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Article 49

A Quantitative Measure of the Effects of Cognitive Behavioral Therapy for Chronic Pain

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Introduction

Physicians and behavioral health professionals have accepted psychological treatments since the 1970s because of inconsistent research findings related to the success of reducing chronic pain by medications alone (Puder, 1988) and research indicating the persistence of pain despite medical treatment (Wall, 1979). As early as 1982, Melzack and Wall found flaws in the medical model as applied to chronic pain treatment, and Thorn (2004) reported weaknesses in the diagnostic tools used by physicians and mental health professionals (i.e., the Diagnostic and Statistical Manual of Mental Disorders [4th ed. text rev.] and the International Classification of Diseases [10th rev.]) because of the lack of biopsychosocial variables in the diagnosis of pain. In recent years, multidisciplinary approaches to pain management became commonly accepted in nonmalignant pain treatment (Marcus, 2000). The idea of incorporating a variety of psychosocial therapies in the treatment of pain is advantageous to patients for whom only one of two types of therapies may not address their situation (Jensen, 2011).

Studies have indicated that a correlation exists between pain and depression (Magni, Moreschi, Rigatti-Luchini, & Merskey,1994; Roy, Thomas, & Matas, 1984; Schattner & Shahar, 2011). When patients struggle with two related major health issues, it is important that health care providers understand the relationship between the two issues. Regardless of the direction of correlation, treating depression and chronic pain needs to be considered when prescribing behavioral health and medicines to treat symptoms.

It is critical that behavioral health professionals collaborate with primary care physicians to treat non-acute chronic pain (Otis, MacDonald, & Dobscha, 2006). In many cases, the dependence of pain patients on the medical model may not be sufficient because of psychosocial factors that may often accompany the existence of pain. Furthermore, a sole reliance on the medical model may fuel the belief that a cure exists.

When a cure for pain is not realistic, a patient can become angry, frustrated, and depressed (Otis et al., 2006). Research in the effectiveness of a multidisciplinary approach continues to be necessary for various areas of chronic pain because, in some cases, findings are inconclusive, such as in the case of migraine pain (Busch & Gaul, 2008).

One of the most prominent treatments for chronic pain and depression (as separate diagnoses) is Cognitive Behavioral Therapy (CBT), which involves learning to change one's paradigm of pain experiences (Thorn, 2004). CBT also involves learning behavioral techniques such as relaxation, meditation, and problem solving skills. The effectiveness of CBT has been reported more than any other counseling approach (Thorn, 2004; Turk & Gatchel, 2002). Gatchel (2005) has reported that positive coping self-statements are related to reduced pain and negative cognitions are related to increased reports of pain.

Newly developed CBT interventions in the past decade indicate the relationship between chronic pain issues and psychosocial and behavioral factors (Barber, 1996; Catalano & Hardin, 1996; Caudill, 1995). Despite the growing availability of these interventions, behavioral health is not sought out by or offered to the majority of chronic pain patients (Eimer & Freeman, 1998). The result is that many pain sufferers are denied the behavioral health care that could provide relief.

The purpose of the present study was to measure the effectiveness of CBT techniques on levels of pain and depression of individuals in a group of chronic pain patients and to contribute to the literature that supports the efficacy of CBT interventions for chronic pain (e.g., Dysvik, Kvaløy, Stokkeland, & Natvig, 2010; Glombiewski, Hartwich-Tersek & Rief, 2010). Assessments measured levels of pain, coping, interference with daily activities and depression.

Participants

The current study utilized a convenience sample of six women ranging in age from 35 to 82, each with diverse types of chronic pain from medical disorders or relatively recent accidents. Six participants responded to a request for volunteers for a treatment study upon physician or physical therapy recommendation. They were recruited via area behavioral health professionals, physicians, physical therapists, and pain specialists. All participants were given an extensive evaluation via telephone screening and received a detailed description of the research project and signed a consent agreement.

Acceptance criteria included age greater than 21, pain of more than 6 months, a rating high of at least "4" on the Numerical Rating Scale (National Institutes of Health [NIH], 2003), no serious medical or psychological problems, and no concurrent psychotherapy for pain. All participants had some prior knowledge about CBT but had not tried the suggested interventions nor were currently utilizing them for pain management. All members who began the group completed the 12-week program and follow-up sessions. The mean number of sessions attended was 5.83 out of 6.

Measures

The researchers used the pain intensity scale designated by the National Institutes of Health called the Numerical Rating Scale (NIH, 2003) for pre-treatment screening

assessment. This scale was selected for its widely accepted measure of pain. Participants with a minimum rating of "4" (moderate level) were selected for the current case study.

The Daily Pain Diary (DPD) was adapted from the assessment used in Puder's (1988) study. Daily ratings of pain, level to which pain interfered with one's activities, and use of new coping behaviors were entered twice a day (morning and late evening). Interference with activities was rated by utilizing a 5-point scale from *did not interfere* (1) to *interfered extremely* (5). Levels of coping were measured (with a 5-point scale ranging from *coped very poorly* [1] to *coped very well* [5], and specific activity noted). Also noted on the Daily Pain Diary were medications taken, and specific non-medication interventions used (heat, cold, relaxation, psychological support, etc.). Data from the DPD was analyzed pre and post treatment, and at the 3- and 6-month follow-up data collections.

The Beck Depression Inventory (BDI; Beck, 1987, 1993) was used in this study as a pre-post measure of depression. The BDI is a brief (21 questions) and convenient assessment instrument. The research participant chooses answers which indicate how he/she felt during the preceding week (Bradley & McKendree-Smith, 2001). Beck, Steer and Garbin (1988) report the alpha coefficients of the BDI range from .71 to .93 in both psychiatric and nonpsychiatric clients. The BDI has been shown to have sensitivity and specificity in measuring depression in persons with chronic pain (Geisser, Roth, & Robinson, 1997; Turner & Romano, 1984). Data from the BDI was analyzed pre and post treatment, and during the 3- and 6-month follow-up data collection meetings.

Treatment

The group members met for 3 hours twice a month for six sessions. Data was collected at screening and at each group session for 3 months during the treatment period. In each treatment session, participants 1) reported their use of CBT techniques learned in the previous session; 2) learned a new CBT technique; and 3) processed current stressful issues and assisted each other in problem solving. The CBT training format included the following skill-building components: goal setting, assertiveness training, cognitive reframing, reinforcing positive behaviors, developing coping skills, identifying core beliefs, journaling, and relaxation. The CBT training also included building awareness of one's distorted thinking and perceptions of pain behaviors (e.g., flinching, complaining). Finally, group discussion of goals met and new issues surfacing was a significant part of each treatment session. Lack of availability of biofeedback treatment prevented the researchers from including that component of CBT in the present study.

Statistical Analysis

A comparison of the pre to post test information for the six participants showed a decrease in average rating scores for almost all of the variables measured prior to treatment and following treatment. The overall body pain rating in the Daily Pain Diary average showed a decrease during the course of the study from 5.2 to 3.94. There was no change shown in a follow-up measure at the 3- and 6-month data collections.

Interference scores measuring the level of interruption caused by pain decreased from the first to tenth week from an average of 2.5 to 1.15. There was a sharp drop in interference scores during the first 4 weeks of treatment (from 2.5 to 1.7) which corresponded with the drop in Overall Body Pain. There was a rise in interference scores

from week six to week nine (1.55 to 2.23) and then a large decrease in scores the tenth week of treatment (to 1.15). Gains were maintained at the 3- and 6-month follow-up.

Coping (or level of coping) scores increased throughout the study (from 2.6 to 3.7). The sharpest increase in coping scores occurred during the first five weeks of treatment (2.6 to 3.9) and then leveled off. This sharp increase in level of coping at the beginning of the study corresponds to the sharp decrease in Overall Body Pain and Interference scores during the first few weeks of treatment. There was no change shown in a follow-up measure at the 3- and 6-month data collections.

The Beck Depression Scale average rating showed a large decrease from 13.17 to 5.2. The Wilcoxon Related Samples Test showed that this was a statistically significant difference ($z=-1.99$, $p=.046$). A follow-up measure four months later showed an additional decrease in the Beck scale to 4.67. An additional follow-up measure 3 months after this showed a small two-point increase. This still represented a significant decrease from the pretest score ($z=-1.99$, $p=.046$).

Discussion

This research project was designed to explore and measure the effectiveness of CBT strategies on a group of individuals with chronic pain issues and related depression. The participants were taught methods designed to give them control over how to perceive their pain and therapies to use to manipulate their response to the pain. In what was originally intended to be a research project involving a number of participants that would provide statistically significant results, the overall positive outcome indicates that despite the lack of significant differences in two of the areas studied (overall body pain and level of coping), the researchers found the treatment to be effective in significantly decreasing the levels of interference in daily activities and depression

The researchers believed that the decreases in activity interference and depression were related to additional benefits that were not measured quantitatively. The first of these was the level of support experienced by individuals from the other group members. The small group size created a significant level of comfort, which encouraged the members to share openly intimate details of their lives in therapeutic ways. Secondly, the group members were all female and were able to share experiences about their lives in similar roles each played in their lives. A third effect was the enhanced communication proficiency with family that resulted from the assertiveness training during group treatment. Each member had reports of increased positive communication with spouses and family members and the result was that each member felt more empowered at the end of treatment than they had previous to the study. A fourth benefit was that all members experienced a paradigm shift of cure versus acceptance of their current condition. Each member reported this was a direct result of learning the cognitive behavioral coping skills during treatment. Finally, all group members reported experiencing an evolution of self-concept whereby they had to envision themselves differently to allow for the limitations imposed by pain. Although these factors were not measured, the researchers believe that future studies on these variables using a larger population could add qualitatively to the current volume of research.

Limitations of the Study

All assessments used in this study were self-report. The number of participants was six. Research utilizing a control group, as well as, assessment methods other than self-reports, and studies with a minimum of 15 participants would strengthen the current study. Additionally, the chronic pain experienced by each group member differed in pain intensity and cause of discomfort. A similarity in disease or condition would create a stronger study. All participants were educated, with at least a college degree; most were career-oriented; all had sought alternatives to the medical model of pain management, thus the findings from this study would not be generalized to the overall population of women experiencing chronic pain. Finally, the inclusion of biofeedback in the CBT format would have created a stronger study.

Acknowledgements

The authors want to thank the participants for their commitment to this research process. The careful attention to data collection, intentional support of each others' group process, and responsible attendance at research events are much appreciated.

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