Mothers' Perceptions of Benefit Following Pediatric Stem Cell Transplantation: A Longitudinal Investigation of the Roles of Optimism, Medical Risk, and Sociodemographic Resources

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ABSTRACT

Background: *This longitudinal study investigated the course and predictors of benefit finding among 144 mothers of children undergoing hematopoietic stem cell transplantation (HSCT), a severely stressful and life-threatening medical procedure.* ***Purpose:*** *Children's medical risk and mothers' dispositional optimism and sociodemographic resources were examined as predictors of benefit finding. The association between benefit finding and mothers' psychosocial adaptation was also investigated.* ***Methods:*** *Assessments occurred during hospitalization for HSCT (Time 1 [T1]) and 6 months later (Time 2 [T2]).* ***Results:*** *Hierarchical multiple regression analyses revealed that predictors of benefit finding differed systematically across assessments, with optimism and medical risk predicting benefit finding at both time points but sociodemographic resources predicting only T2 benefit finding. Benefit finding did not predict psychosocial adaptation until optimism was considered as a moderator of their relation: T1 benefit finding was positively associated with T2 adaptation only for mothers high in optimism.* ***Conclusions:*** *The need for longitudinal research on posttrauma adaptation and the utility of considering the natural history of the trauma are discussed.*

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INTRODUCTION

It has been argued that searching for and finding meaning in a severely stressful or traumatic experience fulfills a basic human need (1). In fact, attempting to find meaning is a prominent theme of posttrauma adaptation (2,3). People often find meaning in a traumatic experience and reduce its aversive quality by identifying beneficial life changes that have occurred because of it (i.e., they engage in *benefit finding*) (4–6). They do this even while acknowledging negative consequences of the experience (7). Perceived posttrauma benefits often include an enhanced sense of personal strength, reprioritization of important life goals and values, and strengthened interpersonal relations (4,8–9).

Benefit finding has been construed as an attempt to restore positive basic beliefs about the self and the world that have been challenged by a traumatic experience (6,10–11). It can also be viewed as a path to posttraumatic growth (3,12–13) or as a means of asserting "secondary control" when primary or objective control over a situation is not possible (14). Benefit finding has been studied in the context of major health-related stressors such as cancer (7,11,15–17), bone marrow transplantation (18–19), and serious illness or chronic disease (20–23). It has been associated with reductions in distress (23–24), use of more adaptive coping strategies (22), and mitigation of physiological stress responses related to neuroendocrine and immune function (16,25).

In this study, we examine factors associated with benefit finding among mothers of children undergoing hematopoietic stem cell transplantation (HSCT) and investigate the association between mothers' benefit finding and their psychosocial adaptation following this highly aggressive, life-threatening treatment. Research has shown that mothers of seriously ill children engage in benefit finding. For instance, they may construct "sustaining interpretations" or change their priorities in light of the child's illness (26). One study of 190 mothers of chronically ill children revealed that 80% of mothers indicated that their family had benefited in some way from the child's illness (27). These benefits included closer family relationships, increased appreciation for life and good health, and greater compassion for others. Further, 88% of mothers reported feeling better about themselves after learning to manage their child's illness.

Pediatric HSCT is an established treatment for a number of malignant and nonmalignant diseases and genetic disorders. Although potentially curative, it involves medical procedures that are highly aversive both physically and psychologically. Moreover, a substantial percentage of children undergoing HSCT do not survive to leave the hospital, either because of the underlying illness that necessitated the transplant or because of transplant-related mortality (28–29). Many mothers experience clinically significant levels of distress at the time of transplantation, with evidence suggesting elevated anxiety (30) and depressive symptoms (31) and increased prevalence of generalized anxiety disorder (31). A significant percentage of mothers experience persistent adjustment difficulties months or years afterward (32–33). Indeed, our research using structured clinical interviews suggests that 14% of mothers suffer from transplant-related posttraumatic stress disorder (PTSD) or subclinical PTSD symptomatology 6 months after transplant (32). However, most mothers do not demonstrate long-term distress reactions or psychiatric morbidity in response to pediatric HSCT (31). One factor that may influence mothers' adaptation is their ability to find benefit in their experience.

The vast majority of existing research on benefit finding is cross sectional, precluding examination of how benefit finding changes as a traumatic experience unfolds. In contrast, we apply a longitudinal study design, assessing benefit finding and the psychosocial adaptation of mothers both at the time of the child's hospitalization for HSCT and 6 months later. This strategy enables investigation of the possibility that the antecedents and consequences of mothers' benefit finding change over time as the challenges posed by pediatric HSCT change. Although a handful of longitudinal studies have examined changes in benefit finding and its adaptational consequences over time, none has considered the natural history of the trauma itself.

Mothers face vastly different challenges at the time of the child's hospitalization compared to 6 months later. Specifically, the transplant begins with admission to the hospital for a conditioning regimen of high-dose chemotherapy and possibly radiation therapy. This intense regimen is designed to eliminate diseased cells, suppress immune function in preparation for the transplant, or both (34); however, this regimen can cause serious and potentially fatal toxicity (35). The conditioning regimen is followed by infusion of marrow or stem cells either from the patient (autologous) or from a genetically similar donor (allogeneic). After infusion, children remain hospitalized to manage side effects of the conditioning regimen and to monitor their progress as they await engraftment of the new cells. During this period, they must remain in protective isolation because their ability to fight infection is significantly reduced. For allogeneic transplant recipients, infection risk is also increased by the use of immunosuppressive medications after the infusion, administered to prevent a serious side effect of transplant known as graft-versus-host disease (GvHD). Children are released from the hospital when their new cells engraft, their immune system normalizes, and no serious medical problems exist (34). However, they are at continuing risk for disease relapse (for malignant diseases), infections, and other acute and chronic medical problems (36). Although a child's health is unstable for the first 70 to 100 days following HSCT, risk for infection and transplant-related mortality progressively declines (36). If no serious medical problems exist after this period, patients begin the process of recovery and reintegration (34). It seems plausible that the natural history of this highly aggressive and life-threatening treatment has implications for mothers' coping efforts.

Predictors of Benefit Finding

The first goal of this study was to examine predictors of mothers' benefit finding at both study assessments, focusing on their dispositional optimism and sociodemographic resources and their child's risk for disease- and transplant-related mortality.

Dispositional optimism is a personality trait characterized by a generalized tendency to expect positive outcomes (37). As such, it is distinct from benefit finding, which refers to a situational, event-related response to a severe stressor. Both theory and research suggest that optimism will be associated with mothers' efforts to find benefit in pediatric HSCT (4,9,13). Optimists are more likely to cope with stress by attempting to see the positive side of a stressful experience and, in general, use more adaptive coping strategies (38). This can be traced to the fact that optimists generally expect good outcomes and tend to behave accordingly (37).

Medical risk and sociodemographic resources are also likely to be associated with mothers' benefit finding. Benefit finding appears to be especially likely to occur when an experience is more severe, such as when there is greater threat to life (9,19). As such,

mothers of children at greater risk for transplant- or disease-related mortality should be more likely to engage in benefit finding than mothers of children at lesser risk. In addition, some studies have shown that personal and family resources embodied in sociodemographic characteristics such as household income and education are associated with benefit finding (8,23–24,39–41). We examine these factors as well as the number of other children in the household. Although not commonly conceptualized as a resource, having other children to care for may provide mothers with opportunities for nurturance and distracting role responsibilities that encourage and assist benefit finding.

Early Versus Late Benefit Finding and Psychosocial Adaptation

The second goal of this study was to investigate early (during hospitalization for HSCT) and late (6 months post-HSCT) benefit finding and their respective association with mothers' psychosocial adaptation. A number of cross-sectional studies have investigated benefit finding occurring months or even years after a traumatic experience, based on the assumption that finding benefit in adversity takes time (8,41–42). These studies show that the association between late benefit finding and adaptation is generally positive (2,4,18), although this is not always the case (43–44).

Other research—both cross-sectional and longitudinal—has shown that benefit finding begins shortly after a traumatic experience and that early benefit finding, like late benefit finding, is associated with better posttrauma adaptation (20,45–48). Several longitudinal studies also suggest that patterns of benefit finding may be important (24,47). These studies differentiate between people whose benefit finding increases over time (i.e., those who report that they did not engage in early benefit finding but that they did engage in late benefit finding) and people whose benefit finding decreases over time (i.e., those who report engaging in early benefit finding but not late benefit finding). People who "gain" benefit appear to demonstrate good posttrauma adaptation, similar to those who report benefit finding across all time points, whereas people who "lose" benefit appear to demonstrate poorer adaptation, similar to those who never engage in benefit finding.

Optimism as a Moderator of Benefit Finding and Psychosocial Adaptation

The third goal of this study was to investigate whether benefit finding is more strongly associated with good adaptation among mothers higher in dispositional optimism than among their less optimistic peers. A recent study conducted on breast cancer patients found that coping with cancer through positive reinterpretation was more effective—that is, more strongly related to positive adaptation—for women high in hope than for women low in hope (49). The authors of that study speculated that positive reinterpretation of the cancer experience was a qualitatively different process in the two groups of women. Hope and optimism are conceptually similar with regard to their emphasis on positive expectations for the future and agentic, goal-directed thoughts (50). As such, optimism may do more

than influence the extent to which benefit finding occurs: It may also influence the extent to which benefit finding promotes better adaptation.

Hypotheses

We tested hypotheses related to each of the three study goals. First, we expected the predictors of benefit finding at each time point to reflect the differing challenges posed by HSCT at the time of the transplant (Time 1 [T1]) versus 6 months later (Time 2 [T2]). We hypothesized that at T1 the intensity of treatment and severity of the threat to the child's life would result in medical risk being a significant predictor of benefit finding, whereas sociodemographic resources (e.g., income, education, number of other children) were not expected to predict benefit finding during this period of severe medical stress. At T2, when the child had survived treatment and was home from the hospital, we hypothesized that medical risk would predict a reduced proportion of variance or become nonsignificant and that sociodemographic resources would emerge as a significant predictor of benefit finding. Based on theory and past research, we hypothesized that optimism would predict benefit finding at both time points.

Second, we tested competing hypotheses regarding the association between early versus late benefit finding and psychosocial adaptation. Specifically, existing evidence would lead us to hypothesize that mothers who engaged in more benefit finding across both study assessments or who gained benefit at T2 would demonstrate better T2 psychosocial adaptation than those who engaged in less benefit finding across both study assessments or who lost benefit at T2. Although this pattern of results is plausible, we would expect it to occur only if we assume that benefit finding reflects the same process regardless of context. However, the severity of the immediate threat to survival differs at the two time points, and these contextual differences may have consequences for the relation between benefit finding and adaptation (i.e., it may be that benefit finding reported during hospitalization for HSCT, when the threat to the child's survival is most intense, represents a more effortful and difficult-to-achieve process). Given this, we also tested the hypothesis that early benefit finding would be more highly associated with adaptation than benefit finding during recovery.

Third, we tested the hypothesis that the adaptational advantages of benefit finding would be greater for mothers higher in optimism than for those lower in optimism.

METHODS

Participants

The sample included 144 women participating in a study of maternal adaptation to pediatric HSCT being conducted at six pediatric HSCT units. Women were approached for recruitment into the parent study if they were the primary caretaker of a child age 21 or younger undergoing HSCT, able to speak and read in English, and were age 18 or older. Of the 415 women approached, 129 (31%) declined to participate, most often because they felt overwhelmed (19%), were not interested (16%), felt the study would take too much time (12%), or did not want to leave

their child (9%). Refusers did not differ significantly from consenters on age, marital status, ethnicity, child's age or sex, type of HSCT (allogeneic vs. autologous), or number of disease relapses prior to HSCT. Of the mothers who agreed to participate, 174 of the 286 were eligible for participation in this study because they had completed the T1 assessment and their child had survived to reach 6 months post-HSCT. However, 21 (12%) of these mothers had either dropped out of the study before T2 ($n = 11$) or skipped the T2 assessment ($n = 10$) for unknown reasons. They did not differ significantly from those who participated on any sociodemographic or medical variable. Nine mothers were missing benefit finding or medical data, leaving 144 in this sample.

Mothers were, on average, 37 years old ($SD = 6.8$). The sample was predominantly White (77%; 10% African American, 8% Latina, 5% other), well-educated (82% of the sample had some college education), and middle income (average income between $50,000 and $60,000). Eighty-five percent of mothers were married, and 83% had other children besides the child receiving HSCT (range = 0–6 other children, $M = 1.6$, $SD = 1.2$).

The children of mothers participating in the study were, on average, 8 years old ($SD = 5.5$, range = 9 months–20 years). Fifty-eight percent were male. Eighty-three percent received HSCT to treat a malignant disease, most often acute lymphatic leukemia (19%), neuroblastoma (17%), and acute myelogenous leukemia (17%). Most children (69%) were undergoing allogeneic HSCT, and 77% of these children received stem cells from human leukocyte antigen (HLA) identical donors (i.e., completely matched on HLAs). The rest received stem cells that were mismatched on one (13%), two (8%), or three (2%) HLAs. The median weeks between diagnosis and transplant was 37 ($M = 102$, $SD = 140$, range = 6 weeks–16 years). The mean number of days between the T1 assessment and stem cell infusion was 3.6 ($SD = 3.0$).

Procedures

Eligible mothers were approached by a research assistant either by phone or in person during a prehospitalization clinic visit or shortly after the child's admission to the hospital and provided with information about the study. Mothers who agreed to participate completed informed consent procedures and were given an appointment for the T1 assessment, which was administered in a 60- to 90-min interview after the child was admitted to the hospital for HSCT. All T1 assessments were completed prior to HSCT infusion. The T2 assessment occurred approximately 6 months after the HSCT ($M = 29.32$ weeks, $SD = 3.53$, range = 24–38 weeks), was completed either in person or by phone, and took about 50 min to complete.

Measures

Measures for this study were embedded in the interview materials for the larger project. Descriptive statistics and correlations between study measures are shown in Table 1.

Benefit finding was assessed at T1 and T2 with two items created for this study: "When I think of my child's illness, I have been looking for positive things that have come out of it for my

family" and "When I think of my child's illness, I have been able to find positive things that have come out of it for my family." These are similar to one-item measures of benefit finding used in past research (20). Mothers rated the items on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Because responses to the two items were highly correlated at both time points (T1 and T2 rs = .67 and .69, respectively; both ps < .001), their mean was calculated to form indexes of T1 benefit finding and T2 benefit finding. The resulting scales had good internal reliability (Cronbach's α = .80 at T1 and α = .82 at T2).

Dispositional optimism was assessed at T1 using the Life Orientation Test, a well-validated measure (37) that includes eight items (e.g., "In uncertain times, I usually expect the best") rated on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). To form an index of optimism, the scores of negatively worded items were reversed and the mean of all items was calculated. The scale had good internal reliability (Cronbach's α = .85).

Psychosocial adaptation in the month preceding each assessment was measured with the Mental Health Summary Scale of the Short Form–36 (SF–36) health survey (51), scored as described by Ware and Kosinski (52). This scale captures variance in the SF–36 related to mental health; it emphasizes perceived vitality, social functioning, the impact of emotional factors on normative role functioning, and mental health. Scores range from 0 to 100, with lower scores denoting more frequent distress, lower perceived general health, and greater social and role disability due to emotional problems (52). This instrument was selected because it is a well-validated scale that measures both psychological and behavioral aspects of psychosocial adaptation, demonstrates clinically meaningful change over time, and has shown excellent internal reliability in past research (52). Comparison of published norms (52) and mothers' psychosocial adaptation scores at T1 and T2 (see Table 1) indicated that mothers participating in this study demonstrated worse psychosocial adjustment at both timepoints than women in the general U.S. population ($M = 49.52$, $SD = 10.40$). Indeed, their scores were comparable to scores obtained from a sample of depressed men and women in the general U.S. population ($M = 36.78$, $SD = 11.60$).

Information regarding risk for transplant- and disease-related mortality was gathered from medical charts by trained study personnel.[1] Factors related to the severity of transplant risk (diagnosis, disease stage, autologous vs. allogeneic transplant, relationship of donor to patient, and degree of HLA match) were used to classify children into a three-level transplant risk variable, resulting in 22% of children classified as low risk, 60% as intermediate risk, and 18% as high risk. Factors related to the severity of disease risk (diagnosis, disease stage) were used to classify children into a four-level disease risk variable, resulting in 17% of children classified as nonmalignant

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[1]Depending on the study site, these individuals included a medical doctor, a data quality analyst, research nurses, or bachelor's degree–level trained research assistants. Data gathered from medical charts were not subjective, so data coding was not an issue (i.e., study personnel examined medical charts to locate and record physicians' notations regarding diagnosis, transplant type, complications, etc.).

TABLE 1
Correlations and Descriptive Statistics for Study Variables

Variables	1	2	3	4	5	6	7	8	9	M	SD
T1 benefit finding	—	.57***	.35***	.13	.19**	.14*	.05	.18*	.11	3.76	1.01
T2 benefit finding		—	.38***	.21**	.15*	.18**	.03	.19**	.10	3.85	.91
Optimism			—	.09	.06	.14*	−.06	.53***	.38***	29.96	5.70
No. of other children				—	.11	−.04	−.16*	−.03	.02	1.58	1.19
Regimen-related toxicity					—	.11	.10	.11	.07	2.69	2.20
Disease risk						—	.54***	.05	.11	2.49	.85
Transplant risk							—	.01	−.16*	1.97	.63
T1 psychosocial adaptation								—	.31**	40.89	11.77
T2 psychosocial adaptation									—	31.08	5.82

Note. $N = 144$. T1 = Time 1; T2 = Time 2.
*$p < .10$. **$p < .05$. ***$p < .001$.

(lowest risk), 24% as malignant–early stage disease, 52% as malignant–intermediate stage disease, and 7% as malignant–advanced disease (highest risk). Other medical information included number of prior relapses, acute GvHd during hospitalization (present–absent), chronic GvHD at T2 (present–absent), transfer to the intensive care unit during hospitalization (yes–no), cumulative conditioning regimen-related toxicity (35), disease status at T2 (relapse–absence of disease), number of Grade 1 to 3 infections during hospitalization and between hospital discharge and T2, and number of additional hospitalizations between hospital discharge and T2.

RESULTS

Predictors of Benefit Finding

Two hierarchical multiple regression analyses were conducted to test the hypothesis that predictors of benefit finding would differ at T1 and T2. T1 benefit finding and T2 benefit finding were separately regressed on medical risk (Step 1), sociodemographic resources (Step 2), and optimism (Step 3).[2] Medical risk and sociodemographic resources variables were entered into these analyses if they were at least marginally correlated ($p < .10$) with benefit finding at either time point. For medical risk, regimen-related toxicity and risk for disease-related mortality met this criterion. For sociodemographic resources, maternal education and the number of other children in the household met the criterion.

Results are summarized in Table 2. Both the model for T1 benefit finding, $F(5, 138) = 5.74$, $p < .001$, and T2 benefit finding, $F(5, 138) = 7.13$, $p < .001$, were significant. As hypothesized, dispositional optimism was a significant predictor of benefit finding at both time points. Note that medical risk and sociodemographic resources were controlled in these models. In addition, hypotheses regarding medical risk and sociodemographic resources were mostly supported: At T1, medical risk was a significant predictor of benefit finding ($p = .02$), whereas sociodemographic resources did not predict a significant proportion of the variance in benefit finding ($p = .14$). This relation was different at T2, when both medical risk ($p = .049$) and sociodemographic resources ($p = .01$) significantly predicted benefit finding. Reversing the order of Steps 1 and 2 did not alter these findings.[3]

Benefit Finding and Psychosocial Adaptation

Several analyses were conducted to test hypotheses concerning the association between benefit finding and psychosocial adaptation. First, T2 psychosocial adaptation was regressed on T1 psychosocial adaptation (Step 1); transplant-related risk for mortality (the only medical risk or sociodemographic resources variable significantly related to the outcome; Step 2); and T1 benefit finding and T2 benefit finding (Step 3). This analysis enabled examination of the independent associations between benefit find-

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[2]All analyses that included optimism were also conducted using a six-item version of the scale that did not include two items highly related to benefit finding ("I always look on the bright side of things" and "I'm a believer in the idea that 'every cloud has a silver lining'"; 4,56). Removing these items did not alter our findings. We did not conduct analyses using separate optimism and pessimism scales, as suggested by Affleck and Tennen (4), because of the large correlation between these subscales ($r = -.56$). This correlation was comparable in size to the mean item total correlation in a reliability analysis of the Life Orientation Test ($r = .59$). In addition, the two-item optimism scale that would have resulted from separating optimism and pessimism and removing two optimism items demonstrated poor internal reliability (a = .60).

[3]An exploratory hierarchical multiple regression was conducted to predict T2 benefit finding controlling for T1 benefit finding, enabling examination of factors predicting changes in benefit finding from T1 to T2. Although we did not formulate hypotheses regarding predictors of changes in benefit finding, these findings may be of clinical interest. In this model, T1 benefit finding was a significant predictor of T2 benefit finding: Step 1, $F(1, 142) = 68.33$, $p < .001$. Further, medical risk was not significant, Step 2, $F(2, 140) = .61$; sociodemographic resources were marginally significant, Step 3, $F(2, 138) = 2.55$, $p = .08$; and optimism was significant, Step 4, $F(1, 137) = 6.71$, $p = .01$. Therefore, only optimism significantly predicted change in benefit finding, although mothers with greater sociodemographic resources demonstrated a marginal increase in benefit finding over time. This was primarily due to having more children ($\beta = .15$, $p = .04$) rather than having more education ($\beta = .07$, *ns*).

TABLE 2

Summary of Hierarchical Multiple Regression Comparing Relative Contributions of Optimism, Medical Factors, and Sociodemographic Resources to Benefit Finding at Times 1 and 2

	Time 1 Benefit Finding				*Time 2 Benefit Finding*			
Variables	β	sr^2	F (Step)	ΔR^2	β	sr^2	F (Step)	ΔR^{2a}
Step 1			3.99**	.05			3.09**	.04
Regimen-related toxicity	.14*	.02			.14*	.02		
Disease risk	.17**	.03			.14*	.02		
Step 2			2.01	.03			4.51**	.06
No. of other children	.14*	.02			.22***	.05		
Education	.10	.01			.13*	.02		
Step 3			15.32****	.09			18.24****	.11
Optimism	.31****	.09			.33****	.11		

Note.   N = 144.

[a]The sum of the proportions of variance associated with individual variables (sr^2) may be greater than stepwise changes in variance (ΔR^2) due to rounding error.

p < .10. **p* < .05. ***p* < .01. ****p* < .001.

ing at each time point and T2 psychosocial adaptation. Both T1 psychosocial adaptation (β = .31, *p* < .001) and transplant-related risk (β = −.17, *p* = .03) predicted T2 psychosocial adaptation. Contrary to expectations, neither T1 benefit finding (b = .05, *ns*) nor T2 benefit finding (β = .02, *ns*) predicted T2 psychosocial adaptation after controlling for T1 psychosocial adaptation and transplant-related risk, *F*(4, 139) = 5.21, *p* = .001.

A second hierarchical multiple regression analysis was conducted in which benefit-finding change scores (T2 benefit finding – T1 benefit finding) were entered into Step 3 of the previous model instead of T1 benefit finding and T2 benefit finding. This analysis enabled examination of the hypothesis that change in benefit finding over time (i.e., gaining or losing benefit) would be related to T2 psychosocial adaptation. However, the change score was not a significant predictor, β = −.02, *ns*; *F*(3, 140) = 6.80, *p* < .001.

Optimism as a Moderator of Benefit Finding and Psychosocial Adaptation

A hierarchical multiple regression was conducted to examine whether benefit finding was more strongly associated with good adaptation among mothers higher in dispositional optimism than among their less optimistic peers. In this analysis, T2 psychosocial adaptation was regressed on T1 psychosocial adaptation (Step 1); transplant risk (the only medical or sociodemographic variable significantly related to the outcome; Step 2); optimism, T1 benefit finding, and T2 benefit finding (Step 3); and the three two-way interaction terms for optimism and benefit finding at T1 and T2 (Step 4). Interaction terms were calculated using mean centered variables, and all predictors were mean centered (53). The results of this analysis, which revealed a significant interaction between T1 benefit finding and optimism, are shown in Table 3. A graph of the interaction (with optimism and T1 benefit finding graphed at 1 *SD* above and below their respective means [53]) is shown in Figure 1. The results show that mothers high in dispositional optimism who reported more benefit finding at T1 demonstrated significantly better psychosocial adaptation 6 months after the HSCT than high optimism mothers who reported less benefit finding at T1, simple slope, *t*(135) = 2.27, *p* = .03. In contrast, low-optimism mothers who reported more benefit finding at T1 demonstrated marginally worse psychosocial adaptation 6 months after the HSCT than low-optimism mothers who re-

TABLE 3

Summary of Hierarchical Regression Predicting Time 2 Psychosocial Adaptation

Step	Variable	B	SE B	β	ΔR^2	F (Step)
1	T1 psychosocial adaptation	.15	.04	.31***	.10	F(1, 142) = 15.16***
2	Transplant risk	−1.61	.73	−.17*	.03	F(1, 141) = 4.89*
3	T1 BF	.02	.55	.00	.06	F(3, 138) = 3.22*
	T2 BF	−.26	.61	−.04		
	Optimism	.30	.10	.30**		
4	T1 BF × Time 2 BF	−.02	.50	.00	.05	F(3, 135) = 2.83*
	T1 BF × Optimism	.28	.10	.30**		
	T2 BF × Optimism	−.12	.09	−.15		
Full model					.24	F(8, 135) = 5.10***

Note.   All predictors were mean centered. N = 144. T1 = Time 1; T2 = Time 2; BF = benefit finding.
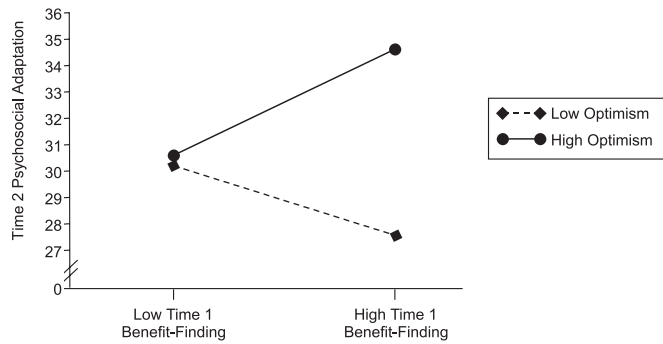
p < .05. **p* < .01. ***p* < .001.

FIGURE 1   Predicted mean psychosocial adaptation as a function of dispositional optimism and T1 benefit finding.

ported less benefit finding at T1, simple slope, $t(135) = -1.72$, $p = .09$.

DISCUSSION

In this study, we investigated mothers' benefit finding as a process capable of changing over time as the challenges posed by a child's HSCT changed. Assessments occurred during the child's hospitalization for HSCT, when the intensity of treatment and severity of the threat to the child's life was highest, and 6 months later, when the child had survived initial treatment and had been released from the hospital. Results indicated that the antecedents and adaptational consequences of benefit finding differed for each assessment and that dispositional optimism moderated the relation between early benefit finding and later psychosocial adaptation.

Our first research question concerned differences in the predictors of benefit finding across study assessments. At both time points, the strongest predictor of mothers' benefit finding was their dispositional optimism: More optimistic mothers were more likely to report benefit finding both at the time of the child's hospitalization and 6 months later despite vastly different circumstances at each timepoint. This effect was independent of the role of medical risk and sociodemographic resources and attests to the importance of dispositional positive expectancies for benefit finding.

In addition, these findings provided evidence that the relation of medical risk and sociodemographic resources to benefit finding differed at each assessment. Medical risk (disease-related risk for mortality and regimen-related organ toxicity) predicted mothers' benefit finding both during the child's hospitalization and 6 months later. Note that many medical risk variables, including transplant-related risk for mortality and indicators of the child's medical course between the two time points, were not related to mothers' benefit finding. The medical risk variables were objective indicators drawn from the child's medical chart, and it is possible that mothers were not informed of them or that their relevance to the child's prognosis was not clearly explained or fully understood. Nonetheless, the fact that mothers of children at greater medical risk engaged in more benefit finding at both time points is consis-

tent with evidence that benefit finding is more likely to occur when a traumatic experience is more severe, such as when there is greater threat to life (9,19). We did not expect the relation between medical risk and T2 benefit finding to be as strong as the relation between medical risk and T1 benefit finding, but in retrospect it is understandable that higher medical risk would continue to be associated with greater maternal benefit finding even after the transplant: Children at higher medical risk are at higher risk for disease relapse and for experiencing long-term or late effects of HSCT than children at lower medical risk.

As predicted, sociodemographic resources did not emerge as predictors of benefit finding until 6 months after HSCT, when more educated mothers and those with more children reported greater benefit finding. This effect was independent of the effects of medical risk and dispositional optimism. We have speculated that having other children to care for may provide mothers with opportunities for nurturance and distracting role responsibilities that encourage and assist benefit finding. However, the exact mechanisms underlying this relation will need to be investigated in future research. Additional research is also needed to clarify the reasons that sociodemographic resources predict late but not early benefit finding. It may be that the advantages conferred by these relatively stable resources require time to accrue. Alternatively, these advantages may only emerge after the most intense period of an extreme stressor passes and the effects of more extreme influences on coping behaviors and stress responses subside.

Together, medical risk and sociodemographic resources accounted for approximately the same amount of variance in benefit finding as did optimism. However, the fact that all three factors demonstrated independent contributions provides evidence that benefit finding is influenced by both dispositional and contextual factors. Still, much of the variance in mothers' benefit finding remains to be explained, and other potential predictors should be investigated, including factors such as coping styles, social support, preexisting vulnerabilities, and event characteristics (8,9).

The second research question addressed relations between early and late benefit finding and psychosocial adaptation 6 months post-HSCT. Mothers' psychosocial adaptation was assessed with a composite measure that included aspects of psychological (symptoms of depression and anxiety), physical (perceived vitality), and behavioral adaptational outcomes (the extent to which emotional and health difficulties interfered with social activities). Analyses revealed that neither early nor late benefit finding predicted psychosocial adaptation.

One reason for this lack of a relation became apparent once mothers' dispositional optimism was examined as a moderator of the relation between benefit finding and psychosocial adaptation. Findings revealed that, for optimistic mothers, early benefit finding was associated with better psychosocial adaptation 6 months later. Conversely, for mothers lower in optimism, early benefit finding was associated with somewhat worse psychosocial adaptation 6 months later (a marginally significant relation). These findings are consistent with the findings of Stanton,

Danoff-Burg, and Huggins (49) who speculated that, for breast cancer patients high in hope, positive reappraisal may reflect an active approach to coping based on positive expectations of their ability to cope with their illness, whereas for patients low in hope, positive reappraisal may reflect an avoidant coping strategy similar to wishful thinking. A similar explanation may apply here (i.e., benefit finding may represent different processes among optimists compared to pessimists). Although dispositional optimism has been investigated as a predictor of benefit finding (24) and proposed as a potential third variable explaining the relation between adaptive coping and finding benefit in adversity (54), it has never been investigated as a moderator of the relation between benefit finding and posttrauma adaptation. Our results suggest that benefit finding is more adaptive for some individuals confronting a severe stressor than for others. These results also indicate that failure to account for influential moderators can obscure important relations between benefit finding and adaptational outcomes (cf. 55).

The prospective association between early benefit finding and later psychosocial adaptation supported our hypothesis that early benefit finding would be more strongly associated with adaptation than late benefit finding. This hypothesis was based on the belief that benefit finding reported during hospitalization, when treatment and the threat to the child's survival were most intense, may be more effortful or difficult to achieve than benefit finding reported 6 months later, when the child was home from the hospital and in recovery (i.e., there may be a fundamental difference in benefit finding at the two time points, influenced by the context provided by the natural history of pediatric HSCT). This possibility must be considered in light of the interaction between early benefit finding and dispositional optimism: Perhaps benefit finding occurring during the most intense part of a severe stressor is more likely to implicate dispositional differences between maladaptive and adaptive coping processes (49). An interesting avenue for future research in this area is provided by Affleck and Tennen's (4) distinction between *benefit reminding* (a motivated, intentional coping strategy that involves reminding oneself of benefits that have been identified) and *benefit finding* (a simple expression of the conclusion that one has gained benefit from an experience). These different types of benefit finding may be more likely to occur at different points in the history of a traumatic experience, or they may have different consequences for optimists versus pessimists. Research incorporating a fine-grained analysis of the motivations, goals, and coping behaviors underlying different types of benefit finding for optimists and pessimists would be valuable.

There are several limitations of this study that must be acknowledged. First, the sample was exclusively female and English speaking, and the participants were predominantly White, married, and well-educated. Caution should be used in attempting to generalize these findings to other populations. Second, this study included only two time points and followed mothers for only 6 months after their child's HSCT. A research design with a greater number of time points would provide a more fine-grained analysis of the process of benefit finding, and following mothers for longer than 6 months would enable investi-gation of benefit finding as it unfolds in the long term. Third, we used a brief measure of benefit finding that does not differentiate between different types of benefits. The use of brief measures of benefit finding is not unusual in this literature (e.g., 20,24). However, future research should include multi-item measures developed to avoid the psychometric shortcomings of single-item measures and to enable assessment of different types of benefits. Finally, although our hypothesis regarding medical risk was supported, a stronger test of the relation between medical risk and benefit finding during the child's hospitalization would involve consideration of the child's medical response to the preinfusion conditioning regimen, which was occurring at the time of the study assessment. Although we gathered data on factors such as development of infections, we were unable to determine whether they had occurred prior to or following assessment of T1 benefit finding; thus, we were unable to investigate their role as predictors of T1 benefit finding.

Despite these limitations, this study makes two unique contributions. First, the longitudinal study design enabled us to determine that benefit finding occurring at different points in a traumatic experience may reflect different processes with different relations to adaptational outcomes. Others have noted a need to investigate benefit finding as a process, emphasizing the need for longitudinal studies to examine changes in benefit finding over time as well as prospective relations between benefit finding and posttrauma adaptation (e.g., 40–41). Our findings demonstrate the advantages of considering the natural history of the stressor itself and its influence on benefit finding. Second, this study adds to the body of research demonstrating the importance of optimism as a resource for coping with adversity and expands on it by demonstrating that optimism moderates the relation between benefit finding and posttrauma adaptation. Additional research is needed to replicate these findings and to confirm potential fundamental differences in benefit finding occurring at different points of a traumatic experience. This research would help advance knowledge of the process by which positive change occurs following trauma. Furthermore, clarifying the course of benefit finding over time through use of a process-oriented approach provides an important foundation for translating empirical literature into interventions and effective clinical practice.

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