

# Effects of Written Emotional Disclosure on Caregivers of Children and Adolescents with Chronic Illness

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**Objective** Tested feasibility of a written emotional disclosure intervention with caregivers of youths with chronic illness and its effects on measures of mood, physical symptoms, health-related quality of life, distress, and caregiver appraisal of stress and efficacy.

**Methods** Measures were administered prior to and immediately after writing and 4 months later. Experimental group ( $n = 29$ ) wrote about traumas and stressors while the control group ( $n = 25$ ) wrote about summer activities for 20 minutes on three different days.

**Results** Consistent with hypotheses, the experimental group experienced less positive affect,  $F(1, 54) = 4.68, p < .05$ , and more negative affect,  $F(1, 54) = 7.92, p < .01$ , and physical symptoms,  $F(1, 54) = 4.30, p < .05$ , immediately following writing than the control group. There were no significant Group  $\times$  Time interactions on long-term mood, distress, health-related quality of life, or caregiver appraisal. Contrary to hypotheses, the control group had more vitality over time,  $F(1, 53) = 21.29, p < .001$ , than the experimental group.

**Conclusions** Recommendations include modifying the procedures to attain more control in applied settings and identifying specific processes that contribute to the efficacy of written emotional disclosure on well-being.

**Key words** written emotional disclosure; caregivers; children; adolescents; chronic illness.

Recent research indicates that caregivers of children and adolescents with chronic illness are likely to experience distress ranging from increases in negative affect (Camden, Rosenbaum, Boyle, & Offord, 1991; Sloper, 2000) to symptoms of posttraumatic stress disorder (PTSD) (Barakat et al., 1997; Landolt et al., 2002). Consequently, the development and evaluation of interventions which can ameliorate distress, improve psychological and physical health, and facilitate adaptive coping of caregivers of children and adolescents with chronic illness are needed (Thompson & Gustafson, 1996). Previous interventions with caregivers of children and adolescents with chronic illness have included a number of methods, including family-centered (e.g., Ireys, Sille, Kolodner, & Walsh, 1996; Wysocki et al., 2000) and home visit programs (e.g., Stein & Jessop,

1991) that were designed to improve problem solving, social support, parent/child relations, and management of the child's illness, and to reduce the distress of multiple family members. To our knowledge, all of these interventions have been conducted in outpatient settings. Thus, the generalizability to caregivers of hospitalized children and adolescents with chronic illness who often present with high levels of stress is not known. Also, most interventions have required multiple sessions of contact with the recipient, making them relatively costly and labor intensive, and thus reducing the feasibility of implementation on a wide scale.

An informal, potentially feasible intervention that is often suggested by health care providers to caregivers of children and adolescents with chronic illness is to write down their thoughts and feelings. Although anecdotal

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reports suggest that this type of intervention has helped caregivers of children and adolescents with chronic health conditions, to our knowledge no study has formally tested the efficacy of written emotional disclosure among such a population. However, research has demonstrated that written emotional disclosure is an effective intervention in many other adult populations. In order to study the effects of written emotional disclosure, Pennebaker (1997) developed an experimental task—the writing task—in which disclosure occurs through writing. Specifically, participants are assigned to either write about traumatic or stressful events in their life (experimental group) or write about superficial topics (control group) for approximately 15 to 20 minutes per day for approximately 3 to 4 days.

The potential positive effects of the writing task are hypothesized to be a result of improved affect regulation, including regulation of emotion-related experience and physiological responses, which in turn influences psychological and physiological function (Lepore, Greenberg, Bruno, & Smyth, 2002). Emotion regulation is facilitated through attention to and habituation to uncomfortable emotional experiences and subsequent changes in cognition such as improved working memory (e.g., ability to sustain attention during distraction and a necessary component for problem solving), an increase in cognitive resources, and increase in cognitive restructuring, which is defined as changes in how people view stressors or their responses to stressors. Cognitive restructuring can result when people feel a sense of control over emotions and can integrate emotional experiences into a sense of identity that is no longer threatening. As a result, an individual will likely experience less negative affect and, ultimately, less chronic subjective stress (Lepore et al., 2002). Habituation and cognitive restructuring through writing are also hypothesized to free up attentional and cognitive resources, thus promoting problem solving and coping and reducing negative emotional and physiological stress (Klein, 2002). Improvements in problem solving and coping may also contribute to better affect regulation and management of physical symptoms that may precipitate an illness.

Given the hypothesized improvements in psychological and physical symptoms following participation in the writing task, it is not surprising that there is evidence that written emotional disclosure can be advantageous for reducing physical symptoms (Greenberg & Stone, 1992; Greenberg, Wortman, & Stone, 1996), reducing visits to physicians (Cameron &

Nicholls, 1998; Greenberg et al., 1996, Pennebaker & Francis, 1996), improving immune functioning (Booth, Petrie, & Pennebaker, 1997; Pennebaker, Kielcolt-Glaser, & Glaser, 1988; Petrie, Booth, Pennebaker, Davison, & Thomas, 1995), and improving well-being, including reduction in depressive and anxious symptomatology (Cameron & Nicholls, 1998; Francis & Pennebaker, 1992; Pennebaker, Colder, & Sharp, 1990; Schoutrop, Lange, Hanewald, Duurland, & Bermond, 1997; Smyth, 1998a). However, the success of the writing task has been demonstrated mostly in a laboratory setting with participants with specific exclusionary criteria (e.g., psychiatric diagnoses, involvement in psychotherapy, use of psychotropic medication). Recently, researchers have indicated the need for studies that test the effectiveness of the written emotional disclosure task as an intervention in an applied setting (e.g., a hospital) with a diverse population (Smyth & Catley, 2002).

In particular, preventative interventions such as the written emotional disclosure task that can be implemented in the hospital and which may potentially improve physical and psychological well-being are advantageous for caregivers of children and adolescents for the following reasons:

1. staying physically healthy is important for caregivers to optimally care for their child, especially if the child is immunosuppressed;
2. research demonstrates that parents of children with chronic illness are at risk for experiencing general distress (Camden et al., 1991; Sloper, 2000) and possibly stress-related problems such as PTSD (Barakat et al., 1997, Landolt et al., 2002);
3. caregivers spending time in the hospital are assuming the burden of caregiving and may be isolated from social support, which are risk factors for distress (Streisand, Rodrigue, Houck, Graham-Pole, & Berlant, 2000; Speechley & Noh, 1992);
4. caregiver use of emotion-focused coping is a risk factor for distress (Baskin, Forehand, & Saylor, 1986; Thompson, Gil, Burbach, Keith, & Kinney, 1993a), thus making a preventative intervention which may elicit more frequent use of problem-solving coping important; and
5. caregiver appraisal of high levels of illness-related stress and low levels of confidence to manage such stress is related to distress (Sloper,

2000), thus making an intervention which can potentially elicit cognitive restructuring of appraisal of stress and self-efficacy also important.

The proposed study was designed to implement the written emotional disclosure task with caregivers of children and adolescents with chronic illness (e.g., cancer, sickle cell disease, immunodeficiency and human immunodeficiency virus, hemophilia, and chronic liver failure) whose children were hospitalized at the time of implementation and were followed up 4 months later. To our knowledge, this study is the first to test the feasibility of the writing task in a pediatric hospital setting, with very few exclusionary criteria for participants, as recommended by Smyth and Catley (2002). The study also tested the generalizability and feasibility of an empirically supported intervention in a pediatric setting, which has also been recommended as a research priority (Drotar & Lemanek, 2001).

The proposed study also extended previous research on the efficacy of the writing task by including a wide range of outcome measures, many of which have not been used in previous research on written emotional disclosure. We included measures of immediate mood and physical symptoms that had consistently been used in previous studies on written emotional disclosure. Additionally, we included other measures of psychological well-being for many reasons. The first reason was the importance of using standardized measures of psychological well-being as opposed to global unstandardized reports of satisfaction. Improvements in psychological well-being have not often been well documented with standardized measures, but rather have often been claimed based on participants' global reports of feeling better (e.g., Francis & Pennebaker, 1992).

Additionally, our goal was to extend previous research on the writing task by including measures of intervention effects on a broader range of psychological outcomes than have been used in previous evaluations of writing task interventions focused on distress. We chose measures that were expected to be sensitive to the specific outcome domains thought to be affected by the intervention in accord with our theoretical rationale for the efficacy of the writing task. Improvements in problem solving, coping, and desensitization to anxious arousal resulting from the writing task intervention were expected to result in improved health-related quality of life (HRQOL), reductions in long-term mood and anxious and depressive symptomatology,

and increased appraisal of and ability to handle caregiver distress.

Thus, based on previous research findings and theoretical rationale described above, it was hypothesized that participants who wrote about traumas or stressors (experimental group), in comparison with those who wrote about neutral topics (control group), would exhibit the following: (1) a greater decrease in distress after 4 months (Schoutrop et al., 1997; Smyth, 1998a), (2) a greater improvement in HRQOL after 4 months (Smyth, 1998a), (3) appraisal of less stress related to the child's illness and of increased efficacy in the ability to deal with stressors related to the child's illness, (4) a greater decrease in positive mood and an increase in negative mood after each writing session, but a return to baseline levels of mood after 4 months (Francis & Pennebaker, 1992; Greenberg et al., 1996; Pennebaker & Beall, 1986), and (5) a greater decrease in physical symptoms after completion of the writing task (Greenberg & Stone, 1992) and 4 months later (Smyth, Stone, Hurewitz, & Kaell, 1999).

## Methods

This study was a randomized controlled trial with caregivers of children and adolescents with chronic illness who were hospitalized at the time of participation. An experimental design was employed by which the primary caregivers were randomly assigned to an experimental (writing about trauma or stressors) or control group (writing about neutral topics). Implementation of the writing task in the hospital with primary caregivers of children and adolescents with a variety of chronic illnesses had several advantages: (1) Caregivers of children who are hospitalized are most likely stressed and in need of an intervention; (2) caregivers in the hospital should have time to write; and (3) caregivers in the hospital provided a research context whereby the feasibility and generalizability of the writing task could be tested in an applied setting with a diverse population.

We limited the implementation of the study to the hematology/oncology floor in the hospital in order to assure that the majority of the participants would have children with a chronic illness (mostly cancer or sickle cell disease) that was associated with repeated hospitalization and thus would be expected to be a salient stressor among the caregivers. Also, the patients on this floor were most often hospitalized for 3 days or more, which increased the feasibility of the implementation of

the writing task in the hospital given the need to write for 3 days.

### Participants

Potential participants were those identified as primary caregivers of the hospitalized child by the child life specialist or head nurse on the hematology/oncology floor at a large Midwestern tertiary care children's hospital. Inclusionary criteria for the caregivers consisted of (1) being the primary caregiver of a hospitalized child or adolescent with a chronic illness, (2) being available to do the writing task for 3 days in the hospital, or agreeing to continue the study at home if discharged earlier than expected, and (3) English literacy. In order to confirm that the referred participants were primary caregivers, the experimenter asked them to identify the primary caregiver of the hospitalized child. If they identified themselves as the primary caregiver, then they were eligible for the study. If they identified themselves and someone else (e.g., spouse, mother), then both were eligible and data from both respondents were used.

One hundred and three potential participants who met the inclusion criteria were approached on the floor from November 2000 to March 2002. Of those, 72 caregivers agreed to participate. There were no differences between the hospitalized child of those caregivers who agreed to participate and those that did not on age, gender, or disease. Of the 72 who agreed to participate, 54 completed all 3 days of writing and the follow-up. Of those who did not complete the study ( $n = 18$ ), 11 did not finish the 3 days of writing and 7 did not return the follow-up. In almost all cases, those who refused participation or discontinued participation in the hospital claimed that they did not have time or had too much to deal with. However, there were no significant differences between those who remained in the study and those who dropped out on measures of general mood (e.g., Profile of Mood States [POMS]–Short Form and Brief Mood Rating Scale). Reasons for those who discontinued after leaving the hospital were more difficult to characterize because many dropped participation by not completing the follow-up and were not reachable after several attempts.

Of the 54 participants, 16 had received a diagnosis for their child during the current hospital admission, while 16 reported that their child was admitted to receive chemotherapy, 15 reported that their child was admitted due to a fever or infection, 6 reported that their child was admitted for a stem cell or bone marrow transplant, 2 reported that their child was

admitted for a sickle cell pain crisis, and 5 reported other reasons for admission. Using the question “On a scale of 1 to 10, how severe is your child's illness?” which appeared on the demographic form, the participants identified that the mean severity of their child's illness was 8.74 (range = 4–10). The average time since diagnosis for those participants with children with cancer ( $n = 42$ ) was about 1 year (11.89 months, range = 0.25–99 months).

Comparisons of demographic data and child illness between those who completed the study and those who did not, using *t*-tests and chi-squares, revealed no significant differences between the groups. Additionally, there were no significant differences between those who dropped out of the study and those who did not. Demographic information for the final sample of 54 participants is presented in Table I.

### Procedures

The possible participants were approached by the experimenter in the hospital room of their child, where informed consent was acquired. They were told that we were testing a coping intervention involving writing about experiences, but they were not given details related to the hypotheses or specific objectives of the study. Participants were given the choice to participate in the hospital room or in another, more private, room. Most participants agreed to participate only if they could remain in the child's hospital room ( $n = 48$ ). Once informed consent was obtained, the participants were randomly assigned to either the control group or the experimental group and were given questionnaires which assessed demographic information, HRQOL, distress, mood, physical symptoms, and appraisal of stress and ability to deal with stressors related to the child's condition. Only the measures of mood and physical symptoms were repeated prior to each day of writing and immediately after writing.

We allotted caregivers flexibility in choosing alternative times to complete the writing task, given that many participants ( $n = 22$ ) preferred not to begin right away due to conflicting priorities or the desire to participate only when their child was asleep. In these cases, the experimenter explained the procedures in detail and also left the participant with a packet with the writing instructions for the measures.

### Instructions for Experimental Group

After baseline measures were completed, the participants in the experimental group were given the following

instructions, which were taken from those used in previous research on written emotional disclosure (Smyth, 1998a):

During each of the three writing days, I want you to write about the most traumatic and upsetting experiences of your entire life. You can write on different topics each day or on the same topic for all 3 days. The important thing is that you write about your deepest thoughts and feelings. You can write about anything you want, but it is critical that you let yourself go and touch those deepest emotions and thoughts that you have. Some people find this writing upsetting and may cry or feel sad or depressed afterward. This is quite normal, and we will allow you as much time as you want when you have finished writing to compose yourself. All of your writing will be completely confidential. Don't worry about spelling, sentence structure, or grammar. The only rule is that once you begin writing, continue to do so until your time is up.

These instructions are general, rather than asking caregivers to write about stress related to their child's illness, for a few reasons. First, research has shown that the effects of the writing task occur regardless of whether the instructions are general or specifically ask participants to write about a particular stressor or event (Smyth, 1998b). Also, what is theoretically important is that participants write about what is most concerning or stressful to them (Pennebaker, 1997).

#### Instructions for the Control Group

Prior research has instructed the control group to write about daily activities (e.g., Smyth, 1998a). However, because the daily activities of the participants in this study were constrained to the hospital setting and care of their child, an alternative control task was chosen. Instead, participants in the control group were asked to write about activities from the previous summer as follows:

During each of the 3 writing days, I want you to write about what you did last summer. You can write about different parts or activities of your summer or you can write about the same topic for all 3 days, but make sure your topics are about last summer. All of your writing will be completely confidential. Don't worry about spelling, sentence structure, or gram-

**Table 1.** Sociodemographic and Disease Information on Caregivers and Their Children, *n* (%)

	Experimental ( <i>N</i> = 29)	Control ( <i>N</i> = 25)
Female sex of caregiver	27 (93)	22 (88)
Age of caregiver, <i>M</i> ± <i>SD</i>	35.16 ± 7.35	38.32 ± 8.65
Relationship to hospitalized child		
Biological mother	24 (83)	19 (76)
Biological father	2 (7)	3 (12)
Grandmother	1 (3)	2 (8%)
Adopted mother	1 (3)	
Aunt		1 (4)
Marital status		
Married	15 (52)	16 (64)
Single/Separated	14 (48)	9 (36)
Employment status		
Not working	21 (72)	12 (48)
Working part-time	3 (10)	4 (16)
Working full-time	4 (14)	9 (36)
Education		
Some high school	3 (10)	2 (8)
High school diploma/GED	9 (31)	3 (12)
Vocational school/some college	11 (38)	13 (52)
College degree	3 (10)	3 (12)
Professional/graduate degree	3 (10)	4 (16)
Income (\$/year)		
< 20,000	10 (34)	8 (32)
20,000–40,000	10 (34)	4 (16)
40,000–60,000	2 (7)	5 (20)
> 60,000	7 (24)	7 (28)
Ethnicity		
White	18 (62)	16 (64)
African American	8 (28)	8 (32)
Latino		3 (10)
Male gender of child	16 (57)	14 (61)
Type of disease of child		
Leukemia	15 (52)	9 (36)
Other cancer	9 (31)	9 (36)
Sickle cell disease	2 (7)	3 (12)
Other	3 (10)	4 (16)

There is one missing data point due to lack of caregiver report on relationship to hospitalized child, marital status, employment status, income, and ethnicity.

mar. The only rule is that once you begin writing, continue to do so until your time is up.

#### General Instructions for the 3 Days of Writing

When doing the writing task, the participants were given blank paper on which to write and were left alone by the experimenter for 20 minutes. After 20 minutes,

participants put the essay in an enclosed confidential envelope. They then completed posttask measures of mood and physical symptoms (the same measures administered prior to writing) and a brief essay evaluation questionnaire. The same procedures—questionnaires of mood and physical symptoms, and essay evaluation, as well as the writing task—were repeated for the next 2 days.

Three consecutive days of participation were requested. However, if this was not possible given caregivers' inability or unwillingness to participate, they could space their days according to preference. The average number of days to complete the 3 days of writing was 5.96 ( $SD = 5.48$ , range = 3–28). The participants were paid \$15 after they completed the initial assessments and 3 days of writing.

### Follow-up

Follow-up consisted of the same baseline measures administered 4 months later. Follow-up packets were mailed to the participants with a self-addressed envelope for return to the experimenter. However, if participants' child was in the hospital approximately 4 months following initial participation, then follow-up was administered in the hospital ( $n = 6$ ). The average number of days between Day 3 of participation and completion of the follow-up was 125 ( $SD = 30.88$ , range = 80–212). Up to three follow-up phone calls were made and/or up to two additional packets were sent to those participants who did not return the follow-up within 2 weeks ( $n = 27$ ). Participants were paid an additional \$10 after completing the follow-up measures.

### Measures

#### Demographics

Caregivers reported on demographics such as age, marital status, employment status, income, diagnosis of child, and other factors related to the child's illness. Additionally, caregivers reported on personal behaviors such as whether or not they keep a journal.

#### Participants' Evaluation of Their Written Essays

The Essay Evaluation Measure (Greenberg & Stone, 1992) provided data to confirm that those in the experimental group revealed more emotion and traumatic events than those in the control group. On a 7-point scale, subjects reported on the extent to which their essays were personal, revealing, and meaningful, and how much they had actually talked to others, wanted to talk to others, and had actively held back from

talking to others about the subjects of their essays. Participants also rated the severity of the event or experience that they wrote about as well as the extent to which it was still affecting their lives.

#### Distress

*Depression and Anxiety.* We posited that the Mood and Anxiety Symptom Questionnaire (MASQ) (Watson et al., 1995), which is guided by a tripartite model of anxiety and depression, might be more theoretically compatible with the processes affected by the writing task. The MASQ is a 90-item measure designed to differentially diagnose depression and anxiety based on the tripartite model. Its five subscales followed by their coefficient alphas for the present sample at baseline are as follows: general distress: mixed symptoms, .82; general distress: depressive symptoms, .89; general distress: anxious symptoms, .87; anxious arousal, .84; and anhedonic depression, .90. Higher scores indicated worse symptomatology.

*Long-term Mood.* Additionally, we were interested in identifying other aspects of mood that may be affected by the writing task independent of depressive and anxious symptomatology. The POMS–Short Form (McNair, Lorr, & Droppelman, 1992) is a 30-item measure used to assess mood by rating the extent to which an individual has experienced certain emotions in the past week. This measure yields a total mood disturbance score which had a coefficient alpha for our sample at baseline of .94. The six subscales are tension-anxiety, depression-dejection, anger-hostility, vigor-activity, fatigue-inertia, and confusion-bewilderment. Higher scores indicated worse functioning except for the vigor-activity subscale.

#### Health-Related Quality of Life

The inclusion of an HRQOL measure was based on prior studies that found improvements in functional status and health as a result of written emotional disclosure (Cameron & Nicholls, 1998; Francis & Pennebaker, 1992; Pennebaker et al., 1990; Smyth, 1998a). The Short Form Health Status Questionnaire (SF-36) (Ware, 1993) was used to assess HRQOL using two summary scales—physical health and mental health—and eight subscales. The eight subscales followed by their coefficient alphas for the present sample at baseline are: (1) limitations in usual role activities because of physical health problems, .94; (2) limitations in physical activities because of health problems, .87; (3) bodily pain, .86; (4) limitations in social activities because of physical or emotional problems, .77; (5) general mental health, .75; (6) limitations in usual role activities because of emotional

problems, .78; (7) vitality, .83; and (8) general health perceptions, .86. Higher scores indicated better functioning.

### Caregiver Appraisal of Stress and Efficacy

Because it was hypothesized that writing about traumas and stressors would help to reduce distress, it was also hypothesized that writing about traumas and stressors would help participants feel less stressed about their child's illness and better able to cope with it. The Caregiver Appraisal Scale (Thompson, Gil, Burbach, Keith, & Kinney, 1993b) is used to assess caregivers' appraisal of the stress related to their child's illness and care, as well as their perceived efficacy to handle such stressors. Four questions require that the caregiver rate the level of stress on a 10-point scale for *dealing with your child's medical problems and symptoms, maintaining your child's emotional well-being, maintaining your own emotional well-being, and preparing for an uncertain future*. Additionally, four questions ask the caregiver to rate on the same scale how competent the caregiver feels that he or she can handle those tasks. Higher scores indicated increased appraisal of stress as well as increased appraisal of efficacy. The coefficient alpha for the four questions assessing appraisal of stress for our sample at baseline was .82. The coefficient alpha for the caregiver appraisal of efficacy in handling illness-related stressors was .71 at baseline and .21 at follow-up. We did not include the questions that assessed caregiver appraisal of efficacy in our analyses due to the low internal consistency.

### Physical Symptoms

Pennebaker's Physical Symptom Scale (Pennebaker, 1982) is a symptom checklist used in research on the writing task which asks subjects to rate on a 7-point scale the extent to which they are currently experiencing a variety of symptoms (e.g., upset stomach, dizziness). Higher scores indicated more severe physical symptoms. The coefficient alpha for our sample at baseline was .80.

### Mood

The Brief Mood Rating Scale (Diener & Emmons, 1985; see also Smyth, 1998a) consists of four adjectives describing positive affect (happy, joyful, playful, pleased) and five adjectives describing negative affect (depressed/blue, unhappy, angry/hostile, frustrated, worried/anxious). Using a 7-point scale, participants rated how likely the adjectives described them at that

moment. Higher scores indicated better positive affect and worse negative affect. At baseline, the coefficient alpha for our sample was .88 for positive affect and .89 for negative affect.

## Results

### Comparability of Groups on Sociodemographic Variables

As seen in Table I, the groups were not significantly different on any sociodemographic variables for caregivers or their hospitalized children based on chi-square and *t*-tests.

### Comparability of Groups on Disclosure Practice Variables

*t*-Tests revealed no significant differences between the groups on frequency of counseling. However, there was an unexpected group difference on the item which asked whether or not the participant wrote in a journal or recorded his/her thoughts in some way. The experimental group reported at baseline that they wrote more often than the control group,  $\chi^2(1, N = 54) = 5.79, p < .05$ .

### Comparability of the Groups on the Evaluation of Their Essays on the Essay Evaluation Measure

*t*-Tests comparing the experimental group with the control group on the items of the Essay Evaluation Measure evaluated participants' self-reports of their response to the experimental and control manipulation. Because the participants completed this questionnaire three times (after each time they wrote), the mean of the 3 days for each participant was used in the analyses. As expected, the experimental group reported that their essays were more personal,  $t(54) = -3.9, p < .001$ ; revealing,  $t(54) = -4.75, p < .001$ ; and meaningful,  $t(54) = -3.86, p < .001$ , compared with the control group. They also reported that the topics of their essays were more likely to have been discussed with others,  $t(54) = -2.63, p < .05$ ; that they had more desire to discuss the topics of their essays with others,  $t(54) = -3.23, p < .01$ ; and that the topics were more often those that they actively held back from talking to others about,  $t(54) = -2.1, p < .05$ , and were more likely to be a severe trauma or stressor,  $t(54) = -8.48, p < .001$ , which was still affecting their lives,  $t(54) = -6.64, p < .001$ . It should be noted that most of the participants wrote

**Table II.** Summary of Repeated-Measures MANCOVAs for Mood and Physical Symptoms Questionnaires

	Experimental ( <i>n</i> = 29)			Control ( <i>n</i> = 25)			<i>p</i>
	Before Writing <i>M</i> ( <i>SD</i> )	After Writing <i>M</i> ( <i>SD</i> )	Follow-up <i>M</i> ( <i>SD</i> )	Before Writing <i>M</i> ( <i>SD</i> )	After Writing <i>M</i> ( <i>SD</i> )	Follow-up <i>M</i> ( <i>SD</i> )	
Positive affect	9.56 (5.72)	7.25 (6.58)	9.52 (5.17)	9.95 (4.44)	10.53 (5.09)	9.44 (6.61)	.01
Negative affect	9.21 (7.06)	11.18 (8.55)	10.72 (8.82)	6.71 (5.57)	4.84 (6.25)	7.88 (6.68)	.01
Physical symptoms scale	17.24 (6.93)	20.50 (8.75)	19.81 (11.64)	16.87 (4.71)	15.61 (4.01)	15.85 (5.27)	.01

MANCOVA = multivariate analysis of covariance.

about their child's illness on at least 1 of the 3 days, regardless of whether or not they wrote about traumas or stressors.

### **Covariates Used in Analyses on Dependent Measures**

The variable which asked whether or not participants previously reported recording thoughts and feelings via writing was used as a covariate given the significant difference between the groups on this variable. Also, parent education was a covariate based on findings from a meta-analysis which indicated that college-student status was a moderator of the effects of written emotional disclosure (Smyth, 1998b).

### **Test of Group by Time Differences on Positive and Negative Affect on the Brief Mood Rating Scale**

Since mood was measured prior to (three data points) and after (an additional three data points) each writing task, in addition to being assessed at follow-up, procedures described by Greenberg and Stone (1992) were used to reduce the number of variables. Thus, 2 (group) by 3 (time) repeated-measures analyses of covariance (ANCOVAs) were used to test for group differences on negative and positive affect immediately prior to and immediately after writing and at follow-up. The Time 1 variable of positive affect and negative affect was an average of the respective scores on the 3 days immediately before writing. The Time 2 variable consisted of an average of the scores immediately following writing. Finally, Time 3 consisted of the scores obtained at the follow-up. There was a significant interaction between time and group for both positive,  $F(2, 54) = 4.85, p < .05$ , and negative affect,  $F(2, 54) = 5.49, p < .01$ . Univariate *F*-tests revealed that, as predicted, the groups did not differ in positive or negative affect prior to writing or at the follow-up. Consistent with hypotheses, immediately after writing,

the experimental group exhibited significantly less positive affect,  $F(1, 54) = 4.68, p < .05$ , and significantly more negative affect,  $F(1, 54) = 7.92, p < .01$ , than the control group (see Table II).

### **Test of Group $\times$ Time Interactions on Physical Symptoms on the Penebaker Physical Symptom Scale**

The same procedure to consolidate the mood data described above was used for the data on physical symptoms. Thus, a 2 (group) by 3 (time) repeated-measures ANCOVA was used to test for group differences over time on physical symptoms immediately prior to and immediately after writing and at follow-up. A significant Group  $\times$  Time interaction on the physical symptom scale was found,  $F(2, 54) = 5.62, p < .01$ . Contrary to hypotheses, univariate *F*-tests conducted at each time point revealed a significant Group  $\times$  Time interaction immediately following writing, whereby the experimental group was reporting more physical symptoms than the control group,  $F(1, 54) = 4.30, p < .05$  (see Table II).

### **Test of Group $\times$ Time Interactions on Symptoms of Distress on the MASQ**

A 2 (group) by 2 (time) repeated-measures multivariate analysis of covariance (MANCOVA) was conducted to test for differences over time between the groups on the five subscales of the MASQ. Contrary to hypotheses, there were no significant group differences over time (see Table III).

### **Test of Group $\times$ Time Interactions on Long-Term Mood on the Profile of Mood States–Short Form**

A 2 (group) by 2 (time) repeated-measures ANCOVA was conducted to test for group differences over time on the overall disturbed mood score of the POMS–Short Form. Contrary to hypotheses, results demonstrated no significant group differences over time. Next, a 2 (group) by 2 (time) repeated-measures MANCOVA was con-



**Table III.** Summary of MASQ Repeated Measures MANCOVAs

	Experimental (n = 27)		Control (n = 23)		p
	Baseline M (SD)	Follow-up M (SD)	Baseline M (SD)	Follow-up M (SD)	
General distress: Mixed	38.67 (11.57)	41.11 (13.61)	34.91 (9.58)	32.48 (10.23)	.10
General distress: Anxious	25.00 (8.38)	25.93 (9.41)	21.79 (7.85)	19.52 (5.54)	.17
General distress: Depressed	27.89 (8.56)	29.19 (10.30)	25.26 (9.47)	23.78 (7.89)	.26
Anxious arousal	26.01 (8.09)	26.52 (10.00)	25.13 (8.74)	25.30 (10.05)	.93
Anhedonic depression	68.74 (13.83)	70.04 (14.64)	62.00 (15.41)	65.00 (13.26)	.87

MASQ = Mood and Anxiety Symptom Questionnaire; MANCOVA = multivariate analysis of covariance.

ducted to test for differences over time between the groups on the six subscales of the POMS–Short Form. Contrary to hypotheses, there were no significant group differences over time 9 (see Table IV).

### **Test of Group $\times$ Time Interactions on Health-Related Quality of Life on the Short Form Health Status Questionnaire.**

Two (group) by 2 (time) repeated-measures ANCOVAs were conducted to test for group differences over time on the physical health summary score and the mental health summary score on the SF-36. Contrary to the hypotheses, results demonstrated no significant group differences over time.

Next, a 2 (group) by 2 (time) repeated-measures MANCOVA was conducted to test for group differences over time on the eight subscales of the SF-36. There was a significant interaction between the groups over time,  $F(8, 53) = 3.83, p < .01$ . Univariate  $F$ -tests, with Bonferroni-adjusted  $p$  values to reduce potential Type I errors, revealed a significant group difference over time on the subscale for vitality,  $F(1, 53) = 21.29, p = 0$ . However, the interaction was in the opposite direction than what was predicted, whereby the control group improved on vitality over time (see Table V).

### **Test of Group $\times$ Time Interactions on Caregiver Appraisal of Stressors on the Caregiver Appraisal Scale**

A 2 (group) by 2 (time) repeated-measures ANCOVA was conducted to test for group differences over time on the stress appraisal subscale of the Caregiver Appraisal Scale. Contrary to hypotheses, results revealed no significant differences over time between the experimental group (baseline:  $M = 28.45, SD = 8.38$ ; follow-up:  $M = 29.98, SD = 8.93$ ) and the control group (baseline:  $M = 29.21, SD = 8.13$ ; follow-up:  $M = 27.46, SD = 9.97$ ).

### **Post Hoc Analyses to Assess Reliable Change and Effect Sizes**

A reliable change index (Jacobson & Truax, 1991) was calculated for the measures with summary scores (e.g., the POMS–Short Form and the SF-36), to determine whether clinically significant reliable change occurred for participants in the group. Results revealed that only 10 (7 in the experimental group) of the participants exhibited reliable positive change on the POMS total mood score, 6 (3 experimental) on the physical health summary scale of the SF-36, and 3 (2 experimental) on the mental health summary scale of the SF-36. Fifteen participants exhibited reliable negative change on the POMS total mood score, 5 on the physical health summary scale of the SF-36, and 1 on the mental health summary scale of the SF-36.

Effect sizes of the written emotional disclosure intervention were calculated using Cohen's  $d$  (Hedges, 1981) on the dependent measures, including summary scales and subscales. The range was  $-1.66$  to  $1.45$  ( $M = 0$ ). Results revealed the following small effect sizes for the measures with summary scales:  $d = .09$  on the POMS total mood score,  $d = .21$  on the mental health summary scale of the SF-36, and  $d = .31$  on physical health summary scale of the SF-36.

### **Discussion**

In accord with recommendations concerning intervention research (e.g., Drotar & Lemanek, 2001; Smyth & Catley, 2002), the present study not only tested a potential intervention for caregivers of hospitalized children and adolescents with chronic illness, but also tested the effectiveness of written emotional disclosure in an applied setting with a distressed population. The group who wrote about traumas and stressors experienced more negative affect and less positive affect immediately following writing than the group who wrote about summer activities, as was found in previous studies

**Table IV.** Summary of POMS–Short Form Repeated-Measures MANCOVAs

Subscales	Experimental ( <i>n</i> = 27)		Control ( <i>n</i> = 23)		<i>p</i>
	Baseline <i>M</i> ( <i>SD</i> )	Follow-up <i>M</i> ( <i>SD</i> )	Baseline <i>M</i> ( <i>SD</i> )	Follow-up <i>M</i> ( <i>SD</i> )	
Total mood	34.57 (22.98)	35.63 (24.22)	23.06 (20.09)	22.13 (19.83)	.74
Anger/hostility	7.50 (4.96)	7.82 (5.98)	4.80 (4.37)	5.08 (4.21)	.63
Confusion/bewilderment	7.68 (4.03)	7.16 (3.87)	6.14 (3.10)	5.79 (3.30)	.42
Depression/dejection	6.57 (3.91)	6.68 (4.97)	5.13 (4.14)	4.79 (4.26)	.46
Fatigue/inertia	10.64 (5.29)	11.19 (5.43)	8.33 (5.45)	7.92 (4.60)	.43
Tension/anxiety	8.21 (5.18)	7.94 (5.55)	5.28 (3.82)	5.54 (3.74)	.93
Vigor/activity	6.04 (4.32)	5.75 (4.06)	6.63 (5.41)	7.00 (4.35)	.56

POMS = Profile of Mood States; MANCOVA = multivariate analysis of covariance.

(e.g., Francis & Pennebaker, 1992; Greenberg et al., 1996; Pennebaker & Beall, 1986). This pattern of mood provides evidence for the fidelity of the writing intervention in a pediatric hospital setting, as it indicates that those writing about traumas and stressors were experiencing the intended emotional response. Also, those in the experimental group reported that their essays were more personal, meaningful, and revealing of their emotions than those in the control group. The topics of their essays were also more likely to be a severe trauma or stressor and were more likely to still be affecting their lives compared with those in the control group.

However, contrary to hypotheses and previous research (Pennebaker et al., 1990; Schoutrop et al., 1997; Smyth, 1998a), there were no significant differences between the experimental and control groups over time on measures of anxious and depressive symptoms, long-term mood, or caregiver appraisal of stress. These findings were contrary to hypotheses and some previous research. Additionally, contrary to hypotheses, the control group evidenced more vitality over time than the experimental group and less physical symptoms immediately following the writing task.

Overall, the data to support compliance to the writing instructions via the Essay Evaluation Measure and the fact that the hypothesized mood change occurred immediately following writing provide evidence that the experimental manipulation occurred over the short term. However, the small effect sizes and the lack of reliable change indicate that the written emotional disclosure task was not effective in changing long-term outcomes. Thus, it is likely that the intervention as implemented in the pediatric hospital setting was simply not effective to change longer-term outcomes. The small effect sizes obtained in this study contrasted with the overall effect size,  $d = .47$ , found in a meta-analysis of randomized controlled studies testing

the efficacy of written emotional disclosure in office/laboratory settings (Smyth, 1998b). While our sample size was relatively small, there were no trends in the data that were in accord with the hypotheses that suggested that inclusion of more participants would have led to meaningful group differences.

Several possibilities may account for the lack of hypothesized intervention effects. As was stated earlier, improvements in well-being as a result of participation in the writing task were expected to result from improved affect regulation, which requires attention and habituation to emotionally provoking stimuli. Our data (e.g., pre- and postwriting measures of affect) provide evidence that attention to emotionally provoking stimuli did occur, as shown by temporary increases in negative affect for the experimental group following writing. However, habituation was not evident, based on the fact that those writing about traumas and stressors did not evidence larger increases in negative mood on the first day than on the subsequent days. In fact, the largest increases in negative mood occurred on the second day. If habituation had occurred, it would be expected that the discrepancy between negative affect after writing compared with prior to writing would decrease each day (Lepore et al., 2002).

Given that the participants were immersed in a stressful environment while their child was in the hospital, it is likely that habituation and an increase in cognitive resources and restructuring was by no means optimal during writing. Stressors in the immediate hospital situation may have limited the hypothesized benefits of the writing task by placing too many cognitive and emotional demands on the participants, thus leaving them unable to habituate to the stressful response to their participation in the writing task. In the absence of habituation to negative affect, a sense of mastery and

**Table V.** Summary of SF-36 Repeated-Measures MANCOVAs

Subscales	Experimental ( <i>n</i> = 27)		Control ( <i>n</i> = 23)		<i>p</i>
	Baseline <i>M</i> ( <i>SD</i> )	Follow-up <i>M</i> ( <i>SD</i> )	Baseline <i>M</i> ( <i>SD</i> )	Follow-up <i>M</i> ( <i>SD</i> )	
Physical health summary score	53.83 (8.46)	51.89 (9.50)	49.96 (14.01)	50.89 (10.46)	.29
Mental health summary score	37.16 (12.04)	33.26 (10.79)	40.28 (15.79)	39.54 (7.03)	.43
Physical functioning	87.59 (19.89)	83.45 (18.23)	74.79 (31.54)	82.71 (24.98)	.04
Role-physical	80.17 (36.83)	69.83 (38.02)	64.58 (37.53)	64.58 (36.05)	.38
Bodily pain	72.52 (24.52)	68.41 (24.14)	67.63 (28.72)	67.88 (28.82)	.75
General health	65.83 (23.04)	62.38 (32.24)	70.67 (21.70)	69.21 (19.85)	.59
Vitality	39.66 (15.13)	27.87 (17.15)	33.68 (16.66)	41.32 (18.18)	.00
Social functioning	55.86 (22.92)	42.41 (22.47)	75.83 (81.29)	59.17 (16.13)	.95
Role-emotional	60.55 (21.45)	57.10 (17.00)	51.39 (39.29)	54.17 (36.53)	.56
Mental health	60.55 (21.45)	57.10 (17.00)	63.50 (15.35)	66.17 (10.81)	.29

SF-36 = 36-Item Short Form Health Status Questionnaire; MANCOVA = multivariate analysis of covariance.

control over emotional responses and cognitive restructuring were not likely. However, given that we did not include measures of appraisals, coping, or problem solving, it is unclear whether failure to change these processes contributed to the lack of effect of written emotional disclosure.

Overall, the many unavoidable departures from the standard protocol of the writing task in this field setting, especially the lack of control of surroundings and timing of implementation, and significant distractions in the setting, may have limited the potency of the intervention for changing outcomes related to distress, quality of life, and physical symptoms. Pennebaker (1994) suggests that the writing take place in a unique isolated setting “removed from the real world” in order to elicit the deepest thoughts and feelings from participants and that participants be debriefed in a similar setting to help them process the experience. The fact that the overwhelming majority of caregivers chose to participate in the written emotional disclosure task in their child’s hospital room, surrounded by reminders of stressors and distractions, may have limited their ability to concentrate and engage in higher-order cognitive processing, which, in addition to expression of emotion, has been hypothesized to be a salient component that underlies the efficacy of the writing task (Smyth & Catley, 2002).

Additionally, there are limitations of the sample worth noting. The sample was unique given that only about half (54 out of 103) of the participants initially approached completed the study and the fact that most who did not agree to participate or did not complete the study stated that they were too distressed to participate. Thus, it is unclear whether the results of the study can be generalized to a sample of caregivers who articulate being too stressed. It is possible that those who

completed the present study may have had enough cognitive and emotional resources to comply with its requirements, thus making it potentially difficult for the written emotional disclosure task to affect well-being in this group. However, without a comparison group of caregivers without chronically ill children, it is impossible to comment on the levels of distress related to caregiving for a hospitalized child in this sample. Also, most of the caregivers had children with cancer. Thus, the findings of the study may be difficult to generalize to caregivers of children with other chronic illnesses.

### **Implications and Recommendations for Future Research**

Results of the present study suggest that greater control over the experimental manipulation is a priority for studies that test the efficacy or effectiveness of the writing task in pediatric settings. For example, it is recommended that future studies testing the writing task as an intervention attempt to more closely follow the recommendations set forth by Pennebaker (1994), e.g., that writing take place in a quiet isolated setting, such as a separate room that is void of the stressors and distractions of the child’s hospital room, for at least 3 consecutive days with time for debriefing. Given constraints of pediatric hospital settings, it is possible that implementation of the writing task may not be feasible in an inpatient setting. On the other hand, it is less likely that the protocol suggested by Pennebaker (1994) can be implemented in a home setting given the lack of control. An outpatient setting could be feasible if parents were willing to participate in the procedure for multiple days in a week. Some caregivers (e.g., of children receiving hemodialysis) do come to the hospital multiple times a week for outpatient procedures.

However, in such cases, successful implementation of the writing task would require caregivers to complete the writing task apart from their children in a quiet room.

Another potential direction of future research is to identify the critical processes that underlie the efficacy of the writing task and to use such data to develop generalizable principles that would guide the implementation of the writing task in applied (including pediatric) settings. Many processes have been hypothesized to play a role in outcomes related to the writing task, including facilitating the regulation of affect through confronting negative experiences (Lepore et al., 2002; Greenberg et al., 1996), facilitating goal pursuit and coping (King, 2002; Pennebaker et al., 1990), and improving working memory (Klein, 2002). Given the multifaceted nature of written emotional disclosure, it is likely that the writing task does not facilitate the same processes within each individual and that various processes may equally influence positive change. Thus, dismantling studies are necessary to identify what components of the writing task are necessary to facilitate various processes that affect change. Similarly, it is necessary to identify individual differences related to the benefits of the writing task. Better understanding of such necessary components and individual differences will allow for the development of more precise implementation of the writing task as an intervention to improve well-being.

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