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Predictors of psychological functioning in children with cancer: disposition and cumulative life stressors

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Abstract

***Objective*: This study examined psychological functioning in children with a history of cancer and a matched sample of healthy peers, while exploring the roles of disposition and stressful life events.**

***Method*: Participants were 255 children with a history of cancer and 101 demographically matched children (8–17 years). Children completed measures of depression, anxiety, and posttraumatic stress symptoms (PTSS); history of stressful life events; and dispositional factors, including optimism and a five-factor personality measure.**

***Results*: Children with cancer did not differ from peers with regard to depression and PTSS, but reported significantly lower anxiety. In hierarchical regressions, children's depression, anxiety, and PTSS scores were largely predicted by dispositional variables and, to a lesser extent, stressful life events, after controlling for demographics and health status.**

***Conclusion*: Children's psychological functioning is predicted primarily by disposition, and secondarily by history of stressful life events, with health status (i.e., cancer versus control) accounting for minimal, and often non-significant variance in children's functioning. These findings further support that children with cancer are generally resilient, with factors predictive of their adjustment difficulties mirroring those of children without history of serious illness.**

Traumatic stress models suggest that childhood cancer is a traumatic event that puts children at increased risk for adjustment problems and adverse psychological outcomes. However, the empiric evidence demonstrates that children with cancer are resilient, generally functioning as well as or better than their healthy peers despite the challenges of their cancer experience [1–5]. In studying resilience following potentially traumatic events, Bonanno and Diminich [6] argued that simply assessing for the absence of psychopathology is a more limited approach than comparing mean levels of pathology between individuals who have and have not been exposed to the stressor of interest. In regard to internalizing symptoms, a preponderance of the literature suggests that children with cancer demonstrate comparable or lower levels of symptoms relative to children without a history of serious illness [2,7–11]. These findings suggest that children who have experienced cancer are relatively resilient and adjusting well. This also highlights the importance of comparing the functioning of children with cancer to a reference group of children without history of serious illness; however, this has not been the norm.

The absence of a control or normative comparison group in this literature carries additional methodological implications. Given that some distress is to be expected in the general population, it would be erroneous to assume that any symptoms of distress in children with cancer history are a result of their cancer experience. Such an approach risks overestimating the illness-related distress experienced in this population. A substantial literature exists suggesting that a subgroup of children with cancer experience significant adjustment problems, although most are doing well [5,12]. However, few of these studies included control comparisons. Alternately, some studies, most notably the childhood cancer survivor study, have included sibling controls, focusing on the statistically greater symptomatology among survivors, despite that fact that both groups were doing exceptionally well [13,14]. Thus, comparing the functioning of children with and without a history of illness is vital to our understanding of the extent to which children with cancer experience *heightened* distress.

Given the evidence that children with cancer do not differ from healthy peers with regard to psychological functioning, any problems that children with cancer do experience may in fact be better attributed to factors other than cancer, such as premorbid functioning, family environment, social supports, temperament or disposition, and other stressful events. Indeed, children's psychological functioning has consistently been associated with the overall number of lifetime stressors experienced, with findings suggesting that more lifetime adversity predicts increased depression, anxiety, and posttraumatic stress symptoms (PTSS) [15,16]. Importantly, children's cumulative stressful life events predict psychological outcomes above and beyond the experience of cancer [17]. Given these findings, the number of stressful

life events experienced is one factor expected to significantly predict children's adjustment when controlling for their diagnosis of cancer.

Disposition, or personality factors, has been shown to be important in accounting for individual differences in the psychological functioning of adults with cancer. Such personality factors have been studied in a variety of ways. Optimism is a trait that has been examined extensively and shown to be predictive of the adjustment of adults with cancer [18,19]. Other studies have used a five-factor model (i.e., neuroticism, extraversion, openness, agreeableness, and conscientiousness) [20], demonstrating that such factors significantly predict adults' adjustment to cancer when controlling for illness-related variables [21], as well as children's psychological functioning more generally [22]. Conceptually, optimism is considered a subdomain within the factor of extraversion. However, optimism is well established as a separately measured construct and has been found to be especially pertinent to the psychological functioning of adults with cancer. Despite the apparent importance of disposition in predicting adjustment of adults with cancer, there is a dearth of research examining dispositional factors in the pediatric population. This is curious given that the constructs of temperament and personality are well established in children and these factors are thought to remain relatively stable from an early age [22,23]. Given that children with a history of cancer appear to be adjusting well and disposition is salient to adults' functioning, examining the possible role of dispositional factors is a critical next step in studying the psychological well-being of children with cancer.

In the present study, we sought to examine psychological functioning in children with a history of cancer and a demographically matched comparison group of children without history of serious illness. We hypothesized that there would be no significant differences between children with cancer and healthy peers with regard to depression, anxiety, and PTSS. Secondly, we sought to examine what factors are predictive of children's psychological functioning, including the role of children's stressful life events and dispositional traits. We hypothesized that cumulative life stressors would significantly predict unique variance in children's adjustment. We further hypothesized that child disposition would significantly predict unique variance in children's depression, anxiety, and PTSS scores when controlling for demographic background, health status (i.e., cancer versus healthy comparison), and stressful life events.

Method

Participants

Cancer group

A cross-sectional sample of children with cancer ($N = 255$) was recruited from outpatient clinics of a large pediatric oncology hospital. Eligible children were between 8 and 17 years of age, were able to read and speak English, had a primary diagnosis of malignancy, were at least 1 month from diagnosis, and had no significant cognitive deficits that would preclude completion of measures. Children in the cancer group were stratified according to time since diagnosis, with patients evenly distributed across the four strata (1–6 months, 6 months to 2 years, 2–5 years, and 5 years or more). Children's treatment and illness status varied; some children were off treatment, and others continued to receive treatment, with some children in remission. Of the 378 patients who were approached about participating in the study, 258 (68%) agreed to participate, resulting in a total of 255 patients after three participants were excluded because of incomplete data. Patients who agreed to participate did not differ from those who declined with regard to age, gender, race/ethnicity, diagnostic category, or time from diagnosis strata.

Comparison group

Children in the healthy comparison group ($N = 101$) were recruited from schools in the community. Students who returned parental permission slips were placed in a pool of potential control participants. Children in the control group were matched using frequency matching to participants in the cancer group based on their age, gender, and race/ethnicity, as reported by their parent. Eligible children were also between 8 and 17 years of age, were able to read and speak English, had no known cognitive deficits, and did not have a history of chronic or life threatening illness by parent report. Of the 107 potential control participants who were contacted based on demographic match to a patient in the study, 94% agreed to participate.

Participant demographics are presented in Table 1. Children in the two groups did not differ based on age (t [356] = 1.59, $p = 0.11$), gender (χ^2 [1, $N = 356$] = 0.63 $p = 0.43$), or ethnicity (χ^2 [5, $N = 356$] = 0.86, $p = 0.97$); however, the groups significantly differed in socioeconomic status (SES) χ^2 [4, $N = 356$] = 19.07, $p < 0.01$. Using the Barratt simplified measure of social status [24] to measure SES, fewer children from the control group were from the lower SES strata, in comparison with children in the cancer group

Procedure

Informed consent/assent was obtained for all participants. Children were informed that this was a study of stress and coping in children, with no mention of cancer or treatment in the study description so as not to create a focusing effect. Identical descriptions were provided to the cancer and comparison groups. Questionnaires were completed during a regularly scheduled hospital visit for children in the cancer group and during an individual appointment at the hospital for the control group. Children completed questionnaires

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Table 1. Demographic Information across study groups

	Percent	
	Patient group ***n*** **= 255**	**Control group** ***n*** **= 101**
Age		
Mean (SD)	12.7 (2.9)	12.1 (2.9)
Range	8–17	8–17
Gender		
Female	48.2	43.6
Male	51.8	56.4
Race		
Caucasian	72.5	72.3
African American	22.7	23.8
Other	1.2	4.0
SES[a]		
Groups I–II	27.5	49.5
Group III	31.8	28.7
Groups IV–V	40.8	21.7
Diagnosis		
Acute lymphoblastic leukemia	23.9	
Acute myeloid leukemia	7.1	
Hodgkin's and non-Hodgkin's lymphoma	13.3	
Solid tumor	38.4	
Brain tumor	17.3	
Time since diagnosis		
<6 months	25.1	
6 months to 2 years	24.7	
2 to 5 years	25.5	
>5 years	24.7	

SES, socioeconomic status.
[a]SES groups are ordered highest to lowest, with group I reflecting higher SES strata and group V indicating lower SES strata.

in a separate room from their parent, and trained research assistants were available during data collection appointments to assist and read questions aloud if necessary.

Measures

Outcome variables

Children's Depression Inventory: Children's symptoms of depression were assessed using the *Children's Depression Inventory* (CDI) [25], a 27-item measure with adequate psychometrics for both children and adolescents [26]. For each item, participants choose the statement that best describes him or her. The CDI demonstrated good internal reliability in the present study ($\alpha = 0.81$). A cutoff score of 16 was used for identifying clinically elevated depression symptoms [26].

Screen for Child Anxiety Related Emotional Disorders: The 41-item *Screen for Child Anxiety Related Emotional Disorders* (SCARED) is a screening measure with strong psychometric properties [27]. Children rated, on a 3-point Likert scale, how true each statement had been of them over the past 3 months. For the present research, all items were summed for a measure of overall anxiety, which demonstrated excellent internal reliability ($\alpha = 0.90$). In accordance with previously established cutoff scores [28], a score of 25 was used for identifying clinically elevated anxiety symptoms. A score of 25 on the SCARED corresponds with the 75th percentile of normed samples [28], whereas previously established cutoff scores for the CDI have been more conservative [26]. The SCARED thus appears to use a more liberal cutoff to increase sensitivity for screening.

University of California at Los Angeles Posttraumatic Stress Disorder Reaction Index for DSM-IV: The *University of California at Los Angeles Posttraumatic Stress Disorder* (PTSD) *Reaction Index for DSM-IV* [29] is a 22-item self-report measure that assesses how frequently in the past month children experienced symptoms characteristic of the re-experiencing, avoidance, and arousal criteria of PTSD. Children first identified their most stressful or traumatic event and then respond to questions regarding that event using a 4-point Likert scale. Only the overall score was used for the present study, which demonstrated good internal reliability ($\alpha = 0.88$). A cutoff score of 38 or higher was used for identifying clinically elevated PTSS [30].

Predictor variables

Life Events Scale: Children completed a modified version of the *Life Events Scale* [31], assessing their history of experiencing 30 different stressful life events. This scale has been found to have good reliability and parent–child consistency [31]. For the present research, children's event count was summed for a total score of the number of stressful life events experienced.

Youth Life Orientation Test: Dispositional optimism was assessed using the *Youth Life Orientation Test* [32], which demonstrates adequate internal reliability [32] ($\alpha = 0.73$, current study). This 16-item measure consists of seven optimism items, seven pessimism items, and two filler items, with children rating their agreement on a 4-point Likert scale (1 = 'true for me', 4 = 'not true for me'). The present research utilized the total global optimism score.

Child and Adolescent Five-factor Inventory: The five-factor model of personality was assessed using the *Child and Adolescent Five-factor Inventory*, a newly developed self-report measure. This measure was developed in our laboratory based on a review of the extant adult measures, a questionnaire developed in Europe for non-English speaking children (the Big Five Questionnaire for Children [33,34]), and the item pool of five-factor measures available in the public domain. Items were created or revised to be more appropriate to a child or adolescent (and English-speaking) population, resulting in a final

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pool of 83-items. Items were rated on a 5-point Likert scale. Preliminary analysis of psychometric properties revealed good internal reliabilities on all scales: neuroticism (15 items, $\alpha = 0.79$); extraversion (16 items, $\alpha = 0.79$); openness (18 items, $\alpha = 0.81$); agreeableness (15 items, $\alpha = 0.82$); conscientiousness (19 items, $\alpha = 0.87$).

Analyses

Analysis of covariance was used to examine whether children's depression, anxiety, and PTSS scores differed between the children with and without cancer. Given group differences in SES, this was included as a covariate. Children's depression, anxiety, and PTSS scores were further compared using cutoffs for identifying clinically elevated symptoms. Pearson correlations were calculated for all variables to examine the relation of other stressful life events and dispositional variables on children's depression, anxiety, and PTSS. Lastly, separate hierarchical multiple regression analyses were performed to examine the relation of children's disposition to each of the criterion variables while controlling for demographics, health status, and cumulative life events.

Results

Preliminary analyses

Means and standard deviations for all variables within each group are presented in Table 2. The mean scores demonstrate that, on average, children in both groups were reporting symptoms of depression, anxiety, and PTSS within the normative range, suggesting a well-adjusted sample. Analyses of covariance, correcting for the effects of SES, indicated that none of the predictor variables significantly differed by group (Table 2).

Table 2. Means, standard deviations, and analyses of covariance comparing cancer versus control for all variables

	M (*SD*)			
	Patient Group $n = 255$	**Control Group** $n = 101$	*F*	η
Outcome variables				
Depression	6.42 (5.41)	6.84 (5.33)	1.35	0.00
Anxiety	18.46 (11.93)	21.44 (12.01)	8.02*	0.02
PTSS	18.32 (13.73)	19.90 (15.82)	3.31	0.01
Predictor variables				
Stressful life events	8.12 (3.84)	7.16 (3.30)	1.45	0.00
Optimism	44.28 (6.97)	44.08 (6.27)	0.26	0.00
Extraversion	58.33 (9.40)	59.96 (10.86)	1.44	0.00
Neuroticism	38.39 (9.85)	38.31 (10.43)	0.05	0.00
Openness	67.33 (11.04)	68.41 (11.07)	0.10	0.00
Agreeableness	59.01 (9.11)	59.40 (8.36)	0.00	0.00
Conscientiousness	64.28 (13.59)	64.87 (13.04)	0.11	0.00

SES was corrected for in all analyses.
PTSS, posttraumatic stress symptoms; SES, socioeconomic status.
*$p < 0.01$.

Cancer versus control differences in child outcomes

Depression

Children from the cancer group did not significantly differ from healthy controls with regard to mean levels of self-reported depressive symptoms, $F(1,352) = 1.35$, $p = 0.18$. Children in the two groups also did not significantly differ in clinically elevated depression (χ^2 [1, $N = 356$] = 0.05, $p = 0.82$), with 16 (6.3%) children in the cancer group and seven (6.9%) in the healthy control group reporting a score of 16 or higher [26].

Anxiety

After adjusting for SES, a significant difference was observed in children's anxiety, with children in the healthy control group endorsing more symptoms of anxiety than their counterparts with history of cancer, $F(1,352) = 8.0$, $p < 0.01$. However, using a cutoff score of 25 [28], children in the cancer and control groups did not differ with regard to their frequency of reporting clinically elevated anxiety (χ^2 [1, $N = 356$] = 2.09 $p = 0.15$), with 71 (27.8%) children in the cancer group and 36 (35.6%) in the healthy control group reporting elevated levels of anxiety.

PTSS

Although children with cancer reported descriptively lower levels of PTSS than their healthy peers, this difference did not reach statistical significance, $F(1,350) = 3.3$, $p = 0.055$. Children in the two groups also did not significantly differ with regard to clinically elevated PTSS (χ^2 [1, $N = 356$] = 0.54, $p = 0.46$), with 28 (11.1%) children in the cancer group and 14 (13.9%) children in the healthy control group reporting a clinically elevated PTSS score of 38 or higher [30].

Predicting children's psychological functioning

To examine the potential role of other stressful life events and dispositional traits on children's psychological functioning, Pearson correlations were calculated for all variables. Given no evidence of significant differences between the cancer and control groups on predictor variables (Table 2), correlations were assessed across the entire sample and not separated by group (Table 3). A similar pattern of correlations was found for all outcomes (depression, anxiety, and PTSS), with adjustment difficulties positively correlated with the number of stressful life events and children's neuroticism, and negatively correlated with children's optimism, extraversion, openness, agreeableness, and conscientiousness.

The relation of child disposition to psychological functioning was further examined using separate hierarchical multiple regression analyses for each of the criterion variables. Demographic variables were first entered as covariates in step 1, with health status (i.e., cancer versus

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Table 3. Correlations between all predictor and outcome variables

	1	2	3	4	5	6	7	8	9
Outcome variables									
Depression	—								
Anxiety	0.64***	—							
PTSS	0.62***	0.57***	—						
Predictor variables									
Stressful life events	0.32***	0.30***	0.35***	—					
Optimism	−0.59***	−0.41***	−0.42***	−0.18**	—				
Extraversion	−0.29***	−0.28***	−0.11*	0.08	0.32***	—			
Neuroticism	0.64***	0.60***	0.57***	0.27***	−0.50***	−0.21***	—		
Openness	−0.41***	−0.19***	−0.17**	−0.09	0.32***	0.29***	−0.27***	—	
Agreeableness	−0.37***	−0.14**	−0.19***	−0.10	0.40***	0.22***	−0.30***	0.46***	—
Conscientiousness	−0.42***	−0.18***	−0.24***	−0.14**	0.34***	0.10	−0.38***	0.41***	0.47***

PTSS, posttraumatic stress symptoms.
*$p < 0.05$.
**$p < 0.01$.
***$p < 0.001$.

control) entered in step 2, number of stressful life events in step 3, and dispositional variables in step 4. Table 4 shows the results of these regression analyses predicting depression, anxiety, and PTSS. All three overall regression models were statistically significant. Given the overlap in findings for each regression analysis, the following review of results is organized by regression steps and predictors, rather than outcomes, and will focus on the commonalities across analyses.

Demographic variables

Demographic variables did not account for a significant amount of variance in predicting depression; however, they accounted for significant variance in predicting anxiety and PTSS. Specifically, girls and younger children were significantly more likely to report anxiety symptoms. Additionally, lower SES predicted higher anxiety and PTSS. Race/ethnicity was not predictive of any outcomes.

Health status

Children's health status did not significantly account for variance when predicting depression or PTSS. It was a significant predictor of anxiety, accounting for approximately 2% of the variance. As previously noted, a history of cancer was associated with lower levels of anxiety, and this finding remained significant after correcting for demographics.

Table 4. Hierarchical multiple regression analyses predicting depression, anxiety, and PTSS

	Depression				Anxiety				PTSS			
Predictor	β	F (df)	R^2	ΔR^2	β	F (df)	R^2	ΔR^2	β	F (df)	R^2	ΔR^2
Step 1		2.15 (4,349)	0.02			11.82 (4,349)***	0.12			4.51 (4,349)**	0.05	
Gender	0.02				0.19***				0.06			
Race	−0.03				−0.09				−0.03			
Age	−0.03				−0.23***				−0.06			
SES	−0.16**				−0.20***				−0.21***			
Step 2		2.08 (5,348)	0.03	0.01		11.43 (5,348)***	0.14	0.02**		4.39 (5,348)**	0.06	0.01
Health status	−0.07				−0.15**				−0.11			
Step 3		8.10 (6,347)***	0.12	0.09***		19.15 (6,347)***	0.25	0.11***		12.30 (6,347)***	0.18	0.12***
Stressful life events	0.32***				0.35***				0.36***			
Step 4		42.78 (12,341)***	0.60	0.48***		31.67 (12,341)***	0.53	0.28***		21.85 (12,341)***	0.44	0.26***
Optimism	−0.27***				−0.12*				−0.20***			
Extraversion	−0.08*				−0.16***				0.04			
Neuroticism	0.40***				0.46***				0.45***			
Openness	−0.17***				−0.03				−0.01			
Agreeableness	0.03				0.09				0.07			
Conscientiousness	−0.10*				0.01				−0.02			

SES, socioeconomic status; PTSS, posttraumatic stress symptoms.
*$p < 0.05$.
**$p < 0.01$.
***$p < 0.001$.

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Number of stressful life events

The number of stressful life events children experienced explained a significant portion of the variance in predicting all three outcomes, accounting for 9–12% of the variance in the models. In all instances, more stressful life events were associated with poorer psychological functioning.

Dispositional factors

Disposition explained the largest portion of variance in all three models, above and beyond the variance accounted for by demographics, health status, and stressful life events. Whereas health status only accounted for 1–2% of variance and stressful life event experience accounted for 9–12%, dispositional factors accounted for the vast majority of the variance were explained. Dispositional variables accounted for a notable 48% of the variance in predicting depression. Additionally, disposition accounted for 28% and 26% of the variance in predicting anxiety and PTSS, respectively, more than the variance accounted for by all of the previous steps combined.

In regard to specific dispositional variables, optimism and neuroticism significantly predicted all three outcomes, with optimism predicting fewer symptoms of depression, anxiety, and PTSS, and neuroticism predicting greater symptoms. Extraversion was inversely associated with depression and anxiety, but not PTSS. Openness and conscientiousness were significantly associated with lower depression scores, but not with anxiety or PTSS.

Discussion

The present findings support and extend previous research suggesting that children with cancer are functioning as well as or better than their healthy peers [1–5]. This was accomplished using a large sample of children with a history of cancer, heterogeneous in terms of diagnosis and time elapsed since diagnosis, and including children both on and off therapy, compared with a demographically similar sample of children without a history of serious illness. These findings extend the research by examining other factors beyond the presence/absence of cancer history, which are predictive of adjustment outcomes, demonstrating that history of prior life stressors, and most importantly, dispositional factors were far more salient predictors of adjustment than cancer history.

Overall, there was no evidence of heightened distress or dysfunction in children with a history of cancer, as assessed using both mean differences and clinical cutoff scores. Although children in the healthy comparison group reported more anxiety and marginally more PTSS symptoms than did children with cancer, the groups did not differ with regard to clinically elevated scores. Thus, these groups appear relatively similar with regard to psychological functioning. Notably, participants from the present study represent a well-adjusted group of children, with low levels of depression, anxiety, and PTSS and few children demonstrating clinically elevated symptoms. These results, together with findings that children with cancer did not report poorer psychological functioning than their healthy peers, further support arguments that children with cancer are resilient and adjusting within developmentally normative expectations. Although low levels of internalizing symptoms could alternatively be attributed to denial or repression, we believe these findings are better conceptualized as indicative of resilience [4–6].

The general absence of cancer-control differences found in the present study may reflect, in part, improvements in contemporary cancer treatments, with reduced intensity and decreased morbidity and mortality [35]. Children with cancer increasingly receive improved psychosocial support that may also be helping them cope better with diagnosis, treatment, and survivorship. It may be that childhood cancer in the 21st century is simply not as demanding and potentially traumatic as it was in prior treatment eras. Rather than a trauma, it appears that cancer is likely to be experienced by most children as a significant, but manageable event, perhaps one that offers opportunity for mastery. In this regard, it should be noted that the majority of prior studies examining psychological adjustment of children with cancer, particularly those examining PTSS outcomes, have not included comparison groups of children without a history of serious illness. Many such studies have utilized a traumatic stress model based on associations between the cancer experience and internalizing difficulties [36] and rates of PTSD ranging from 20% to 35% [12]. However, in the absence of appropriate community controls, studies cannot account for the background level of psychological symptoms present in any general sample of children and risk overestimating the level of symptoms and attributing symptoms as cancer-related, which might be better accounted for by other factors. It should also be noted that although young adult survivors of childhood cancer have been found to report more internalizing symptoms than their healthy siblings, survivors report very little distress [13,14]. Indeed, there will likely always be a percentage of children with cancer who experience significant distress; in the current study, this ranged from 6% to 28% depending on outcome. However, research that focuses on that subset of children, without reference to controls or normative comparisons, may erroneously assume the distress is due to cancer, thereby overestimating the impact of the cancer experience on children's psychological functioning.

Consistent with the adult oncology literature, optimism and extraversion predicted better psychological functioning [18,19,37], and neuroticism predicted poorer functioning [38]. However, only optimism and neuroticism consistently predicted psychological functioning, suggesting that these two traits are particularly relevant to

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children's adjustment. Extraversion was inconsistently related to psychological well-being. Although a subdomain of extraversion, perhaps optimism specifically, rather than extraversion more generally, impacts children's psychological adjustment. Contrary to the adult literature, agreeableness did not significantly predict any measure of psychological functioning [37]; however, agreeableness and conscientiousness may more likely relate to other problems of adjustment in children, such as externalizing difficulties [39]. The examination of dispositional factors in the psychological functioning of children with cancer is a unique aspect of this study, suggesting that relatively stable aspects of children's personality were more strongly related to their psychological well-being than the experience of diagnosis and treatment for cancer, replicating one of the few prior studies to examine this in a childhood cancer sample [40]. Importantly, dispositional variables alone accounted for a surprising amount of variance, ranging from 26% to 48% of the variance. Thus, children's psychological functioning was predicted *primarily* by dispositional traits. This knowledge can aid in the identification of children who might benefit from extra support or intervention to prevent or reduce distress. In other words, the assessment of such traits as optimism and neuroticism could be used to screen for children who are at increased risk for experiencing distress.

Consistent with prior research [17], cumulative life stressors predicted psychological functioning above and beyond the influence of health status, suggesting that the *quantity* of life stressors experienced might be more influential in developing adjustment problems than the experience of any single event, such as the diagnosis of cancer. The number of stressful life events did not significantly differ between groups when corrected for SES, although the mean number of events was nearly one point higher in the cancer group. Because history of a serious illness is an included event for all in the cancer group but not for controls, this approximate one-point difference is expected and suggests a comparable frequency of non-cancer events between groups. The current findings suggest that cumulative life stressors are a significant determinant of children's psychological functioning and should be an important component of the history obtained when planning clinical services for children with cancer.

The present study has methodological limitations that should be considered when interpreting the findings. Importantly, given the correlational and cross-sectional nature of the research design, causation cannot be determined. Nonetheless, findings in the present study suggest a strong relation between disposition and psychological functioning, which warrants future research examining a potential causal role of disposition in children's adjustment to the challenges of cancer or other life adversities. Additionally, all of the measures used in this study were child self-report, allowing for the possibility of artificially inflated effects resulting from shared method variance. However, self-report is considered the gold standard for assessment of children's depression, anxiety, and PTSS, with previous research suggesting that children are preferred reporters of their internal feelings and experiences [41]. The single site nature of this study also limits the generalizability of these findings, necessitating replication at other sites. It is also important to note that despite efforts to match children from the comparison group according to demographic factors, these groups differed on SES.

Despite these limitations, the present study lays the groundwork for future research to further examine predictors of psychological functioning in children with cancer. It will be important to further examine dispositional traits in a pediatric cancer population and the role of disposition in changes to psychological and physical functioning over time. This examination of functioning over time is especially important to the study of resilience in children with cancer, as resilience is best documented via longitudinal research following the stressor of interest [6]. Overall, the present findings provide further support for the resilience of children with cancer, and call for strength based models, rather than trauma models in understanding the response of children to this health challenge.

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