with cancer. It was designed to improve social competence and knowledge about the impact of cancer as well as its treatment and, by extension, to reduce levels of distress. Participants showed improved mental health outcomes. This is in line with other studies regarding group interventions which included psychoeducation for healthy children and parents of children with a chronic disease.<sup>14-18</sup> In Germany, specialized clinics set up a family-oriented rehabilitation (FOR) program that offers medical and multimodal psychosocial interventions to patients and their families, including healthy children. This innovative approach takes into account the importance of all family members for therapeutic success and has been positively evaluated in several studies.<sup>19-21</sup> In contrast to usual rehabilitation programs that focus solely on the chronically ill children, the FOR-program includes parents and healthy children, who are classified as secondary patients in the rehabilitation program, based on the assumption that family functioning is a precondition for achieving the child's with cancer rehabilitation.<sup>19-21</sup> For details of the usual FOR-program, see online supplemental materials S1.

Previous intervention studies are limited due to heterogeneous, small samples and the lack of control groups.<sup>18,20,22</sup> However, a non-controlled mono-centric study including families with a child diagnosed with either cancer, cystic fibrosis, or congenital heart disease showed a significant decrease in the healthy children's behavioral and emotional symptoms after the FOR-program.<sup>20</sup> Enhancement in the current study is defined as increasing the power of the usual FOR-program by including an additional psychoeducational session. Based on the

assumption that appropriate information about the disease enables the healthy children to effectively cope with their siblings' cancer disease, psychosocial care should seek to encourage open communication about the disease and treatment.<sup>23</sup> We expected that an enhanced intervention would lead to an additional benefit for the healthy children. The aim of the current study was therefore to improve the effectiveness of the FOR-program with a special focus on healthy children, with additional psychoeducational intervention sessions given the evidence that healthy children benefit from appropriate medical information about cancer<sup>14-18</sup> and from teaching effective coping strategies. We investigated the following hypotheses:

- Participants in the additional psycho-education program show significantly greater improvement in their knowledge about cancer and more remission of their emotional symptoms (primary outcomes) compared with a control group who received FOR as usual.
- The healthy children's satisfaction with their family and their quality of life would be significantly more improved in the intervention group with additional psycho-educational sessions compared with the control group receiving FOR as usual.
- The expected improvements would be maintained 2 months after discharge from the rehabilitation clinic.

# 2 | METHODS

#### 2.1 | Study design

This study was conducted between 2010 and 2013. A randomizedcontrolled trial appeared neither feasible nor acceptable within the context of an established FOR-program, as this would have led to 2 different standards of care in 1 institution at the same time. Hence, at first, we evaluated the usual 4-week rehabilitation program in 4 German FOR clinics with regard to the outcomes of healthy siblings. Then, we implemented the additional psycho-educational intervention at 2 clinics which were interested in this intervention and had sufficient resources. Additional sessions were documented in the patient charts. Finally, we compared the outcomes of the FOR plus psychoeducational program with the results of usual FOR without psychoeducational sessions for healthy children. All outcomes were assessed on discharge from the rehabilitation program and in a 2month follow-up assessment. The study protocol was approved by the Institutional Review Board at the Ulm University in Germany. The study was listed in the German Clinical Trial Registry (DRKS00000654, Trial Number U1111-1119-0938).

### 2.2 | Participants

Participants were recruited consecutively between December 2010 and June 2013. Inclusion criteria were (1) being a healthy sibling of a child or adolescent with any oncological disease participating in the FOR program, (2) age between 4 and 17 years as the intervention was designed for this age group, (3) being fluent in German to be able

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to understand the intervention content, and (4) the brother/sister with cancer had to have completed her/his acute cancer treatment, and maintenance treatment was allowed. All eligible healthy children were included from families with multiple healthy children who met the inclusion criteria. Parents were informed about the study at admission to the FOR program by the clinicians responsible for the treatment. Parents provided their written informed consent in-person, and the healthy children themselves declared their informed assent to participate in the study, before they started the baseline assessment.

## 2.3 | Control group

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The usual inpatient FOR-program has a standard duration of 4 weeks. The interventions for healthy children are tailored to their individual needs and help them to perceive and express their own desires and feelings. Depending on the presented symptoms, the healthy children receive psychological and physical care, such as art therapy, occupational therapy, relaxation training, and sports lessons. In addition, parents receive psychological counselling aiming to strengthen attention for the healthy child by means of shared positive activities.<sup>20</sup> Detailed explanations of the FOR program are given in the online supplement (table S2).

# 2.4 | Intervention group

The participants in the intervention group underwent a structured psychoeducational program for healthy children in addition to the usual FOR-program as described earlier for the control group.<sup>20</sup> This add-on intervention comprised one 60-minute group session together with parents and 4 group sessions of between 30 and 60 minutes only with the healthy children. Group sizes ranged from 4 to 14 healthy children. All psycho-educational sessions were performed during the standard FOR-program period of 4 weeks. Medical information and psychosocial sessions were adapted to the developmental stage of the healthy children. Medical education was provided by physicians, whereas psychosocial content was provided by allied psychosocial health professionals. The main objectives of the psychosocial sessions were to increase adaptive coping with the ill child's cancer disease, to reduce maladaptive emotional symptoms in response to the ill child's cancer, and to enhance the families' resources for the healthy child. A detailed explanation of the additional psychoeducational intervention program is given in the online supplement (table S3). A detailed protocol of the manualized program is available free of charge from the authors.<sup>24</sup>

## 2.5 | Instruments

Socio-demographic data of the participants and medical information of the child with cancer were collected at baseline. The following questionnaires were used repeatedly at baseline, at discharge from the rehabilitation program, and 2 months after discharge. Detailed description of the used instruments can be found in the online supplement (S4) and are briefly named in the following.

### 2.5.1 | Primary outcomes

#### 2.5.2 | Knowledge about cancer

Knowledge of the healthy child about cancer was assessed either in an interview (healthy children <7 years) or with a self-report questionnaire (>7 years). The interviews were conducted by trained allied health professionals. All instruments for knowledge assessments can be seen in the online supplement (S5–S11).

### 2.5.3 | Emotional symptoms

The Siblings Perception Questionnaire (SPQ) assesses the healthy children's psychosocial adaptation on the 3 subscales interpersonal factor, intrapersonal factor, and communication.<sup>25</sup> The SPQ intrapersonal factor was chosen to evaluate emotional symptoms.

#### 2.5.4 | Secondary outcomes

#### 2.5.5 | Satisfaction with family

The Family-APGAR is a questionnaire to assess a child's satisfaction with the family.  $^{\rm 26}$ 

# 2.5.6 | Quality of life

The LQ-Kid is a questionnaire on health-related quality of life, applicable to children and adolescents between 0 and 16 years.<sup>27</sup>

#### 2.6 Statistical analyses

#### 2.6.1 | Sample size determination

The necessary sample size was calculated based on previous studies of psycho-educational group interventions for healthy children of families who have a child diagnosed with cancer.<sup>12,14,16</sup> We expected at least controlled effect sizes of 0.3 in the primary outcomes, based on a review article regarding psycho-educational intervention studies with healthy children of families with a child diagnosed with cancer.<sup>12</sup> These studies have also used the SPQ as outcome variable. For repeated measures analysis of variance (ANOVA), a sample size of 90 participants is sufficient to detect a controlled effect of  $d \ge 0.3$  on a significance level of 5% (2-tailed) with a statistical power of 80%.

#### 2.6.2 | Statistical analyses

Statistical analyses were performed with the software program IBM Statistical Package for the Social Sciences for Windows Version 21.0. Except for the knowledge questionnaire and interview, single missing values in questionnaire raw item scores were replaced by the respondent's mean value of the respective scale, if the proportion of missing data was less than 25%, otherwise the entire questionnaire was excluded from analysis. Missing data of the knowledge questionnaire and interview were scored as a wrong answer. Primary outcome analyses were based on the assessments on discharge from the rehabilitation program. Intention to treat (ITT) analyses were performed using the imputation method last-observation-carried-forward procedure. This procedure conservatively assumes that the outcome remains constant at the last observed value before dropout.<sup>28,29</sup>

Our primary hypothesis for the respective outcomes was tested by repeated measures ANOVA, with measurement time point as the independent variable and group (intervention vs control) as the between-group independent variable. The interaction term of time and group indicated whether the treatment was superior to the control group. All statistical analyses were conducted for 2 time points (pre, post) and 3 time points (pre, post, 2-month follow-up). To reduce the risk of type I errors due to multiple tests, the significance level for the primary outcome analyses was corrected using a *Bonferroni*-corrected  $\alpha$ -level of 0.017 (2-sided). The analyses regarding secondary outcomes were conducted in an exploratory manner applying a significance level of p < .05 (2-sided).

We defined a subgroup of healthy children (sub-performers) who scored low on the outcome variables knowledge about cancer, Family APGAR, and LQ-Kid (< 25 percentile) as well as high on the outcome variable SPQ (>75 percentile) at baseline. To analyze the results of this subgroup, Student's t-tests for paired samples were computed separately for the intervention and control group to examine the pre-post differences. A significance level of p < .05 was applied (2-sided).

Additionally, effect sizes (Cohen's *d*) were calculated for within-group pre-post comparisons using the following formula:  $d = M_1 - M_2/SD_{\text{pooled}}$ . Controlled effect sizes were computed as follows:  $d = M_1 - M_2/(((n1 - 1)^*s1^2 + (n2 - 1)^*s2^2)/(n1 + n2 - 2))^{0.5} \cdot 3^{0.31}$ 

# 3 | RESULTS

The progress of the participants through the study is shown in the CONSORT flow chart (Figure 1, online supplement S12). Out of N = 199 healthy children who were informed about the study, N = 184 fulfilled the inclusion criteria and were therefore included in the study.

#### 3.1 | Sample description

On average, participants in both groups were 9.20 (*SD* = 3.21) years old. With the exception of mothers' and fathers' employment, there were no significant differences between the groups in terms of socio-demographics or outcome variables at baseline (see Table 1). However, in the intervention group, participants showed significantly more diseasespecific knowledge at baseline compared with the control group. Details of the healthy children's socio-demographic characteristics and descriptive information regarding the child with cancer are presented in Table 1. Descriptive information regarding the child with cancer is given in the online supplement (Table S13).

#### 3.2 | Primary outcomes

#### 3.2.1 | Knowledge about cancer

The repeated-measure ANOVA of the knowledge total score, calculated on the ITT sample (n = 176), demonstrated a significant main



#### **TABLE 1**Description of the study sample

	Control Group	Intervention Group	р
N	111 (60.3%)	73 (39.7%)	
Age (years)			
mean	8.85	9.55	.71
SD	3.27	3.14	
Span	4-17	4-18	
Age groups (n, %)			
4-6	31 (27.9%)	14 (19.2%)	.20
7-10	47 (42.3%)	32 (28.8%)	
11-14	24 (21.6%)	24 (32.9%)	
15 and above	9 (8.1%)	3 (2.7%)	
Gender			
female	53 (47.7%)	35 (47.9%)	.91
male	58 (52.3%)	37 (50.7%)	
not reported	0 (0.0%)	1 (1.4%)	
Participating caregivers			
mother	56 (50.5%)	36 (49.3%)	.37
father	10 (9.0%)	3 (4.1%)	
mother and father together	40 (36.0%)	31 (42.5%)	
not reported	5 (4.5%)	3 (4.1%)	
Mothers' education:			
<10 years school	23 (20.7%)	12 (16.4%)	.001
>10 years school	87 (78.4%)	58 (79.5%)	
not reported	1 (0.9%)	3 (4.1%)	
Fathers' education:			
<10 years school	37 (33.3%)	24 (32.9%)	.04
>10 years school	68 (61.3%)	45 (61.6%)	
not reported	6 (5.4%)	4 (5.5%)	
Mothers' employment:			
full-time	15 (13.5%)	6 (8.2%)	.22
part-time	35 (31.5%)	35 (47.9%)	
not employed	58 (52.3%)	29 (39.7%)	
not reported	3 (2.7%)	3 (4.1%)	
Fathers' employment:			
full-time	95 (85.6%)	62 (84.9%)	.22
part-time	5 (4.5%)	2 (2.7%)	
not employed	5 (4.5%)	5 (6.8%)	
not reported	6 (5.4%)	4 (5.5%)	

effect of time (*F* = 11.03; *p* < 0.001) with a significant increase in disease-specific knowledge from pretreatment to posttreatment (Table 2). There was no significant interaction between group and time ( $F_{(1,174)} = 0.57$ ; *p* = 0.45). Pre-post effect sizes indicated by Cohen's *d* were small in the experimental group and negligible in the usual FOR group.

# 3.2.2 | Emotional symptoms

Results of the SPQ intrapersonal factor, calculated on the ITT sample ( $n_{parents}$  = 181 and  $n_{healthy\ children}$  = 137), again showed a significant main effect of time. A significant decrease in emotional symptoms from pretreatment to posttreatment was found for both self-reports (F = 31.68; p < 0.001) and parent-proxy reports (F = 37.07;

p < 0.001). Again, there were no significant interaction effects either in the self-reports ( $F_{(1,135)} = 1.32$ ; p = 0.25) or in the parent reports ( $F_{(1,179)} = 0.47$ ; p = 0.49; see Table 2). In both groups, pre-post effect sizes indicated by Cohen's d were small.

## 3.3 | Secondary outcomes

#### 3.3.1 | Family satisfaction

The repeated-measure ANOVA of Family APGAR, calculated on the ITT sample ( $n_{parents} = 183$  and  $n_{healthy\ children} = 135$ ), revealed a significant main effect of time for self-reported family satisfaction (F = 7.06; p < 0.01) and as evaluated by the parents (F = 12.99; p < 0.001). No significant interactions between group and time emerged.

TABLE 2 Means, standard deviations, and results of repeated measures analyses (ANOVA) of primary and secondary outcomes, as well as effect sizes

				T1 T2		ANOVA F(p)		Cohens d (Pre-Post)				
Outcome	Group	N	Range	Mean	SD	Mean	SD	Main Effect Time F (p)	Interaction Effect Time × Group F (p)			
Primary outcomes												
Knowled	ge											
	CG	108	10.0-92.0	60.32	19.54	62.81	18.91	11.03 (<0.001)	0.57 (0.45)	0.13		
	IG	71	34.0-94.0	68.41	15.10	72.37	14.10			0.27		
Emotiona	al symptom	าร										
SPQ intrapersonal factor-caregiver report												
	CG	108	4.0-25.0	13.51	4.75	12.17	4.89	37.07 (<0.001)	0.47 (0.49)	0.28		
	IG	73	5.0-23.0	13.66	3.94	11.97	4.49			0.32		
SPQ intrapersonal factor—self report												
	CG	79	4.0-26.0	16.67	5.13	14.48	5.79	31.68 (<0.001)	1.32 (0.25)	0.40		
	IG	58	5.0-25.0	16.72	4.52	15.28	5.44			0.29		
Secondary	outcomes											
Family sa	tisfaction											
Fam	ily Apgar	(Parent	s' perception	of childre	n's satisfa	ction with	n the own	family)				
	CG	110	0.0-20.0	14.79	2.97	15.45	2.54	12.99 (<0.001)	0.02 (0.90)	0.24		
	IG	73	1.0-20.0	14.49	3.73	15.21	2.76			0.22		
Fam	ily Apgar	(childre	en's satisfactio	n with the	e own fan	nily)						
	CG	78	0.0-20.0	14.41	4.83	14.72	4.25	7.06 (0.009)	1.98 (0.16)	0.07		
	IG	57	0.0-20.0	13.32	5.44	14.32	4.95			0.19		
Health-re	elated qual	ity of lif	e									
LQ-	LQ-Kid (Total score—parents' perspective)											
	CG	77	54.0-99.0	77.40	11.69	83.19	11.12	24.28 (<0.001)	1.90 (0.17)	0.51		
	IG	45	46.0-99.0	80.69	11.75	83.95	9.81			0.30		
LQ-Kid (Total score—self perspective)												
	CG	78	20.0-99.0	72.95	16.65	75.82	16.61	11.80 (0.001)	0.75 (0.39)	0.17		
	IG	55	41.0-99.0	74.57	14.55	79.39	12.45			0.36		

Abbreviations: CG, Control Group; IG, Intervention group; SD, standard deviation; T1, baseline assessment; T2, follow-up 1 on discharge from the rehabilitation program.

#### 3.3.2 | Quality of life

The parent proxy report for the healthy child's quality of life, calculated on the ITT sample ( $n_{parents} = 122$ ), also demonstrated a significant main effect of time for the QoL total score (F = 24.28; p < 0.001), as did the self-reported quality of life ( $n_{healthy children} = 133$ ;  $F_1 = 11.80$ ; p < 0.001). Again, there were no significant interactions between group and time.

For details of the results, see Table 2 and the line graphs in the online supplement (S14).

#### 3.4 | Two-month follow-up

Repeated measure ANOVA demonstrated no significant interactions between time and group. Results presented in the online supplement (S15 and table S16).

# 3.5 | Subgroup analysis of sub performer

Subgroup analysis revealed higher effect sizes for the intervention group regarding the outcome variables knowledge (CG: d = 0.68, IG: d = 1.13), emotional symptoms parent proxy report (CG: d = 0.66, IG: d = 0.92),

family satisfaction both self-report (CG: d = 0.56, IG: d = 0.70) and parent proxy report (CG: d = 0.57, IG: d = 0.92), and quality of life self-report (CG: d = 0.71, IG: d = 1.40) (see online supplement table S17).

# 3.6 | Harms

There are no harms which could be attributed to the study (see online supplement \$18).

# 4 | DISCUSSION

The aim of this study was to evaluate the effectiveness of an additional psycho-educational intervention program with healthy children of families who have a child with any oncological disease, added to an already established inpatient family-oriented rehabilitation program.

There were no significant incremental effects of the additional psychoeducational intervention program. Both groups showed improved knowledge about cancer, less emotional symptoms, and higher family satisfaction as well as QoL at discharge from the FOR-

program compared with the baseline assessment. This might be explained by the fact that the control group already received an active family-oriented intervention.<sup>20,21</sup> Furthermore, only a small group of siblings showed higher symptoms of emotional distress. The improvements in the control group replicate findings of our previous study with mixed diagnoses of the index patients.<sup>20</sup>

Regarding those healthy children with poorer functioning and mental health state at admission to the program, our subgroup analysis indicates an additional effect of the psycho-educational sessions in the expected direction. The potential benefit for this subgroup of siblings should be further investigated with larger sample sizes.

The higher commitment to participate in the follow-up assessments in the experimental group might be due to a stronger relationship between the families and the clinic staff who was responsible for both the intervention and the data collection.

#### 4.1 | Limitations

Several methodological factors may have prevented us from demonstrating effects of the additional intervention. First, participants showed an, on average, relatively low emotional burden already at baseline, leaving only limited room for improvement during the intervention. On inclusion in our study, about 1 to 2 years after the initial diagnosis of cancer in their ill child and after remission of the disease, it seems that the healthy children have learned to cope with the disease-related stressors. Similar findings were shown in previous studies.<sup>3,32,33</sup> It is likely that the parents' focus has returned to usual family life and routines, and healthy children may receive more attention from their parents than during the acute treatment phase. There were also ceiling effects in our instruments at baseline, in particular regarding the disease-related knowledge of the participants, which prevented our study from detecting improvements. In addition, for the interpretation of our results should be noted that the intervention group showed higher baseline knowledge than the control group. A control for differences in the baseline knowledge scores was not possible. Second, randomization was not possible. Third, on recruitment for the study, healthy children already had considerable knowledge about the cancer disease of the ill child. Our evaluation was almost exclusively based on guestionnaires, and no formal clinical assessments of the healthy child's mental health state were performed. Fourth, we were not able to systematically monitor the fidelity of the experimental intervention. Fifth, due to insufficient resources within the cooperating clinics, the add-on intervention could only be implemented in 2 clinics. Hence, a selection bias cannot be ruled out. Additionally, due to the use of a data imputation method, the participant's measurement didn't change from the moment of dropout onwards. The amount of information in the data was artificially increased.<sup>34</sup> Therefore, the likelihood of our study to detect small effects was limited. Moderators and mediators of intervention effects should be investigated in future studies. Furthermore, the limited statistical power of our study prevented us from detecting small effects of the additional psycho-educational intervention compared with FOR program as usual. Finally, we included all healthy children from the participating families, which implicated a risk of dependency between multiple participating children from the same family.

Consequently, the variability within our outcome variables may be reduced.

## 4.2 | Clinical Implications

This study showed that the healthy children's knowledge of cancer, mental health, and health-related quality of life significantly improved during inpatient family-oriented rehabilitation. Improvements in both groups were maintained for at least 2 months after discharge from the program. This might not reflect specific effects of the intervention, but might be solely due to improvement with time, or due to factors such as, e.g., learning from other people during their time spent in the FOR clinic or the ability of parents to pay more attention to their children in the FOR clinic compared with their duties when managing daily life at home.

The additional psycho-educational intervention showed no substantial incremental improvement. Future studies should therefore investigate the effectiveness of the psycho-educational intervention in outpatient settings and during the acute phase of cancer treatment. In comparison to the actual treatment, each healthy child could profit from a standardized treatment model within they could experience more attention to their own individual needs (e.g., more knowledge about cancer, dealing with their emotions). Regarding our study, inclusion of covariates such as gender in the analyses should be considered.

After termination of the study, the additional psychoeducational intervention was only partly implemented in the FOR program due to limited resources. Due to the lack of evidence for a general positive benefit of the additional program, and considering a better balance between costs and effectiveness, it might be useful to provide additional psychoeducational sessions to those healthy children with signs of psychological distress only.

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#### FINANCIAL DISCLOSURE STATEMENT

The authors declare that they have no competing financial interests in relation to this article.

#### CONFLICT OF INTEREST STATEMENT

None declared.

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#### SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

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