EFFECTIVENESS OF STRESS INOCULATION TRAINING
IN THE TREATMENT OF ATOPIC DERMATITIS

by

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Abstract
Research indicates that psychological stress plays a role in aggravating Atopic Dermatitis (AD), a genetically-based, chronic, inflammatory skin disorder. Most psychological interventions used to treat AD have employed behavioural techniques such as relaxation training and biofeedback. Some treatments have focused on reducing individuals' stress level, whereas others have focused on eliminating the scratching behaviour associated with exacerbation of the disorder. Very few studies have used a cognitive behavioural approach to treat AD. Stress Inoculation Training (SIT), a cognitive behavioural stress management program has been successful in treating a wide range of psychosomatic disorders. The purpose of this study, therefore, was to determine the effectiveness of SIT in treating seven women suffering from AD of the hands. A multiple baseline design was employed that included a baseline period of 4 weeks for two of the women and 5 weeks for the other 5 women, followed by 8 weeks of treatment, a 2-week post-intervention period, and a 3-month follow-up. Subjective measures of stress, coping, and extent of AD were repeatedly monitored using a diary technique. In addition, a self-report measure of anxiety and quality of life was administered weekly and objective ratings of skin condition were made on three occasions. The data were analyzed visually and statistically on an individual and group level to determine both the effectiveness of the intervention and the nature of the relationship between AD and aspects of the stress process. Overall, a positive treatment effect was revealed (p<.10), however on an individual basis it was apparent that SIT was effective for 4 of the women and not for 3. Positive relationships were also found between the women's skin condition and aspects of the stress and coping process. Implications for further research are discussed.
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CHAPTER ONE - INTRODUCTION

Background to the Problem

Atopic dermatitis (AD) is a chronic, inflammatory skin disorder that affects 7 to 24 individuals per 1000 (Faulstich & Williamson, 1985). Twenty percent of individuals treated at dermatology clinics suffer from AD (Faulstich & Williamson, 1985). The disorder typically begins in childhood and although half of these cases clear by puberty, symptoms can recur any time throughout life (Champion & Parish, 1986). AD, also known as eczema, is characterized by itching, redness, scaling, and clustered papulo vesicles that can involve various parts of the skin. The etiology of AD is unknown, however, a hereditary component is apparent in 70% of cases and a wide range of external and internal factors have been found to influence the course of the disorder (Burton, Rook, & Wilkinson, 1986).

Most cases of AD are treated within a medical framework that relies on medication and the avoidance of external irritants such as wool, soaps, chemicals, and certain foods. However, the medical approach is not successful in treating all cases of AD and the medications that are commonly prescribed may have harmful side effects (Faulstich & Williamson, 1985).

Since the turn of the century, the literature has suggested that psychological factors play a role in the course of AD. Early reports from psychiatric case studies attributed the disorder to a number of factors including unconscious sexual conflicts, repressed hostility, and an overdependent personality (Faulstich & Williamson, 1985). A stronger line of research has suggested a relationship between the psychological factors of stress and anxiety and the course of AD (for a review see Faulstich & Williamson, 1985). To date, however, most of the psychological interventions undertaken to treat AD have utilized a behavioural framework designed
to reduce the associated behaviour of scratching, another factor found to exacerbate
the course of the disorder (Gray & Lawlis, 1982; Haynes, Wilson, Jaffe, & Britton,
1979; McMenamy, Katz, & Gipson, 1988). The small number of intervention studies
that have addressed the psychological processes of stress in the treatment of AD,
have suffered methodological weaknesses (Halford & Miller, 1992; Horne, White, &
Varigos, 1989). Furthermore, most of the studies examining the relationship
between stress and AD have lacked a theoretical framework for understanding
stress.

Therefore, given the limited success of the traditional medical model in
treating AD, the evidence suggesting a link between psychological stress and AD,
and the lack of theoretically and methodologically sound stress intervention studies,
an examination of the effectiveness of a cognitive-behavioural stress management
program in the treatment of AD was warranted and is the focus of the study.

Rational and Aim

Most studies that have evaluated the effectiveness of a psychological
intervention in the treatment of AD have employed single-subject designs (Cole,
Roth, & Sachs, 1988; Haynes et al., 1979; Manuso, 1977; McMenamy, et al.,
1988). By establishing multiple baselines and replicating the design across subjects,
conclusions can be drawn about the effect of the treatment on dependent measures
and the results can be cautiously generalized to similar populations (Hersen &
Barlow, 1976). Therefore, the primary aim of this study was to determine the
effectiveness of a stress management program, Stress Inoculation Training (SIT)
(Meichenbaum, 1985), in reducing the psychological and physical symptoms of
women suffering from chronic AD of the hands.
Atopic Dermatitis. AD is a chronic or chronically relapsing skin disorder (Bernhard, 1994). Many cases of AD have been known to spontaneously remit and then to recur later in life. Even while the disease is in an active state, daily, weekly, or even monthly fluctuations in the severity of symptoms are not uncommon. Although the disease is relatively common, the pathogenesis is still obscure. Although IgE serum levels are often increased in AD sufferers, this is not true for all, therefore, diagnosis of the disorder is based on other criteria such as "pruritus, typical distribution and morphology of lesions, chronic relapsing course, and personal or family history of atopic diseases" (i.e., hayfever and asthma) (Bernhard, 1994, p. 44). Some of the signs and symptoms of AD include erythema, scaling, papulovesicles, excoriations, while itching is by far the most troublesome symptom.

Although the pathogenesis of AD is still under investigation, several triggering factors exacerbate the course of the disorder. Morren et al. (1994) reviewed the most recent developments on the important triggering factors of AD. Factors examined in their article include irritants (e.g., wool, soap, cigarette smoke), aeroallergens (e.g., dust mite, pollen), microbial agents (e.g., Staphylococcus aureus, yeast), food, hormones (e.g., during menstruation, pregnancy, parturition, and menopause), sweating, climate, and the psyche (stress). The factors influencing the course of the disease may vary from one individual to the next and may vary within one individual over time.

The difficulties in studying the interaction between psychological factors and the course of AD include the fluctuating nature of the disorder and the multitude of other factors that may be contributing to the disease course. However, realizing this, systematic investigation into the responsiveness of AD to psychological treatment is still warranted and therefore was explored.
Model of stress and coping. The concept of stress in the area of AD has been operationalized in a variety of ways. Several studies (Arnetz, Fjellner, Eneroth, & Kallner, 1991; Faulstich, Williamson, Duchmann, Conerly, & Brantley, 1985; Gray & Lawlis, 1982; Koehler & Weber, 1992) have presented laboratory stressors in the form of forced mental arithmetic, colour-word conflict tests, intelligence quotient-type questions, cold pressor tests, and disturbing films and then measured the physiological responses of persons with AD to the stressors. Stressful events and daily hassles have also been used to conceptualize stress when researchers have examined its relationship to AD (Gil et al., 1987; Graham & Wolf, 1953; Wittkower & Russell, 1953). McMenamy et al. (1988) conceptualized stress in terms of the emotional response, anxiety, and used Spielberger, Gorsuch, and Lushene's (1970) State-Trait Anxiety Inventory to obtain measures. Utilizing a daily diary to determine the relationship between stress and AD, King and Wilson (1991) also used emotional reactions including anger, frustration, anxiety, and tension to represent a measure of interpersonal stress. Halford and Miller (1992) assessed stress in terms of the most stressful event of the day, the stressor, the level of distress experienced, and the individual's appraisal of the event. Finally, a number of intervention studies have discussed the concept of stress and its relationship to AD without operationalizing stress in terms of measures or instruments (Haynes et al., 1979).

Although a large body of research on stress and AD exists, unfortunately, most studies have failed to provide a theoretical framework for understanding stress and the nature of its relationship to AD. Lack of a theoretical basis for choosing instruments or drawing conclusions has made comparisons among studies difficult and has weakened the validity and reliability of research in the area of stress and AD.
In this study, stress is understood in terms of a transactional model of stress and coping proposed by Lazarus and his colleagues (Lazarus & Folkman, 1984). In their model, stress is viewed as a process, a complex transaction occurring between the person and the environment. Variables involved in the interactive stress process include stressful life events (internal or external) and daily hassles, physiological, psychological, behavioural, and emotional responses to these events, mediating activities such as appraisal, coping or social support, and finally, the constant feedback from the ongoing relationships (Lazarus, 1990).

In other words, although an initial stressor or stressful event may initiate the process, the individual's interaction with the event transforms the environment, which in turn impacts the person and so the process continues. People are not simply victims of stressful events. The nature of stress is determined in part by how the individual appraises the stressful event (primary appraisal) and how she appraises her resources or mechanisms to cope with the event (secondary appraisal). When confronted with a stressful event (either internal or external), the individual surveys the situation and based on factors such as past experiences, beliefs, value systems, and personality, determines the degree of threat present. If the individual appraises the situation as threatening, then the next question that arises is "Do I have the resources to cope with this threat?" (secondary appraisal). The outcome of this cognitive activity then determines the nature of the coping process to follow. The stress process occurs when the individual appraises the situational demands as exceeding her present resources (Lazarus, 1990).

Because individuals are not simply victims of stressful encounters but instead play an active role in determining the outcome of a situation, knowledge of the coping process would be helpful both in understanding the nature of the stress process and
the efficacy of treatment programs. Coping refers to "strategies for dealing with threat" (Lazarus, 1966, p. 151) and from a process standpoint is defined as "ongoing behavioral and cognitive efforts to manage [master, reduce, or tolerate] specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus, 1993, p. 237).

Like the concept of stress, coping is a complex, multi-faceted construct that has been examined from a variety of standpoints. Several of the issues that are relevant to the measurement of coping and that have been assessed in the literature include functions or purposes of coping, modes or categories of coping, outcomes or effects of coping on psychological, social, and physiological processes, dispositional (trait) versus episodic (situational) coping, and adaptiveness or effectiveness of coping (Cohen, 1987). Although a multitude of measures tapping a variety of coping dimensions prevail, coping has received very little attention in the AD literature. Furthermore, although coping is an important aspect of the stress process, a lack of consensus on how to measure coping has meant that even of the studies researching stress and coping interventions, few have assessed coping processes (Long, 1993). Because of the lack of available research and the importance of coping in the stress process, this study included an investigation of the individual's perception of her ability to cope with ongoing stressors (secondary appraisal). Level of perceived coping ability was examined in terms of global perceptions and was not tied to individual coping strategies. An understanding of the nature of the relationship of this dimension of coping to AD, the stress process, and the effectiveness of SIT is an important contribution to the literature in these areas.

To summarize, AD is a troublesome disorder that can be resistant to traditional medical intervention. Although a multitude of factors may contribute to
exacerbations of AD, research has found a link between psychological processes and outbreaks of the disorder. Therefore, the purpose of this study was to link stress and coping theory to the experiences of women suffering from AD and to discover the extent to which a stress management intervention impacts AD.
CHAPTER TWO - REVIEW OF THE LITERATURE

Introduction

A review of relevant literature includes early studies that suggested links between psychological factors and AD. Stronger research building upon these assumptions established the association between aspects of the stress process and AD exacerbations. Several psychological interventions have been successful in treating AD. Few studies, however, have examined the effectiveness of SIT in reducing AD symptoms. The most prominent design for intervention studies in the area of AD has been the single-subject design. Although this particular design provides important information and is particularly relevant to clinical application, many of the studies have suffered methodological weaknesses. Furthermore, studies in this area have lacked a unified conceptualization of stress based upon an established theoretical framework. Therefore, my review of the relevant literature addresses both the methodological and theoretical difficulties that exists in the research.

Psychological Mechanisms and Atopic Dermatitis

The determination of a relationship between the psychological factors involved in the stress process and the exacerbation of AD comes from a number of sources that offer varying levels of support. The earliest accounts of a link are presented as anecdotal reports based on psychodynamic case studies. Later support stems from a range of research that varies in degree of experimental rigor including retrospective reports (Graham & Wolf, 1953), correlational studies (Garrie, Garrie, & Mote, 1974; King & Wilson, 1991), experimental designs exploring the psychophysiological mechanisms often utilizing laboratory stressors (Arnetz et al., 1991), and finally intervention studies (Halford & Miller, 1992; Cole, Roth, & Sachs, 1988).
Anecdotal studies. Psychological factors have been linked to a variety of skin disorders including AD since the turn of the century. Although voluminous in nature, the early reports of the psychophysiological aspects of AD are anecdotal reports that relied upon traditional clinical case studies. AD has been linked to a number of emotional, personality, and unconscious factors (for a review see Whitlock, 1976), but Koblenzer (1987) notes that the two features that appear repeatedly in the literature are reports of disturbances in the mother-child relationship and difficulty in handling aggression. Unfortunately, few conclusions can be drawn from these studies because of the lack of control and the serious weaknesses in the methodologies. However, deKorte and Musaph (1992) believe that the anecdotal psychoanalytic phase of psychodermatology of the 1940s and 1950s provided examples and some understanding of the relationship between skin disease and emotional conflict and also instigated further research into the area of psychodermatology.

Retrospective interviews. The research that followed the anecdotal phase tended to focus on the relationship between AD and various elements of the stress process including stressful events and emotional and psychological responses such as anxiety, distress, and repressed hostility. A group of studies, all utilizing retrospective interviews, attempted to link stressful life events to the onset and/or course of AD. The commonly cited study by Graham and Wolf (1953) relied upon detailed life histories gathered from 31 out-patients of a New York hospital who were being treated for eczema. The authors claimed that for 26 of 31 patients, a correlation could be established between life events, which the patient recognized as emotionally disturbing, and exacerbations of the patient's AD. The difficulty with the
Graham and Wolf (1953) study was that they did not use standard measures for stress, nor did they utilize control groups.

Lammintausta, Kalimo, Raitala, and Forsten (1991) followed up 801 AD patients, 207 allergic rhinitis or asthma patients, and 517 controls who had been previously examined at a university hospital dermatology department in Finland. Participants were examined and interviewed by a dermatologist, completed a questionnaire, and underwent a skin prick test. The authors reported that "psychic stress was the most commonly cited factor provoking relapses of dermatitis or aggravating the symptoms" (Lammintausta et al., 1991, p.565). Unfortunately, once again, the study lacks a formal definition or framework for understanding their use of psychic stress. Furthermore, the authors did not explain how the information regarding the relationship of AD to psychic stress was gathered.

Further support for the link between factors of the stress process and AD outbreaks comes from several studies that provide self-reports of individuals' experiences. For example, Gray and Lawlis (1982) and Dobes (1977) reported that AD sufferers noted flare-ups and exacerbations in symptoms during times of perceived stress stemming from external stressors such as family and job. A 33-year-old female, which Horne, White, and Varigos (1989) studied, also described her AD symptoms as being worse when she was tense. Furthermore, Jordan and Whitlock (1972) found that 12 of their 18 patients believed that emotional factors aggravated their skin conditions.

Within the category of retrospective research, Brown's (1972) study was more methodologically sound and was one of the few in the area that incorporated a theoretical framework for understanding stress. He utilized Harold Wolff's (1953) transactional theory, which is somewhat similar to the "Lazaruthian" model (Lazarus,
1990) and defines stress as "a dynamic state within the organism caused by its interaction with noxious stimuli or situations" (Brown, 1972, p. 321). Brown emphasized that what matters is not life events themselves, but what they mean to the individual (appraisal) and how she or he copes with the event. Following the theoretical framework, Brown posed four questions bearing on the role of stress in precipitating AD: (a) Are potentially stressful life events commoner in the recent histories of eczema patients than those of controls? (b) Are preceding life events regarded as disturbing by the patients? (c) Is there any evidence that eczema patients are particularly vulnerable people? (d) Do their emotional responses indicate difficulty in coping by assertive action or purely psychological mechanisms?

Both standardized questionnaires and interviews were utilized to gather data from 82 AD sufferers from the Skin Department of the Middlesex Hospital and a control group of 123 out-patients from the Royal Dental Hospital. Because of the difficulty in validating and processing statistically the interview data, results were based on the questionnaires. Brown found statistically significant differences between AD sufferers and controls on data bearing on all four research questions.

Although retrospective reports can offer valuable insight into the individual's experience, unfortunately, weaknesses do arise from this particular research method. Retrospective reports can be unreliable due to the recaller's difficulty in remembering specific events and reports may be biased by the participants' own beliefs. In addition, the process of participants self-selecting themselves to one group or another based on the occurrence of experiencing a past stressful event means that the variable of interest is out of the experimenter's control and no firm conclusion can be drawn regarding the nature of the relationship between the stress process and AD. However, weaknesses aside, the evidence gathered from retrospective studies
does suggest the existence of a relationship between the stress process and AD, and it is upon this indication that more methodologically sound studies have been based.

**Correlational designs.** A series of studies have correlated outbreaks and exacerbations of AD with various aspects of the stress process. For example, several authors have found a relationship between anxiety and AD. Garrie et al. (1974) found that AD sufferers scored higher on state and trait anxiety, as measured by the Spielberger (1983) State-Trait Anxiety Inventory, than controls or a group of individuals suffering from a different skin disorder. Jordan and Whitlock (1972) also found significant differences between controls and individuals diagnosed with AD on measures of tension, anxiety, and worry on the Cattell Personality Inventory (Cattell & Eber, 1957) and on the Additional Anxiety Scale of the MMPI (Welsh & Dahlstrom, 1956). McMenamy et al. (1988) suggested that improvements in skin conditions after relaxation training for five adults suffering from AD occurred because of reductions in felt anxiety.

Relying on self-reports, but within a prospective rather than within a retrospective design, King and Wilson (1991) established weak support for a relationship between elements in the stress process and AD utilizing a daily diary technique. The authors had 50 AD sufferers, recruited from dermatologists and general practitioners, and 30 skin-disorder free controls from an undergraduate psychology class fill out a diary on a daily basis for 2 weeks. Aspects of the stress process that were investigated in the King and Wilson (1991) study included emotional reactions such as anger, depression, and anxiety that may have been triggered in response to a variety of interpersonal situations. A factor analysis on the diary scores carried out by the authors and by earlier researchers (Robbins & Tanck,
1982) revealed that two factors could be extracted from the emotional reaction items, an Interpersonal Stress factor and a Depression-Isolation factor. In addition to the psychological questions that asked about emotional reactions, the diary was also comprised of questions that asked about the occurrence of physical complaints including the severity of the AD symptoms.

Several findings emerged from the King and Wilson (1991) study. The first discovery was that, although most of the diaries showed a positive correlation between increases in the Interpersonal-Stress factor and increases in skin symptoms (mean correlation, $r=.22$), only 12 individuals reached a significant level. Similar results were revealed for the correlation between the Depression-Isolation factor and skin symptoms ($r=.23$). The items concerning the intensity of anxiety and tension experienced during the day correlated weakly with the skin condition score ($r=.27$).

Utilizing a lag sequential analysis (described by Faraone & Dorfman in King & Wilson, 1991), the authors discovered that both Interpersonal Stress on Day X predicted skin symptoms on Day X + 1 and that skin symptoms on Day X predicted Interpersonal Stress on Day X + 1. Although the results are not causal, the data strongly suggest that "interpersonal stress appears to be both a cause of the skin symptoms, and is itself caused by the discomfort of the complaint" (King & Wilson, 1991, p. 704). For the Depression-Isolation factor, although it was found that skin symptoms on Day X predicted Depression-Isolation on Day X + 1, the reverse was not found. Although the results from the King and Wilson study are encouraging, the authors pointed out some of the alternate hypotheses as well as the limitations of the study. Because AD is a multi-determined disorder, exacerbations in skin condition that were measured in the study may have been a result of other factors such as climate or allergies. The correlations obtained between emotions and skin condition
were positive, but weak; stronger correlations may have been established if the study had been longer term. King and Wilson suggested that perhaps critical levels of emotional intensity or stress must be experienced before a physiological change is apparent and that the moderate levels experienced by the participants in their study may not have been sufficient to obtain stronger correlations. Finally, the authors added that investigation into the role of appraisal, coping responses, and social support must be undertaken and that consideration of these factors may also reveal stronger associations.

Although emotional distress and perceived stress appear to be related to the course of AD, stressful life events are not significantly associated with AD (Wyler, Masuda, & Holmes, 1971). In contrast to King and Wilson (1991), Gil et al. (1987) investigated the relation of stress and family environment to AD symptoms in children, but failed to find a correlation between stressful life events and AD symptoms. However, similar to the King and Wilson study, scores reflecting distress experienced by the children as a result of problems associated with a chronic skin disorder did relate to AD symptom severity. It appears that correlational studies have revealed mixed results, but like retrospective reports, the suggestion of a link between the stress process and AD has been encouraging enough to provide a foundation for further investigations.

**Psychophysiological Mechanisms**

Another line of research that supports the existence of a relationship between the stress process and AD emerges from studies that investigate the psychophysiological mechanisms underlying AD. Many of the studies in this area have stronger methodologies including before and after tests, control groups, and laboratory-induced stressors.
Although an understanding of the psychophysiological processes of AD is still relatively rudimentary, the evidence collected to date suggests that factors in the stress process can bring about some of the pathophysiological changes seen in AD. Many of the studies exploring this connection have looked for a relationship between psychological stress and abnormal levels of reactivity in the physiological mechanisms of the skin in AD sufferers. For example, in 1953, utilizing measures of skin reactivity, Graham and Wolf undertook one of the first attempts to study the psychophysiological mechanisms underlying AD. They measured skin temperature and reactive hyperemia (increased blood flow) thresholds while discussing stressful or neutral topics with 31 AD patients randomly selected from a dermatology clinic. They discovered that during discussions of stressful life situations a significant number of patients experienced a rise in skin temperature, vasodilatation of the arterioles and minute vessels (lowering of hyperemia threshold) followed by increased itching and scratching. Although their results suggest an association between emotional frustration, vasodilatation, and increased itching, their findings are limited because no control groups were utilized in the study.

Munzel and Schandry (1990) reported mixed results after reviewing several studies that had investigated the influence of psychological stress on AD. The first study undertaken by Faulstich, Williamson, Duchmann, Conerly, and Brantley (1985) provides a minimal empirical basis for the existence of a psychophysiological component to AD. They demonstrated that AD patients exhibited higher forearm EMG activity and increased heart rate during and after one of a series of experimental stressors (i.e., the cold-pressor test) compared to a group of control subjects. Unfortunately, a replication of this study by Kirn, Morciozek, and Ehlers (cited in Munzel & Schandry, 1990) with a larger sample and the added measure of a
subjective rating of the stressors, failed to find any significant differences between AD sufferers and controls. Furthermore, Koehler, Weber, and Peter's (cited in Munzel & Schandry, 1990) study utilizing experimental stressors and measures of heart rate, skin conductance level, blood pressure, and the number of active sweat glands, failed to lend support to the assumption of a general psychophysiological overreactivity of the skin system in individuals suffering from AD.

However, Munzel and Schandry (1990), in their review, pointed to findings from one of their own studies (in Munzel & Schandry) that demonstrated significant differences on several physiological measures between AD sufferers and controls. After experiencing a variety of experimental stressors including mental arithmetic, relaxation, and the expectation of speaking in public, the AD sufferers reacted differently for most of the stressors on all physiological measures (i.e., heart rate, vasomotor response, skin conductance response, forearm skin temperature) except skin resistance level than the control group. In addition, AD sufferers experienced higher subjective tension during most of the phases compared to the controls. The strength of this study is that the authors operationalized stress not only in terms of the presentation of particular stressors, but also in terms of the individual's appraisal of the stressor (subjective tension).

In their review, Munzel and Schandry (1990) suggested that the divergent findings could be due to differences between studies such as sampling procedures, stress induction methods, and type and/or location of measure assessed. They also pointed out that AD sufferers comprise a very heterogeneous group of patients. Because the disorder is difficult to diagnose accurately, a variety of pathophysiological differences may actually exist among subjects labeled as suffering from AD. They concluded by stating that although most studies are looking
for an elevated level of physiological reactivity in AD sufferers, perhaps the reality is that even a normal level of reactivity to stressors is sufficient to trigger itching in especially vulnerable skin.

Whitlock (1976) states that "the fundamental problem in this disorder from the psychophysiological point of view is the inherent tendency of the skin to itch with small provocation" (p. 146). Edwards, Shellow, Wright, and Dignam (1976) showed that AD patients in remission who had experienced a low or high degree of life change in the last 3 months according to the Holmes and Rahe Social Readjustment Scale (Holmes & Rahe, 1967) had a lower itch threshold compared to normal individuals who had also experienced high and low levels of recent life changes. They also discovered that individuals who had high levels of recent life changes also had lower itch thresholds, independent of whether or not they had a skin disorder. Although this study is encouraging, the results may have been stronger if the authors had included a measure to assess the participant's appraisal of the stressor they identified from Holmes and Rahe's scale.

Another study that identified the role of itching as an important mechanism in the link between AD and the stress process was conducted by Arnetz and colleagues (1991). Following exposure to a laboratory stressor, to which all participants showed a significant increase in perceived stress as assessed by a visual analogue scale, the authors discovered that AD sufferers reported the highest percentage of perceived itch compared to controls and psoriatic sufferers. Itching, which usually leads to scratching, is one of the most annoying aspects of the disorder for AD sufferers and is a major contributing factor in the chronicity of the disorder (Jowett & Ryan, 1985). Jordan and Whitlock (1972) and Graham and Wolf...
(1953) suggest that emotional tension leads to vaso-motor changes that in turn lead to itching and scratching.

Jordan and Whitlock (1972) found that compared to a control group, AD sufferers developed more rapidly a conditioned scratch response linked to an itch stimulus and that the response, once established, took longer to extinguish in the AD sufferers than in the controls. Although the pruritic mediator or mediators in AD have not been identified, Whitlock (1992) suggests that there is some evidence to support the concept of central itching. This means that emotional disturbances could be one of the precipitating factors that initiates the physiological mechanisms of itching. In the especially vulnerable skin of AD sufferers, this itch stimulation leads to scratching and ultimately to the deterioration of the skin which perpetuates the cycle of itching and scratching (Whitlock, 1976).

Morren et al. (1994) outlined some of the physiological mechanisms that may account for the link between the psyche and AD. Disturbances in the action of neuropeptides, such as vasoactive intestinal polypeptide (or substance P) has been suggested as a possible link. "Recently a close anatomic relation between mast cells and nerve endings and an increased number of immunoreactive nerve fibers in AD have been demonstrated, which suggests a potential role of innervation and neuropeptides for the disease" (Morren et al., p. 470).

The importance of itching as an identifiable symptom of AD and the consideration it has been given in the literature as a possible psychophysiological link in AD (Edwards et al., 1976; Graham & Wolf, 1953; Jordan & Whitlock, 1972) suggests that a stress management intervention may have an impact on AD by reducing emotional disturbances that may trigger the itch mechanisms.
Psychological Interventions

The recognition of the importance of the psyche as a contributing factor in the course of AD, has led to the use of a number of psychological interventions to treat the disorder. A number of the intervention studies have focused on managing AD by alleviating the scratching behaviour associated with the disorder. Behavioural techniques such as hypnotherapy (Mirvish, 1978), relaxation (McMenamy et al., 1988), imagery (Horne et al., 1989), and self-monitoring (Dobes, 1977) have been successful in reducing scratching and symptom severity. Another group of studies, that provide further evidence for the link between the stress process and AD, have successfully treated AD through stress management procedures such as relaxation, biofeedback, and imagery (Gray & Lawlis, 1982; Haynes et al., 1979; Manuso, 1977).

To date, there appear to be very few studies that have employed a cognitive-behavioural intervention to treat AD. Horne et al. (1989) treated three AD sufferers with a number of therapeutic techniques including relaxation, imagery, habit-reversal, and what can best be described as a cognitive-behavioural component. The cognitive-behavioural component involved "self-monitoring of severity of eczema and examining the relationship between changes in severity and antecedent thoughts, feelings, or external environmental events" (Horne et al., 1989, p. 246). The purpose of the study was to manage AD by controlling the scratching behaviour of the participants. Although each subject showed improvement by the end of treatment, several confounding factors jeopardize the results.

Explanations for the improvements are difficult to determine because no baseline data were established and all participants continued using medical treatment throughout the intervention. In addition, one client made significant life
changes mid-way through therapy including a reduced consumption of previously large quantities of alcohol. Furthermore, it is unclear whether alleviation of symptoms was related to the reduction in scratching behaviour as a result of the habit reversal or to the reduction in stress level in response to the relaxation procedures. Finally, an informal cognitive-behavioural approach was utilized in the study. Without a systematic intervention, the study is difficult to replicate and the mechanisms of change are impossible to identify. However, even though the study is methodologically weak, the results do help confirm the link between stress and AD and they do suggest the usefulness of a cognitive-behavioural program in the treatment of AD.

A study conducted by Halford and Miller (1992) utilized a single-case design and employed a cognitive-behavioural stress management intervention (SIT) to treat a 37-year-old male suffering from AD. The purpose of the study was to assess the existence of a relationship between AD and stress and "to evaluate the effectiveness of a stress management intervention on [the participant's] stress level and AD symptoms" (Halford & Miller, p. 20). Daily stress ratings showed a weak but nonsignificant relationship to the extent of AD symptoms, however, across the baseline and treatment phases, a significant positive correlation existed between the variables. The stress management program was also associated with a decrease in extent of rash and subjective stress level by the end of treatment and at follow-up.

Although the Halford and Miller (1991) study supports the idea of a link between perceived stress and AD and the effectiveness of a cognitive-behavioural program in treating the psychological and physical symptoms, stronger conclusions may have emerged if greater attempts had been made to capture the stress process. The validity of the study is questionable because a simple, rating scale provides a
very narrow definition of stress. In order to capture the broader concept of the stress process, more standardized measures which offer greater reliability and validity of stress and coping could be included. A greater level of significant change may also have been detected between the baseline and treatment phases if a true baseline measurement had been established. During the three week baseline period, while the client was monitoring daily stress levels and skin condition, the authors engaged him in discussions and interviews in an attempt to identify the nature of his stress. Enhancing the client's self-awareness may have had a positive impact on his ability to cope with stress, thereby biasing the baseline measures.

Although the single-subject case design is an acceptable method of research into this area, the Halford and Miller (1992) study is limited because of its reliance on only one subject. Replication of the design among similar participants may increase confidence in the results. Finally, the Halford and Miller study examined stress and AD with a male participant. However, the literature reveals that females' experience of stress is different from males' (Belle, 1991; Spielberger, 1983).

Cole, Roth, and Sachs (1988) utilized an AB single-case experimental design and showed that 10 AD sufferers, recruited from a university AD outpatient clinic, given psychological treatment, demonstrated clinical improvements in their disease process. The method employed involved a 12-week control pre-study period that established baseline ratings for the severity of 5 AD signs (erythema, lichenification, pustules, excoriations, and dryness), a 12-week treatment period, and a 1-month follow-up.

The treatment sessions were run in a group format and participants met once a week for the 12 weeks. Utilizing behavioural and cognitive interventions with relaxation training, the treatment program aimed to reduce the participants'
scratching by starting with awareness of concrete factors, itching and scratching, and eventually moving to "more abstract intangible emotional and attitudinal factors in a body-mind progression" (Cole et al., 1988, p. 290). Through the intervention, participants gained personal understanding of the daily events that aroused feelings of anxiety, helplessness, anger, or resentment and ultimately led to bouts of itching and scratching, which led to further anxiety and helplessness in a vicious cycle. Once awareness and understanding had been reached, participants learned ways of coping with difficult situations in their life that had previously aroused distressing emotions and led to scratching.

Ratings of disease process were made bi-weekly by four dermatology residents and were continued during the 12-week treatment period and again at follow-up. In addition to assessing symptom severity, once per week the participants were questioned and evaluated on the name, frequency, and quantity of medication they were taking to treat their disorder. Results revealed that all participants reduced the use of medication over the course of the study and that all symptom ratings during the treatment phase showed significant reductions (at the .01 level, using a Wilcoxon signed rank test) when compared with ratings during the baseline phase. Finally, no further significant elevations in symptom severity had occurred at the 1-month follow-up.

The Cole et al. (1988) study helps to support both the connection between emotional responses to stressful situations and outbreaks of AD and the effectiveness of cognitive-behavioural intervention in the treatment of AD. Unfortunately, changes in psychological and emotional responses can not be assessed as the Cole et al. (1988) study does not include any standardized psychological measures.
The strongest and most recent evidence for the effectiveness of a psychological intervention to treat AD sufferers was presented by Ehlers, Strangier, and Gieler (1995). Ehlers et al. compared the effectiveness of four group treatments that included a dermatological education program (DE), autogenic training as a form of relaxation therapy (AT), a cognitive-behavioural treatment (BT), comprised of relaxation, self-control of scratching, and stress management, and a combined DE and BT treatments (DEBT). The treatment groups were also compared with standard medical care (SMC).

After screening, 113 AD patients from the outpatient clinic of the Department of Dermatology, Marburg University in Germany were randomly assigned to the four groups. Between 5 and 7 patients, including both men and women, participated in each group which consisted of 12 weekly sessions of 1.5 to 2 hours in length. Twenty-four more patients were recruited to participate in a group receiving only SMC.

Several outcome measures were assessed pretreatment, posttreatment, and at a 1-year follow-up. The most significant findings showed that the psychological interventions (AT, BT, and DEBT) led to significantly larger improvements in skin lesions than the information sessions (DE) and SMC at both posttreatment and at the 1-year follow-up. Independent dermatologists, who were not informed of the treatment conditions, used two assessment measures to rate the patient’s skin. The first was a front and back body schema on which the dermatologists marked the areas of affected skin then placed a grid over the figure and counted the squares containing affected areas. The second measure involved rating the severity of the patient’s skin in terms of erythema, excoriations, and dryness on three rating scales ranging from 0 (none) to 3 (severe).
Another finding revealed that the DEBT group showed a reduction in the use of topical steroids by the 1-year follow-up. The groups were run in the winter season and the follow-up was planned for the same season one year later in order to control for climatic factors that may affect AD. In addition, all four groups showed a reduction in catastrophizing cognitions at both assessments compared to the SMC group. To discover the impact of the treatments on itching and scratching, the participants kept a diary of all instances when they felt itching or scratched during the 2 weeks pretreatment, 2 weeks posttreatment, and 2 weeks at the 1-year follow-up. The BT and DEBT programs showed the greatest positive impact on itching and scratching. Another significant finding revealed that all group treatments led to decreases in the participant's anxiety level at posttreatment but only the DE and DEBT groups maintained the treatment effects at the 1-year follow-up.

Overall, the Ehlers et al. (1995) study was well designed and provides strong evidence that psychological interventions combined with standard medical care are more effective in treating the signs and symptoms of AD sufferers than medical care alone.

Stress Inoculation Training

SIT is not a single technique but is a treatment paradigm that combines a number of strategies designed to provide clients with coping skills to deal with current and future stressful situations (Meichenbaum, 1985). Strategies included in SIT are didactic teaching, Socratic discussion, cognitive restructuring, problem solving, relaxation training, behavioural and imaginal rehearsal, self-monitoring, self-instruction, self-reinforcement, and efforts at environmental change (Meichenbaum, 1985). SIT is designed to be a collaborative process between the client the therapist. Working together, the client and the therapist seek to understand the
nature and impact of stress on the individual's life and then search to find ways to cope more effectively with stressful situations.

SIT is comprised of three phases that may be conducted in a linear fashion but in reality are more likely to overlap and resurface, building upon each other in a spiraling manner throughout the intervention. The first phase is the conceptualization phase. The major objectives of this phase are to establish a collaborative, working relationship with the client, to understand the nature of stress in the client's life, to increase the client's awareness of their responses to stressful situations, and to educate the client about the transactional nature of stress and coping and consider the role that cognitions and emotions play in engendering and maintaining stress.

The goals of the second phase of SIT, skill acquisition and rehearsal, emerge from the conceptualization phase. Once clients gain an understanding of how the stress process is perpetuated in their lives, (i.e., through negative thoughts, states of tension or anxiety, problematic situations etc.) they collaborate with the therapist to develop an effective coping repertoire. Coping skills are generated by the client or suggestions are offered by the therapist. The most common strategies that arise in SIT are applied relaxation skills, problem solving, cognitive restructuring, and self-reward. The type and degree of training required depends on the individual needs of the clients.

The final phase of SIT "is designed to strengthen the coping skills for application in day-to-day situations and to maximize the chances of maintenance across time and settings" (Meichenbaum & Deffenbacher, 1988, p.82). The skills are strengthened first through imagery and role play and then eventually through application to real-life encounters. Relapse prevention is also an important aspect of
this phase. Clients are encouraged to discuss possible future failures and what that means for them as well as preparing ahead for situations that may be difficult.

SIT has been utilized with a range of populations in a variety of settings. The effectiveness of SIT has been demonstrated with various professional groups (teachers, nurses, police officers, athletes etc.), people suffering from specific anxiety problems, phobias, or anger, as well as victims of traumatic events, and a variety of groups from community settings such as women on public assistance or medical outpatients. Within the area of health-related problems, SIT has been utilized with individuals suffering from chronic pain, cancer, rheumatoid arthritis, chronic tension headaches, essential hypertension, dysmenorrhea, and burns (for a review, see Meichenbaum, 1985).

The effectiveness of SIT has been demonstrated with a variety of outcome measures including stress, anxiety, pain level, and anger (see Meichenbaum, 1985). Matheny, Aycock, Pugh, Curlette, and Cannella (1986) performed a meta-analysis on 54 stress coping intervention studies and generated effect sizes for individual treatment domains as well as an overall effect size of .57. The effect sizes for treatment domains relevant to SIT were .54 for cognitive restructuring, .58 for relaxation, and .74 for problem solving when the treatments were used in combination with one or more other treatments and .62 each for cognitive restructuring and relaxation when they were used on their own (problem solving was not used as a sole intervention in any of the studies) (Matheny et al.).

Although a variety of outcome measures have been utilized to evaluate the effectiveness of SIT, aspects of the coping process have rarely been assessed. The studies that have examined coping have looked at utilization of coping styles (Foley, Bedell, LaRocca, & Scheinberg, & Reznikoff, 1987; Long, 1993, 1988). Given that
the objectives of SIT are to improve the client's coping resources, an evaluation of coping would be useful. Because the pressure of completing questionnaires every second day may be fairly demanding for participants, an extensive assessment of modes or categories of coping were not appropriate for this study. A concise way of evaluating coping, such as the use of perceptions of ability to cope, was desirable. Furthermore, in a recent study, Bar-Tal and Spitzer (1994) suggest that assessment of individual's perception of her or his ability to cope may provide important explanations into the role of coping as a mediator in the individual's experience of psychological distress.

Summary of the Literature

The research has revealed that psychological interventions can play an important role in treating individuals suffering from AD. Many studies have aimed at reducing scratching behaviour through techniques such as relaxation, biofeedback, self-monitoring, and cognitive restructuring. Few studies have directly aimed to help individuals cope with ongoing life stressors in an effort to reduce overall responses such as emotional distress and anxiety. Of the few studies that have applied a cognitive-behavioural stress management program to treat AD, some have suffered from methodological weaknesses. Therefore, the aim of this study was to determine the effectiveness of a cognitive-behavioural stress management program, SIT, which supplies individuals with a broad range of coping mechanisms, in reducing the psychological and physical symptoms of AD.

The literature has revealed a link between exacerbations of AD symptoms and aspects of the stress process such as stressful life events (Graham & Wolf, 1953), stressful encounters (Arnetz et al., 1991), emotional responses such as anxiety (McMenamy et al., 1988), anger, frustration, and tension (King & Wilson, 1991), and
appraisals of triggering events (Halford & Miller, 1992). Interestingly, the relationships that have been revealed have not been strong. Perhaps some of the difficulty in discovering a strong relationship between stress and AD has been in the operationalization of the concept, stress. Most research on stress and AD has drawn conclusions on the nature of the relationship based on the examination of only one aspect of the stress process. Oversimplification of this complex, transactional process is bound to produce misleading results. However, utilization of our increasing knowledge of the complexity of the stress process in the design of studies, thereby increasing validity, may help to reveal a more accurate picture of the nature of the relationship between the factors involved in the stress process and exacerbations of AD.

Several theorists (Cohen, 1987; Lazars & Folkman, 1984) have pointed to the importance of individuals' appraisals of events and their ability to cope as mediating or determining the outcome of stressful encounters. However, these factors have received little attention in the AD literature or in the literature examining the effectiveness of SIT. Therefore, in addition to determining the effectiveness of SIT, this study also examined the role of global appraisals of stress and coping in the stress process and as mechanisms of change in SIT.

Statement of the Problem

Women suffering from AD exhibit a number of physical skin signs and symptoms including erythema, lichenification, pustules, excoriations, dryness, vesiculation, and pruritus. Research has suggested that these physical findings can be exacerbated when individuals are feeling stressed or anxious. In addition, some research has shown that the physical signs and symptoms of AD can be reduced when individuals are treated with stress management programs such as relaxation,
imagery, biofeedback, or cognitive-behavioural therapy. SIT (Meichenbaum, 1985), a cognitive-behavioural stress management program, has been found to be effective in treating a number of psychosomatic disorders as well as psychological symptoms of stress and anxiety in a wide range of clients. The effectiveness of SIT, however, has never been investigated with a population of stressed women suffering from AD. Furthermore, few studies have explored individuals' coping processes in relationship to AD exacerbations or even in terms of understanding the process of change for SIT. Therefore, the purpose of this research is twofold. The primary purpose is to investigate the effectiveness of SIT in reducing the psychological and physical signs and symptoms of stressed women suffering from AD. The secondary purpose is to determine whether or not a relationship exists between the women's perceptions of their stress levels, their perceived ability to cope, and the exacerbation of their AD symptoms.

Research Questions

Will women suffering from chronic AD of the hands show clinical improvement in AD signs and symptoms during and after they have received SIT compared to a period of time prior to receiving such training?

**Question 1.** It is expected that women suffering from chronic AD of the hands will report (a) a decrease in itchiness of affected area and (b) a decrease in degree of severity, as assessed by visual analogue scales recorded every second day, over the course of receiving an 8-week SIT intervention, during a 2-week post-intervention phase, and at a 3-month follow-up compared to a baseline period before receiving such training.
**Question 2.** It is expected that women suffering from chronic AD of the hands will report a decrease in extent of rash, as assessed by self-recorded shadings on hand diagrams made every second day, over the course of receiving an 8-week SIT intervention, during a 2-week post-intervention phase, and at a 3-month follow-up compared to a baseline period before receiving such training.

**Question 3.** It is expected that women suffering from chronic AD of the hands will demonstrate clinical improvements in disease severity as assessed by objective ratings of: (a) erythema, (b) lichenification, (c) pustules, (d) excoriations, (e) dryness, and (f) vesiculation, recorded pre-baseline, post-intervention, and at a 3-month follow-up.

**Question 4.** It is expected that women suffering from chronic AD of the hands will demonstrate a clinical improvement in disease severity as assessed by objective ratings of shadings on hand diagrams recorded pre-baseline, post-intervention, and at a 3-month follow-up.

Will the disability or negative impact on quality of life caused by AD decrease for women suffering from chronic AD of the hands, during and after they have received SIT compared to a period of time prior to receiving such training?

**Question 5.** It is expected that women suffering from chronic AD of the hands will report an increase in quality of life, as assessed by the Dermatology Life Quality Index (Finlay & Khan, 1994) once per week, over the course of the 8-week SIT intervention, during 2-week post-intervention phase, and at a 3-month follow-up compared to a baseline period before receiving such training.

Will SIT reduce the level of perceived stress and anxiety of women suffering from chronic AD of the hands?
Question 6. It is expected that women will report a reduction in (a) perceived stress, as assessed by a visual analogue scale that will be completed every second day, (b) appraised distress, as assessed by a subscale of the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) that will be completed every second day, and (c) trait anxiety, as assessed by the Trait-anxiety Scale of Spielberger's (1986) State-Trait Anxiety Inventory that will be completed once per week, during the course of receiving Stress Inoculation Training, during a 2-week post-intervention phase, and at 3-month follow-up, compared to a baseline period before receiving such treatment.

Will SIT improve one's perception of her ability to cope for women suffering from chronic AD of the hands?

Question 7. It is expected that women suffering from chronic AD of the hands will show an increase in their perceptions of their ability to cope, as assessed by a subscale of the Perceived Stress Scale (Cohen et al., 1983) that will be completed every second day, over the course of receiving SIT, during a 2-week post-intervention phase, and at a 3-month follow-up compared to a baseline period before receiving such treatment.

Will a relationship be found between the perceived stress levels of women suffering from chronic AD of the hands and their AD signs and symptoms?

Question 8. It is expected that there will be a weak, but positive relationship between the following variables, assessed every second day, over the course of the study (15 weeks for Group 1 and 16 weeks for Group 2): (a) itchiness, as assessed by a visual analogue scale, and stress, as assessed by a visual analogue scale, (b) itchiness and appraised distress, as assessed by a subscale of the Perceived Stress Scale (Cohen et al., 1983).
Scale (Cohen et al., 1983), (c) extent of rash, as assessed by hand diagrams, and stress, and (d) extent of rash and appraised distress.

Will a relationship be found between the coping efficacy of women suffering from chronic AD of the hands and their AD signs and symptoms?

**Question 9.** *It is expected that a relationship will be found between the women’s perceptions of their ability to cope and their AD signs and symptoms, assessed every second day over the course of the study.*

The exploratory nature of the study allows for a large number of questions to be posed and a number of dependent variables to be assessed.
CHAPTER THREE - METHOD

Overview of Design

The aim of the study was to determine the effectiveness of an 8-week Stress Inoculation Training program for women suffering from chronic hand AD. The study was conducted by way of a multiple-baseline design across two groups of participants utilizing baseline, intervention, post-intervention, and follow-up phases. Objective ratings of skin condition and a repeatedly administered self-monitoring diary were used to assess changes in the dependent variables over the phases. The self-monitoring diary was completed every second day over the course of the study and was comprised of measures assessing skin condition and stress and coping factors.

Participants

Eight women volunteers between the ages of 18 and 65 years who had suffered from AD of the hands for at least a year, participated in the study. When screening the participants, the diagnosis of at least a year was included in order to ensure chronicity of the disorder. A further requirement was that the disease be in an active state at the time of the initial interview. The study was confined to hand AD for several reasons. Compared to AD involving other areas of the body, AD of the hand tends more towards chronicity, has fewer occasions of spontaneous recovery, and may be less responsive to traditional medical treatments. Furthermore, confining the investigation of AD to the hands, increased the accuracy and efficiency of disease reporting for both the participants and the objective rater. All of the women had been diagnosed with AD and this diagnosis was confirmed by a dermatologist from the University of British Columbia's Skin Care Centre who also completed objective ratings of the women's skin. Some of the women had
undergone a patch test to eliminate the possibility of contact dermatitis. For ethical reasons, women who were currently using prescription medication to treat their AD were not required to discontinue its usage. However, the participants were required to record their use and dosage of medication every second day in the self-monitoring diary throughout the course of the study.

Finally, the women were pre-screened in order to ensure that they were experiencing sufficient levels of stress to warrant being treated with a stress management program. The screening was based on information regarding current stressors and coping resources, gathered from a clinical interview and a score of 5 or higher on Walks (1956) 10-point Tension Thermometer. The Thermometer assessed the women's average level of perceived tension for the previous week. The women were recruited through referrals from a number of dermatologists including a university dermatology centre located in the community, advertisements in newspapers, and notices posted on several college, university, and community notice boards (see Appendix E).

The study was restricted to women in order to eliminate gender differences inherent in stress research. Belle (1991) found that women experience and respond to stressful experiences differently than men. In addition, the replication principle for single-subject designs calls for homogeneity of subjects across individual difference domains.

From 65 inquiries and referrals, 10 women were selected for a personal interview, 8 of whom were chosen and agreed to participate in the study. Two of the women who were interviewed were deemed inappropriate because of their inability to fulfill the screening requirements. One of the women's disorder was suspected to be contact dermatitis stemming from a chemical she handled at work. The second
woman's AD was in a very mild state and would have been inadequate in showing any clinical improvement. The decision to include 8 women in the study was made for several reasons. Firstly, 8 is a suitable number for replication of the single-case design without creating an unmanageable amount of data. Second, 8 women could be divided into two groups of 4, a group size that would have been large enough to provide the participants with the experience of group dynamics, yet small enough to ensure time for individual attention. From the eight women who started the study, one dropped out after the first week of the baseline phase due to personal reasons, so that seven women actually completed the study. In order to provide clarity for the reader, the women who participated in the study were given pseudonyms. Demographics, including a medical history of the women, are presented in the following case studies (see Appendix F for a summary table of demographics).

Anne

Anne was a 21-year-old, single, caucasian woman who had suffered from AD since childhood. At the initial interview, Anne's AD was moderately severe and was fairly extensive on her hands. She also suffered from moderately severe AD around her mouth, eyes, and arms. Anne lived with her father and a roommate in a cooperative housing complex in a middle to low income area of the city.

Anne, a high school graduate, had been employed as a waitress for the past 2 1/2 years, but had been laid off the day she had her initial interview. Customers and employees had complained about the open sores on her hands (staff infections resulting from the AD) and subsequently she had been asked to leave. Over the past 2 1/2 years, she had left this same job on two other occasions due to similar complaints. She stated that she noticed her eczema to be at its worse around March and April and this worsening had led to lay offs from work. Although she was
embarrassed and angry about the conditions under which she had been asked to leave, she was also relieved to be away from the stigmatization of the workplace. She also said that she found the cleaning bleach at work had often irritated her AD.

The greatest stress in her life seemed to stem from her eczema. She was ashamed about her appearance and became frustrated over the pain and itchiness that resulted from the eczema. She coped with the stress from her eczema by staying at home, away from people and by smoking (a pack of cigarettes a day).

The prescription medications she was using for her AD consisted of a 5% Cortisone cream, which she applied to her hands, and a 1% Cortisone cream she applied around her eyes. She also used Bactriban for the infections that broke out on her hands and used the lotion, Lidex to alleviate the itchiness and dry skin.

Ruth

Ruth was a 35-year-old Caucasian who was married with two children. She suffered from AD as a child, which then remitted in her adolescence and returned at age 31. At the initial interview, the AD was confined to her hands and was of moderate severity. Ruth lived in a house in a middle-income suburb. She had a high school education, was a homemaker, and worked part-time as a bookkeeper.

She found that she felt stressed and tense around her children, one of whom suffered from behavioural difficulties. She also reported that stress stemmed from a strained relationship with her husband. Ruth found her AD a source of stress because flare-ups could be painful and socially embarrassing. When she became stressed, she tended to feel tense, eat a lot more, smoke more, withdraw, and feel guilty. Ruth had been on a prescription drug, Parnate for 5 years to treat the overwhelming stress and anxiety she experienced.
Ruth found that her AD tended to follow a cyclical pattern. She believed it worsened and then remitted about every 5 weeks. She had not noticed any relationship between exacerbations and climate or time of year. To treat her AD she was taking internally, 5mg of Prednisone and 50mg of Imuran, two times per day. Topically, she was using the ointment, Halog, when needed.

Mary

Mary was a 32-year-old, married caucasian who worked as an environmental consultant from her home. She had suffered from AD for 10 years. At the initial interview, her AD was of moderate severity and was confined to her hands with occasional outbreaks on her eyelids. Mary had a Ph.D. level of education and was of middle socio-economic status.

Mary found that the most troublesome aspect of her AD was its interference in daily activities such as washing her hair or house cleaning. She took measures to protect her hands by constantly wearing cotton gloves. The major areas of stress in her life stemmed from financial and career concerns. She also found that she often felt stressed from interpersonal relationships. She reacted to stress by questioning herself which led to negative thoughts and a decrease in self-confidence. Her body would become very tense and she would isolate herself.

She had noted remissions in her AD, sometimes for months at a time and noticed that it worsened with the dry climate of winter. She believed that stressful episodes triggered exacerbations and was constantly seeking to understand the stress process in her life. She used Prevex-B, a 1% cortisone, prescription cream to treat her AD.
Lilly

Lilly was a 33-year-old, single Asian of Chinese descent. She had suffered from AD for 2 years but had asthma as a child and had a family history of AD. The AD on her hands was of moderate severity and she also suffered from AD on her elbows. Lilly had a university education and had worked as a telephone clerk for the past 7 years. She lived in a middle-income area of the city.

Initially, Lilly stated she rarely felt stressed but quickly adjusted that comment to say that she tended to deny feeling stressed. Most of her stress was internal, stemming from battles against her feelings of insecurity and self-worth. Another major stress came from her inability to sleep at night that left her feeling irritable during the day. Her way of coping with stress was to deny that it existed and as a result, she was unaware of its effects in her life. The quality of all activities she engaged in were marred by the state of her hands. The most troublesome aspect of her AD was the itchiness that led her to constantly scratch her hands. She used to be a hand model but found that she was now ashamed of her hands because she saw them as unattractive. Her AD appeared to worsen when the weather was cold. She used a non-prescription cortisone cream, Prevex, to treat her AD.

Erin

Erin was a 39-year-old, married Caucasian who immigrated from Hungary 15 years ago. She had two small children and had been a homemaker for the last 5 years. She developed AD suddenly, over a year ago after an emotionally and physically stressful time in her life. At the initial interview she had a mild case of AD on her hands. She had had occasional outbreaks on other areas of her body, but mostly it has been confined to her hands. She had a university education and lived in a home in a middle to upper income suburb.
She found that her hands could be very painful and that her AD interfered with daily tasks including washing dishes, gardening, and other household chores. Her stress stemmed from her own expectations of how 'things should be'. She was a perfectionist and became upset when she could not meet her expectations. She coped with this stress through self-training. She was constantly battling to change her negative thoughts to positive ones and to lower her expectations over, for example the cleanliness of her house. She was learning to be more relaxed and flexible, but found it an ongoing struggle.

She noticed that her AD worsened when she was emotionally stressed or physically run-down (i.e., lack of sleep). Outbreaks also occurred more frequently in winter and just before she ovulated. She occasionally used Prevex-B, a prescription, cortisone cream to treat her AD but mainly relied on vitamins and diet.

Jane

Jane was a 28-year-old, single caucasian who had suffered from AD for about 15 years. She had a university education and worked as a cook in a small restaurant. She lived in an apartment near the downtown area. At the initial interview, she was suffering from a severe case of AD that covered almost her entire body including her hands. Although she had suffered from AD since adolescence, her condition dramatically worsened over a year ago after she slipped at work and suffered a back injury. She was bed-ridden for several weeks and had numerous complications resulting from the injury. During the year, she also suffered other personal losses including the death of a close friend. Overall, she considered the last year of her life to have been extremely stressful.

Her major sources of stress were financial, finding meaning and deciding what to do with her life, and asserting herself. In response to stress, she felt tense,
irritable, had difficulty sleeping, and tended to eat a lot of chocolate. She coped by doing deep breathing relaxation techniques and spending time alone. Her AD greatly impacted her life. It was often so painful and tight, she had difficulty moving. She often avoided bathing because of the devastating effects on her skin and as a result worried about the social consequences of uncleanliness. She was also embarrassed and ashamed of her skin.

Jane found that eating chocolate sometimes exacerbated her AD. She also suggested that the condition worsened just before her period. She did not use any medication to treat her AD except a non-prescription, Chinese herbal cream.

Sarah

Sarah was a 43-year-old, caucasian who was married (for the second time) and had two grown biological children and 2 step-children. She had suffered from AD since age 6. At the initial interview, she had a moderate case of AD on her hands, arms, and face. She had a college level of education and had worked as a child-care worker in the school system for the past 3 years. She lived in a home in middle-income suburb.

Her major source of stress stemmed from a strained relationship with her 19-year-old, biological daughter who was raised by her ex-husband. After the divorce, each parent took one child, she raised her son and her ex-husband raised her daughter. Because of this arrangement she had suffered a great degree of guilt that permeated her life. She found that when she was stressed, her stomach tended to feel very upset. She tried to cope with stress by talking about it. The condition of her hands affected her ability to perform certain household tasks including cleaning and cooking. A patch test revealed she was allergic to cobalt chloride. To treat her AD, she used a prescription cream, Topicort and took Evening Primrose Oil internally.
Measures

Stress and Coping

Visual Analogue Scale for Stress. The first item included in the self-monitoring diary was a measure that asked the women to rate their average level of perceived stress for the day on a visual analogue scale (VAS) ranging from 0 to 100; 0 indicating no stress and 100 indicating extreme stress (see Appendix A). Although reliability and validity of the VAS, such as the one used in this study, are unclear (Halford & Miller, 1992), because of their convenient format, the VAS is the most commonly used instrument for measuring stress on a daily basis (e.g., see Halford & Miller, 1992; King & Wilson, 1991; McMenamy et al., 1988; Stone & Shiffman, 1992).

Perceived Stress Scale. The second measure included in the self-monitoring diary was the Perceived Stress Scale (PSS) (Cohen et al., 1983) (see Appendix A). The PSS is a 14-item questionnaire that assesses "the degree to which individuals appraise situations in their lives as stressful" (Cohen, 1986, p. 716). The PSS was developed in response to the objective measures of stressful events that have traditionally failed to assess the cognitive appraisal process, an important aspect of the transactional theory of stress. Instead of focusing on stressful life events and the impact of these events, the PSS focuses on a global evaluation of perceived stress and is not intended to refer to any particular event.

The PSS consists of questions that ask about feelings and thoughts that may have occurred during the day. Respondents are asked to indicate how often they experienced the particular thought or feeling on a 5-point scale, ranging from never (0) to very often (4). PSS scores are obtained by reversing the scoring on the 7 positive items and then summing across all 14 items. The scores can range from 0
to 56, with higher scores indicating a higher level of appraised stress. The scale was originally designed to assess thoughts and feelings over the past month, however, as the PSS is designed to tap current appraisals of one’s stress level, it is suitable for use as a repeated measure on a daily basis (Cohen et al., 1983; Lobel & Dunkel-Schetter, 1990; Stone & Shiffman, 1992). Reported mean scores have varied from 18.26 for a cardiac rehabilitation sample to 23.67 for a student sample and 25.0 for a smoking cessation group (Cohen, 1983). The mean score for an adult population of 1406 females in a national probability sample of the United States was 20.2 (Cohen & Williamson, 1988).

Tested in a number of studies, the PSS has demonstrated adequate reliability and validity. In two college student samples and a smoking-cessation sample, the coefficient alpha reliabilities were, respectively, .84, .85, and .86 (Cohen et al., 1983). In the same study, the PSS was significantly correlated with life event scores, depressive and physical symptoms, social anxiety, and health service utilization. Furthermore, correlations between the PSS and life events were greater when the respondents perception of the life events were taken into consideration. Although the PSS was highly correlated with depressive symptoms (.76 and .65 for the two college samples), when partial correlations were calculated, it was revealed that the two scales were measuring a different and independently predictive construct. In a national probability sample of the United States, Cohen and Williamson (1988) also reported significant correlations between the PSS and physical illness, physical symptoms, and health behaviours.

More recently, Pbert, Doerfler, and DeCosimo (1992) found the PSS to be associated with measures of depression (.67), anxiety (.80), and physical symptoms (.54). Importantly, the authors found that the PSS scores were significantly
correlated with the above measures of affective and physical symptoms even after
the variance associated with life events had been partialed out. In other words,
global appraisals of stress are more closely associated with dysfunction than life
events scores, even when the life events measure includes an individual’s appraisal
of the desirability of the event.

Hewitt, Flett, and Mosher (1992) discovered that the PSS consists of two
factors, appraised distress and perceived coping. The authors factor analyzed the
scores from the PSS items, for a population of 96 psychiatric patients, using a
varimax rotation. They included items with factor loadings greater than .40 and
found that seven of the items loaded on the first factor (appraised general distress)
and four items loaded on the second factor (perceived ability to cope with current
stressors). The subscales appear to be internally consistent as the alpha coefficients
were .81 for the distress factor and .72 for the coping factor. The authors suggest
that “the PSS measures not only the presence of negative responses to stressors,
but also a perception of the degree of coping ability in relation to existing stressors”
(Hewitt et al., 1992, p. 254).

Buntrock and Reddy (1992) also used the PSS to obtain two separate scores,
one that assessed the respondent’s perceived level of disturbance from stressors
and the other that assessed the respondent’s perceived ability to cope. Utilizing their
expert judgment, through visual analysis, they included half of the items under the
first scale and the other half of the items under the second scale. Standardized
Cronbach alpha reliability coefficients of .78 for the perceived disturbance items and
.86 for the perceived ability to cope items were reported.

In this study, scores generated from the two factors established by Hewitt et
al. (1992) were evaluated independently. Items 1, 2, 3, 7, 8, 11, and 14 from the original
scale were assessed as measuring level of appraised distress and items 4, 5, 6, and 9 were assessed as measuring a perceived ability to cope (see Appendix B). The possible range of scores obtainable for the appraised distress factor is 0 to 28, with higher scores indicating a greater degree of globally appraised distress experienced during the day. For the perceived ability to cope factor, the scores can range from 0 to 16. A low score on this scale, indicates that the individual perceives herself as having coped effectively with stressors during the day, whereas a higher score indicates that she perceives herself as having coped less effectively with stressors during the day.

Skin Condition

Visual Analogue Scales for itchiness and severity. Also included in the self-monitoring diary were three different measures of skin condition that indicated the severity of the respondent’s AD. The first measurement was a self rating of skin itchiness on a VAS of 0 to 100 (see Appendix A). Zero represents the experience of no itch and 100 represents extreme itchiness. Rajka and Langeland (1989) suggest that recording an individual’s experience of itch is a good indicator of the intensity of AD. The second measure of skin condition was a self rating of the severity of the AD (based on cracking, pain, stinging, rash, etc.) also using a VAS and scored in the same manner as skin itchiness (see Appendix A).

Shaded hand diagrams. The third measure included in the self-monitoring diary, used to assess skin condition, involved the use of outlined diagrams of the front and back of the left and right hands (see example in Appendix A). The women shaded in the areas of their hands that were affected by rash, lesions, redness, or scaling due to the AD. The dependent measure was determined by laying a transparent grid over the diagrams and calculating the number of squares that
covered a shaded area (see Halford & Miller, 1992). The size of the squares on the grid were 2.5mm.

**Objective ratings.** Berg (1991) discovered that, compared to a number of other skin diseases, AD patients' self-reports of skin condition corresponded very highly to objective measures. However, Watson and Pennebaker (1989) warn that self-reported physical complaints may actually be reflecting negative affect and may confound correlations between perceived stress and health. Therefore, to improve confidence in results, objective assessments of symptom severity were included. At three points throughout the study, a dermatologist, who worked at the university Skin Care Centre, made an objective rating of the women's skin condition. The assessments were made at the beginning of the baseline phase, at the end of the intervention, and at the follow-up. The signs and symptoms that were rated were: (a) erythema, (b) lichenification, (c) pustules, (d) excoriations, (e) dryness, and (f) vesiculation. Each sign or symptom was rated on a 4-point-scale ranging from 0 to 3 with 3 representing severe involvement and 0 being the total absence of the sign or symptom (Cole et al., 1988; Melin, Frederiksen, Noren, & Swebilius, 1986) (see Appendix C). Furthermore, in order to provide a reliability check on the women's self-ratings of the extent of their AD, the dermatologist also shaded the hand diagrams corresponding to areas of the participants' hands that were covered by rash, redness, lesions or scaling (see Appendix C).

**Trait Anxiety**

Another dependent measure was Form Y-2 (Trait-Anxiety Scale) of Spielberger's (1983) State-Trait Anxiety Inventory (STAI) (see Appendix A). The Trait-Anxiety Scale was administered once per week throughout the duration of the study and was included with the the self-monitoring diary at the end of each week.
The Trait-Anxiety Scale assesses components of an individual's emotional, cognitive, and physiological responses to stressors. Trait anxiety is defined as an enduring personality characteristic that differentiates the level of state anxiety at which individuals tend to react. State anxiety is "characterized by subjective feelings of tension, apprehension, nervousness, and worry, and by activation or arousal of the autonomic nervous system" (Spielberger, 1983, p. 1) that occurs when a person perceives a situation as threatening or dangerous.

The Trait-Anxiety Scale provides 20 statements about various emotional, cognitive, and physical states and asks respondents to indicate how they "generally" feel on a 4-point likert scale, ranging from almost never (1) to almost always (4). To score the Trait-Anxiety Scale, half the items on the scale are reverse scored. The scores can range from a minimum score of 20 to a maximum score of 80; a higher score indicates a higher level of anxiety present.

Reports on norms, reliability, and validity of the STAI are extensive. Not only is the STAI the most widely used measure of anxiety in psychological research (Buros, in Spielberger, 1983), but it was also discovered to be the most frequently used outcome measure in a meta-analysis of 54 studies on stress and coping interventions (Matheny et al., 1986). The norms, for females, from a variety of groups including working adults, college students, high schools students, and military recruits were, respectively, 34.79, 40.40, 40.97, and 40.03 for the Trait-Anxiety scale (Spielberger, 1983).

In terms of reliability, test-retest reliability for female college students with 1-hour, 20 days, and 104 days between sittings were .76, .76, and .77, respectively. The internal consistency for the Trait-Anxiety Scale is fairly high as measured by alpha coefficients. Item-remainder correlations ranged from .52 to .57 for college
students, working adults, military recruits, and highschool students. The overall median alpha coefficient was .90 (Spielberger, 1983).

The Trait-Anxiety Scale has been adequately correlated with other measures of anxiety and personality tests. Correlations between the Trait-Anxiety Scale and the IPAT Anxiety Scale (Cattell & Scheier, 1963) and the Taylor Manifest Anxiety Scale (1953) for college students and neuropsychiatric patients were .85 and .73, respectively. Further evidence of the validity of the Trait-Anxiety Scale was demonstrated by its ability to discriminate between a normal population comprised of working adults, college and highschool students, and military recruits and a psychiatric population for whom anxiety was a major symptom. Discriminant validity is revealed in the fact that no relationship was found between intelligence scores and the STAI (Spielberger, 1983).

Although trait anxiety is described as an enduring personality characteristic and tends to remain fairly stable under fluctuating conditions of stress, it has been shown to be responsive to treatment intervention. For example, Charlesworth, Murphy, and Beutler (1981) demonstrated how a stress management intervention, primarily comprised of relaxation techniques, significantly reduced levels of Trait-Anxiety for nursing students. Hussain and Lawrence (1978) also demonstrated how SIT significantly reduced the level of Trait-Anxiety experienced by test-anxious students compared to two comparison control groups. Utilizing a multiple-baseline design across subjects, Hains (1992) demonstrated how adolescents who underwent a SIT program showed a decrease in Trait-Anxiety from baseline to treatment phases and across the treatment phase. Finally, school personnel who participated in a program combining SIT and exercise showed significant decreases in Trait-
Anxiety compared to control groups who only received a minimal treatment intervention (Long, 1988).

Quality of Life

A final outcome measure that assessed the effectiveness of SIT in treating AD was the Dermatology Life Quality Index (DLQI) (Finlay & Khan, 1994). The DLQI was also administered once per week and was included with the self-monitoring diary for the last day of each week over the course of the study (see Appendix A). The DLQI is a 10-item questionnaire that assesses the degree of disability caused by skin disease. The aim of the questionnaire is to measure how much the respondent's skin condition has affected her life over the past week. The six life areas that were targeted by the questionnaire were symptoms/feelings, daily activities, leisure, work/school, personal relationships, and treatment. In the questionnaire, the respondents are asked to consider the impact of the disease on them over the past week. Depending on the degree of disability caused by the skin condition, the respondents check one of four boxes, ranging from not at all (0), a little (1), a lot (2) to very much (3). Eight of the 10 questions also have a 'not relevant' option that was scored as 0. The overall score for the DLQI was calculated by summing the score for each question, resulting in a maximum of 30 and a minimum of 0. The higher the score, the greater the impairment of quality of life.

Salek et al. (1993) conducted a randomized, double-blind, placebo-controlled study investigating the effects of Cyclosporin on adults with severe AD utilizing a quality of life index similar to the DLQI (the Eczema Disability Index). They discovered a lack of relationship between the level of patients' health-related quality of life and clinical assessments of AD and concluded that "objective clinical assessments do not adequately reflect a patient's state of well-being, or the complete
picture of the outcome of medical intervention" (p. 429). Therefore, the DLQI was included in this study in order to reflect intervention effects on the course of the disorder that may not be captured from ratings of physical signs and symptoms alone.

The DLQI was a recently developed instrument, therefore reports on norms, reliability, and validity were not extensive. The DLQI was administered to 200 patients suffering from a range of skin disorders (13 were AD sufferers) and 100 healthy volunteers (Finlay & Khan, 1994). The patients were selected from the dermatology out-patient clinic at the University Hospital of Wales and the controls were selected from relatives who accompanied the patients. The overall mean score for patients on the DLQI was 7.3 with AD sufferers scoring the highest, 12.5. The overall mean score for controls was 0.5. No significant differences were found between men and women. Discriminant validity of the DLQI is established from the significantly different scores revealed by the skin patients compared to the control group.

In terms of test-retest reliability, 53 skin patients were tested with the DLQI and then retested 7 to 10 days later. Using the Spearman rank correlation technique, the test-retest reliability was found to be .99 for the entire questionnaire and ranged from .95 to .98 for individual questions. Furthermore, internal consistency of the test was found to be significant at the .002 level and ranged from .23 to .70.

The preliminary results from an unpublished study (Kurwa & Finlay cited in Finlay & Khan, 1994) revealed that the DLQI was responsive to change from an intervention. Sixty patients demonstrated a reduction in the mean DLQI from 14.3, before admission to treatment for skin disease, to 8.4, after admission.
Ancillary Measures

Medication usage. Included in the self-monitoring diary, administered every second day over the course of the study, was a section in which the participant's recorded their use of medication including frequency and dosage (see Appendix A).

Therapist's observations. Throughout the study, informal notes about the participants, based on observations and discussions with the women, were recorded. These qualitative results were used to help understand the women's responsiveness to the SIT treatment.

Expectancy questionnaire, goals, and final evaluation. In order to help explain the results of the study and understand the impact of the program on each participant, several questionnaires were administered throughout the study. On the first day of the intervention, the participant's were asked to complete an expectancy questionnaire about the stress management program (see Appendix D). At this time, they also wrote down their personal goals and expectations for the program. At the end of the treatment, a postevaluation questionnaire was administered (see Appendix D). The postevaluation questionnaire asked a range of questions including ratings on the extent to which the participants were able to attain their goals, the extent to which they utilized the coping techniques, and other descriptive information about the treatment program.
Design and Procedure

A multiple baseline design across subjects was employed that included: (a) a baseline period (4 weeks for two of the women and 5 weeks for the other five women), (b) an 8-week stress management intervention, (c) a 2-week post-intervention phase, and (c) a 3-month follow-up. Figure 1 provides a visual overview of the procedure.

Figure 1. Flow chart of procedure for multiple-baseline design. Diary=Self-monitoring diary, includes VAS for stress, itchiness, and severity and Perceived Stress Scale. T-anxiety=Trait-Anxiety Scale. DLQI=Dermatology Life Quality Index. Obj. Rat.=Objective Rating of AD signs and symptoms.

The women were assigned to Group 1 or 2. In part, the assignment was dependant on which day they could attend the stress management meetings. Because more of the women could attend the Wednesday evening meeting (Group 2) than the Saturday morning (Group 1), an extra participant, Barb, on whom minimal data was collected, was added to Group 1. Barb fulfilled the requirements for participation in the study but had inquired about involvement after the baseline period.
of the study had already begun. She participated fully in all group sessions and completed some of the ancilliary measures, but was not required to fill out the self-monitoring diary or to undergo objective ratings. Because of her involvement, Group 1 consisted of 3 participants (Barb, Ruth, & Mary) and Group 2 of 5 (Anne, Lilly, Jane, & Erin). Group 1's baseline period was 4 weeks and Group 2's baseline period was 5 weeks. Through the inclusion of the baseline phase, the women served as their own controls.

From a theoretical perspective, a multiple baseline design is particularly suited to Lazarus's (1984) model of stress and coping. Stone and Shiffman (1992) state that frequent and intensive measurement of variables is "rooted in the transactional theory of stress and coping" (p. 116). Because the various aspects of the stress process are continually fluctuating and interacting, small numbers of assessments relying on recall to condense long time periods may not accurately capture the stress process. Therefore, because the units of analysis, namely AD flare-ups and stress and coping processes fluctuate on a daily basis, intensive measurement of a single individual in the form of a multiple baseline design is an appropriate method of capturing the dynamics proposed by the theory.

The flexibility of the single-case design allows easy adaptation of the stress management counselling intervention to the individual needs of each of the women (Galassi & Gersh, 1991). Additionally, Galassi and Gersh (1991) state that when single-case research is rigorously controlled through the use of multiple baselines, intensive measurements, and replication, as in this study, important answers to treatment efficacy can be generated that can be generalized to similar clients.
Initial interview

Initial contact with participant's occurred over the telephone during which time a general overview of the study was provided and suitability was assessed. If the first two steps proved positive, a more formal, personal interview was arranged. The interview lasted approximately 45 minutes and took place in either my home or the participant's home. During the personal interview, I presented the prospective participant with a consent form (see Appendix E) that outlined the purpose and greater details of the study, which she signed. The women were again screened for appropriateness based on a clinical judgment formed from the answers to a series of questions about stress and coping (see Appendix F), a score of 5 or more on Walks (1956) Tension Thermometer, and an active outbreak of AD on their hands. The women's scores on the Past Week Tension Thermometer ranged from 5 to 7.5 with an average score of 6.3 (a rating of 6 was associated with the descriptive, 'tense') on a zero to 10 rating scale (see Appendix G). A Personal Information sheet (see Appendix F) was then completed that included a range of demographics including a history of the disorder and its treatment. Participants were also required to indicate the extent of their AD by shading areas of outlined diagrams of hands that represented the degree of rash or irritation caused by their AD. Finally, detailed instructions and training in the use of the self-monitoring diaries took place.

Baseline Phase

Multiple baselines were employed for the two sets of women. The baseline for Group 1 was 4 weeks and the baseline for Group 2 was 5 weeks. The 4- to 5-week baseline period was chosen as an appropriate length as it covered enough time to accommodate any major cyclical trends but still remained within practical time constraints. During the baseline phase, and throughout the course of the study, the
women completed a self-monitoring diary every second day before retiring at night (see Appendix A). Assessment of the variables every second day, seemed an appropriate compromise between maximizing the number of measurements in order to capture the variables fluctuating nature and limiting the demands placed on the respondents. The diary was comprised of: (a) a subjective rating scale of average stress level experienced during the day, (b) Cohen et al.'s (1983) Perceived Stress Scale, a 14-item questionnaire on perceived stress and coping experienced during the day, (c) a subjective rating of perceived skin itchiness, (d) a subjective rating of perceived severity skin condition, and (e) diagrams of hands on which the women record the extent of their AD by shading in the areas covered by rash.

In addition, Spielberger's (1983) trait form (Form Y-2) of the State-Trait-Anxiety Inventory was completed once per week throughout the study. The Trait-Anxiety Scale was included with the last form of the self-monitoring diary package for each week. Also included with the last form for each week was the Dermatology Life Quality Index (Finaly & Khan, 1994), a 10-item instrument that assesses the degree of disability caused by one's skin disorder. During the baseline period, the women placed the diaries in a self-addressed stamped envelope and returned the diaries through the mail at the end of each week. During the 8-week intervention, the women brought the completed diaries to the weekly sessions. During the baseline period, the women were contacted approximately once a week by phone in order to insure that they were recording measurements in the self-monitoring diary.

A further measure included in the design was objective ratings of the women's AD signs and symptoms. At three points during the study, the dermatologist objectively rated the women's AD signs and symptoms based on clinical criteria and recorded the extent of their AD by shading inside outlines of hand diagrams. The
first objective rating took place at the start of the baseline phase. The second took place on the final day of treatment, and the final rating at a 3-month follow-up.

**Treatment Phase**

During the 8-week intervention phase, the women attended weekly, group, stress management sessions held at a university Skin Care Centre located in the community. Group 1 met on a different day than Group 2 and began the sessions a week earlier. The sessions were 2 hours in length, so each group received a total of 16 hours of intervention. Throughout the intervention phase, the women continued completing the self-monitoring diary.

The intervention was based on Meichenbaum’s (1985) SIT and followed an adapted version of Long’s (1982) *Stress management: Stress inoculation manual and source book* (see Appendix H for outline of program). The first few sessions were devoted to providing the women with a framework for understanding the nature of stress in general and their specific reactions in particular. Each session started with the women sharing stressful situations from the week and noting their emotional, physiological, cognitive, and behavioural reactions to specific events. In order to facilitate the awareness process, the women recorded their reactions on home work sheets during the week then shared the information with the group (see Appendix I).

As the women began to understand how their initial appraisals of a situation impacted the outcome, they learned to modify their negative self-statements and break the stress cycle. The middle phase of the intervention also consisted of developing other coping techniques that could be employed during the stages of a stressful situation including generating positive self-statements, problem solving, deep breathing, focusing, muscle relaxation exercises, and imagery. The final
sessions involved practising the newly acquired coping techniques through role-play and discussion.

I led the sessions for both groups. My training includes a Master of Arts in Counselling Psychology with extensive experience facilitating stress management groups.

Treatment integrity and adherence. Treatment integrity was addressed by specifying the components of the program, in the form of a checklist, that were covered during each session (Gresham, 1989). Comparisons between the two groups, in terms of material presented, was easily confirmed by comparing the checklists after each session (see Appendix H). The sessions were also audiotaped and I used the recordings as an additional guide to ensure both groups were receiving similar information. Overall, the groups received the same information, but due to time constraints and the different issues that arose for the women, some minor differences in the presentation order and inclusion of exercises did occur. Group 2 did not get an opportunity to be led through an imagery hierarchy with a successful outcome, but they did do role plays during two sessions whereas group 1 did a role play only once. During the final session, Group 2 ran out of time and therefore had to complete the final evaluations at home and return them by mail.

Treatment adherence was addressed in a more informal fashion. During session meetings, participants' adherence to treatment components was reviewed through discussions and sharing of homework assignments. Examples of homework sheets can be found in Appendix I. Erin and Mary were the most consistent in completing the homework sheets. Others were more sporadic in recording their experiences on paper but all the women fully participated in group discussions, sharing detailed accounts of their experiences from the week.
Missed sessions. Occasionally, some of the participants missed a session due to illness or a previously planned vacation. When a participant missed a session, an alternate meeting was planned or the women came early to the next meeting to receive the missed information. Lilly and Jane missed two sessions, Anne and Mary missed one, and Sarah missed three. Erin and Ruth attended all eight sessions.

**Post-treatment Phase**

Following the intervention phase, the participants continued to complete the self-monitoring diaries every second day for 2 weeks. Data collection continued into this phase in order to capture any effects on the dependent measures that may not have occurred during the intervention phase. No contact between myself and the participants occurred during this phase.

**Follow-up**

Three months after the post-treatment phase, the women were contacted for a follow-up evaluation. The dependent variables assessed at follow-up included the package of self-monitoring diary measurements (one week of measurements, every second day), which also included the Trait-Anxiety Scale from the State-Trait Anxiety Inventory (Spielberger, 1983) and the Dermatology Life Quality Index (Finlay & Khan, 1994), and an objective rating of skin condition.

**Analysis**

The data were analyzed using both visual and statistical analysis. For the visual analysis, the women’s scores on each of the dependent measures from the self-monitoring diary were plotted on separate graphs. Each woman was treated as a separate case and analyzed individually. The results from the objective ratings and
ancillary measures were utilized to support and explain the outcomes of the repeated measures.

Visual inspection is the primary method of analyzing data in single-subject designs (Kazdin, 1982). The purpose of visual analysis is that the data are organized and presented in such a way that the viewer can conclude or hypothesize about the relationships between the data simply by visually inspecting the array (Parsonson & Baer, 1992). The data were graphically displayed over the course of the baseline, treatment, post-treatment, and follow-up phases (see Figure 2 for example).

The characteristics of the data that were used to determine whether the intervention effects were consistent and reliable were changes in mean, level, trend, and latency of the data. Although these characteristics generally vary together, they can occur independent of each other, and therefore must be considered separately (Kazdin, 1982). "Changes in means across phases refer to shifts in the average rate of performance" (Kazdin, p. 233). "Changes in level refer to the shift or discontinuity of performance from the end of one phase to the beginning of the next phase" (Kazdin, p.234). "Changes in trend or slope refer to the tendency of the data to show systematic increases or decreases over time" (Kazdin, p. 235). Latency refers to the period between onset of the intervention and changes in dependent measures.

To supplement the visual analysis, a paired sample t-test was used to determine an overall group treatment effect and conventional t-tests were performed to determine the effectiveness of treatment for each individual. In addition, a correlational analysis was performed to determine the relationship between skin condition and stress.
Completion Rate and Missed Data

Overall, the completion rate for the self-monitoring diaries was extremely high. One participant dropped out after the first week of the baseline, however, all of the other participants completed the study except for Jane who did not complete the diaries for the last week of the intervention, the post-intervention, or the follow-up phases. Occasionally participants missed a day or two due to time constraints, vacation, or forgetfulness. Anne and Mary missed 1 week of diaries (three sets of questionnaires each) during the intervention phase, Ruth missed 1 day from the intervention phase and 1 day from the post-intervention phase, and Lilly missed scoring one day from the baseline phase and the STAI and DLQI on two other occasions. Over the course of the study, Erin and Sarah missed scoring 5 other dependent measures each (e.g., the extent of AD, the stress VAS, the DLQI, or the STAI). Not including Jane or the woman who dropped out after the first week in the calculation, the combined completion rate for all measures for the remaining participants was 97%.

Missed data were not included in the calculation of mean averages for the phases (i.e., it was not given a score of zero). Missed data is recognized by gaps between data points on the graphs.
CHAPTER FOUR - RESULTS

Visual Analysis

A total of 56 graphs were generated depicting the responsiveness of the seven women on the eight dependent variables from the self-monitoring diary over the course of the study. Utilizing visual analysis, a number of important trends emerged from this data. Generally, three of the women responded positively to the treatment, one showed improvement before the treatment was implemented, two worsened, and one remained the same. Within the dependent variables across the women, some variables showed greater responsiveness to the treatment than others (e.g., extent of AD and quality of life). Rather than describing each graph in detail, outstanding trends or patterns in the graphs are combined with the objective ratings taken by the dermatologist to form overall pictures of the participants’ responsiveness to the treatment. The outcome of the women’s responsiveness to the treatment are categorized and related to the research questions in terms of those participants who showed improvement and those who worsened or remained the same.

Responsiveness of Participants

Participants who improved. Three of the women, Lilly, Ruth, and Jane responded positively to the stress management intervention across a number of variables. For Lilly, changes across the phases indicative of improvement in response to the treatment were revealed on the visual analogue scales measuring stress level, itchiness, and severity, on the extent of AD measured by the shaded areas on the hand diagrams, and the DLQI which measures quality of life. For the stress scale, Lilly’s mean stress level dropped slightly from 47.89 during baseline, to 46.44 during treatment, to 42.0 during post-treatment, and to 40.25 during the follow-
up (see Table 1). Within the phases, the data showed patterns of alternating increasing and decreasing trends, however, the overall trend across the phases was a slight, but gradual decreased level in stress from baseline to follow-up (see Figure 2). Perceived itchiness and perceived severity showed a downward trend a quarter of the way into the treatment phase and also showed a drop in mean scores, indicating improvement, across the phases (see Figure 3, 4 and Table 1). The large decreases in mean scores across the phase for the extent of AD (42.93 in baseline, 33.12 in treatment, 14.88 in post-treatment, and 6.30 in follow-up) suggest a significant improvement in AD signs and symptoms. Furthermore, an upward trend during the baseline phase was curtailed to a downward trend shortly after the start of the intervention and continued consistently downward until the end of the follow-up (see Figure 5).

Lilly's quality of life also improved after the introduction of the intervention, and is represented by a decrease in mean DLQI scores across the phases (see Table 1). The level of the curve for the DLQI decreased from baseline to intervention, where it maintained a consistent level until the end of follow-up (see Figure 6). The objective ratings, made by the dermatologist, support the pattern of improvement in AD signs and symptoms that emerged from Lilly's self-monitoring diaries. The average rating for the six measures of AD (erythema, lichenification, pustules, excoriations, dryness, and vesiculation) dropped from 1.3 at the first rating to 0.6 for the second and third ratings. The extent of AD, as rated by the dermatologist, also decreased from the first to third ratings (see Table 2). Overall, Lilly showed the greatest response to the stress management intervention in terms of decreases in symptom severity, itchiness, extent of AD, and improvement in quality of life.
<table>
<thead>
<tr>
<th>Participants</th>
<th>VAS for Stress</th>
<th>Perceived Coping</th>
<th>Appraised Distress</th>
<th>VAS for Itchiness</th>
<th>VAS for Severity</th>
<th>Extent of AD</th>
<th>Trait Anxiety (STAI)</th>
<th>Quality of Life (DLQI)</th>
</tr>
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<td></td>
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**Note.** The lower the score, the greater the improvement.
### Table 2

Mean Scores from Self-monitoring Diaries for Participants who Remained the Same or Worsened

<table>
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<tr>
<th>Participants</th>
<th>VAS for Stress</th>
<th>Perceived Coping</th>
<th>Appraised Distress</th>
<th>VAS for Itchiness</th>
<th>VAS for Severity</th>
<th>Extent of AD</th>
<th>Trait Anxiety (STAI)</th>
<th>Quality of Life (DLQI)</th>
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<td>Mary</td>
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<tr>
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<td>13.00</td>
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<td>7.29</td>
<td>42.00</td>
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<tr>
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<td>21.00</td>
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**Note.** The lower the score, the greater the improvement.
Figure 2. Lilly's self-monitored ratings of perceived stress.
Figure 4. Lilly's self-monitored ratings of perceived severity of AD.
Figure 3. Lilly's self-monitored ratings of perceived itchiness.
Figure 5. Lilly's self-monitored ratings of extent of AD.
Figure 6. Lilly's self-monitored ratings of quality of life (DLQI).
In terms of the assessed variables, Ruth responded positively to the treatment with a decrease in the extent of her AD, a reduction in AD signs and symptoms, and an increase in quality of life. The greatest improvement for Ruth was seen in the reduction of the extent of her AD assessed by both the self-monitoring diaries and the objective ratings. The extent of AD, from the self-assessment, showed an upward trend during the baseline phase, indicating a worsening of signs and symptoms, then switched to a steep downward trend at the start of the intervention phase, indicating dramatic improvement. Mid-way through the intervention phase, the curve reversed to trend slightly upward before returning downward until the end of the follow-up (see Figure 7). The drop in mean levels for the self-rated extent of AD across the phases also support the significant improvement in Ruth’s AD. The mean levels decreased from 35.94 at baseline, to 25.95 during the intervention, to 8.27 at post-intervention, and finally to 7.78 for the follow-up. The lower scores indicate less surface area covered by rash, redness, scaling, or lesions.

The objective ratings initially support the improvement seen at the end of the intervention, however on the third rating day, during the follow-up assessment, Ruth’s AD had worsened. The average score for the AD signs and symptoms (erythema, lichenification, pustules, excoriations, dryness, and vesiculation) was 1.0 at the first rating, 0.3 at second, post-treatment rating, and 1.0 at the third follow-up rating (see Table 3). The objective ratings of the extent of AD ranged from 13.3 at the first rating, to 3.7 at the second, and to 15.3 at the third rating (see Table 4).

On the appraised distress and perceived ability to cope variables, recorded on the PSS in the self-monitoring diary, Ruth showed a decrease in variability of scores (i.e., less outlying points) starting mid-way through the intervention phase, but no significant changes across the phases (see Figures 8 & 9). In terms of perceived
Table 3

Objective Ratings - Average Score for AD Signs and Symptoms<sup>a</sup>

<table>
<thead>
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<th>Participants</th>
<th>Pre-Baseline</th>
<th>Post-Treatment</th>
<th>Follow-up</th>
</tr>
</thead>
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<td>0.33</td>
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<tr>
<td>Ruth</td>
<td>1.00</td>
<td>0.33</td>
<td>1.00</td>
</tr>
<tr>
<td>Mary</td>
<td>1.00</td>
<td>0.83</td>
<td>1.50</td>
</tr>
<tr>
<td>Lilly</td>
<td>1.30</td>
<td>0.66</td>
<td>0.66</td>
</tr>
<tr>
<td>Erin</td>
<td>1.00</td>
<td>0.83</td>
<td>0.66</td>
</tr>
<tr>
<td>Jane</td>
<td>1.30</td>
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<td>0.00</td>
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<tr>
<td>Sarah</td>
<td>1.00</td>
<td>1.50</td>
<td>1.30</td>
</tr>
</tbody>
</table>

**Note.** The values represent the average score from the six signs and symptoms based on a rating scale of 0 to 3. The higher the score, the worse the symptoms.  
<sup>a</sup>Signs and symptoms include erthyma, lichenification, pustules, excoriations, dryness, and vesiculation.
### Table 4

**Objective Ratings - Extent of AD**

<table>
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<th>Follow-up</th>
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**Note.** Scores are based on shaded areas from hand diagrams (see Appendix C).
Figure 7. Ruth's self-monitored ratings of extent of AD.
Figure 8. Ruth's self-monitored ratings of appraised distress.
Figure 9. Ruth's self-monitored ratings of perceived ability to cope.
Figure 10. Ruth's self-monitored ratings of perceived severity of AD.
Figure 11. Ruth's self-monitored ratings of perceived itchiness.
Figure 12. Ruth’s self-monitored ratings of quality of life (DLQI).
severity, Ruth showed no overall change of worsening or improvement in response to the treatment but she did show a 5-week cyclical pattern with peaks indicating a worsening of her skin at the 5th and 9th weeks of the study (see Figure 10). In addition, Ruth did not appear to suffer greatly from 'itchy' skin. She generally scored 0 (on a 0 to 100 scale) on the measure assessing perceived itchiness (see Figure 11). Finally, Ruth’s quality of life, as measured by the DLQI, showed improvement by the end of the post-intervention and follow-up phases (see Figure 12).

Jane’s skin condition also showed improvement in response to the SIT intervention. She showed a reduction in the extent of her AD, a remission of AD signs and symptoms as assessed by the dermatologist, her skin felt less itchy, and the quality of her life improved. Her graph for the extent of AD portrayed a gradually decreasing trend from the beginning of the intervention phase until the end of that phase (see Figure 13). Unfortunately, the data for the self-monitoring diaries could not be assessed past the intervention phase as the questionnaires for the post-treatment and follow-up phases were not completed. However, the objective ratings, which include the pre-, post-treatment, and follow-up assessments, support the improvement in AD signs and symptoms suggested by the decreasing trend from the extent of AD reports. The average rating for the six signs and symptoms dropped from 1.3 at pre-treatment, to 0.5 at post-treatment, and 0 at follow-up (see Table 3). The extent of AD also reduced dramatically over the three objective ratings from 11.3 at the first, to 3.4 at the second, and 0 at the last (see Table 4).

In addition, the itchiness of Jane’s skin may have improved slightly after the introduction of the treatment. The graph for the VAS assessing perceived itchiness shows a somewhat lower level during the intervention phase than during the baseline phase (see Figure 14 and Table 1). Finally, the stress management intervention also
Figure 13. Jane's self-monitored ratings of extent of AD.
Figure 14. Jane's self-monitored ratings of perceived itchiness.
Figure 15: Jane's self-monitored ratings of quality of life (DLQI).
appeared to have had an impact on Jane's quality of life. The DLQI graph climbed upward during the baseline phase, indicating a decreasing quality of life, then showed a reverse in trend after the second week of the intervention, indicating an improvement in quality of life (see Figure 15). Although the subjective data are incomplete, when the information from the objective ratings are included in the analysis, Jane's AD signs and symptoms appeared to improve over the course of the study.

Anne showed the greatest decrease in signs and symptoms across the phases, however, the decreasing trends started before the end of the baseline period. The appraised distress and perceived ability to cope variables showed a drop in mean levels across the phases and a general decreasing trend, apart from an obvious spike three quarters of the way into the intervention phase (see Figures 16 & 17). The DLQI, the extent of AD, and the VAS assessing stress level, itchiness, and severity all showed decreasing trends across the phases and lower levels during the treatment, post-treatment, and follow-up phases than during the baseline phase (see Figures 18, 19, & 20). However, because the downward trend across all of these variables began shortly before the end of the baseline period, it is difficult to ascertain whether or not the results were due to an intervention effect.

Although four of the women's skin condition improved over the course of the study, apart from Lilly and Anne who showed slight decreases in their stress level, the results reveal that the women's self-rated stress level, trait anxiety, appraised distress, or perceived ability to cope did not change significantly from baseline to post-treatment or follow-up. The graphs revealed some variability within the phases, but no overwhelming trends of improvement or worsening.
Figure 16. Anne's self-monitored ratings of appraised distress.
Figure 17. Anne's self-monitored ratings of perceived ability to cope.
Figure 19. Anne's self-monitored ratings of perceived stress.
Figure 20. Anne's self-monitored ratings of perceived itchiness.
Overall, the women responded most positively to the treatment in terms of decreases in the prevalence of rash or irritated skin that covered their hands. Ruth, Lilly, and Jane all showed a pattern of decrease in trend and mean level in the extent of their AD, indicating an improvement in their skin condition, shortly after the start of the treatment phase. The outcome for Anne also revealed that the extent of her AD improved over the course of the study, but the decreasing trend began during the baseline phase and therefore may not be directly attributed to the treatment.

Participants who remained the same or worsened. Mary, Erin, and Sarah appeared to show no improvement over the course of the study and on some variables, even worsened, in response to the treatment. Apart from the graphs representing the extent and severity of her AD, which exhibited patterns of deterioration, Mary showed very little change in any of the variables across the phases. The overall mean levels were fairly consistent and the trends remained somewhat flat from the beginning of the baseline to the end of the follow-up, although variability on the VAS for stress and itchiness were somewhat high (see Figure 21). In contrast to the unchanging trends of most of the variables, the perceived severity and extent of AD variables showed a gradual but obvious increasing trend across the phases. For the extent of AD, the baseline phase remained fairly stable and was followed by an improvement in symptoms represented by a drop in level during the first half of the intervention phase (although the first week of measures from the intervention phase is missing). After the decrease, the graph climbed steadily upward until the end of the follow-up phase (see Figure 22). AD scores at the follow-up phase finished at a higher mean level than the baseline, indicating a worsened state of AD by the end of the study (see Table 2). The mean scores for the perceived itchiness variable also increased across the phases, however, a
Figure 22. Mary's self-monitored ratings of extent of AD.
Figure 23. Mary's self-monitored ratings of perceived itchiness.
discernable trend is difficult to detect because the variability of the scores is so great (see Figure 23). The objective ratings made by the dermatologist, support the pattern of no significant improvement in Mary’s AD over the course of the study (see Tables 3, 4, and 5).

Similar to Mary, Erin showed a fairly consistent yet unchanging pattern of responses for most of the variables across the phases with the exception of the extent of AD, which reflected a gradually increasing trend across the intervention phase (see Figure 24). The baseline phase for the extent of AD was fairly stable apart from one outlying point. At the start of the intervention, the graph started to slowly trend upwards, indicating a worsening of symptoms. The level of the post-treatment and follow-up phases dropped somewhat but still depicted a greater overall severity in AD than the baseline phase (see Table 2). The average score of the six signs and symptoms from the objective ratings decreased slightly over the three time periods and the overall clinical impression remained fairly constant, however the dermatologist’s ratings of the extent of AD rose dramatically at the follow-up (see Table 3, 4, and 5). Unlike most of the other variables, the appraised distress scores displayed a high degree of variability across the phases (see Figure 25). In other words, Erin's degree of appraised distress rose and fell at each repeated measure. Interestingly, the perceived coping did not show the same degree of variability suggesting that the two measures were independent. Apart from a slight deterioration in the extent of her AD, overall, the treatment intervention appeared to have no significantly noticeable effects on Erin’s AD or stress process.

Sarah also exhibited no apparent improvement or worsening of the signs and symptoms across the phases. On the measure of extent of AD and quality of life, she did show an increase in level at the follow-up, indicating a worsened state of her
## Table 5

**Objective Ratings - Overall Clinical Impression of Participants' AD**

<table>
<thead>
<tr>
<th>Participants</th>
<th>Pre-Baseline</th>
<th>Post-Treatment</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Ruth</td>
<td>1.0</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Mary</td>
<td>1.5</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Lilly</td>
<td>2.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Erin</td>
<td>1.5</td>
<td>2.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Jane</td>
<td>2.5</td>
<td>1.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Sarah</td>
<td>1.5</td>
<td>2.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

**Note.** The scores are based on a rating scale of 0 to 3. The higher the score, the worse the AD.
Figure 24. Erin's self-monitored ratings of extent of AD.
Figure 25. Erin's self-monitored ratings of appraised distress.
Figure 26. Sarah's self-monitored ratings of extent of AD.
Figure 27. Sarah's self-monitored ratings of quality of life (DLQI).
AD and a decreased quality of life resulting from the AD, but this flare-up may have been precipitated by an allergic reaction to the cobalt in money she was handling at a charity function shortly prior to completing the questionnaires (see Figures 26 & 27). The objective ratings also support the persistent, unchanging state of Sarah's skin throughout the study (see Tables 3, 4, & 5).

In summary, three of the women, Lilly, Ruth, and Jane, responded to the SIT with improvement in their skin conditions, one woman, Anne, showed dramatic improvement but possibly unrelated to the treatment, two of the women's skin condition deteriorated (Mary & Erin), and one woman, Sarah, remained the same. Although Ruth experienced a slight flare-up at the beginning of the follow-up, Lilly, Jane, and Anne remained almost symptom free. A summary of the women's general response patterns to the treatment is presented in Table 6.
### Table 6

**General Summary of Participant's Overall Response to Treatment**

**Psychological Factors**

<table>
<thead>
<tr>
<th>Perceived Stress</th>
<th>Ability to Cope</th>
<th>Appraised Distress</th>
<th>Quality of Life</th>
<th>Trait Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lilly</td>
<td>+(^a)</td>
<td>=</td>
<td>=</td>
<td>+</td>
</tr>
<tr>
<td>Ruth</td>
<td>=</td>
<td>=</td>
<td>=</td>
<td>=/+</td>
</tr>
<tr>
<td>Jane</td>
<td>=</td>
<td>=</td>
<td>=</td>
<td>+</td>
</tr>
<tr>
<td>Anne</td>
<td>+</td>
<td>=</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Mary</td>
<td>(^b)</td>
<td>=</td>
<td>=</td>
<td>=</td>
</tr>
<tr>
<td>Erin</td>
<td>(^c)</td>
<td>=</td>
<td>=</td>
<td>=</td>
</tr>
<tr>
<td>Sarah</td>
<td>=</td>
<td>=</td>
<td>=</td>
<td>=/-</td>
</tr>
</tbody>
</table>

**Skin Condition**

<table>
<thead>
<tr>
<th>Extent</th>
<th>Itchiness</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lilly</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Ruth</td>
<td>+</td>
<td>=</td>
</tr>
<tr>
<td>Jane</td>
<td>+</td>
<td>=</td>
</tr>
<tr>
<td>Anne</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Mary</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Erin</td>
<td>-</td>
<td>=</td>
</tr>
<tr>
<td>Sarah</td>
<td>=</td>
<td>=</td>
</tr>
</tbody>
</table>

\(^a\) Generally improved over course of study.

\(^b\) Generally worsened over course of study.

\(^c\) Generally stayed the same over course of study.
Statistical Analysis

Treatment Effect

Statistical analysis was performed in order to supplement the results from the visual analysis. For the statistical analysis, the only variable that was used to determine the treatment effect was the participants' assessments of the extent of their AD which were recorded on the hand diagrams in the self-monitoring diary. Based on the visual analysis, the rash, redness, scaling, and lesions on the women's hands showed the most consistent and greatest improvement in response to the treatment. In order to determine significant differences between phase means, a comparable statistic was generated based on the last 10 assessment points from each phase (the post-treatment and follow-up phases were combined into one phase) (see Figure 28).

In the first analysis, participants were combined and treated as a group in order to determine an overall treatment effect. A paired sample t-test, comparing the mean of the baseline phase with the mean of the treatment phase, revealed a statistically significant difference between the phases (t(6)=2.34, p<.10). Accepting a "relaxed" p value, overall, a positive treatment effect exists.

The second level of analysis examined the effectiveness of treatment for individual participants based on the improvement in the extent of her AD. For each participant, a t-test was performed to determine whether a statistically significant difference existed between the mean of the baseline phase and the mean of the treatment phase (based on the last 10 assessment days of each phase, as indicated previously). Generally, the results of the statistical analysis supported the results of the visual analysis. Anne, Ruth, Lilly, and Jane all showed a significant treatment effect (p<.05) (see Table 7). Sarah also showed a significant treatment effect.
Means for Extent of AD Measure Across Phases

Figure 28. Means for extent of AD measure across phases.
Table 7

*Change in Means for Extent of AD Outcome Measure at Baseline and Treatment*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Baseline</th>
<th>Treatment</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne</td>
<td>15.10</td>
<td>7.65</td>
<td>2.34</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Ruth</td>
<td>39.50</td>
<td>20.47</td>
<td>4.92</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Mary</td>
<td>7.43</td>
<td>6.15</td>
<td>1.45</td>
<td>Not sig.</td>
</tr>
<tr>
<td>Lilly</td>
<td>45.83</td>
<td>20.98</td>
<td>8.94</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Erin</td>
<td>2.44</td>
<td>5.60</td>
<td>-6.83</td>
<td>Not sig.</td>
</tr>
<tr>
<td>Sarah</td>
<td>14.02</td>
<td>10.28</td>
<td>2.51</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Jane</td>
<td>26.95</td>
<td>18.88</td>
<td>2.29</td>
<td>&lt;.05</td>
</tr>
</tbody>
</table>

*Means are based on last 10 assessment days of each phase.*
(p<.05) from baseline to treatment however, a \( t \)-test that compared the baseline mean to post-treatment mean (combined post-treatment and follow-up phases) was not significant with the mean difference indicating a worsening of her AD. The \( t \)-test between the means of the baseline and treatment phases for Mary and Erin were not significant.

The statistical analyses indicate that overall there is a positive treatment effect however, when the results are analyzed on an individual basis, it is apparent that 4 of the participant's skin condition improved in response to the treatment while 3 of the participants' skin did not improve.

Summary of Participant Responding in Relation to Questions 1-7

Three of the women responded positively to the SIT treatment across a number of variables. Characteristics of the graphed data such as changes in mean, level, and trend across the phases indicate the effectiveness of the intervention in reducing stress and AD signs and symptoms for some of the women. The outcome of the participants' responding along a number of indicators, including the results of the objective ratings, support several of the research questions. 

**Question 1.** It is expected that women suffering from chronic AD of the hands will report (a) a decrease in itchiness of affected area and (b) a decrease in degree of severity, as assessed by visual analogue scales recorded every second day, over the course of receiving an 8-week SIT intervention, during a 2-week post-intervention phase, and at a 3-month follow-up compared to a baseline period before receiving such training.

Two of the women reported a decrease in itchiness of the affected area after the introduction of the SIT intervention. Lilly showed a greater decrease in level of itchiness, as assessed by the VAS, than Jane in response to the treatment. Both
women showed improvement shortly after they started attending the treatment sessions. Anne also indicated a decreased level of skin itchiness, however the improvement started before the baseline phase had finished. The decreases in itchiness for Lilly and Anne were maintained in the post-intervention and follow-up phases. Ruth and Sarah showed much variability but very little overall change in perceived itchiness. Erin's level of itchiness remained fairly constant and neither improved or worsened across the phases. Whereas Mary's itchiness worsened from baseline to intervention, improved slightly at post-intervention then worsened again during the follow-up phase.

In terms of perceived severity, Lilly showed a gradually decreasing trend across the phases. Anne showed a dramatic reduction in the severity of her skin that was maintained until the follow-up but the decrease started before the end of the baseline phase. The severity of Ruth's skin waxed and waned across the phases but showed a peak in severity around the 5th and 9th weeks of the study. Erin and Jane showed a fairly consistent level of severity across the phases with no overall trends towards improvement or worsening. The severity of Sarah's skin also waxed and waned across the phases but no overall change was apparent. However, Mary's skin steadily worsened in severity from baseline to follow-up.

**Question 2.** It is expected that women suffering from chronic AD of the hands will report a decrease in extent of rash, as assessed by self-recorded shadings on hand diagrams made every second day, over the course of receiving an 8-week SIT intervention, during a 2-week post-intervention phase, and at a 3-month follow-up compared to a baseline period before receiving such training.
After the introduction of the treatment, Lilly, Ruth, and Jane all showed significant improvement on the indicator assessing the extent to which their hands were covered by rash or irritated skin. Both Lilly and Ruth, responded positively to the treatment shortly after its introduction. For both women, upward trends apparent in the baseline phases, indicating a worsening of AD signs and symptoms, were curtailed to steep downward trends along with drops in mean and level after approximately the second treatment session. Jane’s AD signs and symptoms receded more gradually with consistent improvement apparent near the end of the treatment phase. Finally, the extent of Anne’s AD also reduced dramatically over the course of the study, but again, significant improvement had already occurred before the baseline phase had finished. The remaining participants showed no improvement in their AD signs and symptoms, and in Mary and Erin’s cases, the extent to which AD covered their hands worsened.

Based on the statistical analysis, four of the women, Lilly, Ruth, Jane, and Anne, all showed a significant improvement in the extent of their AD from baseline to treatment.

**Question 3.** It is expected that women suffering from chronic AD of the hands will demonstrate clinical improvements in disease severity as assessed by objective ratings of: (a) erythema, (b) lichenification, (c) pustules, (d) excoriations, (e) dryness, and (f) vesiculation, recorded pre-baseline, post-intervention, and at a 3-month follow-up.

Based on the average score from the six signs and symptoms (erythema, lichenification, pustules, excoriations, dryness, and vesiculation), each of the women except Sarah showed a decrease in severity (based on a rating scale of 0 to 3) from
the pre-baseline assessment to the post-intervention assessment. Ruth and Mary did not maintain these improvements at the follow-up and Sarah still showed a worsening compared to the pre-baseline assessment, however the remaining participants (Anne, Lilly, Erin, and Jane) all maintained the improvements or showed additional improvement.

**Question 4.** It is expected that women suffering from chronic AD of the hands will demonstrate a clinical improvement in disease severity as assessed by objective ratings of shadings on hand diagrams recorded pre-baseline, post-intervention, and at a 3-month follow-up.

In terms of the extent to which the women’s hands were covered by rash, redness, or lesions due to the AD, all of the women except Erin and Sarah showed a receding of the AD from the pre-baseline assessment to the post-intervention assessment. By the follow-up assessment, Lilly and Jane’s AD had receded even further, whereas Erin’s had worsened even further. Anne and Ruth showed a slight deterioration from post-intervention to follow-up but they still maintained a large degree of improvement from the pre-baseline assessment. The extent of Mary and Ruth’s AD remained fairly consistent across the three assessments.

**Question 5.** It is expected that women suffering from chronic AD of the hands will report an increase in quality of life, as assessed by the Dermatology Life Quality Index (Finlay & Khan, 1994) once per week, over the course of the 8-week SIT intervention, during a 2-week post-intervention phase, and at a 3-month follow-up compared to a baseline period before receiving such training.

Four of the women responded to the treatment with an improvement in the quality of their lives. For Lilly, Jane, and Anne, the AD had a less severe impact on a
variety of areas in their lives, such as work, leisure time, relationships, etc., after they started receiving SIT. Ruth's quality of life did not improve until the 3-month follow-up assessment. Erin's quality of life varied over the course of the study but showed no overall pattern of improvement or worsening. Mary's quality of life remained fairly consistent and also did not show a pattern of improvement or worsening. Finally, Sarah's quality of life remained relatively consistent over the first two phases of the study but showed a worsening during the post-treatment and follow-up phases.

*Question 6.* It is expected that women will report a reduction in (a) perceived stress, as assessed by a visual analogue scale that will be completed every second day, (b) appraised distress, as assessed by a subscale of the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) that will be completed every second day, and (c) trait anxiety, as assessed by the Trait-anxiety Scale of Spielberger's (1986) State-Trait Anxiety Inventory that will be completed once per week, during the course of receiving Stress Inoculation Training, during a 2-week post-intervention phase, and at 3-month follow-up, compared to a baseline period before receiving such treatment.

Lilly experienced a mild decrease in her stress level, as assessed by the VAS for stress, by the 2-week post-treatment phase in response to the SIT intervention. Anne also recorded lower levels of perceived stress (VAS), over the treatment, post-treatment, and follow-up phases than during the baseline period. However, the trend towards decreased levels of appraised distress started mid-way through the baseline phase.

Only Anne responded with a slight decrease in appraised distress, as assessed by a subscale of the PSS (Cohen et al., 1983). By the end of the 2-week
post-treatment phase and into the follow-up phase, Anne showed recordings that indicated she appraised less distress in her life.

In terms of trait anxiety, none of the participants responded to the treatment by showing an increase or decrease in their levels of anxiety and the scores from all of the women remained fairly consistent across the phases.

**Question 7.** It is expected that women suffering from chronic AD of the hands will show an increase in their perceptions of their ability to cope, as assessed by a subscale of the Perceived Stress Scale (Cohen et al., 1983) that will be completed every second day, over the course of receiving SIT, during a 2-week post-intervention phase, and at a 3-month follow-up compared to a baseline period before receiving such treatment.

None of the participants recorded significant increases or decreases in their perceived ability to cope after receiving SIT. The treatment did not have an impact for the women on this indicator of the stress process.

**Comparison to Norms**

The women varied in their ratings of stress, anxiety, and quality of life. Three standardized measures (the STAI, the PSS, and the DLQI) were used to assess these variables, but only one variable, the Trait-Anxiety Scale (the STAI), could be appropriately compared to already established norms. The PSS has established norms for assessment periods recalling the past week or more, but norms do not exist for use of the PSS in the adapted version of daily ratings or for its factors of appraised distress and perceived ability to cope as was used in this study. The DLQI is a new scale and norms have not yet been established, however, comparisons were made between the scores for AD sufferers from Finlay and Khan’s (1994) study.
and the women's scores in this study. The score from the first week of the self-monitoring diary for the Trait-Anxiety and quality of life scales were used for comparison purposes. Table 8 provides an overview of the scores for each of the women.

For the Trait-Anxiety Scale of the STAI (Spielberger, 1983), the women's scores ranged from 43 to 54 (see Table 8). All participants scored higher than Spielberger's norms (34.79 to 40.03) for females taken from a variety of groups. The higher trait anxiety scores of the AD participants were expected as the screening criteria required that the participants be stressed and anxious.

In terms of quality of life, the women's scores on the DLQI ranged from 1 to 15 (see Table 8). Jane and Sarah scored higher than the AD sufferers in Finlay and Khan's (1994) study whom averaged 12.5. The remaining women reported lower scores, indicating that their AD had a less severe impact on their quality of life. The greater quality of life enjoyed by the participants in this study compared to Finlay and Khan's may reflect the fact that the women primarily suffered from hand AD, whereas Finlay and Khan's participants may have included more extensive cases involving a greater percentage of body area covered by the AD.
Table 8

Trait-anxiety and Quality of Life Scores for Participants

<table>
<thead>
<tr>
<th>Participants</th>
<th>Trait-anxiety</th>
<th>Quality of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne</td>
<td>53</td>
<td>30</td>
</tr>
<tr>
<td>Ruth</td>
<td>44</td>
<td>4</td>
</tr>
<tr>
<td>Mary</td>
<td>49</td>
<td>1</td>
</tr>
<tr>
<td>Lilly</td>
<td>43</td>
<td>5</td>
</tr>
<tr>
<td>Erin</td>
<td>43</td>
<td>5</td>
</tr>
<tr>
<td>Jane</td>
<td>53</td>
<td>16</td>
</tr>
<tr>
<td>Sarah</td>
<td>54</td>
<td>15</td>
</tr>
</tbody>
</table>
Correlations Between Stress and Skin Condition

Question 8. It is expected that there will be a weak, but positive relationship between the following variables, assessed every second day, over the course of the study (15 weeks for Group 1 and 16 weeks for Group 2): (a) itchiness, as assessed by a visual analogue scale, and stress, as assessed by a visual analogue scale, (b) itchiness and appraised distress, as assessed by a subscale of the Perceived Stress Scale (Cohen et al., 1983), (c) extent of rash, as assessed by hand diagrams, and stress, and (d) extent of rash and appraised distress.

Question 9. It is expected that a relationship will be found between the women’s perceptions of their ability to cope and their AD signs and symptoms, assessed every second day over the course of the study.

For each participant, the variables from the self-monitoring diary assessing skin condition (extent of AD, perceived itchiness, and perceived severity) were correlated, using the Pearson-product moment correlation, with each of the variables assessing stress and coping (perceived stress, perceived ability to cope, and appraised distress). Nine correlations were calculated for each participant. The resulting correlations ranged from $r=-.42$ to $r=.67$ with almost half of the correlations falling over $r=.30$, indicating noticeable positive relationships between psychological factors and skin condition (see Appendix J for correlations). Anne, Jane, and Erin showed the most consistent links between AD and stress with 7 of the 9 correlations for Anne and 6 of the 9 for Jane and Erin, falling over $r=.30$. Across the subjects, itchiness seemed to be most strongly related to stress and coping factors and the extent of AD, the least related.

In order to determine whether the correlations were significant, each participant was treated as a separate independent study and a meta-analysis, using
the unweighted Stouffer technique, was performed (King & Wilson, 1991). The results of the nine meta-analyses are shown in Table 9. The meta-analysis revealed positive relations between each of the factors assessing skin condition and the psychological factors of stress and coping. Seven of the nine analyses were significant ($p<.001$), with perceived itchiness and perceived stress showing the strongest positive relationship.
### Table 9

**Summary of Meta-Analysis Relating Skin Condition to Stress and Coping**

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Z-score</th>
<th>Mean r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent/VAS for Stress</td>
<td>3.1055*</td>
<td>0.17</td>
</tr>
<tr>
<td>Extent/Perceived Coping</td>
<td>0.9214</td>
<td>0.05</td>
</tr>
<tr>
<td>Extent/Appraised Distress</td>
<td>1.7641</td>
<td>0.10</td>
</tr>
<tr>
<td>Itchiness/VAS for Stress</td>
<td>8.5219*</td>
<td>0.45</td>
</tr>
<tr>
<td>Itchiness/Perceived Coping</td>
<td>6.2252*</td>
<td>0.33</td>
</tr>
<tr>
<td>Itchiness/Appraised Distress</td>
<td>6.7441*</td>
<td>0.30</td>
</tr>
<tr>
<td>Severity/VAS for Stress</td>
<td>7.7130*</td>
<td>0.41</td>
</tr>
<tr>
<td>Severity/Perceived Coping</td>
<td>5.2202*</td>
<td>0.28</td>
</tr>
<tr>
<td>Severity/Appraised Distress</td>
<td>5.3956*</td>
<td>0.28</td>
</tr>
</tbody>
</table>

* p<0.001
Results of Ancillary Measures

Medication usage. Over the course of the study, the participants recorded their use of medication every second day as a part of the self-monitoring diary. Some of the women reduced the use of medication whereas others increased its usage. The following outlines the women’s medication usage, including increases, decreases, and changes over the course of the study.

Anne started the study applying Dermovate topically to AD signs and symptoms. For the first two weeks of the baseline, she used it twice a day. After the second week, she reduced its usage to once per day for about another week and a half. Around the 4th week of the baseline phase, she stopped using medication altogether and this abstinence continued until the end of the follow-up.

At the start of the study, Ruth was taking 10mg of Prednisone and 100mg of Imuran, internally. Topically, she was applying Halog once per day. After 3 weeks of baseline, she reduced the Prednisone to 7mg and the Imuran to 75mg. During the 7th week of the study, she reduced the Imuran medication further to 50mg and during the 9th week of the study (midway through the treatment phase) she reduced the Prednisone to 5mg. Around the 11th week of the study, she increased the Prednisone back to 7mg where it remained until the end of the follow-up. Overall, Ruth decreased her internal medication (Prednisone and Imuran) slightly over the course of the study and made no changes to her topical medication (Halog).

The only medication Mary used throughout the study was a non-prescription hand cream called Prevex. Her use of the medication did not increase or decrease in a systematic fashion but varied on a daily basis. Her usage varied from no application to once, twice, and occasionally three times per day. During the baseline and treatment phases she recorded using the cream on 26 out of 39 assessment
days. The longest period of time that Mary refrained from using the cream was during the 2-week post-treatment phase when she only used it once (on the recorded days). During the follow-up, she applied it on two of the four assessment days. Overall, Mary used the Prevex medication more frequently during the baseline and treatment phases than she did during the 2-week post-treatment phase.

Lilly also used the non-medicated Prevex to treat her AD. During the first 8 weeks of the study, she applied the cream once per day on 20 out 28 assessment days. From the 9th week (midway through the intervention) until the end of the study, she used Prevex on only two more occasions. On two days she also used a Chinese Herbal Cream to help relieve the itchiness of her AD. Overall, Lilly’s medication usage dropped significantly after 4 sessions of treatment and she did not use any medication for the 2-week post-treatment and follow-up phases.

Erin alternated use between a tar-based cream and a prescription cortisone cream, Prevex-B to treat her AD. Although she did not apply the creams every day, overall, she showed a 34% increase in the usage of the medication during the treatment, post-treatment, and follow-up phases compared to the baseline phase. During the baseline phase she used either the tar-based or Prevex-B cream on 8 out of 19 assessment days. During the treatment, post-treatment, and follow-up phases, she used either cream on 29 out of 38 assessment days. She applied the cream most often during the treatment phase, then reduced the usage during the 2-week post-treatment phase (2 out of 7 assessment days) but applied the tar-based cream on all four of the follow-up days.

Jane primarily used a non-prescription Chinese herbal cream to ease the itchiness of her AD throughout the study. During the baseline phase, she also applied Bactine on 5 days and a hand salve once. During the treatment phase she
applied a lemon and geranium essential oil once and took primrose oil internally on three different days. She used the Chinese herbal cream more often during the treatment phase (22 out of 23 assessment days) than during the baseline phase (13 out of 19 assessment days). During the treatment phase, she also used more applications of the cream per day (1 to 3 times) than during the baseline phase (1 to 2 times). In addition, she reported verbally that she started taking an anti-inflammatory, prescription medication to treat back pain around the second to last treatment session. Overall, Jane applied the Chinese herbal cream on the assessed days, more often during the treatment phase than during the baseline phase. The questionnaires for the post-treatment and follow-up phases were not completed.

Sarah used Topicort, a topical, prescription, cortisone cream, throughout the study to treat her AD. She also took Fusidic Acid during the second week of the post-treatment phase and Vioform HC and Dermasone (.05%) during the follow-up phase. She recorded using Topicort on 5 out of 14 assessment days (5 days were incomplete) during the baseline phase and 12 out of 27 days during the treatment phase. During the second week of the post-treatment phase, she switched to Fusidic Acid three times per day and then switched to Vioform HC and Dermasone during the follow-up phase. Overall, Sarah's use of Topicort remained relatively unchanged over the baseline and treatment phases but she did switch to stronger medication for the post-treatment and follow-up phases.

Therapists observations. Throughout the study, I recorded informal notes about some of the participants. This qualitative data was gathered from discussions and observations made during the initial interview, treatment sessions, and follow-up.
The following information may be helpful in understanding some of the women's response to the stress management intervention.

Mary started the treatment with enthusiasm and with the hope of adding to her already sophisticated knowledge of herself and a moderate knowledge of stress and coping techniques. Throughout the sessions, Mary seemed to gain a new perspective on her reactions to stress and took measures to improve her coping repertoire. However, near the end of the intervention phase, Mary began to feel depressed due to interpersonal conflicts with family members. At the initial interview, she had stated that interpersonal stress usually caused her the most grief and she felt least able to deal with it. Although the family situation continued to cause stress by the follow-up, she said that her depression would have been even worse if she had not gained the coping skills and support she had received in the treatment sessions.

By the end of the sessions, Lilly felt less 'stressed out' and bothered by potentially stressful events. After tackling much of her negative inner dialogue, her self-doubt had lessened and her confidence had improved. She was focused on working on her self-concept and exploring 'who she was'. Around the second to last treatment session, Lilly found she had developed shingles. Although she was dismayed by this setback, given all the work she had done to deal with stress (her doctor had informed her that the shingles may be stress-related), she felt she could handle this latest challenge. She felt in control of her life. Her AD did not worsen and the shingles had cleared by follow-up.

Upon getting to know Erin during the treatment sessions, information about her recent history was revealed that may have had a bearing on her responsiveness to the intervention. At the start of the study, Erin's AD was in the most improved
state that it had been in for the past year. In comparison to the other women, Erin had the least serious case. Over the past year, since developing the AD, Erin had developed, of her own accord, a number of techniques that were very similar to the coping methods taught in the SIT program. She had been very disciplined in implementing changes in her life including reframing her negative and anxious thoughts, starting an exercise program, taking time out for relaxation, and letting go of some of her more rigid expectations of her self and others. Possibly, in response to the stress management techniques she had implemented in her own life, Erin’s AD had receded dramatically over the past year. Apart from one or two outstanding incidents with her husband, during the sessions, Erin did not appear to experience a great deal of stress but instead reflected back on how she would have felt before she had made the changes in her life. She also reported at the end of the intervention that the worsening of her AD may be related to heat or fatigue because she had not been able to sleep well due to the heat at night. At the follow-up, she reported to the dermatologist that she had been feeling stressed over the past few weeks, and that may have led to the flare-up in her AD she was experiencing at that time.

Near the end of the treatment sessions, Jane began to address issues in her life that had been ‘weighing her down’. She had consistently procrastinated and as a result her life had felt disorganized and out of control. Around the 6th session, she started to make changes such as organizing her home, clearing up paperwork with a health insurance company regarding a back injury, and refocussing on a new career path. At the follow-up, she reported that she had taken anti-inflamatory drugs for a short period to help with her back pain and had also moved back to her family home for a few months to re-evaluate her situation.
Expectancy questionnaire, goals, and final evaluation. Appendix D shows the ratings that each participant gave for the three expectancy questions that they completed at the end of the first treatment session. On a scale of 1 to 7, the ratings range from 3 to 7, with a higher score indicating more confidence in the program. Those participants (Anne, Ruth, Lilly, and Jane) that showed a greater confidence in the program also showed the most positive response to the treatment. The goals and expectations each participant set for themselves at the first session and the post-evaluation of the extent to which they were able to attain the goals are also found in Appendix D. Some examples of goals include: “Learn to deal with stress better; Eventually stop taking medication for my eczema; No eczema; Worryness and high expectations gone; To be aware of my physical self - how my life actions are affecting my body”. Most of the goals were fairly realistic, however, participants that hoped for complete remission from the AD in 8 weeks may have had unrealistic expectations. In terms of the participants’ ratings of the extent to which they were able to attain their goals, the overall average rating, on a 5-point scale, was 3, with 5 indicating a complete achievement of the goal. Unfortunately, Lilly and Jane’s goals and ratings were missing and are therefore not included in the overall average.

Summaries of the extent to which each participant was able to put to use the concepts and skills learned in the intervention program are also found in Appendix D. The technique that received the highest average rating in response to the question “To what extent have you been able to put to use the following concepts and skills in order to cope better with stressful situations?” was the skill of slowing down one’s breathing (i.e., deep breathing). This technique was followed closely by muscle relaxation and then replacing negative self-statements with positive self-statements and instructions.
In answer to the post-evaluation question “What do you do differently as a consequence of this program?”, some of the comments were: “I try to be more positive about negative things in my every day life; I try to see unexpected stresses in best possible light; Find a person or group with whom I can share my struggles in a way that is safe and respectful of both” (see Appendix D).

Some examples from the question “In what way do you feel differently as a consequence of this program?” were: “I feel better able to cope with problems; Becoming more aware of what stress is and I feel as though I am not alone in my struggle with eczema; I feel I have more control over my reaction to stress” (see Appendix D).

Comments from the last question “What aspect of this program was most useful (helpful) to you in learning how to better cope with stress” include: “The breathing techniques; The imagery makes me feel more relaxed and pleasant, which makes it easier for me to see things in a better perspective; Mixture of techniques - good (body, mind, etc.); Self talk; Relaxation techniques, especially the muscle relaxation” (see Appendix D).

Finally, in response to the question “What would you have us change or do differently in this program?”, the participants stated “I would liked to have met less often for a longer time, either more hours at a time or for more weeks; Hand out a list of the techniques as a reference at the start of the course; Elicit stronger commitment to do home exercises each week (mentioned twice)".
CHAPTER FIVE - DISCUSSION, LIMITATIONS, AND IMPLICATIONS FOR COUNSELLING

Discussion

The results of this study show that an 8-week SIT program can help reduce the severity of hand AD for some women. Although each of the women responded uniquely to the SIT intervention, the response patterns from the visual analysis of three of the seven women support the effectiveness of SIT in treating the signs and symptoms of AD and stress. Lilly, Ruth, and Jane all showed a positive response to the treatment on a number of variables assessing stress and the severity of their AD. Taken together, the women showed improvement in skin condition and stress in response to the treatment as assessed by (a) self-ratings on hand diagrams indicating areas affected by AD, (b) a VAS indicating perceived itchiness of skin, (c) a VAS indicating the perceived severity of the disorder, (d) a quality of life index, (e) a VAS indicating stress level, and (f) objective ratings of AD signs and symptoms. Although three of the women responded positively to the intervention, a fourth may have improved independently of the treatment, two women appeared to worsen, and one remained the same. Statistical analysis supported the findings from the visual analysis.

For those who did respond to the treatment, in terms of the self-ratings indicating the extent of rash or irritation caused by the AD, positive results were replicated across the three women. After the introduction of the treatment, the three women showed a reduction in the extent to which rash, redness, scaling, or sores covered their hands. For Lilly and Ruth, the improvements in skin condition were maintained at follow-up. Jane did not complete the self-monitoring diaries but the objective ratings show her hands were free of AD at the follow-up. In addition, when
extent of AD was considered, statistical analyses also revealed a positive treatment
effect for Lilly, Ruth, and Jane.

Lilly and Jane rated their skin as being less itchy after the introduction of the
SIT, whereas itchiness did not seem to be a troublesome symptom for Ruth. Most of
her ratings throughout the study were zero indicating 'no itchiness' and she showed
no overall pattern of worsening or improvement. Ruth may not have experienced
serious itching because the medication she was taking internally, Imuran,
Prednisone, and Parnate, may have surpressed the central nervous system, thereby
reducing the itchiness sensation.

On the VAS assessing the perceived severity of the disorder, only Lilly
responded to the treatment with noticable improvement. However, all three women's
quality of life improved after the introduction of SIT. Once the women started
attending the treatment sessions, the degree of disability caused by their AD
lessened. In addition, Lilly's stress level, as assessed by a VAS decreased slightly
after receiving SIT.

The improvements in the women's skin condition that were revealed in the
ratings from the self-monitoring diaries were supported by the objective observations
made by the dermatologist. The ratings made by the dermatologist showed that Lilly,
Ruth, and Jane's AD signs and symptoms and the extent of their AD had improved
after receiving the treatment. Lilly and Jane's improvements were maintained at the
follow-up, however, Ruth showed a slight deterioration at the third rating. The first
rating in Ruth's self-monitoring diary for the follow-up, which corresponds with the
day of the objective rating, also shows a slight flare-up, but improvement followed
thereafter.
Lilly, who showed the greatest remission in AD, also dramatically reduced the use of medication after the introduction of the intervention. Her almost total lack of medication usage after the 9th week of the study and into the 3-month follow-up, both helps to confirm the improvement in her skin and eliminates the rival hypothesis that the medication was primarily responsible for the healing. Lilly stated that the SIT intervention helped her to reprogram her negative thoughts into positive ones and as a result she felt more in control of her response to potentially stressful situations. Although she developed shingles near the end of the treatment sessions, she felt able to deal with this new challenge and was clear of the shingles by follow-up.

The improvement in Jane’s skin condition corresponded to an emotional healing process she was working through as a result of attending the treatment sessions. In understanding her stress process, Jane realized some major barriers that had left her feeling stuck, guilty, frustrated, and helpless. At the start of the sessions, Jane had felt her life was disorganized and somewhat out of control. Her tendency to procrastinate had caught up with her and she had weaved a complicated web with an insurance company regarding a back injury she had suffered at work about a year prior to starting the study. Around the 6th session, she began to reach some understanding about her habits and how the patterns were affecting her emotionally. In a sense, Jane came clean, took action, and dealt with the relevant parties. As a result, she felt an immense sense of relief and she noticed that her AD had begun to clear. In the process, she also regained some focus in her life and began to make significant decisions about her career. The emotional resolution Jane reached through the changes she made to regain control of her life by rectifying ‘unfinished business’ may have led to the external improvements in her skin condition. However, it can not go unmentioned that the dramatic improvement seen
in Jane's skin from the post-treatment objective rating to the follow-up rating may have been in part due to a lifestyle change she made during this period. For a period of time between the two assessments, Jane quit her job moved back to her family home. Although the improvement in her skin started before this move, the environmental changes (including possibly a reduction in stressors) may have contributed to further improvement.

To summarize, the lack of improvement in Lilly, Ruth, and Jane's skin condition during the baseline phase helps discount the possibility that the self-monitoring process or the passage of time may have been responsible for the changes. Furthermore, the replication of positive results across three participants and the fact that the improvement did not occur until after the treatment was introduced suggests that the SIT intervention was responsible for the improvement in the women's skin condition.

Anne also showed a tremendous degree of improvement over the course of the study, but the reductions in AD signs and symptoms began before the treatment was introduced. Several factors may account for Anne's improvement. First, she may have responded to the self-monitoring process. Researchers have long known that monitoring and tracking one's own behaviours and symptoms can lead to improvement (Tennen & Affleck, 1996). When the treatment was implemented it may have added to the benefits already gained from the self-monitoring process. On the other hand, Anne may have improved in response to other environmental factors including the topical medication she was using at the start of the study and the fact that she had quit her job 3 months prior to starting the study. Anne had been working as a waitress and the chemicals in the cleaning solutions at work had irritated her skin, forcing her to leave her job. She had been on the medication for
several months prior to the start of the study because her AD had been very severe. Therefore, the trend towards improvement may have been part of a longer course of improvement that was in response to the combined effect of the medication and the avoidance of the irritants. Another hypothesis is that Anne’s AD had gone into spontaneous remission, an unexplainable characteristic of the disease.

In contrast to those who improved, Erin and Mary did not respond positively to the SIT and some of their AD signs and symptoms worsened. Although Mary showed an initial improvement after the introduction of the treatment, by the end of the treatment phase and into the post-treatment and follow-up phases, both Mary and Erin had indicated that the rash, scaling, redness, and lesions had become more pervasive. Mary also perceived the severity of her AD, as assessed by a VAS, to worsen across the phases.

Erin’s failure to respond positively to the treatment may have been due to a ‘floor effect’. Prior to participating in the study, Erin’s skin condition had been radically worse. In order to understand her AD, she had undergone a self-study during which she monitored the fluctuations between her stress level and AD exacerbations. As a result, she had already adopted a wide range of cognitive-behavioural coping strategies. The changes she made in her thought patterns and behaviours may have helped bring the disorder under control. The low levels and stableness of her responses in terms of stress and AD signs and symptoms indicated by the graphs suggest the lack of stress she felt and the fairly good condition of her skin. Her average ratings on the VAS for stress, itchiness, and severity for each phase ranged from 12 to 23 on a zero to 100 scale and her average trait anxiety scores for each phase were below Spielberger’s (1983) norms for various groups of females including working adults, college students, high school students, and military
recruits (34.79, 40.40, 40.97, and 40.03, respectively). Possibly, by the time she started the SIT, she had already learned to manage the stress in her life and had reached a floor effect, thus, an 8-week stress management program may not have been able to contribute to any further significant improvements.

Mary’s lack of improvement may have been a result of stress she was experiencing around the end of the treatment sessions and into the post-treatment and follow-up phases. Interpersonal stress with family members and difficulties with her consulting business had led her to feel unhappy and depressed. The constant level of stress in her life may have prevented her skin from healing. Although she claimed that the impact of these episodes may have been even worse if she had not enlisted the coping skills and self-awareness she acquired through the stress management intervention, Mary entered the program with a fairly extensive knowledge of coping skills she had acquired through instructing pain management groups for arthritis patients. Therefore, like Erin, possibly the coping skills Mary already possessed were at work and an 8-week SIT was unable to add any further improvement.

Sarah experienced a moderately severe level of AD on her hands throughout the study and she did not show any responsiveness to the treatment. During a patch test it was revealed that she was allergic to cobalt chloride, a substance found in many common products including plastic, newsprint, and money. The possibility exists that she was constantly exposing her hands to these substances and thereby exacerbating her skin disorder. The flare-up prior to the follow-up came after she had been counting money for a charity fundraiser and therefore had come in contact with a large amount of cobalt chloride for an extended period of time. In addition, Sarah also missed three treatment sessions and although she was informed of the
missed material by phone or by coming early to another session, it could not be
arranged for her to make up all the sessions as some of the other participants did.
Therefore, another possible explanation for Sarah's lack of improvement may be that
because of her absences, she did not receive the full benefit from the stress
management program.

None of the participants showed a reduction in their levels of trait anxiety.
The lack of change in trait anxiety for any of the women, reflects the findings of other
studies from an area where outcome results have been mixed. Overall, an
inconsistent pattern has emerged as some studies have found trait anxiety responds
with improvement to a stress management intervention, whereas others have found
trait anxiety to be unresponsive. Similar to the results of this study, other studies
which have used trait anxiety as an outcome measure for individuals with a medical
condition have failed to find significant decreases in the participant's level of trait
anxiety (e.g., Foley, Bedell, LaRocca, Scheinberg, & Reznikoff, 1987).

The results indicate that the women's perceived ability to cope was also
unaffected by the SIT program. It was expected that the treatment would have a
positive effect on their perceptions about their ability to cope with stressful situations.
Although the women reported both in informal discussions and in the final evaluation
that they felt more able to cope with difficult situations due to the adoption of coping
strategies learned in the stress management program, this outcome was not
reflected in the self-rated recordings. The reasons for the discrepancy may have
been due to the measure chosen to assess coping efficacy, a subscale of the PSS
(Cohen et al., 1983). This subscale of the PSS is not a widely used assessment tool
for coping but was chosen because of its short format and its apparent usefulness in
capturing an individual's appraisal of her coping ability. However, the items in the
scale assess global aspects of coping and do not refer to coping with specific events. Perhaps, when general appraisals of one's overall ability to cope are made, improvements or changes in coping with specific stressors are not given credence. Furthermore, the measure may not have been sensitive enough to capture the proposed concept of perceived ability to cope, as it was only comprised of four items. Another explanation is that, although the women declared that overall they felt more able to cope, perhaps in day to day functioning those appraisals did not hold true. Finally, although SIT may have an impact on individual's use of coping strategies (e.g., Foley, Bedell, LaRocca, Scheinberg, & Reznikoff, 1987; Long, 1988), it may not affect one's perception of her ability to cope.

A correlational analysis revealed positive relationships between aspects of the stress process and the AD fluctuations for most of the women. The variables covary but it can not be inferred that stress leads to outbreaks of AD. The relationship may be bidirectional in that outbreaks of AD led to increased perceptions of stress or stress may have exacerbated the women's AD. Although the variables covary, the psychological measures did not reflect the same degree of improvement as the measures of skin condition. The lack of improvement seen in the measures assessing aspects of the stress process may have been because the instruments assessing these variables were not sensitive enough. Furthermore, the instruments used to operationalize stress did not refer to a specific stressful event and therefore may have been too global to capture changes in perceptions of stress.

However, a further barrier to discovering improvements in the psychological measures of stress for the women who responded to the treatment or to finding a stronger relationship between AD signs and symptoms and self-rated appraisals of stress for all the women, may be in the underlying philosophy inherent in
psychophysiological research. The aim of research in this area is to determine the nature of the relationship between psychological or emotional and physiological processes. However, in the quest to discover this mind-body connection, a mind-body duality is created. In evaluating the psychological factors separately from the physiological factors and then looking for a relationship between the two, we are assuming that they are separate and not expressions of the same phenomenon. However, if a true connection exists and the mind and body are one, then an individual’s “angry”, lesioned skin may be the emotional expression we are futilely attempting to capture through cognitively oriented questionnaires and rating scales. In order to assess a person’s entire experience of stress and other emotions or to make sense of the experience of disease, researchers will have to find new ways to assess the body’s expression of the mind and the mind’s experience of the body. Therefore, future research into the area of mind-body medicine may require more than innovative assessment techniques, it may also require a major paradigm shift from mind-body duality to mind-body unity (Chopra, 1989).

Who May Benefit from SIT?

The results of this study show that individuals do not respond uniformly to SIT. Several possible explanations exist for the differential effect to treatment. Interestingly, the four women, Lilly, Ruth, Jane, and Anne, whose AD and stress level showed the greatest improvement over the course of the study, also had the strongest beliefs that the treatment program would be successful. On the initial expectancy questionnaire, given at the end of the first treatment session, these four women responded with the greatest confidence of all the women, to the question “How confident are you that this program will be successful in reducing your stress reactions?” (see Appendix D). On a 7-point scale, with 7 indicating the most
confidence, the women who showed improvement scored 5s and 7s, whereas the women who did not improve scored 3s and 4s. The positive expectations these women held for the program may have been partly responsible for its successful impact. The possibility that the improvements may be a result of demand characteristics in order to please the researcher can not be entirely be ruled out, however, the positive outcome of the objective ratings recorded by the dermatologist help confirm the existence of real improvements in the participants' skin conditions. Moreover, the responders did not show improvement immediately but began to respond after a few sessions. Therefore SIT may be more effective with individuals who believe the program will be successful.

Another factor that distinguished between participants who responded to the treatment compared with those whom did not was the severity of their AD. Taking the mean score of the self-rated extent of their AD from the baseline phase, Anne, Ruth, Mary, and Jane all indicated a greater degree of rash and irritation that covered their hands than Mary, Erin, or Sarah (see Table 1 and 2). Therefore, the treatment may have a greater impact on those individuals who are suffering from a severe state of AD versus those who are suffering from a mild or moderate case.

A third possibility that may have impacted the effectiveness of the treatment was the women's coping repertoire before entering the program. Based on discussions and therapeutic observations, it was apparent that Erin and Mary, both of whom did not respond positively to the treatment, possessed a wide range of coping techniques in dealing with stressful life events including their AD. Anne, Ruth, and Jane, on the other hand, entered the program with a less extensive knowledge of positive coping techniques and tended to experience more “chaos” in their lives. Therefore, SIT may have made a more important contribution to these
individual's lives and the results of this contribution was seen in the improvement in their skin conditions.

Limitations

The study was limited to a single-subject design with a multiple baseline format comprised of two different baseline lengths across a total of seven participants. The major limitation of the single-subject design is the generalizability of results because of the small number of participants involved. Including more participants and even more multiple baselines would have helped to increase the external validity by controlling for the confounding effects of history and other extraneous variables including spontaneous remission. Therefore, the results must be cautiously generalized to individuals who are similar to the women who participated in the treatment. Finally, although these results must be cautiously generalized, results from previous studies suggest that SIT would be equally effective for a population of men suffering from AD (Cole et al., 1988; Ehlers et al., 1995).

A second major limitation of this study is the question of internal validity. Although efforts to increase the degree of control were taken, such as the use of multiple baselines, repeated measures, and replication across subjects, other variables that may have confounded the outcomes must be considered. The most obvious variable that may have led to improvement in AD signs and symptoms, is the spontaneous remission of the disorder. Other confounds that may have been responsible for clinical improvements in the disorder include climatic factors and changes in environmental irritants (e.g., seasonal changes in airborne allergens, change in use of irritating products such as dish detergent). AD sufferers vary in terms of exacerbations due to the time of year. However, some research suggests
that AD suffers worsen in the winter and improve in the summer. Because the study started in May with the treatment implemented in June, the possibility exists that the improvement seen in the participants was a result of already occurring improvements in response to climatic changes. However, not all participants changed over this time period. Fluctuations in the course of AD due to associations with hormones in the menstrual cycle, were controlled for given the study covered a three month period and repeated measures were taken. Ruth was the only participant who showed the possibility of monthly cycling. On the perceived severity rating scale, her AD appeared to worsen at the 5th and 9th weeks.

Another limitation of the study was the time frame that it covered. Longer baseline periods and the inclusion of more treatment sessions may have resulted in a stronger treatment effect. Variability or trends towards improvement in the baseline phase limit the conclusions that can be drawn. A longer assessment period may have helped to achieve a more stable baseline. In addition, 8 weeks of treatment sessions may not have been a sufficient period of time to positively impact all the participants. The responsiveness of the participants may have been greater if more sessions covering a longer time period had been included. Studies that have shown the effectiveness of a cognitive-behavioural stress management program have generally utilized 12 weeks of weekly, 2-hour treatment sessions (Cole et al., 1988; Ehlers et al., 1995; Long, 1988).

A further confound to the study may have resulted from the reactivity of the measures. Repeated measurements using the same instruments over time may be less sensitive to picking up subtle changes. Over time, participants may have given less and less consideration to each question or they may have lost interest or become frustrated. Although self-reports are used extensively in the social sciences,
they do have limitations. Respondent's answers are based on subjective impressions, for which the criteria may change over time. Finally, self-reports run the risk of falling victim to demand characteristics. Over time, participants may try to please the experimenter by supplying positive results or outcomes. Experimenter expectancies may also have confounded the results as there were no blind raters or facilitators involved.

A further difficulty of this study, common to most research on stress, was the accurate measurement and operationalization of stress and coping. If stress is viewed as a complex, multivariate process, then several measures capturing the various facets of the stress process must be used (Lazarus, 1990). This study was limited because it only examined appraisals of stress and coping, the physiological response via AD symptoms, and the emotional response of anxiety. Furthermore, the instruments used in this study were limited in the amount of information they could provide about an individual's experience. A more complete, yet complex, study would measure all facets of the stress process including the input variables such as environmental factors, personality traits, and values, as well as the mediating factors of appraisal and coping strategies, and finally the outcome effects on emotions, health, and social and psychological well-being. Unfortunately, the instruments presently used to capture greater aspects of the stress and coping process are generally long and involved. Therefore, the challenge in process research is to find a balance between asking too much of the participants and gathering enough information to draw conclusions.

**Implications for Further Research and Counselling**

Although coping was addressed in this study, the measure used to operationalize coping may have been too global. Further research is needed in order
to delineate the effectiveness of specific coping strategies adopted by AD sufferers. Ehlers, Gieler, and Stangier (1995) found that the only difference between AD suffers whose skin condition improved after receiving a cognitive-behavioural stress management intervention and AD sufferers who received only standard medical care and did not show the same level of improvement was that the stress management group reported a greater reduction in frequency of catastrophizing cognitions concerning itching. The study also found that increases in positive coping cognitions were not maintained at follow-up whereas the reduction in catastrophizing cognitions was maintained. The Ehlers et al. study points to the importance of assessing specific coping strategies and suggests that future research and interventions should focus on reducing negative catastrophizing cognitions versus strengthening positive cognitions. In terms of assessing coping strategies, standardized coping scales or frequent in-depth interviews would be helpful in elucidating the factors that are linked to improvement in skin condition and overall psychological health.

With regards to the treatment efficacy of SIT, further research should examine the components of the program that are responsible for producing improvement. SIT is comprised of a number of techniques including cognitive restructuring, relaxation, imagery, socratic discussion, and role play. Although the Ehlers et al. (1995) study points to the importance of modifying negative cognitions, further investigation is needed to confirm their conclusion.

Additionally, from a theoretical perspective, further research is necessary in order to delineate which aspects of the stress and coping process mediate the relationship between the psyche and the physiological symptoms of AD. The stress process and the factors contributing to AD are complex and variable. Although care was taken to assess a broad range of factors in the stress process, Tennen and
Affleck (1996) suggest that an even greater level of examination, using process-oriented designs but involving larger numbers of participants, assessing more variables, and utilizing more statistically sophisticated analysis, is required to elucidate the relevant relationships and mediators. The challenge to future researchers will be to effectively design, execute, and manage such studies.

The clinical implications of this research indicate the need for a more integrative approach between psychology and dermatology. From a medical perspective, inclusion of psychological interventions into the traditional model of treatment may provide relief of AD symptoms for some clients who have failed to respond to medical therapy alone. Further research should extend into systematically investigating the impact physiological variables, such as history and severity of disease, and psychological factors, such as attitudes about the program and current coping strategies, have on a client's responsiveness to stress management programs. Both single subject and larger group designs should be utilized.

Finally, the women repeatedly commented on how grateful they were to have the opportunity to meet with other women suffering from AD and to share and discuss their concerns, frustrations, and ideas about dealing with the disorder. Continued use of the group format for individuals dealing with AD would be beneficial not only in terms of the cost effectiveness of treatment but would provide important support for those struggling to cope with the disorder.
References


APPENDIX A

Self-monitoring Diary:
- Visual Analogue Scale for Stress
- Perceived Stress Scale
- Visual Analogue Scale for Itchiness
- Visual Analogue Scale for Severity
- Record of Medication Usage
- Hand Diagrams (Extent of AD)
- Dermatology Life Quality Index
- Trait Anxiety Scale
SELF-MONITORING DIARY

1) Please indicate on the following scale, with an "X", your average level of stress for the day:

<table>
<thead>
<tr>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
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<tbody>
<tr>
<td>Not Stressed</td>
<td>Moderately Stressed</td>
<td>Extremely Stressed</td>
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2) The following questions ask you about your feelings and thoughts during the course of the day. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

For each question circle the most appropriate answer:

- 0. never
- 1. almost never
- 2. sometimes
- 3. fairly often
- 4. very often

1. During the day, how often were you upset because of something that happened unexpectedly?

   
   0——1——2——3——4
   never almost never sometimes fairly often very often

2. During the day, how often did you feel that you were unable to control the important things in your life?

   
   0——1——2——3——4
   never almost never sometimes fairly often very often

3. During the day, how often did you feel nervous and "stressed"?

   
   0——1——2——3——4
   never almost never sometimes fairly often very often
4. During the day, how often did you deal successfully with irritating life hassles?

0 1 2 3 4
never almost never sometimes fairly often very often

5. During the day, how often did you feel that you were effectively coping with the important changes that were occurring in your life?

0 1 2 3 4
never almost never sometimes fairly often very often

6. During the day, how often did you feel confident about your ability to handle your personal problems?

0 1 2 3 4
never almost never sometimes fairly often very often

7. During the day, how often did you feel that things were going your way?

0 1 2 3 4
never almost never sometimes fairly often very often

8. During the day, how often did you find that you could not cope with all the things that you had to do?

0 1 2 3 4
never almost never sometimes fairly often very often

9. During the day, how often were you able to control irritations in your life?

0 1 2 3 4
never almost never sometimes fairly often very often

10. During the day, how often did you feel that you were on top of things?

0 1 2 3 4
never almost never sometimes fairly often very often

11. During the day, how often were you angered because of things that happened that were outside of your control?

0 1 2 3 4
never almost never sometimes fairly often very often
12. During the day, how often did you find yourself thinking about things that you have to accomplish?

0—never 1—almost never 2—sometimes 3—fairly often 4—very often

13. During the day, how often were you able to control the way you spent your time?

0—never 1—almost never 2—sometimes 3—fairly often 4—very often

14. During the day, how often did you feel that difficulties were piling up so high that you could not overcome them?

0—never 1—almost never 2—sometimes 3—fairly often 4—very often

3) On the following scale, mark an "X" at the point that most accurately indicates the itchiness of your eczema right now:

<table>
<thead>
<tr>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Itchy</td>
<td>Moderately Itchy</td>
<td>Extremely Itchy</td>
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</tbody>
</table>

4) On the following scale, mark an "X" at the point that most accurately indicates the severity of your eczema (based on cracking, pain, stinging, rash, etc.), right now:

<table>
<thead>
<tr>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Severe</td>
<td>Moderately Severe</td>
<td>Extremely Severe</td>
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</tr>
</tbody>
</table>

5) What medication did you apply to your hands today and how many times did you apply it?

Medication ___________________ Times ________
Medication ___________________ Times ________
6) On the following diagrams, for each hand, please shade in the areas that are covered by rash or irritated skin from your eczema:

BACKS

PALMS
The aim of this questionnaire is to measure how much your skin problem has affected your life OVER THE LAST WEEK. Please tick one box for each question.

1. Over the last week how itchy, sore, painful or stinging has your skin been?  
   - Very much  
   - A lot  
   - A little  
   - Not at all

2. Over the last week, how embarrassed or self conscious have you been because of your skin?  
   - Very much  
   - A lot  
   - A little  
   - Not at all

3. Over the last week, how much has your skin interfered with you going shopping or looking after your home or garden?  
   - Very much  
   - A lot  
   - A little  
   - Not at all

4. Over the last week, how much has your skin influenced the clothes you wear?  
   - Very much  
   - A lot  
   - A little  
   - Not at all

5. Over the last week, how much has your skin affected any social or leisure activities?  
   - Very much  
   - A lot  
   - A little  
   - Not at all

6. Over the last week, how much has your skin made it difficult for you to do any sport?  
   - Very much  
   - A lot  
   - A little  
   - Not at all

7. Over the last week, has your skin prevented you from working or studying?  
   - Yes  
   - No  
   - Not relevant
   If "No", over the last week how much has your skin been a problem at work or studying?  
   - A lot  
   - A little  
   - Not at all  
   - Not relevant

8. Over the last week, how much has your skin created problems with your partner or any of your close friends or relatives?  
   - Very much  
   - A lot  
   - A little  
   - Not at all
   - Not relevant

9. Over the last week, how much has your skin caused any sexual difficulties?  
   - Very much  
   - A lot  
   - A little  
   - Not at all
   - Not relevant

10. Over the last week, how much of a problem has the treatment for your skin been, for example by making your home messy, or by taking up time?  
    - Very much  
    - A lot  
    - A little  
    - Not at all  
    - Not relevant
Self-Evaluation Questionnaire

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then CIRCLE the appropriate number to the right of the statement to indicate how you generally feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

1 = Almost Never   2 = Sometimes   3 = Often   4 = Almost Always

1. I feel pleasant................................................................. 1 2 3 4
2. I feel nervous and restless............................................... 1 2 3 4
3. I feel satisfied with myself............................................... 1 2 3 4
4. I wish I could be as happy as others seem to be................. 1 2 3 4
5. I feel like a failure........................................................... 1 2 3 4
6. I feel rested........................................................................ 1 2 3 4
7. I am "calm, cool, and collected"........................................ 1 2 3 4
8. I feel that difficulties are piling up so that I cannot overcome them........ 1 2 3 4
9. I worry too much over something that really doesn't matter........ 1 2 3 4
10. I am happy........................................................................ 1 2 3 4
11. I have disturbing thoughts.................................................. 1 2 3 4
12. I lack self-confidence.......................................................... 1 2 3 4
13. I feel secure........................................................................ 1 2 3 4
14. I make decisions easily......................................................... 1 2 3 4
15. I feel inadequate............................................................... 1 2 3 4
16. I am content....................................................................... 1 2 3 4
17. Some unimportant thought runs through my mind and bothers me... 1 2 3 4
18. I take disappointments so keenly that I can't put them out of my mind.. 1 2 3 4
19. I am a steady person............................................................ 1 2 3 4
20. I get in a state of tension or turmoil as I think over my recent concerns and interests................................................................. 1 2 3 4
APPENDIX B

Subscales of Perceived Stress Scale
Subscales of Perceived Stress Scale

**Appraised Distress Factor:**

1. During the day, how often were you upset because of something that happened unexpectedly?

2. During the day, how often did you feel that you were unable to control the important things in your life?

3. During the day, how often did you feel nervous and "stressed"?

7. During the day, how often did you feel that things were going your way?

8. During the day, how often did you find that you could not cope with all the things that you had to do?

11. During the day, how often were you angered because of things that happened that were outside of your control?

14. During the day, how often did you feel that difficulties were piling up so high that you could not overcome them?

**Perceived Ability to Cope Factor:**

4. During the day, how often did you deal successfully with irritating life hassles?

5. During the day how often did you feel that you were effectively coping with the important changes that were occurring in your life?

6. During the day, how often did you feel confident about your ability to handle your personal problems?

9. During the day, how often did you feel that you were on top of things?
Objective Rating # _____  Participant ID # _____  Date ______

AD OBJECTIVE RATING FORMS

<table>
<thead>
<tr>
<th>LOW</th>
<th>1</th>
<th>2</th>
<th>HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<td>1</td>
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<td></td>
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<td>2</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

A  ERYTHEMA
B  LICHENIFICATION
C  PUSTULES
D  EXCORIATIONS
E  DRYNESS

Please note overall clinical impression (Rate 0 - 3):

<table>
<thead>
<tr>
<th>LOW</th>
<th>1</th>
<th>2</th>
<th>HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td></td>
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</table>

Please add any relevant comments:

Please indicate on the attached diagrams the extent of AD.

Objective Rating # _____  Participant ID # _____  Date ______
On the following diagrams, indicate by shading, the extent of rash or irritation caused by the AD:
APPENDIX D

- Expectancy Questionnaire

- Goals and Post-evaluation Goal Attainment

- Post-evaluation of Stress Management Techniques

- Summary of Answers from Post-evaluation Questions
Expectancy Questionnaire

1. How confident are you that this program will be successful in reducing your stress reactions?

   1  2  3  4  5  6  7
   Not at all  Very much so

2. How logical does this type of program seem to you as a stress management technique?

   1  2  3  4  5  6  7
   Not at all  Very much so

3. How confident are you in recommending the program to a friend who is extremely anxious?

   1  2  3  4  5  6  7
   Not at all  Very much so

Subject's ratings on the Expectancy Questionnaire

<table>
<thead>
<tr>
<th>Question #</th>
<th>Anne</th>
<th>Ruth</th>
<th>Mary</th>
<th>Lilly</th>
<th>Erin</th>
<th>Jane</th>
<th>Sarah</th>
<th>Barb*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>7</td>
<td>4</td>
<td>7</td>
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<td>3</td>
<td>7</td>
<td>4</td>
<td>7</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

*This subject only attended group sessions. She did not complete the Self Monitoring Diaries.
Goals and Post-evaluation Goal Attainment

At the post evaluation, each subject rated the extent to which they were able to achieve the goals they identified at the beginning of the program based on the following scale:

1 2 3 4 5
Not at all  Minimally  Somewhat  A great deal  Completely

Summary of subject's goals at outset

Anne

Goal 1: Learn to deal with stress better. 4

Ruth

Goal 1: Learn to recognize stress better and learn some methods of coping with stress. 4
Goal 2: To eventually stop taking medication for my eczema. 2

Mary

Goal 1: To be more regular and consistent in releasing my stress. 3
Goal 2: To be more aware of my physical self - how my life actions are affecting my body. 4

Lilly - missing goals

Erin

Goal 1: Sharing and learning more information about curing the disease, and/or better coping with it. 4
Goal 2: New strategies for handling stress. 4

Jane - missing goals

Sarah

Goal 1: No eczema. 1
Goal 2: Stress management techniques. 4
Goal 3: Peacefulness/acceptance. 2
Goal 4: "Worryness" gone. High expectations gone. 3
Goal 5: Able to eat all foods and drinks. 1

Barb*

Goal 1: To provide others with successful tips to handle or
control the skin disorder.

**Goal 2:** To learn new ways to control the disorder, including stress management techniques.

*This subject only attended group sessions, she did not complete the self-monitoring diaries.*
Post-evaluation of Stress Management Techniques

To what extent have you been able to put to use the following concepts and skills in order to cope better with stressful situations? Please circle the number that corresponds how you feel for each technique.

1. Challenging negative self-statements. (ie., "fact" or "fiction")
2. Replacing negative self-statements with positive self-statements and instructions.
3. Mentally rehearsing coping behaviours. (ie., Practising or imagining in mind)
4. Inducing muscle relaxation.
5. Slow down breathing (deep breathing).
7. Focusing technique (ie., awareness of 'body sense' to solve a problem).

Summary of Ratings for Extent of Techniques Utilized

<table>
<thead>
<tr>
<th>Subject</th>
<th>Anne</th>
<th>Ruth</th>
<th>Mary</th>
<th>Lilly</th>
<th>Erin</th>
<th>Jane</th>
<th>Sarah</th>
<th>Barb</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technique</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>n/a</td>
<td>3</td>
<td>3</td>
<td>3.1</td>
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<td></td>
<td>2</td>
<td>3</td>
<td>4</td>
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<td>4</td>
<td>3.3</td>
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<td>3</td>
<td>2</td>
<td>2.7</td>
</tr>
</tbody>
</table>

Other Techniques Listed: - Journaling
                          - Imagery
                          - Listening to others
Summary of Answers from Post-evaluation Questions

1. What do you do differently as a consequence of this program?

- I try to be more positive about negative things in my every day life. (Anne)
- I try to see unexpected stresses (car break-down) in best possible light. (Ruth)
- I think of different solutions to daily stresses (kids). (Ruth)
- Friend - find a person or group with whom I can share my struggles in a way that is safe and respectful of both. (Mary)
- Recognize we all have different kinds of stress and it all affects everyone differently. (Lilly)
- Try to break the cycle between the stressor and my eczema. (Erin)
- More positive self-talk. (Sarah)
- I am more aware of how I react to pending stressful situations, ie., I begin to scratch. (Barb)

2. In what way do you feel differently as a consequence of this program?

- I feel better able to cope with problems. (Ruth)
- More hopeful vis-a-vis stress management - aware of many more options. (Mary)
- Becoming more aware of what stress is and I feel as though I am not alone in my struggle with eczema. (Lilly)
- I let less things bother me, especially if they are out of my control. (Erin)
- More aware of guilty feelings towards self. (Sarah)
- I feel I have more control over my reaction to stress. (Barb)

3. What aspect of this program was most useful (helpful) to you in learning how to better cope with stress?

- The breathing techniques. (Anne)
- The imagery makes me feel more relaxed and pleasant, which makes it easier for me to see things in a better perspective. (Ruth)
- Awareness building - self-understanding - monitoring forced 'true' look at coping techniques/situation triggers. (Mary)
- Small groups - supportive, qualified facilitator - provided environment to explore, to be open to new ideas. (Mary)
- Mixture of techniques - good (body, mind, etc.). (Mary)
- Self statements need to be believable by you. (Mary)
- Being able to talk to others, sharing ideas on how to relieve eczema, as well as feeling a friendship or common ground basis. (Lilly)
- Relaxation techniques, especially the muscle relaxation. (Erin)
- Self talk. (Sarah)
- Replacing negative self-statements and mentally rehearsing coping behaviours. (Barb)
APPENDIX E

- Poster Advertisement
- Consent Form
Title of the study: Effectiveness of Stress Inoculation Training in the Treatment of Atopic Dermatitis (eczema).

Purpose of the study: The purpose of this study is to investigate the effectiveness of a stress management program in reducing the symptoms of women suffering from eczema. The study will also look at the impact of emotional stress on eczema flare-ups.

This study is being undertaken by Nona Coles, a graduate student in the Department of Counselling Psychology, in partial fulfillment of the requirements for the degree of Masters of Arts. The Faculty Advisor for the project is Dr. B. Long, Head of the Department of Counselling Psychology (telephone: 822-4756).

Procedure: As a participant, you will be asked to do the following:

1) Attend an initial 1/2-hour confidential interview to discuss current stress level in your life, complete a short questionnaire, and receive an overview of the study.

2) For those who have not already undergone a patch test, the procedure is suggested and will be organized by Dr. Rivers. The patch test involves having small patches of aluminum that have been coated with an ointment such as nickel, chemicals from cosmetics etc. The patches are left on for 48 hours and are then examined for inflammation and irritation. The purpose of the patch test is to rule out the possibility of contact dermatitis and to ensure a diagnosis of atopic dermatitis.

3) Complete a series of pencil and paper questions every second day during a self-monitoring period which will last 4-5 weeks. The questions ask about current stress level and seriousness of eczema. The questions take approximately 5-10 minutes to complete and will be available for you to complete in your own home at your convenience.

4) Attend an 8-week stress management program with a small group of other women suffering from eczema. The 2-hour sessions will be held once per week at the Dermatology clinic. During the sessions we will share and discuss sources of stress in our lives and how we respond to stress. We will then learn coping techniques such as positive reframing, problem solving, relaxation, and imagery. Group sessions will be audio-taped but will remain confidential and anonymous to your identity. Tapes will be destroyed at the completion of the study.
APPENDIX F

- Initial Interview Questions

- Personal Information Sheet (Demographics)

- Table of Demographics
Initial Interview

1. Get name, address, & tel. on separate paper.
2. Administer tension thermometer.

3. Can you tell me about some of the stresses in your life now? Are there times when you feel overwhelmed, out of control, or overly anxious?

4. How are these things interfering with your life?

5. How do you react to stress?

6. How do you feel about your ability to cope with the stresses in your life?

7. How does your eczema affect your life?

8. What do you do to cope with it?

9. Do you find your eczema is worse at some times rather than others? Are there patterns? What are triggering factors?
1. Occupation: __________________________
   Number of years in this field __________

2. Please indicate the highest level of education achieved:
   High School ______
   College ______
   University ______
   Other (please explain) ____________________________________________

3. How would you describe your ethnicity? __________________________

4. Marital status: __________________________

5. How long have you had eczema? __________________________

6. Do you have eczema on other parts of your body, other than your hands?
   Yes _____  No _____
   If yes, where? __________________________________________________

7. What medical treatments are you currently using for your eczema?
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________

8. What other treatments are you currently using? (E.g., Lotions, Herbal remedies, Acupuncture, Elimination diets, etc.)
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________

9. What treatments have you used in the past?
   ________________________________________________________________
10. Have you ever participated in a stress management group?
   Yes _____  No _____
   If yes, when? __________________

11. Do you smoke?  Yes _____  No _____
   Number of cigarettes a day __________

12. Do you consume alcohol?  Yes _____  No _____
   Number of beer (bottles) per week __________
   Wine (glasses) per week __________
   Spirits (oz.) per week __________

13. Do you drink coffee or tea?  Yes _____  No _____
   Number of cups per day:  _____ coffee
                             _____ tea
<table>
<thead>
<tr>
<th>Participants</th>
<th>Age</th>
<th>Marital Status</th>
<th>Ethnicity</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne</td>
<td>21</td>
<td>Single</td>
<td>Caucasian</td>
<td>High school</td>
</tr>
<tr>
<td>Ruth</td>
<td>35</td>
<td>Married</td>
<td>Caucasian</td>
<td>High school</td>
</tr>
<tr>
<td>Mary</td>
<td>32</td>
<td>Married</td>
<td>Caucasian</td>
<td>Graduate</td>
</tr>
<tr>
<td>Lilly</td>
<td>33</td>
<td>Single</td>
<td>Asian</td>
<td>University</td>
</tr>
<tr>
<td>Erin</td>
<td>39</td>
<td>Married</td>
<td>Caucasian</td>
<td>University</td>
</tr>
<tr>
<td>Jane</td>
<td>28</td>
<td>Single</td>
<td>Caucasian</td>
<td>University</td>
</tr>
<tr>
<td>Sarah</td>
<td>43</td>
<td>Married</td>
<td>Caucasian</td>
<td>College</td>
</tr>
</tbody>
</table>
APPENDIX G

-Past Week Tension Thermometer
Think back over the past week. Take each day separately and remember as much as you can of what you did, how the day went, and particularly the level of tension you experienced. Now, use the thermometer below to rate your average level of tension for the past week.

- 10 completely tense (not relaxed at all)
- 9
- 8 very tense (only slightly relaxed)
- 7
- 6 tense
- 5
- 4 relaxed
- 3
- 2 very relaxed
- 1
- 0 completely relaxed (not tense at all)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne</td>
<td>5.6</td>
</tr>
<tr>
<td>Ruth</td>
<td>6.0</td>
</tr>
<tr>
<td>Mary</td>
<td>7.0</td>
</tr>
<tr>
<td>Lilly</td>
<td>5.8</td>
</tr>
<tr>
<td>Erin</td>
<td>7.0</td>
</tr>
<tr>
<td>Jane</td>
<td>7.5</td>
</tr>
<tr>
<td>Sarah</td>
<td>5.0</td>
</tr>
</tbody>
</table>
APPENDIX H

Stress Innoculation Training Session Outline

and

Treatment Integrity
## Outline for 8-Week Stress Inoculation Training

<table>
<thead>
<tr>
<th>Session #1</th>
<th>Material Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group 1</strong></td>
<td><strong>Group 2</strong></td>
</tr>
<tr>
<td>1) Introductions</td>
<td>Yes</td>
</tr>
<tr>
<td>2) Describe shared goals</td>
<td>Yes</td>
</tr>
<tr>
<td>3) Participants write out goals and expectations</td>
<td>Yes</td>
</tr>
<tr>
<td>4) Share a successful coping incident from past week</td>
<td>Yes</td>
</tr>
<tr>
<td>5) Discuss examples of stressor and share reactions</td>
<td>Yes</td>
</tr>
<tr>
<td>6) Visualize recent stressor and share reactions</td>
<td>Yes</td>
</tr>
<tr>
<td>note negative self-statements</td>
<td></td>
</tr>
<tr>
<td>7) Presentation of treatment rationale</td>
<td>Yes</td>
</tr>
<tr>
<td>8) Overview of upcoming sessions</td>
<td>Yes</td>
</tr>
<tr>
<td>9) Homework: identify negative self-statements</td>
<td>Yes</td>
</tr>
<tr>
<td>10) Go over ground rules</td>
<td>Yes</td>
</tr>
<tr>
<td>11) Complete expectancy questionnaire</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Session #2</th>
<th>Material Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group 1</strong></td>
<td><strong>Group 2</strong></td>
</tr>
<tr>
<td>1) Overview of first session, address questions</td>
<td>Yes</td>
</tr>
<tr>
<td>2) Review homework by sharing stressful situation</td>
<td>Yes</td>
</tr>
<tr>
<td>3) Present negative dialogue exercise. Cover: stages of a stressful encounter &amp; cues for coping</td>
<td>Yes</td>
</tr>
<tr>
<td>4) Homework: record stages of a stressful situation</td>
<td>Yes</td>
</tr>
<tr>
<td>*See Individual Stress Record in Appendix ?</td>
<td></td>
</tr>
<tr>
<td>5) Introduce &amp; rational for progressive relaxation</td>
<td>Yes</td>
</tr>
<tr>
<td>6) Lead relaxation using 17 muscle groups, debrief</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Session #3</th>
<th>Material Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group 1</strong></td>
<td><strong>Group 2</strong></td>
</tr>
<tr>
<td>1) Overview of previous session</td>
<td>Yes</td>
</tr>
</tbody>
</table>
2) Share situations from Individual Stress Record | Yes | Yes
3) Present positive dialogue exercise | Yes | Yes
4) Generate positive thoughts for stressful situation | Yes | Yes
5) Discuss barriers to practicing relaxation at home | Yes | Yes
6) Introduce importance of breathing and "Quick Fix" | Yes | Yes
7) Lead shortened relaxation (7 muscle groups) | Yes | Yes
8) Homework: Individual Stress Record & relaxation | Yes | Yes

**Session #4**

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Halfway evaluation - discussion</td>
<td>Yes</td>
</tr>
<tr>
<td>2) Share Individual Stress Records and changes in awareness about self</td>
<td>Yes</td>
</tr>
<tr>
<td>3) Handout positive coping statements and discuss</td>
<td>Yes</td>
</tr>
<tr>
<td>4) Record an ANTICIPATED stressful situation</td>
<td>Yes</td>
</tr>
<tr>
<td>5) Introduce imagery and rationale</td>
<td>Yes</td>
</tr>
<tr>
<td>6) Practice imagery with image of lemon being cut</td>
<td>Yes</td>
</tr>
<tr>
<td>7) Lead visualization of &quot;Walk in the Forest&quot; and discuss accessing our inner wisdom</td>
<td>Yes</td>
</tr>
<tr>
<td>8) Lead imagery of lake scene</td>
<td>Yes</td>
</tr>
<tr>
<td>9) Homework: Individual Stress Records</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Session #5**

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Overview of last session</td>
<td>Yes</td>
</tr>
<tr>
<td>2) Share successes or difficulties from the week</td>
<td>Yes</td>
</tr>
<tr>
<td>3) Create on cards a hierarchy of a stressful situation</td>
<td>Yes</td>
</tr>
<tr>
<td>4) Lead a visualization through the hierarchy of images from the stressful situation</td>
<td>Yes</td>
</tr>
</tbody>
</table>
5) Recreate the hierarchy imagery but see oneself coping well and a successful outcome

6) Discuss alternate coping methods

7) Lead short relaxation (7 Muscle Groups)

**Session #6**

1) Overview of previous session

2) Share successes and difficulties from the week

3) Introduce Problem-Solving. Dialectic between rational and intuitive self

4) Problem-Solving sheets: work through a stressful situation in pairs. Share and discuss

5) Role play the situation in pairs

6) Introduce ‘Focusing’ as a relaxation process and decision-making tool. Go through exercise

**Session #7**

1) Overview of previous session

2) Share successes and difficulties from the week

3) Lead an imagery hierarchy with successful outcome

4) Role play an upcoming stressful situation

5) Lead a ‘Focusing’ exercise for a particular problem

6) Explain ‘symbolic’ gift for final session as closing ritual

**Session #8**

1) Overview of previous session

2) Share successes and difficulties from the week

3) Role play a present or upcoming stressful situation

4) Leader presents a stressful situation, members coach
<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>Yes</th>
<th>Somewhat</th>
<th>Yes</th>
<th>Yes</th>
<th>Took home</th>
</tr>
</thead>
<tbody>
<tr>
<td>leader through problem based on learned techniques</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) Discuss applications of techniques in their own life</td>
<td>Yes</td>
<td></td>
<td>Somewhat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) Exchange &quot;symbolic&quot; gifts</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7) Debrief their experience of being in the group</td>
<td>Yes</td>
<td></td>
<td>Somewhat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8) Complete final evaluations</td>
<td>Yes</td>
<td></td>
<td>Took home</td>
<td></td>
<td></td>
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</tr>
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</table>
APPENDIX I

Examples of Homework Sheets
<table>
<thead>
<tr>
<th>Stress/Demand</th>
<th>Perception (What you tell yourself/imagine about the demand)</th>
<th>Response (emotional, physiological, behavioral)</th>
<th>Consequence (environment/self)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Constant Interception For Managed Override by Another Area of Office</td>
<td>In the beginning, part of my job, they have been to do you, etc. As time went on, less frequently when I was actually interrupted.</td>
<td>Preparing (Kneejerk Response) Later on, annoyance at the person making request as well as those that should have been providing override but never being done.</td>
<td>Environment - Suspended from computer system due to breach of security (Assumed - Insecure). Self - Beginning - Annoyed with people who requested the override. Latter - Annoyed with myself for not stopping when I recognized the chance to suspend myself was apparent.</td>
</tr>
</tbody>
</table>
## INDIVIDUAL STRESS RECORD

<table>
<thead>
<tr>
<th>Stress/Demand</th>
<th>Perception (What you tell yourself/imagine about the demand)</th>
<th>Response (emotional, physiological, behavioral)</th>
<th>Consequence (environment/self)</th>
</tr>
</thead>
<tbody>
<tr>
<td>On the day of my daughter's piano recital, my husband comes home early for it, and starts giving me a hard time about me inviting the grandparents and two of my daughter's aunts to the recital. He says it should only be for us four to go.</td>
<td>Unexpected</td>
<td>I feel very angry because I was looking forward to this event for weeks and now I'm made to feel guilty about planning it all. I am enraged because I feel my husband makes his family a lower priority than work (his disagreement with my plan has its roots in something that happened to him at work that day). I am disappointed for having the whole atmosphere ruined because of this argument.</td>
<td>I feel nervous inside. My whole body is tense. My hands get itchy.</td>
</tr>
</tbody>
</table>
APPENDIX J

Correlations between Psychological Factors

and

Skin Condition
### Correlations between Psychological Factors and Skin Condition

<table>
<thead>
<tr>
<th>Participants</th>
<th>Psychological Factors</th>
<th>Skin Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Extent of AD</td>
<td>Itchiness</td>
</tr>
<tr>
<td>Anne</td>
<td>Perceived Stress</td>
<td>0.6716</td>
</tr>
<tr>
<td></td>
<td>Perceived Coping</td>
<td>0.5013</td>
</tr>
<tr>
<td></td>
<td>Appraised Distress</td>
<td>0.4210</td>
</tr>
<tr>
<td>Ruth</td>
<td>Perceived Stress</td>
<td>0.2992</td>
</tr>
<tr>
<td></td>
<td>Perceived Coping</td>
<td>0.2264</td>
</tr>
<tr>
<td></td>
<td>Appraised Distress</td>
<td>0.1465</td>
</tr>
<tr>
<td>Mary</td>
<td>Perceived Stress</td>
<td>-0.0573</td>
</tr>
<tr>
<td></td>
<td>Perceived Coping</td>
<td>-0.0058</td>
</tr>
<tr>
<td></td>
<td>Appraised Distress</td>
<td>-0.1299</td>
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<tr>
<td>Lilly</td>
<td>Perceived Stress</td>
<td>0.0849</td>
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<tr>
<td></td>
<td>Perceived Coping</td>
<td>-0.4229</td>
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<td>Appraised Distress</td>
<td>-0.1821</td>
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<td>Erin</td>
<td>Perceived Stress</td>
<td>0.0769</td>
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<td></td>
<td>Perceived Coping</td>
<td>0.1138</td>
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<td>Appraised Distress</td>
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<td>Jane</td>
<td>Perceived Stress</td>
<td>0.2754</td>
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<tr>
<td></td>
<td>Perceived Coping</td>
<td>0.0987</td>
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<td>Appraised Distress</td>
<td>0.2902</td>
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<td>Sarah</td>
<td>Perceived Stress</td>
<td>-0.0096</td>
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<td>Perceived Coping</td>
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<td>Appraised Distress</td>
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