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Alexithymia, social constraints, and self-efficacy as moderators of written emotional disclosure and coping skills training: for which patients with rheumatoid arthritis do these interventions improve pain and physical functioning?

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**ALEXITHYMIA, SOCIAL CONSTRAINTS, AND SELF-EFFICACY AS
MODERATORS OF WRITTEN EMOTIONAL DISCLOSURE AND COPING SKILLS
TRAINING: FOR WHICH PATIENTS WITH RHEUMATOID ARTHRITIS DO THESE
INTERVENTIONS IMPROVE PAIN AND PHYSICAL FUNCTIONING?**

by

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THESIS

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CHAPTER 1

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic autoimmune disorder that causes pain, inflammation and stiffness in joints, and fatigue, and often results in disability in its sufferers. This disease impacts approximately 1% of the general population and is three times more common in women than men (Anderson, Bradley, Young, McDaniel & Wise, 1985). Furthermore, although rheumatoid arthritis is typically treated through traditional medicine (e.g., disease modifying, biological response modifying, or anti-inflammatory medications), many patients still report symptoms of pain and fatigue.

It is widely recognized that psychological factors have a relationship with physical health and may cause and/or worsen illness. Patients with rheumatoid arthritis reported that stress was the most common cause of a flare up and that interpersonal stress was related to their levels of pain (Keefe et al., 2002). Evidence has also shown that 13-15% of patients with RA have been diagnosed with major depressive disorder, which is approximately twice as prevalent as the normal population (Dickens, McGowan, Clark-Carter & Creed, 2002). Specifically, a link between RA and stress, coping, and depression has been found (Anderson et al. 1985; Dickens et al., 2002), suggesting that these psychological factors impact people with RA. These psychological factors likely not only result from having RA, but also appears to cause, trigger, exacerbate, or maintain pain and dysfunction among patients with RA.

The role played by psychological factors in the onset and course of RA is further substantiated by evidence that psychological interventions improve the health of patients with RA. Two psychological interventions that have been demonstrated to have some health benefits in RA are written emotional disclosure (WED) and pain coping skills training (CST).

Written Emotional Disclosure

Written emotional disclosure (WED) is a technique that is used to improve patient's emotional awareness and decrease pain, and has been examined in a number of studies. During WED, patients are asked to write about their most stressful or traumatic experience freely and openly and to discuss their thoughts and feelings about the event. Often patients are additionally instructed to write about ways in which they have coped with their stressors and to find meaning behind their stressor. Written emotional disclosure typically occurs in 3 to 4 sessions lasting 20-30 minutes each. These sessions can occur in the laboratory or at the participant's home.

Early work on WED suggested that participants who did not share their stressful or traumatic experiences had worse health, more physical symptoms and higher health care utilization (Pennebaker, Barger, & Tiebout, 1989; Pennebaker & O'Heeron, 1984). Based on this early work, Pennebaker and Beall (1986) tested WED on healthy undergraduates. Results from this initial study found that participants who engaged in WED used less health care at follow-up.

It is believed that WED is a useful technique because suppressing negative emotions and experiences can have a deleterious impact on health, and WED provides an outlet for people to express those emotions and experiences they normally withhold. Thus, the goal of WED is to reduce physical symptoms by allowing patients to express rather than suppress their emotions and cognitions, which may help them resolve stressors. Suppression of emotions may be particularly problematic in those with already comprised health, and those with chronic health problems often have barriers (e.g., lack of social support) that may limit their ability to express their thoughts and feelings. This suggests WED may be particularly beneficial to those with rheumatoid arthritis.

Since Pennebaker's initial study, this technique has been extended to treat various populations, including chronic pain patients. Meta-analyses showed that patients with physical or psychological problems who engaged in WED had significant improvements on their physical and psychological well-being; however, the effect size was small ($d = .19$; Frisina, Borod, & Lepore 2004). It should also be noted that these effect sizes in individual studies ranged from $d = -.24$ to $d = .49$, suggesting substantial unexplained variability in outcomes.

A number of studies have examined WED in patients with RA and have shown mixed results of the efficacy of this technique in improving outcomes. For example, one study examined 51 RA patients who wrote for 3 consecutive 20-minute sessions about their most stressful life event and found that WED improved disease activity at the 4-month follow-up (Smyth, Stone, Hurewitz, & Kaell, 1999). Lumley and colleagues (2011) examined WED in 88 RA participants who wrote about a traumatic or stressful experience for 4, 20-minute sessions. Results showed that participants who engaged in WED had decreased pain at 1 and 6 months follow-up compared to participants who wrote about positive or neutral events; however this study showed no effects on various other measures. No main effects on disease activity, physical or psychological functioning were discovered in another study comparing the effects of enhanced written disclosure, time management writing, or an arthritis educational video in RA patients (Broderick, Stone, Smyth, & Kaell, 2004). Furthermore, in a study of verbal emotional disclosure in which RA patients spoke into a tape recorder about a traumatic event, Kelley and colleagues (1997) found less mood disturbance and improved physical functioning compared to the control condition but there were no treatment effects on joint condition or pain.

Although there appears to be modest effects of WED on pain and physical functioning, there is evidence to suggest that improvements are made in a subset of these participants. For

example, Smyth and colleagues (1999) found that 47.1% of patients (which included their sample of asthma patients) had clinically relevant improvements. It should also be noted that 48.6% of these participants had no change, while 4.3% got worse, indicating that WED is effective for only a subset of patients.

Coping Skills Training

Coping skills training, which is a form of cognitive-behavioral therapy, is aimed specifically to help patients with pain conditions, including RA, manage their pain and the psychological impact of their condition. Dixon and colleagues (2007) described CST as typically consisting of 3 phases. In the first phase, patients are educated about the biopsychosocial model of pain, which views pain as a result of, and maintained by, biologic or genetics factors, psychological traits or factors, and social issues such as support, culture and environment. The goal of this phase is to educate patients on the rationale for using psychological interventions to treat what many patients view as a physical disease. In the second phase of CST, patients are trained in various cognitive-behavioral techniques, such as progressive muscle relaxation training, pleasant activity scheduling, imagery, distraction and cognitive restructuring. This phase aims to give patients a battery of skills that can aid in managing their physical symptoms. The third and final phase involves teaching patients how to apply the skills they have learned to specific situations and problems that arise in their lives. Additionally, this phase teaches patients to recognize the antecedents and early signals to their pain so that they are able to implement these techniques early.

Dixon and colleagues (2007) conducted a meta-analysis on the effectiveness of cognitive-behavioral treatments, including CST, in patients with rheumatoid arthritis or osteoarthritis. Results from this meta-analysis of 15 studies showed a significant, albeit small, benefit of CBT

on pain and a moderate effect size benefit on joint swelling; however, no effects were found on fatigue or stiffness.

Another meta-analysis of cognitive-behavioral therapies in RA patients found positive effects of these treatments on pain, and mixed findings regarding effects on disability and joint functioning (Astin, Beckner, Soeken, Hochberg, & Bernman, 2002). Of the nine studies examined in this meta-analysis, moderate to large effect sizes of CBT on reduced pain were found. Findings regarding the impact of CBT on joint dysfunction and disability were highly inconsistent, ranging from no significant effects to large effect sizes.

It may be informative to examine in detail several of the original studies included in these meta-analyses. One study examined 55 RA patients who were receiving treatment in an outpatient clinic (Leibing, Pfingsten, Bartman, Rueger, & Schuessler, 1999). Participants were randomized to receive 12 weekly group CBT sessions or routine care. Results showed that participants who engaged in CBT compared to those who received routine care had improvements in a variety of measures including pain, depression, helplessness, and improved coping, which was defined as increased positive reappraisal and acceptance, and decreased resignation. Both pain and pain intensity were measured and there was on average a 28.8% reduction in pain and 17.5% average reduction of pain intensity after engaging in CBT. There were no effects from CBT on many objective measures of disease status including C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), joint dysfunction, or grip strength.

Sharpe and colleagues (2000) examined 53 RA patients who engaged in either 8, weekly individual CBT sessions or routine care. This study found that CBT decreased CRP, joint dysfunction, and depression; but it did not affect coping strategies, ESR, or subjective pain ratings. Results also showed that there was variability in how much improvement was made by

patients regarding swollen and painful joints. At post-treatment for the CBT group, 30% showed no change, 35% were defined as “improved,” and 17% were “much improved.” This pattern was maintained at follow-up with 48% showing no change, 22% with improvement and 26% with much improvement. These results demonstrate that some patients show large benefit from CBT, whereas others do not improve at all.

Results from these studies suggest that CBT seems to have positive effects for RA patients, specifically in its ability to reduce pain. However there are mixed findings regarding its effectiveness on physical functioning and physiology. More importantly for the current study, these findings suggest that CBT is not uniformly effective for all patients.

In summary, research has demonstrated small to moderate effect sizes of both WED and CST on improvements in patients with RA, and that only some people improve. Thus, it is important to determine which patients are most likely to benefit from each intervention. It is likely that certain psychological and social factors impact who improves the most from treatments and techniques such as WED and CST. Three such constructs that potentially moderate the effects of either WED and/or CST are alexithymia, social constraints, and self-efficacy. These are examined in the current study.

Alexithymia

Alexithymia was first described by Sifneos (1973) in reference to a subgroup of patients who had psychosomatic disorders and were unresponsive to traditional insight-oriented psychotherapy. Alexithymia was defined as a patient’s inability to put their thoughts and feelings into words, a difficulty in describing and identifying their emotions, and an inclination to focus on external factors, such as physical symptoms (Bagby & Taylor, 1997). Apfel and Sifneos (1979) described a typical patient with alexithymia as presenting a multitude of physical

complaints, having an absence of fantasy or imagination, having trouble finding the appropriate words to describe their feelings, and often being passive-aggressive and rigid. Additionally, it has been found that people with alexithymia have an increased risk for developing health problems and for worsening their current symptoms (Lumley et al., 2008).

Previous research of psychological interventions on patients with alexithymia focused largely on insight oriented or emotional processing, which could be the reason these studies showed little effectiveness since these are areas known to be troublesome in such patients. Research has shown that alexithymia predicted worse treatment outcomes in various conditions, such as alcoholism, gastrointestinal, depression and mixed psychiatric disorders (Lumley et al., 2008), supporting the original observation by Sifneos.

There is still reason to believe that people with alexithymia will benefit from certain psychological interventions or techniques, but perhaps not others. In particular, a cognitive behavioral approach, such as coping skills training, would likely be beneficial to people with alexithymia. Specifically, it would be useful for patients with alexithymia to be taught concrete skills, such as restructuring their cognitions and modifying their behaviors, and navigating social situations that they may normally find difficult.

Positive outcomes with alexithymic patients who have engaged in cognitive behavioral treatments have been found. For example, alexithymic patients who received CBT were more likely to remain in smoking cessation groups (Lumley, Downy, Stettner, Wehmer, & Pomerleau, 1994). Alexithymic patients were also more likely to have favorable outcomes in CBT aimed at patients who were undergoing treatment for substance use and in vitro fertilization (Kakatsaki et al., 2004).

Skills based approaches, like CBT, have shown to improve outcomes in people with alexithymia; however, improvements may not be seen in insight and emotion focused approaches, such as WED. People with alexithymia, by definition, have difficulty putting into words their thoughts and feelings, which is a key component of WED. There is evidence to suggest that individual differences in alexithymia and its facets may predict who improves from WED. One study examined 68 rheumatoid arthritis patients who completed a written emotional disclosure exercise about their thoughts and feelings about a traumatic life event (Lumley, 2004). Results from this study showed that higher levels of Difficulty Identifying Feelings, a subscale of the TAS-20, was significantly related to worse disability and joint impairment compared to participants who engaged in a time management writing exercise, compared to WED. In a similar study with 48 women with chronic pelvic pain, higher alexithymia was related to more pain in participants who engaged in the disclosure exercise, compared to the control writing condition (Lumley, 2004). Another study by Lumley (2004) suggested that in participants with migraine headaches, alexithymia predicted increased headache frequency and pain. Though these studies suggest that patients with alexithymia would not benefit from engaging in a disclosure exercise, several studies suggest that there are favorable outcomes from WED for those with alexithymia (Paez, Velasco, & Gonzalez, 1999; Solano, Donati, Pecci, Persichetti, & Colaci, 2003).

It is likely that alexithymia moderates the relationship between WED and health, but that the direction of that relationship differs based on the facets of alexithymia, which the current study seeks to explore further. Based on this evidence it is expected that alexithymia will be a moderator of both WED and CST.

Social Constraints

Social constraints have been defined as the situations and perceptions of those situations that lead a person to feel misunderstood or unsupported by their social network, such as their family, friends and co-workers (Lepore & Revenson, 2007). Stemming from a social psychology perspective, researchers often suggested that these constraints arise from the thoughts, feelings and actions of other individuals (Lepore & Revenson, 2007). Frequently the consequences of these feelings lead people to inhibit or refrain from sharing their thoughts, feelings, and experiences with others. Recently this construct has been applied to the field of health psychology because of the increasing realization that individuals suffering from illness often having difficulty expressing their emotions surrounding their illness, and the concern that when emotional expression is impeded there may be a worsening of physical and psychological health. Indeed empirical evidence demonstrates that social constraints are often experienced by people with chronic or long-term illnesses and have deleterious effects on their psychological and physical functioning. In an early study of social constraints, Lepore and colleagues (1998) examined a sample of 177 men with prostate cancer. Results suggested that men who had more social constraints had worse mental health and more avoidance than men who had few social constraints. Techniques such as WED, which allow people to express themselves in private, may be particularly helpful for people with high levels of social constraints.

Several studies have examined social constraints as a moderator of the effects of WED. One study of the effects of WED in 104 cancer patients had patients write about how cancer affected their lives for three, 20-minute sessions. At the 6-month follow-up, patients who had high baseline levels of social constraints had less distress after engaging in WED than those with low levels of social constraints (Zakowski, Herzer, Barret, Milligan, & Beckman, 2004). These

results illustrate that social constraints may have a moderating effect on WED, such that engaging WED may buffer the negative impact of social constraints.

Current research on the role of social constraints has not focused on rheumatoid arthritis. However, because many people experience social constraints, it is likely that patients with RA also have these experiences. Thus, it is reasonable to hypothesize that RA patients with elevated social constraints would benefit from WED.

Self-efficacy

Self-efficacy is another psychological construct that likely plays a role in who improves from psychological interventions. Bandura (1982), who pioneered work in self-efficacy, defined this construct as a person's belief that he or she has the ability to control or change a difficult situation. In the same vein, he suggested that self-efficacy is the confidence a person has within himself or herself to successfully accomplish something. This definition implies that self-efficacy has to do with people's judgments of how well they will deal with the event, not how well they will actually deal with the event. It is likely that improvements from psychological interventions often occur in people with high amounts of self-efficacy because those with high self-efficacy often exert more effort than those with low self-efficacy (Bandura, 1982).

A substantial body of literature suggests people with high self-efficacy have less physical and psychological impairments than those with low self-efficacy. One example of this was demonstrated in research conducted by Schiaffino and Revenson (1995) on patients with RA. This study showed that in participants who had low self-efficacy there were higher levels of depression than participants who had high self-efficacy; however, they did not examine the effects of self-efficacy as a moderator of pain or physical functioning.

Indeed very little research has been conducted on how self-efficacy moderates the outcomes of psychological interventions. One study that did examine relationship found that in participants with migraine headaches, lower self-efficacy was significantly related to improvements from relaxation training and WED compared to their respective control groups (Kraft, Lumley, D'Souza, & Dooley, 2008). This result is opposite of what would be expected as another body of literature on mental health, which can be extended to self-efficacy, has shown that participants who begin treatment with better mental health have better treatment outcomes. For example, Barron (1953) showed patients entering treatment with better mental health had better mental health when their treatment concluded than those who entered treatment with worse mental health. It is likely then that self-efficacy does moderate treatment outcomes from WED; however, the directionality is unclear at this point. As there has been no evidence to the contrary, it is, also, hypothesized that people entering treatment with higher self-efficacy will have better health outcomes from CST

Overall these findings suggest that psychological interventions and techniques have some beneficial outcomes for patients with RA, but that these improvements do not seem to be seen equally across all patients. This prompts the question, which patients with RA show improvements in pain and physical functioning from these interventions? It is likely that this answer lies in psychological variables such as alexithymia, social constraints, and self-efficacy.

Goals of this study

The goal of this study was to examine which patients with rheumatoid arthritis improve from engaging in CST or WED, compared with control conditions. Alexithymia, social constraints, and self-efficacy were examined as potential moderators of health outcomes of CST and WED. Data for this study were gathered from a recently completed randomized controlled

trial examining the effects of CST and WED on physical and psychological functioning in patients with RA. This thesis conducted analyses on these data to determine moderators of the effects of these two interventions, relative to their control conditions.

Hypotheses

This study examined three hypotheses regarding the impact of the three potential moderators on health outcomes of CST and WED.

- 1) It was hypothesized that alexithymia would moderate the effects of health outcomes on CST and on WED.
 - a. It was hypothesized that those high in alexithymia would have greater health improvements from CST compared to a control condition, Arthritis Education.
 - b. It was hypothesized that those high in alexithymia would have poorer outcomes after WED compared with a control writing condition, Health Behavior writing.
 - c. For both of the above hypotheses, the three facets or subscales were examined separately as potential moderators, because research suggests that they may not all predict outcomes uniformly, or in the same direction.
- 2) It was hypothesized that social constraints would moderate the effects of health outcomes on WED, such that those high in social constraints would have greater improvements in health outcomes following WED compared to Health Behavior writing. No specific hypotheses are made about the potential moderation of social constraints on the effects of CST.
- 3) It was hypothesized that self-efficacy would moderate the effects of health outcomes on CST, such that those high in self-efficacy would have greater improvements in

health outcomes from CST compared to Arthritis Education. No specific hypotheses are made about the potential moderation of self-efficacy on the effects of WED.

CHAPTER 2

METHOD

Participants

From March, 2005 to November, 2007 we recruited and randomized to intervention conditions a total of 264 adults who met the 1987 American College of Rheumatology's criteria for a diagnosis of rheumatoid arthritis from hospitals and clinics in the metropolitan areas of Detroit, Michigan and Durham, North Carolina. Participants were 81.1% female and had an average age of 55 years old and had an RA diagnosis for an average of 15.65 years. Additionally, participants were 67.8% Caucasian, 28% African American, 1.5% Asian, and 2.3% other.

Participants were excluded from the study if they a) had another disorder that would significantly affect function (e.g., lupus, COPD, CHF, cancer); b) had cognitive impairment (dementia, retardation, psychosis) or illiteracy; c) were currently in psychotherapy or a formal behavioral pain management program; d) were physically unable to walk (walking aides were acceptable) or write; or e) had RA for less than two years. Participants were not asked to change their current medications or treatments for RA to be included in this study.

Procedures

Recruitment occurred at Wayne State University / Detroit Medical Center and Duke Medical Center. During the initial visit written informed consent was obtained, and participants went through a medical examination during which they were screened for inclusion criteria and verification of a diagnosis of RA by a rheumatologist. Additionally, participants completed a series of measures including those to assess alexithymia and social constraints. Participants who remained eligible were asked to return 30 days later for their baseline visit to complete physical and mental health questionnaires to assess pain severity, physical and psychological functioning,

as well as self-efficacy. They were also asked to get a blood draw at a nearby clinic to assay C-reactive protein (CRP) within a week of completing questionnaires.

After the baseline session participants were randomized into a 2 x 2 factorial design to receive a written condition (WED or control writing) and an educational condition (CST or education control). For the current study, participants were examined to compare written emotional disclosure to neutral control writing about health behaviors and coping skills training to arthritis education. After randomization, participants received their instructions for their writing and education groups. Next, they scheduled times to complete their first writing session and all 8 of their weekly treatment sessions. Participants completed their first writing session in the laboratory and the remaining 3 writing sessions at home. Participants returned 1, 4 and 12 months after completing the intervention for follow-up questionnaires, a physical examination with the rheumatologist, and a CRP blood draw. Participants were given monetary compensation for completing the evaluation and for the blood draw.

Written Emotional Disclosure

The WED technique was modeled after Pennebaker's research and occurred over 4 sessions, 20 minutes in length, over the course of 1 week. Participants were instructed to write about one particular stressful experience that continued to affect them, as described more fully below. They were encouraged to write freely and openly about their thoughts and emotions.

Session 1. Participants were asked first to identify a stressful or traumatic experience that still causes them distress. They were asked to pick an event that they try to avoid thinking about and that they are not comfortable discussing with other people. Next, they were asked to think about that particular event and to recall their memories of it as vividly as possible. Then they

were instructed to write about the facts about the experience, and their innermost thoughts and feelings.

Session 2. In this session, participants were instructed to first re-read their prior writing. Next, they were asked to continue writing about that particular experience, their emotions, and thoughts about that stressful event. Participants were also told that if they thought of a more difficult or traumatic topic that they may begin to write about that during this session.

Session 3. Participants reviewed their previous writing and continued writing about their most traumatic experience. Participants were asked to try to find meaning from their stressful experience and how it had possibly changed their views, beliefs or their health. Specifically, they were asked to focus on how this event has affected their RA. In addition, they were asked to write about anything they have learned from the experience or any new insights they had gained.

Session 4. In the final session participants were asked to write about how they have coped with their stressful experience or feelings in the past. They were asked to discuss whether they found their coping strategies useful or not, and how they plan to cope with this problem or their feelings in future. Participants were asked to brainstorm new coping strategies and how they believed they could implement them into their life.

Health Behavior Writing

Health behavior writing occurred in the same format as WED, but participants were instructed to writing about various health related topics, as described more fully below, as opposed to writing about stressful topics. Participants were instructed in this condition to write only about the facts and events and not to include their feelings and opinions. This served as the control condition for WED.

Session 1. During the first session participants were instructed to write about how they spent and managed their time during the past week.

Session 2. In this session participants were asked to write about their eating habits. They were told to start writing about what they had eaten on the current day and work their way backwards for each day until their time had run up

Session 3. Participants were told to write about the kinds and how much physical activity they had engaged in during the past week. They were also instructed to write about any times that they had not engaged in exercise or physical activities.

Session 4. In the final session, participants were instructed to write about their sleeping habits over the past week. They were told to write what time they went to sleep, how many hours they slept, if they woke up in the night and if they were able to fall back asleep. Participants were told to focus on the characteristics of their sleep.

Coping Skills Training

The eight, 1-hour long CST sessions were given by a trained therapist (graduate student or post-doc in clinical psychology) and were based on cognitive-behavioral techniques that have demonstrated effectiveness for chronic pain problems. The overarching goal of CST was to provide patients skills to manage their pain and other symptoms. The eight sessions were as follows:

Session 1. Therapists explained the theory of CST and the gate-control theory of pain, so that participants had an understanding that pain and stress are interconnected. Participants also learned progressive muscle relaxation.

Session 2. This session focused on teaching participants how to increase pleasurable activities to reduce or combat their pain and discomfort. Therapists discussed the benefits of

activity pacing; that is, taking frequent breaks or spreading out an activity to avoid overexertion and potential flare-ups. Participants and therapists brainstormed ways to engage in pleasant activities. Participants were instructed to continue using relaxation techniques at home.

Session 3. Training in communication skills and assertiveness began during the third session. Specifically, participants learned how to ask for and turn down requests, and how to give positive and negative feedback in relationships. Therapists taught these skills using role playing, modeling, and by giving feedback. Participants also learned in this session how to engage in mini-relaxation, through which they learned how to relax in 30-60 seconds.

Session 4. In this session, communication skills were revisited and cognitive restructuring was introduced. Participants were taught cognitive techniques to help them identify the relationships between their thoughts, feelings and behaviors. Cognitive restructuring was used to teach participants how to rephrase their maladaptive thoughts with positive coping thoughts.

Session 5. This session focused on recognizing automatic thinking and in particular automatic maladaptive thoughts. Participants practiced identifying these thoughts and positively reframing them. In addition, participants learned about using activity-rest cycles to prevent themselves from overexertion that can lead to increased pain.

Session 6. Participants continued to learn how to change negative thinking and reviewed the activity-rest cycle. They also learned about distraction techniques for pain and relaxation techniques that be easily done anywhere, quickly.

Session 7. This session began by reviewing all of the coping skills participants were taught. The majority of the session focused on using coping skills to solve problems in the participants' lives. With their therapist they identified problems and brainstormed which coping techniques would work best to solve the issue.

Session 8. During the final session, the main goal was to address relapse prevention by having participants write a maintenance plan that included coping skills to deal with anticipated setbacks and pain.

Arthritis Education

The eight, 1-hour arthritis education sessions were directed by a health educator and served as the control condition against CST. These sessions focused on the etiologies, symptoms and treatment options for RA and will be described in detail below.

Session 1. This session focused on basic disease characteristics of RA such as possible etiologies, information about joint anatomy, and how RA specifically affects joints.

Session 2. In this session reviewed information about joints and symptoms RA patients often feel in their joints, such as swelling and stiffness. This session also taught participants about other RA symptoms, in addition to joints, such as fatigue or muscle aches.

Session 3. Participants learned about diagnosing RA, possible courses of the disease, and kinds of treatments. Focus was specifically on the various ways of treating RA (e.g. medications, nutrition, and exercise) and what the general goals of treatment are (e.g. remission, pain reduction).

Session 4. During this session, participants learned briefly about the immune system and its relation to RA. The focus of this session was on specific types of medications and therapies used to treat RA, such as steroids and biologic response modifiers, and how the medications suppress the effects of RA.

Session 5. In this session participants were taught about pain and the differences between acute and chronic pain. Participants also continued to learn about pain medications such as

analgesics (e.g. Tylenol, Excedrin) or non-steroidal anti-inflammatory drugs (e.g. Motrin) that are often used in treating RA.

Session 6. Participants learned about complementary and alternative treatments for RA. Homeopathy, chiropractic medicine, acupuncture, massage therapy and biofeedback were discussed as treatments often used for RA patients. Additionally, dietary supplements (e.g. vitamins), nutrition, and exercise were discussed.

Session 7. In this session, participants learned about surgeries, physical and occupational therapy and adaptive devices (e.g. jar openers, grooming aids, canes) that are used to treat RA. Benefits and risks of each were discussed.

Session 8. During the last session, the educator discussed with the participant the benefits of being educated about their RA. They also discussed the importance of self-managing their disease with the treatments discussed in previous sessions and about sharing responsibility of their treatment with their physician. Participants also learned how to find more information on their own through websites and other resources.

Measures

Potential Moderator Measures

Toronto Alexithymia Scale – 20 (TAS-20; Bagby, Parker, & Taylor, 1994). The TAS-20 is a widely used scale that measures alexithymia. This 20-item scale assesses overall alexithymia and the three facets or subscales: Difficulty Identifying Feelings (e.g. “I am often confused about what emotion I am feeling”), Difficulty Describing Feelings (e.g. “I find it hard to describe how I feel about people”), and Externally Oriented Thinking (e.g. “I prefer to just let things happen rather than to understand why they turned out that way”). All items are rated on a scale of 1

(“strongly disagree”) to 5 (“strongly agree”), with higher scores indicating higher levels of alexithymia. Total scores and subscale scores were examined.

General Social Constraints Scale (Lepore & Ituarte, 1999). This 15-item scale is used to rate how often participants feel that they must conceal, avoid, or minimize the problems they have surrounding their chronic illness to their family and friends (e.g. “How often in the past month did they change the subject when you tried to discuss your problems?”). Additionally, they were asked to report how supported they feel when they do disclose this information to their family and friends (e.g. “How often in the past month did you get the idea that they didn’t want to hear about your problems?”). All items are rated on a scale of 1 (“never”) to 4 (“often”). Items are then averaged together for a total score in which higher scores indicate more social constraints.

Arthritis Self-efficacy Scale (ASE; Lorig, Chastain, Ung, Shoor, & Holman, 1989). This is a 20-item self-report scale used to measure self-efficacy specifically related to RA. Participants were asked to report how certain they are that they can perform specific tasks (e.g. “How certain are you that you can turn on outdoor faucet all the way on and all the way off?”), manage their RA pain (e.g. “how certain are you that you can keep arthritis pain from interfering with your sleep?”), and manage other RA symptoms (e.g. “how certain are you that you can deal with the frustration of arthritis?”). Each item is rated on a scale of 1 (“very uncertain”) to 10 (“very certain”), with higher scores indicating higher levels of self-efficacy.

Health Outcome Measures

Arthritis Impact Measurement Scales -2, Pain and Physical Functioning Subscales (AIMS-2; Meenan, Mason, Anderson, Guccione, & Kazis, 1992). Both subscales consist of items on the AIMS-2 that are rated on a scale of 1 (“all days”) to 5 (“no days”), such that higher scores

indicate higher levels of either pain or physical functioning. The pain subscale consists of 5 items and measures the amount of self-reported pain experienced in the past month (e.g. “How often did you have pain in 2 or more joints at the same time?”) and stiffness (e.g. “How often did you have stiffness that lasted more than 1 hour from the time you woke up?”) due to RA. The physical functioning subscale, which consists of 28 items, is used to indicate levels of physical functioning on a variety of areas, such as mobility (e.g. “How often were you able to do errands in the neighborhood”), ability to walk and bend (e.g. “How many days did you have trouble bending, lifting and stooping?”), and ability to engage in self-care tasks (e.g. “You needed help to take a bath or shower.”).

McGill Pain Questionnaire (MPQ; Melzack, 1975). The McGill Pain Questionnaire is a widely used scale that uses ratings of 20 categories with words describing various dimensions of pain and one question asking participants to rate the pain that they have experienced in the past week. Participants were asked to circle each word that describes their pain. For the current study, the present pain, sensory pain, and affective pain subscales were used. The present pain subscale of the MPQ is a widely used one item, self-reported measure of pain the participant has been experiencing in the past week. This item is rated on a scale of 1 (“no pain”) to 6 (“excruciating”). The sensory pain subscale consists of 10 word categories (e.g. “pulsing,” “aching.”), and the affective pain subscale consists of 5 categories (e.g. “punishing,” “suffocating.”).

C-reactive protein (CRP). CRP is widely used to measure inflammation and disease status in patients with RA. Participants’ blood samples were assayed to measure mg/L of CRP, with higher levels of CRP indicating more inflammation and worse disease status.

Swollen Joints. Measures of amount of swollen joints currently being experienced by each participant were gathered as part of a physical examination by a rheumatologist. The

rheumatologist noted whether each joint was swollen or not, and a total number of swollen joints was calculated from this report. Joints examined included phalanges (fingers), metacarpal phalanges (hands), wrists, elbows, shoulders, and knees on both the right and left side. Participants can receive a swollen joint count from 0 to 28, with higher scores indicating more swollen joints.

Data analyses

Data were entered into and analyzed using SPSS 19.0. Data were examined for potential outliers and skewed distributions. Both swollen joints and C-reactive protein had skewed distributions, so to normalize them, the swollen joints variable was transformed using a square root transformation, and C-reactive protein was transformed using a log transformation.

Analyses of outcomes were conducted on the entire randomized sample; that is, intent to treat analyses of moderators was conducted. Missing outcome values were replaced by the last value was carried forward technique, which meant using the baseline value for those participants who discontinued the study before providing any follow-up data. Intent to treat analyses was used to prevent any bias from occurring by using only participants who had completed the treatment.

Next, to test the hypotheses, moderator analyses were conducted using hierarchical linear regressions, predicting residualized outcomes. Unstandardized residualized variables were created for each of the outcome variables at each follow-up period (1 month, 4 month, and 12 month) by covarying its baseline value, using the entire sample. Moderator variables were then centered, and interaction terms were created between each moderator variable and group variable. Hierarchical regression analyses were set-up with unstandardized residual health outcomes predicting the interaction term, while covarying for moderator and group. This was

done to test for potential moderators of CST compared to Arthritis Education, and WED compared to Health Behavior writing separately. When significant interactions were found, it was concluded that there was a moderator relationship.

CHAPTER 3

RESULTS

Alexithymia as a Moderator

Written Emotional Disclosure vs. Control Writing (Health Behavior Writing)

To test the hypothesis that participants with higher alexithymia would have poorer health outcomes after WED compared to the control writing condition, the interactions between writing group and alexithymia (total and each subscale) in predicting outcome residual scores in a regression model were examined. In general this hypothesis was supported; participants with higher alexithymia had more swollen joints and worse physical functioning after WED compared to control writing.

Specifically, total alexithymia marginally interacted with writing condition in predicting swollen joints 12 months later, $t(259) = -1.90$, $p = .06$, $\beta = -0.37$. Higher alexithymia tended to predict increased swollen joints in participants who engaged in WED ($\beta = .12$, $p = .18$), but decreases in swollen joints for the control writing group ($\beta = -.12$, $p = .18$). This finding appears to be driven by the difficulty identifying feelings subscale of the TAS-20, which significantly interacted with writing group in predicting swollen joints 12 months later, $t(259) = -2.68$, $p = .008$, $\beta = -.51$. Again, higher difficulty identifying feelings tended to predict increased swollen joints in participants who engaged in WED ($\beta = .13$, $p = .14$), but decreases in swollen joints for the control writing group ($\beta = -.20$, $p = .02$). Further, difficulty identifying feelings marginally interacted with writing condition in predicting physical functioning 1 month later, $t(259) = 1.69$, $p = .09$, $\beta = .32$. Higher difficulty identifying feelings tended to predict decreases in physical functioning in participants who engaged in WED ($\beta = -.11$, $p = .22$), but increases in physical

functioning for the control writing group ($\beta = .10, p = .25$). See Table 1 for the remaining moderator effects of alexithymia on WED vs. HBW on health outcomes.

Coping Skills Training vs. Control Group (Arthritis Education)

To test the hypothesis that participants with higher alexithymia would have greater health improvements from Coping Skills Training compared to the control group, Arthritis Education, the interactions between training condition and alexithymia (total and each subscale) in predicting residual outcome scores in a regression model were examined. In general, results suggested the opposite of this hypothesis; participants higher in alexithymia tended to have worse outcomes after engaging in CST compared to the control group.

Specifically, total alexithymia significantly interacted with training condition in predicting C-reactive protein 1 month later, $t(252) = -2.21, p = .03, \beta = -.44$ and 4 months later, $t(252) = -2.77, p = .006, \beta = -.54$. At both time points, greater alexithymia tended to predict increased levels of CRP in the CST condition (1-month: $\beta = .12, p = .18$; 4-month: $\beta = .14, p = .12$), but decreased levels of CRP in the control group (1-month: $\beta = -.16, p = .07$; 4-month: $\beta = -.21, p = .02$). This finding was largely driven by the difficulty identifying feelings subscale, which significantly interacted with training condition in predicting CRP 1 month later, $t(252) = -2.49, p = .01, \beta = -.49$, and 4 months later, $t(252) = -2.70, p = .008, \beta = -.53$. Again, higher difficulty identifying feelings tended to predict increased levels of CRP in participants who completed the CST condition (1-month: $\beta = .18, p = .05$; 4-month: $\beta = .20, p = .03$), but decreased levels of CRP in the control condition (1-month: $\beta = -.13, p = .13$; 4-month: $\beta = -.14, p = .13$). Externally oriented thinking, a subscale of alexithymia, also significantly interacted with training condition to predict C-reactive protein, $t(252) = -2.46, p = .01, \beta = -.49$, such that higher externally oriented thinking tended to predict increases in CRP in participants who

engaged in the CST condition ($\beta = .05, p = .57$), but decreases in CRP in the control condition ($\beta = -.15, p = .09$). Externally oriented thinking significantly interacted with training condition to predict sensory pain 1 month later, $t(259) = -3.09, p = .002, \beta = -.59$. Higher externally oriented thinking predicted increased sensory pain in participants who engaged in the CST condition ($\beta = .16, p = .06$), but decreases in sensory pain in the control condition ($\beta = -.21, p = .01$). Externally oriented thinking significantly interacted with training condition to predict affective pain 1 month later, $t(259) = -2.65, p = .009, \beta = -.51$ and 12 months later, $t(259) = -2.55, p = .01, \beta = -.49$. At both time points, higher externally oriented thinking predicted increased affective pain in participants who engaged in the CST condition (1-month: $\beta = .18, p = .05$, 12-month: $\beta = .23, p = .007$), but decreases in affective pain in the control condition (1-month: $\beta = -.15, p = .08$; 12-month: $\beta = -.09, p = .28$). Difficulty identifying feelings also marginally interacted with training condition in predicting pain, on the AIMS-2 pain subscale, 4 months later, $t(259) = 1.95, p = .05, \beta = .38$. Inconsistent with the findings on CRP, higher alexithymia on the DIF subscale tended to predict decreased pain in participants who engaged in the CST condition ($\beta = -.11, p = .23$), but increases in pain in the control condition ($\beta = .13, p = .13$). See Table 1 for the remaining moderator effects of alexithymia on CST vs. AE on health outcomes.

Social Constraints as a Moderator

Written Emotional Disclosure vs. Control Writing (Health Behavior Writing)

To test the hypothesis that participants with higher social constraints would have improved health outcomes from WED compared to control writing, the interactions between writing group and social constraints in predicting outcome residuals scores in a regression model were examined. In general, findings were limited but consistent with this hypothesis.

Social constraints significantly interacted with writing in predicting pain, measured by the AIMS-2, 4 months later, $t(259) = -2.63$, $p = .009$, $\beta = -.52$. Higher social constraints predicted increased pain in participants who engaged in WED ($\beta = .26$, $p = .002$), but social constraints were unrelated to pain in the control writing group ($\beta = -.05$, $p = .61$). See Table 2 for the remaining moderator effects of social constraints on WED vs. control writing on health outcomes.

Coping Skills Training vs. Control Group (Arthritis Education)

To test the hypothesis that social constraints would predict health improvements from Coping Skills Training compared to the control group, interactions between training condition and social constraints in predicting residual outcome scores in a regression model were examined. Findings were limited, but consistent with the hypothesis.

Social constraints significantly interacted with training condition in predicting sensory pain 1 month later, $t(259) = 2.02$, $p = .04$, $\beta = .40$. In this model, social constraints were unrelated to sensory pain for participants who engaged in the CST condition ($\beta = -.03$, $p = .74$), but greater social constraints predicted more sensory pain in the control condition ($\beta = .22$, $p = .01$). See Table 2 for the remaining moderator effects of social constraints on CST vs. AE on health outcomes.

Self-efficacy as a Moderator

Written Emotional Disclosure vs. Control Writing (Health Behavior Writing)

To test the hypothesis that self-efficacy would predict health improvements in WED compared to control writing, the interactions between writing group and self-efficacy in predicting residual outcome scores in a regression model were examined. In general, findings were limited and inconsistent.

Self-efficacy significantly interacted with writing in predicting sensory pain 4 months later, $t(260) = 2.87, p = .004, \beta = .56$. Higher self-efficacy predicted decreased sensory pain after participants engaged in WED ($\beta = -.29, p = .001$), and was unrelated to sensory pain in the control writing group ($\beta = .05, p = .55$). Self-efficacy also significantly interacted with writing in predicting swollen joints 1 month later, $t(260) = -2.10, p = .04, \beta = -.42$, and 4 months later, $t(260) = -2.16, p = .03, \beta = -.43$. In this model, self-efficacy was unrelated to swollen joints in WED at 1 month ($\beta = .09, p = .28$), but predicted decreased swollen joints in the control writing group ($\beta = -.16, p = .07$). At 4 months, higher self-efficacy predicted increased swollen joints in WED ($\beta = .16, p = .06$), but predicted decreased swollen joints in the control writing group ($\beta = -.10, p = .26$). See Table 3 for the remaining moderator effects of self-efficacy on WED vs. control writing on health outcomes.

Coping Skills Training vs. Control Group (Arthritis Education)

To test the hypothesis that self-efficacy would predict health improvements in CST compared to control condition, AE, the interactions between training condition and self-efficacy in predicting residual outcome scores in a regression model were examined. Results were consistent across follow-up periods, but only for one outcome. Self-efficacy significantly interacted with training condition to predict CRP 1 month later, $t(253) = 2.12, p = .04, \beta = .41$, and 4 months later, $t(253) = 2.22, p = .03, \beta = .43$, and marginally interacted with training condition to predict CRP 12 months later, $t(253) = 1.86, p = .07, \beta = .36$. Greater self-efficacy predicted improved CRP after the CST condition (1-month: $\beta = -.26, p = .004$; 4-month: $\beta = -.26, p = .003$; 12-month: $\beta = -.29, p = .001$), and was unrelated to CRP in the control condition (1-month: $\beta = .00, p = .10$; 4-month: $\beta = .01, p = .90$; 12-month: $\beta = -.06, p = .51$). See Table 3 for the remaining moderator effects of self-efficacy on CST vs. AE on health outcomes.

CHAPTER 4

DISCUSSION

Psychological interventions for patients with chronic pain conditions have small to moderate effect sizes in improving pain and physical functioning (Astin et al., 2002; Dixon et al., 2007; Frisina et al., 2004), and only a subset of patients with chronic pain improves from such psychological treatments. Accordingly, it is important to identify which patients with chronic pain benefit from psychological treatments. The goal of the current study was to examine if psychological and social factors predict health improvements from two psychological interventions. Specifically, alexithymia, social constraints, and self-efficacy were examined to see how they might differentially predict improvements in health from written emotional disclosure and coping skills training. Findings from this study suggest that, in general, alexithymia, social constraints, and self-efficacy inconsistently predict which patients will benefit from the psychological interventions. It appears that these factors may not be important predictors of which patients will benefit from the interventions in the current study.

Alexithymia as a Moderator of WED vs. Control Writing

Results for the first hypothesis showed inconsistent findings. Specifically, participants with higher alexithymia and difficulty identifying feelings had an increase in swollen joints after engaging in written emotional disclosure. Further, those with higher alexithymia and difficulty identifying feelings had decreased swollen joints after engaging in the control writing condition. But one finding was not consistent with this pattern. Participants with higher difficulty identifying feelings had improvements in physical functioning after engaging in written emotional disclosure, whereas participants higher in difficulty identifying feelings showed a decline in physical functioning after control writing.

The finding that those higher in alexithymia and difficulty identifying feelings had worse swollen joints after engaging in written emotional disclosure is consistent with Lumley's (2004) findings, in which participants with various chronic health conditions (rheumatoid arthritis, chronic pelvic pain and headaches) who were higher in alexithymia had worse health outcomes after engaging in written emotional disclosure compared to a control condition. This pattern appears to be the most robust among those who are higher on the difficulty identifying feelings facet of alexithymia, suggesting that this facet is of particular importance in determining who will benefit from written emotional disclosure. This is not an altogether novel finding, as previous literature has shown that alexithymia predicted worse outcomes from insight-oriented treatments that are similar to written emotional disclosure (Sifneos, 1973). It is also important to note that in this sample, participants who were higher in alexithymia showed health benefits from engaging in the control writing condition, health behavior writing. This may have occurred because individuals with alexithymia are more likely to show more improvements when they are given concrete tasks, such as those in the health behavior writing condition (Lumley et al., 2008). This finding suggests that when given insight-oriented treatments (i.e., written emotional disclosure), rheumatoid arthritis patients with higher alexithymia tend to have worse health outcomes, whereas when they are given concrete and behaviorally oriented treatments (i.e., health behavior writing) they tend to have improvements in health.

Opposite to the above findings, results showed that participants who were higher in difficulty identifying feelings had improvements in physical functioning after engaging in written emotional disclosure, whereas they had declines in physical functioning after engaging in the control writing condition. This finding is not consistent with previous literature (e.g., Lumley et al., 2004), and it is unclear how this finding should be interpreted.

These inconsistent findings suggest that it is still unclear how alexithymia moderates the effects of writing techniques (i.e., WED vs. HBW) on health outcomes. For some health outcomes participants higher in alexithymia had more improvements from written emotional disclosure than from the control writing group; however the opposite was also true for other health outcomes.

Alexithymia as a Moderator of CST vs. Control Group (AE)

The hypothesis that participants with higher alexithymia would have greater health improvements from coping skills training compared to the control condition was not supported, and findings were generally opposite than expected. Specifically, participants with higher alexithymia had less health improvement from coping skills training compared to the control condition, arthritis education. Participants who were higher in global alexithymia, difficulty identifying feelings, or externally oriented thinking had increased C-reactive protein, suggestive of more inflammation, after engaging in coping skills training; however, these participants showed decreases in C-reactive protein after engaging in arthritis education, the control condition. Additionally, participants higher in externally oriented thinking had increases in sensory and affective pain after engaging in coping skills training, but again showed decreases in sensory and affective pain after engaging in arthritis education. Conversely, participants who were higher on alexithymia and difficulty identifying feelings showed decreases in pain, after engaging in coping skills training, but increases in pain after engaging in the control condition.

Unlike previous research, which found positive effects of CBT on health problems such as smoking cessation, substance use, and in vitro fertilization for individuals who have high alexithymia, results from the current study suggest that these findings may not extend to patients with chronic illness. One possible explanation for these findings could be that for those

individuals who are higher in alexithymia, it might be more difficult to engage in coping skills training, because the version of CST used in this study had a substantial focus on exploring thoughts and feelings, and engaging in these processes are more difficult for those who are higher in alexithymia.

Again, it appears that the moderating relationship of alexithymia on coping skills training is inconsistent. These conflicting results suggest that the results on of the moderating effects of alexithymia on coping skills training, compared to arthritis education, and physical health may need to be interpreted with caution.

Social Constraints as a Moderator of WED vs. Control Writing

The second hypothesis, that participants with higher social constraints would have improved health from written emotional disclosure compared to the control writing condition, was not supported. Indeed, there was only one moderator relationship identified, and it was opposite to that hypothesized. Participants with more social constraints had increases in pain after engaging in written emotional disclosure compared to the control writing condition about health behaviors, which was unrelated to levels of pain in participants high in social constraints.

If this finding is reliable, it is not consistent with prior, but limited, research on the moderating effects of social constraints. The moderating effects of social constraints on outcomes from psychological interventions has been examined only on mental health variables as outcomes, and has not examined how those effects would apply to physical health. This study was unique in that it did examine the effects of social constraints on physical health and pain after a psychological treatment. Prior research by Zakowski and colleagues (2004) found that those with higher social constraints had improvements in distress after engaging in written emotional disclosure compared to a control treatment, but this finding could not be extrapolated

to the current study on physical health. Findings from the current study suggested that the opposite is true for health outcomes; those high in social constraints had *worse* health outcomes from written emotional disclosure compared to control writing. Zakowski and colleagues (2004) suggested that their findings could be due to a buffering effect that social constraints has on psychological outcomes, and it could be that the opposite is true for physical health. It is possible that people with more social constraints have an exacerbation of symptoms when they are asked to write about their most traumatic experience because they are unable to discuss that situation with members of their support group or are invalidated when they do try to discuss their traumatic experience, thereby worsening their pain. This explanation is parallel to Cohen's (1998) theory of the buffering model of social support. This model indicates that social support includes two components: appraisal support, or someone to discuss your problems with, and self-esteem support, or a person or relationship that makes you feel better about yourself. Written emotional disclosure allows individuals to receive a variation on appraisal support, but does not offer self-esteem support. The lack of self-esteem support, both in the treatment condition and in the lives of individuals with higher social constraints, may impede improvements in their physical health.

Additionally, findings on the moderating effects of social constraints were limited and could have resulted from capitalization on chance. As such, the findings should be interpreted with caution. These results were limited to only one outcome measure and one time-point for each treatment comparison (WED vs. HBW). Further, the result that participants with more social constraints had increases in pain after engaging in written emotional disclosure compared to the control writing condition was not supported by other similar outcome measures that were

included in this study (e.g., MPQ Affective Pain, AIMS-2 Pain). As such, this finding should be interpreted with caution.

Social Constraints as a Moderator of CST vs. Control Group (AE)

The current study also explored how social constraints might predict health outcomes differently in coping skills training compared to the control condition. Findings were limited, and only one moderating relationship of social constraints was found. Results suggested that those who were higher in social constraints had *more* sensory pain after engaging in arthritis education, the control condition, whereas higher social constraints were unrelated to sensory pain after coping skills training. If this finding is reliable, these results might suggest that coping skills training may work by preventing pain from worsening for those with social constraints, but that it does not decrease pain for these individuals.

It is also important to note that this is the first study of its kind to examine how social constraints may moderate the effects of various psychological treatments on health outcomes, and results from this study provide only minimal support that social constraints are an important factor in predicting which rheumatoid arthritis patients improve from psychological treatments.

Self-efficacy as a Moderator of WED vs. Control Writing

This study also explored how self-efficacy might predict improvements in written emotional disclosure compared to control writing. Findings were generally inconsistent and limited. More specifically, results from this study suggest that those with higher self-efficacy had improved sensory pain after engaging in written emotional disclosure compared to the control writing. In contrast, those who were lower in self-efficacy generally had improved swollen joints from written emotional disclosure compared to the control writing condition.

Although no specific hypotheses were made about how self-efficacy might moderate the health outcomes from the writing conditions, it might be expected, based on Bandura's (1982) theory of self-efficacy that more health improvements would be seen in individuals who were higher in self-efficacy at the beginning of treatment (Schiaffino & Revenson, 1995). One finding from this study was supportive of this theory. This result found that those who were higher in self-efficacy had improved pain after written emotional disclosure compared to the control writing group.

On the other hand, previous research has suggested that more health improvements would be seen in individuals who were lower in self-efficacy at the beginning of treatment. For example, results from Kraft and colleagues (2008) found that participants who were lower in self-efficacy had more improvements from written emotional disclosure compared to the control writing group. One finding from the current study is consistent with this previous research. This finding suggested that for those lower in self-efficacy, there were improvement in swollen joints after engaging in the written emotional disclosure group compared to the control writing group.

It is also important to note that these results are contradictory. Results showed that higher self-efficacy predicted less sensory pain, but more swollen joints after participants engaged in written emotional disclosure compared to control writing. One possible explanation for these inconsistencies could be that the participants are rating their health as more improved than the rheumatologists.

Due to the inconsistent and limited nature of the results, findings from the current study do not clearly illuminate the moderating effects of self-efficacy. It appears that that self-efficacy may not be an important predictor of which patients have health improvements after engaging in written emotional disclosure compared to the control writing group.

Self-efficacy as a Moderator of CST vs. Control Group (AE)

The hypothesis, that higher self-efficacy would predict health improvements from coping skills training compared to the control condition, was supported, but only on one outcome, C-reactive protein. Findings suggest that those who have higher self-efficacy had decreases in inflammation after engaging in coping skills training, but were unrelated to inflammation after engaging in the control condition. Further, this result was consistent at 1-month, 4-month and 12-month follow-ups, suggesting it is a robust finding. This result is parallel to the literature on mental health, which suggests that those who enter treatment with better mental health (e.g., higher self-efficacy) will have better outcomes from treatment (Barron, 1953). It is important to note, however, that this result was only found on one outcome measure, so it is possible that this finding is specific to inflammation only and does not generalize to overall improved physical health. Further, this result may need to be interpreted with caution, as this result was not found for swollen joints, a similar objective measure of inflammation.

Limitations

One limitation of the study is that only a few psychological moderators were examined. It may be that other factors, such as coping style or readiness to change, predict which patients improve from these treatments. Additionally, demographics, such as, race, gender, and age, and disease characteristics (e.g. duration of diagnosis, disease severity) may also play an important role in which patients improve from these treatments.

Additionally, the data could have been analyzed differently. This study chose to examine how certain factors might moderate improvements from written emotional disclosure and coping skills training as two distinct treatments. As such, analyses were conducted separately to compare written emotional disclosure and coping skills training to their respective control

groups. However, participants were randomized to receive a component of each treatment arm, so they received one of the writing conditions as well as one of the class conditions. It is possible that there were synergistic effects of having both written emotional disclosure and coping skills training, or any combination of the treatments and control groups, which were missed by conducting the moderator analyses in such a way that kept them as independent groups. However, analyses of the various combined interventions would have yielded very small sample sizes to detect moderators.

Another limitation of this study is that it applies only to the specific treatments used in this study (i.e., WED and CST). It could be the case that the moderators examined in the current study are important for other types of interventions, such as those that are insight-oriented or more purely behaviorally focused. Furthermore, results may have varied in this study if the interventions had been conducted in a different manner. For example, coping skills training could have been conducted in a group format, or participants could have kept their writings private or received feedback for them in the written emotional disclosure group. In a similar vein, findings from this study may apply only to individuals who have rheumatoid arthritis, and cannot be applied, at this point, to other patients with chronic pain or other illnesses.

Additionally, participants may have had a difficult time fully engaging in written emotional disclosure. Many participants appeared to write about topics that were only mildly distressing, or they did not appropriately follow instructions and instead wrote about living with rheumatoid arthritis as a stressor. The lack of complete engagement by participants could have decreased the effectiveness of this intervention. Further, the writing control condition, health behavior writing, may have too closely mimicked an active intervention. In the control condition participants were asked to write about time management, eating, exercise, and sleeping habits.

Previous research has shown that by self-monitoring, the target behavior is likely to change, which is similar to the task that these “control” participants were given (Kumanyika et al., 2009). It is likely that participants saw improvements and changes in their pain, health, and functioning as a result of this control condition, which would have constrained the likelihood of finding moderating effects.

Future Directions

It will be important for future studies to examine other possible moderators of written emotional disclosure and coping skills training, so that individuals with rheumatoid arthritis can have the most suitable treatments offered to them, matched to their individual differences. It is possible that personality and demographic factors as well as other psychological constructs (e.g. coping style, readiness to change) are important indicators of who may improve from psychological treatments, and these should be examined as well. Future research should also examine if and how these findings might generalize to other chronic pain conditions, such as, fibromyalgia, low back pain or migraine headaches, or if the results are unique and specific to patients with rheumatoid arthritis.

Future studies would benefit from having a wait-list or no treatment control group in addition to an active control condition, such as the arthritis education and health behavior writing groups that were included in this study. Having a wait-list or no treatment control group would help to further elucidate some of the inconsistent findings from this study. It will be important to know how patients with rheumatoid arthritis change over time without any treatment, and how those changes compare to an active control condition, as well as the treatment group. If the control groups in the study indeed are too similar to the active interventions, which might particularly be the case with written emotional disclosure and its control condition, then having

an inactive control group may more easily illuminate moderator effects that would otherwise be hidden.

Implications

The findings from this study indicate that written emotional disclosure and coping skills training may not work differently for individuals based on various psychological and social factors, at least those examined in this study. In particular, this study has shown that individuals with rheumatoid arthritis do not respond differently to these treatments based on levels of alexithymia, social constraints, and self-efficacy. However, there may be other moderator variables that would be important in illuminating which patients with rheumatoid arthritis improve from written emotional disclosure and coping skills training. Previous research has found that cognitive-behavior treatments and emotional disclosure have only small to moderate effect sizes, and that only a minority of patients shows improvements. Thus, it is likely that there are some psychological, social and/or personality variables that are important in determining which patients improve from these interventions. However, detecting these moderators might necessitate the development of better theory and a detailed analysis of components and requirements of these interventions. The search for these moderators is an important one and should continue.

On the other hand, the focus may need to be shifted towards strengthening the interventions so that they can be more effective, and placing less focus on finding the individual differences that account for which patients improve from these interventions. Barlow and colleagues (2004) have suggested a similar concept, in which they propose that treatment research should focus on identifying what the most powerful components of treatments are, rather than examining individual differences that are predictive of treatment outcomes. In this

model they proposed that there are three factors that are three key components: 1) identifying antecedent cognitive reappraisals; 2) preventing emotional avoidance; and 3) facilitating action tendencies not associated with the emotion that is dysregulated. These authors argue that this approach will yield the most treatment gains, while cutting across various interventions, theoretical orientations, and—importantly—individual differences. Perhaps then, as Barlow and colleagues suggest, the real goal is to strengthen treatments, rather than tailoring them to individuals, particularly because the latter appears to be a difficult and complex task, as evidenced by the inconsistent and limited findings of the current study.

Table 1. Alexithymia as a moderator of the effects of WED vs. HBW and in CST vs. AE on health outcomes*

	WED N = 135	HBW N = 127	CST N = 129	AE N = 133
AIM-2 Pain				
1 month follow-up	.03 (.00, .00, .08)	-.06 (-.12, -.05, .05)	-.01 (-.05, -.02, .05)	-.01 (-.04, -.04, .07)
4 month follow-up	.05 (.03, .02, .06)	.00 (-.04, -.01, .07)	-.09 (-.11 _c , -.09, .00)	.13 (.13 _d , .07, .12)
12 month follow-up	.02 (.09, -.06, -.01)	-.09 (-.06, -.12, -.04)	-.09 (-.03, -.15, -.07)	.03 (.09, -.05, .00)
AIM-2 Physical functioning				
1 month follow-up	-.08 (-.11 _a , -.06, .00)	.04 (.10 _b , .02, -.04)	.01 (-.05, .03, .08)	-.03 (.04, -.03, -.10)
4 month follow-up	-.01 (-.01, -.05, .03)	.10 (.05, .03, .05)	-.01 (-.05, -.07, .12)	.09 (.17, .06, -.04)
12 month follow-up	-.04 (-.01, -.08, -.01)	-.12 (-.04, -.18, -.08)	-.14 (-.10, -.20, -.06)	.00 (.06, -.05, -.03)
MPQ Sensory Pain				
1 month follow-up	.01 (.03, .07, -.09)	-.02 (.01, -.08, .02)	.09 (.03, .05, .16 _c)	-.08 (.03, -.05, -.21 _d)
4 month follow-up	-.06 (.09, -.09, -.17)	-.06 (-.08, -.10, .04)	-.09 (-.05, -.16, -.02)	-.04 (.04, -.03, -.12)
12 month follow-up	.01 (.04, .08, -.12)	.01 (.00, -.07, .09)	.07 (.02, .02, .15)	-.04 (.05, .00, -.17)
MPQ Affective Pain				
1 month follow-up	.02 (.05, -.05, .04)	-.01 (.08, -.06, -.05)	.12 (.12, .01, .18 _c)	-.07 (.03, -.09, -.15 _d)
4 month follow-up	.04 (.10, -.04, .00)	.06 (.09, .00, .05)	-.01 (.04, -.10, .04)	.11 (.16, .06, .02)
12 month follow-up	.15 (.22, .06, .05)	.10 (.13, .05, .06)	.24 (.25, .12, .23 _c)	.04 (.15, .01, -.09 _d)
C-reactive protein				
1 month follow-up	-.03 (-.04, -.06, .04)	-.01 (.09, .00, -.14)	.12 _c (.18 _c , .05, .05)	-.16 _d (-.13 _d , -.10, -.15)
4 month follow-up	.00 (.03, -.08, .05)	-.07 (.03, -.09, -.16)	.14 _c (.20 _c , .01, .11 _c)	-.21 _d (-.14 _d , -.17, -.20 _d)
12 month follow-up	-.04 (.04, -.14, -.01)	-.01 (.12, -.05, -.14)	.04 (.14 _c , -.10, .01)	-.08 (.01 _d , -.09, -.15)
Swollen joints				
1 month follow-up	-.05	-.03	-.04	-.03

	(-.10, -.07, .07)	(-.17, .03, .11)	(-.14, .02, .05)	(-.15, -.03, .13)
4 month follow-up	.05 (-.01, .05, .10)	.06 (-.05, .12, .11)	.00 (-.06, .03, .04)	.12 (.00, .13, .16)
12 month follow-up	.12 _a (.13 _a , .06, .09)	-.12 _b (-.20 _b , -.10, .03)	.00 (-.04, -.02, .08)	.02 (-.01, .00, .05)

Note: *The value on the first line is the standardized beta, relating the TAS-20 total score to the residualized outcomes. The values in the parentheses are for the TAS-20 subscales: Difficulty Identifying Feelings, Difficulty Describing Feelings, and Externally Oriented Thinking, respectively. Standardized beta values with different subscripts are significantly different from one another, as determined by hierarchical regressions predicting health outcomes from an interaction of group by alexithymia.

Table 2. Social constraints as a moderator of the effects of WED vs. HBW and in CST vs. AE on health outcomes*

	WED N = 135	HBW N = 127	CST N = 129	AE N = 133
AIM-2 Pain				
1 month follow-up	.14	-.10	-.07	.09
4 month follow-up	.26 _a	-.05 _b	.02	.16
12 month follow-up	.16	-.02	-.03	.12
AIM-2 Physical functioning				
1 month follow-up	.20	-.01	.07	.12
4 month follow-up	.17	.05	.15	.06
12 month follow-up	.15	-.03	.03	.08
MPQ Sensory Pain				
1 month follow-up	.16	.06	-.03 _c	.22 _d
4 month follow-up	.19	.08	.05	.21
12 month follow-up	.20	.16	.11	.23
MPQ Affective Pain				
1 month follow-up	.14	.04	.10	.08
4 month follow-up	.12	.12	.12	.12
12 month follow-up	.10	.18	.07	.19
C-reactive protein				
1 month follow-up	.09	-.06	-.05	.06
4 month follow-up	.09	-.07	.03	-.01
12 month follow-up	-.04	-.01	.04	-.08
Swollen joints				
1 month follow-up	-.18	-.12	-.08	-.18
4 month follow-up	-.22	-.06	-.16	-.12
12 month follow-up	-.20	-.11	-.04	-.24

Note: *The value on the first line is the standardized beta, relating the GSC total score to the residualized outcomes. Standardized beta values with different subscripts are significantly different from one another, as determined by hierarchical regressions predicting health outcomes from an interaction of group by social constraints.

Table 3. Self-efficacy as a moderator of the effects of WED vs. HBW and in CST vs. AE on health outcomes*

	WED N = 135	HBW N = 127	CST N = 129	AE N = 133
AIM-2 Pain				
1 month follow-up	-.17	-.06	-.05	-.20
4 month follow-up	-.23	-.09	-.08	-.24
12 month follow-up	-.14	.00	.00	-.15
AIM-2 Physical functioning				
1 month follow-up	-.02	-.21	-.09	-.17
4 month follow-up	-.05	-.20	-.10	-.15
12 month follow-up	-.05	-.09	-.03	-.12
MPQ Sensory Pain				
1 month follow-up	-.22	-.11	-.16	-.18
4 month follow-up	-.29 _a	.05 _b	-.13	-.09
12 month follow-up	-.22	-.06	-.23	-.08
MPQ Affective Pain				
1 month follow-up	-.17	-.13	-.20	-.12
4 month follow-up	-.20	-.06	-.06	-.20
12 month follow-up	-.15	-.09	-.16	-.11
C-reactive protein				
1 month follow-up	-.11	-.15	-.26 _c	.00 _d
4 month follow-up	-.14	-.11	.26 _c	.01 _d
12 month follow-up	-.16	-.17	-.29 _c	.06 _d
Swollen joints				
1 month follow-up	.09 _a	-.16 _b	-.05	-.04
4 month follow-up	.16 _a	-.10 _b	.00	.06
12 month follow-up	.09	.03	.05	.06

Note: *The value on the first line is the standardized beta, relating the ASE total score to the residualized outcomes. Standardized beta values with different subscripts are significantly different from one another, as determined by hierarchical regressions predicting health outcomes from an interaction of group by self-efficacy.

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ABSTRACT**ALEXITHYMIA, SOCIAL CONSTRAINTS, AND SELF-EFFICACY AS
MODERATORS OF WRITTEN EMOTIONAL DISCLOSURE AND COPING
SKILLS TRAINING: FOR WHICH PATIENTS WITH RHEUMATOID
ARTHRITIS DO THESE INTERVENTIONS IMPROVE PAIN AND PHYSICAL
FUNCTIONING?**

by

JENNIFER N. CARTY**August 2012****Advisor:** Dr. Mark A. Lumley, Ph.D.**Major:** Psychology (Clinical)**Degree:** Master of Arts

Rheumatoid arthritis (RA) causes pain, disability, and inflammation. Written emotional disclosure (WED) and pain coping skills training (CST) improves adjustment, but effect sizes are small to moderate; research needs to identify patients most likely to benefit from WED and CST. A moderator analyses was conducted to determine if alexithymia, social constraints, or self-efficacy predicted health outcomes from interventions at 1-, 4-, and 12-month follow-up. Health assessed at baseline and at each follow-up. Patients were randomized to WED or equivalent control (Health Behavior Writing), and to CST or equivalent control (Arthritis Education). Findings from this study suggest that alexithymia and social constraints inconsistently predict which patients will benefit from the psychological interventions, and that self-efficacy has consistent but limited moderating effects on the interventions. In general, it appears that these factors may not be important predictors of which patients will benefit from the psychological interventions in the current study.

AUTOBIOGRAPHICAL STATEMENT

Jennifer Carty is currently a graduate student in the Clinical Psychology program at Wayne State University. She completed her undergraduate degree in Psychology, with a Health concentration at Wayne State University in 2008.

Jennifer's career interests are in the area of health psychology, specifically, in the area of emotion-focused treatments for individuals with chronic health conditions. Her work and graduate training have provided the opportunity to be an active member of the WSU Stress and Health Research Lab. Jennifer is currently working as a research assistant on a study examining the efficacy of three interventions for patients with fibromyalgia.

Jennifer has gained additional experience at the Women's Urology Center at William Beaumont Hospital as a research assistant since August 2011. She has been involved in implementing a research protocol for all patients receiving treatment at the Women's Urology Center, and in research involving a one-week multidisciplinary, intensive treatment program. This experience has further developed her goals of becoming a clinical research scientist, largely focusing her interests in health psychology, issues related specifically to women's health with attention on emotion-focused interventions. Jennifer has also worked at Wayne State University teaching several courses to undergraduate students, including Introduction to Psychology Lab and Health Psychology.