Compas BE, Haaga DAF, Keefe FJ, Leitenberg H, Williams DA. Sampling of empirically supported psychological treatments...

Article *in* Journal of Consulting and Clinical Psychology · March 1998

DOI: 10.1037//0022-006X.66.1.89 · Source: PubMed

CITATIONS
175

READS
855

5 authors, including:

Dave Haaga
American University Washington D.C.
157 PUBLICATIONS **5,430** CITATIONS
SEE PROFILE

Francis J Keefe
Duke University Medical Center
456 PUBLICATIONS **27,248** CITATIONS
SEE PROFILE

David Alan Williams
University of Michigan
232 PUBLICATIONS **10,596** CITATIONS
SEE PROFILE

Journal of Consulting and Clinical Psychology
1998, Vol. 66, No. 1, 89–112

0022-006X/98/$3.00

Sampling of Empirically Supported Psychological Treatments From Health Psychology: Smoking, Chronic Pain, Cancer, and Bulimia Nervosa

Bruce E. Compas
University of Vermont

David A. F. Haaga
American University

Francis J. Keefe
Duke University Medical Center

Harold Leitenberg
University of Vermont

David A. Williams
Georgetown University Medical Center

Interventions in health psychology and behavioral medicine represent an integral area of research for the development of psychological therapies to enhance health behaviors, manage symptoms and sequelae of disease, treat psychological symptoms and disorders, prolong survival in the face of a life-threatening illness, and improve quality of life. A sampling of interventions in health psychology and behavioral medicine is offered that meet the criteria for empirically supported treatments for smoking cessation, chronic pain, cancer, and bulimia nervosa. Evidence for empirically supported treatments is identified, along with promising interventions that do not yet meet the criteria as outlined by D. L. Chambless and S. D. Hollon (1998). Evidence for the effectiveness and clinical significance of these interventions is reviewed, and issues in this area of research are outlined.

Interventions in clinical health psychology and behavioral medicine are broadly concerned with helping people live longer and improve their overall quality of life (Kaplan, 1994). These broad goals are accomplished through interventions that address an impressive array of diseases, conditions, and symptoms that fall into four broad categories. First, interventions have been designed to decrease health risk behaviors, such as alcohol and substance abuse and smoking, and increase health promoting behaviors, such as exercise and a following a healthy diet. Second, interventions are available to manage specific symptoms or problems such as chronic pain, including headache, back pain, and chronic abdominal pain. Third, interventions have been designed to facilitate effective coping with chronic or life-threatening diseases and conditions, including cancer, HIV and AIDS, diabetes, asthma, arthritis, Alzheimer's disease, stroke, and brain and spinal cord injuries. Fourth, health psychology interventions have been developed to address health-related problems that are manifested in the *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed. (*DSM–IV*; American Psychiatric Association [APA], 1994) diagnoses, including bulimia nervosa and anorexia nervosa and body dysmorphic disorder.

Populations that have been the target of health psychology interventions differ from those in most outcome studies of psychological therapies for psychopathology. Except for the fourth category of interventions, patients typically do not meet criteria for a *DSM–IV* diagnosis. Instead, many of the participants in these studies are identified because of their exposure to stress associated with a disease or medical condition, exposure to or participation in high-risk situations and behaviors, or the experience of a specific symptom (e.g., pain) rather than a particular disorder.

The desired outcomes in health psychology interventions are also often different from the goals in the treatment of psychopathology. On the one hand, health psychology interventions frequently address more focused goals, often concentrating on a single symptom (e.g., pain) or a single behavior (e.g., smoking). On the other hand, the goals of these interventions are often broader than those in interventions to treat psychopathology, as

Bruce E. Compas and Harold Leitenberg, Department of Psychology, University of Vermont; David A. F. Haaga, Department of Psychology, American University; Francis J. Keefe, Department of Psychology, Duke University Medical Center; David A. Williams, Department of Psychiatry, Georgetown University Medical Center.

Preparation of this article was supported in part by Grant CA67936 from the National Cancer Institute. We thank the following individuals for feedback and recommendations on earlier versions of this article: Joan Romano, Laurence Bradley, Karen Gil, Angele McGrady, Janice Chu, Thomas Brandon, Rick Brown, Dianne Chambless, Paul Cinciripini, Susan Curry, Ed Fisher, Russell Glasgow, Joel Killen, Harry Lando, Edward Lichtenstein, Kenneth Perkins, Bill Sanderson, Saul Shiffman, Sheila Woody, Kenneth Holroyd, and Donald Penzien. Francis J. Keefe thanks John Lefebvre, Jennifer Ward, David Wasserman, and Marlene Jacobs for their help in identifying relevant articles and reviewing earlier drafts of the article.

Correspondence concerning this article should be addressed to Bruce E. Compas, Department of Psychology, University of Vermont, Burlington, Vermont 05405. Electronic mail may be sent to b_compas@dewey.uvm.edu.

they include the enhancement of overall quality of life. The outcomes of health psychology interventions can also be dramatic, including prolonged survival in the face of a life-threatening disease, such as cancer or AIDS, or behaviors that may contribute to a life-threatening disease, such as smoking as a risk for lung cancer. Finally, health psychology interventions are often explicitly concerned with increasing efficiency in the utilization of health care and with cost-effectiveness (Friedman, Sobel, Myers, Caudill, & Benson, 1995).

In spite of these differences from interventions for psychopathology, the application of the Chambless and Hollon (1998) criteria for empirically supported treatments to health psychology is extremely important. The identification of empirically supported treatments can help to further establish the role of psychological interventions as part of interdisciplinary approaches to the management and treatment of a wide range of health problems. We have selected one problem from each of the four intervention categories for the focus of this review: smoking cessation, management of chronic pain, coping with cancer and its treatment, and treatment of bulimia nervosa. These four topics reflect both the diversity and significance of psychological therapies in health psychology. The outcomes of interventions in these four areas include subclinical levels of symptoms of anxiety and depression (in response to pain or the diagnosis and treatment of cancer), symptoms that can dramatically interfere with daily functioning and quality of life (chronic pain), a psychiatric diagnosis (bulimia nervosa), a potentially life-threatening behavior (smoking), and prolonged survival (cancer).

In accordance with the evaluation criteria, each study used to support efficacy must have been published or accepted for publication and written in English. Each study must have used random assignment to treatment conditions; be manual guided or, at a minimum, be very clearly described; standardized, and replicated by different investigators. The psychological intervention should have demonstrated statistically significant superiority in relationship to a no- (or minimal) treatment control condition, to another viable treatment, pill, or placebo, or equivalence to another well-established empirically supported psychological intervention. The focus is exclusively on individual and small-group psychosocial interventions conducted face-to-face by professionals or paraprofessionals.

Smoking Cessation

Cigarette smoking cessation is an extremely important domain for the identification of empirically validated psychological interventions. Despite dramatic societal changes in the past 30 years favoring nonsmoking, about one fourth of the adult population of the United States smokes cigarettes (APA, 1996). A smaller proportion would qualify for the *DSM–IV* diagnosis of nicotine dependence, but given that there is no known safe level of smoking and considerable evidence of health benefits of smoking cessation, this is one area of clinical research in which diagnostic categorization plays only a secondary role, with objectively defined and measurable problematic behavior being primary (APA, 1996).

We exclude many intervention methods from consideration, including (a) self-help books, (b) audiotapes or videotapes, (c) telephone hotlines, (d) work-site interventions, (e) mass media interventions for communities or population-based interventions, (f) legal and political interventions (e.g., increasing cigarette taxes), and (g) biological interventions (e.g., antidepressant medications).

To identify potentially relevant studies, we reviewed abstracts obtained through PsycLIT searches covering January 1990 through September 1996 (articles database) using (a) the term *smoking cessation* and (b) the term *smoking* crossed with *meta-analysis*. Reference sections of articles retrieved from this search were consulted to gather additional relevant citations. Several reviews of the smoking cessation literature were used to identify apt sources as well (Baillie, Mattick, Hall, & Webster, 1994; Carroll, 1996; Curry & McBride, 1994; Fisher, Lichtenstein, Haire-Joshu, Morgan, & Rehberg, 1993; Glasgow & Lichtenstein, 1987; Hajek, 1994; Law & Tang, 1995; Lichtenstein, 1982; Lichtenstein & Glasgow, 1992; J. L. Schwartz, 1987). 1996 issues (January–October) of journals especially likely to publish pertinent material (*Addictive Behaviors, Experimental and Clinical Psychopharmacology, Journal of Consulting and Clinical Psychology, Journal of Substance Abuse,* and *Psychology of Addictive Behaviors*) were searched by hand.

For this review, we elected to base our judgments of superiority of one treatment condition to another on 1-year follow-up data after the conclusion of treatment, consistent with the review by Hajek (1994) and recommendations by Lando (1989). Also, we based our judgments only on the proportion of smokers achieving complete abstinence, not on decreased rates of smoking. Finally, consistent with the preference indicated by Chambless and Hollon (1998) for multiple methods of assessment rather than sole reliance on self-report, we required that abstinence be corroborated biochemically (e.g., by expired air carbon monoxide or blood nicotine levels indicative of nonsmoking).

Efficacy

Multicomponent behavior therapy programs incorporating relapse prevention techniques qualified as efficacious and specific. There are many studies documenting this conclusion. For illustrative purposes we describe below two such studies (the minimum required for concluding that a treatment fits this category).

Hill, Rigdon, and Johnson (1993) randomly assigned 82 chronic (at least 30 years of smoking), older (at least 50 years of age) cigarette smokers to receive behavior therapy, behavior therapy plus nicotine gum, behavior therapy plus physical exercise, or physical exercise alone. The group behavior therapy program included educational information (e.g., on health consequences of smoking and benefits and feasibility of quitting for older adults), environmental management (e.g., removing ashtrays), setting a specific quit date, and relapse prevention training (e.g., identifying high-risk situations and role-playing coping responses applicable in them, and problem-solving lapses between sessions). Groups met for 12 sessions over 3 months. The exercise condition controlled for group contact time as well as general encouragement by group leaders to quit smoking. The behavioral groups did not differ significantly from one another (averaging 32% of participants showing 12-month confirmed abstinence) but were significantly superior to the exercise-only control condition (10% of 12-month abstainers).

Second, Stevens and Hollis (1989) studied 744 adult smokers from a health maintenance organization (HMO) smoking cessation program. All of the participants were enrolled in a 4-day (2 hr/day) intensive smoking cessation intervention conducted in groups and teaching numerous cognitive and behavioral techniques, such as relaxation, cognitive restructuring, and behavioral methods of coping with withdrawal symptoms. Participants who achieved smoking cessation (79%) were then randomly assigned to relapse prevention skills training, group discussion, or no further treatment. Group discussion and no-further-treatment conditions were equivalent in effectiveness, whereas the skills-training group was significantly superior (41% 1-year follow-up abstinence, compared with 34% and 33% in the other groups). Relapse prevention consisted of three weekly group sessions in which participants role-played coping responses likely to be useful in situations individually chosen as the most problematic for maintaining abstinence.

Two other treatment programs qualified as possibly efficacious. The first, scheduled reduced smoking is possibly efficacious as a variation on multicomponent behavior therapy programs including relapse prevention; supporting studies for scheduled reduced smoking are by Cinciripini et al. (1994) and Cinciripini et al. (1995). Scheduled smoking is a 3-week process of gradually reducing nicotine intake and thereby, in principle, easing withdrawal after cessation occurs, by increasing the intercigarette interval for smokers. It differs from the more widely studied nicotine fading (also called *brand switching*) procedure, in which smokers switch to a lower nicotine brand each week until quitting (Foxx & Brown, 1979); in scheduled smoking the act of smoking is controlled by the passage of time rather than by the smoker's wishes or urges. As such, scheduled smoking is hypothesized to break the association between personally relevant cues (e.g., situations or mood states) and nicotine intake. A multicomponent treatment involving scheduled smoking was superior to a minimal-contact self-help control condition (Cinciripini et al., 1994). Also, a larger study confirmed experimentally the importance of scheduling smoking rather than allowing it to be ad lib (Cinciripini et al., 1995). The scheduled reduced smoking condition achieved 44% 1-year abstinence, significantly superior to nonscheduled reduced smoking (18%) and nonscheduled nonreduced smoking (22%), nonsignificantly superior to scheduled nonreduced smoking (32%) as a cessation technique (all four conditions received cognitive–behavioral relapse prevention training).

The second possibly efficacious treatment is a five-weekly-session group cognitive–behavioral therapy (CBT), adapted from CBT for depression and incorporating pleasant-events scheduling and cognitive restructuring. This treatment significantly enhanced the efficacy of nicotine gum plus an initial five sessions of group support and education about consequences of smoking (Hall, Muñoz, & Reus, 1994). Particularly important to note is that the significant effect of the cognitive–behavioral mood management intervention was specific to smokers with a history of major depressive disorder (34% 12-month abstinence, relative to 18% of those receiving standard treatment alone). Those without a history of depression were nonsignificantly less likely (16% vs. 24%) to achieve 12-month abstinence in the CBT condition.[1]

Clinical Significance

Consideration of clinical significance is built into our evaluation of efficacy in that we have required complete abstinence from smoking as the indicator of successful treatment. Methods of evaluating clinical significance, predicated on whether a person has moved from a dysfunctional distribution to a functional distribution (Jacobson & Truax, 1991) or has become indistinguishable from a member of the normal population (Kendall & Grove, 1988), can be complicated to apply in many disorders, but in smoking it is relatively clear-cut. Nearly three fourths of the U.S. adult population are abstinent (Centers for Disease Control, 1996), so it seems reasonable to conclude that abstinence is required for one to be considered normalized on this variable. A review of health risks attributable to smoking, and health benefits attributable to smoking cessation, similarly concluded that "the only logically clinically significant change in smoking is *total cessation*" (Blanchard & Schwarz, 1988, p. 180).

Cost-Effectiveness

There is surprisingly little formal research available on the cost-effectiveness of specific psychological techniques for achieving smoking cessation (Groth-Marnat & Edkins, 1996) and, to our knowledge, none that pertains specifically to the interventions identified in our review as empirically supported. Cost-effectiveness of physician advice to quit smoking and of nicotine replacement strategies has been found to be quite impressive (for a review, see Groth-Marnat & Edkins, 1996). For example, Law and Tang (1995) estimated the cost of saving a life, by physicians routinely advising all smokers to quit, at about $1,500 and noted that this figure compares favorably with most other medical interventions. On the basis of current research, however, we are not able confidently to provide parallel data for multicomponent behavior therapy, scheduled reduced smoking, or cognitive–behavioral mood management.

Comments

As indicated earlier, this section is not intended as a comprehensive review of smoking cessation methods but instead focuses solely on face-to-face psychosocial interventions conducted by professionals or paraprofessionals meeting the

[1] In a subsequent study, the same CBT mood management therapy was not significantly more effective than the educational intervention when the two were equated for number of sessions. Neither was there a significant interaction between treatment condition and depression history, although the nonsignificant trend in the depression–history–positive group was the same as in the prior study (24% 12-month abstinence in CBT, 17% in the educational treatment; Hall et al., 1996). The treatment still qualifies as possibly efficacious, however. Ignoring nonsignificant trends, the two studies taken together suggest that the CBT intervention is more effective than nothing (for smokers with a history of depression) but is not more effective than an alternate intervention of the same duration. This pattern is consistent with viewing CBT as efficacious but not specific in the terminology of Chambless and Hollon (1998). Because the positive finding has not been replicated by independent investigators, *efficacious* becomes *possibly efficacious.*

Chambless and Hollon (1998) criteria for empirically supported treatments. Many viable strategies for smoking cessation do not fall under this rubric. These include unaided smoking cessation (self-quitting), large-scale community interventions, and biological interventions. For example, many studies support the efficacy of nicotine gum, perhaps especially as an adjunct to intensive psychosocial interventions (Cepeda-Benito, 1993) or for highly nicotine-dependent smokers (Niaura, Goldstein, & Abrams, 1994). The transdermal nicotine patch has been found to increase smoking cessation rates significantly in the context of either intensive treatment or minimal adjunctive treatment (Fiore, Smith, Jorenby, & Baker, 1994). These treatments are not incompatible with cognitive and behavioral methods described in this section (Klesges, Ward, & DeBon, 1996), and combining nicotine replacement with behavior therapies may work better than either works alone. Such multifaceted therapies are consistent with practice guidelines developed by the American Psychiatric Association (APA, 1996) and the Agency for Health Care Policy and Research (AHCPR; Fiore et al., 1996).

Readers interested in more details on the entire range of smoking cessation interventions, including novel delivery systems for nicotine replacement, the use of antidepressant medications, and public health perspectives on cigarette smoking, should consult the APA and AHCPR guidelines, the review of major trends in the field by Lichtenstein and Glasgow (1992), and Haaga (in press). The literature on smoking cessation is vast. For example, the review by J. L. Schwartz (1987)—which covered only 1978 through 1985, focused mainly on the United States and Canada, and excluded case studies or studies with less than 3-month follow-up—included more than 600 studies. Prior reviewers have not applied the Task Force on Promotion and Dissemination of Psychological Procedures (Task Force; 1995) or Chambless and Hollon (1998) criteria in particular, and it is therefore entirely possible that in combing such secondary sources for relevant citations, we have made errors of omission. We attempted to address this issue by circulating a draft of this review to 14 prominent smoking cessation researchers and asking them to identify key citations we had missed. This is not a foolproof technique, however, and we wish to emphasize that omission of a treatment procedure from our list does not even guarantee that it has failed to garner empirical support sufficient to meet the criteria, let alone that it has been shown to be ineffective.

Second, we required biochemical corroboration of self-reported abstinence. A number of reviewers have strongly endorsed this standard (e.g., Lando, 1989; Lichtenstein, 1982). For example, Lichtenstein depicted biochemical verification as "a necessary part of any serious study of smoking behavior or cessation" (p. 808). This requirement has been questioned in recent years, however, most notably by Velicer, Prochaska, Rossi, and Snow (1992). Their review suggested that false claims of abstinence are quite rare in low-demand situations such as self-change studies, although perhaps more common in high-demand intensive treatment outcome studies. Consistent with this conclusion, a meta-analysis of studies relating self-report and biochemical indicators led to the conclusion that "self-reports from subjects in intervention studies, in which there is an expectation of cessation of smoking, are more likely to involve underreporting of actual smoking" (Patrick et al., 1994, p. 1091).

To be sure, the mere existence of some underreporting of smoking does not necessarily mean that the relative success of treatment conditions will be distorted in studies without biochemical verification. Velicer et al. (1992) showed convincingly that if typical misreporting rates are used to correct typical (for this area of research) treatment effects, the adjustment is unlikely to make a meaningful difference in relative success. However, a difficulty with this line of reasoning is that estimates of typical misreporting rates are (of necessity) based on studies in which biochemical measures were collected. To whatever extent use of biochemical testing increases the accuracy of self-reports (via bogus pipeline effects), such studies will underestimate how common misreporting is when biochemical testing is not conducted.

Given this uncertainty, we concluded that it was best to require biochemical verification for supporting studies for a treatment approach.[2] Note, however, that this is a conservative decision and affects the final selection of treatments, in part for historical reasons. Biochemical verification was an infrequent methodological feature of smoking cessation studies before the early 1980s. Just as biochemical corroboration became routine, though, research emphasis in the area of smoking shifted away from the sort of manual-guided face-to-face psychosocial therapy methods that are the focus of our review and toward self-help, mass media and community campaigns, primary prevention, and nicotine replacement (Lichtenstein & Glasgow, 1992).

Several treatments that were researched extensively in the 1960s through the early 1980s may have therefore gotten short shrift in our review. One example is the broad-spectrum behavioral approach developed by Lando (1977) emphasizing nicotine fading in preparation for quitting and group support in the early maintenance phase after smoking cessation. This program was widely disseminated, with evidence provided that paraprofessionals could administer the treatment effectively (for review and description, see McGovern & Lando, 1991). However, many of the studies either did not use biochemical verification of self-reports or did not find significant differences between groups (often because parametric variations of the approach were being compared with no-treatment or minimal treatment controls omitted). Another example is rapid-paced aversive smoking, which was judged to be efficacious in a quantitative review of randomized controlled trials (with at least 6-month follow-up) when all studies were taken into account but not when the focus was solely on the few studies of this method with biochemical verification of abstinence (Law & Tang, 1995).

We acknowledge the difficulty of deriving a uniform set of criteria for empirically validated treatments, yet the Chambless and Hollon (1998) criteria seem somewhat problematic in that they rely so heavily on within-study comparisons. For instance, one way a study can qualify as supporting a treatment is for the treatment in question to prove superior to another treatment. It is not required that this comparison treatment itself be at all

[2] In some older studies lacking biochemical verification of self-reported abstinence at 12-month follow-up, observer (e.g., relative or coworker) reports were used as a check on self-reports. Observer reports do not seem sufficient in this context, though, for they rarely disagree with self-reports and as many as one third of participants whose informants confirm their self-reported abstinence failed biochemical tests in intervention studies (e.g., Hughes, 1992).

effective. Therefore, finding a treatment to be well-established is in part a function of its efficacy but also is in part a function of the weakness of the comparison conditions to which researchers have contrasted it. For example, if Treatments X, Y, and Z all achieve symptom improvement for 30% of patients, whereas Treatment Q works for only 5%, and the published literature consists of two randomized comparisons of X and Y, as well as two randomized comparisons of Z and Q, the Task Force criteria would lead to the conclusion that Z is well-established, whereas X and Y would remain off the list, although all three in absolute terms are equally effective.

One way to address this concern is to examine the results of quantitative reviews that are based on absolute results (e.g., percentage symptom reduction or percentage of patients achieving a target criteria of symptom reduction). Our conclusions appear to be broadly consistent with those of one such review from the smoking literature (Viswesvaran & Schmidt, 1992), which found conditioning-based (29% abstinence) and instructional therapies (28%) far more effective than the average no-treatment control group (6%). This review, however, was much less conservative than ours in its inclusion criteria.

Important sample characteristics (e.g., typical levels of nicotine dependence, disease severity, educational background, and depression levels) can be confounded with type of treatment. As such, it is important also to consider meta-analyses based solely on controlled studies (e.g., Baillie et al., 1994; Holroyd & Penzien, 1990). More generally, practice guidelines are being based on consideration of many previous studies and both qualitative and quantitative reviews (e.g., APA, 1996, p. 10). Individual trials of the relapse prevention component in particular have yielded mixed results (for a review, see Carroll, 1996). Inadequate statistical power may be a factor here, as studies with a large sample size are more likely to find a significant effect for relapse prevention (Stevens & Hollis, 1989), and a quantitative review suggests that this effect is statistically reliable overall (Baillie et al., 1994).

Management of Chronic Pain Conditions

Chronic pain is a major health problem that has enormous medical, social, and psychological costs. In the United States, back pain alone is estimated to affect 12 million individuals and to be responsible for 25% of all disabling occupational injuries and 40% of all visits to orthopedists and neurosurgeons (Cavanaugh & Weinstein, 1994). Most individuals with persistent pain have repeatedly failed to respond to trials of conventional biomedical treatment. The biomedical model has long guided the treatment of chronic pain. This model views pain as a sensory event that directly reflects underlying disease or tissue damage. The biomedical model has difficulty accounting for three clinical observations: (a) Patients having the same level of underlying disease activity often report very different levels of pain, (b) pain can be present even when there is no clear-cut evidence of tissue damage, and (c) pain may persist long after a reasonable time for healing has passed. Psychological treatments for pain are guided by a more comprehensive biopsychosocial model that not only recognizes the importance of biological factors, but also emphasizes the important influences that psychological factors (e.g., anxiety, depression, coping, and perceived control over pain) and social factors (e.g., family and work environment) can have on the pain experience.

Biopsychosocial approaches to pain are gaining increasing acceptance. One indication of this is that the International Association for the Study of Pain (IASP) has recommended that chronic pain management should involve both medically trained and psychologically trained health professionals (Fields, 1991). The growing acceptance of psychological treatments is an encouraging development for psychologists who are interested in pain control. However, if these interventions are to continue to be accepted and become applied even more broadly, they need to be shown to be efficacious in well-controlled treatment outcome studies. This section reviews controlled studies examining outcomes of the most common psychological treatments for chronic pain.

Studies included in this section were identified through a literature search of PsycLIT and MedLine from 1984 through 1996. Further selection was guided by prior reviews (Blanchard & Andrasik, 1987; Blanchard & Malamood, 1996; Chapman, 1986; Emmelkamp & van Oppen, 1993; Holroyd & Penzien, 1990; NIH Technology Assessment Panel [NIH], 1996; Pearce, 1983; Tan, 1982; Turner & Chapman, 1982; Turner & Romano, 1990) and two reviews that used the Task Force (1995) criteria (Keefe, 1996; J. J. Wilson & Gil, 1996). Also, hand searches of 1996 issues of *Pain, Clinical Journal of Pain, Health Psychology,* and *Behavior Therapy* were completed.

Types of Treatments

We examined the efficacy of five psychological treatments for pain: operant behavioral treatment, cognitive–behavioral treatment, biofeedback, hypnosis, and psychodynamic treatments. The five treatments reviewed are those identified in the IASP (in press) *Curriculum on Pain for Students in Psychology.* We also briefly comment on variants of these major treatments (e.g., cognitive therapy).

Operant–behavioral therapy. Operant–behavioral therapy (OBT) was one of the first psychological interventions to be used to manage persistent pain. Based on Fordyce (1976), OBT emphasizes the reinforcing role that social and environmental factors can play in the development and maintenance of pain. The goal of OBT is to identify and reinforce adaptive "well" behaviors (e.g., exercising and talking about nonpain topics) while reducing reinforcement for pain behaviors (e.g., excessive reclining and guarded movement). OBT is typically used in individuals whose pain behaviors are excessive, in light of underlying tissue pathology, and clearly related to social and environmental contingencies, such as attention from a solicitous spouse. Major OBT treatment techniques include graded activation and exercise programs to increase activity level and fitness, tapering of habit-forming pain medications, social reinforcement by trained staff members, and spouse and family training to enhance generalization and maintenance of treatment gains.

Cognitive–behavioral therapy. Cognitive–behavioral theorists view pain as the result of a complex interaction of pathophysiology, cognition, affect, and behavior (Keefe, Gil, & Ross, 1986; Turk, Meichenbaum, & Genest, 1983). CBT for pain involves three phases: (a) an educational phase, in which patients are familiarized with a biopsychosocial model of pain;

(b) a skills-training phase, in which training is provided in a variety of cognitive and behavioral pain coping skills (e.g., relaxation training, activity pacing, pleasant activity scheduling, visual imagery techniques, distraction strategies, cognitive restructuring, problem solving, and goal setting); and (c) an application phase, in which patients learned to apply their skills in progressively more challenging pain-related situations (Turk et al., 1983).

Biofeedback training. Biofeedback (BFB) can help individuals increase their awareness of and ability to control psychophysiological processes that contribute to pain. BFB training involves three components: (a) an electronic device to record and amplify physiologic signals; (b) an audio or visual feedback display that delivers accurate, ongoing information to the patient; and (c) a therapist who assists the patient in learning to control physiological responses (M. S. Schwartz, 1995). The most common BFB modalities used in treating pain are electromyographic (EMG) and thermal BFB.

Hypnotherapy. Most hypnotic interventions for pain use selective attention and imagery to induce the relaxation response. They also tend to include hypnotic suggestions for analgesia or healing, and posthypnotic suggestions to help patients generalize and maintain learned skills for pain reduction. The goals of hypnosis include not only immediate pain relief, but also learning self-hypnosis as a long-term self-management skill (Barber, 1990).

Psychodynamic therapy. Psychodynamic therapy is typically used when there is clear evidence that psychosocial risk factors appear to play a role in pain symptoms, when emotional changes accompany severe and protracted pain, and when the goal of therapy is long-term adaptation to pain as well as to relieve symptoms (Tunks & Merskey, 1990).

Types of Pain Conditions Reviewed

We review psychological treatment outcome data for four pain conditions drawn from a larger group of chronic intractable benign and chronic episodic pain conditions (Turk et al., 1983). The pain conditions reviewed include rheumatic diseases, chronic pain syndromes (e.g., back pain), migraine headache, and irritable bowel syndrome.

Relevant Outcomes

To be considered successful, psychological pain treatments should decrease pain when compared with control conditions. Other relevant outcomes examined in this review include changes in psychological functioning (e.g., coping, perceived ability to control pain, anxiety, or depression), and physical functioning (e.g., activity level, exercise tolerance, or mobility).

Efficacy: Rheumatic Diseases

Persistent, episodic pain is one of the most common and troubling symptoms of rheumatic diseases such as osteoarthritis, rheumatoid arthritis, lupus erythematosus, and ankylosing spondylitis. Pain is a primary concern of most patients having rheumatic diseases, and much of the day-to-day medical management of these diseases focuses on methods for controlling pain. Several studies have demonstrated that psychological interventions in combination with traditional medical interventions can improve pain management for these diseases.

Cognitive–behavioral therapy. Multicomponent CBT for rheumatic diseases qualified as an efficacious and specific treatment. Five studies have compared multicomponent CBT to both attention control and standard medical control conditions. Although each study emphasized slightly different combinations of CBT components for pain, all were well described and included training in the broad CBT categories of relaxation techniques, coping skills, and cognitive restructuring. All of the studies found improvements in psychological functioning and three out of five found significant reductions in pain (Parker et al., 1995; Bradley et al., 1987; Keefe et al., 1990b). One of the studies that failed to show overall improvements in pain (Parker et al., 1988) did find significant reductions in pain intensity at long-term follow up in a group of CBT participants who had shown high adherence to the practice of CBT techniques. The only study that failed to demonstrate any improvements in outcome following CBT (Kraaimaat, Brons, Geenen, & Bijlsma, 1995) used a sample of rheumatoid arthritis patients who had very active disease and demonstrated significant and progressive deterioration with statistically significant increases in clinical and laboratory measures of disease activity over the course of the study.

CBT has also been found to be effective in studies that have compared this intervention with either a waiting list (e.g., a study of rheumatoid arthritis patients by O'Leary, Shoor, Lorig, & Holman, 1988) or an education control condition (e.g., a study of anklyosing spondylitis patients by Basler & Rehfisch, 1991). In a study of ankylosing spondylitis patients using a waiting-list control, Basler & Rehfisch found that CBT was significantly more effective in reducing pain, anxiety, and psychophysiological symptoms. In a study of rheumatoid arthritis patients using an education control condition, O'Leary et al. found that CBT produced significant decreases in pain and joint impairment and inflammation, as well as improvements in self-efficacy. At 4 months follow-up, patients receiving CBT were coping better and maintained their initial gains in self-efficacy for function and other arthritis symptoms.

Chronic Pain Syndrome and Chronic Low Back Pain

Chronic pain syndromes such as back pain are common and can be quite disabling. In addition to persistent pain, individuals having chronic pain often become depressed, inactive, preoccupied with physical symptoms, and overly dependent on family members. Research has shown that patients having such chronic pain syndromes not only consider pain to be an important outcome, but also view functioning as a key index of treatment outcome (Melles, McIntosh, & Hall, 1995).

Operant–behavioral therapy. OBT programs for chronic pain syndrome and chronic low back pain qualified as an efficacious treatment. Three randomized controlled studies have evaluated OBT, two of these compared OBT with a wait-list control (Linton & Gotestam, 1984; Turner, Clancy, McQuade, & Cardenas, 1990) and the other to an attention control and standard care control condition (Nicholas, Wilson, & Goyen, 1991). In all of these studies, OBT led to improvements in psychological

functioning and physical functioning, and in two out of three studies (the exception being Linton & Gotestam, which had a very small sample size) significant reductions in pain were also found.

Two studies have specifically compared OBT with CBT (Nicholas et al., 1991; Turner & Clancy, 1988). Nicholas et al. found that both treatments reduced pain, but that OBT had greater immediate effects in reducing medication intake and improving significant others' ratings of functional impairment. Turner and Clancy found that OBT produced significantly greater immediate (pre- to posttreatment) improvements in psychological and physical functioning than CBT. The CBT group in this study, however, continued to improve posttreatment, making the OBT and CBT groups equivalent at 6 or 12 months follow-up.

Cognitive–behavioral therapy. CBT for chronic pain syndrome and low back pain also met the criteria for efficacious treatment. Four studies supported the efficacy of CBT compared with a waiting-list control group (Nicholas et al., 1991; Phillips, 1987; Puder, 1988; Turner, 1982). All of these studies found that CBT increased activity and improved psychological functioning. Three out of four found that CBT led to improvements in pain (Nicholas et al., 1991; Phillips, 1987; Turner, 1982).[3] Puder found that CBT decreased medication use.

EMG biofeedback training. The evidence for the efficacy of EMG BFB training for chronic pain is mixed. Three controlled studies suggest EMG BFB may be beneficial. Flor, Haag, Turk, and Koehler (1983) found that patients receiving BFB had significant reductions in pain and negative pain-related cognitions when compared with pseudotherapy or standard medical care control conditions. More recently, Flor and Birbaumer (1993) conducted a study comparing EMG BFB, CBT, and a standard medical control condition. At posttreatment, participants in the BFB group demonstrated significant improvements in pain and psychological functioning relative to the standard medical care control condition, but did not differ from those receiving CBT. At 6 months follow-up, however, participants in the BFB group had significantly lower levels of pain, pain interference, and affective distress than those in either the CBT or control conditions. Newton-John, Spence, and Schotte (1995) found that patients receiving either EMG BFB or CBT showed significant short- and long-term improvements in pain intensity, physical disability, and psychological functioning when compared with a waiting-list control group.

Although promising results have been achieved in the studies cited above, other early studies testing BFB for lower back pain reported less positive findings. Nouwen (1983) found that patients receiving BFB learned to decrease muscle activity during standing, but had no improvements in pain. In a well-controlled study, Bush, Ditto, and Feuerstein (1985) found that patients treated with EMG BFB, a placebo BFB control, and no-treatment control condition showed small, but significant improvements in pain, anxiety, and depression, with no differences between the groups. Thus, although BFB has been found to be effective in some studies, the negative findings in other studies prevent one from definitively classifying it as efficacious.

Migraine Headache

Migraine headaches involve paroxysmal attacks of pain that can vary substantially in intensity and frequency. Migraine headaches are usually unilateral and can be accompanied by photophobia, nausea, loss of appetite, and vomiting. Factors commonly triggering migraine headaches include psychological stress, food sensitivities, and hormonal fluctuations. The primary focus of psychological treatments for migraine headaches has been on relieving the intensity or frequency, or both, of headache activity.

Thermal biofeedback plus relaxation training. Thermal BFB plus relaxation (progressive or autogenic training) qualifies as an efficacious treatment for migraine headaches. Three randomized controlled trials have found that thermal BFB plus autogenic training is more effective than a no-treatment control condition that involved headache monitoring (Blanchard, Theobald, Williamson, Silver, & Brown, 1978; Blanchard et al., 1990; Sargent, Solbach, Coyne, Sphon, & Segerson, 1986).

Several studies have compared thermal BFB plus relaxation to other BFB or relaxation conditions. Blanchard et al. (1978), for example, directly compared thermal BFB plus autogenic training with relaxation training alone and found that patients in both interventions showed improvements on multiple dependent measures, with no between-group differences evident either at posttreatment or follow-up. Sargent et al. (1986) compared thermal BFB plus autogenic training, EMG BFB plus autogenic training, and autogenic training alone. Participants in all three conditions showed improvements in outcome relative to a no-treatment control condition, once again with no between-group differences found among the active treatment conditions.

Studies comparing thermal BFB with attention placebo conditions have not shown consistent between-group differences in outcome. The most rigorous of these (Blanchard et al., 1990) was a study of vascular headache patients (either migraine or combined migraine and tension headaches) that compared two BFB training interventions (thermal BFB/relaxation training, and thermal BFB/relaxation training plus cognitive therapy) to a pseudomeditation control condition. The BFB training interventions and the attention placebo groups were all found to be more effective than a control group that simply monitored headache activity. The level of clinically significant improvement found for the two BFB conditions (51%) was higher than that for pseudomeditation group (37.5%), but this difference was not statistically significant. The authors reason that the pseudomeditation group, which consisted of body awareness training and imagery techniques, may have served as an active treatment. Other studies (cited by Blanchard et al., 1990) have also failed to show that thermal BFB training is more effective than attention placebo conditions such as nonveridical feedback (Mullinix, Norton, Hack, & Fishman, 1978; Reading, 1984) and thermal feedback for hand cooling (Gauthier, Bois, Allaire, & Drolet, 1981; Jessup, Neufield, & Stenn, 1976; Kewman & Roberts, 1980), although these studies had methodologi-

[3] Although between-group analyses were not presented in the Phillips (1987) article, we were able to conduct *t*-test comparisons of the treatment and control conditions using the means and standard deviations that were presented. These analyses revealed that the CBT group had significantly lower ratings of daily pain, lower ratings on the sensory dimension of the McGill Pain Questionnaire (MPQ), and a trend toward reductions in total score on the MPQ ($p = .054$) and avoidance on the pain behavior checklist ($p = .058$.)

cal problems (small sample sizes, failure to check treatment credibility).

In addition to comparing BFB with control conditions, it is also important to compare it with standard and effective medical treatments. Of the preventive drug therapies for migraine headache, propranolol hydrochloride (HCL) is the "gold standard" for comparison as it has the largest body of empirical support. Holroyd and Penzien (1990) conducted a meta-analysis that examined studies documenting the efficacy of propranolol and thermal BFB plus relaxation training. Included were 35 clinical trials of thermal BFB plus relaxation training and 25 clinical trials of propranolol HCL, representing a total of 2,445 patients. The results revealed that thermal BFB plus relaxation training produced improvements in daily migraine headaches (43.3% reduction in headache activity) that were quite similar to those obtained with propranolol (M = 43.7% reduction). These improvements in headache were not only clinically meaningful, but were also statistically significant when compared with placebo (M = 14% improvement) and no-treatment control conditions (M = 2% improvement.) Although these results are interesting, there are two reasons to be cautious in interpreting them. First, the methodologies used in the drug and psychological treatment studies are different. Second, only two of the studies included in the meta-analysis (Mathew, 1981; Sovak, Kunzel, Sternbach, & Dalessio, 1981) featured a direct experimental comparison of thermal BFB plus relaxation training with propranolol. One of these studies (Sovak et al., 1981) found equivalent results with BFB and propranolol, and the other (Mathew, 1981) found that propranolol (62% improvement) was superior to thermal BFB (35% improvement). However, in the Mathew study, the dropout rate in the BFB group (35%) was much higher than the dropout rate in the propranolol group (6%), raising questions about BFB treatment compliance (Holroyd et al., 1995).

In sum, although thermal BFB plus relaxation training appears to be efficacious when compared with headache monitoring control conditions, it has not consistently been shown to be more efficacious than other BFB and relaxation interventions. The fact that thermal BFB with relaxation has not been shown to be superior to attention placebo control conditions is a concern in evaluating this literature. This may be due to the fact that is very difficult to design an attention placebo treatment for headaches that is both credible and does not include treatments that are potentially active in terms of producing changes in relaxation or cognitions that may, in turn, affect headache activity (Blanchard et al., 1990.) Because of these problems, Holroyd (personal communication, June 12, 1997) has argued that placebo medication may provide the best placebo control condition for studies evaluating psychological treatments for migraine headaches.

EMG biofeedback plus relaxation. Frontalis EMG BFB therapy plus relaxation instructions (either relaxation or autogenic training) also qualifies as efficacious in the management of migraine headache. Two studies have demonstrated that frontalis EMG BFB plus relaxation training is significantly more effective than a headache monitoring control condition in terms of indices of clinical improvement (Lake, Rainey, & Papsdorf, 1979; Sargent et al., 1986). Several published studies have also directly compared the effectiveness of frontal EMG BFB plus relaxation with thermal BFB plus relaxation (e.g., Cohen, McArthur, & Rickles, 1980; Daly, Donn, Galliher, & Zimmerman, 1983; Lacroix et al., 1983; Lake et al., 1979; Sargent et al., 1986; Solbach, Sargent, & Coyne, 1984). With one exception (Lacroix et al., 1983), these studies found no significant between-group differences in outcome, suggesting that the two treatments may be equally effective. However, most of these comparison studies had small sample sizes and only two (Solbach et al., 1984, n = 16–24; and Sargent et al., 1986, n = 24) approached the sample sizes (n = 25–30 per group) that Chambless and Hollon (1998) recommend to demonstrate equivalence.

Taken together, the findings regarding EMG BFB suggest that this treatment is effective, but it is no more effective than more widely used and investigated thermal BFB plus relaxation training interventions.

Cognitive therapy and cognitive behavior therapy. Studies using cognitive therapy techniques for migraine headaches can be divided into two major groups: (a) those using cognitive therapy methods very similar to those described by Beck (1973) and Beck, Rush, Shaw, and Emory (1980), and (b) those in which cognitive therapy methods are combined with behavioral techniques such as behavioral analysis, role-playing, and self-reinforcement (CBT).

Three early studies addressed the question of whether a cognitive therapy intervention is more effective than some type of BFB intervention (Gerhards et al., 1983; Knapp & Florin, 1981; Lake et al., 1979). None of these studies demonstrated between-groups effects, but all had very small sample sizes. A more important and timely question, in light of recent findings on BFB, is whether cognitive therapy can significantly enhance the outcome of simpler, well-established BFB treatment regimens (e.g., thermal BFB plus relaxation). This question has been addressed in two well-controlled studies conducted by Blanchard and his colleagues, both of which used patients having vascular headaches (Blanchard et al., 1987, 1990). Neither study provided evidence that cognitive therapy enhances the effects that can be obtained with BFB plus relaxation training procedures alone.

Sorbi and colleagues conducted a series of studies testing the efficacy of a more comprehensive CBT stress-coping protocol. The first study (Sorbi & Tellegen, 1984) compared CBT plus autogenic training and thermal BFB plus autogenic training, and the second study (Sorbi & Tellegen, 1986) compared CBT with relaxation training. Although neither study included a control group, both found that the treatments tested significantly reduced headache activity and medication intake with no between-group differences evident.

In sum, we concur with Holroyd and Penzien (1994) that, at this point, there is no evidence that cognitive therapy or CBT adds to the effectiveness of simpler BFB plus relaxation training interventions for migraine headache.

Irritable Bowel Syndrome

Irritable bowel syndrome (IBS) is a functional disorder—not associated with demonstrable tissue pathology—that is characterized by a variety of major symptoms including pain, abdominal tenderness, and diarrhea or constipation, or both.

Given that pain is only one of the major symptoms of IBS, we adjusted the relevant outcomes when evaluating IBS studies. Thus, to be considered effective, the treatments reviewed had to be shown to decrease pain or one or more of the other major symptoms of this condition.

Multicomponent cognitive–behavior therapy. Multicomponent CBT qualifies as efficacious in managing IBS symptoms. Controlled studies comparing CBT with either a symptom monitoring control (Neff & Blanchard, 1987) or wait-list control condition (Lynch & Zamble, 1989) have shown that multicomponent CBT can reduce gastrointestinal symptoms or enhance psychological or behavioral functioning. Three studies have also compared multicomponent CBT with standardized medical care regimens. Shaw et al. (1991) found that CBT was significantly more effective than a conventional medical regimen in reducing the reported severity and frequency of attacks of IBS symptoms. Although Corney, Stanton, Newell, Clare, and Fairclough (1991) found that CBT was more effective than standardized medical care in reducing symptom-related avoidance of specific foods and domestic tasks, and Bennett and Wilkinson (1985) found that CBT produced significant reductions in anxiety relative to a structured medical regimen, neither of these studies found between-group differences in pain or other IBS symptom, because patients receiving both treatments improved on these outcomes.

Blanchard et al. (1992) presented two well-controlled studies testing the effects of a multicomponent CBT protocol. The first study, which used a small sample size (n = 10 per group), showed nonsignificant trends for CBT to be superior to a symptom-monitoring control group. The second study, which used larger samples (n = 30 per group), found that CBT was more effective than a symptom-monitoring group in reducing pain and tenderness, diarrhea, and constipation. One concern about the second study was that no difference in outcome was found between CBT and a pseudomeditation condition that was designed to serve as an attention control condition. The pseudomeditation was not only credible, but also provided training in techniques (meditation, imagery) participants reported using frequently and may have enhanced their abilities to cope with IBS symptoms.

Cognitive therapy. Two controlled studies by the same research team have demonstrated that cognitive therapy is more effective than a control condition for IBS. Using Chambless and Hollon's (1998) criteria, this qualifies cognitive therapy for IBS as possibly efficacious. The cognitive therapy protocol exclusively used cognitive techniques (e.g., recording of automatic thoughts, challenging of overly negative thoughts, and cognitive restructuring), but did not include behavioral therapy techniques (e.g., relaxation and assertion training). Greene and Blanchard (1994) found that cognitive therapy produced significant reductions in IBS symptoms when compared with a symptom-monitoring control group. Payne and Blanchard (1995) reported that cognitive therapy was more effective than both a self-help support group and waiting-list control condition in reducing pain and tenderness, diarrhea, and overall IBS symptoms.

Psychodynamic psychotherapy. Two studies have evaluated the efficacy of psychotherapy for IBS. Strictly speaking, these studies do not meet Chambless and Hollon's (1998) criteria for review because descriptions of the treatment methods are incomplete. Nevertheless, the results appear to be promising and deserve mention. Svedlund (1983) compared psychodynamically oriented short-term psychotherapy with standard medical care. The psychotherapy intervention was significantly more effective than standard care in reducing abdominal pain, colonic pain, and epigastric pain, as well as indigestion. The gains in pain relief were maintained at 15 months follow-up. Data gathered at follow-up also revealed that psychotherapy was superior to standard medical care in reducing global somatic complaints and enhancing perceived ability to cope. Guthrie, Creed, Dawson, and Tonenson (1991) compared the effectiveness of short-term dynamic psychotherapy (including a brief introduction to relaxation) and a supportive listening control intervention. Post-treatment comparisons showed that the psychotherapy intervention was more effective than the control condition in reducing abdominal pain, bowel symptoms, and depression.

Given the positive findings regarding short-term dynamic psychotherapy for IBS, more attention needs to be given to standardizing its format and delivery (Blanchard & Malamood, 1996). In the future, dynamic psychotherapy protocols for IBS should be based on an explicit conceptual model and use standardized treatment manuals, therapist training, and monitoring methods. Standardization of these protocols is needed to permit replication and extension of initial promising findings.

Hypnotherapy. Hypnotherapy qualifies as a possibly efficacious treatment for IBS pain. One controlled study (Whorwell, Prior, & Faragher, 1984) compared hypnotherapy with a control condition (psychotherapy plus placebo medication) and found that hypnotherapy significantly reduced abdominal pain and distention and enhanced well-being. There is one other randomized study of hypnotherapy for IBS (Harvey, Hinton, Gunary, & Barry, 1989), but this study did not include a control group. This study compared individual and group hypnotherapy for IBS and found that both treatments produced very similar improvements in IBS symptoms.

Clinical Significance

The studies reviewed here have all been conducted with clinical populations, with most patients having protracted histories of pain. The fact that statistically significant improvements in pain and functioning can be obtained in these individuals is noteworthy. However, at this point, there is no consistent agreement on what constitutes clinically meaningful or significant improvement. Headache researchers, and to some extent IBS researchers, have adopted a convention that 50% improvement in pain represents a clinically significant improvement. However, changes in pain represent only one of a number of important outcomes. Severely disabled patients who are able to increase their time up and out of bed from 4 hr per day to 10 or 11 hr per day or who have decreased their intake of narcotic medications to near zero levels clearly have made major treatment gains, even if their pain has only been reduced by 20 to 25%. In the future, pain researchers need to more systematically address how one defines and assesses the clinical significance of therapeutic effects.

Comments

The results of this review indicate that psychological treatments are often effective in reducing pain and improving the

psychological and physical functioning of individuals having persistent pain. Taken together, the findings are impressive, particularly because most study participants had long histories of pain and multiple failures to respond to conventional medical treatments.

In this review, the psychological treatments most often found to be efficacious for chronic pain were OBT, CBT, and BFB. Evidence for the efficacy of hypnosis and psychodynamic psychotherapy was much more limited. Although there are a number of well-controlled studies on hypnosis for experimental pain, the clinical studies are not as rigorous methodologically (Turner & Chapman, 1982). Hypnosis is potentially useful for clinical pain because of its effects on the affective dimension of pain (Barber, 1990; Hilgard & Hilgard, 1983) and deserves more research attention.

A factor that contributed substantially to the development of empirically validated treatments for pain was the publication of books in the 1970s and 1980s that provided very detailed descriptions of treatment methods. We found frequent citations to books by Fordyce (1976) on operant conditioning approaches, Turk et al. (1983) on cognitive–behavioral approaches, and Blanchard and Andrasik (1987) on the management of headaches. Researchers also are increasingly using standardized manuals to guide their treatment protocols (e.g., Keefe et al., 1990a; Turner & Clancy, 1988; Turner et al., 1990), and the availability of these manuals should prove useful to future investigators wishing to evaluate the efficacy of individual components of these interventions.

Several important themes are evident in the current literature on pain management. One theme is the best format for delivering treatment. Investigators are beginning to systematically assess the effects of involving spouses or family members in treatment. Recent studies, for example, have examined spouse-assisted or family-assisted CBT for rheumatoid arthritis (Radojevic, Nicassio, & Wesiman, 1992) and osteoarthritis (Keefe et al., 1996). Given ongoing changes in health care, we also need to determine whether psychological treatments can be offered in a more cost-effective fashion. Several controlled studies have shown that minimal-therapist-contact, home-based BFB and relaxation interventions are as effective as traditional clinic-based BFB and relaxation treatments in reducing vascular or migraine headaches (Blanchard, 1990; Jurish et al., 1983; Richardson & McGrath, 1989). Home-based treatments have many advantages, but may not always be the most effective intervention for individuals who are very disabled by their pain. Williams et al. (1996) recently conducted a randomized study evaluating the effects of inpatient-based CBT and outpatient-based CBT for chronic pain patients who had significant disruptions in their functioning. At the end of treatment, both CBT groups had reductions in pain and improvements in physical and psychological functioning, relative to a waiting-list control. However, the magnitude of improvement on all physical measures and many psychological measures was significantly greater with inpatient than outpatient CBT. It is interesting that at 1 year follow-up, patients receiving inpatient CBT maintained their gains better and used significantly less health care than those receiving outpatient CBT.

Another question raised in this literature is What is the most appropriate control condition? Untreated control patients are used in many studies, but this is clearly inappropriate for individuals suffering severe, disabling pain. Waiting-list control patients are also widely used, but do not permit one to make long-term follow-up comparisons. Attention placebo controls often lack credibility with patients and therapists. Furthermore, credible attention placebo or pseudotherapy conditions inadvertently may serve as an active treatment mobilizing self-help efforts and changing cognitive appraisals of pain (Blanchard et al., 1990, 1992). Another alternative is to compare the effects of psychological pain treatments with disease education programs (e.g., arthritis education), therapist-led self-help groups, or support groups. Structured disease education programs represent a particularly appropriate comparison condition as they focus on imparting information (rather than on training coping skills), provide equivalent therapist contact, and are seen as very credible by patients. Several studies in the rheumatic diseases literature have shown that CBT is more effective than equally credible arthritis education interventions (Keefe et al., 1990a; Parker et al., 1988, 1995). In the pain area (as in other domains of treatment outcome research), there is probably no perfect control condition (C. E. Schwartz, Chesney, Irvine, & Keefe, in press; Turner et al., 1990), and researchers need to remain cognizant of the strengths and limitations of control conditions when interpreting their findings.

An important topic for future research is examining the efficacy of protocols that combine psychological and medical treatments for pain. It is surprising that few controlled studies have examined this important topic. A good example is a study of vascular headache patients conducted by Holroyd et al., (1995). This study found that the combination of thermal BFB plus relaxation training and propranolol was significantly more effective than thermal BFB plus relaxation training alone in reducing headache pain and medication intake, and in enhancing quality of life.

A final theme in this literature is the importance of individual differences in treatment outcome. Some individuals having pain are much more responsive to psychological treatments than others. Many studies have examined variables that potentially may predict successful treatment outcome. Although a review of this research is clearly beyond the scope of this article, consistent predictors of treatment outcome have not yet been identified. Further research on this important topic is clearly needed. With an improved understanding of predictors of treatment outcome, researchers may be able to tailor psychological treatments to the needs of individual patients and be even more effective in preventing and managing persistent pain and suffering.

Cancer

Cancer is an important target for health psychology interventions for a number of reasons: Cancer is highly prevalent, with over 1 million new diagnoses per year in the United States (American Cancer Society, 1997); cancer is the second leading cause of death in the United States (approximately one-half million deaths annually); and the adverse psychological effects of cancer and its treatments are well documented, including increased affective distress (symptoms of anxiety and depression), increased rates of major depression, and impaired quality of life (Glanz & Lerman, 1992; McDaniel, Musselman, Porter,

Reed, & Nemeroff, 1995). Psychological interventions, including individual and group psychotherapy, are widely offered to patients and their families in a variety of health care settings. Furthermore, there are generally held suppositions about the effects of psychological interventions for cancer patients, including the provocative and controversial possibility that psychological interventions can prolong disease-free intervals and increase length of survival (Spiegel, 1993). Given the wide practice and potential importance of psychological interventions for cancer patients, determining the efficacy of these interventions is a high priority.

Studies included in this review were identified through a literature search of the PsycLIT and MedLine databases from 1984 through June 1996 using the terms *cancer, psychological treatment,* and *psychotherapy.* Further selection of studies was guided by those cited in five prior reviews (Andersen, 1992; Carey & Burish, 1988, Fawzy, Fawzy, Arndt, & Pasnau, 1995; Meyer & Mark, 1995; Trijsburg, van Knippenberg, & Rijpma, 1992). Finally, a manual search of 1996 issues of relevant journals was also conducted.

Types of Treatment

Psychological interventions for cancer patients have included both individual and group formats. These interventions can be further distinguished among those that involve primarily education, supportive psychotherapy, behavioral therapy, and CBT (a mixture of coping skills, stress management, and other efforts to enhance cognitive and behavioral processes in adjustment to cancer). The duration of these interventions has varied widely, ranging from as few as 6 to more than 50 sessions.

Patient Characteristics and Types of Cancer

A number of patient characteristics are important to consider to allow for some degree of specificity in the efficacy of interventions for cancer patients, including patients' age, level of education, gender, type and severity of cancer, and types of treatments received. Andersen (1992) has argued for the importance of considering disease severity and the nature of treatments that are used (e.g., surgery, chemotherapy, radiotherapy, or hormone therapy). Disease and treatment characteristics may be correlated with psychological risk or morbidity, and psychological interventions may have different effects as a function of these factors. Type of cancer may also be crucial; for example, breast cancer patients and lung cancer patients may differ in the etiology for their disease, their psychological response to their condition, and their sociodemographic characteristics.

Relevant Outcomes

The efficacy of psychosocial interventions for cancer patients needs to be considered in light of a variety of different outcomes or endpoints. These include psychological disorders that meet *DSM–IV* criteria, symptoms of affective distress (most typically symptoms of anxiety and depression), quality of life, length of disease free intervals, and length of survival. Evaluations of the efficacy of behavioral treatments to manage the negative side effects of chemotherapy, a more specialized form of treatment, have concentrated on ratings of physical symptoms (nausea, vomiting, fatigue) as well as affective distress.

Efficacy

Behavior therapy for side effects of chemotherapy. Behavior therapy—specifically, the use of progressive muscle relaxation, with or without guided imagery, to control anxiety, nausea, and vomiting associated with chemotherapy—meets the criteria for an efficacious treatment (Burish & Tope, 1992; Carey & Burish, 1988). Data on the positive effects of behavioral treatments have been provided by two separate research groups, Burish and colleagues (Burish, Carey, Krozely, & Greco, 1987; Burish & Lyles, 1981; Burish, Snyder, & Jenkins, 1991; Carey & Burish, 1987; Lyles, Burish, Krozely, & Oldham, 1982) and Contach and associates (Contach, 1983; Contach & Strum, 1985). The treatment methods have been well documented, as they have relied on standardized methods of progressive muscle relaxation with guided imagery.

Other treatment methods that have been evaluated with regard to chemotherapy effects include systematic desensitization, hypnosis, and the use of distraction. However, the data on each of these methods have been more limited, and they only meet the criteria for possibly efficacious treatments. For example, cognitive distraction techniques were as effective as relaxation methods in managing chemotherapy side effects as measured by patient self-reports, nurse observations, and physiological measures (Vasterling, Jenkings, Tope, & Burish, 1993). In contrast, neither EMG or skin-temperature BFB were as effective as relaxation methods in controlling nausea, anxiety, or physiological arousal (Burish & Jenkins, 1992).

The relative efficacy of behavior therapy as compared with antiemetic medications is less clear. Recent advances in the development of medications to control the side effects of chemotherapy have resulted in highly effective medical management of the noxious consequences of treatment (Grunberg & Hesketh, 1993; Morrow, Hickok, & Rosenthal, 1995). At least one half of cancer chemotherapy patients show a positive response to these medications, which are primarily 5-hydroxytryptamine (5-HT3) antagonists that produce their effects by competing with 5-HT receptors at the synapse (Grunberg & Hesketh, 1993). In spite of the documented efficacy of both behavioral and pharmacologic antiemetic treatments, no studies have reported on their relative efficacy nor on the ways in which these treatments may be combined to enhance their efficacy. For example, it is plausible that some patients who are less responsive to antiemetic medications may be helped with behavior therapy. Furthermore, little in known about the effects of medication for managing anticipatory nausea in chemotherapy patients; relaxation training may be an important adjunctive treatment for this side effect.

Psychological distress and quality of life. Two interventions have been the focus of efficacy research in reducing distress and enhancing quality of life in cancer patients: cognitive behavioral group therapy and supportive expressive group therapy.

Several different variations of basic coping skills and stress management interventions that rely on cognitive–behavioral techniques and principles have been evaluated in controlled intervention studies using both group and individual therapy formats (Cunningham & Tacco, 1989; Edgar, Rosberger, & Nowlis,

1992; Fawzy, Cousins, et al., 1990; Telch & Telch, 1986). Although the specifics of these interventions have differed somewhat, they are all brief in duration (five to six sessions of 1 to 1.5 hr each). They have all included components of relaxation training, stress management skills, and problem-solving training. The interventions appear to have devoted a single session to each of these skills, supplemented by homework assignments for practice in some instances. In addition, some of the programs have included components that address health education, communication and assertion, management of emotions, or psychological support from other group members.

Two of the studies included no-treatment comparisons (Fawzy, Cousins, et al., 1990; Telch & Telch, 1986), one involved a cross-over waiting-list design (Edgar et al., 1992), and two included comparisons with supportive group therapy (Cunningham & Tacco, 1989; Telch & Telch, 1986). In each case, comparisons favored the effects of the cognitive–behavioral intervention in comparison with no treatment or supportive therapy. These benefits were found on a range of measures, with negative affect and mood being the most frequently measured outcome. The Profile of Mood States (POMS) was used as a critical dependent variable in two of these studies (Fawzy, Cousins, et al., 1990; Telch & Telch, 1986). Reductions in total mood disturbance were reported in both studies, with Fawzy, Cousins, et al. reporting larger differences at 6-month follow-up than immediately posttreatment. Only Telch and Telch included a broader measure of quality of life and found that the coping-skills intervention produced significant improvement in this domain compared with either no treatment or a supportive group therapy control. These interventions have typically produced relatively small effects on affective distress (see Meyer & Mark, 1995), with the exception of Telch and Telch, who reported large effects on the POMS, $d > 1$. The larger effects found in this study are likely the result of the researchers using a screening procedure in which only moderately to highly distressed patients were recruited to participate.

In spite of these generally favorable results, the use of cognitive–behavioral or coping-skills interventions with cancer patients meets the criteria for a possibly efficacious treatment rather than efficacious. First, although the interventions used in these studies share many common elements, the degree to which these studies involve replication of a single intervention is unclear. Second, characteristics of patient samples in these studies varied widely. For example, the types of cancer ranged from melanoma (Fawzy, Cousins, et al., 1990) to heterogeneous diagnoses (e.g., breast cancer and lung cancer) included in the other three studies. Patients also differed widely in disease severity and types of treatments received. Therefore, with the exception of the Fawzy, Cousins, et al. study, it is unclear how these findings apply to clinical work with patients who have been diagnosed with specific types of cancer. Third, these studies have included relatively small samples, and treatment and control groups have differed substantially on pretreatment levels of psychological functioning. Although covariance analyses have been used to control for these pretreatment differences, they emphasize the need for carefully controlled replication studies with larger, more homogeneous samples.

The second widely used approach to psychosocial interventions for cancer patients has been labeled *supportive–expressive* group therapy, with the most comprehensive development and research represented in the work of Spiegel and colleagues (Spiegel & Bloom, 1983; Spiegel, Bloom, Kraemer, & Gottheil, 1989; Spiegel, Bloom, & Yalom, 1981). The focus of this intervention is the development of supportive relationships among group members; the expression of deep emotional reactions to their experiences with cancer, including concerns about death and facing grieving and loss; and extracting meaning from tragedy by using their experience to help other patients and their families. In addition, in the Spiegel intervention studies, patients were taught self-hypnosis and techniques to aid in pain management, physical problems (e.g., the side effects of chemotherapy and radiotherapy) were discussed, and assertiveness in dealing with medical professionals was encouraged.

The major clinical trial that has evaluated supportive–expressive group therapy was conducted with metastatic breast cancer patients (Spiegel et al., 1981). The results indicated that, compared with no-treatment control participants, patients who participated in the intervention experienced improved mood and fewer phobic symptoms, and reported reduced pain sensation and suffering (Spiegel & Bloom, 1983; Spiegel et al., 1981). The promising nature of these findings indicate that supportive–expressive group therapy meets the criteria as a possibly efficacious treatment for psychological adjustment to breast cancer. However, the method used by Spiegel and associates requires replication by other investigators in order to meet the Chambless and Hollon (1998) criteria as an efficacious treatment. Furthermore, the existing data suggest the potential efficacy of this intervention for women with metastatic breast cancer, but not for patients with other forms of cancer nor for women with less advanced forms of breast cancer. Therefore, any inferences regarding the efficacy of this intervention are limited to this population.

Psychosocial interventions have used other formats, including educational groups and individual psychotherapy. Educational interventions have been very brief (one to three sessions, approximately 1 hr in duration) and have not involved psychological treatment methods per se (see Fawzy et al., 1995, for a review of these studies). Although these programs have led to some decreases in affective distress, the primary outcome in these studies has been the amount of knowledge gained. The interventions themselves have been sufficiently dissimilar that they cannot be considered as replication of a single method. Similarly, most of the studies of the efficacy of individual psychotherapy have failed to supply sufficiently detailed information regarding the nature of the treatment to allow for evaluation of the efficacy of a particular type of intervention.

Clinical Significance: Disease-Free Intervals and Length of Survival

Two studies have examined the effects of group psychosocial interventions on disease-free intervals and length of survival in cancer patients within the framework of a randomized clinical trial.[4] These are the investigations by Spiegel et al. (1989) with

[4] Linn, Linn, and Harris (1982) did not find beneficial effects on survival for late-stage cancer patients who were randomly assigned to individual counseling. In a nonrandomized retrospective study, Gellert, Maxwell, and Siegel (1993) failed to find effects for increased survival for breast cancer patients who participated in support groups.

metastatic breast cancer patients, and Fawzy et al. (1993) with malignant melanoma patients. As described above, the Spiegel study involved the evaluation of supportive–expressive group therapy and the Fawzy study investigated the effects of a cognitive–behavioral coping-skills intervention. Both of these studies reported striking and significant increases in the length of survival for patients who received the interventions in comparison with control patients. At a 10-year follow-up, Spiegel et al. (1989) found an average increase of 18 months survival for patients who received the intervention (all of the patients died as a result of their metastatic disease over the course of the study). At a 5- to 6-year follow-up, Fawzy et al. (1993) found a significantly lower death rate among patients who received the intervention (3 of 34 patients had died) than among control patients (7 of 34 had died).

These intriguing findings indicate that supportive–expressive group therapy, as implemented by Spiegel et al. (1989), is a possibly efficacious treatment for prolonging survival among patients with metastatic breast cancer. Similarly, the cognitive–behavioral coping-skills intervention of Fawzy et al. (1993) is a possibly efficacious treatment for prolonging survival among patients with malignant melanoma. These two studies provide a number of strengths on which future research can build: The interventions are standardized and can be replicated, and they were delivered to patient samples that were homogenous with regard to type and severity of disease. However, in the absence of replication of either intervention with these two distinct populations, they do not yet meet criteria for established efficacy. Furthermore, the mechanisms that may account for increased survival are not clear. Enhanced immune function (Fawzy, Kemeny, et al., 1990) has been suggested as one potential mediator; however, data testing mediational effects of this or other biological or behavioral mechanisms have not been reported.

Effectiveness

Research on psychosocial interventions for cancer patients has addressed effectiveness and generalizability in several ways. First, because of the nature of this type of research, all of the studies have been carried out in clinical contexts with appropriate patient samples. That is, although most of these studies have been conducted in university medical centers, concerns about the use of analogue samples do not apply here. Second, increased attention has been given of late to more carefully specified and documented forms of treatment. Relatively standardized versions of both CBT and supportive–expressive therapy are needed to provide comparability across future studies and to allow for direct comparisons of these interventions in future studies. Manuals provided by Fawzy, Cousins, et al. (1990) and Spiegel and Spira (1991) represent important steps in this direction.

These strengths notwithstanding, there are several aspects of effectiveness for future research to address. Increased attention needs to be given to patient characteristics, including gender, age, education, type of cancer, severity of cancer, time since diagnosis, types of treatment received, and possible individual differences in psychological characteristics. For example, by selecting only those patients with moderate to high levels of initial distress, Telch and Telch (1986) identified much larger effects for both a cognitive–behavioral and a supportive group intervention. This is consistent with findings that a subgroup of patients are at greater risk for prolonged symptoms of anxiety and depression and are, therefore, in greatest need of intervention (Compas et al., 1997). However, limiting patients on the basis of either psychological or disease characteristics will limit the generalizability of the findings. Increased attention also needs to be given to therapist training and characteristics, as therapist effects in all of these interventions remain a salient possibility. For example, the groups in the Fawzy, Cousins, et al. (1990, 1993) study were all co-led by F. I. Fawzy and Norman Cousins. D. Spiegel or J. R. Bloom co-led the groups in their trial, along with a therapist who had breast cancer in remission. In each of these instances, the qualities of these rather unique individuals may have contributed to the positive findings. In one of the few direct comparisons of cognitive–behavioral and supportive interventions (Telch & Telch, 1986), an advanced doctoral student in counseling psychology led two groups in each of the conditions, and a licensed clinical social worker led one group in each condition. As a result, the investigators were unable to control for the possibility of therapist allegiance effects influencing the efficacy of the two conditions. Training and assignment of different therapists to each condition would have controlled for the possibility that individual therapists were biased in favor of one therapy over the other, and as a result were more effective in delivering one therapy compared with the other.

Cost-Effectiveness

Cost containment has not been a focus of research on psychological interventions for cancer patients. Psychological interventions for the effective management of the side effects of chemotherapy, cancer-related distress and pain, and other stressful aspects of cancer may lead to reductions in utilization of other health care services and, as a result, a reduction in overall costs. However, psychological interventions for cancer patients also represent a challenge to typical notions of cost offset and containment. For example, Friedman et al. (1995) pointed out that prolonging the survival of patients with advanced disease may, in fact, result in an increase in total lifetime medical costs and that, clearly, the primary goals of prolonging and improving the quality of patients' lives outweigh the desire to manage health care costs.

Comments

Careful examination of the outcomes of psychosocial interventions for breast cancer patients has yielded differing opinions on the status of this research. On the one hand, there is clear evidence that these interventions have beneficial effects on both the quality of life (particularly levels of affective distress) and possibly the length of survival of cancer patients (Spiegel, 1993). On the other hand, the magnitude of these effects on quality of life outcomes is typically small (Myer & Mark, 1995), whereas effects on survival are considerable. The application of the criteria for efficacious treatments outlined by Chambless and Hollon (1998) offers another perspective on this literature. This review has identified one psychosocial treatment for cancer

patients that meets the criteria for established efficacy and two additional treatments that are judged to be possibly efficacious at this time. Progressive muscle relaxation combined with guided imagery has been found to be an efficacious treatment for the management of the psychological and physical side effects of chemotherapy. It is noteworthy, however, that recent improvements in antiemetic medications have resulted in the relative decline of the use of behavioral treatment of chemotherapy patients. This shift may be premature, however, as the combined use of these treatments or the possible use of behavioral treatments with patients who do not experience a full response to medication have not been examined in controlled studies.

Cognitive–behavioral group coping-skills interventions and supportive–expressive group psychotherapy both meet the criteria for possibly efficacious interventions. Their potential beneficial effects include both improved psychological adjustment as well as prolonged survival, at least among patients with malignant melanoma and patients with metastatic breast cancer. The specificity of these two promising interventions has not been examined, as they have not been compared with one another or with other active interventions within the context of a single randomized trial. CBT was compared with supportive group therapy in the Telch and Telch (1986) study; however, this supportive intervention differs in substantial ways from the supportive–expressive model used by Spiegel and colleagues.

Increased attention needs to be given to potential mechanisms of both psychological and physical outcomes (see Andersen, Kiecolt-Glaser, & Glaser, 1994). These include social support, emotional expression, cognitive style, and coping strategies as mediators of psychological outcomes (Spiegel, 1993) and immunologic function and treatment adherence versus avoidant behaviors as mediators of disease outcomes (Epping-Jordan, Compas, & Howell, 1994; Fawzy, Kemeny, et al., 1990).

Eating Disorders

Although there are two officially recognized eating disorders, anorexia nervosa and bulimia nervosa, described in *DSM–IV* (APA, 1994), we will focus only on bulimia nervosa. There are few controlled studies of treatment of anorexia nervosa, and no one form of treatment has been empirically demonstrated to be more effective than any other form of treatment (Steinhausen, 1995). A proposed new category of eating disorder, binge-eating disorder (Spitzer et al., 1991), will also not be considered, because research on treatment outcome is just beginning. It should be noted, however, that preliminary evidence suggests that both CBT and interpersonal therapy may be effective treatments for this disorder (e.g., Smith, Marcus, & Kaye, 1992; Telch, Agras, Rossiter, Wilfley, & Kenardy, 1990; Wilfley, et al., 1993).

Bulimia nervosa is a chronic eating disorder in which normal-weight individuals, the vast majority of them women, habitually vomit or abuse laxatives after binge-eating or after eating even minimal amounts of "forbidden" foods. Vomiting is self-induced, and the mean purging frequency per week reported in the treatment literature is usually between 10 and 15 times. The major complaint of patients with bulimia nervosa is that they cannot control their eating and therefore have to vomit or otherwise purge to prevent themselves from becoming fat. People with this disorder typically have a negative body image and feel that various parts of their body are too fat, even if they are in the lower end of the normal weight range. Most important, they are terrified of gaining any weight and believe they cannot eat normally without purging or they will inexorably and very rapidly become obese. Surveys conducted in the United States and in England suggest that the prevalence rate for bulimia nervosa involving purging behavior is around 1% to 3% in adult women (cf. Cooper, Charnock, & Taylor, 1987; Drewnowski, Hopkins, & Kessler, 1988; Fairburn & Beglin, 1990; Hart & Ollendick, 1985; Pope, Hudson, & Yurgelun-Todd, 1984; Pyle, Neuman, Halvorsen, & Mitchell, 1991; Rand & Kuldan, 1992; Schotte & Stunkard, 1987). The prevalence in high-school samples in the United States also appears to be around 3% of adolescent girls (Johnson, Tobin, & Lipkin, 1989).

There are many forms of treatment that are provided to bulimia nervosa patients. Virtually all of the controlled research, however, has been with CBT and pharmacotherapy, and more recently there has been an examination of a structured form of interpersonal psychotherapy.

This review is based on articles written in English and published prior to May 1996. Articles were located through PsycLIT, perusal of tables of contents of relevant journals in the last few years, and examination of prior reviews.

Efficacy

Cognitive–behavioral therapy. A number of studies have compared CBT to waiting-list controls (Agras, Schneider, Arnow, Raeburn, & Telch, 1989; Freeman, Barry, Dunkel-Turnbull, & Henderson, 1988; Lacey, 1983; Lee & Rush, 1986; Leitenberg, Rosen, Gross, Nudelman, & Vara, 1988; Ordman & Kirschenbaum, 1985; Wolchik, Weiss, & Katzman, 1986; Wolf & Crowther, 1992), and in each of these studies CBT was shown to be more effective than no treatment. This was true not only for primary measures of binge-eating and purging behavior but also for measures of attitudes toward body shape and weight and more global measures of psychological and social adjustment, including depression. Therefore, CBT for bulimia nervosa meets the criteria for an efficacious treatment.

Interpersonal therapy. A recent study by Fairburn et al. (1991) provided a test of the specificity of CBT, as well as the efficacy of interpersonal therapy for bulimia, by comparing CBT to structured interpersonal therapy (Klerman, Weissman, Rounsaville, & Chevron, 1984). In the interpersonal psychotherapy condition, therapy focused on the interpersonal problems involved in the development and maintenance of the disorder. No attention was paid to the patients' eating behavior or attitudes to shape and weight, and there was no self-monitoring of eating and purging behavior. At the end of treatment, the CBT condition was more effective in reducing purging, increasing nonpurged food intake and improving attitudes toward body shape and weight. At 12-month and 6-year follow-ups, however, these differences were no longer evident (Fairburn, Jones, Peveler, Hope, & O'Connor, 1993; Fairburn et al., 1995). Also, there was no difference between the groups on the amount of improvement in general psychopathology and depression at the end of treatment or at follow-up. Because these results have not been independently replicated with bulimia nervosa samples, interper-

sonal psychotherapy meets the criteria defined by Chambless and Hollon (1998) as possibly efficacious with this disorder. However, it has been independently demonstrated to be efficacious with binge-eating disorder (e.g., Telch et al., 1990; Wilfley et al., 1993), which has some overlap with bulimia nervosa. Given these results, it would be interesting to determine if interpersonal therapy could be combined with CBT to improve outcomes. Although, intuitively, one would guess that there might be an additive effect, a recent study with binge-eating disorder indicated that patients who had not responded to CBT also did not improve when later given interpersonal psychotherapy (Agras et al., 1995). Whether the same result would occur with bulimia nervosa or whether it would be more optimal to combine the two forms of therapy at the outset is unknown.

Specificity

Several studies have compared CBT with another form of psychotherapy and therefore provide data on the specificity of CBT for bulimia nervosa. Kirkley, Schneider, Agras, and Bachman (1985) compared cognitive–behavioral group therapy with nondirective group therapy with 28 bulimia nervosa patients. At posttreatment, there was a 95% reduction in vomiting frequency in the cognitive–behavioral group and a 69% reduction in the nondirective group. This difference was statistically significant. In addition, at a 3-month follow-up, 38% of the patients in the CBT condition had completely stopped vomiting compared with 11% of the patients in the nondirective condition. This difference was not statistically significant, however. Both groups also improved equally on measures of depression, anxiety, and attitudes about eating. Garner et al. (1993) recently compared CBT with supportive–expressive therapy containing both nondirective and psychodynamic elements. A total of 25 patients completed each treatment (18 sessions). There was greater improvement in purging behavior and attitudes toward eating, shape and weight, depression, and self-esteem in the group receiving CBT.

Fairburn, Kirk, O'Connor, and Cooper (1986) assigned 24 participants to either CBT (Fairburn, 1981, 1985) or short-term structured psychotherapy (B. Rosen, 1979) adapted for bulimia nervosa on the basis of Bruch's writings about psychotherapy for anorexia nervosa (e.g., Bruch, 1973). The distinction between treatment conditions may have been somewhat blurred, however, because education regarding weight regulation and the effects of dieting and purging were also provided, and some self-monitoring took place. Outcome was assessed using multiple measures at posttreatment and at 4- , 8- , and 12-month follow-ups. Although binge-eating and purging were equally and substantially improved at posttreatment, at 1-year follow-up 55% of the CBT patients, compared with only 27% of the short-term psychotherapy patients, had completely stopped vomiting. Moreover, when the outcome measures were combined to yield a global rating of improvement, the cognitive–behavioral condition proved superior at posttreatment and follow-up.

At least 16 double-blind controlled drug studies have been conducted to evaluate the effectiveness of pharmacotherapy in the treatment of bulimia nervosa (Agras, Dorian, Kirkley, Arnow, & Bachman, 1987; Barlow, Blouin, Blouin, & Perez, 1988; Fluoxetine Bulimia Nervosa Collaborative Study Group, 1992; Goldbloom & Olmstead, 1993; Horne et al., 1988; Hughes, Wells, Cunningham, & Ilstrup, 1986; Kennedy et al., 1988; Mitchell & Groat, 1984; Mitchell et al., 1990; Pope, Hudson, Jonas, & Yurgelun-Todd, 1983; Pope, Keck, McElroy, & Hudson, 1989; Rothschild et al., 1994; Sabine, Yonace, Farrington, Barratt, & Wakeling, 1983; Walsh et al., 1988; Walsh, Hadigan, Devlin, Gladis, & Roose, 1991; Walsh, Stewart, Roose, Gladis, & Glassman, 1984). Of these studies, 13 found that bulimia nervosa patients were significantly more improved with the active drug than with a placebo (2 that did not were Mitchell and Groat, and Sabine et al.), and another reported a significant difference 6 weeks into treatment but not at 16 weeks (Agras et al., 1987). For the studies that reported these data, the average reduction in bulimic episodes for patients receiving antidepressant medication was about 64%, and 31% completely stopped purging and vomiting. Drug studies have typically measured short-term outcomes while patients were still receiving medication, whereas most CBT studies evaluated outcomes at follow-up after treatment was discontinued. Clinical reports suggest that a substantial relapse will occur when antidepressant medication is discontinued (Pope, Hudson, Jonas, & Yurgelun-Todd, 1985), and more recent research has confirmed this (Pyle et al., 1990; Walsh et al., 1991).

Several studies have directly compared pharmacotherapy with CBT for bulimia nervosa. The first such study randomly assigned patients to four treatment conditions: imipramine alone, imipramine combined with group CBT, placebo, and CBT combined with placebo (Mitchell et al., 1990). CBT was more effective than imipramine in reducing binge-eating and vomiting episodes, even though imipramine was more effective than placebo. Moreover, imipramine combined with CBT was not more effective in changing binge-eating and purging behavior than CBT alone. Both the CBT group and the imipramine group improved on measures of depression and anxiety, with no significant difference between them. Accordingly, Mitchell et al. (1990) concluded that CBT was more effective than antidepressant medication in the treatment of bulimia nervosa, and there was no benefit to combining the two forms of treatment.

A second study examined the relative effectiveness of another antidepressant medication, desipramine, with CBT (Agras et al., 1992) in five groups: desipramine alone (for 16 or 24 weeks); desipramine combined with CBT (for 16 or 24 weeks); and CBT alone (for 16 weeks plus three additional sessions at Weeks 20, 24, and 28). There was no placebo group. At 16 weeks, both the CBT-alone and the combined treatment conditions showed significantly greater reductions in binge-eating and purging than the desipramine-alone condition, and there was no significant difference between the CBT-alone condition and the combined conditions. At 32 weeks, the 24-week combined condition showed significantly greater reductions in binge-eating and purging compared with the 16-week medication-alone condition. The CBT-alone condition, however, was no longer significantly different from the 16-week medication-alone condition. The authors therefore concluded that a combination of desipramine and CBT may be the preferred treatment for bulimia nervosa. However, although their results support the conclusion that the combined condition is superior to medication alone, they do not support the conclusion that the combined condition is superior to CBT alone. The combined condition did not sig-

nificantly differ from the CBT-alone group at any time on reduction of binge-eating and purging behavior.

A third study compared CBT alone, desipramine alone without any supportive psychotherapy, and CBT combined with desipramine (Leitenberg et al., 1994). CBT was more effective than desipramine alone, and there was also no evident benefit of combining desipramine with CBT on any of the outcome measures—binge-eating and purging episodes, attitudes toward eating, weight and body shape, depression, self-esteem, and psychological distress.

Finally, two studies failed to find any benefit of combining CBT with pharmacotherapy compared with CBT alone, in one case using fluoxetine (Fichter et al., 1991) and in the other case using fenfluramine (Fahy, Eisler, & Russell, 1993).

In summary, these studies suggest that CBT is more effective than nondirective therapy and short-term psychodynamic therapy in changing the core symptoms of bulimia nervosa. Thus, CBT is both efficacious and specific. Furthermore, it seems that CBT is more effective than antidepressant medication in the treatment of bulimia nervosa (again, evidence that it is both efficacious and specific) and that CBT should be the treatment of first choice for this disorder. If a patient does not respond, then antidepressant medications should be considered. The combination at the outset, however, appears to offer no apparent benefit compared with CBT alone. It should also be noted that a few studies that have tried to independently assess the benefits of family therapy (Russell, Szmuckler, Zare, & Eisler, 1987) and psychodynamic oriented therapy (Frommer, Ames, Gibson, & Davis, 1987) have yielded very poor outcomes. The comparison of CBT with interpersonal psychotherapy is less clear. It was more effective than interpersonal psychotherapy at the end of treatment, but at follow-up the two groups no longer differed significantly.

Component and procedural analyses. Studies have begun to investigate the contribution of different components and procedural variations of CBT. One series of studies has examined the benefit of including an exposure plus response-prevention component. The exposure plus response-prevention procedure involves having patients eat frightening foods during therapy sessions without being able to purge immediately afterward (Leitenberg, Gross, Peterson, & Rosen, 1984; J. C. Rosen & Leitenberg, 1982, 1985). Initial experimental analyses with this procedure indicated that the ability to eat anxiety-provoking foods without vomiting increased as each type of food was treated in sequence with exposure plus response prevention (J. C. Rosen & Leitenberg, 1982) and that the amount of anxiety provoked by eating these foods without vomiting declined within and across therapy sessions (Leitenberg et al., 1984). The results of two subsequent studies suggested that CBT that included exposure plus response prevention was more effective than CBT without exposure plus response prevention (Leitenberg, Rosen, Gross, Nudelman, & Vara, 1988; G. T. Wilson, Rossiter, Kleinfield, & Lindholm, 1986)). Agras et al. (1989), however, made a similar comparison between CBT with and without exposure plus response prevention and obtained opposite results. One important procedural difference between these studies was that session length was only 1 hr in Agras et al. (1989) compared with 2 hr in Leitenberg et al. (1988). The exposure plus response-prevention procedure was designed to supplement, not replace, the standard CBT package for bulimia nervosa, and more ample session time is needed to accomplish this goal. G. T. Wilson, Eldredge, Smith, and Niles (1991) made another comparison of CBT with and without exposure plus response prevention and found both treatments to be equally effective, but the exposure plus response-prevention procedure was not introduced until the 10th treatment session, and it lasted only 3 sessions. In short, it is still uncertain whether adding therapist-assisted exposure plus response prevention to standard CBT of bulimia nervosa provides a sufficient further benefit to warrant the extra effort and time involved. Probably, it is most useful for those patients who are most anxious about resuming eating feared foods at home on their own without vomiting. Finally, a recent study by Cooper and Steere (1995) demonstrated that if the cognitive aspect of exposure plus response prevention is omitted, it is not as effective at 12-month follow-up as the standard CBT package.

Several other studies have examined whether omitting the cognitive component from standard cognitive–behavioral treatment of bulimia nervosa is harmful. The results are mixed. Freeman et al. (1988) found the amount of reduction in binge-eating and purging was the same for the behavioral and cognitive–behavioral conditions, but there was no extended follow-up or measures of attitudes toward weight and body shape. Fairburn et al. (1991, 1995) and Fairburn, Marcus, and Wilson (1993) found that the full CBT package produced better effects on binge-eating and purging as well as on attitudes about shape and weight at follow-up. Thackwray, Smith, Bodfish, and Myers (1993) also compared a behavioral treatment focused exclusively on eating habits versus the combined CBT and found that although binge-eating and purging were similarly reduced at end of treatment, by 6-month follow-up the combined group had much better outcomes. Wolf and Crowther (1992), on the other hand, found that the behavioral condition without cognitive restructuring produced a greater reduction in binge-eating at follow-up, although the combined condition produced greater reductions in general psychological symptoms of distress and preoccupation with dieting.

It appears that the full cognitive–behavioral package is more effective than any of its single components. A study by Mitchell et al. (1993) also indicates that more intensive therapy involving multiple sessions per week with early encouragement of abstinence of binge-eating and purging produces more favorable results than does weekly cognitive–behavioral group therapy.

Clinical Significance

Considerable evidence supports the effectiveness of CBT for bulimia nervosa. Reviews of outcome studies evaluating CBT indicate that on average there is about an 80% reduction in binge-purge episodes, and about 50 to 60% of patients achieve complete remission at 6 months to 1 year follow-up (Craighead & Agras, 1991; Leitenberg, 1993; Wilson, 1996).

Effectiveness

The generalizability of these findings to clinical practice has not been directly addressed in these studies. Although all of the studies have included the appropriate use of *DSM–IV* criteria

for bulimia nervosa in the selection of patients, the degree to which these patients are representative of those seen in clinical practice is not clear. However, several uncontrolled studies in field settings have been reported in the literature and have supported the effectiveness of CBT (e.g., Giles, Young, & Young, 1985; Williamson et al., 1989). Moreover, the degree to which the therapists who have participated in these studies are representative of those in general clinical practice is also unclear. The procedures have been clearly outlined in treatment manuals, facilitating the generalization of the interventions.

Conclusion

Although CBT has been demonstrated to be an efficacious and specific treatment for bulimia nervosa in comparison with no treatment and alternative treatments including pharmacotherapy, on average only about 55% of treated patients are in complete remission at follow-up. Thus, there is still room for considerable improvement.

General Discussion

The application of the Chambless and Hollon (1998) criteria for empirically supported treatment to this sampling of interventions in health psychology offers several very clear inferences about the state of the field. First, significant progress has been made in identifying empirically supported treatments for health-related problems and conditions. Efficacious interventions were identified for smoking cessation, management of chronic pain, reducing the conditioned negative effects of chemotherapy in the treatment of cancer, and the treatment of bulimia nervosa. It is likely that interventions in other areas of health psychology meet the efficacy criteria but were not included in the areas sampled in this review; their omission in no way implies that they are not efficacious. Therefore, the number of efficacious treatments in health psychology is probably much larger than those reported here. Second, it is clear that research is more advanced in some of these areas than in others. For example, research on management of chronic pain and on smoking cessation has examined a variety of different types of interventions in multiple studies, providing a large base of evidence for the efficacy of these treatments. In contrast, research on facilitating effective coping with cancer has been characterized by a small number of seminal studies that now await replication and extension of these original findings. Third, interventions in health psychology meet the criteria as efficacious or possibly efficacious with regard to a wide range of outcomes. These extend from efficacious treatments for the management of specific symptoms (pain) and the treatment of a specific disorder (bulimia nervosa), to possibly efficacious treatment for prolonging survival of cancer patients. Fourth, relatively less progress has been made in determining the specificity of interventions in health psychology. This has been attributable, in part, to the lack of comparative studies in some areas and to the difficulty in establishing a credible comparison treatments in other areas.

Support for the efficacy of cognitive–behavioral and behavioral interventions is relatively stronger than for other models of intervention in the areas that were sampled. As alternative models of intervention have become more standardized and have been examined in controlled trials, however, evidence of their possible efficacy has emerged. Examples include interpersonal therapy for the treatment of bulimia nervosa and supportive–expressive group therapy for breast cancer patients. The application of a variety of treatment modalities, as well as comparison of these methods with cognitive–behavioral and behavioral interventions, is a high priority for health psychology research. This will enable researchers to both expand the range of interventions that can be applied efficaciously, as well as to establish specificity in distinguishing those treatments or components of treatments that are responsible for facilitating change.

These generally positive findings notwithstanding, there are several issues that emerged in this review that warrant attention in interventions in health psychology. These reflect both limitations in previous research as well as the challenges in applying the Chambless and Hollon (1998) criteria to interventions in health psychology.

Patient Heterogeneity

Chambless and Hollon (1998) have noted the importance of considering the homogeneity of samples often included in randomized clinical trials, as compared with the heterogeneity of patient samples that typically present in clinical practice. Diversity among patients is clearly the rule in populations served by health psychology interventions, as they are typically not identified on the basis of *DSM–IV* criteria. Examination of the samples included in the intervention studies reviewed here indicates that they are quite heterogeneous with regard to demographic characteristics, the disease or health condition that they present, and their premorbid psychological functioning. Although this variability presents challenges to researchers, it also argues in favor of the representativeness of these samples. The heterogeneity of these samples also highlights the need to identify subgroups of patients that may differ in their response to psychological treatments. Although interactions between treatments and characteristics are notoriously difficult to detect, there is promising research in health psychology interventions in this direction (e.g., Rudy, Turk, Kubinski, & Zaki, 1995; Sanders & Brena, 1993; Turk & Ruby, 1988).

Cost-Effectiveness

Surprisingly little attention has been given to the cost-effectiveness of the interventions reviewed here. Cost-effectiveness has been a priority in health psychology in general, both in terms of savings in health care costs that result from psychological interventions and the relative cost of psychological as compared with biomedical interventions (Friedman et al., 1995). Whether long-term savings can result from psychological interventions in comparison with continued treatment with medication is unclear. Similarly, the reduction in health care costs that results from smoking cessation requires further attention. However, reduced costs are not the only bottom line in health psychology interventions, as some treatments may actually increase costs as a result of increased survival (Friedman et al., 1995). For example, if psychological interventions actually do increase the survival of cancer patients, there may be additional costs, especially among patients with advanced disease. As long as increased survival is

accompanied by enhanced quality of life, as it appears to be in these interventions, then these additional costs are more than outweighed by the benefits. Similarly, if for example, CBT continues to be shown to be a more efficacious treatment for bulimia nervosa than medication, how much weight should be given to relative differences in economic costs versus relative differences in outcomes and quality of life? It is clear that equations for cost-effectiveness in health psychology are highly complex and require attention to multiple dimensions.

Health Psychology Interventions in the Health Care System

Finally, it is essential to place health psychology interventions in the general context of our current health care system. This includes the relationship between psychological treatments and preventive interventions, and between psychological treatments and biomedical interventions. Our task in this article was to address psychological interventions that are designed to treat existing symptoms, disorders, or diseases. However, much of the important work that is carried out by health psychologists is done so in the context of preventive interventions. Examples that are relevant to the four areas that were discussed here include smoking prevention programs, screening and early detection programs for breast cancer, and interventions to promote healthy diet and body image in adolescents. Health psychology interventions that are designed to treat existing problems are part of a broader system of interventions that include the promotion of health and the prevention of high-risk behaviors and disease. It is very likely that many of the promotion and prevention interventions would meet standards for efficacy as well.

Psychological interventions are, of course, not intended to replace or even compete with biomedical interventions for diseases such as cancer, AIDS, arthritis, and many other conditions to which psychological treatments have been applied. Rather, psychological interventions complement and work in conjunction with biomedical interventions, filling a unique role that other forms of treatment cannot address. This places psychologists and other mental health professionals as members of comprehensive multidisciplinary teams that have been established in many health care settings. For example, should either cognitive–behavioral or supportive–expressive therapies, or both of these treatments, prove efficacious in prolonging the survival of cancer patients, they would of course not be viewed as a replacement for standard treatments of surgery, chemotherapy, and radiation therapy. Similarly, psychological treatments to foster smoking cessation may best be used in conjunction with other biological treatments such as nicotine-replacement systems. Therefore, a high priority for future research is to continue to examine combinations of treatments that include psychological interventions along with established and emerging biomedical treatments. These are likely to be the most efficacious in achieving the dual goals of health psychology interventions—to both increase the length of patients' lives while enhancing the quality their lives.

References

Agras, W. S., Dorian, B., Kirkley, B. G., Arnow, B., & Bachman, J. (1987). Imipramine in the treatment of bulimia: A double-blind controlled study. *International Journal of Eating Disorders, 6,* 29–38.

Agras, W. S., Rossiter, E. M., Arnow, B., Schneider, J. A., Telch, C. F., Raeburn, S. D., Bruce, B., Perl, M., & Koran, L. M. (1992). Pharmacologic and cognitive–behavioral treatment for bulimia nervosa: A controlled comparison. *American Journal of Psychiatry, 149,* 82–87.

Agras, W. S., Schneider, J. A., Arnow, B., Raeburn, S. D., & Telch, C. F. (1989). Cognitive–behavioral and response prevention treatments for bulimia nervosa. *Journal of Consulting and Clinical Psychology, 57,* 215–221.

Agras, W. S., Telch, C. F., Arnow, B., Eldredge, K., Detzer, M. J., Henderson, J., & Marnell, M. (1995). Does interpersonal therapy help patients with binge eating disorder who fail to respond to cognitive–behavioral therapy? *Journal of Consulting and Clinical Psychology, 63,* 356–360.

American Cancer Society. (1997). *Cancer facts and figures—1996.* Atlanta, GA: Author.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

American Psychiatric Association. (1996, October). Practice guideline for the treatment of patients with nicotine dependence. *American Journal of Psychiatry, 153* (Suppl.).

Andersen, B. L. (1992). Psychosocial interventions for cancer patients to enhance quality of life. *Journal of Consulting and Clinical Psychology, 60,* 552–568.

Andersen, B. L., Kiecolt-Glaser, J. K., & Glaser, R. (1994). A biobehavioral model of cancer stress and disease course. *American Psychologist, 49,* 389–404.

Baillie, A. J., Mattick, R. P., Hall, W., & Webster, P. (1994). Meta-analytic review of the efficacy of smoking cessation interventions. *Drug and Alcohol Review, 13,* 157–170.

Barber, J. (1990). Hypnosis. In J. J. Bonica (Ed.), *The management of pain* (pp. 1733–1741). Philadelphia: Lea & Febiger.

Barlow, J., Blouin, J., Blouin, A., & Perez, E. (1988). Treatment of bulimia with desipramine: A double-blind crossover study. *Canadian Journal of Psychiatry, 33,* 129–133.

Basler, H. D., & Rehfisch, H. P. (1991). Cognitive–behavioral therapy in patients with ankylosing spondylitis in a German self-help organization. *Journal of Psychosomatic Research, 35,* 335–354.

Beck, A. T. (1973). *Cognitive therapy and the emotional disorders.* New York: International Universities Press.

Beck, A. T., Rush, J., A., Shaw, B. F., & Emery, G. (1980). *Cognitive therapy of depression.* New York: Guilford Press.

Bennett, P., & Wilkinson, S. (1985). Comparison of psychological and medical treatment of the irritable bowel syndrome. *British Journal of Clinical Psychology, 24,* 215–216.

Blanchard, E. B., & Andrasik, F. (1987). Biofeedback treatment of vascular headache. In J. P. Hatch, J. G. Fisher, & J. D. Rugh. *Biofeedback: Studies in clinical efficacy* (pp. 1–80). New York: Plenum.

Blanchard, E. B., Appelbaum, K. A., Nicholson, N. L., Radnitz, C. L., Morrill, B., Michultka, D., Kirsch, C., Hillhouse, J., & Dentinger, M. P. (1990). A controlled evaluation of the addition of cognitive therapy to a home-based biofeedback and relaxation treatment of vascular headache. *Headache, 30,* 371–376.

Blanchard, E. B., Appelbaum, K. A., Radnitz, C. L., Morrill, B., Michultka, D., Kirsch, C., Guarnieri, P., Hillhouse, J., Evans, D. D., Jaccard, J., & Barron, K. D. (1990). A controlled evaluation of thermal biofeedback and thermal biofeedback combined with cognitive therapy in the treatment of vascular headache. *Journal of Consulting and Clinical Psychology, 58,* 216–224.

Blanchard, E. B., & Malamood, H. S. (1996). Psychological treatment of irritable bowel syndrome. *Professional Psychology: Research and Practice, 27,* 241–244.

Blanchard, E. B., & Schwarz, S. P. (1988). Clinically significant changes in behavioral medicine. *Behavioral Assessment, 10,* 171–188.

Blanchard, E. B., Theobald, D. E., Williamson, D. A., Silver, B. V., & Brown, D. A. (1978). Temperature biofeedback in the treatment of migraine headaches. *Archives of General Psychiatry, 35,* 581.

Bradley, L. A., Young, L. D., Anderson, K. O., Turner, R. A., Agudelo, C. A., McDaniel, L. K., Piski, E. J., Semble, E. L., & Morgan, T. M. (1987). Effects of psychological therapy on pain behavior of rheumatoid arthritis patients. *Arthritis and Rheumatism, 30,* 1105–1114.

Bruch, H. (1973). *Eating disorders: Obesity, anorexia nervosa, and the person within.* New York: Basic Books.

Burish, T. G., Carey, M. P., Krozely, M. G., & Greco, F. A. (1987). Conditioned nausea and vomiting induced by cancer chemotherapy: Prevention through behavioral treatment. *Journal of Consulting and Clinical Psychology, 55,* 42–48.

Burish, T. G., & Jenkins, R. A. (1992). Effectiveness of biofeedback and relaxation training in reducing the side effects of cancer chemotherapy. *Health Psychology, 11,* 17–23.

Burish, T. G., & Lyles, J. N. (1981). Effectiveness of relaxation training in reducing adverse reactions to cancer chemotherapy. *Journal of Behavioral Medicine, 4,* 65–78.

Burish, T. G., Snyder, S. L., & Jenkins, R. A. (1991). Preparing patients for cancer chemotherapy: Effect of coping preparation and relaxation interventions. *Journal of Consulting and Clinical Psychology, 59,* 518–525.

Burish, T. G., & Tope, D. M. (1992). Psychological techniques for controlling the adverse side effects of cancer chemotherapy: Findings from a decade of research. *Journal of Pain and Symptom Management, 7,* 287–301.

Bush, C., Ditto, B., & Feuerstein, M. (1985). A controlled evaluation of paraspinal EMG biofeedback in the treatment of chronic low back pain. *Health Psychology, 4,* 307–321.

Carey, M. P., & Burish, T. G. (1987). Providing relaxation training to cancer chemotherapy patients: A comparison of three methods. *Journal of Consulting and Clinical Psychology, 55,* 732–737.

Carey, M. P., & Burish, T. G. (1988). Etiology and treatment of the psychological side effects associated with cancer chemotherapy: A critical review and discussion. *Psychological Bulletin, 104,* 307–325.

Carroll, K. M. (1996). Relapse prevention as a psychosocial treatment: A review of controlled clinical trials. *Experimental and Clinical Psychopharmacology, 4,* 46–54.

Cavanaugh, J. M., & Weinstein, J. N. (1994). Low back pain: Epidemiology, anatomy and neurophysiology. In P. D. Wall & R. Melzack, *Textbook of pain* (pp. 441–456). Edinburgh, NY: Churchill Livingston.

Centers for Disease Control. (1996). Cigarette smoking among adults—United States, 1994. *Morbidity and Mortality Weekly Report, 45,* 588–590.

Cepèda-Benito, A. (1993). Meta-analytic review of nicotine chewing gum in smoking treatment programs. *Journal of Consulting and Clinical Psychology, 61,* 822–830.

Chambless, D. L., & Hollon, S. D. (1998). Defining empirically supported therapies. *Journal of Consulting and Clinical Psychology, 66,* 7–18.

Chapman, S. L. (1986). A review and clinical perspective on the use of EMG and thermal biofeedback for chronic headaches. *Pain, 27,* 1–43.

Cinciripini, P. M., Lapitsky, L. G., Wallfisch, A., Mace, R., Nezami, E., & Van Vunakis, H. (1994). An evaluation of a multicomponent treatment program involving scheduled smoking and relapse prevention procedures: Initial findings. *Addictive Behaviors, 19,* 13–22.

Cohen, M. J., McArthur, D. L., & Rickles, W. H. (1980). Comparison of four biofeedback treatments for migraine headache: Psychological and headache variables. *Psychosomatic Medicine, 42,* 463–379.

Compas, B. E., Oppedisano, G., Primo, K., Epping-Jordan, J. E., Gerhardt, C. A., Osowiecki, D. M., & Krag, D. N. (1997). *Psychological adjustment to breast cancer: Markers of subgroup differences in emotional distress.* Manuscript submitted for publication.

Contach, P. (1983). Relaxation training for control of nausea and committing in patients receiving chemotherapy. *Cancer Nursing, 6,* 277–283.

Contach, P., & Strum, S. (1985). *Progressive muscle relaxation a antiemetic therapy for cancer patients: A controlled study.* Unpublished manuscript, Duke University, Durham, NC.

Cooper, P. J. (1993). *Bulimia nervosa: A guide to recovery.* London: Robinson.

Cooper, P. J., Charnock, D. J., & Taylor, M. J. (1987). The prevalence of bulimia nervosa: A replication study. *British Journal of Psychiatry, 151,* 684–686.

Cooper, P. J., & Steere, J. (1995). A comparison of two psychological treatments for bulimia nervosa: Implications for models of maintenance. *Behaviour Research and Therapy, 33,* 878–885.

Corney, R. H., Stanton, R., Newell, R., Clare, A., & Fairclough, P. (1991). Behavioral psychotherapy in the treatment of irritable bowel syndrome. *Journal of Psychosomatic Research, 35,* 461–469.

Craighead, L. W., & Agras, W. S. (1991). Mechanisms of action in cognitive–behavioral and pharmacological interventions for obesity and bulimia nervosa. *Journal of Consulting and Clinical Psychology, 59,* 115–125.

Cunningham, A. J., & Tacco, E. K. (1989). A randomized trial of group psychoeducational therapy for cancer patients. *Patient Educational Counseling, 14,* 101–114.

Curry, S. J., & McBride, C. M. (1994). Relapse prevention for smoking cessation: Review and evaluation of concepts and interventions. *Annual Review of Public Health, 15,* 345–366.

Daly, E. J., Donn, P. A., Galliher, M. J., & Zimmerman, J. S. (1983). Biofeedback applications to migraine and tension headaches: A double-blind outcome study. *Biofeedback Self-Regulation, 3,* 135–152.

Drewnowski, A., Hopkins, S. A., & Kessler, R. L. (1988). The prevalence of bulimia nervosa in the U.S. college student population. *American Journal of Public Health, 78, 10,* 1322–1325.

Edgar, L., Rosberger, Z., & Nowlis, D. (1992). Coping with cancer during the first year after diagnosis. *Cancer, 69,* 817–828.

Emmelkamp, P. M. G., & van Oppen, P. (1993). Cognitive interventions in behavioral medicine. *Psychotherapy and Psychosomatics, 59,* 116–130.

Epping-Jordan, J. E., Compas, B. E., & Howell, D. C. (1994). Predictors of cancer progression in young adult men and women: Avoidance, intrusive thoughts, and psychological symptoms. *Health Psychology, 13,* 539–547.

Fahy, T. A., Eisler, I., & Russell, G. F. M. (1993). A placebo-controlled trial of *d*-Fenfluramine in bulimia nervosa. *British Journal of Psychiatry, 162,* 597–603.

Fairburn, C. G. (1981). A cognitive behavioural approach to the treatment of bulimia. *Psychological Medicine, 11,* 707–711.

Fairburn, C. G. (1995). *Overcoming binge eating.* New York: Guilford Press.

Fairburn, C. G., & Beglin, S. J. (1990). Studies of the epidemiology of bulimia nervosa. *American Journal of Psychiatry, 127,* 401–408.

Fairburn, C. G., Jones, R., Peveler, R. C., Carr, S. J., Solomon, R. A., O'Connor, Burton, J., & Hope, R. A. (1991). Three psychological treatments for bulimia nervosa: A comparative trial. *Archives of General Psychiatry, 48,* 463–469.

Fairburn, C. G., Jones, R., Peveler, R. C., Hope, R. A., & O'Connor, M. (1993). Psychotherapy and bulimia nervosa: Longer-term effects of interpersonal psychotherapy, behavior therapy, and cognitive behavior therapy. *Archives of General Psychiatry, 50,* 419–428.

Fairburn, C. G., Kirk, J., O'Connor, M., & Cooper, P. J. (1986). A comparison of two psychological treatments for bulimia nervosa. *Behaviour Research and Therapy, 24,* 629–643.

Fairburn, C. G., Marcus, M. D., & Wilson, G. T. (1993). Cognitive–behavioral therapy for binge eating and bulimia nervosa: A comprehensive treatment manual. In C. G. Fairburn & G. T. Wilson (Eds.), *Binge eating: Nature, assessment, and treatment* (pp. 361–404). New York: Guilford Press.

Fairburn, C. G., Norman, P. A., Welch, S. L., O'Connor, M. E., Doll, H. A., & Peveler, R. C. (1995). A prospective study of outcome in bulimia nervosa and the long-term effects of three psychological treatments. *Archives of General Psychiatry, 52,* 304–312.

Fawzy, F. I., Cousins, N., Fawzy, N. S., Kemeny, M. E., Elashoff, R., & Morton, D. (1990). A structured psychiatric intervention for cancer patients: I. Changes over time in methods of coping and affective disturbance. *Archives of General Psychiatry, 47,* 720–725.

Fawzy, F. I., Fawzy, N. W., Arndt, L. A., & Pasnau, R. O. (1995). Critical review of psychosocial interventions in cancer care. *Archives of General Psychiatry, 52,* 100–113.

Fawzy, F. I., Fawzy, N. S., Hyun, C. S., Elashoff, R., Guthrie, D., Fahey, J. L., & Morton, D. (1993). Malignant melanoma: Effects of an early structured psychiatric intervention, coping, and affective state on recurrence and survival 6 years later. *Archives of General Psychiatry, 50,* 681–689.

Fawzy, F. I., Kemeny, M. E., Fawzy, N. S., Elashoff, R., Morton, D., Cousins, N., & Fahey, J. L., (1990). A structured psychiatric intervention for cancer patients: II. Changes over time in immunological measures. *Archives of General Psychiatry, 47,* 729–735.

Fichter, M. M., Leibl, K., Rief, W., Brunner, E., Schmidt-Auberger, S., & Engel, R. R. (1991). Fluoxetine versus placebo: A double-blind study with bulimic patients undergoing intensive psychotherapy. *Pharmacopsychiatry, 24,* 1–7.

Fields, H. L. (1991). *Core curriculum for professional education in pain.* Seattle, WA: IASP Press.

Fiore, M. C., Bailey, W. C., Cohen, S. J., et al. (1996, April). *Smoking cessation: Information for specialists.* (Quick Reference Guide for Smoking Cessation Specialists, No. 18, AHCPR Publication No. 96-0694). Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research and Centers for Disease Control and Prevention.

Fiore, M. C., Smith, S. S., Jorenby, D. E., & Baker, T. B. (1994). The effectiveness of the nicotine patch for smoking cessation: A meta-analysis. *Journal of the American Medical Association, 271,* 1940–1947.

Fisher, E. B., Jr., Lichtenstein, E., Haire-Joshu, D., Morgan, G. D., & Rehberg, H. R. (1993). Methods, successes, and failures of smoking cessation programs. *Annual Review of Medicine, 44,* 481–513.

Flor, H., & Birbaumer, N. (1993). Comparison of the efficacy of electromyographic biofeedback, cognitive–behavioral therapy, and conservative medical interventions in the treatment of chronic musculoskeletal pain. *Journal of Consulting and Clinical Psychology, 61,* 653–658.

Flor, H., Haag, G., Turk, D. C., & Koehler, H. (1983). Efficacy of EMG biofeedback, pseudotherapy, and conventional medical treatment for chronic rheumatic back pain. *Pain, 17,* 21–31.

Fluoxetine Bulimia Nervosa Collaborative Study Group. (1992). Fluoxetine in the treatment of bulimia nervosa. *Archives of General Psychiatry, 49,* 139–147.

Fordyce, W. E. (1976). *Behavioral methods of chronic pain and illness.* St. Louis, MO: Mosby.

Foxx, R. M., & Brown, R. A. (1979). Nicotine fading and self-monitoring for cigarette abstinence or controlled smoking. *Journal of Applied Behavioral Analysis, 12,* 111–125.

Freeman, C. P. L., Barry, F., Dunkeld-Turnbull, J., & Henderson, A. (1988). Controlled trial of psychotherapy for bulimia nervosa. *British Medical Journal, 296,* 521–526.

Friedman, R., Subel, D., Meyers, P., Caudill, M., & Benson, H. (1995). Behavioral medicine, clinical health psychology, and cost offset. *Health Psychology, 14,* 509–518.

Frommer, M. S., Ames, J. R., Gibson, J. W., & Davis, W. N. (1987). Patterns of symptom change in the short-term group treatment of bulimia. *International Journal of Eating Disorders, 6,* 469–476.

Garner, D. M., Rockert, W., Davis, R., Garner, M. V., Olmsted, M. P., & Eagle, M. (1993). Comparison of cognitive–behavioral and supportive–expressive therapy for bulimia nervosa. *American Journal of Psychiatry, 150,* 37–46.

Gauthier, J., Bois, R., Allaire, D., & Drolet, M. (1981). Evaluation of skin temperature biofeedback training at two different sites for migraine. *Journal of Behavioral Medicine, 4,* 407–409.

Gellert, G. A., Maxwell, R. M., & Siegel, B. S. (1993). Survival of breast cancer patients receiving adjunctive psychosocial support therapy: A 10-year follow-up study. *Journal of Clinical Oncology, 11,* 66–69.

Gerhards, F., Rojahn, J., Boxan, K., Gnade, C., Petrik, M., & Florin, I. (1983). Biofeedback versus cognitive stress-coping therapy in migraine headache patients: A preliminary analysis of a comparative study. In K. A. Holroyd, B. Schlot, & H. Zenz (Eds.), *Perspectives in research on headache* (pp. 171–182) New York: Hogrefe.

Giles, T. R., Young, R. R., & Young, D. E. (1985). Behavioral treatment of severe bulimia. *Behavior Therapy, 16,* 393–405.

Glanz, K., & Lerman, C. (1989). Psychosocial impact of breast cancer: A critical review. *Annals of Behavioral Medicine, 14,* 204–212.

Glasgow, R. E., & Lichtenstein, E. (1987). Long-term effects of behavioral smoking cessation interventions. *Behavior Therapy, 18,* 297–324.

Goldbloom, D. S., & Olmstead, M. P. (1993). Pharmacotherapy of bulimia nervosa with fluoxetine: Assessment of clinically significant attitudinal change. *American Journal of Psychiatry, 150,* 770–602.

Green, B., & Blanchard, E. B. (1994). Cognitive therapy for irritable bowel syndrome. *Journal of Consulting and Clinical Psychology, 62,* 576–582.

Groth-Marnat, G., & Edkins, G. (1996). Professional psychologists in general health care settings: A review of the financial efficacy of direct treatment interventions. *Professional Psychology: Research and Practice, 27,* 161–174.

Grunberg, S. M., & Hesketh, P. J. (1993). Control of chemotherapy-induced emesis. *New England Journal of Medicine, 329,* 1790–1796.

Guthrie, E., Creed, F., Dawson, D., & Tonenson, B. (1991). A controlled trial of psychological treatment for the irritable bowel syndrome. *Gastroenterology, 100,* 450–457.

Haaga, D. A. F. (Ed.). (in press). Smoking cessation: Clinical and research directions. *Annual review of addictions treatment and research* [Special issue]. *Addictive Behaviors.*

Hajek, P. (1994). Treatments for smokers. *Addiction, 89,* 1543–1549.

Hall, S. M., Muñoz, R. F., & Reus, V. I. (1994). Cognitive–behavioral intervention increases abstinence rates for depressive-history smokers. *Journal of Consulting and Clinical Psychology, 62,* 141–146.

Hall, S. M., Muñoz, R. F., Reus, V. I., Sees, K. L., Duncan, C., Humfleet, G. L., & Hartz, D. T. (1996). Mood management and nicotine gum in smoking treatment: A therapeutic contact and placebo-controlled study. *Journal of Consulting and Clinical Psychology, 64,* 1003–1009.

Hart, K. J., & Ollendick, T. H. (1985). Prevalence of bulimia in working and university women. *American Journal of Psychiatry, 142,* 851–854.

Harvey, R. F., Hinton, R. A., Gunary, R. M., & Barry, R. E. (1989). Individual and group hypnotherapy in treatment of refractory irritable bowel syndrome. *Lancet, 1,* (8635), 424–425.

Hilgard, E. R., & Hilgard, J. R. (1983). *Hypnosis in the relief of pain* (2nd ed.). Los Altos, CA: Williams Kaufman.

Hill, R. D., Rigdon, M., & Johnson, S. (1993). Behavioral smoking

cessation treatment for older chronic smokers. *Behavior Therapy, 24,* 321–329.

Holroyd, K. A., France, J. L., Cordingly, G. E., Rokicki, L. A., Kvaal, S. A., Lipchik, G. L., & McCool, H. R. (1995). Enhancing the effectiveness of relaxation–thermal biofeedback training with propranolol hydrochloride. *Journal of Consulting and Clinical Psychology, 63,* 327–330.

Holroyd, K. A., & Penzien, D. B. (1990). Pharmacological versus nonpharmacological prophylaxis of recurrent migraine headache: A meta-analytic review of clinical trials. *Pain, 42,* 1–13.

Holroyd, K. A., & Penzien, D. B. (1994). Psychosocial interventions in the management of recurrent headache disorders: 1. Overview and effectiveness. *Behavioral Medicine, 20,* 53–63.

Horne, R. L., Ferguson, J. M., Pope, H. G., Hudson, J. I., Lineberry, C. G., Ascher, J., & Lato, A. (1988). Treatment of bulimia with bupropion: A multi center controlled trial. *Journal of Clinical Psychiatry, 49,* 262–266.

Hughes, J. R. (1992). Observer reports of smoking status: A replication. *Journal of Substance Abuse, 4,* 403–406.

Hughes, P. L., Wells, L. A. Cunningham, C. J., & Ilstrup, D. M. (1986). Treating bulimia with desipramine. *Archives of General Psychiatry, 43,* 182–186.

International Association for the Study of Pain. (in press). *Curriculum on pain for students in psychology.* Seattle, WA: Author.

Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology, 59,* 12–19.

Jessup, B., Neufeld, R. W. J., & Stenn, P. G. (1976). *Autogenic training and hand temperature biofeedback in the treatment of migraine: A preliminary analysis* (Research Bulletin No. 390, ISSN 0316-4575). London, Ontario, Canada: University of Western Ontario, Department of Psychology.

Johnson, C., Tobin, D. L., & Lipkin, J. (1989). Epidemiologic changes in bulimic behavior among female adolescents over a 5-year period. *International Journal of Eating Disorders, 8,* 647–655.

Jurish, S. E., Blanchard, E. B., Andrasik, F., Teders, S. J., Neff, D. F., & Arena, J. G. Home-versus clinic-based treatment of vascular headache. *Journal of Consulting and Clinical Psychology, 51,* 743–751.

Kaplan, R. M. (1994). The Ziggy theorem: Toward an outcomes-focused health psychology. *Health Psychology, 13,* 451–460.

Keefe, F. J. (1996). Cognitive behavioral therapy for managing pain. *The Clinical Psychologist, 49,* 4–5.

Keefe, F. J., Caldwell, D. S., Baucom, D., Salley, A., Robinson, E., Timmons, K., Beaupre, P., Weisberg, J., & Helms, M. (1996). Spouse-assisted coping skills training in the management of osteoarthritic knee pain. *Arthritis Care and Research, 9,* 279–291.

Keefe, F. J., Caldwell, D. S., Williams, D. A., Gil, K. M., Mitchell, D., Robertson, C., Martinez, S., Nunley, J., Beckham, J. C., & Helms, M. (1990a). Pain coping skills training in management of osteoarthritic knee pain: A comparative study. *Behavior Therapy, 21,* 49–62.

Keefe, F. J., Caldwell, D. S., Williams, D. A., Gil, K. M., Mitchell, D., Robertson, C., Martinez, S., Nunley, J., Beckham, J. C., & Helms, M. (1990b). Pain coping skills training in the management of osteoarthritic knee pain: II. Follow-up results. *Behavior Therapy, 21,* 435–447.

Keefe, F. J., Gil, K. M., & Ross, S. C. (1986). Behavioral approaches in the multidisciplinary management of chronic pain: Programs and issues. *Clinical Psychology Review, 6,* 87–113.

Kendall, P. C., & Grove, W. M. (1988). Normative comparisons in therapy outcome. *Behavioral Assessment, 10,* 147–158.

Kennedy, S. H., Pinan, N., Warsh, J. J., Prendergast, P., Mainprize, E., Whynot, G., & Garfinkel, P. E. (1988). A trial of isocarboxazid in the treatment of bulimia nervosa. *Journal of Clinical Psychopharmacology, 8,* 391–396.

Kewman, D., & Roberts, A. H. (1980). Skin temperature biofeedback and migraine headache: A double-blind study. *Biofeedback and Self-Regulation, 51,* 754–751.

Kirkley, B. G., Schneider, J. A., Agras, W. S., & Bachman, J. A. (1985). Comparison of two group treatments for bulimia. *Journal of Consulting and Clinical Psychology, 53,* 43–48.

Klerman, G. L., Weissman, M. M., Rounsaville, B. J., & Chevron, E. S. (1984). *Interpersonal psychotherapy of depression.* New York: Basic Books.

Klesger, R. C., Ward, K. D., & DeBon, M. (1996). Smoking cessation: A successful behavioral/pharmacologic interface. *Clinical Psychology Review, 16,* 479–496.

Knapp, T. W., & Florin, I. (1981). The treatment of migraine headache by training in vasoconstriction of the temporal artery and a cognitive–stress coping training. *Behavior Analysis & Modification, 4,* 267–241.

Kraaimaat, F. W., Brons, M. R., Geenen, R., & Bijlsma, J. W. J. (1995). The effect of cognitive behavior therapy in patients with rheumatoid arthritis. *Behaviour Research and Therapy, 33,* 487–495.

Lacey, J. H. (1983). Bulimia nervosa, binge eating, and psychogenic vomiting: A controlled treatment study and long term outcome. *British Medical Journal, 286,* 1609–1613.

Lacroix, M., Clarke, M. A., Bock, J. C., Doxey, N., Wood, A., & Lewis, S. (1983). Biofeedback and relaxation in the treatment of migraine headaches: Comparative effectiveness and physiological correlates. *Journal of Neurology, Neurosurgery, & Psychiatry, 46,* 525–532.

Lake, A., Raney, J., & Papsdorf, J. D. (1979). Biofeedback and rational–emotive therapy in the management of migraine headache. *Journal of Applied Behavioral Analysis, 12,* 127–140.

Lando, H. A. (1977). Successful treatment of smokers with a broad-spectrum behavioral approach. *Journal of Consulting and Clinical Psychology, 45,* 361–366.

Lando, H. A. (1989). Treatment outcome evaluation methodology in smoking cessation: Strengths and key issues. *Advances in Behaviour Research and Therapy, 11,* 201–214.

Law, M., & Tang, J. L. (1995). An analysis of the effectiveness of interventions intended to help people stop smoking. *Archives of Internal Medicine, 155,* 1933–1941.

Lee, N. F., & Rush, A. J. (1986). Cognitive–behavioral group therapy for bulimia. *International Journal of Eating Disorders, 5,* 599–615.

Leitenberg, H. (1993). Treatment of bulimia nervosa. In T. R. Giles (Ed.), *Handbook of effective psychotherapy* (pp. 279–304). New York: Plenum Press.

Leitenberg, H., Gross, J., Peterson, J., & Rosen, J. C. (1984). Analysis of an anxiety model and the process of change during exposure plus response prevention treatment of bulimia nervosa. *Behavior Therapy, 15,* 3–20.

Leitenberg, H., Rosen, J. C., Gross, J., Nudelman, S., & Vara, L. S. (1988). Exposure plus response prevention treatment of bulimia nervosa: A controlled evaluation. *Journal of Consulting and Clinical Psychology, 56,* 535–541.

Leitenberg, H., Rosen, J. C., Wolf, J., Vara, L. S., Detzer, M. & Srebnik, D. (1994). Comparison of cognitive behavior therapy and desipramine in the treatment of bulimia nervosa. *Behaviour Research and Therapy, 32,* 37–45.

Lichtenstein, E. (1982). The smoking problem: A behavioral perspective. *Journal of Consulting and Clinical Psychology, 50,* 804–819.

Lichtenstein, E., & Glasgow, R. E. (1992). Smoking cessation: What have we learned over the past decade? *Journal of Consulting and Clinical Psychology, 60,* 518–527.

Linn, M. W., Linn, B. S., & Harris, R. (1982). Effects of counseling for late-stage cancer patients. *Cancer, 49,* 1048–1055.

Linton, S. J., & Gotestam, K. G. (1984). A controlled study of the effects of applied relaxation and applied relaxation plus operant proce-

dures in the regulation of chronic pain. *British Journal of Clinical Psychology, 23,* 291–299.

Lyles, J. N., Burish, T. G., Krozely, M. G., & Oldham, R. K. (1982). Efficacy of relaxation training and guided imagery in reducing the aversiveness of cancer chemotherapy. *Journal of Consulting and Clinical Psychology, 50,* 509–524.

Lynch, P. M., & Zamble, E. (1989). A controlled behavioral treatment study of irritable bowel syndrome. *Behavior Therapy, 20,* 509–523.

Mathew, N. T. (1981). Prophylaxis of migraine and mixed headache: A randomized controlled study. *Headache, 21,* 105–109.

McDaniel, J. S., Musselman, D. L., Porter, M. R., Reed, D. A., & Nemeroff, C. B. (1995). Depression in patients with cancer: Diagnosis, biology, and treatment. *Archives of General Psychiatry, 52,* 89–99.

McGovern, P. G., & Lando, H. A. (1991). Reduced nicotine exposure and abstinence outcome in two nicotine fading methods. *Addictive Behaviors, 16,* 11–20.

Melles, T., McIntosh, G., & Hall, H. (1995). Provider, payor, and patient outcome expectations in back pain rehabilitation. *Journal of Occupational Rehabilitation, 5,* 57–69.

Meyer, T. J., & Mark, M. (1995). Effects of psychosocial interventions with adult cancer patients: A meta-analysis of randomized experiments. *Health Psychology, 14,* 101–108.

Mitchell, J. E., & Groat, R. (1984). A placebo-controlled, double-blind trial of amitriptyline in bulimia. *Journal of Clinical Psychopharmacology, 4,* 186–193.

Mitchell, J. E., Pyle, R. L., Eckert, E. D., Hatsukami, D., Pomeroy, C., & Zimmerman, R. (1990). A comparison study of antidepressants and structured group therapy in the treatment of bulimia nervosa. *Archives of General Psychiatry, 47,* 149–157.

Mitchell, J. E., Pyle, R. L., Pomeroy, C., Zollman, M., Crosby, R., Seim, H., Eckert, E. D., & Zimmerman, R. (1993). Cognitive–behavioral group psychotherapy of bulimia nervosa: Importance of logistical variables. *International Journal of Eating Disorders, 14,* 277–287.

Morrow, G. R., Hickok, J. T., & Rosenthal, S. N. (1995). Progress in reducing nausea and emesis. Comparisons of ondansetron (Zofran), granisetron (Kyril), and tropisetron (Navoan). *Cancer, 76,* 343–357.

Mullinix, J., Norton, B., Hack, S., & Fishman, M. (1978). Skin temperature biofeedback and migraine. *Headache, 17,* 242–244.

Neff, D. F., & Blanchard, E. B. (1987). A multicomponent treatment for irritable bowel syndrome. *Behavior Therapy, 18,* 70–83.

Newton-John, T. R. O., Spence, S. H., & Schotte, D. (1995). Cognitive–behavioral therapy versus EMG biofeedback In the treatment of chronic low back pain. *Behaviour Research and Therapy, 33,* 691–697.

Niaura, R., Goldstein, M. G., & Abrams, D. B. (1994). Matching high- and low dependence treatment with or without nicotine replacement. *Preventive Medicine, 23,* 70–77.

Nicholas, M. K., Wilson, P. H., & Goyen, J. (1991). Operant–behavioral and cognitive–behavioral treatment for chronic low back pain. *Behaviour Research and Therapy, 29,* 235–238.

NIH Technology Assessment Panel. (1996). Integration of behavioral and relaxation approaches into the treatment of chronic pain and insomnia. *Journal of the American Medical Association, 276,* 313–318.

Nouwen, A. (1983). EMG biofeedback used to reduce standing levels of paraspinal muscle tension in chronic low back pain. *Pain, 17,* 353–360.

O'Leary, A., Shoor, S., Lorig, K., & Holman, H. R. (1988). A cognitive–behavioral treatment for rheumatoid arthritis. *Health Psychology, 7,* 527–544.

Ordman, A. M., & Kirschenbaum, D. S. (1985). Cognitive–behavioral therapy for bulimia: An initial outcome study. *Journal of Consulting and Clinical Psychology, 53,* 305–313.

Parker, J. C., Frank, R. G., Beck, N. C., Smarr, K. L., Buescher, K. L., Phillips, L. R., Smith, E. I., Anderson, S. K., & Walker, S. E. (1988). Pain management in rheumatoid arthritis patients: A cognitive–behavioral approach. *Arthritis and Rheumatism, 31,* 593–601.

Parker, J. C., Smarr, K. L., Buckelew, S. P., Stucky-Ropp, R. C., Hewett, J. E., Johnson, J. C., Wright, G. E., Irvin, W. S., & Walker, S. E. (1995). Effects of stress management on clinical outcomes in rheumatoid arthritis. *Arthritis and Rheumatism, 38,* 1807–1818.

Patrick, D. L., Cheadle, A., Thompson, D. C., Diehr, P., Koepsell, T., & Kinne, S. (1994). The validity of self-reported smoking: A review and meta-analysis. *American Journal of Public Health, 84,* 1086–1093.

Payne, A., & Blanchard, E. B. (1995). A controlled comparison of cognitive therapy and self-help support groups in the treatment of irritable bowel syndrome. *Journal of Consulting and Clinical Psychology, 63,* 779–786.

Pearce, S. (1983). A review of cognitive–behavioral methods for the treatment of chronic pain. *Journal of Psychosomatic Research, 27,* 431.

Phillips, H. C. (1987). The effect of behavioral treatment on chronic pain. *Behaviour Research and Therapy, 25,* 365–377.

Pope, H. G., Hudson, J. I., Jonas, J. M., & Yurgelun-Todd, D. (1983). Bulimia treated with imipramine: A placebo-controlled, double-blind study. *American Journal of Psychiatry, 140,* 554–558.

Pope, H. G., Hudson, J. I., Jonas, J. M., & Yurgelun-Todd, D. (1985). Antidepressant treatment of bulimia: A two-year follow-up study. *Journal of Clinical Psychopharmacology 5,* 320–327.

Pope, H. G., Hudson, J. I., & Yurgelun-Todd, D. (1984). Anorexia nervosa and bulimia among 300 suburban women shoppers. *American Journal of Psychiatry, 141,* 292–294.

Pope, H. G., Keck, P. E., McElroy, S. L., & Hudson, J. I. (1989). A placebo-controlled study of trazodone in bulimia nervosa. *Journal of Clinical Psychopharmacology, 9,* 254–259.

Puder, R. S. (1988). Age analysis of cognitive–behavioral group therapy for chronic pain outpatients. *Psychology and Aging, 3,* 204–207.

Pyle, R. L., Mitchell, J. E., Eckert, E. D., Hatsukami, D., Pomeroy, C., & Zimmerman, R. (1990). Maintenance treatment and 6-month outcome for bulimia patients who respond to initial treatment. *American Journal of Psychiatry, 147,* 871–875.

Pyle, R. L., Neuman, P. A., Halvorson, P. A., & Mitchell, J. E. (1991). An ongoing cross-sectional study of the prevalence of eating disorders in freshman college students. *International Journal of Eating Disorders, 10,* 667–677.

Radojevic, V., Nicassio, P. M., & Weisman, M. H. (1992). Behavioral intervention with and without family support for rheumatoid arthritis. *Behavior Therapy, 23,* 13–30.

Rand, C. S. W., & Kuldan, J. M. (1992). Epidemiology of bulimia and symptoms in a general population: Sex, age, race, and socioeconomic status. *International Journal of Eating Disorders, 11,* 37–44.

Reading, C. (1984). Psychophysiological reactivity in migraine following biofeedback. *Headache, 24,* 70–74.

Richardson, G. M., & McGrath, P. J. (1989). Cognitive–behavioral therapy for migraine headaches: A minimal-therapist-contact approach versus a clinic-based approach. *Headache, 23,* 352–357.

Rosen, B. (1979). A method of structured brief psychotherapy. *British Journal of Medical Psychology, 52,* 157–162.

Rosen, J. C., & Leitenberg, H. (1982). Bulimia nervosa: Treatment with exposure and response prevention. *Behavior Therapy, 13,* 117–124.

Rosen, J. C., & Leitenberg, H. (1985). Exposure plus response prevention treatment of bulimia. In D. M. Garner & P. E. Garfinkel (Eds.), *A handbook of psychotherapy for anorexia nervosa and bulimia* (pp. 193–209). New York: Guilford Press.

Rothschild, R., Quitkin, H. M., Quitkin, F. M., Stewart, J. W., Ocepek-Welikson, K., McGrath, P. J., & Tricamo, E. (1994). A double-blind placebo-controlled comparison of phenelzine and imipramine in the

treatment of bulimia in atypical depressives. *International Journal of Eating Disorders, 15,* 1–9.

Rudy, T. E., Turk, D. C., Kubinski, J. A., & Zaki, H. S. (1995). Differential treatment responses of TMD patients as a function of psychological characteristics. *Pain, 61,* 103–112.

Russell, G. F. M., Szmuckler, G. I., Zare, C., & Eisler, I. (1987). An evaluation of family therapy in anorexia nervosa and bulimia nervosa. *Archives of General Psychiatry, 44,* 1047–1056.

Sabine, E. J., Yonace, A., Farrington, A. J., Barratt, K. H., & Wakeling, A. (1983). Bulimia nervosa: A placebo controlled double-blind therapeutic trial of Mianserin. *British Journal of Clinical Pharmacology, 15,* 195–202.

Sanders, S. H., & Brena, S. F. (1993). Empirically derived chronic pain patient subgroups: The utility of multidimensional clustering to identify differential treatment effects. *Pain, 54,* 51–56.

Sargent, J. D., Solbach, P., Coyne, L., Sphon, H., & Segerson, J. (1986). Results of a controlled experimental outcome study of non-drug treatment for the control of migraine headache. *Journal of Behavioral Medicine, 9,* 291.

Schotte, D. E., & Stunkard, A. J. (1987). Bulimia vs bulimic behaviors on a college campus. *Journal of the American Medical Association, 258,* 1213–1215.

Schwartz, C. E., Chesney, M. A., Irvine, J., & Keefe, F. J. (in press). The control group dilemma in clinical research: Applications for psychosocial and behavioral medicine trials. *Psychosomatic Medicine.*

Schwartz, J. L. (1987). *Review and evaluation of smoking cessation methods: The United States and Canada, 1978–1985* (NIH Publication No. 87-2940). Washington, DC: U.S. Department of Health and Human Services.

Schwartz, M. S. (1995). *Biofeedback: A practitioner's guide* (2nd ed.). New York: Guilford Press.

Seligman, M. E. P. (1996). Science as an ally of practice. *American Psychologist, 51,* 1072–1079.

Shaw, G., Srivastava, E. D., Sadler, M., Swann, P., James, J. Y., & Rhodes, J. (1991). Stress management for irritable bowel syndrome: A controlled trial. *Digestion, 50,* 36–42.

Smith, D., Marcus, M. D., & Kaye, W. (1992). Cognitive–behavioral treatment of obese binge-eaters. *International Journal of Eating Disorders, 12,* 257–262.

Solbach, P., Sargent, J., & Coyne, L. (1984). Menstrual migraine headache: Results of a controlled experimental outcome study of non-drug treatments. *Headache, 24,* 75–78.

Sorbi, M., & Tellegen, B. (1984). Multimodal migraine treatment: Does thermal feedback add to the outcome? *Headache, 24,* 249–255.

Sorbi, M., & Tellegen, B. (1986). Differential effects of training in relaxation and stress-coping in patients with migraine. *Headache, 26,* 473–481.

Sovak, M., Kunzel, M., Sternbach, R., & Dalessio, D. J. (1981). Mechanism of the biofeedback therapy of migraine: Volitional manipulation of the psychophysiological background. *Headache, 21,* 81–89.

Spiegel, D. (1993). Psychosocial intervention in cancer. *Journal of the National Cancer Institute, 85,* 1198–1205.

Spiegel, D., & Bloom, J. (1983). Group therapy and hypnosis reduce metastatic breast carcinoma pain. *Psychosomatic Medicine, 45,* 333–339.

Spiegel, D., Bloom, J., Kraemer, H. C., & Gottheil, E. (1989). Effect of psychosocial treatment on survival of patients with metastatic breast cancer. *Lancet, 2,* 888–891.

Spiegel, D., Bloom, J. R., & Yalom, I. (1981). Group support for patients with metastatic cancer. *Archives of General Psychiatry, 38,* 527–533.

Spiegel, D., & Spira, J. (1991). *Supportive–expressive group therapy: A treatment manual of psychosocial intervention for women with breast cancer.* Stanford, CA: Stanford University School of Medicine, Psychosocial Treatment Laboratory.

Spitzer, R. L., Devlin, M. J., Walsh, B. T., Hasin, D., Wing, R., Marcus, M. D., Stunkard, A. J., Wadden, T., Yanovski, S., Agras, W. S., Mitchell, J., & Novas, C. (1991). Binge eating disorder: To be or not to be in *DSM–IV? International Journal of Eating Disorders, 10,* 627–630.

Steinhausen, H. C. (1995). The course and outcome of anorexia nervosa. In K. D., Brownell & C. G. Fairburn (Eds.), *Eating disorders and obesity: A comprehensive handbook* (pp. 234–237). New York: Guilford Press.

Stevens, V. J., & Hollis, J. F. (1989). Preventing smoking relapse, using an individually tailored skills-training technique. *Journal of Consulting and Clinical Psychology, 57,* 420–424.

Svedlund, J. (1983). Controlled study of psychotherapy in irritable bowel syndrome. *Acta Psychiatrica Scandinavica, 67* (Suppl. 306), 1–86.

Tan, S. (1982). Cognitive and cognitive–behavioral methods for pain control: A selective review. *Pain, 12,* 201.

Task Force on Promotion and Dissemination of Psychological Procedures. (1995). Training in and dissemination of empirically-validated psychological treatments: Report and recommendations. *The Clinical Psychologist, 48,* 3–23.

Telch, C. F., Agras, W. S., Rossiter, E. M., Wilfley, D., & Kenardy, J. (1990). Group cognitive–behavioral treatment for the nonpurging bulimic: An initial evaluation. *Journal of Consulting and Clinical Psychology, 58,* 629–635.

Telch, C. F., & Telch, M. J. (1986). Group coping skills instruction and supportive group therapy for cancer patients: A comparison of strategies. *Journal of Consulting and Clinical Psychology, 54,* 802–808.

Thackwray, D. E., Smith, M. C., Bodfish, J. W., & Meyers, A. W. (1993). A comparison of behavioral and cognitive–behavioral interventions for bulimia nervosa. *Journal of Consulting and Clinical Psychology, 61,* 639–645.

Trijsburg, R. W., van Knippenberg, F. C. E., & Rijpma, S. E. (1992). Effects of psychological treatment on cancer patients: A critical review. *Psychosomatic Medicine, 54,* 489–517.

Tunks, E. R., & Merskey, H. (1990). Psychotherapy in the management of chronic pain. In J. J. Bonica (Ed.), *The management of pain.* (pp. 1751–1756). Philadelphia: Lea & Febiger.

Turk, D. C., Meichenbaum, D., & Genest, M. (1983). *Pain and behavioral medicine: A cognitive–behavioral perspective.* New York: Guilford Press.

Turk, D. C., & Rudy, T. E. (1988). Toward an empirically derived taxonomy of chronic pain patients: Integration of psychological assessment data. *Journal of Consulting and Clinical Psychology, 56,* 233–238.

Turner, J. A. (1982). Comparison of group progressive-relaxation training and cognitive–behavioral group therapy for chronic low back pain. *Journal of Consulting and Clinical Psychology, 50,* 757–765.

Turner, J. A., & Chapman, C. R. (1982). Psychological interventions for chronic pain: A critical review: II. Operant conditioning, hypnosis, and cognitive–behavioral therapy. *Pain, 12,* 23–46.

Turner, J. A., & Clancy, S. (1988). Comparison of operant behavioral and cognitive–behavioral group treatment for chronic low back pain. *Journal of Consulting and Clinical Psychology, 56,* 261–266.

Turner, J. A., Clancy, J. A., McQuade, K. J., & Cardenas, D. D. (1990). Effectiveness of behavioral therapy for chronic low back pain: A component analysis. *Journal of Consulting and Clinical Psychology, 58,* 573–579.

Turner, J. A., & Romano, J. M. (1990). Cognitive–behavioral therapy. In J. J. Bonica (Ed.), *The management of pain* (pp. 1711–1721). Philadelphia: Lea & Febiger.

Vasterling, J., Jenkins, R. A., Tope, D. M., & Burish, T. G. (1993). Cognitive distraction and relaxation training for the control of side effects

due to cancer chemotherapy. *Journal of Behavioral Medicine, 16,* 65–80.

Velicer, W. F., Prochaska, J. O., Rossi, J. S., & Snow, M. (1992). Assessing outcome in smoking cessation studies. *Psychological Bulletin, 111,* 23–41.

Viswesvaran, C., & Schmidt, F. L. (1992). A meta-analytic comparison of the effectiveness of smoking cessation methods. *Journal of Applied Psychology, 77,* 554–561.

Walsh, B. T., Gladis, M., Roose, S. P., Stewart, J. W., Stetner, F., & Glassman, A. H. (1988). Phenelzine versus Placebo in 50 patients with bulimia. *Archives & General Psychiatry, 45,* 471–475.

Walsh, B. T., Hadigan, C. M., Devlin, M. J., Gladis, M., & Roose, S. P. (1991). Long-term outcome of antidepressant treatment for bulimia nervosa. *American Journal of Psychiatry, 148,* 1206–1212.

Walsh, B. T., Stewart, J. W., Roose, S. P., Gladis, M., & Glassman, A. H. (1984). Treatment of bulimia with phenelzine: A double-blind, placebo controlled study, *Archives of General Psychiatry, 41,* 1105–1109.

Whorwell, P. J., Prior, A., & Faragher, E. B. (1984). Controlled trial of hypnotherapy in the treatment of severe refractory irritable bowel syndrome. *Lancet, 2,*(8414), 1232–1234.

Wilfley, D. E., Agras, W. S., Telch, C. F., Rossiter, E. M., Schneider, J. A., Cole, A. G., Sifford, L., & Raeburn, S. D. (1993). Group cognitive–behavioral therapy and group interpersonal psychotherapy for the nonpurging bulimic individual: A controlled comparison. *Journal of Consulting and Clinical Psychology, 61,* 296–305.

Williams, A. C., Richardson, P. H., Nicholas, M. K., Pither, C. E., Harding, V. R., Ridout, K. L., Ralphs, J. A., Richardson, I. H., Justins, D. M., & Chamberlain, J. H. (1996). Inpatient vs. outpatient pain management: Results of a randomized controlled trial. *Pain, 66,* 13–22.

Williamson, D. A., Prather, R. C., Bennett, S. M., Davis, C. J., Watkins, P. C., & Grenier, C. E. (1989). An uncontrolled evaluation of in patient and outpatient cognitive–behavior therapy for bulimia nervosa. *Behavior Modification, 13,* 340–360.

Wilson, G. T. (1996). Treatment of bulimia nervosa: When CBT fails. *Behaviour Research and Therapy, 34,* 197–212.

Wilson, G. T., Eldredge, K. L., Smith, D., & Niles, B. (1991). Cognitive–behavioral treatment with and without response prevention for bulimia. *Behaviour Research and Therapy, 29,* 575–583.

Wilson, G. T., Rossiter, E., Kleinfield, E. I., & Lindholm. L. (1986). Cognitive–behavioral treatment of bulimia nervosa: A controlled evaluation. *Behaviour Research and Therapy, 24,* 277–288.

Wilson, J. J., & Gil, K. M. (1996). The efficacy of psychological and pharmacological interventions for the treatment of chronic disease-related and non-disease-related pain. *Clinical Psychology Review, 16,* 573–597.

Wolchik, S. A., Weiss, L., & Katzman, M. K. (1986). An empirically validated, short-term psycho-educational group treatment program for bulimia. *International Journal of Eating Disorders, 5,* 21–34.

Wolf, E. M., & Crowther, J. H. (1992). An evaluation of behavioral and cognitive–behavioral group interventions for the treatment of bulimia nervosa in women. *International Journal of Eating Disorders, 11,* 3–15.

Received January 24, 1997
Revision received June 24, 1997
Accepted July 21, 1997 ■