

DEVELOPMENT AND EVALUATION OF A COPING SKILLS TRAINING PROGRAM
FOR ADOLESCENTS WITH INFLAMMATORY BOWEL DISEASE (IBD)

by

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(Under the Direction of Ronald Blount)

ABSTRACT

The current study involved the development and evaluation of a skills-based, psychological intervention for adolescent females with Inflammatory Bowel Disease (IBD) and their parents. Thirteen and eleven adolescent females and one parent made up the treatment and control groups respectively, for a total of 24 parent-child dyads. Adolescents and parents attended a one-day intervention which taught disease-related coping skills, pain management, relaxation techniques, communication, and limit setting (parents only). The treatment day was followed by 6 weeks of web-based skill reinforcement including homework assignments and weekly group chat sessions. Results indicated significant changes in the therapeutic direction for adolescent somatic symptoms, adaptive coping strategies, and catastrophizing cognitions from pre- to post-intervention. Implications of these findings, as well as limitations and future directions are discussed. Overall, findings support the use of psychosocial interventions for reducing physical as well as psychological symptoms in adolescents with IBD.

INDEX WORDS: Pediatric, inflammatory bowel disease, skills training, coping, parents, treatment

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DEDICATION

To my mom and dad who gave me a love to learn. Although I'm sure you never thought it would materialize to this degree, you have been nothing but supportive, loving, and encouraging. Your constant prayers and listening ears have sustained me and will continue to for the next leg of this journey. You are my biggest fans and I am yours. To Mark for your endless patience and love. You are my sanity, my source of relaxation, and my best friend. Thank you for continuing to endure this race with me and for being my rock to lean on. To Mady for giving me a reminder that life's daily stressors pale in comparison to the blessings that God has given us. And to Brian and Ali. Thank you both for your constant prayers, encouragement, advice, and friendship. To everyone in my life who participates in and is affected by my schooling. I cannot say how much I acknowledge and appreciate your contributions to getting me to this place and for helping me go on. I promise I'll finish one day.

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Chapter 1: Introduction

Physical and Psychosocial Aspects of IBD

The impact of chronic illness in children and adolescents can be pervasive. Chronic illness requires constant attention to physical and medical needs, significant emotional, social, and the financial consequences can lead to additional stress for the child and the family. Estimates in 2006 revealed that greater than ten percent of children are living with some form of chronic illness or condition (Mussatto, 2006). Thus, attention to this population is imperative.

Inflammatory bowel disease (IBD) is one of the myriad conditions that may affect children and adolescents. IBD includes two chronic gastrointestinal diseases: Ulcerative colitis (UC) and Crohn's disease (CD). As of 2000, approximately 9 out of 100,000 children and adolescents suffered with IBD (Lindberg, Lindquist, Holmquist, & Hildebrand, 2000). IBD is most frequently diagnosed in adolescence or young adulthood; however, for some, symptoms may exist for years prior to diagnosis (Loftus, 2004). In CD, a slight female predominance exists, suggesting the possible role of hormonal factors in the expression of the disease (Loftus, 2004).

UC and CD are chronic, unpredictable, and often embarrassing conditions characterized by symptoms such as abdominal pain, frequent diarrhea, weight loss, growth delay, and intestinal or rectal bleeding (Engstrom & Lindquist, 1991; Mackner, Sisson, & Crandall, 2004). In addition, medications used to treat IBD (e.g., corticosteroids, immunosuppressants) may result in negative side-effects such as hair growth, facial swelling, increased acne, and mood swings (Mackner et al., 2004).

Coupled with the already heightened psychosocial demands of adolescence and the significant developmental changes experienced during this time, the effects of IBD and its treatment can adversely impact not only physical but also emotional well-being (Loonen, Grootenhuis, Last, & Derkx, 2004). For example, possible physical changes due to medication side-effects have been shown to reduce self-esteem (Engstrom 1992, 1999) and lead to medication nonadherence and subsequent exacerbation of IBD symptoms (Cunningham & Banez, 2006). Also, 31% to 50% of children reported that IBD restricts their functional abilities (Moody, Eaden, & Mayberry, 1999). For example, physical symptoms of IBD often affect school attendance or limit activities in which an adolescent can physically engage. In addition, body-image concerns can decrease participation in age-appropriate activities, affecting peer relationships and social functioning (Akobeng et al., 1999; Banez & Cunningham, 2003; MacPhee, Hoffenberg, & Feranchak, 1988; Rabbett et al., 1996). Since adolescent females report higher levels of emotional perception and greater emphasis on their interpersonal relationships than do adolescent boys, these difficulties may be even more salient for girls (Luebbbers, Downey, & Stough, 2007; Eder, 1985).

Adolescents with IBD also experience poorer emotional adjustment than do healthy controls (Engstrom, 1999; Mackner et al., 2004). The most prevalent psychological problems among this population are internalizing symptoms such as depression and anxiety (Ondersma, Lumley, Corlis, & Tojek, 1997; Rabbett et al., 1996). Factors that have been associated with poor emotional functioning in these patients include pain (Engstrom, 1992), impairments in physical functioning (Moody et al., 1999; Rabbett et al., 1996), and elevated stress levels (Tojek, Lumley, Corlis, Ondersma, & Tolia, 2002).

Dynamics within the family system can not only be influenced by adolescent chronic illness, but can also serve as a source of stress and/or support for the adolescent and his or her parents. Engstrom (1999) found that mothers of children with IBD reported significantly greater family dysfunction than either mothers of healthy controls or mothers of children with diabetes. For adolescents with IBD, there also may be tension between the normal developmental demands of identifying with peers and establishing independence and their continued dependence on parents to help provide intensive, ongoing health care, resulting in greater levels of family conflict (Santrock, 1998; Grzywacz, & Fuqua, 2000). In turn, it has been suggested that interpersonal dynamics in the family may affect disease activity in families of children with CD, UC, RAP, and asthma (Wood, 1995). Thus, a consideration of familial factors is vital for the success of psychosocial treatments for adolescents with IBD.

Additional literature suggests correlates between stress and physical symptom exacerbation. Cunningham and Banez (2006) suggested that stress may affect a patient's ability to cope with IBD and thus lead to indirect negative effect on physical outcomes. Regardless of the exact mechanism involved, psychological functioning is correlated with disease severity and symptoms, including pain. Thus, it is possible that improvements in reactions to disease-related and non-disease related difficulties can have a positive effect on physical outcomes.

Prior Intervention Research

IBD. Despite literature indicating greater physical and emotional difficulties experienced by adolescents with IBD, there have been few psychologically based treatment interventions developed for patients with IBD, especially in the pediatric population. Schwarz and Blanchard (1991) implemented a multi-component behavioral treatment package for adults with IBD. Treatment consisted of education, progressive muscle relaxation, biofeedback, and instructional

coping strategies. Following the intervention, treated participants felt more competent in coping with IBD and felt less stress pertaining to their disease as compared to participants in a symptom-monitoring control condition. The success of adult treatment programs supports the development of similar programs for children and adolescents.

An investigation by Szigethy and colleagues (2004) utilized cognitive behavioral therapy (CBT) intervention to promote reductions in depression and other disease-related difficulties in adolescents with IBD. Eleven participants completed 12-14 sessions of CBT. The intervention included components such as problem-solving, cognitive restructuring, relaxation training, and pain coping strategies. Several sessions included various family members. Following the intervention, 10 of the 11 adolescents no longer met criteria for major or minor depression, and participants also reported improvements in perceptions of physical health, feelings of helplessness, and increased control in social situations. In a follow-up evaluation conducted 12 months later (Szigethy et al., 2006), results were maintained, although booster sessions of CBT or psychotropic medications were required for a number of the participants during the follow-up period. An additional controlled group investigation by Szigethy and colleagues (2007) revealed similar findings to those mentioned above. Overall, although results indicated general improvements in perceived physical health, no specific report was made regarding changes in levels of pain or other physical symptoms.

Prior work in this lab has involved the development and preliminary testing of a 10-week coping skills training intervention specifically for adolescent girls with IBD and their parent(s) (Hayutin, Blount, Lewis, Simons, & McCormick, 2009). Participants met for 10 weekly two-hour group skills-training sessions. Six parent-adolescent dyads participated in this investigation using a case study design, with measurements taken pre/post-intervention and at 6 month follow-

up. The data indicated improvements in abdominal pain and functional disability for adolescents, as well as improvements in adolescent self-esteem and sense of inadequacy. There were also decreases in parent reported stress related to feelings of incompetence and improvements in parental coping strategies. However, despite promising clinical benefits of this skills-training intervention, interpretations are limited by the small size and uncontrolled design.

In general, there remains a paucity of intervention research specifically focused on reducing physical symptoms as well as disease-related coping in pediatric IBD. To further examine the potential benefits of psychologically based treatments to assist patients with IBD, we turn to the related area of recurrent abdominal pain (RAP) and Irritable Bowel Syndrome (IBS) to highlight intervention research specifically focused on reduction in physical symptoms for this pediatric population.

RAP and IBS. Patients with IBD and RAP share similar symptoms of abdominal pain and functional impairment (Walker, Garber, Van Slyke, & Greene, 1995). According to the American Academy of Pediatrics' Subcommittee on Chronic Abdominal Pain (2005) patients with IBD and RAP are indistinguishable in terms of concomitant psychosocial symptoms. This is particularly important in that the psychosocial treatment interventions that have been used for patients with RAP may help inform the design of interventions for patients who have IBD.

Sanders and colleagues (1989) found that an 8-week cognitive behavioral (CBT) family intervention for children with RAP to be successful in improving pain and other disease-related variables. Eight families were taught skills such as self-monitoring of pain, the use of distraction during pain episodes, relaxation, and imagery. An additional 8 families received a pain-monitoring control condition. Results indicated that the groups did not differ on pain ratings over time. However, pain was reduced more quickly in the treatment group and there were a greater

number of pain-free members in the treatment group. This pattern of findings remained when the study was replicated with a larger group and were maintained at 6- and 12-month follow-up (Sanders, Shepherd, Cleghorn, & Woolford, 1994). Additionally, reductions in internalizing emotional symptoms occurred in tandem with pain reduction. Participants also experienced reductions in functional disability at 12-month follow-up (Sanders et al., 1994).

Additionally, IBS is marked by abdominal pain, gas, bloating, and functional disability, similar to IBD. Kuttner and colleagues (2006) designed a program in which adolescents with IBS were taught yoga skills during a one hour session and subsequently engaged in home practice of the skills for four weeks. Results showed decreases in functional disability, gastrointestinal symptoms, and maladaptive coping strategies compared to a wait-list control group. These study results reiterate the effectiveness of non-medical interventions for managing and reducing physical symptoms.

Theoretical Basis for the Current Study

We conceptualized our approach to treatment within a biopsychosocial context, understanding that the experience of chronic illness in childhood and adolescence is not purely medical but involves psychological and social factors which all interact to determine the functioning and quality of life of the patient. More specifically, we viewed the factors that impact the illness experience as relating to one another within a four point framework of physiological stress, maladaptive cognitions, negative emotions, and unproductive behaviors. This framework is similar to that proposed by Beck, Rush, Shaw, and Emery (1987), which suggest the interaction between thoughts, affect, and behavior and has been used consistently and effectively in clinical psychology for treating a variety of disorders (Beck, 2004). Further, we conceptualized that the experience of pain can be worsened by the presence of anxious or

negative emotions, as supported by the Gate Control Theory of Pain (Melzack & Wall, 1982), as well as stressful life experiences (Cunningham & Banez, 2006). Unproductive behavioral repertoires, such as avoidant or other ineffective coping responses and/or poor communication skills, may lead to increases in daily stress and thus increase pain and other physical symptoms. In sum, the development of the current treatment sought to employ training components that addressed these aforementioned areas of potential influence within a biopsychosocial framework.

Family factors were viewed as potentially impacting the child's experience with chronic illness. Parents may experience emotions such as fear or guilt related to their child's illness, which may be impacted by maladaptive cognitions and thus impact their behavior toward their children. Anecdotally, many parents report feeling inclined to indulge or over-protect their sick child. Thus, parents may unintentionally direct their child's attention to their physical symptoms, for example by removing normal or unpleasant behavioral expectations in the presence of their child's pain and thereby promote sick-role behaviors and functional disability (Levy et al., 2004; Van Slyke & Walker, 2006). In the same way, if parents have additional knowledge about adaptive skills their child can use, they can promote normal and adaptive behaviors on the part of their child and thus contribute to reductions in physical symptoms. Given these factors, parental involvement in treatment is justified.

Treatment Components of the Current Study

The primary treatment model for the current investigation is adapted from the aforementioned case study by Hayutin et al. (2009). Although the structure of the manual used in this previous work has been altered (discussed later), the current investigation employs similar components for addressing pain management, disease-related coping, appropriate parenting behaviors, and parent-child communication. Justification for the inclusion of these specific

components comes from literature within traditional clinical samples as well as from treatments utilized in pediatric medical settings and is detailed below.

Coping Skills. With children, cognitive coping skills training has been used effectively for treating anxiety, depression, and impulse control in children within a variety of settings (Spirito & Kazak, 2006). Given that anxiety and other negative emotions can accompany pediatric conditions such as IBD and impact physical and psychosocial functioning, these strategies are justifiably appropriate for usage within pediatric populations. Manuals such as the *Coping Cat* by Kendall (1992) take a coping skills approach to resolving maladaptive thoughts in order to reduce negative emotions and has not only proven effective for treating anxiety disorders in children, but has also been suggested for use with children who have physical disorders (Hudon, Krain, & Kendall, 2001).

Pain Management. Strong empirical support exists for the use of CBT in treating pediatric chronic pain and functional abdominal pain of a cyclical nature (Eccleston, Morley, Williams, Yorke, & Mastroyannopoulou, 2002, Spirito & Kazak, 2006). Additional treatments are often utilized for pain management as part of multicomponent interventions. These have included relaxation, breathing exercises, distraction, imagery, and progressive muscle relaxation, which have received support throughout the literature in chronic and acute pain populations (Blount, Piira, Cohen, & Cheng, 2006; Powers, 1999; Varni, 1984). These techniques are effective in that they provoke a physiological state that is incompatible with feeling negative physical sensations or emotions.

Parenting. Parent training techniques such as setting limits and appropriate expectations have been utilized in programs by Forehand and McMahon's (1981) and have been used effectively to shape children's behaviors (McMahon, Wells, & Kotler, 2006). Literature in the

pediatric domain has delineated helpful (e.g., coping promoting, coaching) and detrimental (e.g., reassurance, criticism) parenting responses to children while in pain (Blount et al., 1989; Blount, Sturges, & Powers, 1990; Schechter et al., 2007). In addition, research has demonstrated that techniques such as modeling, reinforcement, rehearsal, and coaching are effective for promoting pain-reducing behaviors in children (Powers, 1999). In the current treatment, parents are provided information about how to recognize their own unconstructive responses and are encouraged to set normal, age-appropriate limits for their adolescents.

Communication. As mentioned above, poor parent-child communication can serve to increase familial stress and potentially exacerbate disease-related difficulties, especially when parents and adolescents have difficulty communicating about disease-related issues. Research has documented the negative effects of poor parent-adolescent communication, including low self-esteem, familial discord, and problems with peer relationships (Johnson, & Johnson, 2004; Mruk, 1999). Programs such as Parents and Adolescents Communicating Together (PACT; Soltys, & Littlefield, 2008) include components of problem solving and reaching mutually acceptable outcomes and has demonstrated effectiveness towards reducing parent-adolescent conflict. Additional support exists for the use of reflective listening and learning to use problem-focused communication skills between parents and adolescents (Robin, 1977).

Summary and Hypotheses

In sum, correlational studies indicate that pediatric patients with IBD have more psychosocial difficulties than healthy children and adolescents (e.g., Mackner et al., 2004). However, there have been few efforts to intervene using psychologically-based treatments with this population. Of the treatment studies reviewed, the evidence is promising for the benefits of

CBT for reducing the frequency of disease-related difficulties, specifically pain and functional disability, in patients with gastrointestinal disorders.

Each of the treatment studies for pediatric patients with IBD, RAP, and IBS included a small number of participants, and most used uncontrolled, case study designs. The sometimes extensive time commitment required by some treatment programs may discourage patient recruitment and retention necessary for conducting experimentally controlled investigations. The current study addressed these limitations and employed an intensive one day treatment program followed by a six week web-based treatment component that reinforced those skills and facilitated group interactions. The reduced time commitment was intended to make the program more accessible to a greater number of families, therefore increasing enrollment and retention.

The primary goals of this study were to preliminarily investigate this modified treatment manual in order to bring about physical and psychological improvements for adolescent IBD patients and their parents. By using an all female sample, we sought to maintain sample homogeneity and to facilitate greater disclosure during group while addressing potentially sensitive issues that may be particularly salient to adolescent females. Additionally, because adolescents with IBD are both influenced by and influence the members of their family, parents of participating adolescents were enrolled in the intervention. The parental component of the intervention aimed to increase parents' adaptive responses to their children's pain and other disease symptoms, as well as reduce personal unconstructive thoughts. This parental component also sought to educate parents about coping skills being learned by their daughters so they could coach them to utilize those skills after the intervention.

We hypothesized that adolescent patients would show reductions over time on primary variables of abdominal pain and functional disability. In addition, secondary variables such as

additional physical symptoms, coping, cognitions, and parental behaviors were expected to improve in the therapeutic direction. More specifically, adolescents were expected to show a decrease in somatic physical symptoms and catastrophizing thoughts related to pain, as well as an increase in the use of adaptive coping strategies. Finally, parents' personal catastrophic cognitions related to their children's pain and maladaptive parental responses were expected to decrease.

Chapter 2: Method

Recruitment and Participants

Participants were recruited from two gastroenterology specialty clinics in Atlanta, GA. Recruitment focused primarily on patients who were experiencing some form of abdominal pain, additional physical symptoms, and/or functional disability related to their disease. Although the focus of the study was to train skills useful for reducing pain, the study did not exclude patients who did not endorse current disease-related pain or other difficulties, given the potential for their benefitting from components of the curriculum (e.g., coping, parenting skills). Also, given the cyclical nature of the disease, patients can typically expect to experience periods of remission followed by periods of flare-ups. Participants were required to have either diagnosis of CD or UC, at least one parent willing to participate, speak English, have internet access, and have no pervasive developmental delay.

Approximately 300 potential participants who had a diagnosis of IBD were called by the investigators or contacted in person by an assistant during a clinic visit and informed about the study. A large portion of the patients were unable to be reached by phone. For those with whom contact was established, reasons for not participating included the absence of any pain or disease-related difficulties for the adolescent, living too far away from the treatment center, not having enough time/interfering activities, and not being interested in participating. Throughout recruitment, a total of 31 families agreed to participate.

The treatment group consisted of 20 total parent-adolescent dyads. The adolescent girls were between 12 and 17 years of age ($M = 14.2$, $SD = 1.86$) and were 90 % Caucasian. Sixty-

five percent had a diagnosis of CD with the remainder being diagnosed with UC. In addition, 55% had some additional medical diagnosis. Age at diagnosis ranged from 5- to 16-years-old ($M = 11.2$, $SD = 2.89$). Seven of the 20 dyads (35 %) were lost to follow-up and did not complete any post-treatment assessment. Four additional families (31%) were lost at the 6 month follow-up and did not provide these data. All attrition for this group was due to families not being able to be contacted to obtain post-treatment and follow-up data.

The wait-list control group consisted of 11 parent-adolescent dyads. Adolescents were between 11 and 17 years ($M = 14.6$, $SD = 1.86$) and were 91 % Caucasian. Forty-six percent were diagnosed with CD and the remainder with UC. Of these, 36 % had at least one additional medical condition. Age at diagnosis ranged from 2- to 16-years-old ($M = 10.2$, $SD = 4.26$).

Design and Procedure

This investigation utilized a wait-list control group design in order to evaluate the effects of the intervention. Using this design, all participants eventually were provided access to the intervention. The treatment group participated in a one day intervention, followed by a six week web-based component. The wait-list control group began treatment after the treatment group completed the 6-week program.

After approval by a university IRB, approximately four waves of recruitment took place over an 18-month period. Following each recruitment wave, two treatment days occurred, the first for treatment group participants and the second for the wait-list control group. This resulted in four total treatment days for the treatment group participants over 18 months. During each wave, interested families were mailed an information packet which included consent forms, assent forms, and a brief measure to gauge the adolescent's current level of abdominal pain and functional disability. Families also indicated their availability for one of two upcoming treatment

days. Those families only available for the first treatment day were automatically assigned to the treatment group. Families available only for the second treatment day were assigned to the wait-list condition. In rarer cases, if a family indicated availability for both treatment days, they were either randomly assigned into a condition or were placed in the group with fewer people in order to have the group numbers as balanced as possible. Families were unaware of the which experimental condition was associated with availability on one of the two treatment days.

The treatment group completed their pre-treatment assessment immediately prior to attending their treatment day. They were then assessed following the day-long training and subsequent 6-week web based aspect of the treatment, and again at 6-month follow-up. Wait-list control families completed two pre-treatment assessments, at the beginning and the end of the control period which coincided with the treatment group's participation in the 6-week treatment.

The results of these first two assessments for the treatment and wait-list groups provide the data for the between group comparisons, as well as the pre-post within group comparisons for both the treatment and wait-list groups, during this experimental phase of the investigation. In addition, 6-month follow-up data will be presented for the treatment group participants. Following their second baseline assessment, the wait-list group participants also were provided with the treatment. However, since the focus of this investigation is on the effects of receiving versus not receiving the treatment during the experimental phase of the study, the wait-list groups post-treatment and 6-month follow-up data will not be included in this investigation. All of the measures included in the study were administered at each assessment occasion.

Assessment took place using two methods to allow for convenience for the family. Families were given a choice between having measures mailed to them to complete or to have the measures verbally administered over the phone. However, if a family was mailed a packet of

measures and had not returned these to the investigators within the allotted time, the family was contacted and the investigator attempted to schedule a phone interview to collect the data. Phone interviews lasted approximately 30 minutes for each parent and adolescent interviews.

Interviews were conducted by an undergraduate research assistant or graduate student in psychology who was trained by the principal investigator. Interviewer training provided instructions for rapport building, demonstrating sensitivity to participants regarding illness experiences and cultural issues (e.g., ethnicity, SES), verbally administering questionnaires, and providing appropriate answers to participants' questions.

Participants received \$20 gift cards to a local store following the completion of each phone interview for data collection (three or four occasions, for the treatment and wait-list groups, respectively), as well as a \$25 gift certificate at end of the training program if the parent and adolescent each completed five out of six homework web-based assignments, five of six chat sessions, and follow-up data was successfully collected.

Measures

Background Information Form (BIF). This is a brief questionnaire that assesses demographic information (i.e., gender, ethnicity, members of family, family income), diagnosis (Crohn's Disease or ulcerative colitis), number of recently missed school days, and family history of disease.

Abdominal Pain Index (API; parent and child report). The API (Walker et al., 1995) is a 4-item measure of abdominal pain frequency and severity in the past 6 weeks. Questions assess how many days the child had pain, how many times a day the child had pain, the duration of the pain, and the severity of a pain. Responses were reported using 6-, 9-, and 10-point likert scales. The API has demonstrated adequate psychometric properties (Walker et al., 1995). For this

sample, the API had good internal consistency for parent and child reports ($\alpha = .862$ and $\alpha = .833$, respectively).

Functional Disability Inventory (FDI; parent and child report). The FDI (Walker & Greene, 1991) consists of 15 items assessing physical and psychosocial functioning related to physical health during the past 6 weeks. Respondents endorsed items assessing involvement in activities using a 5-point scale ranging from “no trouble” to “impossible”. Walker and Greene (1991) report good test-retest reliability and adequate validity. For this sample, the FDI had a coefficient alpha of .911 for parent report and .835 for child report .

Child Somatization Inventory (CSI; parent and child report). The CSI (Garber, Walker, & Zeman, 1991 ; Walker & Garber, 2003) asks children or parents to rate 35 symptoms on a 5 point scale to indicate how much the child was bothered by each symptom in the past 6 weeks. The scale has demonstrated adequate psychometric properties, correlating significantly with measures of emotional problems. In this sample, the CSI had good internal consistency (parent report: $\alpha = .733$, child report: $\alpha = .936$)

Pain Coping Questionnaire (PCQ; parent and child report). The PCQ (Reid, Gilbert, & McGrath, 1998) is a measure of coping with pain for use with children and adolescents. The measure assesses coping in three higher-order scales: approach (which includes information seeking, problem solving, seeking social support, and positive self-statements), problem-focused avoidance/distraction (which includes behavioral distraction and cognitive distraction) and emotion-focused avoidance (which includes externalizing and internalizing/catastrophizing). The measure has demonstrated good internal consistency (Reid et al., 1998). In this sample, coefficient alphas were .840 (parent) and .970 (child) for the approach scale, .938 (parent) and

.921 (child) for the problem-focused avoidance scale, and .888 (parent) and .841 (child) for the emotion-focused avoidance scale.

Pain Catastrophizing Scale for Children (PCS-C) and Pain Catastrophizing Scale for Parents (PCS-P). The PCS (Sullivan, Bishop, & Pivik, 1995) measures children's cognitions related to their own pain or parents' cognitions related to their children's pain. The scale assesses catastrophizing as a total score, which is made up of three areas: rumination, magnification, and helplessness. The PCS has been found to be reliable (Osman et al., 2000) and to have adequate test-retest reliability (Sullivan et al., 1995). Supportive of its construct validity, PCS scores have been found to be positively associated with catastrophic thoughts in response to an analogue cold pressor task and to contribute significant and unique variance to the prediction of pain intensity during such procedures (Sullivan et al., 1995). In this sample, the PCQ demonstrated good internal consistency ($\alpha = .947$ for parent report, $\alpha = .967$ for child report).

Adult Responses to Children's Symptoms (ARCS; parent report). The ARCS (Van Slyke & Walker, 2006) is a 29-item measure that examines how parents' respond to children experiencing pain. Specific responses are classified into 3 domains: Protect; Minimize; Distract/Monitor. Internal consistency was adequate for all 3 scales, as reported by Van Slyke and Walker (2006). Validity for the Protect Scale has been established; specifically, mothers' scores significantly correlated with their subsequent diary reports of protective responses to their children's abdominal pain (Walker, Levy, & Whitehead, 2006). In this sample, coefficient alphas were .903 for the Protect scale, .582 for the Minimization scale, and .948 for the Distract/Monitor scale. Item analysis for the Minimization scale revealed that no one item would substantially increase the alpha coefficient if removed.

Treatment Overview

As stated above, the intervention day consisted of a one-day skills training program for pain management, disease coping, communication, and effective parenting using a cognitive-behaviorally oriented manualized curriculum. Clinical psychology graduate students and a licensed clinical psychologist served as facilitators for the parent and adolescent sessions during the intervention day. Facilitators were trained to effectively and consistently use the treatment manual to ensure reliable administration.

Following the intervention day, treatment continued via a web-based component of the training program. Participants weekly accessed WebCT, a program used by universities to provide classes and groups with assignments, quizzes, test grades, and other related information. Separate adolescent and parent sites were created, both of which were password protected and only accessible by the individual families and the researchers. Each week participants completed one homework assignment and participated in a 30-minute chat session during which all participants were encouraged to log in to the program at the same designated time and engaged in a live discussion about the homework and other IBD-related issues. The homework assignments and chat sessions were facilitated and monitored by trained research assistants. The web component also provided resources for information on gastrointestinal diseases. The intervention components are described below.

Curriculum: Intervention Day

Parents and adolescents met for brief introductions. A format for the day's activities was presented, as well as an introduction to WebCT. Confidentiality was also reviewed during this time. Parents and adolescents then separated to cover each skill area. Generally, each intervention component followed a similar format, involving the introduction of a new skill,

providing examples of how to implement the skill, encouraging discussion about the application of the skill, and practicing the skills if appropriate. The entire intervention day typically lasted approximately 6 hours.

Introduction. This section included introductions of the group members and facilitators and some ice-breaker activities. Goals for the program were also set.

4 point model, gate control theory of pain, and changing cognitions and behavior. The 4-point treatment model was introduced, with emphasis on how each of these points influence each other. An every day example (e.g., daughter leaves dishes in the sink), acute pain example (e.g., getting an injection), and stomach pain example were used to illustrate the interplay of the four points with each other, with the goal of showing how each point could increase or serve as a domain for intervention to decreasing pain. In addition, the Gate Control Theory of Pain (Melzack & Wall, 1982) was presented to introduce the idea that pain can be influenced by biopsychosocial factors. Strategies were presented for how to change cognitions, such as catastrophizing about mild pain, and how to change overt behavior patterns, such as avoidance of unpleasant responsibilities or providing contingent attention, that may result in unintended reinforcement of pain and disability (Blount et al., 1990).

Relaxation. Progressive muscle relaxation, deep breathing, and imagery were introduced in session as a physiologically based avenue for reducing pain (Powers, 1999). Participants were given CD's of progressive muscle relaxation exercises and access to online videos for home practice.

Coping with pain. The groups explored strategies that are helpful to employ when experiencing pain (Blount et al., 2006). Participants were presented with a pain scenario and a list of possible responses. They were asked to rate the responses as helpful or not helpful on a 5-

point scale. Together, the group identified characteristics of the helpful responses (i.e., distraction) and characteristics of the unhelpful responses (i.e., focusing on the pain). The use of fantasy was introduced and explored as a distraction strategy. Parents were presented with a briefer version of this section than that which was presented to the girls. Both parents and daughters were encouraged to construct a pain thermometer with agreed upon labels for pain intensity, and associated indicators for what the daughter can do (e.g., go to school, go to school nurse, stay home, go to doctor) at each pain level. The purpose of the pain thermometer was to facilitate open communication free of adverse emotional components, such as daughters feeling annoyed at parent's persistent inquiries or parents consistently worrying if their daughter is in pain but acting stoic.

Setting limits (parent group only). Appropriate parenting techniques for adolescent girls and how to set and enforce limits and boundaries were presented. IBD-specific concerns were addressed, including the possibility of lax limit setting or guilt when disciplining their adolescent due to their having IBD, as well as not reinforcing sick-role behavior and/or unintentionally encouraging functional disability (Van Slyke & Walker, 2006).

Communication skills. This session involved the introduction and practice of nonverbal listening skills and active listening skills, as well as contexts in which these skills may prove most useful. I-feel statements and reflective listening were taught (Robin, 1977). I-feel statements take the form of "I feel _____, when you _____, because _____. I want _____." Listener reflection then followed, with the goal of using these skills to define the problem satisfactorily, then resolve the conflict.

Application of listening Skills. The parents and daughters met together to practice the use of nonverbal and verbal communication skills while being coached by one of the facilitators.

Wrap-up, feed-back. Reminders about the homework were given, and any further questions were answered.

Curriculum: Web-based Treatment Component

Web-based psychological interventions have received support for being effective in reducing physical and psychological problems for youth with health problems (Stinson, Wilson, Gill, Yamada, & Holt, 2008). The web-based component of the treatment began the week after the intervention day, and followed the same basic topic format progression as the intervention day.

Week 1: My goals. Participants set short-term and long-term goals they hope to accomplish with the help of the skills they learn throughout treatment.

Week 2: Changing a thought. Participants specified a time that they used a negative thought in response to a situation, how that impacted their feelings, behaviors, and physiology, a positive thought that they could have used, and how the outcome would have been different.

Week 3: Breathing, relaxation, and imagery exercise. Participants practiced their relaxation techniques and reported how many times they used these skills that week, in what situations they used the skills, and whether or not they found the skills helpful for dealing with their pain and other IBD-related problems.

Week 4: Coping with pain (adolescents); limit setting (parents). Adolescents specified what pain-coping strategies they have found most useful, when they use them, and how they were helpful. Parents indicated a recent situation in which limit setting was a problem, as well as what they did right and/or what they could have done differently.

Week 5: Communication skills. Participants specified a recent situation in which they were able to use an “I feel” statement to communicate their feelings, or one in which they could have used an “I feel” statement and how the outcome would have been different.

Week 6: Applying Your skills. Participants were to complete an exercise in which both the parent and daughter specified a conflict that they wish to address, then, using the skills they learned during the intervention day, discussed the issue and tried to employ these skills. They then reported on the result of the conversation, the use of their skills, and the helpfulness of the skills for that situation.

Chapter 3: Results

Consistent with the a priori directional hypotheses, one-tailed tests of significance were used for examining changes in the dependent variables as a result of treatment, with the alpha level set at .05 level. In order to use a consistent standard, one-tailed tests were also used when examining changes in the wait-list control group over time, as well as differences between the groups.

One-way ANOVA analyses were conducted in order to detect any demographic differences between those 13 treatment group participants who provided post-treatment data and the 7 who did not. Results revealed that there were no significant differences between the two groups on any demographic variables. The analyses described below evaluating treatment outcome were performed with participants lost at the post-treatment measurement occasion being excluded from the database. Thus, the sample sizes were 13 and 11 for the treatment and wait-list control groups, respectively, representing those participants who completed two assessments. Nine of the treatment group participants provided 6 month follow-up data. Other methods of handling missing data were considered, including last observation carried forward and mean replacement. However, given the large proportion of participants to which either of these methods would apply (7 of 20 participants; 35%), justification for using either method was not strong and could have resulted in findings that were too conservative and/or too liberal.

Preliminary Analyses

A series of independent samples tests for continuous variables (e.g., adolescent's age, time since diagnosis) and χ^2 for categorical variables (e.g., adolescent's ethnicity, diagnosis type)

were conducted between the treatment and wait-list groups. There were no significant differences between the groups ($p < .05$) on any preliminary demographic information.

Independent sample tests were also performed for all measures at baseline between the two groups. For the primary analyses, no significant differences were present between groups on measures of adolescent abdominal pain or functional disability. For secondary measures of adolescent somatization, adolescent coping, parent and adolescent catastrophizing, and adult responses to children's symptoms, two significant findings were apparent. A significant difference was noted between groups for the Minimization scale of the ARCS, for which the control group ($M = 7.5$, $SD = 4.20$) was higher than the treatment group ($M = 3.7$, $SD = 3.01$; $t = -2.61$, $p = .008$) and thus engaged in minimizing behaviors more often. Also, a significant difference was present on the parent-reported use of distraction by their child ($t = -2.02$, $p = .028$), with the wait-list control ($M = 3.3$, $SD = .71$) engaging in greater use of distraction than the treatment group ($M = 2.7$, $SD = .80$).

Between-Group Comparisons

In order to account for baseline differences between groups, a series of one-way ANCOVAs were also performed using baseline measurements of each variable as the covariate and post-treatment measurements as the outcome. No significant differences existed at post-treatment between the two groups on the primary variables. Regarding secondary variables, Bonferroni corrections were made for each measure to account for the number of comparisons being made. Following these corrections, the treatment group ($M = 3.1$, $SD = .54$) demonstrated higher scores on the parent-reported Approach scale of the PCQ as compared to the control condition ($M = 2.8$, $SD = .43$) at the end of the treatment period, $F(1, 20) = 7.87$, $p = .005$. Large effect size as measured by partial eta squared ($\eta_p^2 = .282$) were noted. Cohen's guidelines

(1988) were used to interpret effect size, which specify .01, .06, and .14 as small, medium, and large effects, respectively.

Within-Group Comparisons

Treatment group. Repeated measures MANOVAs were also used to determine within-group changes for the treatment group from pre- to post-treatment. Table 1 displays additional information about the following results. For primary variables of abdominal pain and functional disability, no significant changes were apparent. In addition, separate analyses were performed with participants who endorsed a zero on baseline levels of parent-reported abdominal pain ($n = 3$) and functional disability ($n = 1$), and adolescent-reported abdominal pain ($n = 2$) and functional disability ($n = 4$) being excluded from the respective analyses. No significant pre- to post-treatment differences were found.

For secondary variables of interest, significant changes over time were noted for some measures following Bonferroni corrections for multiple comparisons. There were significant reductions in parent-reported somatic symptoms from pre- to post-treatment, $F(1, 12) = 7.48, p = .009, \eta_p^2 = .384$, as well as adolescent-reported somatic symptoms, $F(1, 12) = 8.32, p = .007, \eta_p^2 = .410$, both revealing large effect sizes. Parents also reported significant improvement from pre- to post-treatment for their children's use of approach coping strategies, $F(1, 12) = 9.11, p = .006, \eta_p^2 = .432$, and distraction techniques, $F(1, 12) = 6.44, p = .013, \eta_p^2 = .349$. Both revealed large effect sizes. Additionally, parents reported significant reductions in their personal pain catastrophizing cognitions, $F(1, 12) = 3.25, p = .048, \eta_p^2 = .213$.

Changes from the baseline to 6 month follow-up were also examined. At follow-up, parent-reported somatic symptoms continued to be significantly lower than at pre-treatment assessment, $F(1, 8) = 5.47, p = .021, \eta_p^2 = .354$. Additionally, there were significant decreases in

protective behaviors by parents in response to their children's physical symptoms, $F(1, 8) = 7.69, p = .010, \eta_p^2 = .435$, from the pre-treatment assessment to follow-up.

Wait-list group. A one-way repeated measures MANOVA was performed for the wait-list condition to determine whether any significant changes took place on the primary or secondary dependent measures during the interval when the treatment group participated in the intensive day-long treatment and the 6-week web component. Table 2 displays additional information about these two assessment occasions. Significant change in the therapeutic direction was noted from the first to the second assessment for teen-reported use of emotional-avoidance coping strategies, $F(1, 10) = 4.95, p = .027, \eta_p^2 = .355$, and from the first to the second assessment on parents' reports of their use of minimizing behaviors in response to their child's symptoms, $F(1, 10) = 4.68, p = .030, \eta_p^2 = .342$.

Participation in Web Component

The web component of treatment required parents and adolescents to complete six homework assignments and attend six chat sessions. Following treatment, parents and adolescents earned an individual score from 0 to 12 to represent completion of these requirements. For both parents and adolescents, participation ranged from 0 to 12. Adolescents' mean participation was 7.23 ($SD = 3.90$) and parents' mean participation was 5.85 ($SD = 4.38$). Twenty three percent of adolescents participated in zero to three assignments, 23% participated in four to six assignments, 15% participated in seven to nine assignments, and 39% percent participated in 10-12 assignments. For parents, 38% participated in zero to three, 8% participated in four to six, 23% participated in seven to nine, and 31% participated in 10-12 assignments.

Analyses were conducted for exploring the relationship between change over time for the treatment group and participation scores. Accordingly, change scores were created for primary

and secondary dependent variables. Spearman Rank Order Correlations were performed given that the distribution of participation scores was not normal. Results did not reveal any significant correlations between participation and change over time. However, these more exploratory analyses may require more power to detect these effects.

Chapter 4: Discussion

This study is one of the first investigations of the effects of a coping skills training program designed specifically for reducing not only psychological but also physical symptoms in a pediatric patients with IBD. Given the assessment literature in this area which highlights increased psychosocial difficulties for these patients (Engstrom, 1999; Loonen et al., 2004; Mackner et al., 2004), as well as the connection between physical and psychological difficulties (Cunningham & Banez, 2006), this study sought to address this much needed area of research. As hypothesized, several changes in the therapeutic direction were evident for the treatment group from pre- to post-treatment. Parents reported reductions in their own catastrophizing cognitions related to their children's pain. Catastrophizing was targeted directly throughout treatment by training in both cognitive restructuring and pain management skills. Anecdotally, parents tended to endorse catastrophizing thoughts and discuss them more frequently during the one-day intervention and during chat sessions than did adolescents. For adolescents, it is possible that incorporation of these cognitive skills require more face-to-face practice and feedback than was available during the day-long session.

Parents also reported significant increases in their children's use of adaptive coping strategies when their children were in pain. Changes in adolescents' reports of improved coping did not reach significance. It is possible that adolescents are not optimal reporters of coping and/or do not readily recognize changes in their use of coping strategies. Alternatively, it is possible that parents are not fully aware of what strategies their child is using or not using. In

general, both possibilities speak to the need for multi-method reporting when assessing children and adolescents, especially for concepts that may have less tangible components such as coping.

No decreases in abdominal pain or functional disability were found. There are several possible explanations for this. For adolescent reports of abdominal pain trends were in the therapeutic direction, particularly at the 6-month follow-up. However, low statistical power mitigated the likelihood of finding significant reductions in pain following the coping skills intervention. In addition, IBD symptoms tend to be cyclical, with periods of flare-up and remission. Some patients may have been experiencing few symptoms at the onset of the coping skills intervention but entered into a period of flare at the end of treatment, affecting the resulting data. About one-third of patients and/or their parents (31% of treatment group) reported no abdominal pain or little pain at baseline, thus no further improvements were possible. Similarly, many of these patients may have been receiving effective medical interventions for their disorder, thus reducing the likelihood of finding further reductions. There were also low levels of functional disability reported at baseline.

In contrast to the findings for abdominal pain and associated functional disability, both parents and adolescents reported significant reductions in somatization symptoms following treatment. No changes in these symptoms were found for the control group. This suggests that the intervention achieved the intended effect, although that effect was found for a broader set of somatic symptoms beyond just abdominal pain. It is possible that the reduction in somatic symptoms may have represented changes in physical symptoms which were less cyclical in their nature, or which were unaddressed by effective pharmaceutical interventions and other forms of medical care they received from their gastroenterologists. It is also possible that these

somatic symptoms were influenced more by psychological factors than was true for abdominal pain due to IBD.

In terms of post-treatment between-group comparisons, few differences were found. This lack of differences could be due to a variety of factors. As opposed to within-subject analyses where each person serves as their own control and individual differences are not as much of an issue, between-group analyses require more power in order to detect results. Given our reduced sample size due to high rates of attrition, power became a significant limitation in this study. Thus, our ability to detect these between group differences was likely impaired. Further, some differences were found between the groups at the pre-treatment assessment and some changes for the wait-list control group were evident. Given that our groups were small and that they were established based on the schedule convenience of the participant, some differences between groups could be expected. These differences could have affected the observed results and made it more difficult to detect between group differences on some variables.

Six-month follow-up assessment revealed maintained improvements from baseline in somatic symptoms as reported by parents. Also, continued reduction in parents' protective behaviors towards their children when they experienced physical symptoms was apparent. Anecdotaly, we observed that many of the parents who participated in treatment tended to have over-protective and sheltering parenting styles in regard to their child's chronic illness status. It is likely that training in limit setting alerted parents to the potential negative affects of restricting their children's activities or being encouraging of their children's self-imposed restrictions. Both of these undesirable parental behaviors might have provided secondary gain for their children's somatic complaints. Parents were also given "permission" throughout treatment to discipline their adolescent, set normal limits, and allow for their adolescent to engage in the typical age

appropriate developmental process of gaining autonomy. The lack of additional significant benefits from baseline to follow-up suggest that some benefits obtained during the treatment period did not maintain during this 6 month period. Limitations in the design of this study, including infrequent face-to-face contact with participants, varying levels of participation with the homework and web-based components, and further reduced statistical power could have contributed to reduced maintenance.

Limitations to this study should be noted. First and foremost, the lack of true random assignment to groups does not allow us to conclude that improvements for the treatment group were solely due to the intervention. In addition, there were some changes over time for the wait-list group, although these were fewer than were found for the treatment group. The small number of participants per group also limited statistical power and the ability to detect additional effects, including between-group differences. Participation in the web-based component of treatment proved less than ideal. The mean level of participation indicated about a 50-60% adherence rate to this aspect of the intervention. It is possible that weekly phone call reminders to families, a more engaging and interactive web design, or redesigned homework assignments might have improved participation in the homework and web components. Further, although the chat sessions appeared to be enjoyable to participants and provided a source of support and means of building relationships, the facilitators had difficulty maintaining a focus on skills building during the sessions. This was particularly true for the adolescent groups. Thus, these sessions may not have contributed significantly to strengthening skills as was hoped. In general, although web-based interventions are a potentially viable way of providing treatment to different patient groups, they also entail less face-to-face contact with participants and require more effort in order to maintain quality participation in treatment. It is also important to note that the multi-

component nature of the treatment did not allow for a determination of which components of the treatment contributed to the observed effects. Finally, about a third of those who were enrolled in the treatment did not complete post-treatment assessments. It is unclear how their data might have influenced the evaluation of treatment outcome.

Future studies in this area should evaluate the efficacy of this treatment by using a larger sample in the context of a randomized clinical trial. This will likely clarify the effects of the treatment and provide more internal validity for interpreting the results. A larger sample might be attained either by inclusion of adolescent boys with IBD, and/or including adolescents with functional gastrointestinal disorders such as Irritable Bowel Syndrome (IBS). This latter option might be particularly desirable, given our findings about reductions in somatization behaviors. Additionally, treatment evaluation might include cost-benefit analyses to shed light on the validity of utilizing this type of intervention for reducing school absences, extensive medical workups, hospitalizations, and/or exacerbations in somatic symptoms associated with functional versus disease processes. It is possible that one day of contact with the patients is simply too little, and that a second day, or part of day, is necessary to provide feedback, reinforcement, and refinement of the use of the skills that were taught to the patients. This could be conducted prior to transitioning to a web based means for interacting with the adolescents and parents. Finally, a more engaging web-based component should be incorporated for teaching skills and aiding in the application of those skills for families.

In summary, this treatment outcome study contributes to the relatively small percentage of treatment research within the broader field of pediatric psychology (Blount et al., 2008; Roberts, McNeal, Randall, & Roberts, 1996). This pilot intervention was associated with improvements in somatic symptoms, coping processes, and parents' reactions toward their

children who had been diagnosed with IBD. Although abdominal pain did not decrease, it is possible that some changes started in this investigation may prove to be useful on future occasions when abdominal pain is experienced. The inclusion of parents in addition to adolescents represents a more comprehensive biopsychosocial intervention than inclusion of the adolescents alone. Parents are often overlooked, and often suffer along with their children. Recent research in other labs indicates that parents' quality of life is significantly associated with their children's disease processes and quality of life (Greenley & Cunningham, 2009). This suggests that parents are worthy targets of intervention, both for affecting change in their children and for teaching the parents better skills for coping with the demands of having an adolescent with a chronic illness.

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Table 1
Treatment Group Changes from Pre-Treatment to Post-Treatment and 6-Month Follow-Up

	<u>Pre-treatment</u>		<u>Post-treatment</u>		<u>Follow-up</u>		<u>Pre-Post comparisons</u>		<u>Post-Follow up comparisons</u>	
	M1	SD1	M2	SD2	M3	SD3	<i>F</i> 1,2	<i>p</i> 1,2	<i>F</i> 1,3	<i>p</i> 1,3
Adolescent Functioning										
API- Teen	9.96	5.26	8.88	5.92	6.77	5.72	.62	.224	3.12	.054
Parent	10.31	7.19	11.54	6.48	8.10	6.45	.32	.292	.88	.186
FDI- Teen	4.23	4.92	3.23	3.27	4.64	5.20	1.35	.135	.30	.297
Parent	7.69	5.62	6.85	6.26	8.82	11.16	.27	.306	.01	.461
CSI-Teen	16.92	15.28	11.42	9.21	15.00	13.85	8.32	.007**	.69	.213
Parent	17.62	10.35	12.38	9.27	14.32	10.91	7.48	.009**	5.48	.021*
PCQ Approach- Teen	2.89	.72	2.64	.97	2.68	.86	1.38	.133	1.91	.099
Parent	2.59	.76	3.06	.54	2.96	.83	9.11	.006**	1.75	.108
PCQ Distract- Teen	3.18	.54	2.82	1.03	3.53	.58	3.21	.051	.21	.330
Parent	2.72	.80	3.13	.69	3.07	.53	6.44	.013*	.69	.213
PCQ Emot Avoid- Teen	1.60	.48	1.38	.38	1.44	.44	3.63	.042 [■]	.21	.330
Parent	2.17	.64	2.06	.79	1.74	.51	.63	.220	4.78	.027 [■]
PCS- Teen	14.23	11.43	12.54	9.88	8.55	7.30	1.02	.116	2.15	.087
Parent Functioning										
PCS-Parent	19.69	11.17	15.85	6.84	15.82	10.22	3.25	.048*	2.61	.069
ARCS Protect	25.62	8.82	21.35	9.59	20.18	8.64	4.35	.030*	7.69	.010**
Minimize	3.69	3.01	5.08	2.78	4.27	2.90	2.28	.079	.36	.282
Distract/Monitor	21.31	7.03	23.00	6.49	19.32	5.51	1.13	.155	.76	.202

Note. API = Abdominal Pain Index, FDI = Functional Disability Inventory, CSI = Child Somatization Inventory, PCQ Approach = Pain Coping Questionnaire subscale detecting approach coping strategies, PCQ Distraction = Pain Coping Questionnaire subscale (Problem Focused Avoidance) detecting use of distraction techniques, PCQ Emot Avoid = Pain Coping Questionnaire (Emotion Focused Avoidance) detecting catastrophizing, internalizing, and externalizing approaches to coping, PCS = Pain Catastrophizing Scale, ARCS Protect = Adult Responses to Children's Symptoms subscale detecting overly protective responses, ARCS Minimize = Adult Responses to Children's Symptoms subscale detecting minimizing parental responses, ARCS Distract/Monitor = Adult Responses to Children's Symptoms subscale detecting parental use of appropriate distraction and monitoring with child. Asterisks represent significant *p*-values following Bonferroni corrections for secondary variables. * = $p \leq .05$; ** = $p \leq .01$. [■] = *p* value became non-significant following Bonferroni corrections for multiple tests.

Table 2
Changes for the Wait-List Control Group during the Control Period

		<u>Pre-Treatment</u>		<u>Post-Treatment</u>	
		M	SD	M	SD
Adolescent Functioning					
API	Parent	12.40	9.49	10.20	7.02
	Adolescent	11.95	8.33	10.86	6.53
FDI	Parent	9.00	11.31	11.90	15.93
	Adolescent	9.27	11.63	4.00	6.29
CSI	Parent	19.90	11.88	20.50	16.60
	Adolescent	22.00	19.30	17.91	13.35
PCQ					
<i>Approach</i>	Parent	2.97	.32	2.75	.43
	Adolescent	2.87	.97	2.82	.88
<i>Distract</i>	Parent	3.45	.66	2.99	1.02
	Adolescent	3.30	.87	3.63	.72
<i>Emot Avoid</i>	Parent	2.31	.88	2.21	.62
	Adolescent	1.85	.66	1.62	.42
PCS	Adolescent	20.20	15.79	17.90	12.90
Parent Functioning					
PCS	Parent	19.55	11.28	15.20	8.44
ARCS					
<i>Protect</i>	Parent	27.00	14.64	25.60	6.85
		7.40	4.40	5.30	3.40
		25.40	4.55	25.00	5.10

Note. API = Abdominal Pain Index, FDI = Functional Disability Inventory, CSI = Child Somatization Inventory, PCQ Approach = Pain Coping Questionnaire subscale detecting approach coping strategies, PCQ Distract = Pain Coping Questionnaire subscale (Problem Focused Avoidance) detecting use of distraction techniques, PCQ Emot Avoid = Pain Coping Questionnaire (Emotion Focused Avoidance) detecting catastrophizing, internalizing, and externalizing approaches to coping, PCS = Pain Catastrophizing Scale, ARCS Protect = Adult Responses to Children's Symptoms subscale detecting overly protective responses, ARCS Minimize = Adult Responses to Children's Symptoms subscale detecting minimizing parental responses, ARCS Distract/Monitor = Adult Responses to Children's Symptoms subscale detecting parental use of appropriate distraction and monitoring with child. Asterisks represent a significant change from the first to the second pre-treatment assessment; * = $p \leq .05$; ** = $p \leq .01$.