Journal of Behavioral Medicine, Vol. 18, No. 5, 1995

Cognitive Factors in Adjustment to Cancer: Attributions of Self-Blame and Perceptions of Control

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Accepted for publication: April 19, 1995

We examined attributions of behavioral and characterological self-blame and perceptions of control over disease progression and recurrence as predictors of symptoms of psychological distress in a sample of adult men and women with cancer. Data were obtained near the time of diagnosis and at 4-month follow-up. Initial levels of behavioral and characterological self-blame were unrelated to concurrent psychological distress. Initial characterological self-blame as well as the interaction of characterological and behavioral self-blame was predictive of psychological distress 4 months later. Perceptions of control over cancer recurrence were unrelated to psychological distress near diagnosis or at follow-up, and control beliefs did not function as a mediator of self-blame. Initial levels of psychological distress predicted characterological but not behavioral self-blame at follow-up, suggesting a reciprocal relationship between characterological self-blame and distress.

KEY WORDS: cancer; self-blame; control beliefs; psychological distress.

INTRODUCTION

Cancer patients' cognitive appraisals of their disease play an important role in psychological adjustment to the stress of cancer. Appraisals influ-

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0160-7715/95/1000-0401$07.50/0

ence the degree to which cancer is experienced as stressful, interpretations of the cause of the disease, and the meaning of one's experience with cancer; subsequent reappraisals are central in the management of emotional reactions (e.g., Lazarus and Folkman, 1984; Taylor, 1983). It has been widely suggested that attributions of self-blame and appraisals of personal control are particularly important in the process of adjustment to stress and trauma, including the stress of cancer (e.g., Folkman, 1984; Janoff-Bulman, 1992; Taylor, 1983; Tennen and Affleck, 1990; Thompson *et al.*, 1993).

Self-blame attributions are those in which individuals ascribe the cause of particular events to some aspect of themselves. Blaming oneself for a negative event can have adverse psychological consequences, including increased symptoms of depression (e.g., Abramson *et al.*, 1976; Peterson *et al.*, 1981). In distinguishing between *behavioral* and *characterological* self-blame, however, Janoff-Bulman (1979) has argued that self-blame is not always associated with poor psychological outcomes. Behavioral self-blame is defined as the attribution of undesirable events to one's own behavior, whereas characterological self-blame is defined as the attribution of undesirable events to stable aspects of the self. Behavioral self-blame may promote positive adjustment if the behavior being blamed is viewed as modifiable and allows for the opportunity to regain a sense of control and invulnerability to future trauma. For example, in the case of cancer, attributing one's disease to diet might allow for the belief that a recurrence could be prevented through changes in eating habits. In contrast, characterological self-blame is hypothesized to be related to maladjustment because individuals view their character as more fixed and less controllable than their behavior (Janoff-Bulman, 1979). Thus, holding one's character to blame for negative events would lead to the view of such events as beyond one's control and more apt to recur. For example, cancer patients who feel that the disease is their particular lot in life would be unlikely to believe that they had control over the course or recurrence of the cancer. More recently, Janoff-Bulman (1992) has argued that behavioral self-blame may have adaptive consequences in the absence of characterological self-blame, but the beneficial effects of blaming one's behavior may be lost when characterological attributions are also made. That is, once one's character is implicated or blamed, the possible beneficial effects of blaming one's behavior are overshadowed by the attribution to more stable aspects of one's character.

Research investigating self-blame processes in cancer patients has generated mixed results. Gotay (1985), in a study of 42 early-stage and 31 advanced-stage gynecologic and breast cancer patients, found that the degree of characterological or behavioral self-blame reported by patients was not significantly correlated with current mood. Taylor *et al.* (1984) studied

78 breast cancer patients averaging 2 years postdiagnosis and found that self-blame was related to better psychological adjustment (i.e., more positive mood) only for patients who were 17 to 36 months postsurgery and was not significantly related to adjustment for patients either 2 to 17 months or more than 36 months post surgery. Taylor *et al.* did not distinguish, however, between behavioral and characterological self-blame. In a study of 42 breast cancer patients averaging 9 months postdiagnosis, Timko and Janoff-Bulman (1985) found that behavioral self-blame attributions were associated with greater perceived invulnerability to cancer recurrence, whereas characterological self-blame was associated with lower perceived invulnerability to recurrence; neither form of self-blame was associated with depressive symptoms. Perceived invulnerability to recurrence, however, was significantly associated with lower depressive symptoms. Timko and Janoff-Bulman's (1985) findings support the hypothesis that perceptions of invulnerability, and therefore control, may mediate the relationship between self-blame and adjustment (Janoff-Bulman, 1979).

The mixed findings from these studies do not provide strong support for the role of self-blame processes in the psychological adjustment of cancer patients. These investigations have been limited, however, by the use of retrospective as opposed to prospective designs, as well as variability in the length of time since patients' diagnoses, stage or severity of cancer, and types of self-blame, control beliefs, and psychological adjustment/distress that have been measured. All of these studies relied on retrospective reports of self-blame that were obtained, on average, 1 to 2 years postdiagnosis. Self-blame attributions near the time of diagnosis have not been examined as predictors of subsequent psychological distress. Given that health care professionals have extensive contact with patients at the time of their diagnosis and treatment, it is important to understand the effects of self-blame at these initial points in the process of adjusting to cancer.

The discrepant results in prior studies of self-blame may also depend on distinctions among attributions of cause for one's cancer, perceived control over cancer outcome, and perceived control over cancer recurrence (Tennen *et al.*, 1986). Tennen *et al.* (1986) suggested that a person who blames his or her behavior (versus his or her character) may experience relatively little control over the progression or outcome of the current cancer but may experience a sense that he or she can avoid recurrence of the disease. Thus, while cancer patients who engage in behavioral self-blame may not believe that they can control the course of their present disease, they may feel that changes in their behavior can prevent the cancer, once cured or in remission, from recurring. It is possible that self-blame may be related to psychological distress through its influence on perceptions of control over future recurrence of cancer rather than control over progression

of current symptoms. A comparison between the relationships of these different perceptions of control with psychological adjustment is in order.

Finally, in addition to contributing to increased psychological distress, self-blame attributions also may be the result of psychological distress. That is, high levels of psychological distress may increase the tendency to generate explanations for the event, including explanations that involve self-blame. Those individuals whose assumptions about the world have been most adversely affected by a cancer diagnosis, and therefore who may be experiencing the highest levels of psychological distress, may be in greatest need to generate attributions of self-blame (Janoff-Bulman, 1992; McCann and Pearlman, 1990). The role of initial psychological distress in predicting subsequent self-blame attributions for cancer has not been tested.

Based upon the literature described above, several research questions were investigated in a study of cognitive processes and psychological distress in cancer patients within a few months of their diagnosis and 4 months later. First, are behavioral and characterological self-blame attributions near the time of diagnosis associated with subsequent psychological distress and perceptions of control over one's cancer? Second, is there an interaction between behavioral and characterological self-blame in predicting psychological distress? Psychological outcomes may be worse when both behavioral self-blame and characterological self-blame attributions are made (Janoff-Bulman, 1992). Third, is there a direct association of initial behavioral and characterological self-blame with subsequent psychological distress, or is this relation mediated by perceived control over the recurrence of the illness? Within a mediated model, initial behavioral self-blame would predict increased perceived control over cancer recurrence, which in turn would be related to lower psychological distress. In contrast, characterological self-blame would be related to decreased control over recurrence, which would be related to higher psychological distress. Finally, initial levels of psychological distress were examined in predicting subsequent self-blame attributions.

METHOD

Subjects

Participants were 72 adults (79% female, 21% male; mean age of 42.46 years, SD = 7.49 years) recently diagnosed with cancer. The median level of education of participants was equivalent to having attended some college. With regard to ethnicity, 96% described themselves as Caucasian, which is representative of the northern New England and northern New

York population from which the sample was drawn. These patients are the portion of participants in a study of coping and adjustment in cancer patients and their families (total $N = 126$) for whom complete data were available on structured interviews and questionnaires near the time of their diagnosis and again 4 months later. Of the 54 participants who were not included in the present analyses, 30 did not complete at least one of the measures used in the present analyses, 11 withdrew from the study between Time 1 and Time 2, and 15 died between the two data collections. The original 126 participants in the study represent 75% of those eligible cancer patients who were approached regarding the study. On average, patients had been diagnosed with cancer approximately 10 weeks before the time of the first data collection (M = 9.75 weeks, SD = 7.34 weeks). Men (M = 11.06 weeks, SD = 7.24 weeks) and women (M = 9.39 weeks, SD = 7.39 weeks) did not differ significantly in their time since diagnosis at the first data collection. A variety of sites and stages of cancer is represented in the sample. The distribution of cancer sites was 40% breast, 22% gynecologic, 10% hematologic, 10% brain, 6% lung, 4% testicular or prostate, 3% skin, and 4% with other cancers. Type of diagnosis differed by sex of patient [$\chi^2(7) = 46.47, p < .0001$], as a large portion of women had breast or gynecologic cancer.

The severity of patients' cancers was reflected in four variables obtained through medical chart review: stage, initial prognosis (estimated 5-year disease-free survival rate), and best and worst performance status. With regard to stage, 37% had cancers classified as Stage I, 40% as Stage II, 14% as Stage III, and 9% as Stage IV. Initial prognosis was operationalized as patients' projected 5-year survival rate. This percentage is derived from statistics collected by the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program (American Cancer Society, 1992) and is used to rate cancer severity at time of diagnosis. Survival rates, which can theoretically range from 1 to 99%, are based on both site and pervasiveness of cancer. A research assistant and an oncology nurse, both of whom were blind to patients' psychological data, jointly reviewed each patient chart. A separate review by a research assistant blind to previous findings was conducted and interrater reliability was established at greater than 90% agreement. In this sample, survival rates ranged from 13 to 96%, with a mean of 68% (SD = 26%). Performance status ratings were derived from medical chart reviews derived from criteria developed by the Eastern Cooperative Oncology Group (ECOG) to reflect patients' level of best and worst recent physical functioning. Scores can range from 0 (fully ambulatory and no physical symptoms) to 4 (100% bedridden). Best performance status ratings during the time of diagnosis to the first assessment ranged from 0 to 2 (M= 0.62, SD = 0.57) and worst performance status

ranged from 1 to 3 (M = 2.76, SD = 0.60). At the time of second data collection, best performance status ranged from 0 to 1 (M = 0.49, SD = 0.50) and worst performance status ranged from 0 to 3 (M = 1.81, SD = 0.84). Men and women did not differ on disease stage, initial prognosis, or performance status ratings at Time 1 and Time 2.

Comparison of the 72 patients for whom complete data were available at both data collections with the 54 patients who did not have complete data indicated that these two groups did not differ on sex, education level, cancer site, Time 1 performance status ratings, time from diagnosis to Time 1 data collection, or any of the psychological measures (self-blame, perceived control, or psychological distress). The 72 individuals who continued their participation were older (mean age of 42 years vs. 39 years), had a lower stage rating for their cancer (mean of 1.95 vs. 2.62), and had a more positive prognosis as reflected in their projected 5-year survival rate (67.9 vs. 3.9). These differences are attributable primarily to the more severe cancers in the 15 patients who died before the second data collection.

Measures

Behavioral and Characterological Self-Blame. Behavioral and characterological self-blame were assessed during individual structured interviews by two separate items used by Timko and Janoff-Bulman (1985) and Mueller and Major (1989). Behavioral self-blame was measured by asking patients, "How much do you blame yourself for the kind of things you did (that is, for any behavior that led to your cancer)?" The second question, assessing characterological self-blame, asked patients, "How much do you blame yourself for the kind of person that you are (that is, for being the kind of person that has things like cancer happen to them)?" Patient ratings were made on a 5-point Likert scale, ranging from (1) not at all to (5) completely.

Perceptions of Personal Control. Following a procedure used by Tennen *et al.* (1986), two interview questions assessed patients' perceptions of personal control over the progression of their cancer and personal control over the recurrence of their cancer with 4-point Likert scales ranging from (1) none at all to (4) a lot. The first item asked patients about their current situation: "How much control do you feel you have over the progression of your cancer?" This was followed by a question assessing perceived control with regard to a possible recurrence: "How much control do you feel you have in keeping the cancer from coming back?"

Psychological Distress. Symptoms of psychological distress were assessed with the Brief Symptom Inventory, a 53-item standardized index of a wide range of symptoms of psychological and somatic problems (Derogatis and Spencer, 1982). Internal consistency and validity are well established for the BSI. For this study, a modified version of the Global Severity Index (GSI) of the BSI, the mean of ratings for all items, was used in the analyses. For this population, several somatic items are direct side effects of chemotherapy and radiation and, therefore, could falsely raise GSI scores for those patients receiving aggressive treatment. To address this issue, the BSI was given to four oncology professionals: two nurses and two physicians. They were asked to indicate those items that would be expected to be affected by standard treatment such as chemotherapy and radiation. Those items that were marked by at least three out of the four oncology specialists were removed from the GSI. Thirteen items were deleted, leaving 40 items for inclusion in the modified GSI.[4] The alpha coefficient for the modified GSI indicated good internal consistency ($\alpha = .96$). Additionally, correlational analyses between the original GSI and this modified version revealed a very high association ($r = .98$, $p < .0001$). However, since the modified GSI represents a measure of psychological symptoms free from the confound of physical symptoms, this modified version was retained for predictive analyses.

Procedure

Participants were recruited through three cancer clinics, Medical Oncology, Radiation Oncology, and Gynecologic Oncology, affiliated with the Vermont Cancer Center. Recently diagnosed patients were told about the study and invited to participate by a member of the medical staff. If patients indicated interest, a member of the research team then contacted the patient and obtained written consent to participate from patients and their spouses and children. Each individual participated in intensive interviews of 1 to 2 hr (either in person or by telephone) and completed sets of questionnaires at or near the diagnosis of the patient's cancer and at a follow-up 4 months later. The 4-month period between data collections was selected to allow for comparability to previous studies (e.g., Anderson *et al.*, 1989).

[4]Items deleted from the Brief Symptom Inventory to create the modified GSI were nervousness or shakiness inside, faintness or dizziness, trouble remembering things, feeling easily annoyed or irritated, poor appetite, feeling blue, nausea or upset stomach, trouble falling asleep, difficulty making decisions, hot or cold spell, numbness or tingling in parts of your body, trouble concentrating, and feeling weak in parts of your body.

RESULTS

Descriptive Analyses

Means and standard deviations for disease variables, cognitive appraisals, and psychological distress at Time 1 (near diagnosis) and Time 2 (4-month follow-up) are presented in Table I. In general, subjects endorsed relatively low levels of behavioral or characterological self-blame near the time of diagnosis (Time 1) or at the second data collection point 4 months later (Time 2). For behavioral self-blame, subjects' mean responses at Time 1 and at Time 2 both represent responses of "very little" self-blame; these ratings did not differ across the two data collections. For characterological self-blame, subjects' mean responses at Time 1 and Time 2 also reflect responses of "very little" self-blame. Ratings of characterological self-blame were significantly higher at Time 2 than at Time 1 [$t(70) = 2.29, p < .05$]. Subjects reported that they could personally control the current progression of their cancer "somewhat," both near the time of diagnosis and 4 months later. Subjects reported experiencing a similar sense of control over the possibility of recurrence of their cancer at Time 1 and at Time 2. Perceptions of control over the progression and control over the recurrence of their cancer did not change from Time 1 to Time 2. Mean GSI scores also did not differ across time. Ratings of best performance status improved from Time 1 to Time 2 [$t(71) = 17.15, p < .001$]. Similarly, ratings of patients' worst performance status improved from Time 1 to Time 2 [$t(66) = 6.52, p < .001$]. Thus, as expected, the functional status of the participants improved during the 4 months as they completed their initial treatments for their cancer, although there were no changes in their reported psychological distress.

Correlations of Psychological Variables with Disease Variables

Correlational analyses of self-blame, control beliefs, and psychological distress with the three disease variables (stage, ECOG performance status, and probability of survival at 5 years) indicated that the psychological variables were generally unrelated to specific disease characteristics. The only exception occurred in the association between perceptions of control and stage of cancer, with patients who had a higher initial stage (i.e., a more advanced form of cancer) reporting higher perceptions of personal control over the progression ($r = .27, p < .05$) and recurrence of their illness ($r = .34, p < .01$) at Time 1 and higher perceptions of control over recurrence at Time 2 ($r = .33, p < .01$). Because the disease characteristics were gen-

Table I. Means and Standard Deviations for Disease Characteristics, Cognitive Appraisals, and Psychological Distress Near the Time of Diagnosis and 4 Months Later

	Time 1		Time 2	
	Mean	SD	Mean	SD
Initial estimated survival rate	68	26	—	—
ECOG best performance status	0.62	0.57	0.49	0.50
ECOG worst performance status	2.76	0.60	1.81	0.84
Behavioral self-blame	1.90	1.01	2.04	1.10
Characterological self-blame	1.56	0.98	1.86	1.23
Personal control				
Progression	2.97	0.96	3.06	1.00
Recurrence	2.64	1.08	2.69	1.03
Psychological distress (GSI)	0.38	0.51	0.36	0.46

Note. The initial estimated survival rate reflects the percentage of patients expected to be alive at 5 years postdiagnosis based on SEER data.

erally uncorrelated with the psychological variables, they were not included in the subsequent analyses.

Correlations Among Cognitive Appraisals and Psychological Distress

The associations among self-blame, perceptions of control, and psychological distress at Time 1, Time 2, and across the two time points are presented in Table II. To control for the probability of Type I errors given the number of correlations involved, those correlations marked with a superscript asterisk are considered significant by a multistage Bonferroni test, and those considered nonsignificant after the Bonferroni adjustment are marked with a superscript italic *a*. Because such a test is highly conservative, α before adjustment was set at .10 (Larzelere and Mulaik, 1977). All of the measures were moderately to highly stable across the 4 months from the first to the second data collections. Psychological distress as measured by the BSI was the most consistent [$r(71) = .78$]. Self-blame attributions and perceptions of control were all moderately stable, with correlations between .36 and .54. There were moderate positive correlations between behavioral and characterological self-blame at Time 1, [$r(71) = .47, p < .001$], and at Time 2 [$r(68) = .62, p < .001$]. Behavioral self-blame at Time 1 was related to characterological self-blame at Time 2 [$r(70) = .47, p < .001$], and characterological self-blame at Time 1 was related to behavioral self-blame at Time 2 [$r(68) = .57, p < .001$]. Thus, the two types of self-blame attributions were clearly not independent of one another. Perceived

Table II. Pearson Correlations Among Cognitive Appraisals and Psychological Distress Near Diagnosis and 4 Months later

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Behavioral self-blame T1	—								
(2) Characterological self-blame T1	.47*	—							
(3) Personal control: Progression T1	.16	.24[a]	—						
(4) Personal control: recurrence T1	.24[a]	.26[a]	.63*	—					
(5) Psychological distress T1	.19	.17	-.09	-.01	—				
(6) Behavioral self-blame T2	.41*	.57*	.20	.16	.20	—			
(7) Characterological self-blame T2	.47*	.54*	.19	.25[a]	.38*	.62*	—		
(8) Personal control: progression T2	.05	.19	.41*	.37*	-.11	.15	.17	—	
(9) Personal control: recurrence T2	-.00	.01	.31[a]	.36[a]	-.12	-.03	.12	.53*	—
(10) Psychological distress T2	.26[a]	.33[a]	-.00	.05	.78*	.30[a]	.31[a]	.01	-.18

[a]Considered nonsignificant after Bonferroni correction.
*$p < .05$ after Bonferroni adjustment.

control over disease progression[5] and disease recurrence were also moderately and positively correlated at Time 1 [$r(71) = .63, p < .001$], and at Time 2 [$r(48) = .53, p < .001$]. Although perceived control over progression at Time 1 was not significantly related to perceived control over recurrence at Time 2, perceived control over recurrence at Time 1 was related to perceived control over progression at Time 2 [$r(49) = .37, p < .05$].

In cross-sectional analyses, behavioral and characterological self-blame were not significantly correlated with psychological distress at Time 1 and/or at Time 2 ($r = .30$ and .31, respectively; both nonsignificant after the Bonferroni adjustment). Initial behavioral and characterological self-blame at Time 1 were not significantly correlated with Time 2 psychological distress ($r = .26$ and .33, respectively; both nonsignificant after the Bonferroni adjustment). Self-blame attributions and control beliefs were not correlated either cross sectionally or from Time 1 to Time 2. Psychological distress at Time 1 was related to higher levels of characterological self-

[5]The number of participants who answered the question regarding perceived control over disease progression at Time 2 was less than at Time 1, as several patients reported that they were free of their disease at that point and the question no longer had any meaning for them.

blame at Time 2 [$r(70) = .38, p < .001$] but not related to Time 2 behavioral self-blame.

Multiple Regression Analyses

Multiple regression analyses were used to test further the relations among self-blame, control beliefs, and psychological distress. In all of the regression equations, initial levels of the dependent variables were controlled for when predicting these variables at Time 2, allowing for examination of changes in the dependent variable over the 4-month interval. First, the main effects and interaction of characterological and behavioral self-blame attributions at Time 1 were tested as predictors of perceived control over cancer recurrence at Time 2. Second, the main effects and interaction of behavioral and characterological self-blame at Time 1 were examined as predictors of psychological distress at Time 2. Third, perceived control over recurrence at Time 2 was added as a possible mediator of the effects of initial self-blame attributions on Time 2 psychological distress. Finally, initial psychological distress was tested as a predictor of behavioral and characterological self-blame at Time 2. As recommended by Finney *et al.* (1984) for analyses of interaction effects in multiple regression analyses, all predictor variables were centered at their means.

Prediction of Time 2 Control Beliefs. Behavioral and characterological self-blame at Time 1, as well as their interaction, were tested as predictors of perceived control over cancer recurrence at Time 2. The overall equation was significant [$F(4,67) = 2.66, p < .05$], but the only individual predictor variable that was significant was perceived control over recurrence at Time 1. Time 1 self-blame attributions and their interaction failed to predict changes in perceived control over progression of current cancer at Time 2 [$F(4,45) = 2.00, p = .11$]. Thus, self-blame attributions near the time of diagnosis did not contribute to increased feelings of control 4 months later.

Prediction of Time 2 Psychological Distress. A series of multiple regression analyses was computed predicting psychological distress at Time 2 from the Time 1 variables, including initial levels of psychological distress, self-blame, and control beliefs. First, the main effects of behavioral self-blame and characterological self-blame at Time 1 were examined in predicting Time 2 psychological distress, while controlling for initial levels of psychological distress. The overall equation was significant [$F(3,68) = 42.70, p < .001$]. Time 1 psychological distress was a significant predictor ($sr^2 = .53, p < .001, \beta = .74$), and Time 1 characterological self-blame also accounted for change in psychological distress from Time 1 to Time 2 ($sr^2 = .03, p < .05, \beta = .19$). In both cases the direction of the relationship

was positive. When the interaction of characterological and behavioral self-blame was added, the overall equation remained significant [$F(4,67) = 35.22$, $p < .001$]. Initial psychological distress was a significant predictor ($sr^2 = .53$, $p < .001$, $\beta = .74$), and the interaction of behavioral and characterological self-blame was significant ($sr^2 = .02$, $p < .05$, $\beta = .18$). The main effect for characterological self-blame was no longer significant once the interaction of behavioral and characterological self-blame was included in the equation. This was true whether or not the main effects were centered to reduce the correlations among the predictors.

The interaction of behavioral and characterological self-blame was examined further by grouping participants on their ratings of characterological self-blame as either "no characterological self-blame" (a rating of 1 on the 5-point scale; $n = 50$) or "some characterological self-blame" (a rating of 2 to 5 on the 5-point scale; $n = 22$). The slopes of the regression lines of the association between behavioral self-blame and psychological distress were then calculated for these two groups, after controlling for initial levels of psychological distress (Cohen and Cohen, 1983). For the no characterological self-blame group, there was no association between behavioral self-blame and distress after controlling for the initial level of distress. For the group of patients who made attributions of characterological self-blame, there was a significant positive association between behavioral self-blame and psychological distress at follow-up ($sr^2 = .03$, $p < .01$), even after accounting for initial psychological distress.

To test the role of control beliefs as a possible mediator of the relation between initial self-blame and subsequent psychological distress, perceptions of control over cancer recurrence at Time 2 were added to the regression equation along with initial behavioral self-blame, characterological self-blame, and psychological distress in predicting psychological distress at Time 2. The overall equation remained significant [$F(5,66) = 24.91$, $p < .001$]. Initial psychological distress ($sr^2 = .52$, $p < .001$, $\beta = .75$), and initial characterological self-blame ($sr^2 = .03$, $p < .05$, $\beta = .19$), remained significant positive predictors once Time 2 control beliefs were included, and control beliefs were not a significant predictor. Thus, perceptions of control over cancer recurrence were not related to initial attributions of self-blame or to Time 2 psychological distress. Therefore, perceived control over recurrence did not mediate the relation between initial self-blame and subsequent psychological distress (see Baron and Kenny, 1986).

Prediction of Time 2 Self-Blame. Two additional regression equations were constructed to examine whether initial psychological distress contributed to later characterological and behavioral self-blame. With regard to characterological self-blame, Time 1 characterological self-blame accounted

for a significant portion of the variance in Time 2 characterological self-blame ($sr^2 = .23$, $p < .001$). Time 1 psychological distress also accounted for a significant portion of the variance in the change in Time 2 characterological self-blame ($sr^2 = .09$, $p < .01$). In the equation predicting Time 2 behavioral self-blame, only Time 1 behavioral self-blame was a significant predictor ($sr^2 = .14$, $p < .01$).

DISCUSSION

Patients' attributions of self-blame for the cause of their cancer, particularly the tendency to attribute the cause to aspects of one's character, appear to play a role in the psychological adjustment to cancer during the early months surrounding diagnosis and treatment. When controlling for initial levels of distress, characterological self-blame near the time of diagnosis predicted a small but significant portion of the variance in changes in psychological distress 4 months later, both alone and in interaction with behavioral self-blame. Further, initial psychological distress predicted increased characterological self-blame attributions at follow-up, suggesting that some cancer patients may engage in a negative cycle in which self-blame and distress mutually contribute to one another.

In contrast to the negative effects of characterological self-blame, none of the anticipated beneficial effects of attributing the cancer to one's behavior were apparent in the early months of coping with illness. Janoff-Bulman (1992), Tennen *et al.* (1986), and others have reported an association between behavioral self-blame and greater perceptions of control over the recurrence of a stressor and an association between feelings of control and lower psychological distress. In the present study initial behavioral self-blame was not related to control beliefs or psychological distress 4 months later. Further, there was no support for a mediational model in which behavioral self-blame would lead to reduced psychological distress through increased perceptions of control over cancer recurrence.

These findings extend our understanding of self-blame attributions in the adjustment to cancer in several ways. First, although behavioral and characterological self-blame were moderately correlated at both of the assessments, characterological self-blame was more clearly associated with psychological distress. The present findings underscore the adverse nature of blaming enduring aspects of one's character for the cause of a serious disease. Although initial behavioral self-blame was correlated with later psychological distress, this relationship was no longer significant in the regression analyses once the level of characterological self-blame was taken into account. Further, the present findings provide the first evidence of

which we are aware for a prospective relation between self-blame and subsequent psychological distress among cancer patients. That is, initial attributions of self-blame to one's character predicted increases in psychological distress 4 months later. This is consistent with the effects of self-blame attributions on subsequent distress among women who had an abortion (Mueller and Major, 1989). The present study provides data on the role of self-blame attributions at a much earlier point in the process of adjustment to cancer than has been available in previous studies. It is clear that patients who make characterological self-blame attributions near the time of their diagnosis are likely to be more distressed than those who do not generate such attributions.

Second, the interaction of characterological and behavioral self-blame indicated that behavioral self-blame is associated with increased psychological distress only when attributions of characterological self-blame were also made. This supports Janoff-Bulman's (1992) hypothesis that the combination of behavioral and characterological self-blame is important to consider. It suggests that those patients who hold themselves accountable in terms of both their behavior and their character are at greatest risk for increased psychological distress in the months following their diagnosis.

Finally, as hypothesized by Janoff-Bulman (1992) and others, the association between self-blame and psychological distress is a reciprocal process. In fact, initial psychological distress accounts for approximately four times the percentage of variance in later characterological self-blame than initial self-blame accounts for in later distress. The present study provides the first evidence of which we are aware to indicate that initial distress predicts increases in later self-blame, just as initial self-blame predicts increases in later distress.

Why might the data have failed to support the hypothesized role of behavioral self-blame in contributing to enhanced perceptions of control and reduced psychological distress as found by Timko and Janoff-Bulman (1985) in their cross-sectional study of cancer patients? Perhaps the answer lies in the length of time it takes for patients to begin to rebuild their assumptive world. Janoff-Bulman (1992) suggested that it may be naive to assume that behavioral self-blame could result in enhanced feelings of control over relatively short periods of time. The benefits of seeing one's own behavior as a contributing cause in one's disease may emerge only as part of the larger, complex, and lengthy process of coping with disease. Patients in the present study may not have had sufficient time to restructure their beliefs about themselves and their world. Further, many of the these patients were still in treatment for their cancer and the outcome of their treatment may have still been ambiguous. Self-blame and control beliefs may serve a beneficial function once one's condition has stabilized and a

more definitive prognosis has been generated. Longitudinal data in which self-blame attributions are monitored from the time of diagnosis over the period of a year or more are necessary to evaluate the changing role of these cognitive processes.

Control beliefs were not associated with psychological distress near diagnosis or at the 4-month follow-up. This is in contrast to a number of studies that have identified the beneficial effects of enhanced feelings of personal control, especially control over the possible recurrence of an illness (e.g., Helgeson, 1992; Thompson *et al.*, 1993). The discrepancy between this study and prior research may be due to several factors. As noted above, the present study examined the role of cognitive appraisals, including control beliefs, at a much earlier point in the process of adjustment to illness than has been the case in prior studies. The positive effects of control, like the effects of behavioral self-blame, may not emerge until later in this process. Further, recent research has suggested that control beliefs interact with other factors in contributing to psychological adjustment and reducing psychological distress (e.g., Helgeson, 1992; Thompson *et al.*, 1993). Future research will need to consider potential moderators of the relation between control beliefs and adjustment to cancer in the months following diagnosis and during the course of treatment.

The present findings provide information that may be useful in an applied context. Health professionals, including psychologists who assist cancer patients in coping with their illness, need information that will guide their efforts to facilitate successful psychological adaptation to cancer. The present data suggest that characterological self-blame, especially in combination with behavioral self-blame, in the first few months after a cancer diagnosis may serve as a marker of increased distress in the months to follow. Helping patients to identify changeable aspects of their behavior, and diverting their focus from the more stable aspects of their character, may be a useful focus for intervention efforts at these early stages of the adjustment process.

Future research can build on the present findings in several ways. First, the effects of self-blame near the time of patients' diagnoses need to be compared with the longer term impact of these beliefs on psychological adjustment. Whether the adverse effects of characterological self-blame continue and whether any beneficial effects for behavioral self-blame emerge over time are important questions for future investigation. Second, the role of control beliefs as possible mediators of the relationship between self-blame and psychological distress also warrants further attention. Enhanced perceptions of control over one's disease may also develop later in the process of recovery from and adjustment to cancer. Third, self-blame and control beliefs, as in previous studies, were measured by single items

in the present study. While the use of these single item measures provided the opportunity to compare our results to previous studies, the development of more refined measures of characterological and behavioral self-blame and perceptions of control over various aspects of cancer is needed. Finally, future research should investigate distinctions among other types of control beliefs as possible correlates of self-blame, including perceptions of control over one's emotions, physical symptoms, treatment, and interpersonal relationships that are affected by the disease (Affleck *et al.*, 1987; Thompson *et al.*, 1993).

ACKNOWLEDGMENTS

This research was supported by Grant MH43819 from the National Institute of Mental Health and Grant P30CA22435 from the National Cancer Institute. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the National Cancer Institute. The authors are grateful to numerous individuals for their assistance in carrying out this research, including oncologists Jerome Belinson, Thomas Roland, and James Stuart; oncology nurses Elaine Owen, Susan Guillan, Debbie Potter, and Joyce Silveira; staff assistant Jeannie Bernard; and research assistants Sydney Ey, Carol Kottmeier, Nancy Worsham, Doug Bolton, Caroline Freidman, Kathy Grant, Gina Mireault, Pam Orosan, and Cindy Gerhardt. The authors are grateful to Rick Ingram for his comments on an early version of the manuscript.

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