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Coping with Prostate Cancer: A Meta-Analytic Review

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The present meta-analytic review assessed the relations between coping categories and indices of adjustment in men with prostate cancer. Relevant methodological and statistical information was extracted from 33 target studies ($n = 3{,}133$ men with prostate cancer). Men with prostate cancer who used approach, problem-focused, and emotion-focused coping were healthier both psychologically and physically, although the effect sizes for problem-focused coping and emotion-focused coping were more modest. For approach coping these effect sizes were particularly strong for measures of self-esteem, positive affect, depression, and anxiety. Conversely, men with prostate cancer who used avoidance coping experienced heightened negative psychological adjustment and physical health, and particularly for measures of positive mood and physical functioning. The findings of this study suggest that active approaches to coping with prostate cancer are beneficial psychologically, physically, and are positively associated with a return to pre-cancer activities.

KEY WORDS: coping; cancer; adjustment; meta-analysis.

According to the American Cancer Society (2003) prostate cancer is now the leading cancer diagnosed in males and is the second leading cause of mortality in males. Moreover, 1 out of 10 men is expected to develop prostate cancer during his lifetime, with this fraction increasing over time. Interestingly, however, survival rates are fairly promising. For example, less than 20% of these men are expected to die from the disease and 93% will survive for at least 5 years post-diagnosis, making quality of life issues extremely important for this group.

Both the diagnosis and treatment for prostate cancer are extremely invasive, and this illness engenders feelings of depression and anxiety not only for the individual diagnosed with prostate cancer but for his family as well. In addition, physical outcomes can include incontinence and impotence. For this reason, the identification of psychosocial factors that lead to both positive and negative psychological (and physical) outcomes is warranted, and is empirically under-represented relative to other major cancer types (Sestini and Pakenham, 2000).

The diagnosis of cancer can trigger a sequence of life-altering decisions that can induce stress (e.g., financial concerns, role changes) and increase personal vulnerability. The stage and the type of treatment that the cancer patient finds himself in, further complicates stressful feelings. Psychological research has confirmed that diagnosis of cancer leads to feelings of uncertainty, a loss of personal control, and a feeling of powerlessness (Davison and Degner, 1997). The consequences of cancer and its treatment, however, can produce sequelae varying from inconsequential to severely debilitating. Cognitive and social processes may account for these inconsistent findings; that is, coping strategies or general perceptions of the illness may predict which individuals with prostate cancer have better or worse psychological and physical adjustment (quality of life) during the course of cancer management.

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Quality of Life

An important objective of clinical medicine is to improve patients' quality of life. Quality of life (QOL) is defined at two levels (or types): disease-specific and general. However, in the typical research study only one type of QOL is used. Disease-specific QOL for men with prostate cancer includes disruptions in sexual, bowel, urinary, and hormonal functioning. General QOL, on the other hand, includes disruptions in areas such as social relationships, physical and role functions, and emotional well-being. Interestingly, QOL findings for men with prostate cancer are equivocal. In general, men with prostate cancer have normative levels of QOL (Litwin *et al.*, 1995, 1998; Ptacek *et al.*, 1999) and normative levels of anxiety and depression specifically (Bjorck *et al.*, 1999). Men appear to perform better in the psychosocial domains than in the physical domains, suggesting that although metastatic cancer exacts a physical toll, patients may respond by being more optimistic (Litwin *et al.*, 1998), and particularly in comparison to other cancer groups such as breast cancer patients (Frazer *et al.*, 1998).

Other areas of concern do emerge. In particular, a majority of men describe their sexual functioning as unsatisfactory (Arai *et al.*, 1999; Braslis *et al.*, 1995; Pederson *et al.*, 1993) even if the nerve-sparing procedure of Walsh (1992) is used as the primary treatment option. These men also report being ill-prepared for the aftermath of surgery, including catheter care, postoperative pain, incontinence, and erectile dysfunction (see Sestini and Pakenham, 2000). In addition, indices of QOL differ as a function of primary treatment option. Further complicating the matter is that, for survivors of prostate cancer, comorbidity with other medical illnesses, time since diagnosis, and comorbidity due to psychiatric difficulties are all related to QOL (Schag *et al.*, 1994).

The major limitation to QOL research is that researchers have not identified and tested the potential mediating mechanisms (e.g., coping) or processes that lead from prostate cancer diagnosis to QOL. This need is further magnified when one considers that 93% of all men diagnosed with prostate cancer will survive at least 5 years and 72% of all men diagnosed with prostate cancer survive 10 years (American Cancer Society, 2003). These impressive statistics lead researchers to wonder how they are doing it? Is it just medical care that leads to increases in QOL or even prolongs life, or can psychosocial variables, such as coping, help explain these survival statistics?

Coping

Although there are many definitions and theoretical approaches used to understand coping, it can generally be defined as a cognitive and/or behavioral attempt to manage (reduce or tolerate) situations that are appraised as stressful to an individual. Moreover, no single coping strategy or dimension can be considered (mal)adaptive. The quality of the coping strategy and process should be evaluated according to its impact on the outcome of importance. From the previous conceptual definition, Folkman and Lazarus (Folkman and Lazarus, 1980, 1985; Lazarus and Folkman, 1984) have distinguished two primary categories of coping: *emotion-focused* and *problem-focused*. These coping categories describe efforts to either alter the source of stress in the environment or to alleviate the personal emotional stress induced by the stressor. Emotion-focused coping is an attempt to manage internal demands and conflicts such as stressful emotions. It involves such coping strategies as: distancing, self-control, escape-avoidance, and positive reappraisal. Problem-focused coping is an attempt to manage external demands or reduce the conflict between an individual and the individual's environment. It includes strategies such as: managing external aspects of a stressor, seeking instrumental support, accepting responsibility, and planful problem-solving.

In addition to the problem-focused/emotion-focused coping taxonomy, a taxonomy of coping that emphasizes the focus or orientation of the coping strategy has also been emphasized. Many terms have been used to explain how cognitive and behavioral coping attempts are orientated towards a stressor (Roth and Cohen, 1986), for example, vigilance versus nonvigilance (Averill and Rosenn, 1972); vigilance versus avoidance (Cohen and Lazarus, 1973; Janis, 1977); attention versus inattention (Kahnemann, 1973); and intrusion versus denial (Horowitz, 1976). However, a common label given to coping attention directed toward a threat is termed *approach* and coping activity that is deflected from a threat is often termed *avoidance* (Holahan and Moos, 1987; Moos and Schaefer, 1993).

Between the various theories and taxonomies of coping, there is considerable overlap. Theoretical attempts have been made to explain the overlap (Moos and Schaefer, 1993). For example, positive

re-appraisal, and self-control (types of emotion-focused coping) and planful problem-solving, and seeking information (types of problem-focused coping) may be regarded as types of approach coping (Roesch and Weiner, 2001). Distancing and escape-avoidance coping (types of emotion-focused coping) may be considered as types of avoidance coping.

Coping with Prostate Cancer

When individual studies are examined, a complex coping picture emerges. Some researchers have found that men with prostate cancer take a passive role in cancer management, particularly when they are married, older, and/or less well-educated (Davison *et al.*, 1995; Gray *et al.*, 1997). However, others (e.g., Wong *et al.*, 2000) have found that a majority of men with prostate cancer want detailed information that focuses on their disease, treatment, survival, self-care, and empowerment. Still other studies (e.g., Laverly and Clarke, 1999) have found that over 60% of patients wanted to share decision-making with their physician. Gathering and processing information about cancer may lead to a better sense of control over the cancer, thus leading to better psychological (and even physical) outcomes (Johnson *et al.*, 1988).

Further inconsistencies are noted when individual coping strategies are considered. Lepore and Eton (2000) have found that men with prostate cancer who revise their life goals had noticeable improvement in QOL. Conversely, other studies (e.g., Perczek, 1999) have found that optimism was a predictor of postdiagnosis anxiety, whereas venting and behavioral disengagement predicted postdiagnosis distress. Still other studies (Ptacek *et al.*, 1999; see also Bjorck *et al.*, 1999) have found that coping strategies such as blaming oneself, engaging in wishful thinking, and avoidance in general were all associated with negative psychological adjustment. Surprisingly, McBride *et al.* (2000) have been the only researchers to link individual coping strategies to indices of compliance (dieting and exercise) during cancer management. These researchers found that men with early stage prostate cancer who used less avoidance coping methods complied more frequently.

A small number of individual intervention studies have been undertaken with men with prostate cancer, and, not surprisingly, inconsistent results emerge (Davison and Degner, 1997; Hellbom *et al.*, 1998; Johnson, 1996; Johnson *et al.*, 1988, 1989, 1997). Davison and Degner (1997) examined whether or not assisting men with prostate cancer obtain information about their cancer treatment (i.e., assisting them in taking an active role in treatment decision making) would reduce anxiety and depression in men newly diagnosed with prostate cancer. Those involved in the intervention group(s) reported significantly less anxiety 6 weeks after the intervention was introduced. Similarly, a short-term, problem-focused individual psychological support intervention has also been devised for use with newly diagnosed men with prostate cancer (Hellbom *et al.*, 1998). This intervention used cognitive-behavioral techniques to increase patients' active role in their treatment. Those men with prostate cancer that were part of the intervention were satisfied with the intervention, but this, however, was *not* associated with depression and anxiety.

Present Study

This meta-analysis reviews the relations among coping strategies and psychological and physical adjustment in individuals who have been diagnosed with prostate cancer. It was hypothesized that men with prostate cancer would be better adjusted both psychologically and physically if they engage in approach, problem-focused, and (to a lesser degree) emotion-focused coping methods relative to those who use avoidant coping methods. These differences were hypothesized across a variety of adjustment variables including negative psychological adjustment (e.g., depression, anxiety, distress), positive psychological adjustment (e.g., well-being, positive affect, self-esteem), physical adjustment (e.g., sexual functioning, urinary functioning, bowel functioning), as well as resumption of pre-cancer activities.

METHOD

Selection of Studies and Inclusion Criteria

Studies had to meet two basic criteria for inclusion in the meta-analysis. First, the investigation had to have at least one coping variable and one outcome variable (hereafter referred to as adjustment: either psychological or physical). Second, study participants/patients in each study had to have been already diagnosed with prostate cancer. Guided by

these basic criteria, the Psychinfo, PsychLit, Social Sciences Citation Index, Dissertation Abstracts, and Medline databases were searched. Only "Prostate cancer" was used in the keyword searches. The abstract of each resulting article was then read and a determination was made as to whether or not the primary study could be included in the meta-analysis (i.e., if the study contained an index of coping and adjustment, respectively). In addition, all volumes of the most central journals to health issues in the social sciences were manually searched: *Social Science and Medicine, Psychology and Health, Psychosomatic Medicine, Journal of Psychosomatic Research, Health Psychology, Psychology and Health, Anxiety, Stress, and Coping, Anxiety Research, Psychological Medicine, British Journal of Medical Psychology, Journal of Health and Social Behavior, Annals of Behavioral Medicine, Stress Medicine*, *Quality of Life Research* and the *Journal of Behavioral Medicine*. In addition, relevant medical journals were also examined (e.g., *Journal of Urology, Cancer*).

From this literature search, 33 studies met the inclusion criteria and had usable data within the manuscript or data that could be obtained from the authors.[4] These 33 studies represented 3,133 independent participants. The primary studies included 26 published journal articles and seven dissertations, a mean publication year of 1999, and a mean sample size of 101.06. From the primary studies, a number of variables were coded for the analyses: (a) sample size, (b) publication status (journal article/book chapter, dissertation, conference presentation), (c) type of study (intervention vs. correlational), (d) ethnicity, (e) mean age, (f) time since diagnosis, (g) cancer status (localized vs. nonlocalized), (h) cancer stage, (i) type of coping strategy, (j) type of adjustment, and (k) effect size(s) for the coping strategy-adjustment relations. The effect sizes were culled directly from each primary study or obtained from the primary authors. The first author and multiple research assistants coded all these variables from the primary studies. Reliability values were relatively high for all coded variables (Cohen's Kappa and Pearson correlations ranged from .92 to .98). A third judge resolved all disagreements.

[4]Relevant data could not be obtained from the following studies after directly contacting the researchers (Alperovitz, 2001; Ellis, 1998; Flood *et al.*, 1993; Merluzzi and Martinez Sanchez, 1997; Perczek *et al.*, 2002; Schag *et al.*, 1994; Whelan *et al.*, 1997; Wong *et al.*, 2000), and thus could not be used in the meta-analysis.

Coping and Adjustment Classifications

Coping

Coping strategies were classified into broader coping categories according to two coping taxonomies: (a) approach, avoidance; (b) emotion-focused, problem-focused.[5] The judges were provided with definitions of each coping category and with items from the relevant self-report instruments that indicated these coping categories. Definitions and strategies from the COPE (Carver *et al.*, 1989), the Coping Responses Inventory (Moos, 1993), and previous meta-analyses (Roesch and Weiner, 2001; Suls and Fletcher, 1985) were used to classify strategies as either approach or avoidant; and the ways of Coping Questionnaire (Folkman and Lazarus, 1988) was used to classify strategies into problem-focused or emotion-focused coping categories. Coping strategies could be classified into one or more of the two coping classification schemes (see Table I). Interrater reliability was calculated and deemed to be acceptable (Cohen's kappa ranged from .84 to .96); a third judge resolved disagreements. Higher scores on each coping category reflects greater use of the category.

Adjustment

Adjustment was also operationalized in various ways in the primary studies. Positive adjustment included measures of positive affect, self-esteem, well-being, life satisfaction, martial satisfaction, sexual satisfaction, and resumption of pre-cancer activities; negative adjustment included measures of negative affect, depression, distress, anxiety, fatigue, and pain. In addition, in some primary studies overall quality of life measures were used to operationalize adjustment, and included subscales such as social functioning, urinary functioning, bowel functioning, physical role limitations, emotional role limitations, and general health perceptions. Because adjustment was operationalized in numerous ways, we evaluated effect sizes at two levels. First, we examined the relations between coping and indices of adjustment at the specific construct level (e.g., approach coping-positive affect, approach coping-depression, approach coping-quality of life). However, to examine these relations at this level we required data

[5]The wide variability in the individual coping strategies assessed by the primary studies precluded the possibility of looking at coping–adjustment relations at the specific coping strategy level.

Table I. Taxonomy for Coping Components Strategies

1. Approach-avoidance coping	
Approach	Avoidance
Approach/active coping	Avoidance/passive coping
Positive expectancies/ optimism	Wishful thinking
Coping self-efficacy	Denial
Seeking information	Behavioral disengagement
Seeking guidance/support	Mental disengagement
Self-control	Self-blame
Positive reappraisal/ reinterpretation	Religion
Medical compliance	Threat minimization
Planning, logical analysis	Distancing/distraction
Suppression of competing activities	Emotional discharge/ venting
Acceptance	Alcohol/drug use
Problem solving	Helplessness
	Humor
2. Problem-focused and emotion-focused coping	
Problem-focused	Emotion-focused
Seeking instrumental support	Positive expectancies/ optimism
Active coping	Coping self-efficacy
Suppression of competing activities	Seeking emotional support
Medical compliance	Self-control
Planning, logical analysis	Positive reappraisal/ reinterpretation
Problem solving	Acceptance
	Threat minimization
	Wishful thinking
	Seeking other rewards
	Religion
	Humor

from at least four studies and a minimum analysis sample size of 100. Second, we developed a broad bipolar adjustment variable to maximize the sample size of the coping–adjustment relations. Positive adjustment was defined using criteria presented by Zeidner and Saklofske (1996) as positive affect and return to normative functioning. Indices of negative adjustment (e.g., distress, depression) were reverse scored to create a bipolar dimension of adjustment. This dimension ranged from negative to positive, with higher scores reflecting more positive (or better) adjustment (or health).

Meta-Analytic Statistical Procedures

All relevant statistical data not already in the form of a correlation coefficient (r) were converted to this effect size.[6] These study-level correlation coefficients were then weighted, aggregated, and then assessed with the Q statistic (Hedges and Olkin, 1985) using a random effects model.[7] These weighted correlations were calculated so that each coping category (approach, avoidance, emotion-focused, problem-focused) was crossed with each index of adjustment as well as the global index of adjustment. Subsequently, a moderator analysis was conducted using weighted regression to determine if publication status, year of publication, type of study, samples' age, and time since diagnosis moderated the coping–adjustment relation.[8] Cancer status (localized vs. nonlocalized) and stage of cancer could not be evaluated as moderator variables because the primary studies that comprise this meta-analysis used samples that were largely afflicted with localized and early stage forms of prostate cancer.

RESULTS

Effect Sizes and Moderator Analysis for Coping and Overall Adjustment

Individual effect sizes for the primary studies are presented in Table II. Weighted correlation coefficients (and 95% confidence intervals) between each coping category and adjustment are presented below. The effect sizes range from low to medium according to Cohen's (1988) classification scheme. The largest effect sizes were found for approach coping and overall adjustment ($M = .23$, $p < .001$; CI = .14 to .32) and avoidance coping and overall adjustment ($M = -.21$, $p = .002$; CI = $-.35$ to $-.08$). Men with prostate cancer who used more approach coping and less avoidance coping were better off psychologically and physically than men with prostate cancer who used less approach coping and more avoidance coping. However, there was significant variability in the effect sizes for both coping–adjustment relations ($Q = 107.01$, $p < .001$ for the approach-overall adjustment effect sizes; $Q = 51.94$, $p < .001$ for the avoidance-overall adjustment effect sizes), suggesting moderator variables might explain this

[6]Only zero-order relations were used in the meta-analysis. Some studies meeting the inclusion criteria presented partial relationships such as semi-partial correlations or regression coefficients. As noted by Becker and Schramm (1994), incorporating measures of partial relations in a meta-analysis provides information about *different* partial relations, and thus only zero-order relations should be used.

[7]These effect sizes were not disattenuated for unreliability.

[8]Small sample sizes precluded the possibility of examining moderator variables with each individual index of adjustment.

Table II. Descriptive Information and Effect Sizes Between Coping and Overall Adjustment for Primary Studies

Study	*n*	Effect sizes			
		Ap-Adj	Av-Adj	Pf-Adj	Ef-Adj
Ahmad (2001)	131	.07			
Bjorck *et al.* (1999)	30	.26	−.40	.26	
Curtis (2000)	277	.42			−.10
Davison and Degner (1997)	60	−.18			
Dow (1992)	288	.11			
Eton *et al.* (in press)	256	.18			
Germino *et al.* (1998)	201	.02	−.08	−.13	.08
Green *et al.* (2002)	65			−.13	−.07
Hack *et al.* (1999)	18	−.03		−.03	
Hellbom *et al.* (1998)	37	.69			
Jakobsson *et al.* (1997)	11		.00	.00	
Johnson *et al.*[a] (1988, 1989)	40	.14			.14
Johnson (1996)	41	−.04		.05	−.09
Krongrad *et al.* (1997)	96	.25			.25
Lepore and Helgeson (1998)	170	.49	−.53		
McBride *et al.* (2000)	420		−.08		
McGovern *et al.* (2002)	51		−.11		
Nordin *et al.* (2001)	105		−.41		.14
Ota and Tanaka (1997)	52	.34		.34	.18
Penedo *et al.* (2003)	46	.72			
Perczek (1999)	31	−.19	.27	.19	.11
Perez *et al.* (2002)	134	.19			.19
Poole *et al.* (2001)	229	.32		.30	.34
Ptacek *et al.*[b] (1999, 2002)	57	.13	−.33	.08	.19
Rosenberg *et al.* (2002)	16	.13			.13
Schnoll *et al.* (2002)	38	.17	−.11	.25	.20
Shrock *et al.* (1999)	94	.16			
Thornton (2002)	80	.10	−.13		
Walker *et al.* (1996)	9		.04		.04
Weber (2001)	30	.27			
Zucchero (1998)	20	.59			

Note. Ap: proach coping, Av: avoidance coping, Pf: problem-focused coping, Ef: emotion-focused coping.

[a]Data from analyzed in these two studies were from the same data set.

[b]Data from analyzed in these two studies were from the same data set.

variability. Positive, but smaller, effect sizes were evident for the relations between problem-focused coping and adjustment ($M = .11$, $p = .048$; CI = .01 to .22) and emotion-focused coping and adjustment ($M = .11$, $p = .021$; CI = .02 to .20). As with the approach and avoidance coping categories, significant variability in the effect sizes was evident for the problem-focused and adjustment relation ($Q = 29.35$, $p = .004$) and the emotion-focused and adjustment relation ($Q = 50.23$, $p < .001$).

To explore this effect size variability further, moderator analyses were conducted with the following variables: Time since prostate cancer diagnosis, type of study, mean age of sample, publication year, and form of manuscript. Time since prostate cancer diagnosis was significantly and positively associated with the emotion-focused coping and overall adjustment effect size ($\beta = .84$, $p = .001$), indicating that the longer the time since diagnosis the stronger (or higher) the emotion-focused coping and overall adjustment relation was. Time since diagnosis did not significantly predict the coping-overall adjustment relations for approach, avoidance, and problem-focused coping (*p*s ranged from .552 to .984). Type of study did not significantly predict the effect sizes for any of the coping-overall adjustment relations (*p*s ranged from .209 to .847), indicating no significant difference between correlational and intervention studies in coping-overall adjustment effect relations. Mean age of the sample was significantly and negatively associated with the emotion-focused coping and overall adjustment effect size ($\beta = -.46$, $p = .003$), indicating that the younger the sample, the stronger the emotion-focused coping and overall

adjustment relation was. Mean age of sample did not significantly predict the coping-overall adjustment relations for approach, avoidance, and problem-focused coping (*p*s ranged from .372 to .841). Neither publication year nor the form of the manuscript (journal article vs. dissertation) was significantly associated with any of the coping-overall adjustment effect sizes (*p*'s ranged from .130 to .989).

Effect Sizes for Coping and Specific Indices of Adjustment

Effect sizes for the coping categories and the specific indices of adjustment also ranged from small to medium (see Table III). Approach coping was significantly and positively related to measures of self-esteem, positive affect, resumption of pre-cancer activities, social functioning, quality of life, and energy/vitality. Approach coping was significantly and negatively related to measures of anxiety, depression, and pain. Approach coping was not significantly related to measures of life satisfaction, sexual functioning, physical role limitations, urinary functioning, distress, and emotional role limitations.

Avoidance coping was significantly and negatively related to measures of positive affect and physical functioning. Avoidance coping was not significantly related to measures of distress and social functioning.

Problem-focused coping was significantly and positively related to measures of social functioning and positive affect. This coping category, however, was not significantly related to measures of sexual functioning and distress.

Emotion-focused coping was significantly and negatively related to measures of emotional role limitations, depression, pain, and physical role limitations. Emotion-focused coping was not significantly related to measures of life satisfaction, positive affect, social functioning, quality of life, physical functioning, energy/vitality, sexual functioning, and distress.

DISCUSSION

The findings of this meta-analysis support the hypothesis that individuals who confront their illness in a direct way, either emotionally or instrumentally, reap both psychological and physical benefits, whereas those who do not are apt to experience increasing psychological and physical pain (see also Roth and Cohen, 1986; Suls and Fletcher, 1985 for reviews). Interestingly, the magnitude of the effect sizes between approach, avoidance, problem-focused, and emotion-focused coping with overall

Table III. Effect Sizes for Coping and Specific Indices of Adjustment

	Coping category							
	Ap		Av		Pf		Ef	
Type of adjustment	M	CI	M	CI	M	CI	M	CI
Quality of life	.17*	.10 to .24					.11	−.10 to .33
Positive affect	.24*	.07 to .40	−.20*	−.35 to −.05	.13*	.01 to .26	.07	−.16 to .29
Self-esteem	.33*	.16 to .51						
Energy/vitality	.17*	.08 to .26					−.02	−.40 to .35
Life satisfaction	.25	−.05 to .54					.02	−.11 to .14
Return pre-cancer Activities	.18*	.07 to .28						
Social functioning	.18*	.10 to .25	−.08	−.26 to .09	.21*	.11 to .31	.10	−.07 to .26
Sexual functioning	.05	−.10 to .20			.13	−.13 to .39	−.05	−.14 to .05
Urinary functioning	−.09	−.25 to .08						
Physical functioning			−.11*	−.18 to .03			.12	−.14 to .38
Physical role limitations	−.07	−.18 to .04					−.17*	−27 to −.07
Emotional role limitations	−.18	−.42 to .05					−.33*	−.53 to −.13
Anxiety	−.40*	−.69 to −.12						
Depression	−.37*	−.50 to −.18					−.30*	−.48 to −.11
Distress	−.11	−.34 to .13	.13	−.16 to .43	.02	−.10 to .14	−.19	−.43 to .03
Pain	−.13*	−.22 to −.04					−.18*	−.27 to −.08

Note. AP: approach coping, AV: avoidance coping, PF: problem-focused coping, EF: emotion-focused coping. M: mean effect size. CI: 95% confidence interval for the effect size.
*$p < .05$.

adjustment are also comparable to those found in a recent meta-analysis of randomized psychosocial interventions in patients with other types of cancer (ESs ranged from .19–.28; Meyer and Mark, 1995). The importance of using active coping methods is further underscored when one considers that stress can retard the rate of recovery from illness (Grassi and Rosti, 1996; Kiecolt-Glaser *et al.*, 1995; Mullins *et al.*, 1997) and increase fatigue, which is associated with other treatment side-effects such as vomiting and nausea and poor treatment compliance (Ayres *et al.*, 1994; Gilbar and De-Nour, 1989; Lewis *et al.*, 1983; Richardson *et al.*, 1988). Thus, those men with prostate cancer who used more active coping strategies such as positive reinterpretation and problem-solving did not experience fatigue as readily and thus appear to have avoided the concomitant side-effects during cancer management.

The current and past findings are best codified when considering the biobehavioral model of disease course of cancer presented by Andersen and colleagues (Andersen *et al.*, 1994, 2001). According to this theoretical model, cancer diagnosis influences cancer patients' stress levels, which in turn influences his or her QOL. In essence, the temporal sequence from diagnosis to stress to QOL serve as the primary antecedents to more proximal behavioral and biological pathways to the course of the disease. The current meta-analysis has shown that higher QOL scores (and related adjustment measures) are associated with those men with prostate cancer who make active attempts to reduce stress, and lower QOL scores are associated with those men with prostate cancer who avoid any active attempt to reduce stress. One would predict, for example, that men with prostate cancer who experience increased or high QOL should engage in healthy behaviors like eating more nutrious meals, experience fewer sleep disturbances, are more likely to comply with their medical treatment, and experience favorable neuroendrocrine functioning than men who have decrements in their QOL. According to Andersen's model, then, these behavioral and biologic factors are subsequently associated with immune functioning and ultimately the progression of the disease (see Herbert and Cohen, 1993; Maier *et al.*, 1994). In sum, it appears that how one initially copes with the stress of being diagnosed with cancer that creates a cascade of adaptive versus maladaptive behaviors and biological functioning that ultimately impacts disease progression. Thus, those individuals who cope with the stress of cancer diagnosis by using avoidance coping appear to be at high risk for poor disease progression, whereas those who use approach coping appear to be at low risk for poor disease progression.

These findings are also potentially consistent with the transaction model of stress and coping (Lazarus and Folkman, 1984). According to the transactional model, one's interpretation or perception of a stressful event (e.g., treatment of prostate cancer) is thought to determine, at least to a degree, how one copes with this event. Appraisal is an individual's perception or judgment of an event that determines the stressfulness of the situation in terms of personal significance, goals, and resources. In the primary appraisal stage, the individual assesses the meaning of an event or situation and judges how the situation relates to the individual. In this sense, primary appraisals are the determinants of the personal significance of the event. In general, those who appraised their illness as a challenge rather than a threat are more likely to use approach coping. Due to the risks associated with cancer, such as the interference with goal accomplishment and/or the danger of death, it is likely that individuals who see the prospect as challenging will focus their energy and attention directly on the stressful circumstances. In more tangible terms, activities such as complying with treatment regimes, seeking information about cancer and treatment options, and the suppression of competing activities that take energy away from dealing directly with the management of cancer, are all strategies that can be effective in cancer management. This suggests that it is not just these specific approach and problem-focused coping activities but also additional approach coping strategies, such as seeking support from friends and believing in the effectiveness of one's action in managing cancer, that are associated with indices of adjustment.

Past studies have shown that avoidant strategies may reduce the effects of acute, severe stressors because they prevent the individual from becoming overwhelmed when emotional resources are limited, such as immediately after diagnosis (see Dean and Surtees, 1989; Greer *et al.*, 1979; Levine *et al.*, 1978; Suls and Fletcher, 1985). This finding was not supported in the current research. Not only was the use of avoidance coping associated with poor overall adjustment as well as low positive affect and physical functioning, this variable was also unrelated to time since diagnosis. This is consistent with Stanton and Snider (1993) who found that cognitive avoidance coping prior to breast biopsy predicted more distress at that point, after cancer diagnosis, and after surgery

(see also Carver *et al.*, 1994). These findings are also consistent with most breast cancer research (see Delahanty and Baum, 2001 for a review), which suggests that individuals who have characteristics such as unassertiveness and have a greater likelihood to suppress their emotions (the Type C individual) experience poor adjustment (Temoshok, 1987), including neoplastic spread (Jensen, 1987).

Contrary to some past research (see Maes *et al.*, 1996), emotion-focused coping was positively associated with overall adjustment. In the current meta-analysis, however, emotion-focused coping was more approach-oriented in that it included coping strategies such as positive reinterpretation and emotional support rather than coping strategies such as emotional discharge and denial. This might explain why time since diagnosis did not moderate the avoidance coping–adjustment relation but did, interestingly, moderate the emotion-focused coping–adjustment relation. It appears that men with prostate cancer do engage in coping strategies that alleviate or minimize the distress associated with cancer diagnosis and management. However, their emotional expression is relatively adaptive, in that they are more optimistic and engage in socially supportive acts during cancer management. This relation was also moderated by age, with stronger emotion-focused adjustment relations being found for those men with prostate cancer who are younger. This is consistent with research that has shown that younger cancer patients are more likely to experience distress than older patients (Van't Spijker *et al.*, 1997) and perceive (breast) cancer to be a greater threat (Funch and Marshall, 1983; Vinokur *et al.*, 1990), and thus may be more likely than older men to seek out support and/or to be more optimistic about their chances for survival.

A recent criticism of cancer research is the lack of construct and measure definition (see McKenna *et al.*, 1999), which can preclude comparisons between studies. This meta-analysis attempted to overcome this limitation by aggregating across measures of both coping and adjustment. However, relations between coping and specific indices of adjustment also yield valuable information because it determines the generalizability of the findings to different constructs and measures of QOL. Relations were found between coping categories and a number of affect-based psychological measures, physically-based measures, and objective life measures (e.g., resumption of pre-cancer activities) of adjustment. Specifically, approach coping was associated with affect-based measures such as self-esteem, positive affect, depression, anxiety and quality of life, physically-based measures such as energy/vitality and pain, and objective life measures such as a return to pre-cancer activities and increases in social functioning. Avoidance was related to both affect-based measures such as positive affect and physical measures such as physical functioning. Similarly, problem-focused coping was related to both positive affect and social functioning. Emotion-focused coping was similarly related to a number of affect-based measures such as depression and emotional role limitations and physical health measures such as pain and physical role limitations. Beyond showing that there is considerable variability not only in measures of adjustment but with measures of coping as well (see also Stanton *et al.*, 2001), these findings suggest that the influence of coping goes beyond the psychological component of adjustment and also may influence physical health and everyday normative functioning.

These findings, however, suggest that some indices of adjustment have more explainable variation as a function of specific coping categories. Two affect-based adjustment measures were particularly sensitive to multiple coping categories: (a) Positive affect was related to approach, avoidance, and problem-focused coping; and (b) depression was related to approach and emotion-focused coping. However, these sensitivities were not confined to affect-based measures. Perceived pain was associated with both approach and emotion-focused coping and social functioning was associated with both approach and problem-focused coping. However, important adjustment indices of physical health such as sexual and urinary functioning were not related to coping categories. In general, then, problem-focused, and emotion-focused coping can increase positive affect and social functioning and reduce depression and general pain, but these coping categories do not alleviate specific worries about sexual and urinary functioning that are a particular concern for men with prostate cancer (see Sestini and Pakenham, 2000). Thus, while some coping categories are adaptive for some specific adjustment outcomes, other psychosocial predictors (e.g., pre-treatment cancer knowledge, previous experience with a catheter) might be more predictive of specific physical functioning.

There were a number of limitations to the meta-analysis, and many were a function of the relatively low number of coping studies that have been conducted in men with prostate cancer and the uniformity of the samples employed in these studies. First, we could not examine the relations

between specific coping strategies (rather than the global coping categories) and indices of adjustment. It could be the case that stronger relations are found between positive reinterpretation and adjustment than between emotion social support and adjustment. Second, the samples that comprised the meta-analysis typically had localized/low stage cancer and were undergoing radical prostatecomy for their primary medical treatment. We could not examine these potential moderators as suggested by others (Moyer, 1997; Van't Spijker *et al.*, 1997). Related to representation of the sample, the samples used in the primary studies were predominately Caucasian. This is particularly disappointing because minority men, and African American men in particular, have the highest incidence of prostate cancer (American Cancer Society, 2003). Third, the primary studies overwhelmingly used self-report measures to assess both coping and adjustment. Conducting studies that assess immune functioning as a marker of adjustment would be extremely useful. Finally, longitudinal assessments of those individual dealing with prostate cancer is needed, rather than the all to often employed cross-sectional designs that the current meta-analysis is largely based on. Specific coping methods and social supportive actions may differ as a function of the post-diagnosis period. For example, emotion-focused coping may better predict only psychological health immediately after diagnosis but problem focused-coping may better predict both psychological and physical health outcomes 6 months or longer post-diagnosis.

It could be argued that coping categories account for a small amount of variance in the adjustment variables. However, the fact that coping does not account for a great deal of variance should not denigrate their significance as correlates of these health outcomes. Instead, these results confirm that individual coping methods are not the sole determinants of psychological adjustment and physical health. Coping may, in fact, interact with other situational, personality, or cultural variables such as sense of coherence, attributions, hardiness, dispositional optimism, health locus of control, self-efficacy, and acculturation to better predict these outcomes, a possibility that needs to be addressed in primary research. Although we have presented many reasons to be cautious about the findings, our results suggest that coping cognitions and behaviors do indeed matter for those dealing with prostate cancer. These findings are important in that building interventions to increase cancer patients' quality of life have been effective in a variety of cancers, in varying stages of the disease (Andersen, 1992, Helgeson and Cohen, 1996; Helgeson *et al.*, 1999). Self-help groups are a particularly interesting application of self-intervention in that men with prostate cancer do not necessarily attend to receive emotional support, but rather attend to give and receive information. Because of the light of the increasing number of national and local self-groups (e.g., US TOO, Man to Man and Prostate Support and Awareness) programmatic evaluation of these interventions is warranted.

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