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Psychological Adjustment to Cancer: Control Beliefs and Coping in Adult Cancer Patients

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Appraisals of control, the use of problem- and emotion-focused coping strategies, and symptoms of anxiety/depression were assessed in a sample of 83 adult cancer patients (mean age of 41.6 years) on average 10 weeks after their diagnosis. Anxiety/depression symptoms were related to patients' ratings of their use of problem-focused coping, but not to perceived control or emotion-focused coping in simple correlations. In hierarchical multiple-regression analyses, problem-focused coping was associated with lower symptoms of anxiety/depression and emotion-focused coping with higher symptoms. The interaction of problem-focused coping and perceived control was a significant predictor of lower symptoms of anxiety/depression. This pattern was found for patients' but not external judges' ratings of patients' coping intentions. The interaction of coping and control did not predict anxiety/depression symptoms 4 months later, after controlling for initial anxiety/depression symptoms. Implications for adaptive coping with cancer are highlighted.

KEY WORDS: coping; control; stress; cancer.

INTRODUCTION

The most fundamental issue for researchers investigating processes of adaptation to stress concerns the association of coping and emotional distress in the face of significant psychosocial stress. In spite of the importance of this research question, the relationship between coping and distress remains unclear (Carver & Scheier, 1994). The relative lack of progress in identifying characteristics of effective coping may be a result of several factors, including (a) characteristics of the stressful event, including intrusive thoughts about the stressor, that are the target of coping efforts; (b) cognitive appraisals of the stressor, especially appraisals of control; and (c) the optimal way to measure the goals and intentions of individuals as they attempt to cope with stress in their lives.

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With regard to the first of these issues, characteristics of the stressful event, the present study investigated the association between coping and emotional distress in the context of adaptation to a significant stressor—the diagnosis and treatment of cancer. The diagnosis and treatment of cancer represent an important opportunity for studying coping processes for several reasons. First, much of the previous research on coping has been based on individuals' reports of their coping with heterogeneous stressors. For example, participants are frequently asked to report on a recent stressful event that may have occurred in any domain of their lives, ranging from work stress to interpersonal relationships to health problems, at an unspecified point in the recent past (e.g., Holohan & Moos, 1991). This approach has confounded individual differences in coping with differences in the types and the timing of stressful events. It is difficult to evaluate the efficacy of specific types of coping when effectiveness may have differed across the various stressors that were reported (Kuyken & Brewin, 1994). By selecting cancer as a target event, a sample of individuals can be compared who are reporting on a relatively homogeneous source of stress.[3] Second, the diagnosis of cancer has a clear onset and individuals are able to report on their coping within a clearly defined period of time. Third, coping with cancer is a topic of considerable importance in its own right, in light of the high prevalence of cancer and the well-documented adverse psychological effects associated with diagnosis and treatment. Cancer represents a significant threat to the well-being of the individual, as well as a source of potential harm to personal appearance, work performance and achievement, interpersonal relationships, and sexuality (e.g., Andersen, Anderson, & deProsse, 1989a; Heinrich & Schag, 1987). Moreover, the diagnosis and early phases of treatment of cancer are associated with heightened levels of symptoms of anxiety, depression and other forms of emotional distress (Andersen, Andersen, & deProsse, 1989b; Carver et al., 1993; Derogatis et el., 1983; Stanton & Snider, 1993).

In addition to the objective features of the stress of cancer, stress-related intrusive thoughts and avoidance are frequently reported by cancer patients (e.g., Cordova et al., 1995). Intrusive thoughts are associated with poorer psychological and physical outcomes in cancer patients (e.g., Epping-Jordan, Compas, & Howell, 1994), and represent a form of cognitive reexposure to the stressor (Baum, Cohen, & Hill, 1993). Intrusive thoughts and avoidance are thought to occur more rapidly in response to the stressor and thus are conceptualized as more proximal responses than more generalized symptoms of anxiety and depression (e.g., Miller, Shoda, & Hurley, 1996; Osowiecki, Epping-Jordan, Oppedisano, & Compas, 1995; Schwartz, Lerman, Miller, Daly, & Masny, 1995). Therefore, along with more objective features of the stress of cancer, intrusion and avoidance were controlled in the present study in predicting anxiety/depression symptoms as an index of generalized emotional distress.

[3]Although cancer represents a relatively more homogeneous stressor than has been the focus of much of the prior research on coping, we recognize that there is still considerable variability in the aspects of cancer and its treatment that are stressful for patients. In order to further account for variability in the stress associated with cancer, we controlled for characteristics of the disease (stage, prognosis, time since diagnosis) and patients' demographic characteristics.

A second issue that has impeded research on coping efficacy involves differences in coping as a function of cognitive appraisals of stress. Foremost among these is the controllability of the stressor, with both objective and subjective aspects of control being important. Appraisals of control can be viewed as a moderator of a stressful transaction and its adaptational outcome, and it has been hypothesized that certain coping strategies will be more effective with stressors that are appraised as controllable as opposed to uncontrollable (e.g., Compas, Banez, Malcarne, & Worsham, 1991; Helgeson, 1992; Thompson, Sobolew-Shubin, Galbraith, Schwankovsky, & Cruzan, 1993). There is evidence to support the hypothesis that in more controllable situations problem-focused coping strategies (efforts to act on or change the stressor) are used more frequently and in relatively uncontrollable situations emotion-focused strategies (efforts to palliate one's negative emotions) are employed more often (Lazarus, 1993; Lazarus & Folkman, 1984). Furthermore, the interaction of perceived control and the use of problem-focused (but not emotion-focused) coping has been found to predict psychological distress in several studies—less emotional distress is evident when problem-focused coping is used and perceived control is high, whereas more emotional distress is seen when problem-focused efforts are used and perceived control is low (e.g., Compas, Malcarne, & Fondacaro, 1988; Conway & Terry, 1992; Forsythe & Compas, 1987; Vitaliano, DeWolfe, Maiuro, Russo, & Katon, 1990). Only one study (Weisz, McCabe & Dennig, 1994) found evidence for lower distress and the use of emotion-focused coping with an uncontrollable stressor (medical procedures associated with childhood leukemia).

These findings suggest that perceived control is a moderator of the association between problem-focused coping and emotional distress, and that distress is lower when the type of coping is a "good fit" with the level of perceived control. Therefore, it is not the type of coping response per se that is used which is the key to reduced emotional distress, but rather how well the coping strategy fits the perceived situation. Previous studies have not clarified, however, whether this type of interaction will be reflected in coping with cancer. The efficacy of matching control appraisals and problem-focused coping when faced with a relatively uncontrollable event such as cancer warrants investigation.

A final issue involves the measurement of coping. The assessment of coping has not been standardized in the field and there is still little consensus on the best way to measure coping responses (e.g., Endler & Parker, 1994; Ptacek, Smith, Espe, & Rafety, 1994; Stone, Greenberg, Kennedy-Moore, & Newman, 1991). Most conceptualizations of subtypes of coping make reference to the goals or intentions of the individual (Lazarus, 1993; Rudolph, Dennig, & Weisz, 1995), yet most coping questionnaires use externally derived classifications of coping responses into different categories. Little or no attention has been given to assessing individuals' goals or intentions rather than inferring these intentions from their responses. Therefore, it is important to determine whether individuals' subjective impressions of their coping efforts are different than those of external raters. Coping efforts that seem objectively to be more emotion-focused may serve a problem-focused function for the individual and vice versa. For example, a cancer patient may report using exercise to cope with her or his disease with the goal of relaxing and managing negative emotions. This strategy may be coded, however, as a problem-focused coping

strategy with the intention of improving one's health in order to fight off the cancer. That is, coping intentions for a specific strategy may differ as function of the goals of the individual, and these intentions may not be readily apparent to external raters. As existing scales do not allow for respondents to report their intentions, a semistructured interview was used for the measurement of coping.

The present study examined appraisals of control, reports of problem- and emotion-focused coping, and symptoms of anxiety/depression in a sample of men and women recently diagnosed with cancer. Based on previous research, it was hypothesized that anxiety/depression symptoms would vary as a function of the interaction of perceived control and the use of problem-focused coping, with symptoms being lower when perceived control and problem-focused coping were high; prior research also led us to expect that the interaction of control beliefs and emotion-focused coping would not be significant. Analyses are presented using both self-ratings and external ratings of problem- and emotion-focused coping intentions to examine the importance of obtaining self-reports of coping intentions. Data were available on a subset of this sample to test the prospective relationship between coping and control beliefs with anxiety/depression symptoms 4 months later.

METHOD

Subjects

Participants were 83 young adult cancer patients (82% female), drawn from a larger sample of 126 patients participating in a longitudinal study of family coping and adjustment with cancer. Patients had a mean age of 41.49 years (SD = 7.46, range = 21 to 61). Five percent of the patients had completed some high school education, 33% had completed high school, 15% had completed some college, 5% had completed some graduate school, and 14% had completed graduate school. Patients in the present study were diagnosed with a variety of different types of cancer including breast cancer (40%), gynecologic cancer (21.7%), blood/lymph system cancers (8.4%), brain tumors (9.6%), lung cancer (2.4%), testicular cancer (6%), gastrointestinal cancer (4.8%), malignant melanoma (3.6%), and other (3.6%). Because the larger study from which these participants were drawn focused on patients who had children living in their homes, subjects in the present study tended to be younger than the general cancer population, and consequently their diagnoses represented cancer sites that are common among younger adults. Inclusion in the present study was based upon availability of complete data on the interview and all of the questionnaires. Comparisons were made between the 83 subjects included in this study and the 43 subjects for whom partial data were missing. The only significant difference was that patients not included in this study were judged by external raters as using significantly fewer problem-focused strategies.

Complete data were available on 62 of these patients at a follow-up 4 months later. The 62 patients with complete data differed from the 64 patients with incomplete data on two variables. Patients with incomplete data were lower in their

personal ratings of the use of problem-focused coping at the first assessment, and had higher avoidance scores on the IES at the first assessment.

Procedure

Participants were recruited through three cancer clinics affiliated with the Vermont Cancer Center: Medical Oncology, Radiotherapy, and Gynecologic Oncology. Patients were approached by a member of the medical staff (nurses, physicians' assistants, physicians) about participating in the study. For those who were willing, a member of the research team then contacted the person and obtained written consent. Approximately 75 % of patients who were approached agreed to participate in the study. Each individual participated in an individual structured interview (in person or over the telephone) and completed written questionnaires assessing psychological variables within several weeks of their diagnosis (mean time from diagnosis to interview of 10 weeks, $SD = 5.84$).

Measures

Stress and Coping Interview

A semistructured interview was developed for this study to collect information on patient demographics, perceived severity, perceived control, and individual coping efforts. Portions of the interview were based on prior research with cancer patients conducted by Taylor and colleagues (e.g., Taylor et al., 1985). Trained interviewers administered the protocol and recorded participants' responses verbatim.

Based on methods used in previous studies with cancer patients, perceptions of personal control were assessed with the following question: "How much control do you believe you have over the progression of your cancer?" Patients' rated their perception of their control on a Likert scale ranging from 1 (*not at all*), to 4 (*a great deal*). Use of a single item to assess perceived control over cancer progression is somewhat problematic in that it is not possible to determine the reliability of this measure; however, single item measures have been used frequently in other studies of perceived control over cancer (e.g., Taylor et al., 1985).

Coping was assessed in response to the following prompt: "I'd like to ask you to list all the ways you have handled or dealt with the cancer. This includes your feelings about the cancer and its effects on you and your family. I'd like you to list everything you have done and whether you think it worked well or not." After patients had given their responses, the interviewer asked them to state what their goal was when they tried each coping strategy. The patients were then given a description of problem-focused coping and emotion-focused coping and asked to rate their own coping responses as problem-focused coping, emotion-focused coping, or a mixture of the two. Examples of problem-focused strategies generated by subjects were "I read about the cancer that I have; even if the information is scary it helps" and "I met the situation head on. I went and got medical treatment and did what I was supposed to do." Examples of emotion-focused strategies were "I didn't spend

a lot of time dwelling on it" and "I refused to be depressed, I shoved away my fears."[4]

Participants' coping strategies were also coded by trained raters who classified the patient coping strategies without knowledge of how the patients rated them. Using a coding scheme based on prior empirical and theoretical coping research, definitions of problem- and emotion-focused coping were developed. Two raters were provided with these definitions and instructed to categorize each coping response as either problem-focused (defined as "any attempt to manage or change the problem or situation that is causing the individual distress") or emotion-focused (defined as "any attempt by the individual to regulate her or his emotional response to the problem or situation"). Interrater reliability with this coding scheme was 80% for emotion-focused coping and 89% for problem-focused coping. Scores reflecting patients' and external raters' scores for problem- and emotion-focused coping showed adequate convergent and discriminant validity. That is, patients' problem-focused coping scores were correlated with external raters' problem-focused coping scores ($r = .50, p < .01$) but not correlated with external raters' emotion-focused coping scores ($r = .14$). Similarly, patients' emotion-focused coping scores were correlated with raters' emotion-focused ($r = .60, p < .01$) but not raters' problem-focused coping scores ($r = .18$).

Stress Response Syndrome Symptoms

Avoidance and intrusive thoughts were measured by the Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1979; Zilberg, Weiss, & Horowitz, 1982), which was administered during the interview. The IES is a 15-item scale that assesses the current degree of impact experienced in response to a specific stressful event, in this case cancer. Participants were asked to indicate how frequently each item has been true with respect to their cancer in the 7 days preceding the interview. Responses were made with 4-point scales, from *not at all true* to *often true* (scores corresponding to 0, 1, 3, 5). There are two subscales to the IES, Avoidance (eight items, range 0 to 40) and Intrusion (seven items, range 0 to 35). Sample items in the Avoidance subscale include "I try not to think about it," "I try to remove it from my memory," and "I try not to talk about it." Examples of items on the Intrusion subscale include "I think about it when I don't mean to," "Any reminder brings back feelings about it," and "Pictures about it pop into my mind." Higher scores correspond with greater degree of impact. Internal consistency of the Avoidance and Intrusion subscales were adequate in the present sample (.73) and (.71), respectively. In original validation studies (Horowitz et al., 1979), the two subscales correlated $r = .42, p < .01$. In the current sample, Avoidance and Intrusion were correlated $r = .51, p < .001$. These correlations are small enough to infer that the

[4]Patients' responses reflected only a portion of the different types of problem- and emotion-focused coping (cf. Lazarus & Folkman, 1984, pp. 150-152). Reports of problem-focused coping emphasized efforts to change the stressful circumstances but not inward directed problem-focused coping (e.g., shifting levels of aspiration, developing new standards for behavior). Emotion-focused coping responses reflected primarily avoidance, distancing, and emotional release.

scales represent relatively separate constructs, but also indicate a moderate degree of covariation.

Anxiety/Depression Symptoms

Symptoms of anxiety/depression were measured by the Brief Symptom Inventory (BSI; Derogatis & Spencer, 1982). The BSI is a 53-item self-report questionnaire covering symptoms of psychological and physical distress with well-established internal consistency and test-retest reliability. For this study the Anxiety scale and the Depression scale were used as an index of patients' emotional distress. These two scales were chosen because they reflect overall psychological distress or negative affect (Clark & Watson, 1991; Katon & Roy-Byrne, 1991; Watson et al., 1995) and because they are relatively free of symptoms that may occur as a result of factors related to the patients' cancer or the treatment patients were receiving. The Anxiety and Depression scales were significantly correlated in the present sample, $r(82) = .63$, $p < .001$. The two scales were converted to normalized *T*-scores based on the normative data from a community sample of adult women reported by Derogatis and Spencer (1982) and the mean of the two *T*-scores was used in all analyses. Internal consistency of the subscales was good in the present sample (.87).

RESULTS

Descriptive Statistics

Means, standard deviations, and ranges for the variables measured at the first assessment are displayed in Table I. The means for the Avoidance (11.0) and Intrusion (12.55) subscales of the IES were moderately high, greater than those of community samples, and comparable to or higher than those reported for previous samples of cancer patients (cf. Horowitz, Field, & Classen, 1993). Although norms are not available for the combined Anxiety and Depression Symptom scales, the mean of the Anxiety and Depression Symptom *T*-scores for this sample was 54.37, indicating that patients in this study had moderately elevated scores on anxiety-depression (i.e., approximately 0.5 tandard deviation above the normative mean).

Patients' ratings of their coping efforts yielded a mean of 1.05 problem-focused strategies and 2.47 emotion-focused strategies. External ratings of patients' coping efforts resulted in a mean of 1.71 problem-focused strategies and 2.43 emotion-focused strategies.[5] Patients' ratings of their amount of control (on a 4-point scale), yielded a mean of 3.01, corresponding to having some amount of control over the

[5]There was a third category, mixed problem- and emotion-focused coping that subjects could use to classify their coping responses. Because the external raters categorized coping efforts either as problem-focused or emotion-focused, this mixed category was not used for the analyses in this paper. Another reason this category was not used in our analyses is because it is not possible to generate a clear hypothesis about how this type of coping would interact with perceived control. That is, it does not lend itself to the hypothesized interaction with control beliefs in the same way as problem-focused coping and emotion-focused coping.

Table I. Means and Standard Deviations of Predictor Variables[a]

Variables	Mean	SD	Range
Stage	2.16	1.06	I to IV
Prognosis	60.77	30.03	1 to 96
Time since diagnosis (weeks)	10.00	5.84	1 to 44
Age	41.49	7.46	21 to 61
Time 1 Anxiety/Depression Symptoms	54.37	8.45	40 to 76.5
Time 2 Anxiety/Depression Symptoms	52.17	9.12	40 to 71.0
Avoidance	11.00	7.60	0 to 30
Intrusion	12.55	7.06	0 to 33
Patient rating of problem-focused coping	1.05	1.36	0 to 5
Patient ratings of emotion-focused coping	2.47	1.97	0 to 12
External ratings of problem-focused coping	1.71	1.56	0 to 8
External ratings of emotion-focused coping	2.43	2.23	0 to 11
Patient ratings of control over cancer progression	3.01	0.96	1 to 4

[a]Scores for Anxiety/Depression Symptoms are normalized *T*-scores.

progression of their cancer. The stage of cancer ranged from I to IV; 33.7% had Stage I, 32.5% Stage II, 18.1% Stage III, and 15.7% Stage IV. The mean projected 5-year survival rate (i.e., percentage of patients with a similar prognosis expected to be alive in 5 years) was derived from the National Cancer Institute Surveillance, Epidemiology, and End Results (SEER) program (American Cancer Society, 1994). The mean for this sample was 60.77, indicating that these patients, on average, had a 60% probability of being alive in 5 years.)

Correlational Analyses

Intercorrelations among the variables measured at the initial assessment are shown in Table II. The three psychological predictors were moderately correlated in the range of $r(82) = .46$ to .52. Thus, the measures of anxiety/depression symptoms, intrusive thoughts, and avoidance were related but distinct indices of psychological distress in this sample.

The only significant correlation of coping or control with the indices of psychological distress was the association of patient-rated problem-focused coping with symptoms of anxiety/depression, $r(82) = -.24$, $p < .05$. Thus, the simple correlations between either patients' or external judges' ratings of coping and psychological distress were very limited. Stage and SEER prognosis also were not related to any of the psychological variables. Intrusion was marginally correlated with perceived control, $r(82) = -.21$, $p < .06$. Patient age was related to lower symptoms of anxiety/depression and intrusive thoughts.

Multiple-Regression Analyses

A series of hierarchical multiple-regression equations were constructed to examine control beliefs, coping and the interaction of coping and control as predictors of the symptoms of anxiety/depression. Separate equations were constructed to test patients' ratings of each of the two types of coping (problem- and emotion-focused) and external judges' ratings of the two types of coping, along with control beliefs and the

Table II. Intercorrelations of Demographic, Disease, and Psychological Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Stage	–													
2. Prognosis	−.79[c]	–												
3. Time since diagnosis	.01	.02	–											
4. Age	−.21	.13	−.04	–										
5. Sex	−.14	.07	.01	.15	–									
6. Education	−.05	.09	.10	−.13	−.06	–								
7. Anxiety/Depression symptoms	−.07	−.10	−.13	−.27[b]	−.18	.01	–							
8. Avoidance	−.09	−.19	−.03	−.00	−.07	−.12	.52[c]	–						
9. Intrusion	−.05	.04	.07	−.22[a]	−.19	.17	.46[c]	.46[c]	–					
10. Patient-rated problem-focused coping	.05	.03	.10	.03	.06	.14	−.24[a]	−.04	−.04	–				
11. Patient-rated emotion-focused coping	−.16	.19	−.06	.01	.06	.38[b]	.15	−.04	.12	−.07	–			
12. Externally rated problem-focused coping	.17	−.09	.07	.04	.07	.44	−.13	−.07	.08	.50[c]	.18	–		
13. Externally rated emotion-focused coping	−.04	.05	.10	−.01	.05	.33[a]	−.06	−.07	−.08	.14	.60[c]	.12	–	
14. Control	.17	−.14	−.13	−.02	−.06	.11	.02	−.15	.21	.15	.05	.00	−.08	–

[a] $p < .05$.
[b] $p < .01$.
[c] $p < .001$.

interaction of coping and control. In the first step in each equation, demographic (patient age, sex, education) and disease characteristics (stage, initial prognosis, time since diagnosis) were entered as control variables. Because intrusive thoughts and avoidance are viewed as more proximal reactions to stress, these variables were entered in the second step in the prediction of symptoms of anxiety/depression. The next step added the main effects for perceived control and the relevant coping variable. Finally, the primary hypothesis of the study was tested by adding the interaction of control and coping in the final step in each equation.

Predicting Anxiety/Depression Symptoms

The first regression equation was constructed to examine the role of patients' ratings of problem-focused coping in predicting anxiety/depression symptoms, and the results are presented in Table III. The table presents the significance of each step in the equation, as well as the standardized beta coefficients and squared semipartial correlations (i.e., the amount of unique variance explained) are presented for each predictor. The first step was significant, $F(6, 76) = 3.21$, $p < .01$, adjusted $R^2 = .20$. A less advanced stage, a better prognosis, and older age were all predictors of lower anxiety/depression. In the second step, stage and age remained significant predictors, and avoidance and intrusive thoughts were also significant. The third step added the main effects for problem-focused coping and perceived control. Stage was now marginally significant ($p < .10$); patient age, intrusive thoughts, and avoidance remained significant predictors; and the main effect for problem-focused coping was significant. In the final step, stage, patient age, avoidance, intrusive thoughts, problem-focused coping, and the interaction of problem-focused coping and perceived control were all significant predictors (total adjusted $R^2 = .51$). The use of more problem-focused coping and the interaction of problem-focused coping and higher perceived personal control were related to lower symptoms of anxiety/depression, explaining a significant unique portion of the variance (3%). Although this portion of unique variance appears small, this is a moderate effect for an interaction in linear multiple regression (McClelland & Judd, 1993). The main effect for problem-focused coping and the interaction of problem-focused coping and control together accounted for a moderate (6%) portion of unique variance in anxiety/depression symptoms.

To further understand the nature of this interaction, problem-focused coping scores were dichotomized (no problem-focused coping vs. some use of problem-focused coping) and the association of anxiety/depression symptoms and perceived control were calculated for patients who did and did not use problem-focused coping (see Fig. 1). As can be seen in the figure, anxiety/depression symptoms and control were unrelated for those patients who did not report using problem-focused coping. There was a negative relationship between anxiety/depression symptoms and control, however, for those patients who used problem-focused coping strategies. As hypothesized, anxiety/depression symptoms were lowest for those patients who used problem-focused coping and were high in perceived control.

In the second regression equation, patients' ratings of emotion-focused coping were substituted for problem-focused coping in the third and fourth steps in the

Table III. Hierarchical Multiple-Regression Analyses Predicting Anxiety/Depression Symptoms from Problem-focused Coping

Predictors entered	Beta	sr^2
Step 1: $F(6, 76) = 3.21, p < .01; R^2 = .20$		
Stage	−.49	.09[b]
Prognosis	−.42	.07[a]
Time since diagnosis	−.12	.02
Sex	−.18	.03
Age	−.30	.08[b]
Education	−.03	.00
Step 2: $F(8, 74) = 7.19, p < .0001; R^2 = .44$		
Stage	−.31	.03
Prognosis	−.24	.02
Time since diagnosis	−.14	.02
Sex	−.10	.01
Age	−.24	.05[a]
Education	−.03	.00
Avoidance	.35	.08[b]
Intrusion	.24	.04[a]
Step 3: $F(10, 72) = 6.75, p < .001; R^2 = .48$		
Stage	−.28	.03[a]
Prognosis	−.19	.01
Time since diagnosis	−.10	.01
Sex	−.08	.01
Age	−.23	.05[a]
Education	−.02	.00
Avoidance	.37	.09[b]
Intrusion	.26	.04[a]
Problem-focused coping	−.18	.03[a]
Control	.14	.02
Step 4: $F(11, 71) = 6.74, p < .001; R^2 = .51$		
Stage	−.32	.03[a]
Prognosis	−.22	.02
Time since diagnosis	−.06	.00
Sex	−.09	.01
Age	−.20	.03[a]
Education	−.01	.00
Avoidance	.36	.09[b]
Intrusion	.26	.04[a]
Problem-focused coping	−.17	.03[a]
Control	.09	.01
Coping × Control	−.18	.03[a]

[a] $p < .05$.
[b] $p < .001$.

hierarchy. The third step was significant, $F(10, 72) = 6.68, p < .001$. The significant predictors were stage (beta = −.33, sr^2 = .04), patient age (beta = −.22, sr^2 = .05), avoidance (beta = .36, sr^2 = .08), intrusive thoughts (beta = .25, sr^2 = .04), and emotion-focused coping (beta = .19, sr^2 = .03).

The final step was significant, $F(10, 72) = 5\ 99, p < .001$, adjusted R^2 = .40; however, the interaction of control and emotion-focused coping was not significant when added in the final step. The other predictors remained significant and the

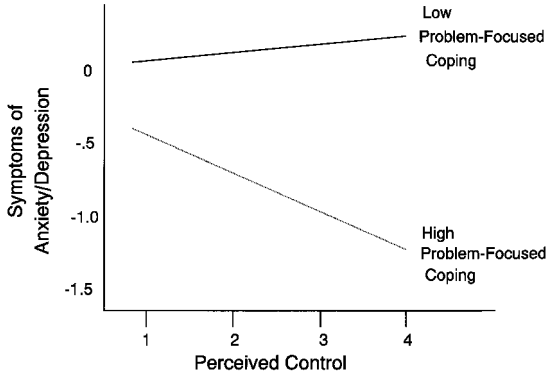

Fig. 1. Interaction of problem-focused coping and control in predicting symptoms of anxiety/depression. Anxiety/Depression scores are standardized ($M = 0$, $SD = 1$).

values of the betas and amount of variance explained remained unchanged from those reported for the third step in the equation. Thus, the use of emotion-focused coping predicted higher anxiety/depression symptoms. However, because the simple correlation between emotion-focused coping and anxiety/depression symptoms was nonsignificant , this finding should be viewed with considerable caution.

These same regression equations were repeated with external ratings of problem- and emotion-focused coping as predictors. Both of the overall equations were significant; however, neither problem- or emotion-focused coping or the interactions of coping and control were significant predictors when the external ratings of coping were used. Cancer stage, patient age, avoidance, and intrusive thoughts were the significant predictors in these equations.

Predicting Anxiety/Depression Symptoms at Follow-Up

This same set of variables was used to predict anxiety/depression symptoms assessed at the 4-month follow-up, controlling for prior levels of anxiety/depression symptoms. The overall equation was significant, $F(10, 52) = 3.57$, $p = .0012$. The only significant predictors were initial anxiety/depression (beta = .26, $p = .074$), and initial avoidance on the IES (beta = .36, $p = .016$). Neither the main effects for perceived control or problem-focused coping, nor the interaction of control and coping, were significant predictors in this equation.

DISCUSSION

The present study indicates that the association of cancer patients' coping responses with their emotional distress differs as a function of the type of coping and patients' perceptions of control over their cancer. Some evidence was found that the use of problem- and emotion-focused coping were directly related to emotional distress in these patients. Based on patients' ratings of their coping intentions, both

correlational and regression analyses indicated that the use of problem-focused coping was related to less emotional distress, whereas the use of emotion-focused coping was associated with greater distress in the regressions but not the correlations. Furthermore, the findings indicate that the combination of high perceptions of personal control and the use of relatively more problem-focused coping was associated with lower symptoms of anxiety/depression. This pattern was found when patients' ratings but not external judges' ratings of patients' coping intentions were used in the analyses.

The main effects for problem- and emotion-focused coping are consistent with findings from previous studies with cancer patients (e.g., Carver et al., 1993). An important issue addressed by this study involves patients' coping intentions; that is, patients' ratings of their coping goals provided a unique perspective on the coping process. The types of problem-focused coping reported by these patients involved seeking information about their disease, following treatment recommendations, and actively solving the stressors that occurred as a result of their cancer and its treatment. As in many prior studies, there was some evidence that emotion-focused coping was related to greater emotional distress in this sample. Examination of the specific types of emotion-focused coping reported by these patients indicates that their responses reflected avoidant types of coping, which have been found to be related to greater distress among cancer patients in previous research (e.g., Carver et al., 1993). Other types of emotion-focused coping (e.g., the use of relaxation and meditation techniques) may be more effective in managing emotional distress but were not reflected in the responses generated by this sample. However, the absence of a significant correlation between emotion-focused coping and distress in the bivariate analyses indicates that this finding should be viewed with caution.

The interview method that was used to assess coping allowed for the opportunity to compare patients' ratings of their coping goals and intentions with ratings made by external judges. Self and external ratings were moderately and significantly correlated for both problem-and emotion-focused coping. However, only patient ratings of problem- and emotion-focused coping were related to emotional distress, and only patient ratings of problem-focused coping showed the hypothesized interaction with control beliefs in predicting distress. Thus, patients' reports of the intentions of their coping efforts appear to have been a more sensitive index of whether they were trying to act on the source of stress (i.e., their cancer or cancer-related stressors) or palliate their emotions.

This study provides further support for the importance of the goodness-of-fit between coping and control beliefs. Consistent with findings from previous studies (Compas et al., 1988; Conway & Terry, 1992; Forsythe & Compas, 1987; Vitaliano et al., 1990), emotional distress was found to be lower when problem-focused coping and perceived control were high. As in the prior studies, the interaction of emotion-focused coping and control beliefs was not significant. Although the interaction of problem-focused coping and control beliefs explained only a relatively small portion (3%) of unique variance in emotions distress, this pattern is noteworthy in light of the relatively low level of objective control that may actually be available to cancer patients. Furthermore, the main effect for problem-focused coping and its interaction with control beliefs accounted for a moderate amount (6%) of unique

variance in anxiety/depression symptoms, after controlling for demographic factors, disease characteristics, and intrusive thoughts and avoidance. The magnitude of this effect is consistent with the small to moderate effects that are typically tound in field studies using multiple-regression analyses to assess interaction effects (McClelland & Judd, 1993).

It appears that only problem-focused coping is related to the perceived availability of control (Compas et al., 1991). Problem-focused coping may be most effective in producing changes in the stressful situation and in generating feelings of personal efficacy when it is accompanied by expectations of personal control (cf. Conway & Terry, 1992). A mismatch between coping and control was associated with higher symptoms of anxiety and depression. This mismatch may reflect efforts to gain control through problem-focused coping even though there was little opportunity for control or, alternatively trying to pursue active coping efforts when opportunities to gain control were available. Emotion-focused coping, on the other hand, appears to be responsive to cues and factors other than control beliefs (Compas et al., 1991). Emotion-focused strategies may be driven primarily by one's emotional distress in an effort to manage such distress. Avoidant strategies such as those reported by these patients appear to be ineffective, however, in achieving this goal.

The interaction of problem-focused coping and control at the initial assessment did not predict anxiety/depression symptoms 4 months later, after controlling for initial anxiety/depression. There are several possible interpretations of the failure to find support for a prospective effect. First, the sample of 62 patients on whom we had complete data differed from the 64 patients who dropped out on both patients' reports of problem-focused coping (those who dropped out reported more problem-focused coping) and avoidance (those who remained in the study were higher in avoidance). As a result, the range of problem-focused coping responses was more restricted in the prospective analyses, and this may have reduced the ability to detect any effects with this measure. Second, there was a loss of statistical power compared with the cross-sectional analyses at the initial time point, decreasing the ability to detect medium or even small effects. Third, the interaction of coping and control may not be related to changes in anxiety/depression over time. That is, the direction of this effect may actually run in the opposite direction with lower symptoms of anxiety/depression facilitating the ability to match coping and control beliefs.

The present findings expand on the growing literature on the process of coping with cancer. Prior studies have not found that the use of problem-focused or other forms of instrumental coping are related to lower distress in coping with cancer (e.g., Carver et al.,1993; Stanton & Snider, 1993). Moreover, none of the prior studies have examined the interaction of coping and perceptions of control as was done in the present study. The current findings suggest that active, problem-focused coping may be associated with lower distress for those patients who believe they have some degree of control over their disease. This suggests that active coping is effective when patients believe that they have the opportunity to exert some influence over their cancer. Should these findings hold up in future studies, psychological interventions for cancer patients can integrate these findings into practice. Specifically, it appears that such interventions could teach patients methods of active,

problem-focused coping and to recognize their usefulness in situations that are perceived as controllable.

Future research needs to build on the present study in several ways. First, further research is needed to clarify the prospective relationship of coping and control with emotional distress. Studies with larger samples, and therefore increased statistical power, are needed to determine if prospective effects exist. Second, the interview method of assessing coping used in the present study, while allowing patients to describe their coping efforts in their own words, may have provided a limited sample of the coping strategies that were used by these patients. The numbers of coping strategies that were generated by patients were low in comparison with those found in studies using questionnaires to assess the coping efforts of cancer patients. Further studies using questionnaire methods to assess coping are needed. Finally, individual difference factors that may be associated with the effective matching of coping and control beliefs need to be investigated. For example, dispositional optimism has been found to be an important predictor of coping with breast cancer and it is possible that optimism may be associated with the capacity to identify controllable aspects of one's cancer and to cope in ways that are matched with these appraisals (Scheier, Weintraub, & Carver, 1986).

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