PSYCHO-ONCOLOGY
Psycho-Oncology (in press)
Published online in Wiley InterScience (www.interscience.wiley.com). **DOI**: 10.1002/pon.922

PSYCHOSOCIAL IMPACTS OF A CAMPING EXPERIENCE FOR CHILDREN WITH CANCER AND THEIR SIBLINGS

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SUMMARY

Background: We conducted a prospective two-group evaluation of pediatric cancer patients and their siblings regarding experiences and affective changes resulting from a 1-week summer camp experience.

Methods: The patients and siblings were assessed prior to camp (Baseline), at the end of camp (Follow-up 1), and again 4–6 months later (Follow-up 2). Assessments included standardized tests for depressive affects, social competency, and a measure of pleasure and participation in camp activities.

Results: Sixty-six children were assessed, including 31 (47%) patients and 35 (53%) siblings. Ages ranged from 7 to 17 years. Of the patient campers 19 (61%) had leukemia or lymphoma and 12 (39%) had solid tumors. Results showed marked changes in affective symptoms for patient campers over time (improvements), not shown by sibling campers. For patient campers these affective changes were not present immediately after camp, but were quite significant when measured 4–6 months later. Both patient and sibling campers reflected the same positive memories and pleasure in camp activities over time. For neither group did memories or pleasure fade over time. The camping experience did not have differential impacts on first time versus returning campers. Twelve campers (18% of sample) indicated suicidal ideation on the measure of depressive affects. They did well at camp and presented no special management issues.

Conclusion: Expectations appear substantially different for patient versus sibling campers. The camping experience appeared to impact these groups differently, with patient campers impacted in ways not experienced by sibling campers.

KEY WORDS: summer camp; siblings; anhedonia; suicidal; ideation

INTRODUCTION

Children with needs for close medical supervision are often excluded from traditional youth camping programs. As a result specialty camps have been developed to serve particular groups of children. One study of psychosocial changes associated with a camp experience for children with diabetes, asthma, or spina bifida showed changes toward better attitudes toward their illness and lower levels of trait anxiety at the end of camp. These changes were evident across diagnostic groups and gender (Briery and Rabian, 1999). Another discusses the difficulty in evaluating the use of camp as an educational and therapeutic tool to improve the quality of life of children with Type 1 diabetes (Mancuso and Caruso-Nicoletti, 2003).

Early reports of specialized summer camps as a rehabilitation tool for children with cancer have been descriptive (Hvizdala *et al*., 1978; Greenwood and Dax, 1982; Silberman *et al*., 1985; Fochtman, 1988). Attempts to measure the effects of camp have often been hampered by small sample size (Benson, 1987; Smith *et al*., 1987). Other reports include self-concept in children with cancer (Eng and Davies, 1991), peer relationships (Bluebond-Langner *et al*., 1991) and changes in children's

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Received 17 February 2004
Accepted 18 January 2005

knowledge of cancer and its treatment (Bluebond-Langer *et al.*, 1990).

Siblings of children with cancer have been noted to be socially isolated and be prone to adjustment difficulties (Murry, 2000, 2001). Anxiety and loneliness have also been noted in this population (Hamma *et al.*, 2000). The need for intervention to decrease anxiety and isolation is well documented (Bendor, 1990; Zeltzer, 1996). One study discusses evaluation of a camp program for siblings of children with cancer (Sahler and Carpenter, 1989).

Camp Ronald McDonald for Good Times provides a medically supervised camping experience for children and adolescents with cancer and their siblings. The campers come from a wide geographic area and many treatment centers to attend camp as part of a psychosocial rehabilitation process.

The current study was designed to assess how the camp experience impacts mood, social interactions, and relationships with children and adults in pediatric cancer patients and their siblings. Further, this study seeks to determine what activities these children participated in and their reaction to a variety of camp activities. This study is designed to assess the effects of camp experience over time and to assess the immediate and longer-term psychosocial impacts.

We focused on the following key questions:

(1) Are there changes in affective symptoms over time?
(2) If changes in affective symptoms are present, would they be more pronounced in patients versus siblings?
(3) Do campers retain (remember) activities and a sense of pleasure in activities over time?
(4) Does the camping experience have different impact(s) on first time campers versus returning campers?
(5) Does the camping experience have different impacts on campers who report suicidal ideation versus those who do not?

METHODS

Subjects

Children from age 7 to 19 who were attending Camp Ronald McDonald for Good Times for 1 week summer sessions were invited to participate. These children were either patients with cancer diagnoses, or their siblings. Sixty-six (66) children in total completed this study. Of these 31 (47%) were patients and 35 (53%) were siblings. Of the 66 total children, 29 (43.9%) were males, and 37 (56.1%) were females. Ethnic breakdown included: Caucasian (61%), Hispanic (23%), Asian (3%), Afro American (7%), and did not state or other (6%). Ages ranged from 7 to 17 years. Ages 7–10 were 38.7%, ages 11–13 were 38.7%, ages 13–17 were 22.6% of the sample.

Regarding the diagnoses of the 31 patients, 19 (61%) had leukemia or lymphoma, the other 12 (39%) had a variety of solid tumors such as brain tumors, sarcomas, and Wilms tumor. Time since diagnosis for the patient campers ranged from 9 to 166 months, with a mean of 81 months (6 years, 9 months).

History at camp was assessed. Overall 52 (78.8%) had previously attended camp, while 14 (21.2%) were new to camp. Among the patient group, 25 (80.6%) were returning to camp and six (19.4%) were new to camp. Among the sibling group, 27 (77.1%) were returning to camp, and eight (22.9%) were new to camp.

Referral sources for patients (and siblings) included approximately nine pediatric cancer treatment centers located in Southern California and Nevada. These included academic and community hospital treatment centers. Data from six 1-week camp sessions are presented in this study. All had identical programming. One session was siblings only, one session was patients only, and four sessions were mixed.

Procedures

Institutional Review Board (IRB) approval was obtained from the coordinating research site at UCLA and from the Board of Trustees of Camp Ronald McDonald. Consent and test forms were prepared in both English and Spanish.

Table 1 shows the sequence of when each measure was administered.

Children signing up to attend camp were informed of the possibility of participating in this study by flyers available at the registration desk. Informed consent from a parent and assent from each participation was obtained. The children were then given a private room to fill out the tests with an adult available if they had questions. Of the 77 children who consented at this time, two (2.5%)

Table 1. Sequence of testing

Baseline	Follow-up 1	Follow-up 2
Pre-camp	Immediate post-camp	4–6 months later
CDI	CDI	CDI
CBCL	CBCL	CBCL
	Activities like/dislike	Activities like/dislike

did not complete the testing and withdrew from the study.

Follow-up 1 testing was performed on the last day of each 1-week camping session on-site at the camp. Five children out of 77 (6%) failed to complete the Follow-up 1 testing. Testing was done in a quiet area of the dining hall and was monitored by the camp director.

For Follow-up 2, approximately 4–6 months following the end of each child's camp session, each subject and parent were contacted by phone and given the choice of having the testing done verbally over the phone or having the materials mailed. Of the 70 children left in the study at this point, four (6%) declined to complete the final measures. This left a grand total of 66 children in the final study matrix. Of these 66 children, five chose telephone testing interviews (7.5%), and the other 61 (92.5%) chose to mail in the testing forms. Some reminder calls were made if materials were not received. All measures were completed by the children themselves, none by parental proxy.

Measures

Three measures were utilized in the testing battery. These included:

Children's Depression Inventory. This is a 27-item screen for symptoms of depression, where the child is asked to self-rate areas of depression symptoms on a three-point scale for each item. The child has the option to rate the degree to which each statement describes him or her for the past 2 weeks. The test was standardized on 1266 Florida public school children, ages 7–16. It was then further standardized on groups of children ($N = 134$) in clinical settings. Achenbach's alpha for the 27-item test was found to equal 0.86, indicating good internal consistency/reliability. Five factors were found within these 27 items. They include: (1) Negative Mood, (2) Interpersonal Problems, (3) Ineffectiveness, (4) Anhedonia, and (5) Negative Self-Esteem. In addition, a total CDI score is calculated. Test–retest reliabilities have been calculated in numerous studies of the CDI, and range from $r = 0.38$ to 0.87; the bulk of the studies show r's $= 0.65$ and better (Kovacs, 1992).

Youth Self-Report (YSR). This is a self-report scale used to assess self-reported feelings and behavior in a standardized fashion. For purposes of this study, we chose to use the 20 social competency behavioral items. We utilized this as a self-rating by each child over time. The ratings were scored 1–3 on each item, with 1 being lowest social competence and 3 being highest. We also added one item relating to fear about going to camp. Thus, the scoring in these items ranged from 21 to 63. Over a 7 month period, the mean stability R of the YSR was 0.50 for competence scales and 0.49 for problem scales in a general population sample of 11–14 years old. Stability R's were 0.62 for total competence and 0.56 for total problems. In a clinical sample 12–17 year olds, the 6 month stability was $r = 0.69$ for the total problem score (Achenbach, 1991).

Things you did at camp. The investigators created an instrument to assess activities available to campers. The development of this scale emerged from a focus group of camp staff and volunteers where a comprehensive list was generated of the most common camp activities. This generated a list of 21 possible camp activities. The instrument was designed to assess two things:

(1) Did the camper participate in the activity (yes/no) X.
(2) If so, how much did they like it. This was assessed in two ways. For children aged 7–12, ratings of liking the activities were obtained by the child circling a cartoon of a sad, neutral, or happy face (a common procedure in pediatric ratings). The older children rated their likes or dislikes on this scale by checking a rating ('I liked it a lot,' 'It was ok,' 'I didn't like it').

In these ways a total number of activities participated in was calculated, and an average rating of pleasure obtained from those activities was calculated.

Statistical analysis

Statistical analyses aimed to identify important changes between baseline and follow-up measures for patients and siblings. The key response variables, dependent variables, in this study consisted of the Child Depression Inventory (CDI), including both the total score and its five component subscales, along with measures of social adjustment, participation in camp activities, and enjoyment of camp activities. Paired *t*-tests were used to evaluate the significance of changes between baseline and two post-baseline time points, with analyses conducted separately for patients and siblings in addition to overall analyses combing the study participants. Multiple testing considerations were evaluated using the false-discovery-rate measure of Benjamini and Hochberg (1995). Comparisons between patients and siblings were conducted using independent-samples *t*-tests allowing group variances to differ. Using CDI total scores as outcomes, repeated-measures analysis of variance was used to identify main effects and interactions (especially over time) involving patient-versus-sibling status, whether the participant was new to camp, and whether the camper exhibited suicidal ideation. Using changes in CDI total scores as outcomes, supplementary regression analyses were performed to facilitate interpretation and also to assess whether differences emerged over time controlling for indicators of gender or ethnicity (classified as Caucasian, Hispanic, or other). Statistical significance was deemed to correspond to *p*-values less than 0.05, with *p* values between 0.05 and 0.10 interpreted as weak evidence or borderline significance of a given effect. Finally, we explored sensitivity of conclusions to possibly correlated outcomes within families using linear mixed-model analysis.

Results

Table 2 shows descriptive summaries of the samples of patients and siblings. The average age was 11.8 (S.D. = 2.8) among patients (range: 7–17) and 12.0 (S.D. = 3.0) among siblings (range: 7–18). Gender, prior camping experience, ethnicity, and suicidal ideation were similarly distributed in the patient and sibling groups.

Table 3(a) shows mean outcome scores, standard deviations, and findings from paired *t*-tests among the $n = 31$ patients in the study, with sample sizes for different outcomes varying due to some measures not being completed. Table 3(b) shows the corresponding results among the $n = 35$ siblings in the study.

Table 2. Characteristics of sample

Variable	Patients ($n = 31$)	Siblings ($n = 35$)	Total ($n = 66$)
Female	17 (55%)	20 (57%)	37 (56%)
Ethnicity			
Caucasian	21 (68%)	25 (71%)	26 (70%)
Hispanic	7 (23%)	8 (23%)	15 (23%)
Other	3 (10%)	2 (6%)	5 (8%)
New Camper	6 (19%)	8 (23%)	14 (21%)
Suicidal Ideation	6 (19%)	6 (17%)	12 (18%)
Age mean (S.D.)	11.6 (2.8)	12.2 (3.0)	11.9 (2.9)

Percentages may not sum to 100% due to rounding.

The only significant difference seen in these results is for the CDI total score between Baseline and Follow-up 2 ($p = 0.003$). It should be noted that there was no significant difference for CDI time 1 versus CDI time 2 ($p = 0.643$, ns). The mean score on the CDI at Baseline for the patients was 4.83, and the mean score at Follow-up 2 was 3.03, thus indicating a significant decrease in the overall depression score for patients. No such significant finding was seen in the siblings. There was a borderline significant finding for siblings on the CBCL between Baseline (mean = 55.21) and Follow-up 1 (mean = 56.61), $p = 0.068$, suggesting a trend for social competency to increase and improve. However, the effect did not remain as of Follow-up 2.

Table 4(a) and 4(b) evaluate CDI results further by evaluating CDI subscale scores (Negative Mood, Interpersonal, Ineffectiveness, Anhedonia, Negative Self-Esteem) over time on patients and siblings, respectively. The patient results show borderline significant improvement on the Negative Mood ($p = 0.051$) and Interpersonal ($p = 0.0$ 54) subscales between Baseline and Follow-up 1, and statistically significant improvement on the Negative Mood ($p = 0.018$) and Anhedonia ($p =$ 0.011) subscales between Baseline and Follow-up 2. No significant differences are seen on CDI subscales among the siblings.

Table 3. Patient (a) and sibling (b) outcomes across time and results from paired *t*-tests

Measure	Baseline Mean (S.D.) *n*	Follow-up 1 Mean ($n = 35$) *n*	Follow-up 2 Mean ($n = 66$) *n*	Paired-*t* *p*-value Follow-up 1 versus Baseline	Paired-*t* *p*-value Follow-up 2 versus Baseline
(*a*) *Patient*					
CDI total	42.62 (3.47) 29	42.00 (4.58) 27	40.19 (2.98) 31	0.643	0.003*
CBCL	54.79 (3.47) 28	54.63 (4.60) 27	55.00 (5.20) 31	0.371	0.966
Activities did	—	16.21 (2.96) 28	16.69[a] (3.40) 29	—	—
Activities liked	—	42.68 (7.28) 28	44.76[b] (9.88) 29	—	—
Activities did/liked	—	2.65 (0.26) 28	2.69[c] (0.19) 29		
(*b*) *Sibling*					
CDI total	43.43 (7.76) 35	42.47 (7.13) 27	43.06 (9.34) 33	0.197	0.646
CBCL	55.21 (4.86) 34	56.61 (4.92) 31	55.91 (4.50) 34	0.068	0.400
Activities did	—	16.12 (3.03) 34	15.88[d] (2.64) 34	—	—
Activities liked	—	42.97 (8.95) 34	41.12[e] (8.16) 34	—	—
Activities did/liked	—	2.65 (0.26) 28	2.59[f] (0.28) 34		

[a] Paired-*t* *p*-value comparing Follow-ups 1 and 2: 0.347.
[b] Paired-*t* *p*-value comparing Follow-ups 1 and 2: 0.381.
[c] Paired-*t* *p*-value comparing Follow-ups 1 and 2: 0.902.
[d] Paired-*t* *p*-value comparing Follow-ups 1 and 2: 0.658.
[e] Paired-*t* *p*-value comparing Follow-ups 1 and 2: 0.235.
[f] Paired-*t* *p*-value comparing Follow-ups 1 and 2: 0.072.
* Significant.

We evaluated paired *t*-test results from the multiple-testing perspective of Bejamini and Hochberg (1995), who introduced a measure known as the false discovery rate, or FDR, with the aim of the procedure being to ensure that a proportion no greater than the FDR of significant findings are false findings of significance. The procedure is sensitive to the number of tests considered; for example, if one considers the 14 paired *t*-test results for patients reflected in Tables 3(a) and 4(a), then the significant finding at the 0.003 level of a change in CDI from Baseline to Follow-up 2 remains significant at an FDR of 0.05. Using a more stringent standard across all 28 paired *t*-tests considering both patients and siblings, the 0.003 finding is no longer significant for an FDR of 0.05 but remains significant for an FDR of 0.10.

Findings from Table 3(a) can be compared with those from Table 3(b) to contrast patients and

Table 4. Patient (a) and sibling (b) CDI subscale scores and results from paired *t*-tests

Measure	Baseline Mean (S.D.) *n*	Follow-up 1 Mean S.D. *n*	Follow-up 2 Mean S.D. *n*	Paired-*t* *p*-value Follow-up 1 versus Baseline	Paired-*t* *p*-value Follow-up 2 versus Baseline
(*a*) *Patient*					
CDI total	42.62 (3.47) 29	42.00 (4.58) 27	40.19 (2.98) 31	0.643	0.003*
CDI-Negative Mood	46.83 (8.00) 29	43.59 (5.12) 27	43.06 (5.25) 31	0.051	0.018*
CDI-Interpersonal	46.24 (4.60) 29	45.07 (3.37) 27	44.90 (4.42) 31	0.054	0.150
CDI-Ineffectiveness	44.52 (5.62) 29	44.44 (6.22) 27	43.45 (5.77) 31	0.058	0.280
CDI-Anhedonia	44.45 (6.25) 29	43.81 (9.03) 27	41.87 (5.90) 31	1.000	0.011*
CDI-Negative Self-Esteem	41.10 (3.75) 29	41.93 (5.58) 27	40.90 (3.30) 31	0.614	0.620
(*b*) *Sibling*					
CDI total	43.43 (7.76) 35	42.47 (7.13) 34	43.06 (9.34) 33	0.197	0.646
CDI-Negative Mood	44.66 (7.00) 35	43.74 (6.95) 34	45.03 (8.21) 33	0.436	0.521
CDI-Interpersonal	46.34 (6.00) 35	46.06 (6.83) 34	46.85 (5.68) 33	0.900	0.623
CDI-Ineffectiveness	46.06 (9.24) 35	45.12 (7.72) 34	45.21 (8.97) 33	0.229	0.470
CDI-Anhedonia	44.63 (8.42) 35	45.12 (7.77) 34	43.55 (9.28) 33	0.658	0.247
CDI-Negative Self-Esteem	42.46 (5.36) 35	42.56 (5.77) 34	42.85 (8.83) 33	0.957	0.848

* Significant.

siblings, as can those from Table 4(a) and 4(b), using independent-samples *t*-tests. Across 27 such tests, only a borderline significant difference emerged between Activities Did/Liked, with means (S.D.'s) of 2.69 (0.19) for patients and 2.59 (0.28) for siblings ($p = 0.086$). When one accounts for the multiplicity of testing, these results suggest no meaningful differences between patient and sibling scores on these measures in the aggregate.

In a repeated-measures analysis of variance, time was treated as a within-subjects factor to represent changes across Baseline, Follow-up 1, and Follow-up 2, while patient-versus-sibling status, new-camper status, and suicidal ideation were treated as between-subjects factors. Main effects and interactions among all factors up to the highest order were estimated, and changes across the three time points were represented through

both linear and quadratic contrasts. Interest focused on interactions of between-subjects factors with time, as these results reflect how trajectories over time differ across subgroups of the sample. Significant results were seen for the patient $\times$ linear time interaction ($p = 0.022$) and the patient $\times$ suicidal ideation $\times$ linear time interaction ($p = 0.013$). The patterns in mean CDI total scores over time are summarized in Table 5. Among both patients and siblings without suicidal ideation, mean CDI scores show modest declines that continue beyond the camping experience. As expected, mean CDI scores are higher at baseline among both patients and siblings who reported suicidal ideation during the study compared to those who did not report suicidal ideation. Among those who report suicidal ideation, CDI scores show decreases on average over time in the patient group, while the CDI scores in the sibling group show modest decline during the camping experience but a substantial reversal at Follow-up 2 several months later. A review of the individual cases revealed two individuals responsible for this result: one individual whose CDI total scores went from 42 at Baseline and 41 at Follow-up 1 to 69 at Follow-up 2 (a gain of 27 points from Baseline), and a second individual whose CDI total scores went from 57 at Baseline and 55 at Follow-up 1 to 68 at Follow-up 2 (a gain of 11 points from Baseline). With only the other four siblings being considered, the means (S.D.'s) across the three time points are 54.25 (11.0) at Baseline, 52.25 (9.3) at Follow-up 1, and 51.0 (13.0) at Follow-up 2.

Multiple regression analyses using $n = 59$ subjects with complete covariate information, including both patients and siblings, were carried out to identify potential predictors of CDI change scores, with one model evaluating change from Baseline to Follow-up 1 and another evaluating change from Baseline to Follow-up 2. Predictors in these models were indicators for sibling versus patient, female versus male, Hispanic versus Caucasian, other non-Caucasian ethnicity versus Caucasian, new camper versus not, and suicidal ideation versus not. Neither model features a significant overall F-test nor any significant or borderline significant predictors. Given concerns about possible overfitting, we followed up these analyses with stepwise regressions using backward elimination, again producing no significant results. When we analyzed patients and siblings separately in stepwise analyses, we found borderline significant Caucasian ethnicity than in Caucasian siblings ($\beta = -6.34$, $p = 0.055$), borderline significant evidence of greater CDI declines from Baseline to Follow-up 2 in siblings with suicidal ideation than in siblings without ($\beta = 5.76$, $p = 0.058$), and statistically significant evidence of greater CDI declines in patients with suicidal ideation than in patients without ($\beta = -4.26$, $p = 0.0311$). The latter two findings are consistent with the findings from the repeated measures analysis but help quantify the magnitude of the respective effects on a set of subjects with complete data.

To assess the potential sensitivity of findings to possibly correlated outcomes among patients and

Table 5. Means (standard errors) of CDI total scores across time among patients and siblings according to presence or absence of suicidal ideation

Group	Suicidal ideation	Time	n	Mean	SE
Patients	No	Baseline	23	41.1	1.7
		Follow-up 1	22	40.2	1.7
		Follow-up 2	25	39.7	1.5
	Yes	Baseline	6	44.8	3.3
		Follow-up 1	5	43	3.4
		Follow-up 2	6	39.6	3.1
Siblings	No	Baseline	29	42.1	1.5
		Follow-up 1	28	41.8	1.5
		Follow-up 2	27	40.2	1.4
	Yes	Baseline	6	54.4	3.3
		Follow-up 1	6	52.5	3.3
		Follow-up 2	6	61.3	3.1

Standard error (SE) = S.D./$\sqrt{n}$.

siblings in the same families, we performed analyses using linear mixed models. One analysis used change in CDI total score between Baseline and Follow-up 1 as an outcome, and another used change in CDI total score between Baseline and Follow-up 2 as an outcome, with patient-versus-sibling status, suicidal ideation, and their interaction as fixed effects. Between Baseline and Follow-up 1, there was no significant fixed effect, and the intraclass correlation capturing the degree of association between patient and sibling outcomes was estimated to be a very modest −0.015. Between Baseline and Follow-up 2, there was a significant interaction ($p = 0.005$) reflecting the earlier described difference in trajectories for patients and siblings with suicidal ideation; the intraclass correlation was estimated to be 0.059, which was not significant ($p = 0.716$).

Finally, the profiles of the 12 campers who indicated suicidal ideation at any time point were developed and compared to all other campers. Demographically six siblings and six patient campers indicated such ideation; eight were females, four were males. Their ages ranged from 9 to 18 years, two were new campers and ten were returning campers, six were Caucasian and five were Hispanic, one was African-American. Of the six patients, three had acute leukemia, two had brain tumors, and one had a solid tumor. None of the patients with suicidal ideation had a sibling in sample who also reported suicidal ideation, but two siblings who reported suicidal ideation were in the same family. They happened to be in the largest family represented in the sample, with six family members included; a patient and three other siblings also in the same family did not report any suicidal ideation.

The 12 campers who endorsed suicidal ideation at any time were compared on all the test variables to all other campers who did not ever endorse suicidal ideation. Table 6 shows these differences. Substantial and significant differences were seen on the CBCL, CDI total score, and the CDI Anhedonia and Negative Self Esteem measures across all time points, and a mix of significant and borderline significant results were seen for the CDI Negative Mood subscale across all time points. In every case of a significant difference, those campers with suicidal ideation had less good social competency and more depressive symptoms.

Discussion

The discussion section will be focused but not confined to answering the five major study

Table 6. Comparison of campers with and without suicidal ideation on study outcomes

Measure	Baseline Mean difference (*p*-value)	Follow-up 1 Mean difference (*p*-value)	Follow-up 2 Mean difference (*p*-value)
CBCL	−5.32	−6.15	−4.88
	(0.010)	(0.017)	(0.026)
CDI total	8.54	7.44	9.02
	(0.005)	(0.35)	(0.033)
CDI-Negative Mood	6.90	4.61	6.57
	(0.036)	(0.066)	(0.053)
CDI-Interpersonal	1.58	3.34	2.27
	(0.356)	(0.317)	(0.299)
CDI-Ineffectiveness	3.25	2.99	4.38
	(0.333)	(0.329)	(0.201)
CDI-Anhedonia	9.89	8.84	8.63
	(0.008)	(0.046)	(0.038)
CDI-Negative Self-Esteem	6.76	7.53	10.06
	(0.005)	(0.016)	(0.016)

Mean difference calculated as mean among those with suicidal ideation − mean among those without suicidal ideation, *p*-value based on two sample *t*-test assuming unequal variances.
Higher scores on CBCL correspond to better social adjustment; here a negative difference corresponds to a lower score among those with suicidal ideation.
Higher scores on CDI subscales indicate more severe depression; here, a positive difference corresponds to higher scores among those with suicidal ideation.

questions. Questions 1 and 2 need to be answered jointly. Questions 1 and 2 are: Were there changes in affective symptoms over time? If changes in affective symptoms were present, were they more pronounced in patients versus siblings?

The overall answer is that there were marked changes in affective symptoms for patient campers over time but not for sibling campers. It was noteworthy that the improvement in overall affective symptom status for patient campers was not present immediately after the camping experience, but was quite significant when measured 4–6 months later. This effect was not observed in the data for siblings at either time period. These results were unexpected. We acknowledge that given the lack of a control group that these changes could have been due to the passage of time. Also, we acknowledge that the CDI scores were not in the range of clinical significance and therefore did not reflect clinical depression as defined by the test standardization. It is also important to note that for patient campers the CDI subscales of Negative Mood and Anhedonia both followed the same pattern of delayed significance. For siblings no subscale of the CDI approached significance. We think this points up a major difference between these two groups of children and this may reflect differing expectations from the two groups.

The next question to be addressed dealt with whether campers retain (remember) activities and a reuse of pleasure in activities over time. The reason that this measured was that it was seen as a potentially important outcome measure. The investigators as well as camp staff felt it could not be assumed that such memories of camp activities would be retained over time.

For patient and sibling campers alike no differences were observed in the data between the two measurements. This would include measurements of activities remembered, and amount of pleasure in activities remembered. We assessed whether the scores for these measures were significantly different over time. In no case were they different. Given this fact, we conclude that both memories and pleasure about camp activities remain fully intact.

In this area, unlike the CDI, there were no differences within or between the groups over time. All remained constant in their memories and pleasures of camp activities.

In regard to the question of the impacts on first time versus returning campers, this was difficult to answer given the very high proportion of returning siblings and patient campers in the study. However, the data did not support clear differences between first time and returning campers.

Finally, of significant concern to the investigators were the 12 campers who indicated suicidal ideation. Several issues were raised in relation to this subgroup (18% of total sample). Who are they?, How did the camp experience impact them?, and What implications does this have for their care and management at camp?.

The demography of this sub-group showed no clear pattern. There were no patterns in regard to age, gender, ethnicity, old/new camper, medical diagnosis, or whether they were a sibling or patient. There were in fact, six siblings and six patients in this group. In regard to their camp experience, at all points their social competency scores were lower than the other camper subjects. As would be predicted, at all points their Negative Mood was higher and total CDI scores were higher. The same was true for the Anhedonia and Negative Self-Esteem subscales. It should be noted this group presented no special management issues at camp. Therefore, we recommend they not be excluded from the camp experience. In fact, we would recommend that depressed children be encouraged to attend camp.

In conclusion, several caveats must be noted in relation to this study. First, the study did not include a control group, thus the passage of time may have contributed to changes noted. The study utilized only self-report measures of the campers with no objective measures filled out by parents or staff. The study included too few first-time campers to make effective conclusions about issues regarding first-time versus returning campers. Finally, the study contains no formal measure of where patient campers were on the health illness continuum. This would affect sibling campers as well. We were only to infer about this issue by time since diagnosis for the patient campers.

In summary, we feel the most important finding was the fact that affective improvements were demonstrated and became more pronounced, not just sustained, over time. This finding was much more evident in patient campers. The lack of demonstration of these changes in sibling campers may mean that the sibling experience with the illness and the camp may be quite different than for the patient campers. In view of the data, more intensive exploration of the sibling experience appears necessary.

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