CHAPTER II

REVIEW OF LITERATURE
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The literature available provides immense amount of information on the management of anxiety in adult samples along behavioural and cognitive behavioural lines. Research on the predictors of therapeutic outcome is sparse.

The review of literature will cover the following sections:

1. Outcome studies which have used frontal EMG feedback assisted relaxation as a treatment for clients with clinical anxiety.

2. Outcome studies which have used cognitive treatments for clients with clinical anxiety.

3. Outcome studies which have used SIT as a treatment for anxious clients.

The relationship of sociodemographic parameters and clinical characteristics of anxious clients with therapeutic outcome needs to be more extensively researched. Some researchers have reported certain relationships of these variables with therapeutic outcome as incidental findings. Predictors of therapeutic outcome did not constitute the main objective of their work. These findings will be highlighted in the review.
Outcome studies which have used frontal EMG feedback assisted relaxation as a treatment for clients with clinical anxiety:

The musculo-skeletal system is greatly involved in the physiological aspects of anxiety. The principle response which has been monitored from this organ system is the EMG. It is important that relaxation of muscles becomes a prominent component in treatment packages for anxiety related disorders.

There are quite adequate studies with frontal EMG biofeedback on both clinical populations and with analogue volunteer groups but only the studies on the clinical populations shall be reviewed. The majority of these studies have been on generalized anxiety clients though there are a few studies on situation specific anxiety clients as well. However, only the research done with generalized anxiety clients will be highlighted in the review.

Raskin, Johnson and Rondestvedt (1973) assessed the effects of daily deep muscle relaxation achieved through electromyographic feedback training on the symptoms of 10 chronically anxious clients, who had remained symptomatic despite two years of psychotherapy and medication. The assessment of symptoms, i.e., anxiety, insomnia and headache was done for 8 weeks prior to feedback training, during the training and for 8 weeks of daily relaxation practice. All 10 clients successfully learned to lower their frontal EMG
levels with and without feedback. Four out of 10 clients had beneficial effects on anxiety, 1 of whom had a dramatic lessening of all his anxiety symptoms while the other 3 learned to use relaxation techniques to decrease previously intolerable situational anxiety. Four learned to abort tension headaches. Though clients with insomnia learned to put themselves to sleep, most experienced frequent awakenings. Though this is a preliminary study with the design being of the case study type, with no follow-up data, the results are promising.

Townsend, House and Addario (1975) found EMG feedback relaxation training to be more useful than group therapy in reducing anxiety. The authors state that EMG feedback training is an important addition to the therapists' armamentarium for the treatment of chronic anxiety.

Canter, Kondo and Knott (1975) found an advantage for EMG feedback over progressive relaxation training. The occurrence of proportionate changes in clients' and therapists' ratings indicated that the response to EMG feedback training was superior to that of progressive relaxation.

Lavellee, Lamontagne, Pinard, Annable and Tetreault (1977) studied the effects of EMG feedback, diazepam, and their combination on 40 clients with chronic free floating
anxiety of at least 6 months duration. Ten clients were assigned randomly to each of the 4 groups, namely, EMG feedback plus diazepam, EMG feedback plus diazepam placebo, EMG control (no feedback) plus diazepam and EMG control (no feedback) plus diazepam placebo. Although all active treatment groups reduced their anxiety after treatment, diazepam treated subjects (with or without feedback) did less well than the other subjects on anxiety measurements, adjuvant medication usage and home practice indicating that EMG feedback treatment without diazepam had a more prolonged therapeutic effect for these chronic anxious clients. This is one of the earliest controlled group outcome studies methodologically superior to the others.

Arnarson and Sheffield (1980) conducted a study on 30 clients with the diagnosis of anxiety neurosis. They were randomly assigned to 1 of 3 groups:

1. Frontal EMG feedback
2. Finger temperature feedback
3. Non-contingent auditory feedback

Results showed that the EMG group was significantly more successful in lowering their frontal EMG level, although all groups reported decrease in anxiety after treatment.

Leboeuf and Lodge (1980) compared frontal EMG feedback training and progressive relaxation in the treatment of 26
clients with chronic anxiety of at least 2 years duration. Although EMG feedback was much superior in reducing frontalis EMG activity, this treatment was no more effective than progressive relaxation in reducing symptoms of anxiety. Few clients in each group showed more than marginal improvement. A no-treatment control could have been incorporated to make this study methodologically more sound.

Raskin, Ball and Peeke (1980) conducted a controlled evaluation to find out the efficacy of muscle biofeedback, transcendental meditation and relaxation therapy in the treatment of chronic anxiety of at least 1 year duration. All treatments significantly lowered the anxiety and EMG scores. There were no differences between treatments with respect to treatment efficacy, onset of symptom amelioration or maintenance of therapeutic gains.

The authors found no evidence suggesting that the degree of muscle relaxation induced by any of the treatments was related to the therapeutic outcome. Like in the previous study, a no-placebo control could have been incorporated to make this study methodologically more robust.

Rupert, Dobbins and Mathew (1981) assessed the separate and combined effects of EMG feedback and relaxation instruction over 9 treatment sessions in a sample of 20 clients with chronic anxiety, in the age group of 20-55 years. The treatment conditions were relaxation instruction,
EMG feedback, a combination of the two and a no-treatment control group. The results indicated that the 3 treatment conditions did not significantly reduce muscle tension relative to the no-treatment group. The biofeedback alone group had a greater reduction in trait anxiety. The combination group did not effectively reduce anxiety relative to the no-treatment group.

Lavellee, Lamontagne, Annable and Fontaine (1982) evaluated the anxiety levels of 40 chronically anxious clients over a 6 month period. Treatment consisted of a 45 minute EMG feedback training session once a week for 8 weeks. All subjects who completed treatment, i.e., 32 out of 40, succeeded in reducing their EMG scores during treatment. Improvement was partly maintained during follow-up, but only 25% of the subjects who completed treatment believed their anxiety levels had improved substantially.

The authors in their study also evaluated the characteristics of chronically anxious clients who responded to EMG feedback training. They found that the responders did not differ from the non-responders on pre- or post-treatment EMG scores, but there was a consistently closer level between EMG score and anxiety level for the responders. No differences were seen between the two groups on demographic variables or IQ as measured on the Ottawa Weschler Adult Intelligence Scale (Weschler, 1955) but responders had a
higher mean score for extraversion and a lower mean score for depression as seen on the Eysenck Personality Inventory (Eysenck and Eysenck, 1968) and the Minnesota Multiphasic Personality Inventory (Hathaway and McKinley, 1967), respectively.

This study being a single group outcome study with only psychological measures is not methodologically superior to the preceding studies. However, the results are encouraging. Although EMG feedback alone does not appear to be an effective treatment for all subjects with chronic anxiety, the technique can be of value in some clients.

Weinman, Semchuk, Gaebe and Mathew (1983) evaluated the effect of frontal EMG biofeedback assisted relaxation training on a group of 20 anxious clients, all female, fulfilling DSM-III criteria for generalized anxiety disorder and experiencing stressful life events. The clients were divided into 2 groups, high and low in stress based on their life change score on the Recent Life Changes Questionnaire (Rahe, 1975). Results indicated that the high stress group showed greater pre to post significant changes on depression, anxiety, symptom scores and EMG scores, while low stress group showed no significant change. Post to follow-up comparison except in biological symptoms of anxiety showed maintenance of improvement for the high stress group and no
change for the low stress group. From pre- to follow-up assessment, the high stress group showed significant changes.

Clients with high stress responded better to therapy than the clients with low stress. The authors found, however, that both groups reported internal attributions following biofeedback and relaxation training. The high stress group attributed their improvement to the belief that they were in control of their minds and bodies, while the low stress group most frequently reported the effort put into the task. There was also a tendency for high stress subjects to select the feedback as the most important component of the biofeedback programme while low stress subjects chose the trainers.

A small sample size of 20 necessitates caution in generalizing from these results. Control groups are lacking and hence it is difficult to determine how much improvement is to be attributed to the biofeedback treatment.

Libo and Arnold (1983) conducted a long-term follow-up study to find out the utilization and effectiveness of relaxation practice after biofeedback therapy. Fifty eight clients in 6 diagnostic groups, i.e., migraine headache, tension headache, mixed headache, chronic pain, anxiety and essential hypertension were studied. Biofeedback assisted relaxation was found to be useful to most of the clients. Eighty one percent was the improvement reported on follow-up indicating a high level of maintenance. The highest proportion
of improved clients on follow-up were those with migraine headache (100%), anxiety (100%), mixed headache (93%), hypertension (92%), tension headache (80%) and chronic pain (33%).

Although continued relaxation practice was significantly related to the maintenance of long term improvement, it appeared that even occasional relaxation practice after therapy was sufficient to maintain long term therapeutic gains. Yet a few clients managed to improve without it, or continued to practice, but relapsed. The authors in relation to this, highlight certain characteristics of respondents who comprised of more males than females and had higher educational qualification. They found no significant differences in age, length of time out of therapy, number of therapy sessions, or improvement during therapy between the two groups. The authors in their study also bring out characteristics of clients who did not continue relaxation who were of the older age group, were retired, were non-compliant during therapy, who had not improved during therapy nor on follow-up.

The outcome measures used in this study were solely based on self-reports. More precise criteria and more objective measures would have been better. The authors, however, must be complimented for their efforts at conducting a long term follow-up study and their attempts at delineating characteristics of clients who respond to therapy.
Sargunaraj, Kumaraiah and Mishra (1987) studied EMG feedback in the management of anxiety neurosis. Sixteen clients with anxiety neurosis were assigned to the experimental group and the control group (8 clients in each group). The experimental group was trained to relax with EMG feedback during a 20 day period while the control group had no therapeutic contact at all. Both the groups were assessed on psychological as well as physiological measures of anxiety before and after a 20 day period of therapy. Results revealed that there was a significant decrease in muscle tension levels and increase in the frequency of alpha activity. The control group on the other hand showed no significant changes. There was a significant difference in the symptom scores on the Behaviour Disorder Checklist (Mishra, 1974) in the post-assessment.

Sargunaraj, Kumaraiah, Mishra and Kumar (1987) in another study, compared the efficacy of EMG and alpha feedback therapy in anxiety neurosis. Both the interventions were effective in inducing clinical change. Control group subjects showed no significant change on any of the variables. The changes in the symptom scores on the Behaviour Disorder Checklist (Mishra, 1974) significantly differentiated the groups, with the EMG biofeedback group manifesting a greater reduction in scores than the alpha feedback group. The latter group manifested a greater
decrease in symptom scores than the control group. Both interventions had significantly altered the relevant physiological variable.

The above two studies are good attempts at a controlled evaluation, although a bigger sample size and follow-up data would have made them more useful.

Sargunaraj and Kumaraiah (1990), based on the work of Sargunaraj (1988), designed a study to evaluate the efficacy of EMG biofeedback training in the management of anxiety neurosis. Thirty six clients were assessed before, during and after the 20 feedback sessions using psychological and physiological assessment measures. The data analysis indicated that the clients succeeded in lowering frontalis muscle tension levels during the feedback and no-feedback phases of the training sessions. They were able to maintain reduced levels of frontalis muscle tension at rest and during a stress condition without concomitant changes in electrodermal activity or in skin temperature. The clinical benefits of the training were manifested in the decreased anxiety symptom scores. Sargunaraj, Kumaraiah and Subba Krishna (1991) further, found out that the inter-correlations among the outcome measures indicated that with an increasing amount of control of muscle tension, the clients perceived change in state anxiety and in anxiety symptoms implying that EMG biofeedback can affect cognitive changes in clients.
Further, the analysis of data on the subgroups of clients designated as adequate and inadequate responders to the therapy (Sargunaraj and Kumaraiah, 1991a), indicated that the former group of clients were younger and that they reported a fewer number of symptoms at the short term follow-up assessment. The data analysis of the group of clients who dropped out of therapy (Sargunaraj and Kumaraiah, 1989), indicated that these clients had had lesser number of prior treatment experiences than those who completed the therapy programme. The other characteristics of dropouts included higher levels of neuroticism and a tendency to have higher state and cognitive anxiety.

From the review on the outcome studies which have used frontal EMG biofeedback assisted relaxation as a treatment for clients with clinical anxiety, we can conclude the following:

1. There are quite adequate studies, but they are few in number, and not easily comparable owing to different methodologies used in them.
2. EMG feedback training does significantly reduce frontal EMG levels.
3. There is no strong relationship between EMG level and subjective anxiety. One problem in EMG research that may contribute to this is the exclusive use of the frontalis muscle as the target muscle. The issue of
cross-muscle generalization remains controversial (Alexander, 1975; Fridlund, Fowler and Pritchard, 1980; Arnarson et al. 1980). Some researchers have concluded that the clinical effects achieved with EMG feedback may be due more to changes in mental activity during training or to the demand characteristics of the biofeedback setting (Freedman and Glaros, 1979). Others caution that generalization of relaxation is not a robust phenomenon and that further studies are essential to evaluate the usefulness of EMG feedback in producing relaxation (O'Connell and Yeaton, 1981).

4. Despite the controversies and unresolved problems remaining in this area, the fact remains that EMG biofeedback can be equivalent or superior in effectiveness to traditional relaxation procedures.

5. EMG feedback training is effective, however, the exact mechanism of action still remains unclear.

6. The relationship between sociodemographic parameters and clinical characteristics with therapeutic outcome needs to be extensively researched.

7. Muscle relaxation does not appear to be the sole means to facilitate anxiety reduction. Relaxation based treatments appear to be insufficient by themselves in treating chronic anxiety. Other interventions such as cognitive restructuring must also be incorporated.
Outcome studies which have used cognitive treatments for clients with clinical anxiety:

Interest in the treatment of clients with clinical anxiety on cognitive lines began in the 1980s. It was during this time that panic disorder was elevated to the status of a separate, distinct diagnostic entity markedly different from generalized anxiety disorder. Reviewing the literature, one finds that there has been more research work done on panic disorder than on generalized anxiety disorder. This section, however, will review studies on both these disorders originally conceptualized as one and the same entity - 'anxiety neurosis'.

Mathews and Shaw (1977) conducted a pilot study of treatment to highlight that cognitions are related to anxiety. It was found that anxious clients could report anxiety associated cognitions and that a self-reported reduction in such cognitions was accompanied by improvement on the mood scale. Since this study is only a pilot study, the investigation is very preliminary but the results are, however, promising.

Ram, Marks, Yuksel and Stern (1981) carried out an anxiety management training programme for anxiety states comparing positive self-statements with negative self-statements. Clients in both treatment conditions improved,
with a small trend favouring positive over negative self-instruction especially at follow-up. This is not a well controlled study. It is unclear how much self-instruction rather than therapeutic attention or mere passage of time accounted for the bulk of the modest improvement obtained. The authors point out that individualized treatment programmes may yield better results.

Jannoun, Oppenheimer and Gelder (1982) conducted a self-help treatment programme for anxiety state clients. Nineteen clients were randomly allocated to one of 3 groups which differed only in the length of time clients waited for treatment. Intervention included both relaxation training and cognitive treatment. Treatment was a modification of Suinn and Richardson's Anxiety Management Training described in detail by Suinn (1974). There was found to be a significant reduction in anxiety level at the end of treatment and improvement was maintained during the follow-up period. Comparison between anxiety management training and the no-treatment condition showed that the changes during treatment were mainly due to the effects of the treatment rather than other factors. The design of this study being the time series design is not suitable for evaluating therapeutic efficacy. However, a self-help programme such as this one is cost effective although it could have a
therapeutic bias. It must also be commended for the booster session that it has incorporated. Since this is the first study with psychiatric clients, it can be spurious to generalize findings.

Waddell, Barlow and O'Brien (1984) conducted preliminary investigation of cognitive and relaxation treatment of panic disorder to compare the effects on intense anxiety and background anxiety. Three adult males diagnosed as having panic disorder were treated with cognitive therapy followed by relaxation training combined with cognitive therapy in a multiple baseline across subjects design. Cognitive therapy was based on Meichenbaum's (1977) self-statement training; Beck, Laude and Bohnert's (1974) cognitive therapy, as well as training subjects to refocus their attention during anxiety or panic. Relaxation training used was progressive muscular relaxation (Bernstein and Borkovec, 1973). All 3 subjects were assessed on psychological measures of anxiety and depression at pre-treatment and at a 3 month follow-up. All subjects demonstrated a decrease in the number and duration of episodes of intense anxiety which was maintained at 3 months follow-up. Daily time sampled ratings of background anxiety showed a substantial decrease for subject 2 only, which was maintained at 3 months follow-up.
Although this study is only a preliminary investigation and requires replication with a large sample, there is evidence to show that psychological treatments for clients classified as suffering from panic disorder are effective.

Barlow, Cohen, Waddell, Vermilyea, Klosko, Blanchard and Dinardo (1984) studied the nature and treatment of panic and generalized anxiety disorder. Eleven clients meeting DSM-III criteria for panic and 9 meeting the criteria for generalized anxiety disorder were assessed comprehensively and divided into a treatment and a wait-list control group. Treatment comprised of progressive muscular relaxation (Bernstein et al. 1973), EMG feedback assisted relaxation and cognitive behaviour therapy which was based on Meichenbaum and Turk's (1973) SIT and Beck and Emery's (1979) cognitive therapy for anxiety. The assessment revealed significant differences between panic disorder and generalized anxiety disorder, with panic disorder clients showing higher somatic responding on both the psychological and physiological measures. The generalized anxiety disorder and panic disorder clients responded equally well to treatment; the wait-list group did not improve. At follow-up, the treated group continued to improve. Though this study provides evidence for the efficacy of psychological treatment in clinical anxiety, future research requires careful specification and separation of both generalized anxiety
disorder and panic disorder in order to examine the effects of different treatment components.

Gitlin, Martin, Shear, Frances, Ball and Josephson (1985) treated 11 clients who met DSM-III criteria for panic disorder with behaviour therapy techniques. Treatment lasted for a mean of 14 weeks and consisted of education about physiology and management of panic symptoms; relaxation, abdominal breathing, and cognitive anxiety management skills; and imaginal and invivo exposure. Upon termination of treatment, 10 of the 11 clients were panic free. Follow-up data revealed excellent stability of remission.

Clark, Salkovskis and Chalkley (1985) examined the effect of a treatment on 18 clients who experienced frequent panic attacks. Treatment consisted of brief voluntary hyperventilation; explanation of the effects of overbreathing and reattribution of the cause of a client's attacks to hyperventilation; and training in a respiratory control technique. Treatment sessions lasted for 30-60 minutes. Substantial reductions in panic attack frequency and in self-reported fear during a behaviour test were obtained after 2 weeks of treatment. Further reductions in panic attack frequency were evident at a 6-month and a 2-year follow-up.

Durham and Turvey (1987) evaluated cognitive therapy versus behaviour therapy in the treatment of chronic anxiety. Forty-one clients were randomly assigned to either behaviour
therapy or Beck's Cognitive therapy (Beck and Emery, 1979). At the end of treatment there was no difference between the cognitive and behavioural treatments in the amount of improvement observed. By the sixth month follow-up, however, there was a trend which was significant on a number of outcome measures for the cognitive therapy clients to maintain or improve upon their progress and for the behaviour therapy clients to revert toward their pre-treatment scores highlighting the enduring effects of cognitive therapy. Absence of a no-treatment control group does not rule out the possibility of spontaneous remission. However, the population studied had chronic anxiety, with an average duration of anxiety of 6 years and average length of time on the waiting list once referred, of approximately 3 months. Moreover, many clients had received previous treatment, spontaneous changes if any, should have occurred before commencement of therapy. The promising results of this study are consistent with those of a study by Barlow et al (1984).

Lindsay, Gamsu, Mclaughlin, Hood and Espie (1987) conducted a controlled trial of treatments for generalized anxiety to test the relative effectiveness of cognitive behaviour therapy (Beck and Emery, 1979; Beck, Rush, Shaw and Emery, 1979 and Meichenbaum, 1974), anxiety management training (Suinn and Richardson, 1971 and Bernstein et al. 1973), and treatment by benzodiazepines against a waiting
list control. Forty clients with chronic anxiety of at least 1 year duration and of mean duration of 4.2 years were randomly assigned to the above groups. The most immediate and greatest improvement in anxiety were seen in the group receiving drugs. However, these improvements reduced as the trial progressed and were minimal at the end of therapy. Both psychological treatment groups improved as the trial progressed with the most significant and consistent changes seen in the cognitive behaviour therapy group. However, at follow-up there was no difference between the two groups receiving psychological treatment. Over half of the group receiving drug therapy refused to wait without treatment for the follow-up assessment because of their lack of sustained improvement. The results of this controlled evaluation are promising, however, they have to be treated with caution because there was no formal assessment of therapist skillfulness and no independent assessment of the content of therapeutic sessions.

Watkins, Sturgis and Clum (1988) described the use of guided imaginal coping (Clum, 1986) for panic disorder which simultaneously combined symptom exposure and cognitive therapy techniques. A 36 year old married female diagnosed as having panic disorder with agoraphobia with depression as per DSM - III - R of 8 months duration was given 10 sessions of therapy and followed up 3 and 6 months after therapy. The client treated here experienced reduction in panic attack
frequency as well as duration and became less depressed as therapy progressed. A case study format such as the one adopted in this study does not permit causal interpretation of the observed changes. The dependent measures used were unable to detect at which stage cognitive changes began to occur, or the magnitude of these changes.

Borkovec, Mathews, Chambers, Ebrahimi, Lytle and Nelson (1987) studied the effects of relaxation training with cognitive or nondirective therapy. Thirty volunteers, mostly students, who met criteria for generalized anxiety disorder received 12 sessions of training in progressive muscular relaxation (Bernstein et al. 1973). From session three onwards, 16 clients were also given cognitive therapy (Beck and Emery, 1979) and the remaining 14 received nondirective therapy that was developed by the first author. The group as a whole showed substantial reduction in anxiety although relaxation plus cognitive therapy produced significantly greater improvement than relaxation plus non-directive therapy.

The authors further found that relaxation induced anxiety, as measured by a questionnaire after each relaxation session, was significantly related to improvement in the total group. Clients who became anxious during relaxation training showed the least improvement.
The limitations of this study are that the therapists had limited clinical experience, the follow-up was inadequate, and that the participants were primarily students solicited through advertisements which limits generalizability.

Borkovec and Mathews (1988) based on the work of Borkovec et al. (1987), compared the efficacy of nondirective therapy, coping desensitization, and cognitive therapy in the treatment of generalized anxiety disorder and panic disorder. The group as a whole showed significant and continued improvement on the outcome measures. No differences were found between the 3 conditions.

As was found in the investigation by Borkovec et al. (1987), the degree to which clients experienced relaxation induced anxiety during relaxation training sessions predicted poorer outcome.

The results of this study contrast with the earlier one by Borkovec et al. 1987. These two studies shared numerous features. However, the previous study was distinguished by its clients and its therapists. Together, the two studies suggest that cognitive therapy may make a unique contribution to the reduction of anxiety when anxiety is not severe or chronic, when the abilities of more experienced therapists do not negate difference between techniques, or when a combination of these variables is present.
Barlow, Craske, Cerny and Klosko (1989) report the results of a long term clinical outcome study testing variations of behavioural treatments for panic disorder without agoraphobic avoidance. A sample of subjects meeting DSM-III-R criteria for panic disorder were randomly assigned to one of 4 treatment conditions - (1) exposure to somatic cues combined with cognitive therapy, a modification of that outlined by Beck and Emery (1979) (2) relaxation therapy designed specifically for panic disorder (Bernstein et al. 1973) (3) all the techniques in the former two conditions combined and (4) a wait-list control group. All three treatments were superior on a variety of measures to the wait-list control group. In the two treatment conditions containing exposure to somatic cues and cognitive therapy, 83% or more of clients were panic free at post-treatment. These were the only groups significantly better than the wait-list control on this measure. Relaxation on the other hand, tended to effect greater reduction in generalized anxiety associated with panic attacks. Overall improvement in associated anxiety and general functioning were apparent in all the subjects. Relaxation, though it tended to effect greater reduction in generalized anxiety associated with panic attacks, was also associated with high dropout rates. This study unlike the preceding studies is a fairly better controlled one and does highlight that effective behavioural treatments for panic
disorder are available. Whether it will prove beneficial or not to combine these treatments with drugs for some clients is a question for future research.

Sokol, Beck, Greenberg, Wright and Berchick (1989) examined the effectiveness of cognitive therapy in the treatment of panic disorder. Focused cognitive therapy of panic (Clark and Salkovskis, 1986) was used. As measured by the self-report weekly panic log, the mean number of panic attacks was reduced to 0 at the end of treatment. There was a concomitant reduction in self-report measures of depression and anxiety. Further, there was a significant reduction on the measure of cognitive dysfunction during panic attacks. Treatment results were maintained at 12 months follow-up.

The authors also found that clients with a personality disorder or depression required a longer duration of treatment to become symptom free.

This study does provide preliminary support to its objective despite the fact that it does not offer adequate controls. This study like an earlier one (Jannoun et al. 1982), must be commended for the available booster sessions that were incorporated into the treatment protocol wherever necessary.

Michelson, Marchione, Greenwald, Glanz, Testa and Marchione (1990) examined the effectiveness of cognitive
behavioural therapies for panic disorder. The treatment protocol included elements of the cognitive model of panic procedures (Clark et al., 1986), cognitive therapy derived from the authors' programmatic research and Beck's (1986) seminal contribution and applied relaxation training. Analysis indicated statistically significant improvement across all outcome domains. All subjects were free of spontaneous (uncued) panic attacks at post-treatment and all met operationalized criteria for high end state functioning. Since the issue of long term maintenance is important, longitudinal research will be needed to examine the stability of improvement.

Welkowitz, Papp, Cloitre, Liebowitz, Martin and Gorman (1991) conducted a cognitive behavioural treatment programme for panic disorder which was delivered by psychopharmacologically oriented clinicians. Of the 24 clients treated, 14 were panic free after treatment and 3 additional clients showed moderate improvement and decreased frequency of panic. Although an uncontrolled study, it provides preliminary evidence for the exportability of a cognitive behavioural treatment for panic as an useful adjunct to pharmacotherapy or as an alternative to this type of treatment for those clients who cannot tolerate medication.
Shear, Ball, Fitzpatrick, Josephson, Klosko and Frances, (1991) report results of an open prospective study on cognitive behavioural therapy for 26 clients who met DSM-III criteria for panic disorder or agoraphobia with panic attacks. Treatment resembled that developed by Barlow et al. (1984) and Clark (1986). Treatment produced clinically and statistically significant improvement in panic symptoms, including both full-blown and limited symptom episodes. In addition, it produced improvement in associated symptoms of phobic avoidance and generalized anxiety.

The authors also found a relationship between initial severity of impairment and outcome in that severe impairment resulted in poorer outcome.

The results are preliminary considering that this study is an uncontrolled one. However, they are consistent with other published uncontrolled results providing further indication of the usefulness of cognitive behavioural strategies as an alternative to medication in symptom oriented treatments.

Salkovskis, Clark and Hackmann (1991) used a multiple baseline across subjects design to investigate whether a modified form of treatment involving only cognitive procedures could reduce panic attack frequency. Seven clients fulfilling DSM - III-R criteria for panic disorder were included in the study. Six out of the 7 clients showed a
decrease in panic frequency providing preliminary evidence that cognitive procedures directed at changing misinterpretations of bodily sensations can reduce panic attack frequency and also, that cognitive procedures which do not target misinterpretations may not reduce panic.

From the preceding review of research studies which have used cognitive treatments for clinical anxiety, the following concluding remarks can be highlighted:

1. Interest in the treatment of clinical anxiety on cognitive lines began in the 1980s and though there are adequate studies, they are few in number and not comparable owing to methodological differences.
2. Most of the studies have used some form of relaxation training along with cognitive therapy in their treatment protocol.
3. There are more research studies on panic disorder than on generalized anxiety disorder.
4. Treatments along cognitive lines are efficacious in the management of clinical anxiety.
5. More research is needed to substantiate the efficacy of cognitive therapy in clients with clinical anxiety especially generalized anxiety.
6. Research on the relationship of sociodemographic parameters and clinical characteristics with therapeutic outcome is sparse.
7. The cognitive strategies that have been employed have mostly been a combination of techniques that have been put forward by several workers in the field. In a few studies, parts of Donald Meichenbaum's cognitive behavioural treatment strategy-SIT, has been used in combination with other strategies. It may be useful to evaluate the efficacy of this cognitive behavioural treatment strategy in clinical anxiety especially generalzied anxiety in isolation to other strategies.

Outcome studies which have used SIT in the treatment of anxiety:

The pioneer of SIT is Donald Meichenbaum. However, several other workers in association with him, and independently, have used this cognitive behavioural treatment in the management of a wide range of stress related groups other than anxiety. Being a very flexible approach, it has been used with modifications to suit the necessary and required conditions. In general, SIT falls into the rubric of self-statement modification techniques which are based on the assumption that clients' anxieties depend on their interpretations of situations and thus the goal of therapy is to change the self-statements, i.e., what clients say and think to themselves. Training in relaxation is often included.
There are quite a number of research studies done on clients with anxiety but they are predominantly with situation specific anxieties and have been of the analogue type - studies on college student volunteers.

Meichenbaum, Gilmore and Fedoravicius (1971) compared 3 forms of group treatment for their relative therapeutic effectiveness in reducing speech anxiety. Fifty three subjects in the age range of 18-26 years, and mostly undergraduate students, were assigned randomly to the groups. The groups were matched on sex and speech anxiety. Treatment groups included desensitization; insight, which emphasized making subjects aware of both their anxiety producing self verbalizations and ways they might counter such verbalizations; and a combined desensitization and insight treatment condition. A discussion group (attention placebo) and a waiting list control group were also included. Fifteen additional low speech anxious subjects were selected who afforded a baseline measurement for each measure of anxiety and a comparison group. Results indicated that the insight group was as effective as the desensitization group in significantly reducing speech anxiety over control group levels as assessed by the self-report and behavioural measures given immediately after post-treatment and later at a 3 month follow-up. The desensitization treatment appeared to be significantly more effective than insight treatment.
with subjects for whom speech anxiety was confined to formal speech situations. Conversely, insight treatment appeared to be significantly more effective with subjects who suffered anxiety in many varied situations. This study is a controlled evaluation. Despite the modest size of the sample, the findings were consistent across the dependent measures and were significant, indicating the reliability of the data.

Meichenbaum (1972) examined the cognitive modification of 21 test anxious college students in the age range of 17-25 years, who were randomly assigned to one of 3 groups - group cognitive modification treatment procedure, group desensitization and a waiting list control group. These groups were matched on sex and test anxiety. An additional group of 10 low anxious subjects afforded a baseline for each measure of anxiety as elicited in the test taking situation and a comparison group. The cognitive modification group combined an insight oriented therapy which was designed to make test anxious subjects aware of their anxiety engendering thoughts with a modified desensitization procedure which employed (a) coping imagery on how to handle anxiety and (b) self-instructional training to attend to the task and not ruminate about oneself. Results indicated that the cognitive modification group was most effective in significantly reducing test anxiety as assessed by (a) test performance obtained in an analogue test situation, (b) self-reports
given immediately after treatment and later at a 1 month follow-up and (c) grade point average. Following treatment, the test anxious subjects in the cognitive modification group did not differ from the group of low test anxious subjects and in fact, the cognitive modification subjects reported a significant increase in facilitative anxiety. This study is also a fairly well controlled study. Despite the small sample size, the findings are important.

Fremouw and Harmatz (1975) assessed the effect of a helper model for behavioural treatment of speech anxiety. Forty four subjects were rank ordered for pre-treatment anxiety, matched in groups of 4 and randomly assigned to any one of 4 treatments - helper, helpee, latent helper and a waiting list control group. Treatment assignments were then adjusted to match helper-helpee pairs for sex, anxiety level and time schedule. Forty one out of 44 completed pre-, and post-treatment assignments. A group of low speech anxious subjects was also identified. This group was included to test the validity of the speech anxiety measures. Each group received 5 hours of relaxation for 6 weeks. Helpers gave helpee groups 5 hours of training while the latent groups practised the technique for 5 hours between training sessions. Training comprised of relaxation and skill building based on the work of Goldfried and Trier (1974) and Meichenbaum et al. (1971), respectively. Both the helpers and
help assistants significantly reduced speech anxiety on each behavioural and self-report measure relative to the waiting list control group at post-treatment and the improvement was maintained at a 3 month follow-up. At post-treatment, the latent helpers improved on all self-report measures and one of the behavioural measures. The helpers showed more absolute improvement on each measure than the help assistants or latent helpers. However, none of these differences were statistically significant. The small sample size could explain the lack of significance. This study, however, highlights the use of people with behavioural problems as therapists for others with similar problems.

Glass, Gottman and Shuruk (1976) designed 3 training programmes for girl-shy males. Sixty one males were randomly assigned to one of 6 groups. The effectiveness of a response acquisition treatment was compared with a cognitive self-statement modification treatment, a combination of these two treatments and a waiting list control group. Two enhanced treatment groups were used to control for the longer time of the combined treatment group. The results indicated that subjects trained in cognitive self-statement modification showed significantly better performance in role play situations for which they were not trained, made significantly more phone calls, and made a significantly better impression on the women than subjects in other groups. These effects were generally maintained at follow-up, and the
cognitive self-statement group's performance on the role play measures improved from post-treatment to follow-up. The above study adds to the evidence amassed by Meichenbaum and his colleagues that cognitions can be directly modified by subjects and that these modifications can result in significant changes in behaviour.

Weissberg (1977) randomly assigned 73 speech anxious subjects from introductory psychology and speech communication classes to one of 3 treatments and a no-treatment control group. Each treatment group was then divided so that half received treatment directly while the other half received treatment vicariously, i.e., observed direct subjects on videotape. Treatment comprised of desensitization (Paul, 1966); desensitization with coping imagery; and cognitive modification (Meichenbaum, 1972). Results indicated no consistent significant differences between the direct and vicarious conditions or among the three treatments. However, comparison with the control group indicated that the pooled treatment subjects did improve significantly on all measures of speech anxiety and general anxiety. Furthermore, trends in the data pointed to the greater effectiveness of the direct treatments in reducing general anxiety and to the greater consistency of the cognitive modification programme in reducing both speech and general anxiety. Results provide some support for
Meichenbaum's (1972) findings that cognitive modification is more effective than desensitization in reducing test anxiety. The study, in addition, highlights that vicarious treatments hold a great deal of promise as packaged videotaped programmes can be seen by many people simultaneously. However, this may never come to pass unless, in addition to improving the effectiveness of vicarious programmes, a serious attempt is made to make the programmes more palatable to their users.

Norton, MaClean and Wachna (1978) evaluated the use of cognitive desensitization and self-directed mastery training for treating stage fright. The design of this study was a single case study design. The purpose of this study was to reduce a woman's fear of playing the piano in front of an audience. A cognitive desensitization procedure which combined Meichenbaum's verbal self-directed procedure and a variant of systematic desensitization was used to reduce the client's fear. After the programme, the client gave several performances for approximately 5-20 people in an University concert centre. The client was encouraged to use the relaxation and positive self-statement exercises before and during performances. Despite the fact that the design of the study was only a single case study design with no objective self-report measures of outcome, it does highlight that cognitive methods may be an effective alternative. In addition to reducing anxiety, the programme seemed important.
for providing the client with a set of cognitively modelled coping experiences which could be initiated in actual performance.

Fremouw and Zitter (1978) in their study compared the effects of skills training and cognitive restructuring-relaxation for the treatment of speech anxiety. Fifty seven speech anxious undergraduates were divided at the median of the Social Anxiety and Distress Scale (Watson and Friend, 1969) into a high and low social anxiety group. Subjects in each group were randomly assigned to one of 4 treatment conditions - skills training (Fremouw et al. 1975; Fawcett and Miller, 1975), cognitive restructuring - relaxation (Meichenbaum et al. 1971; Goldfried et al. 1974), a discussion placebo group and a waiting list control. Both the skills training and cognitive restructuring - relaxation groups significantly improved on one self-report measure and two behavioural measures of speech anxiety. Improvements were maintained at a 2 month follow-up. Reduction in speech anxiety did not generalize to decreases in social anxiety. Discussion placebo and the waiting list groups improved slightly but did not differ from each other.

The authors also explored the interaction between type of clients and treatment outcome. Although the trends did not reach significance, interaction between clients and treatments suggest that the skills training was equally
effective for subjects high and low in social anxiety, while cognitive restructuring - relaxation appeared to be more effective for subjects high in social anxiety.

Small samples, large variability within treatments, and moderate improvement by the control groups prevented the difference from reaching significance levels. Studies have shown that cognitive restructuring may be important to maximize treatment generalization (Fremouw et al. 1975; Meichenbaum et al. 1971 and Glass et al. 1976). The above study failed to replicate this finding. One explanation could be the shorter duration of treatment. Further research is needed to replicate these tentative results with larger samples.

Clogower, Fremouw and McCroskey (1978) conducted a study to assess the contribution of the following components of cognitive restructuring developed by Meichenbaum (1969, 1972): (a) extinction, (b) insight into negative self-statements, (c) knowledge and rehearsal of coping statements and (d) a combination of insight into negative self-statements followed by learning and rehearsal of coping statements. Sixty communication apprehensive subjects were divided among the 4 treatment groups and a waiting list control group. A low anxious group was also included to test the validity of the dependent measures. Each treatment group met for 5 one hour weekly sessions. On both self-report and
behavioural measures, the coping statement group improved more than the negative self-statement or extinction groups. The combination of the components produced the largest improvement at post-treatment and at a 6 week follow-up. These results suggest that while all of the components produce some improvement, the coping statement component is of primary importance to cognitive restructuring.

Hussain and Lawrence (1978) employed test specific and generalized SIT as initiated by Meichenbaum (1975) in order to reduce test, state and trait anxiety. Forty eight test anxious students in an introductory psychology class were randomly assigned to one of 4 treatment conditions. Two experimental conditions, a test specific SIT condition and a generalized SIT condition were compared with 2 control conditions - a discussion control and a waiting list control. Results revealed that test specific training reduced test and trait anxiety relative to the 2 control groups and the generalized training reduced test anxiety relative to the waiting list control group. These gains were maintained at follow-up. This study showed that SIT reduces test anxiety and trait anxiety. Why this method works is not made explicit in the study. Future research efforts should be aimed at the possible explanations for the effectiveness of SIT. The data suggest that the nature of the coping statements learned by the subject may be the initial
variable. Tighter controls on the content covered in the discussion control group are needed to ensure that no general cognitive restructuring is taking place considering that the generalized training reduced test anxiety relative to the waiting list control only. Other test anxious populations could be used since subject bias exists in the sampling of college students.

McCordick, Kaplan, Finn and Smith (1979) randomly assigned test anxious students to one of 3 experimental or 2 control conditions: (a) a core treatment which consisted of Meichenbaum's cognitive behaviour modification, and study skills training, (b) the core treatment plus videotaped modelling, (c) the core treatment plus rehearsal modelling, (d) study skills control and (e) waiting list control. No treatment led to significant improvement in academic performance, a finding consistent with the majority of test anxiety studies which have used grades as a dependent variable.

Jaremko, Hadfield and Walker (1980) evaluated the contribution of an educational phase to stress inoculation of speech anxiety. Thirty one speech anxious students were assigned to one of 3 experimental groups or a control group. The 3 treatment groups received either the educational phase only, the skills phase only or both (Jaremko, 1979, Meichenbaum and Turk, 1976). These were compared with a no-
treatment control group. Results revealed that the education group was the only group to improve significantly on self-reported anxiety, measured before giving a public speech. The education and the combination groups improved on self-reported self-efficacy as a speaker. All groups improved on the behavioural measures of speech anxiety. The results highlight the apparent potency of using an educational model in the treatment of anxiety, but the small number of subjects limits generalizability. However, the results provide preliminary support that education is an active component in stress inoculation.

Jaremko (1980) reported the results of separate speech anxiety treatment studies that used SIT (Jaremko, 1979; Meichenbaum et al. 1976 and Goldfried, Linehan and Smith, 1978). The approach taken in each of the 3 studies was the same. Sixty two undergraduate students in introductory speech classes who reported speech anxiety were assigned either to a treatment group or a no-treatment group. Results revealed that the treated subjects improved significantly on both measures of outcome, i.e., self-report and behavioural measures. Despite the fact that therapist bias was not controlled, the results appear promising. Future work should, however, attempt to generalize SIT to clinical conditions.
Woodward and Jones (1980) conducted a controlled trial of cognitive restructuring treatment with anxious clients. Twenty seven clients from a hospital waiting list diagnosed by the referring doctor or psychologist as having general anxiety were randomly assigned to one of 4 groups: systematic desensitization, cognitive restructuring, cognitive behaviour modification, a combination of the former two and a no-treatment control. Cognitive behaviour modification was found to be a superior form of treatment relative to the no-treatment control and the other active treatment groups. It was found to show greater improvement than the cognitive restructuring group on certain of the anxiety measures.

Results also demonstrated a relationship between outcome and initial severity of condition. The higher the subjects' initial scores on neurotic symptoms and subjective anxiety level, the greater the degree of positive change after treatment. Moreover, subjects with high levels of internal control as seen on the Internal-External Control Scale (IE) (Rotter, 1966), prior to treatment responded most to therapy.

This study is one of the earliest studies in which therapy was carried out on cognitive lines modelled according to SIT with this group of clients. Being a fairly well controlled study, it demonstrates that a multi-dimensional approach to treatment is more likely to succeed with this
type of clients than treatments comprising of one element only.

Deffenbacher and Hahnloser (1981) evaluated the effects of cognitive and relaxation coping skills in stress inoculation in the management of test anxiety. Forty seven psychology students were assigned to one of 3 treatment groups - cognitive coping skills group, relaxation coping skills and a combination of the former two, or a waiting list control group. The results demonstrated that relaxation and cognitive components of stress inoculation alone or in combination effectively lowered test anxiety. Follow-up revealed that treatment effects were maintained. However, while cognitive and relaxation components alone were effective, their combination appeared somewhat superior both at post-treatment and at follow-up 5 weeks after treatment.

Altmaier, Ross, Leary and Thornbrough (1982) assigned 65 speech anxious students who were classified as experiencing primarily cognitive or somatic symptoms of anxiety to one of 3 treatment groups - the cognitive restructuring group, the coping relaxation group and a combined cognitive - somatic treatment group or a no-treatment group. All treatments followed the 3-phase model of SIT (Meichenbaum, 1977). All treatments were more effective than the no-treatment control in reducing behavioural indicants of anxiety.
Schuler, Gilner, Austrin and Davenport (1982) like Jaremko et al. (1980) evaluated the contribution of the education phase to SIT in treating speech anxious college students. Eighteen speech anxious college students were assigned either to a full stress inoculation group or a group without the education phase of SIT. Treatment comprised of 3 seventy five minute sessions spaced over 3 weeks. By a 4 week follow-up, the full stress inoculation group improved significantly more than the group receiving stress inoculation without the education phase on the self-report and behavioural indices supporting the assertion that the initial conceptualization phase is an effective component in this cognitive learning therapy. Absence of a no-treatment control group restricts any consideration of the absolute effectiveness of SIT. Brief duration of therapy could have resulted in the absence of any effect on the physiological measure. Research should continue to investigate the relative effectiveness of components and whether the efficacy of the education phase is due to heightened expectancy, meaningful conceptualization or just providing insight.

Last, Barlow and O'Brien (1983) compared the relative efficacy of two cognitive strategies, i.e., coping self-statements and paradoxical intention using an alternating treatment design for a client with generalized anxiety disorder. Although measures did not indicate a differential effectiveness between the two cognitive strategies, the
client reported that she found the coping self-statement strategy more helpful, a preference that continued at a 1 year follow-up. Results of the above study provide some support for the effectiveness of cognitive intervention for generalized anxiety. However, data are based on a preliminary investigation with a single subject. It remains possible that a combination of cognitive and physiological procedures may be the optimal approach for successful intervention.

Long (1984) compared the efficacy of a jogging programme (aerobic conditioning) with SIT (Meichenbaum and Cameron, 1973) and a waiting list control in the treatment of 73 community residents with chronic intermittent stress. Analysis of data indicated that both the aerobic conditioning and the stress inoculation groups were effective in reducing self-reported anxiety and increasing self-efficacy and that these changes were maintained 3 months after completing the programme. It was concluded that participation in aerobic conditioning was a viable alternative to SIT as a stress management treatment.

Sharp and Forman (1985) in their study compared the effects of two approaches to anxiety management for teachers—SIT and classroom management training. Sixty subjects were randomly assigned to either of the treatment groups or to a no-treatment control group. SIT was based on Meichenbaum's
(1977) model adapted for teacher stress management training. Both SIT and classroom management training were found to improve teachers' affect and behaviour. This study did not provide evidence for the superiority of either type of training. Future studies can explore the effects of combined training. The use of a placebo control and direct assessment of coping skills procedures can be tried. The relationship of subject characteristics and therapeutic outcome needs to be studied.

Öst (1985) conducted two controlled case studies to test the effects of two coping techniques in the treatment of anxiety disorders: applied relaxation, and stress inoculation (Meichenbaum, 1977). The effects were tested for 1 client with panic disorder and 1 with generalized anxiety disorder. Both clients improved to a large extent. These improvements were sustained or furthered even at the 1 year follow-up. Since the design of the study is of the case study type, the results are only suggestive. Controlled group studies are necessary. However, these single case studies do show that two of the coping techniques—applied relaxation and SIT—can be used in clinical conditions of anxiety and can give significant improvements which can be sustained or even furthered on a follow-up period as long as 1 year.

Wells, Howard, Nowlin and Vargas (1986) designed a study to test a method for preparing surgical patients to actively
cope with the stress of hospitalization and surgery. It examined the effects of a stress inoculation procedure on patients' anxiety, pain and post-operative adjustment. Results demonstrated the utility of SIT in providing surgical patients with a self-regulation technique to reduce their experiences of anxiety and pain and improve their post-operative adjustment, including the reduction of reliance on analgesics and number of post-operative recovery days.

In the literature survey, there has been only one study available by Lustman and Sowa (1983) where EMG feedback assisted relaxation and SIT have been used. The authors compared the efficacy of EMG biofeedback and stress inoculation for stress reduction. Twenty four senior undergraduates in education who had identified stress were divided equally into 3 levels of stress (high, medium and low) on the basis of scores obtained on Life Experience Survey (LES) (Sarason, Johnson and Seigel 1978). They were assigned randomly from each level to one of 3 groups - frontalis EMG biofeedback along with auto suggestion phrases, a primarily somatic intervention (Brown, 1978); stress inoculation, a self-instructional form of cognitive behaviour therapy (Meichenbaum, 1975; Cox, 1978); and a waiting list control group. Treatments were assigned randomly to these 3 groups. Results indicated that both frontalis feedback and stress inoculation groups improved significantly more than the no-treatment control but did not differ overall from one
another. The stress inoculation group showed more improvement in self-reported anxiety than the EMG group, while the EMG group tended to do better than the stress inoculation group on blood pressure measures. The untreated control group regressed somewhat across all measures. The results of this study strongly support the continued use of both frontal EMG feedback and stress inoculation in the treatment and management of stress. Further research is however, needed, not only to compare the effectiveness of these treatments, but also to combine these approaches across a wide variety of populations especially clinical populations of anxiety.

Within the broader context of cognitive behaviour therapy, the results of the studies which have used SIT in the treatment of anxious clients add to the increasing number of outcome studies indicating that the cognitive re-appraisal of anxiety provoking situations can offer a markedly effective treatment procedure for the reduction of anxiety.

From the preceding survey of literature the following concluding remarks can be made:

1) SIT has been extensively researched in clients with anxiety but the studies are not easily comparable owing to methodological differences.

2) Studies have been predominantly with situation specific anxieties and have been on college student volunteers.
3) SIT as a treatment strategy is viewed as a flexible approach and is subject to a lot of modifications to suit the necessary or required conditions.

4) It has been used mostly on a group basis rather than on an individual one.

5) The efficacy of this self-instructional form of cognitive behaviour therapy needs to be more firmly established in clinical populations of anxiety especially generalized anxiety.

6) Studies on the relationship of sociodemographic parameters and clinical characteristics with therapeutic outcome are lacking.

In the treatment of generalized anxiety, it is necessary that behavioural researchers take on a two pronged approach - a somatic intervention for the physiological manifestation of anxiety and a cognitive behavioural intervention for the subjective manifestation of anxiety. It is with the above idea in mind that the present investigation was carried out.

The main objective of the present study was to evaluate the combined efficacy of frontalis EMG feedback assisted relaxation, a primarily somatic intervention, and SIT - a self-instructional form of cognitive behaviour therapy, in anxiety neurotic clients. Since reports of predictive factors in generalized anxiety are sparse, the subsidiary objective of the present study was to find out the relationships of some of the sociodemographic parameters and clinical characteristics with therapeutic outcome.
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