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Socioeconomic Disparities in the Quality of Life in Children with Cancer or Brain Tumors: The Mediating Role of Family Factors

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Abstract

Objective—This study aimed to determine if and to what extent: (1) socioeconomic disparities exist in the health-related quality of life (QOL) of children with cancer or brain tumors and healthy children; and (2) family functioning and burden mediate the relationship between socioeconomic status and children's QOL.

Methods—In this cross-sectional study, parents of children ages 2–18 with (n=71) and without (n=135) cancer or brain tumors completed in-person interviewer-assisted surveys assessing sociodemographics (including income and parental education), child QOL (measure: PedsQL), family functioning (measure: FACES IV) and burden (measure: Impact on the Family Scale). For children with cancer, clinical characteristics were captured through medical record abstraction. Multiple linear regression was used to determine the relationship between income and child QOL; the interaction between group status and income was assessed. Staged multivariate regression models were used to assess the role of family factors in this relationship among children with cancer.

Results—In multivariate analyses, the effect of income differed by cancer status; lower income was associated with worse QOL in children with cancer, but not among healthy children. Among children with cancer, this relationship was significantly attenuated by family burden.

Conclusions—Significant socioeconomic disparities exist in the QOL of children with cancer. Family factors partially explain the relationship between low income and poor QOL outcomes among these children. Lower income families may have fewer resources to cope with their child's cancer. Increased support, monitoring, and referrals to reduce burden for these families may lead to improved QOL in children with cancer.

Keywords

cancer; oncology; quality of life; family functioning; burden; socioeconomic disparities

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INTRODUCTION

As treatment advances and survival rates have improved for childhood cancer [1], it has become increasingly important to understand the factors that influence health-related quality of life (QOL) among survivors. Disease and treatment-related factors are known to influence the QOL of children with and survivors of childhood cancer. However, little is known about the family-level effects on QOL [2]. In particular, family socioeconomic status (SES) and family functioning have each been shown to be associated with worse child health [3–5], and may be important predictors of the QOL of children with cancer.

Few studies have explicitly explored the effect of SES on child QOL. Among studies of children with cancer or survivors of childhood cancer*, no study has explicitly focused on the impact of SES on child QOL as a primary aim of the study*. Extant studies have included SES as one of many demographic predictors of child QOL [6–9] or have utilized SES as a control variable in their analyses [10; 11] without explicitly examining this factor. Findings from these studies have also been inconsistent; of the five studies reporting the unadjusted (i.e., bivariate) association between SES and child QOL, two [8; 10] found that lower SES was associated with worse child QOL, while three [7; 9; 11] found no such association. Only two studies reported the *adjusted* association between these factors, controlling for confounding variables, and reported contradictory findings [6; 8]. These inconsistencies are likely due to methodological differences, including variation in the population under examination (based both in the US and abroad, and at various stages of the cancer and survivorship trajectory) and the covariates considered. Further, these studies used various measures of SES, including parental income [6; 7], adjusted household income thresholds [8], paternal occupation, and maternal education [9]. Studies also often collapsed these SES variables into a summary measure or composite of SES [10; 11] or dichotomized these variables in their analyses [6; 7]. Studies are needed to test the relationship between SES and child QOL that employ continuous or multi-category measures of SES (e.g., family income and parental education), as this would enable a more nuanced evaluation this potential association.

This study explicitly explored the relationship between SES and child QOL. Theory suggests that family functioning may mediate the relationship between low SES and adverse QOL outcomes. Specifically, social-ecological systems theory supports the idea that children and parents are nested within families and that stress on the family system has a major influence on the health and functioning of all family members [12–14]. Few studies, however, have examined the role of family functioning in child QOL (e.g., [15]) and none has explored it as a mediator of the SES-QOL relationship, despite the well-established association between low SES and poor family functioning [16–19].

Based on this background and theory, Figure 1 presents the conceptual model utilized in this study. The model highlights the potential moderating role of childhood cancer in the association between family SES and child health, the hypothesized mediating role of family functioning and burden, and the potential bi-directional or reciprocal relationships between these factors (as indicated by the dashed arrows). Moreover, the effect of family functioning as a mediator may differ for children with cancer and healthy children, suggesting a moderated mediation model.

To our knowledge, no study has evaluated the role of family functioning in the relationship between low SES and poor QOL among children with cancer. To address this gap in the literature, the purpose of this study was to: (1) evaluate the relationship between SES and child QOL outcomes among families of children with and without cancer or brain tumors; and (2) evaluate if and to what extent family functioning and burden mediated this

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relationship. We hypothesized that children from higher SES families would have better QOL than children from lower SES families, that family factors would attenuate this association, and that this association would differ for children with cancer and healthy children. Understanding if such disparities exist and what factors may mitigate this relationship will be essential in improving child outcomes across the income spectrum.

METHODS

Study Design, Population, and Data Sources

This research used a cohort study design and enrolled parents and their children with cancer or a brain tumor and a comparison group of parents and their healthy children. The parent who was the most involved in providing support and care to the child was recruited into the study. Parents in this study were defined as biological, step, adoptive or foster parents, grandparents, or legal guardians of the child.

Participants

Participant recruitment and selection and data collection have been reported in detail elsewhere [20]. Briefly, parents and children with cancer, including malignant or non-malignant brain tumors, were eligible to participate in the study if the child (aged 2–18 years) was currently or previously receiving cancer or brain tumor care at a local pediatric hematology and oncology clinic, as determined from the medical record or clinic database; children at any stage of treatment or survivorship were eligible. Eligible families were invited to participate by clinical staff if they attended one of the following during the study period: 1) the child's cancer or brain tumor outpatient visit or inpatient stay at the hospital; 2) a parent-provider advisory board meeting; 3) the hospital support groups for parents; or 4) a childhood cancer survivor reunion. In addition, clinical staff mailed an invitation letter to eligible families in the clinic's patient database who could not be contacted in-person (either because they did not attend an appointment, advisory board meeting, support group, or reunion during the study period, or could not be approached in person during their visit). Of the 162 families of children with cancer invited to participate in the study, 46 declined participation, 24 did not respond to the invitation, 2 were ineligible, and 8 could not be scheduled to participate within the study timeframe. Eighty (50% of those eligible) ultimately participated. Of those, 9 surveys were missing data and were removed from this analysis, resulting in a final sample of 71 children with cancer and their parents.

Comparison dyads of healthy children ages 2 to 18 and their parents (hereafter referred to as "comparison" group) were recruited by mail from two community-based research registries. Comparison families were eligible to participate if they resided in the greater metropolitan area and if no child in the family had cancer, a brain tumor, a chronic condition, or an activity limitation or special healthcare need; eligibility was confirmed during a telephone screening with trained interviewers. Of the 768 comparison families invited to participate in the study, 344 responded to the invitation. Of these 122 declined to participate, 50 were not eligible based on the health of one of the children in the family, and 31 could not be scheduled for participation before the end of the study period. 141 (41%) eligible comparison families ultimately participated. Six participants were removed from this analysis due to missing data, resulting in a final comparison sample of 135.

Procedures

This study was approved by the Health Sciences Institutional Review Board of the University of Wisconsin-Madison. Written informed consent was obtained from all participants. Parents of children with cancer provided written Health Insurance Portability and Accountability Act Privacy Rule (HIPAA) authorization for abstraction of the child's

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medical record. All participating parents completed an in-person interviewer-assisted survey that included items about sociodemographic characteristics and a series of validated self-reported measures. Interviews were completed between September 2008 and July 2009.

Measures

Outcome Measures—Children's QOL was measured using the *Pediatric Quality of Life Index (PedsQL) Generic Core Scale* [21]. The PedsQL measures child QOL using 23 questions addressing problems children may have with physical, social, emotional, and school functioning. Problems in the past week are measured on a 5-point Likert scale ranging from 0 (never) to 4 (almost always). Items were reverse coded such that a higher score indicates better QOL, and translated to a scale of 0–100. An overall summary score of child QOL was then calculated as the mean of all items answered. All parents in this study proxy-reported QOL for their child.

Independent Variable—*Socioeconomic status* was evaluated both as family income and parents' education. Since income was highly skewed in this sample, the natural log of family income was used in the analyses. Parents' education level was categorized as high school or less, some college, college degree, or professional or graduate degree.

Mediating Variables—*Family functioning* was evaluated using the Family Adaptability and Cohesion Evaluation Scale (FACES) IV [22], a measure that operationalizes the circumplex model [23] to evaluate family cohesion, or "the emotional bonding that family members have toward one another," and flexibility, defined as the "quality and expression of leadership and organization, role relationship, and relationship rules and negotiations" [22, p. 65]. Under the circumplex model, extreme high or low levels of cohesion (enmeshed and disengaged, respectively) and flexibility (chaotic and rigid) are detrimental to family functioning. Parent's responses to the 52 questions were recorded on a 5-point Likert scale (1=Strongly Disagree, 5=Strongly Agree); scores were used to create Cohesion, Flexibility, and Total Circumplex Ratio Scores. Specifically, the cohesion ratio was calculated by dividing the balanced cohesion score by the average of the disengaged and enmeshment scores, the flexibility ratio was calculated by dividing the balanced flexibility scale score by the average of the rigid and chaotic scores, and the total circumplex ratio was calculated by averaging the balanced cohesion and balanced flexibility scores. The level of balance versus unbalance in the family system was used to assess family functioning. Balance versus unbalance ratio scores further above one indicated better family functioning, whereas ratio scores below one were indicative of problematic family functioning.

Among children with cancer and their parents only, *family burden* was evaluated using the Impact on the Family Scale [24]. Parents self-reported to what extent their child's illness impacted their family in four subscales: financial, familial/social, personal strain, and mastery. For this study, a 4-point Likert scale ranging from 1 (not at all) to 4 (a great deal) was used. Subscale scores were created by summing the items in each subscale. A summary score ranging from 24 to 96 was calculated as the sum of the 24 items in the measure. Higher scores indicate greater impact of the illness on the family.

Covariates

Parent/Family Characteristics: Parental age, gender, single parent household status, household composition (number of adults and children in the household), and employment status (full-time work, part-time work, or not working outside the home), were evaluated in the survey. Parents also reported their children's age and gender.

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Child clinical characteristics: Key diagnosis and treatment variables were abstracted from the child's medical record by a trained and licensed clinician. These factors included type of cancer (leukemia/lymphoma, Central Nervous System (CNS) tumor, or non-CNS tumor), time since diagnosis (years between the date of diagnosis and date of interview), and any type of treatment received (chemotherapy, radiation, surgery, and/or transplant).

Data Analyses

Parent, family, and child characteristics for the full sample and for families of children with cancer only were summarized using descriptive statistics. Cross-tabulations and chi-square analyses were used to compare children with cancer against the comparison group on sociodemographic characteristics of parents and children. T-tests were performed to test for mean differences in household composition, parent and child age, family functioning and burden, and child QOL. The Whitney-Mann U-test was performed to test for mean differences in family income.

Bivariate and multiple linear regression analyses were conducted to evaluate the relationship between SES factors (family income and parental education) and child QOL among both families of children with cancer and comparison families, adjusting for sociodemographic factors. An interaction term was included in this regression to evaluate whether the relationship between income and QOL was different for families of children with cancer than for comparison families. Parsimonious models were constructed for the families of children with cancer only using linear regression. Specifically, single covariates that were statistically significant or impacted the QOL point estimate for income were included in the final models (Model 1); variables tested included parental age, gender, and employment status, household composition (number of adults and children), single parent household status, child age, gender and insurance status, type of cancer, time since diagnosis and treatment status (on active/maintenance treatment or off treatment), and type and number of treatments received. Family functioning and family burden were then added to the models independently (Models 2 and 3, respectively) and jointly (Model 4) to test if these factors reduced the QOL point estimate for income, indicating mediation. The final models report empirical standard errors to correct for unequal variance of the regression residuals. Sobel tests [25] were performed to confirm statistically significant mediation of the relationship between income and QOL by each family factor using the bootstrapping approach recommended by Preacher and Hayes [26]. In order to determine which factors of family burden were influencing the relationship between family income and child QOL, we conducted additional regression analyses using the subscales of the Impact on the Family Scale.

RESULTS

Table 1 summarizes the sociodemographic and family characteristics of families of children with cancer and comparison families. Parents of children with cancer were more likely to be single parents, less educated, and have a lower mean income than comparison parents; children with cancer had significantly worse QOL than comparison children. Additionally, families of children with cancer experienced significantly worse family functioning than comparison families. Among children with cancer, nearly half had been diagnosed with leukemia or lymphoma and an additional 36% of patients experienced a CNS tumor. Time since initial diagnosis ranged from less than a year to more than ten years. Among families of children with cancer, family burden scores ranged from 34 to 81, with a mean of 52.2. Families of children with cancer and comparison families did not differ significantly in age, gender, race/ethnicity, household composition or employment status of the primary

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caregiver; children with cancer and comparison children did not differ significantly on age or gender.

Results from bivariate (unadjusted) and multivariate (adjusted for confounders) linear regression analysis are reported in Table 2. In the unadjusted (bivariate) analyses, both cancer status and log family income were significantly associated with child QOL ($p<0.001$); parent's education was not significantly associated with child QOL. Multivariable linear regression among both families of children with cancer and comparison families indicated that children with cancer had worse QOL than their healthy counterparts (17.1 points lower, on average, $p<0.0001$). Table 2 also reveals a significant interaction between cancer status and family income, such that the relationship between income and child QOL is much steeper among families of children with cancer than among comparison families. A 50% increase in income was associated with a 0.3 point increase in child QOL among healthy children, but a 4.3 point increase among children with cancer, controlling for parental education, employment, and child insurance status ($p=0.001$). A stratified analysis revealed that the effect of log income on child QOL was statistically significant among families of children with cancer ($p=0.002$) but not among comparison families ($p=0.65$, data not shown). As such, subsequent analyses were conducted only among the children with cancer.

Among families of children with cancer only (Table 3), log family income was significantly associated with child QOL such that a 50% increase in income was associated with a 3.9 point increase in child QOL (Model 1), controlling for sociodemographic factors and time since the child's diagnosis. Other clinical confounders (e.g., type of cancer) and parent's education were not found to influence the relationships of interest, and were therefore excluded from the final parsimonious models. When family functioning was added to the model (Model 2), this association was attenuated to a 3.6 point increase in QOL per 50% increase in income, and family functioning was independently associated with child QOL. The Sobel test revealed that this attenuation was not statistically significant (data not shown; $z=0.5$, $p=0.60$). Alternatively, including family burden in the model (Model 3) reduced the effect of log income on child QOL and eliminated its statistical significance (2.4 point increase in child QOL per 50% increase in income, NS). The Sobel test revealed this attenuation to also be statistically significant ($z=2.1$, $p=0.03$). In this model, family burden was independently associated with child QOL. Including both family factors in the model simultaneously (Model 4) also eliminated the statistical significance of the coefficient for log income. In this model, family burden remained statistically significant ($p<0.0001$) while family functioning did not. In all models, time since the child's diagnosis and child age were independently associated with child QOL.

In order to determine which factors of family burden accounted for the relationship between family income and child QOL, we conducted additional regression analysis using the subscales of the Impact on the Family Scale (data available upon request). Results revealed that while financial impact, familial/social impact, and personal strain were all independently significantly associated with child QOL, only the financial subscale significantly attenuated the association between log family income and child QOL (Sobel test: $z=2.9$, $p=0.003$). When including the financial subscale only, a 50% increase in income was associated with a 1.4 point increase in QOL and this association was no longer statistically significant.

DISCUSSION

To our knowledge, ours was the first study to *explicitly* investigate socioeconomic disparities in the QOL of children with cancer and healthy children. Furthermore, we also

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examined the mediating role of family factors on socioeconomic status and children's QOL. Our results reveal that significant socioeconomic disparities exist in the QOL of children with cancer, such that children from families with lower incomes have worse QOL than children from wealthier families. Moreover, family burden appears to mediate this relationship, suggesting a potential pathway by which SES affects the QOL of children with cancer. This information will be crucial in developing family-level interventions aimed at improving the health and QOL outcomes of children with cancer and childhood cancer survivors.

Pronounced socioeconomic disparities in child health are prevalent [27–29]; however, little is known about such differences among children with cancer. Our study shows that SES differentially affects the QOL of children with cancer, such that additional income was associated with better QOL of these children. Higher incomes for families of children with cancer may be particularly vital as such resources may facilitate access to adequate health care and reduce children's exposure to stressful conditions.

Our study highlights an important pathway through which income may affect the QOL of children with cancer, specifically family functioning and burden. To our knowledge, this is the first study to examine these factors as mediators of the SES-QOL relationship among children with cancer. Our findings support previous work indicating that better family functioning is associated with improved QOL in some children with cancer [15; 30] and other conditions [31]. Lower income families may have fewer resources to cope with their child's cancer, which may increase the burden experienced by these families. Indeed, additional analyses in this study revealed that family *financial* burden, specifically, was a key factor in mediating the SES-QOL relationship. This is unsurprising, as low-income families may be disproportionately likely to experience financial burden when caring for a child with an activity limitation [32]. The financial stress and burdens associated with caring for a child with cancer may in turn negatively impact child QOL as they reverberate throughout the family.

Although many factors influence QOL among children with cancer and childhood cancer survivors, family-level and contextual factors offer important and often overlooked opportunities for intervention. Although no studies have yet examined the impact of family burden interventions on SES disparities or QOL in children with cancer, evidence from other intervention studies suggests that such approaches may be both feasible and effective at improving family functioning and child depression scores [33], and child well-being [34]. Future research will need to evaluate how family-level interventions impact health and QOL outcomes, particularly among children with cancer.

The findings from this study have important clinical and policy implications. Lower-income families, especially, may benefit from increased support, monitoring, and referrals in the clinical setting. Family-centered care [35; 36] may be one vehicle to help identify and provide support for these families [37]. In addition, tracking family factors and QOL over time may prove essential in identifying emerging problems for families as they arise. Further, psychosocial oncology programs (as described by Kazak [38]) or coordination of care may be especially beneficial at connecting lower-income families with financial, interpersonal, and psychosocial resources that may help improve their family functioning or limit their burden. Finally, implicit class bias among clinicians may negatively influence family-provider communication, care decisions, or outcomes among low-SES families [39] and may negatively influence QOL; as such, provider education that addresses social class bias among clinicians may be important for reducing these disparities.

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The SES disparities identified in this paper, if confirmed, suggest that policy may be needed to provide lower-income families with more resources for catastrophic illnesses such as pediatric cancer. Although Medicaid and state-based health-care programs protect the lowest income families, those who are ineligible for this benefit may be *underinsured* [40]. Improving the provision and coverage of mental health services may also prevent family burden and improve family functioning. This may be especially important in the outpatient setting, where such services may not be as accessible for patients and their families. Further, policies that provide additional resources to these families, such as those supporting the provision of paid time off work, may help mitigate families' financial burden.

This study has important strengths and limitations. To our knowledge, this is the first study to evaluate the role of family factors in the relationship between SES and QOL among children with cancer. In addition, while most existing studies utilized composite measures of SES or dichotomized their SES variables, this study instead explored these as continuous variables. Due to limitations in the dataset, however, we could not explore other indicators of SES in these families, such as type of employment. Second, child QOL is based on parent reports, which may be influenced by parents' own health and mental health status. However, parents are often the best source of information about their children, and the instrument used in this study was developed and validated as a parent-reported measure of child QOL [21]. In addition, the cross-sectional design of the study limited our ability to fully evaluate the temporality of these associations (e.g., children with greater impairment or late effects following cancer treatment may create burden for caregivers that necessitates less workforce participation thereby adversely influencing income). Our research questions and findings, however, are supported by theories of the impact of stress in the family system [12–14; 41]. Additionally, we were unable to evaluate subgroups of children in this study, such as those diagnosed with CNS tumors or children at various stages of their treatment and survivorship trajectory. Future work should use longitudinal data and advanced statistical methods to more fully evaluate the interrelationships between SES, family factors, and child QOL, and should evaluate whether these effects differ throughout the cancer treatment and survival trajectory. Finally, this study was conducted in a single metropolitan area and may not be generalizable to other populations. However, as the mean income and education were quite high, the findings from this study are likely conservative. Future studies should utilize a population based and should consider employing a moderated mediation model.

CONCLUSIONS

Not only does this study identify children with cancer from lower-income families as being at a higher risk of poor QOL, it also implicates family burden as a potential mechanism for this association and identifies a potential point of intervention. As such, reducing family burden, potentially brought about by improved monitoring and referral of such families to additional support services, stands to improve QOL and health outcomes for these children and their families.

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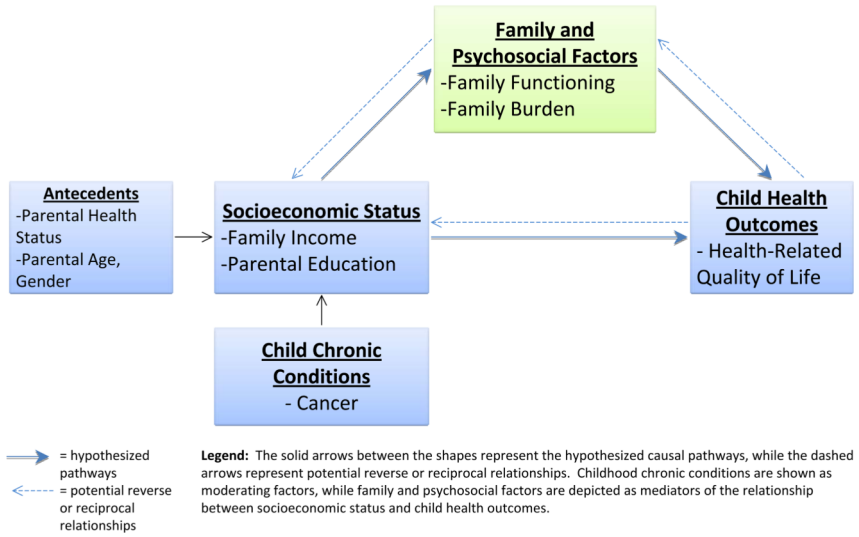

Figure 1.
Conceptual Model of the Impact of Socioeconomic Status on Child Health Outcomes: the Role of Moderators and Mediators

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Table 1

Characteristics of parents and children with and without cancer

	Full Sample N=206	Controls N=135	Cases N=71	P-value (Controls v Cases)
Parent/Family Characteristics				
Age, Mean (SD)	42.6 (5.7)	43.0 (5.8)	42.0 (5.7)	0.25
Gender, %				0.55
Male	10.2%	11.1%	8.5%	
Female	89.8%	88.9%	91.6%	
Race/Ethnicity, %				0.29
White (non-Hispanic)	95.1%	96.3%	93.0%	
Other	4.9%	3.7%	7.0%	
Income, Mean (SD)	110,566 (99,677)	122,778 (117,067)	87,346 (45,031)	0.02
Single Parent Household, %	8.7%	5.2%	15.5%	0.01
Household Composition, Mean (SD)				
# Adults	2.0 (0.4)	2.0 (0.3)	2.0 (0.6)	0.62
# Children	2.3 (0.9)	2.3 (0.8)	2.3 (1.1)	1.00
Education, %				0.02
High School Graduate or Less	7.3%	5.2%	11.3%	
Some College	24.3%	19.3%	33.8%	
College Graduate	38.4%	43.0%	29.6%	
Professional or Graduate Degree	30.1%	32.6%	25.4%	
Employment Status, %				0.88
Employed Full-Time	47.1%	48.2%	45.1%	
Employed Part-Time	38.8%	38.5%	39.4%	
Not Employed Outside the Home	14.1%	13.3%	15.5%	
Family Functioning, Mean (SD)	2.3 (0.6)	2.4 (0.6)	2.1 (0.6)	0.001
Family Burden[§], Mean (SD)				
Summary Score	--	--	52.2 (11.6)	--
Financial Subscale	--	--	7.8 (3.2)	--
Familial/Social Subscale	--	--	16.2 (6.2)	--
Strain Subscale	--	--	11.2 (4.3)	--
Mastery Subscale	--	--	17.0 (2.2)	--
Child Characteristics				
Age, Mean (SD)	10.0 (4.1)	9.6 (3.8)	10.7 (4.4)	0.07
Gender, %				0.88
Male	51.5%	51.8%	50.7%	
Female	48.5%	48.2%	49.3%	
Quality of Life, Mean (SD)	79.8 (15.0)	86.2 (7.7)	67.5 (17.9)	0.0001
Clinical Characteristics				
Type of Cancer[§]				
Leukemia/Lymphoma	--	--	49.3%	--
CNS Tumor	--	--	36.2%	--

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	Full Sample N=206	Controls N=135	Cases N=71	P-value (Controls v Cases)
Non-CNS Tumor	--	--	14.5%	--
Time Since Diagnosis[§]				
< 1 year	--	--	16.9%	--
1 year to < 2 years	--	--	15.5%	--
2 years to < 5 years	--	--	28.2%	--
5 years to < 10 years	--	--	25.4%	--
10+ years	--	--	14.1%	--
Treatment Factors[§¤]				
Received Chemotherapy	--	--	87.0%	--
Received Radiation	--	--	18.8%	--
Received Surgery	--	--	49.3%	--
Received Transplant	--	--	5.8%	
Number of Treatment Types	--	--	1.6 (0.9)	--

Note: “Cases” refers to children with cancer or brain tumors and their families; “controls” refers to healthy children and their families

SD: Standard Deviation

[§]Data only available on cases

[¤]Categories not mutually exclusive

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Table 2

Unadjusted and adjusted associations between income, sociodemographic factors, and quality of life in children with and without cancer or brain tumors

	Unadjusted[a]			Adjusted[b]		
	Beta	**SE**	**P-value**	**Beta**	**SE**	**P-value**
Intercept				95.9	7.5	
Case Status (1=child with cancer/brain tumor)	−18.7	2.2	<.0001	−17.1	2.1	<.0001
Log Family Income $^{\mathcal{F}}$	6.9	2.0	0.001	0.7	1.3	0.563
Interaction (Case Status by Log Income)				10.2	3.8	0.008
Parent's Education						
High School Graduate or Less		REF			REF	
Some College	0.2	4.4	0.957	−2.2	4.4	0.619
College Graduate	6.0	4.0	0.137	−0.7	4.3	0.867
Professional or Graduate Degree	5.8	4.2	0.167	−1.1	4.3	0.798
Parent's Employment Status						
Employed Full-Time		REF			REF	
Employed Part-Time	−3.3	2.3	0.145	−3.4	1.7	0.049
Not Employed Outside the Home	−0.6	3.1	0.841	−0.6	2.4	0.806
Child's Insurance Status						
Private Insurance	10.5	8.1	0.195	−7.4	6.4	0.248
Public Insurance		REF			REF	

[a] bivariate analyses;

[b] multivariate analyses, controlling for all variables in the table

$^{\mathcal{F}}$ Centered at the full-sample mean

SE: Standard Error

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Table 3

Impact of income and family functioning on quality of life among children with cancer or brain tumors

	Model 1			Model 2			Model 3			Model 4		
	Beta	**SE**	**P-value**	**Beta**	**SE**	**P-value**	**Beta**	**SE**	**P-value**	**Beta**	**SE**	**P-value**
Intercept	61.9	17.4		46.0	19.3		102.6	17.6		92.8	19.0	
Log Family Income $^{\mathcal{F}}$	9.6	4.1	0.02	8.9	4.2	0.04	5.9	3.1	0.06	5.9	3.2	0.07
Time Since Diagnosis (Years)	1.1	0.5	0.05	1.2	0.5	0.03	1.1	0.5	0.03	1.1	0.5	0.02
Child Age	−1.0	0.5	0.04	−1.0	0.4	0.02	−1.5	0.4	0.0001	−1.5	0.4	0.0001
Parental Age	0.4	0.4	0.27	0.5	0.4	0.24	0.5	0.3	0.13	0.5	0.3	0.13
Child's Insurance Status												
Private Insurance	−5.5	9.6	0.57	−5.9	9.3	0.53	−4.3	6.8	0.53	−4.5	6.9	0.51
Public Insurance		REF			REF			REF			REF	
Family Functioning (per SD)	--	--	--	4.2	3.4	0.05	--	--	--	1.9	3.0	0.30
Family Burden (per SD)	--	--	--	--	--	--	−8.7	0.2	<.0001	−8.2	0.2	<.0001

$^{\mathcal{F}}$Centered at the full-sample mean

SD: Standard Deviation; SE: Standard Error