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THE USE OF HABIT REVERSAL TRAINING IN THE TREATMENT OF
TRICHOTILLOMANIA: A SINGLE SUBJECT DESIGN

by
Courtney M. Jones

A Thesis

Submitted in partial fulfillment of the requirements of the
Master of Arts Degree
of
The Graduate School
at
Rowan University
April 30, 2004

Approved by _____
Professor

Date Approved 4/30/04

ABSTRACT

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THE USE OF HABIT REVERSAL TRAINING IN THE TREATMENT OF
TRICHOTILLOMANIA:
A SINGLE SUBJECT DESIGN
2003/04

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The purpose of this study was to explore the effectiveness of self-monitoring and a multicomponent behavioral intervention on the treatment of Trichotillomania (TTM). The subject in this study was a 12-year-old African American female who has demonstrated hair-pulling behavior for several years. The interventions that were implemented were journaling and Habit Reversal Training (HRT). The types of measurements that were used were direct observation, daily logs, and standardized questionnaires. The standardized assessments were the Multidimensional Anxiety Scale for Children (MASC, March, 1998) and the Trichotillomania Severity and Impairment Scales (Swedo et al., 1989). In the study, the introduction of journaling decreased the targeted behavior by 5.79% and HRT decreased the targeted behavior by 34.84%. The standardized assessments showed very little change or worsening of symptoms. Overall, results of this study were consistent with research on habit reversal training which suggests that this technique is successful in decreasing or eliminating hair pulling (Azrin & Nunn, 1973; Rosenbaum & Ayllon, 1981).

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Chapter 1

Literature Review

Trichotillomania (TTM) is defined in the Diagnostic and Statistical Manual IV-Revised (DSM-IV-TR) as an impulse control disorder (American Psychiatric Association, 2000). The major symptom is the compulsive and irresistible urge to pull out one's own hair. Furthermore, the individual experiences an increasing sense of tension immediately before the action and relief when pulling out the hair. In this disorder, hair is most commonly pulled from the scalp. However, other locations have included the eyebrows, eyelashes, and hair on the extremities and pubic area. In a sample of college students, lifetime prevalence of hair pulling ranged from 0.6% to 3.4% (Christenson, Pyle, & Mitchell, 1991). The prevalence of TTM is estimated to be between 2% and 4 % of the general population (Azrin & Nunn, 1977; Stein, Simeon, Cohen, & Hollander, 1995; Swedo et al., 1989). Early studies have estimated the prevalence of childhood hair pulling to be less than 1% (Anderson & Dean, 1956; Mannino & Delgado, 1969; Schachter, 1961).

Chapter one will be divided into several sections in order to further explain TTM. The different theories and empirical research about the causes of TTM will be discussed. Also, treatment options and empirical research about the treatment outcomes will be described.

Etiology

Clinicians and researchers have speculated on the etiology of TTM. Biological issues, such as brain structure, may play a role in the development of this disorder. TTM may also be linked to behavioral issues, which focus more on the maintenance of hair pulling, not on the causes. There have also been some etiological theories based on psychodynamic theory.

Biological

Researchers have hypothesized that TTM has a biological basis. One reason for this hypothesis is the observed similarities between TTM and obsessive-compulsive disorder (OCD). OCD, which is classified in the DSM-IV as an Anxiety Disorder, is defined as a disorder where obsessions or compulsions are severe enough to be time consuming and cause marked distress or significant impairment. The DSM-IV describes obsessions as persistent ideas, thoughts, impulses, or images that are experienced as intrusive and inappropriate. The obsessions must also cause marked anxiety or distress. Compulsions are repetitive behaviors or mental acts. The goal of these acts is not pleasure or gratification, but to decrease anxiety or stress.

Researchers are interested in investigating possible relationships between TTM and OCD because of the similarities in diagnostic symptoms. Both TTM and OCD are characterized by repetitive behaviors over which the individual feels they have little control. The hair pulling behaviors of many individuals with TTM can seem ritualistic much like the compulsions seen in OCD. Furthermore, the increasing tension that occurs prior to hair pulling can be compared to the increasing anxiety experienced with obsessions.

However, most of the studies conducted show more differences than similarities between OCD and TTM (Tukel, Keser, Karali, Olgun & Calikusu, 2001; Stanley, Bell, Wagner, Noe, Borden, & Walters, 1992; Christenson, Mackenzie, & Mitchell, 1991). Two differences that have been found when comparing the two disorders are attention focus and prevalence of the disorder across groups. For example, Christenson et al. (1991) studied 56 female and 4 male adults with chronic hair pulling ranging in age from 18 to 61 years. Results of this study indicated that only fifteen percent of these individuals reported that they are always fully aware of their hair pulling. Additionally, results of a study by Tukel et al (2001) indicated that 15 TTM patients and 25 OCD patients differed in age of onset and gender. More specifically, results indicated that the onset of TTM was significantly earlier and was found mostly in females. Furthermore, individuals diagnosed with TTM and OCD also differ in obsessional symptoms and pleasure from the behavior (Stanley et al., 1992). In the study conducted by Stanley and colleagues (1992), TTM was not associated with obsessions; patients only reported mild difficulties with repetitive thoughts about hair pulling.

In addition to hypotheses about similarities between TTM and OCD, researchers have also spent time studying the brain to see if there were any differences in structure or function between individuals with and without these disorders. Outcomes of such research have found that differences in brain composition may be associated with TTM. Brain structure differences in 10 females with TTM compared to 10 matched women without TTM have been observed on magnetic resonance imaging (MRI) tests (O'Sullivan et al, 1997). The mean age of the women in the TTM group was 31.1 years and 28.5 years for the controls. In this study, the left putamen volume was found to be

significantly smaller in the women with TTM. The putamen is located deep in the center of the brain and helps to control movement and attention. In addition to this study, Swedo et al. (1991) investigated the role of brain composition in TTM. Using positron emission tomography and 18-F-fluorodeoxyglucose, women with TTM were found to have elevated resting cerebral glucose metabolism. Frontal lobe dysfunction was found in a case study by Mittal, O'Jile, Kennedy, and Jimerson (2001). An MRI showed asymmetrical lateral ventricles, mild cerebral atrophy, and ischemic lesions in the right cerebral hemisphere in deep white matter in a 67-year old right-handed male. Along with hair pulling, the subject also had symptoms of fronto-tempora dementia, which included personality changes, decreased language ability, memory loss, confusion, and an inability to follow specific instructions. The researchers speculated that TTM might have resulted from damage to the brain due to the dementing processes.

Besides relationships in brain structure, other biological factors have been investigated as possible causes of TTM. In 1992, Swedo and Leonard described two cases where hair-pulling behavior in children developed after streptococcal infections and ended after the infections were treated. In another study, Keuthen et al. (1997) investigated the relationship between menstruation and hair pulling. A retrospective survey was conducted of fifty-nine women with a mean age of 34.3 years. Participants reported that prior to menstruation, urge intensity as well as urge and hair pulling frequency increased. They also reported a decreased ability to control hair-pulling behavior at this time. These symptoms improved during and immediately after menstruation. The validity of these findings is greatly reduced, however, due to the data being reported retrospectively.

In summary, researchers continue to speculate about the etiological relationship between TTM and biological factors. Part of this speculation is the result of similarities of symptoms between this disorder and OCD. Also noted were differences in brain composition and structure when comparing individuals with and without this hair pulling disorder. Despite these observed relationships and differences, researchers continue to be unclear about the biological causes of TTM.

Behavioral

Behavioral theories suggest that that hair pulling is a form of tension reduction (Azrin & Nunn, 1973). Azrin and Nunn (1973) proposed that this disorder is learned similarly to how other habits are learned. Specifically, the hair pulling is thought to develop as a coping behavior in response to stress and is negatively reinforced by the decrease in anxiety that follows the hair pulling. Some stressors identified by Oranje and colleagues (1986) to be related to hair pulling included school difficulties, death of family members, obesity, or hospitalizations of parents or child. Bhatia et al (1991) organized a study that addressed the psychological aspects of TTM. The sample of 16 females and 8 males ranged from 5 to 36 years of age. They were assessed using detailed psychological, physical, and systemic evaluations. Stressors identified in the cases included disharmony among parents (25%), stress of examination and failure (20.9%), overprotection (4.2%), strictness of parents or teachers (8.3%), death, illness or separation from parents (12.5%), and rivalry with siblings, boredom, or negligence (8.3%). Chang, Lee, Chiang, and Lu (1991) also developed a study to understand the clinical characteristics of TTM. Sixteen males and 20 females, who ranged in age from 2 to 42 years, met the DSM III-R criteria for TTM. Stressful life events were identified in

many of these patients who were assessed using clinical interviews. Academic problems were identified in 66.7%, parent-child conflicts were identified in 11.1%, and a change of environment was found in 2.8%. There was no significant stress found in 19.4% of these individuals.

Along with tension reduction, response covariation has been hypothesized as another etiological factor. Altman, Grahs, and Friman (1982) treated TTM and a possibly covarying behavior. The subject in this study was a three-year-old typical female. On rare occasions, the child was observed by her parents pulling her hair while she appeared to be asleep as she simultaneously sucked her thumb. This behavior was mostly unobserved, however, but her parents would note large amounts of hair on her bed and an increased bald area on her head. Since the hair pulling occurred privately, researchers used a reversal design in which they treated the thumb sucking, the presumably covarying behavior. In this case, the successful treatment of thumb sucking eliminated the hair pulling.

Psychodynamic/Family Issues

Dysfunctional familial attachments and relationships have long been discussed as precipitating factors for TTM. Specifically, the mother-child bond has been the focus of numerous studies (Buxbaum, 1960; Langford, 1955). Research suggests that ruptures in this bond and emotional deprivation may be linked to the disorder (Chauhan, Jain, & Dhir, 1985). In a study of seven individuals with hair pulling as the chief complaint, Chauhan et al. (1985) found that five of the individuals demonstrated disruptions in this attachment as assessed by a psychiatric evaluation and detailed accounts of personal and

family history. The researchers went on to speculate that there is an increased risk to develop TTM when the family atmosphere is dominated by neurotic personalities.

There may also be a link between TTM and childhood trauma (Lochner et al., 2002). In this study, childhood trauma was assessed in 36 individuals with TTM, 74 with OCD, and 31 healthy controls. Incidence of childhood trauma was significantly higher in those individuals with OCD and TTM. These incidents included physical abuse and emotional neglect. Actual or threatened object loss was found to be common in TTM, which included the death of a sibling, illness of a parent, temporary moves from significant relatives, and the birth of a sibling (Greenberg & Sarner, 1965). This correlation was found in 9 of 16 individuals with TTM.

Buxbaum (1960) reported on two cases where young females, ages 6 and 3, developed hair pulling behavior after a misunderstood traumatic experience regarding genital areas. In both cases, Buxbaum used talk and play therapy and obtained detailed family histories in order to identify precipitating factors to hair pulling. Both girls had the opportunity to view their parents' genitals on numerous occasions at an early age. The 6 year old saw her mothers' genitals while she was menstruating, which she mistaken as being injured. The 3 year old viewed her father's genitals, which were indeed injured; his genitals had a tumor. Buxbaum reported that she assumed that these traumatic experiences caused the hair-pulling behavior because the symptoms stopped after the experiences were discussed and clarified. This research was primarily based on self and parental reports. In this study, Buxbaum did not report the use of standardized assessment measures.

Again, there is no conclusive evidence of the relationship between psychodynamic/ family issues and TTM. Dysfunctional familial relationships as well as childhood trauma seemed to be linked to TTM. However, the association between these factors and TTM symptoms does not necessarily mean the relationship is causal. Furthermore, much of the data is based on retrospective self-reports.

Treatment

Few well-controlled outcome studies have been conducted on the treatment of TTM. The results of these studies are conflicting depending on the intervention used, the comorbid disorders, and duration of hair pulling behavior. Most often, there seems short-term improvement and long-term gains are either not investigated or not achieved. Treatment options for TTM are pharmacotherapy, behavior therapy, and hypnosis.

Pharmacotherapy

Studies that focus on the efficacy of medicinal treatments for TTM are infrequent and the results are variable. Some of the most frequently mentioned medications that have been used to treat this disorder include clomipramine, fluoxetine, fluvoxamine, desipramine, and nositol.

Of the few studies that have been conducted, many involve the use of clomipramine, which is a serotonin reuptake inhibitor (SRI), and fluoxetine, a selective serotonin reuptake inhibitor (SSRI). These medications have been investigated because their effectiveness in treating OCD (Flament et al., 1985; Leonard et al., 1989) and the suspected link between OCD and TTM. Researchers often compare the efficacy of these medications to other treatments. For example, Cohen and colleagues (1995) compared the outcomes of treatment with clomipramine, psychotherapy, behavior therapy, and

fluoxetine. Data was collected from 123 individuals with TTM, 21 of which were treated with clomipramine. Researchers reported a limited treatment response to clomipramine when being compared to psychotherapy, behavior therapy, and fluoxetine. Iancu, Weizman, Kindler, Sasson, and Zohar (1996) also compared the efficacy of clomipramine, fluoxetine, and fluvoxamine. Eleven women and one man, ranging in age from 14 to 42 years, were assessed by the frequency of hair pulling, quantity of hair pulled, and severity of depilation at the hair pulling sites. Nine of these patients relapsed by the ninth week of treatment, after an initial improvement. Three of the participants did not respond at all. Treatment using clomipramine, fluoxetine, and fluvoxamine was shown to have positive short-term outcomes but poor long-term results in these individuals diagnosed with TTM.

Although clomipramine has not demonstrated long-term success in some studies, (Iancu, Weizman, Kindler, Sasson, & Zohar, 1996) the majority of studies do indicate that it is more beneficial than not implementing any treatment to decrease hair-pulling behavior (Ninan, Rothbaum, Marsteller, Knight, & Eccard, 2000). Ninan and colleagues (2000) investigated the role of clomipramine and a placebo in decreasing the symptoms of TTM. Six individuals with a mean age of 33.38 and an average of 20.62 years of hair pulling were given low doses of clomipramine. Four of the six individuals responded to the treatment but were not symptom free. Those given a placebo were reported to be minimally improved or showed no change at all. The differences in the decrease of TTM symptoms between the clomipramine and the placebo were not statistically significant, however.

Supporting these results, a survey conducted by Cohen and colleagues (1995) also reported limited treatment response to clomipramine when being compared to psychotherapy, behavior therapy, and fluoxetine. This data was collected from 123 individuals with TTM, 21 of which were treated with clomipramine. The effectiveness of clomipramine was compared to desipramine, a tricyclic antidepressant, in 13 women with severe TTM (Swedo et al., 1989). Women reported a decreased urge and frequency of hair pulling behavior along with an increased ability to resist this urge during treatment with clomipramine but not with desipramine.

Besides clomipramine, fluoxetine has also shown to be effective in decreasing TTM symptoms. A case report describing a 25-year-old female with TTM and a trichobezoar (hair ball) demonstrated the effectiveness of fluoxetine when combined with psychotherapy. After being treated with daily doses of the SSRI, she reported decreased hair pulling and improved mood (Bouwer & Stein, 1998). As previously mentioned, a survey conducted of 123 individuals, 93% of whom were female, also reported the effects of fluoxetine treatment (Cohen et al., 1995). Sixteen percent were treated with fluoxetine and reported limited treatment response when being compared to psychotherapy, behavior therapy, and clomipramine. Fluoxetine was shown to have positive short-term effects but poor long-term effects, along with clomipramine and fluvoxamine (Ianco et al, 1996). Three of six participants who were being treated with fluoxetine relapsed.

Positive short-term effects with limited or no long-term improvement seems to be common with medicinal treatment of TTM. Fluvoxamine showed effectiveness when used for short periods of time (Christenson et al., 1998). This study consisted of nineteen

individuals with TTM, 17 of which were women, with a mean age of 34.8 years. Most of these participants had other psychiatric diagnoses such as major depression, panic disorder, simple phobia, generalized anxiety disorder, social phobia, undifferentiated somatization disorder, adjustment disorder, alcohol abuse, or hallucinogen abuse. Results showed a moderate short-term reduction in hair pulling behavior. A survey was conducted to rate the loss of efficacy over time in 38 TTM patients receiving various medications (Keuthen et al., 2001). These medications were fluoxetine, fluvoxamine, clomipramine, paroxetine, venlafaxine, nefazodone, lithium, and sertraline. Medications were found to be helpful at first but lost their efficacy in 34.2% of individuals and 65.8% reported the effectiveness remained stable over time. Researchers did not specify which medications remained stable and which ones lost their effectiveness, however. An extensive study conducted by Boughn and Holdom (2002) seemed to summarize the usefulness of the several treatment options for TTM. Forty-four women with TTM were studied to analyze the efficacy of various treatments as perceived by the women who took them. The treatments that were compared were pharmacotherapy, psychotherapy, and behavior modification. Seventy-seven percent of these women had used medication to treat either TTM or another comorbid disorder such as depression or anxiety. These drugs included buspar, xanax, lithium, klonopin, valium, St. John's Wart, wellbutrin, pamelor, zyprexa, desyrel, effexor, or a combination of these drugs. Only 6% of the women reported long-term effectiveness with these medications and 38% reported no positive effects with any of the medications.

There have been other medicinal treatments used to treat TTM. For example, inositol, a simple isomer of glucose, proved to be successful in decreasing hair pulling

and skin picking in three women (Seedat, Stein, & Harvey, 2001). Fluvoxamine, along with risperidone, decreased bulimic and hair pulling symptoms in a case study of 27-year-old female (Gabriel, 2001). In this case, when fluvoxamine was administered alone, both sets of symptoms worsened.

Medications are often utilized in conjunction with behavioral treatments in order to increase effectiveness. For example, a case study of a 17-year-old female with TTM demonstrated the efficacy of fluoxetine versus clomipramine (Minichiello, O'Sullivan, Osgood-Hynes, & Baer, 1994). The subject reported a 25% reduction in pulling hair from her eyebrows, eyelashes, and scalp after beginning fluoxetine treatment. Her treatment was later changed to clomipramine and a behavioral treatment was introduced, which resulted in complete control over her hair pulling behavior in two weeks. In another study, fluoxetine, along with behavioral techniques, also showed promising results in a case study of a 38-year-old Caucasian woman who had been pulling hair from her scalp since the age of 12 (Christenson & Crow, 1996). She also had a diagnosis of major depressive disorder and generalized anxiety disorder. In this same case, fluoxetine was discontinued after side effects that may have been caused by the drug had occurred. paroxetine was then introduced, which improved her depressive symptoms but not the hair pulling behavior. Clonazepam was then added and no hair pulling behavior was reported for 8 months.

In summary, studies that focus on the efficacy of medicinal treatments for TTM are infrequent and the results are variable. Based on the research conducted, short-term improvements occur more frequently than long-term improvements. Furthermore, TTM

symptoms seem to be more greatly reduced when medicinal treatments are combined with other interventions such as a behavioral therapy.

Hypnosis

Hypnosis has also been used as a treatment for TTM but the lack of large controlled studies makes it difficult to determine its overall effectiveness (Fabbri & Dy, 1974; Spiegel & Spiegel, 1978; Barabasz, 1987). Methods of trance induction, symptom targets, and specific hypnotic suggestions are determined by the theoretical orientation of the clinician (Rothbaum & Ninan, 1999). There is no evidence that specific trance inductions or hypnotic suggestions result in different outcomes for hair pulling, however (Barabasz, 1987).

Several studies have proven that hypnosis can effectively decrease hair pulling behavior. Barabasz (1987) conducted a study to test the effectiveness of hypnosis, along with a restricted environmental stimulation (REST) technique. The goal of this treatment is to increase awareness and control of the hair pulling behavior. Participants in this research were four females with a mean age of 24.5 years and an average of 4.8 years of symptoms. The women reclined in chairs in a REST chamber, which was dark and soothing, and were given 2 to 4 inductions. Initially, all participants had stopped pulling their hair; one participant had relapsed by a 1-year follow-up.

Fabbri and Dy (1974) investigated the use of hypnosis along with a behavioral treatment, habit substitution, in the reduction of TTM symptoms. The goals of this treatment were to decrease anxiety and substitute alternative behaviors for the hair pulling. Only two participants were included, a male and a female, both 21 years of age with a duration of 4 to 5 years of hair pulling. The interventions included autohypnosis

training, hypnotic suggestion, muscle relaxation training, and breathing exercises. Ten weeks after the end of treatment, the woman's hair pulling behavior was completely eliminated, the man's was reduced by 90%.

In 1987, Spiegel and Spiegel used restructuring autohypnotic techniques to treat TTM in 2 individuals. The participants were induced to consider their hair pulling as an abusive to their bodies and to reaffirm their commitment to take care of their bodies. Also, they were suggested to convert their impulses to pull their hair into more beneficial impulses to stroke or caress it. One participant was a 23-year-old woman with 3 years of TTM symptoms; the other was a woman in her late 20s with 1 year of TTM symptoms. The former, who was treated with hypnosis, trifluoperazine hydrochloride, and group therapy, reported a 90% reduction in her symptoms. The latter was treated only with hypnosis and reported a complete cessation of hair pulling.

Investigations on the efficacy of hypnosis in treating TTM are generally infrequent. The few that were conducted involved extremely small samples or case studies which make its effectiveness difficult to determine. Furthermore, the techniques involved in hypnosis vary depending on the theoretical orientation of the clinician, which complicates the comparison of outcomes.

Behavioral

Behavior treatments for TTM have also demonstrated positive effects in some cases. Habit reversal, developed by Azrin and Nunn (1973), seems to be the most promising behavioral intervention (Friman, Finney & Christophersen, 1984; Peterson, Campise, & Azrin, 1994; Rosenbaum & Allyon, 1981). Cognitive behavioral treatment (Ninan, Rothbaum, Marsteller, Knight, & Eccard, 2000; Rothbaum & Ninan, 1999;

Lerner, Franklin, Meadows, Hembree, & Foa, 1998) is also a promising intervention. Another noted behavioral intervention is attention reflection along with punishment (Altman et al., 1982).

Forty-four women with TTM were studied to analyze the efficacy of various treatments as perceived by the women who were treated (Boughn & Holdom, 2002). The treatments that were compared were pharmacotherapy, psychotherapy, and behavior modification. The behavior modification techniques that were identified included keeping their hands busy, keeping themselves busy, using distraction techniques (e.g., gardening), or using barrier methods (e.g., gloves). Of the 44 women studied, 73% of them had used behavior modification, 56% of which found it effective.

Attention-reflection has been used to treat symptoms of TTM. In this technique, high amounts of attention are paid to appropriate behaviors and negative behaviors are ignored (Altman, Grahs, & Friman, 1982). In this study, a 3-year-old female displayed hair-pulling behavior since she was 4 months old and frequently sucked her thumb while pulling her hair. Attention reflection, along with punishment of thumb sucking proved to be effective in significantly decreasing both behaviors after 20 months of follow up phone calls.

Negative practice is also known as the beta method of extinction. It is a technique based on well-established principles of learning. Negative practice calls for an individual to consciously and voluntarily produce the unwanted behavior when the individual is not compelled to act. The rationale for the success of negative practice is that repeated voluntary practice gradually weakens the involuntary power of the compulsion (Smith, 1957). In a comparison of habit reversal training and negative practice, habit reversal

training was twice as effective as negative practice in decreasing the average percentage of hair pulling episodes, percentage of individuals stopping hair pulling completely or almost completely at all follow ups (Azrin, Nunn, & Frantz, 1980). In this study, participants were 10 males and 24 females, with a mean age of 28 years and an average duration of 12 years of hair pulling behavior.

Habit reversal training (HRT) (Azrin & Nunn, 1973) uses several major components and techniques to eliminate hair pulling: (1) Competing Reaction Training: The individual learns an unnoticeable competing response of grasping or clenching hands for 3 minutes whenever hair pulling has occurred or is likely to; (2) Awareness Training: The individual learns to be aware of the specific movements involved in the hair pulling, especially by observing self in the mirror; (3) Identifying Response Precursors: The individual learns specific behaviors that are precursors to the hair pulling such as touching the face or straightening the hair; (4) Identifying Habit Prone Situations: The individual learns specific situations that lead to hair pulling; (5) Relaxation Training: The individual is taught how to relax by deep regular breathing and postural adjustment; (6) Prevention Training: The person with TTM practices the competing reaction for 3 minutes; (7) Habit Interruption: The individual practices using the competing grasping or clenching reaction to interrupt the act of hair pulling immediately; (8) Positive Attention (Overcorrection): The individual practices positive hair care such as combing or brushing her hair; (9) Daily Practice of Competing Reaction: The individual practices the competing reaction before a mirror at home on a scheduled basis to be assured of the inconspicuousness of the competing reaction; (10) Self-recording: She records each instance of hair pulling and each strong compulsion to hair pull, on a recording chart to

provide greater awareness and feedback for progress; (11) Display of Improvement: The individual begins to seek out situation that were avoided because of her hair pulling which will provide reinforcement for her efforts at control; (12) Social Support: A significant other is present at the end of the training and will be taught how to encourage and remind the person to stop pulling her hair; and (13) Annoyance Review: At the start of the training, the individual lists and discuss negative aspects of hair pulling. This will help increase motivation for treatment.

Habit reversal training was reported to be successful in eliminating mild TTM symptoms in 4 individuals within 3 weeks (Rosenbaum & Ayllon, 1981). These results continued throughout a 6 and 12-month follow up period. Azrin and Nunn (1973) used this technique to “virtually eliminate” habits in 12 participants and gains were reportedly maintained throughout a 5-month follow up period. Only one of these individuals, however, was diagnosed with TTM.

Rothbaum and Ninan (1999) completed an abbreviated manual for the cognitive-behavioral treatment (CBT) of TTM, which was adapted from Rothbaum (1992). This program requires nine 45-minute treatment sessions. The individual is taught habit reversal, stimulus control, and stress management techniques in order to decrease hair-pulling behavior. Stimulus control is used to interfere with or prevent pulling or to decrease opportunities to pull the hair. Some techniques that may be used include wearing rubbing fingertips or bandages, covering the hair, exercising regularly, or keeping the hands busy. Stress management techniques include deep muscle relaxation and breathing control. Rothbaum (1992) reported on a pilot study on 2 individuals utilizing this cognitive behavioral treatment package. Data was gathered pre- and post-

treatment using the Beck Depression Inventory (1979), and a TTM Questionnaire developed by the National Institute of Mental Health (NIMH-TQ). The mean scores on both measures were reduced on the post-treatment assessments. This brief clinical report failed to specify characteristics of the two individuals involved.

When behavioral treatments were compared to pharmacotherapy, behavior therapy, specifically, cognitive-behavior therapy was more effective than medication (Ninan et al, 2000). This study utilized 16 people with TTM, 81.3% being women, to compare the efficacy of CBT, clomipramine, and a placebo.

Overall, there have been studies that found behavioral treatment more efficacious when combined with medicinal interventions. A case study of a 17-year-old female with TTM being treatment clomipramine and behavioral treatment resulted in complete control over her hair pulling behavior in 2 weeks (Minichiello et al., 1994). In this case, habit-inducing situations and response precursors were identified. The individual was also trained in relaxation techniques to utilize whenever she experienced anxiety or stress. Habit reversal, along with medication, also showed promising results in a case study of a 38-year-old Caucasian woman who had been pulling hair from her scalp since the age of 12 (Christenson & Crow, 1996). She also had a diagnosis of major depressive disorder and generalized anxiety disorder. Keuthen et al (1998) found that individuals who were treated with medication and behavior modification showed a greater reduction on the Massachusetts General Hospital Hair Pulling Severity Scale than those who received only one form of treatment.

Chapter 2

Method

Participant

Jasmine is a 12-year-old African American female who meets the DSM IV-TR criteria for trichotillomania. She is unable to resist the urge to pull out hair from her scalp. Upon observation, Jasmine has been seen lifting her hand up to her hair, grasping several strands with her fingers, and pulling the hair so that it breaks. Jasmine has also been observed smelling the hair after she pulls it out. Hair pulling seems to occur more frequently in times of high anxiety or stress but does occur during times of relaxation or distraction.

Hair pulling has impacted on Jasmine's functioning. Because of the hair pulling, she has areas in the front and back of her scalp where the hair is extremely short and broken. Jasmine has low self-esteem because of the appearance of her hair.

Measures and Materials

The types of measurements that will be used are direct observation, daily logs, and standardized questionnaires.

Direct Observation. The target in this study is the act of pulling out the hair. Hair pulling is defined as fingers making contact with hair and pulling hair. Pulling is defined as forceful movement of hand and/or arm against hair. This will be scored whether or not hair is pulled out. One episode (i.e., frequency of one) is defined as beginning with hand

higher than shoulder and ends with hand moving below shoulder level. Fingers contacting hair without pulling will not be counted as hair pulling.

Direct observation will be completed in the school setting by a classroom aide and at home by Jasmine's mother. Jasmine will be unobtrusively observed in school for a period of 40 minutes during math class. Math class was chosen because Jasmine's frustration seems to be highest during this period. Also, according to her grades and self-report, Jasmine is having difficulty with this subject. At home, Jasmine's mother will observe her while she is completing her homework, while she is watching television, and during periods of agitation. Jasmine will be observed for the same duration every day and at the same time of day at home.

Both the classroom aide and her mother will participate in training to clearly identify target behaviors. The number of times Jasmine pulls her hair during the observation period as well as the duration of each hair pulling episode will be recorded. At home, her mother will also record the amount of time spent on the activity.

Daily Logs. Jasmine will also complete daily logs of her feelings immediately before and after homework. This will begin after the baseline period to avoid having an effect on the target behavior. Since Jasmine is only 11 years old, her reports will consist of very brief (1-3 sentences) statements of how she is feeling. Jasmine will be prompted with "Tell me what you are thinking and feeling right now." Jasmine will also be given a "feelings list" with pictures to help her identify her emotions. This list will be reviewed with Jasmine so that she will have a good understanding of each feeling.

Standardized Measures. Jasmine will complete two standardized assessment measures at the beginning and end of the study. The Multidimensional Anxiety Scale for

Children (MASC; March & Parker, 1997) is a 39-item 4-point Likert scale self-report scale that assesses anxiety. This scale has good test-retest and internal consistency reliability. The Cronbach's alpha coefficient for internal reliability for the MASC Total Anxiety scale is 0.876. The intraclass correlation coefficient for test-retest reliability for the MASC Total Anxiety scale is 0.933 ($p < 0.05$). Furthermore, the MASC has good construct validity and high discriminate validity.

The other standardized measure is the Trichotillomania Severity and Impairment Scales (Swedo et al., 1989). This instrument yields a severity score by (1) combining the 0-5 ratings on 5 questions and (2) an impairment score based on ratings of damage from hair pulling, time spent hair pulling or concealing damage, and ability to control pulling. The scores are based primarily on self-report with clinical corroboration based on degree of hair loss. Although detailed psychometric information is not available, the measure has been sensitive to change in symptoms with treatment (Swedo et al., 1989).

Experimental Design

A multiple baseline design across settings will be used in this study. The first phases will be baseline in which hair pulling will be observed and recorded. The second phase, self-monitoring, consists of the daily logs. The third phase will be habit reversal training. The baseline and self-monitoring phases will contain a minimum of five points each. The next phase will be introduced when the data are stable. The introduction of the phases across settings will be separated by at least three points. The habit reversal training will be used for a minimum of 10 days or until the behavior is stable if longer than 10 days.

Independent Manipulation

Habit reversal training (Azrin & Nunn, 1973, 1977): This technique for eliminating hair pulling consists of several major components:

(1) Competing Reaction Training: Jasmine will learn a an unnoticeable competing response of grasping or clenching her hands for 3 minutes whenever hair pulling has occurred or is likely to occur

(2) Awareness Training: Jasmine will learn to be aware of the specific movements involved in the hair pulling, especially by observing herself in the mirror

(3) Identifying Response Precursors: Jasmine will learn specific behaviors that are precursors to the hair pulling such as touching her face or straightening her hair

(4) Identifying Habit Prone Situations: Jasmine will learn specific situations that lead to hair pulling

(5) Relaxation Training: Jasmine will be taught how to relax by deep regular breathing and postural adjustment

(6) Prevention Training: She will practice the competing reaction for 3 minutes

(7) Habit Interruption: Jasmine will practice using the competing grasping or clenching reaction to interrupt the act of hair pulling immediately

(8) Positive Attention (Overcorrection): Jasmine will practice positive hair care such as combing or brushing her hair

(9) Daily Practice of Competing Reaction: Jasmine will practice the competing reaction before a mirror at home on a scheduled basis to be assured of the inconspicuousness of the competing reaction

(10) Self-recording: She will record each instance of hair pulling and each strong compulsion to hair pull, on a recording chart to provide greater awareness and feedback for progress

(11) Display of Improvement: Jasmine will begin to seek out situation that were avoided because of her hair pulling which will provide reinforcement for her efforts at control

(12) Social Support: Her mother will be present at the end of the training and will be taught how to encourage and remind the person to stop pulling her hair

(13) Annoyance Review: At the start of the training, Jasmine will list and discuss negative aspects of hair pulling. This will help increase motivation for treatment.

Procedure

After Jasmine's mother provided informed consent, Jasmine was asked to provide assent. She was then given the MASC to complete. Jasmine's mother and the classroom aide then began data collection. The investigator collected the data sheets on a weekly basis. The daily logs were introduced when the data was stable in one setting. After the third day, daily logs were introduced in the other setting.

When data was stable in both settings, the investigator began habit reversal training with Jasmine. All components of the intervention were taught at the first session and each component was reviewed at all other sessions. After five days, if the data was stable in the first setting, the intervention was introduced in the other setting.

Data Analysis

Data on hair pulling was summarized as rate and graphed on a daily basis in each setting. Visual inspection of these data determined the effectiveness of the treatment approach.

Chapter 3

Results

Baseline

Data was collected from two settings: home and school. In school, Jasmine did not display any hair pulling behavior during the observation period. This is a result of it being the beginning of the school year and Jasmine and her mother had decided that Jasmine would wear a wig to school in order to increase her self-esteem. At home, Jasmine's rate of hair pulling averaged 5.18 times per 40-minute interval during the baseline phase of this study. This phase lasted for a period of 11 sessions. Data is depicted visually in Figure 1.

Journaling

The second phase of the study, journaling, was implemented at home on day 16. Average number of hair pulling incidents was 4.88 times per 40-minute period. Data for this phase was collected for 8 sessions. This rate is a 5.79% decrease from the baseline average of 5.18 incidents of the target behavior per 40-minute period. Data is shown in Figure 1.

Journaling was not introduced in school. Jasmine continued to wear a wig and the frequency of hair pulling behavior in school remained at 0 for 8 sessions.

Habit Reversal Training

Habit reversal training was implemented on day 24 as the third phase of the study. Data was collected for a period of 11 sessions. Jasmine's hair pulling during this phase

averaged 3.18 incidents per 40-minute period, a 34.84% decrease from phase 2 of the study. There was a 38.61% reduction in the total average of hair pulling from the baseline period to the end of the study. This data is depicted visually in Figure 1.

Standardized Assessments

Jasmine was administered the Multidimensional Anxiety Scale for Children (MASC; March & Parker, 1997) and the Trichotillomania Severity and Impairment Scales (Swedo et al., 1989) before treatment began to gain baseline data and at the end of treatment.

Baseline data. The MASC converts the raw data scores to T-scores, which have a mean of 50 and a standard deviation of 10. Higher T-scores on this assessment suggest that the client suffers from the set of symptoms and low scores suggest that the client does not suffer from the set of symptoms. Jasmine's T-scores are noted in parentheses after each sub-scale.

On the MASC, many of Jasmine's scores were in the average range. Jasmine's T-scores on the "harm avoidance" anxiety scale, which contained sub-scales to assess perfectionism (43) and anxious coping (50), were either average or slightly below average. These scores suggest that Jasmine is not overly concerned with disappointing authority figures or making sure things are done perfectly. Her T-score was also average on the tense/restless subscale (45) of the "physical symptoms" anxiety scale. Within this scale, Jasmine T-score was slightly above average on the somatic/autonomic subscale (59), which may suggest that Jasmine shows bodily signs of anxiety. Jasmine tested above average in both humiliation/rejection (59) and performance fears (75), in the "social anxiety" scale. Jasmine tested above average on the "separation/panic" anxiety

scale (57), which suggests she may report feeling afraid when she is alone or in unknown settings. With this baseline data, Jasmine did not score high on the inconsistency index, which shows that she responding to the items on the assessment consistently. Jasmine's MASC baseline scores are depicted in Figure 2.

The Trichotillomania Severity and Impairment Scales yields a severity score based on 5 questions rated from 0 to 5 and an impairment score based on ratings of damage from hair pulling, time spent hair pulling or concealing damage, and ability to control pulling. On the assessment, Jasmine scored in the moderate/severe impairment range. This indicates that the pulling causes significant in many areas of her life.

Post-test data. Upon the completion of this study, Jasmine completed the MASC and the Trichotillomania Severity and Impairment Scales again in order to gain comparison data. Jasmynes' scores differed slightly in the "physical symptoms" anxiety scale. Her T-score in the tense/restless subscale increased to 56 from her baseline score. The somatic/autonomic subscale T-score remained the same at 59. Once again, Jasmine tested slightly below average in the perfectionism subscale (43) of the "harm avoidance" anxiety scale and slightly above average on the anxious coping subscale. Jasmine's most problematic area seems to be in the "social anxiety" scale of the MASC. She scored above average on subscales humiliation/rejection (57) and performance fears (75), which were similar to her baseline scores. Jasmine's score was elevated in the separation/panic scale as well. Once again, Jasmine did not score high on the inconsistency index, which shows that she responding to the items on the assessment consistently. Jasmine's MASC post-test scores are depicted in Figure 2.

Jasmine's scores on the Trichotillomania Severity and Impairment Scales did not differ significantly from her baseline scores. She scored in the lower range of "moderate/severe impairment".

Chapter 4

Discussion

In general, the implementation of journaling and HRT seemed to decrease hair pulling behavior in Jasmine, which is consistent with research that states that HRT is effective in decreasing or eliminating symptoms of TTM (Azrin & Nunn, 1973). In the study, the introduction of journaling decreased the targeted behavior by 5.79% and HRT by 34.84% compared to the previous phase. On the MASC, Jasmine's total T-scores on the "physical symptoms" and "harm avoidance" anxiety scales increased from baseline to posttest. The increase in self-reported physical symptoms may demonstrate Jasmine's reaction to being assessed. The increase on the "harm avoidance" scale may be a result of Jasmine's extra effort (perfectionism) to decrease her hair pulling behavior. Her T-score on the "social anxiety" scale decreased from the pre- to post-test suggesting that Jasmine may feel more comfortable in social settings resulting from wearing a wig or learning the behavioral techniques. Jasmine's score on the Trichotillomania Severity and Impairment Scales decreased slightly from baseline.

At home, direct observation data, which was collected by Jasmine's mother, showed some decrease in hair pulling behavior. As previously reported, the introduction of journaling at home decreased hair pulling by 5.79%. This slight reduction could indicate that Jasmine may have felt less anxious or may have been distracted from pulling her hair. Also, the decrease may have been related to promptings from her mother to keep her hands out of her hair or her mother observing her while she completed her

homework. Both of which do not occur under normal circumstances. This data supports findings that relaxation techniques are partially effective in decreasing symptoms of TTM (De Luca & Holborn, 1984).

When HRT was introduced, Jasmine's hair pulling behavior decreased 38.61% from baseline and 34.84% from phase 2. Once again, this difference may be related to promptings from her mother to keep her hands out of her hair or her mother observing her while she completed her homework. These findings replicate existing literature that HRT is an effective treatment form TTM (Azrin & Nunn, 1973; Rosenbaum & Ayllon, 1981).

The self-report data from the MASC and the Trichotillomania Severity and Impairment Scales showed hardly any change from baseline or a worsening of symptoms. This lack of change in scores may be related to the content of sessions. Techniques for decreasing Jasmine's anxiety were not addressed; learning and utilizing the steps of HRT was the focus.

This study was initially planned to use a multiple baseline design. Interventions were to be employed in two different settings: home and school. This design was unable to be implemented due to unforeseen circumstances. Jasmine began wearing a wig to school as a result of extreme embarrassment of the appearance of her hair. She had been recently transferred to a new school and feared that her new peer group would tease her. All hair pulling stopped in school when Jasmine began wearing the wig. She reported fearing that her peers would figure out that she was wearing a wig and would tease her. Consequently, the presented intervention techniques, journaling and habit reversal training, were only introduced in the home.

The findings in this study correlate with previous research on habit reversal training (Azrin & Nunn, 1973; Rosenbaum & Ayllon, 1981). Existing literature reports that this technique has proven successful with decreasing or eliminating hair pulling. Much of the research also shows that long-term gains for TTM are infrequent (Iancu, Weizman, Kindler, Sasson, & Zohar, 1996; Christenson, et al, 1998). Unfortunately, this study was conducted for a short period of time so long-term results are unavailable.

The results of the current research must be considered in relation to some of the limitations of the study. One limitation involves the nature of how information was collected, which included the use of self-report and possible observer bias. Data collection was dependent on individuals who were personally connected to the subject. As a result, Jasmine's hair pulling behavior may have been under- or over-reported. Furthermore, although both observers were instructed on how to identify the targeted behavior, subjective judgments may have entered into deciding which behaviors were significant. The standardized assessments, specifically the Trichotillomania Severity and Impairment Scales, which relied on Jasmine reporting her own hair pulling may also have not been indicative of her true behavior due to Jasmine under- or over-reporting the severity of her symptoms.

Another limitation to this study that should be considered is that the change in Jasmine's hair pulling behavior may have been related to other factors besides the intervention techniques implemented. The passage of time and other external circumstances may have led to the change in data. Also, the decrease may have resulted from the knowledge of being observed, reactivity of assessments, or interruptions from her mother while Jasmine displayed the target behavior.

Furthermore, data was unable to be collected in the school setting as previously intended due to external circumstances; Jasmine had begun wearing a wig to school as a result of feeling embarrassed of the appearance of her hair. This condition eliminated the possibility of gaining comparison data, which may have increased the validity of these findings.

The timeframe of this study was limited due to uncontrollable conditions that may have influenced the findings. Gains in this study seemed to be insignificant when compared to existing literature (Rosenbaum & Ayllon, 1981; Azrin and Nunn, 1973). Perhaps if treatment was implemented for an extended period and data was able to be collected for an increased period of time, Jasmynes progress using HRT may have been greatly improved. Also due to time limitations, the phases could not be reversed between, so the affect of habit reversal training may be a result of journaling first.

Although the manual on HRT was strictly adhered to during training sessions, there was no measure available to insure that Jasmine has been in fact taught habit reversal. This fact could be considered a limitation in this study.

A final limitation of the presented study is the use of only a single subject. This fact decreases the generality of the findings to other subjects. The use of a single subject design does not allow the comparison of how various subject characteristics may interact with the specific treatments used in this research.

Future directions for research of TTM should include larger samples of children and adolescents who exhibit this disorder. There seems to be very little recent information on this population with TTM when compared to the amount of literature on adults with this disorder. Also, more research is needed to fully explore the relationship

between TTM and social anxiety. It is possible that external stressors may exacerbate this condition. Jasmine's T-scores on the MASCS were much higher in the social anxiety scale of the assessment. Finally, longitudinal studies to explore the lack of long-term efficacy of behavioral intervention for this disorder would also be beneficial.

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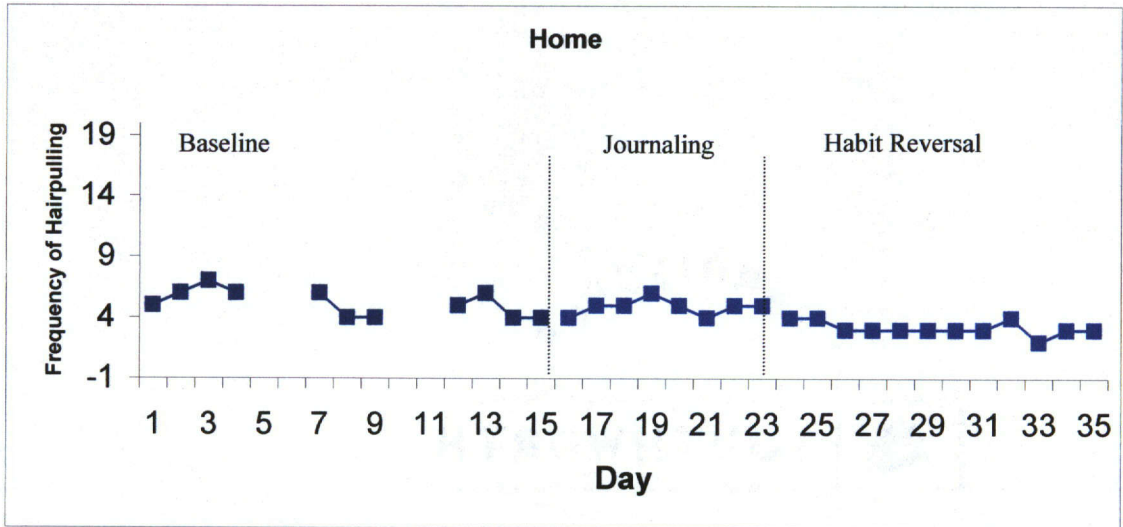
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Figure 1
 Frequency of Hairpulling Behavior at Home



Frequency of Hairpulling Behavior at School

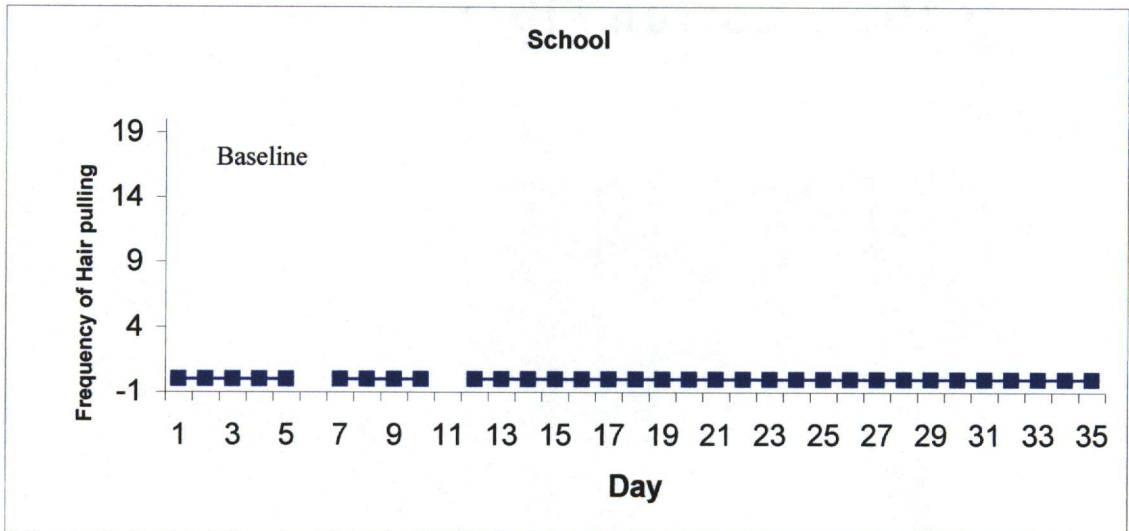
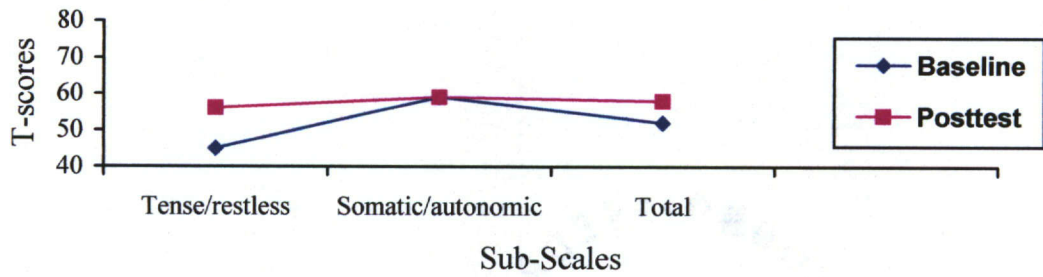
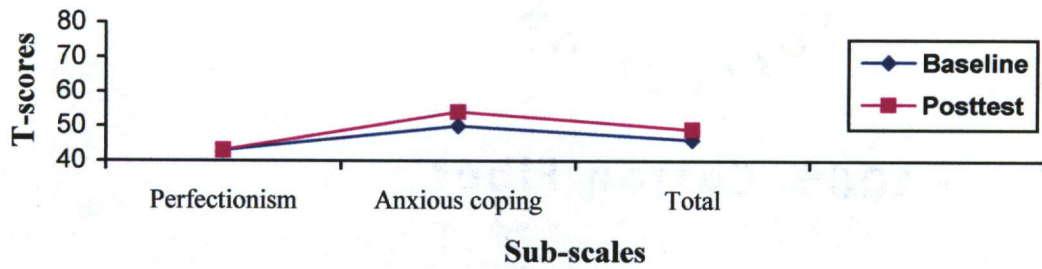


Figure 2

MASC Physical Symptoms



MASC Harm Avoidance



MASC Social Anxiety

