



Management of Tension –type Headache with Relaxation

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Abstract:

The present study was done to study the effectiveness of relaxation techniques in management of tension -type headache. Two relaxation techniques were used - Jacobson's progressive muscle relaxation [PMR] technique and Deep Breathing. Three groups of subjects were taken with ten participants in each group. Two groups were given ten sessions of the two relaxation techniques on alternate days. The third group was a control group. It was found that Jacobson's PMR was most effective in reducing the intensity and duration of headache and the symptoms associated with it. Implications on health are also discussed.

Keywords: *Jacobson's Progressive Muscle Relaxation, Tension-type Headache*

1. Introduction

Pain and headache have been known to mankind for long time. Different methods for their treatment have also been known for a fairly long time. In ancient stone inscriptions made over 5000 years ago, one comes across the term "a headache sufferer". In China, headaches were treated over 2.5 thousand years ago. According to the ancient Greek historian Herodotus, the priest of ancient Egypt who was also doctors specialized in the treatment of different diseases; among them were the priests who treated headache alone.

Headaches are common conditions that can be barometers of emotional stress, chronic and recurrently incapacitating illnesses or symptoms of serious disease. Several varieties of headaches are usually cited such as muscle contraction headache or tension type headache, migraines, cluster headaches, post concussive headaches and trigeminal neuralgia.

Tension-type headache (TTH) is a disorder associated with sustained contraction of the skeletal muscles in the absence of the permanent structural change, usually as part of the individual's reaction to life stresses. They are generally mild, transient and infrequent. The pain is often dull, non-pulsatile and persistent. There is a band like sensation around the head. Associated with contracted muscles of the scalp and neck.

The International Classification of Headache Disorders (ICHD-2), published in 2004 classified TTH into three types:

1. Infrequent Episodic (fewer than 12 headache days per year)
2. Frequent Episodic (between 12 and 180 days per year)
3. Chronic TTH (at least 180 days per year)

TTH is characterized by a bilateral, pressing, tightening pain of mild to moderate intensity, occurring in short episodes of variable duration (episodic forms) or continuously (chronic form). The headache is not associated with the typical migraine features, such as vomiting, severe photophobia, and phonophobia. In the chronic form, only one of these accompanying symptoms is allowed and only mild nausea is accepted. (Bendtsen, 2009).

Tension is habitual or persistent reflex contraction of voluntary muscles. This habit pattern arises through involuntary practices because of bracing to real or imagined uncertainties or to painful stimuli. Difficulties arise because we are continuously exposed to uncertainties resulting in frequent tightening. Any repeated muscular action is apt to become a habit pattern. In time fatigue muscles begin to cramp. It is frequently prominent in neck and shoulder (fight) or lower back (flight). TTH have generally been associated with stress and tensions.

1.1 Epidemiology

Despite TTH being the most common form of headache, the epidemiology has received little attention. This is probably due to the fact that people with TTH never consult a physician. A Danish population based survey reported that TTH causes work absence on 820 days per year per 1000 employed population as compared to 270 days of work absence because of migraine in the same population. Frequent Episodic and Chronic TTH is significantly high in women than men. The prevalence of Episodic TTH increase slightly in both men and women until age 39 after which it declines. (Russell, 2006). Prevalence of frequent TTH has risen significantly from 1929-2006. (Bendtsen and Jensen, 2006)

1.2 Correlates of TH

TTH is the most common, most neglected and the most difficult type to treat. It may be caused by jaw clenching, intense work, missed meals, too little sleep, depression, anxiety, stress and other personality variables. Other correlates of health are Stress, Anxiety, Locus of Control, Type A behavioral pattern and Depression.

1.3 Relaxation

According to Stebbins, 1960 "Relaxation refers to a complete recognition of the body to the laws of gravity, the mind to nature and the entire energy transferred to a deep dynamic breathing. Relaxation should not be mistaken for inertia. It also does not mean lying in a lazy manner or doing nothing. Relaxation really means rest after effort more truly conscious rest after conscious effort. Therefore, the more perfect the effort, the more perfect the relaxation."

1.4 Treatment

Some of the Pharmacological Treatment of TTH are Amitriptyline (tricyclic antidepressants), Diazepam, Imipramine, Amobarbital, Chlordiazepoxide, Memproamate, Naproxen Sodium (Sargent et. al., 1988), Paracetamol and Aspirin (Bendtsen, et. al., 2010) and Phenothiazines.

There is a danger of getting addicted to the drugs. Sometimes the side effects of the drugs may do more harm than the disease.

Some of the Non Pharmacological Treatment of TTH Biofeedback, Relaxation, Acupuncture (Carlsson, et. al., 1990), CBT (Cognitive Behavioral Therapy), Hot tub baths, Massage, Meditation, Hypnosis and Yog Nidra.

Fumal and Schoenen (2008) found that tension-type headache (TTH) is the most common form of headache, and chronic tension-type headache (CTTH) is one of the most neglected and difficult types of headache to treat. The pathogenesis of TTH is multifactorial and varies between forms and individuals. Peripheral mechanisms (myofascial nociception) and central mechanisms (sensitisation and inadequate endogenous pain control) are intermingled: the former predominate in infrequent and frequent TTH, whereas the latter predominate in CTTH. Acute therapy is effective for episodes of TTH, whereas preventive treatment--which is indicated for frequent and chronic TTH--is, on average, not effective. For most patients with CTTH, the combination of drug therapies and non-drug therapies (such as relaxation and stress management techniques or physical therapies) is recommended. There is clearly an urgent need to improve the management of patients who are disabled by headache. This

Review summaries the present knowledge on TTH and discusses some of its more problematic features.

2. Review of Literature

Bendtsen and Jensen (2006) found that prevalence of frequent TTH has risen significantly from 1989 to 2001.

Bendtsen, et.al. (2010) said that non-drug treatment/management of TTH should be considered.

Anderson, et.al. (2011) found that two minutes of daily resistance training for 10 weeks reduces headache frequency among office workers with neck and shoulder pains.

Russell, et.al. (2006) found that TTH increased slightly in men and women until age 39 after which it declined. They also found that it was more prevalent among women than men.

Martin (1983) conducted a literature review and concluded that tension headache is a multi-factored illness for which there is no specific and totally effective therapy.

Holroyd, et.al. (1991) compared pharmacological (amitriptyline HCl) and non-pharmacological (cognitive behavioral) therapies for chronic tension headache. CBT yielded more positive outcomes than amitriptyline. Neither treatment, however, eliminated headache problems.

3. Methodology

The present research is an attempt to study the efficacy of two relaxation techniques in the management of tension headache.

1. Jacobson's Progressive Relaxation
2. Deep Breathing

4. Hypothesis

1. The two relaxation techniques will reduce the duration, intensity and frequency of TH as compared to the control group. The control group would not be able to feel the reduction in pain because there is no active involvement of the mind and body to make subjects fatigued after exercise and then relaxed.
2. TH has been associated with anxiety. Psycho physiological expression or somatization of anxiety in the form of increase muscle tension is uniformly present in cases of TH. Anxiety and depression are converted into acceptable physical symptoms. Relaxation reduces skeletal muscle tension and reduces anxiety and headache.
3. The physiological symptoms of TH in a tension headache patient will decrease with relaxation.
4. Most of the symptoms of TH are the manifestations of tension experienced by the body muscle. As relaxation relaxes the muscles of the body, the symptoms will naturally reduce. (Bendtsen, 2006; Smith, 1987; Hart, 1984)

The two relaxation techniques shall produce different amounts of reduction in TH.

Jacobson's PMR will be more beneficial because:

- Jacobson's technique employs steps especially for the relaxing of the muscles of the head and neck regions.
- His technique has continuously proved effective in reduction of anxiety.

5. Sample

The sample consisted 30 TH patients (all females). It was checked with the help of doctors that they did not have any other problems other than TH. The age of the sample aged from 14-45 years. The sample was divided into groups of 10 each.

6. Variables

Independent variables had three levels:

1. Jacobson's Relaxation technique

2. Deep breathing technique
3. Control group

7. Dependent variables

1. Symptom checklist scores
2. Frequency of headache
3. Duration of headache
4. Intensity of headache

8. Design

1. Randomized group design was used in which technique was the main factor which had three levels.
2. Pre and post design where the symptom checklists were given before and after specific technique, on the 1st and the 20th day.
3. An alternate 10 day session of treatment was used.

9. Materials Used

1. Symptom checklist
2. Intensity chart (6 am to 10 pm)
 - 0 – no pain
 - mild to moderate pain
 - 2 – severe pain
3. Frequency chart: how many times a day she experienced pain
4. Pain duration chart: when it started and when it ended

10. Symptom Checklist

1. Panic
2. Restlessness
3. Dizziness
4. Impaired concentration
5. Respiratory difficulty
6. Palm sweating
7. Loss of sleep
8. Excessive sleep
9. Gastrointestinal problem
10. Nightmares
11. Irritability
12. Diarrhea
13. Lack of appetite
14. Nausea
15. Constipation
16. Tension
17. Anxiety
18. Loss of weight
19. High pulse rate
20. Worry
21. Muscular tension
22. Forgetfulness
23. Absentmindedness
24. Palpitation
25. Faintness
26. Muscle stiffness

27. Periodic dull light headache of variable duration
28. Contracted muscles of scalp and neck
29. Dull pressing or band like pain
30. Waxes and wanes in intensity during the day
31. Pain daily and constantly
32. Steady non pulsatile ache
33. Digestive problems
34. "Tightness" by temporally or at the occiput

This Symptom Checklist was prepared in a pilot study consisting of 10 TTH patients. They were interviewed and asked about their various symptoms.

11. Results

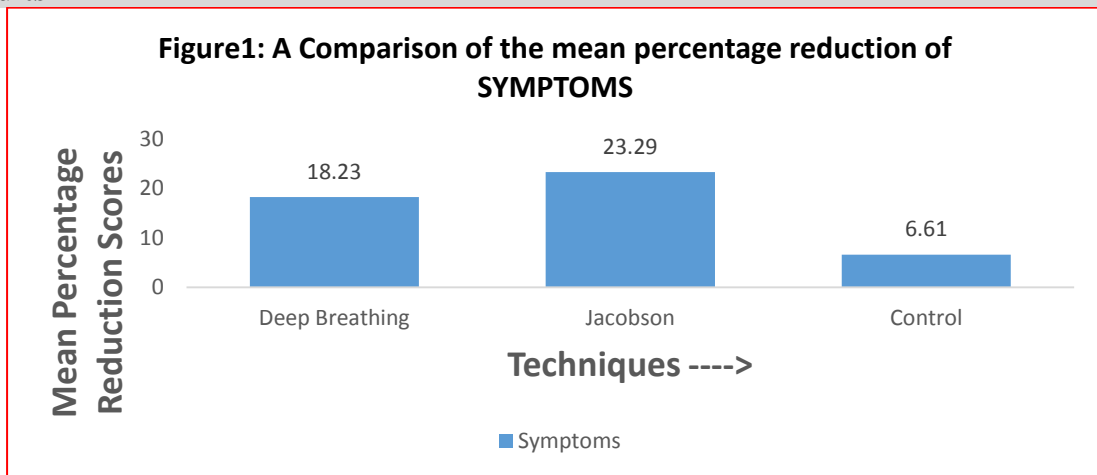


Table1: Summary of ANOVA for the 3 Groups of Symptom Checklist Scores

Source of Variation	SS	df	MS	F
Between Groups	4593.642	2	2296.82	**85.97
Within Group	836.083	27	30.966	

Table 2: Summary Table showing Pre and Post Relaxation Scores for the 3 Level of Factor A

	b_1	b_2	Σ
a_1	120.4	62.6	183
a_2	160.4	54.4	214.4
a_3	124.2	92.4	216.6
Σ	405.0	209.4	614.0

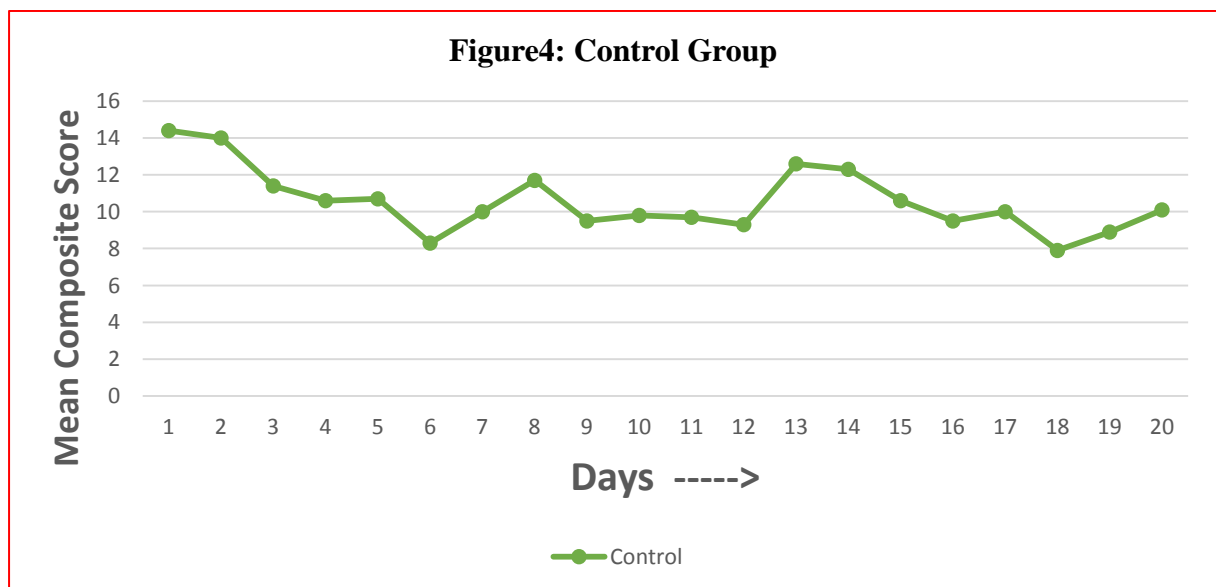
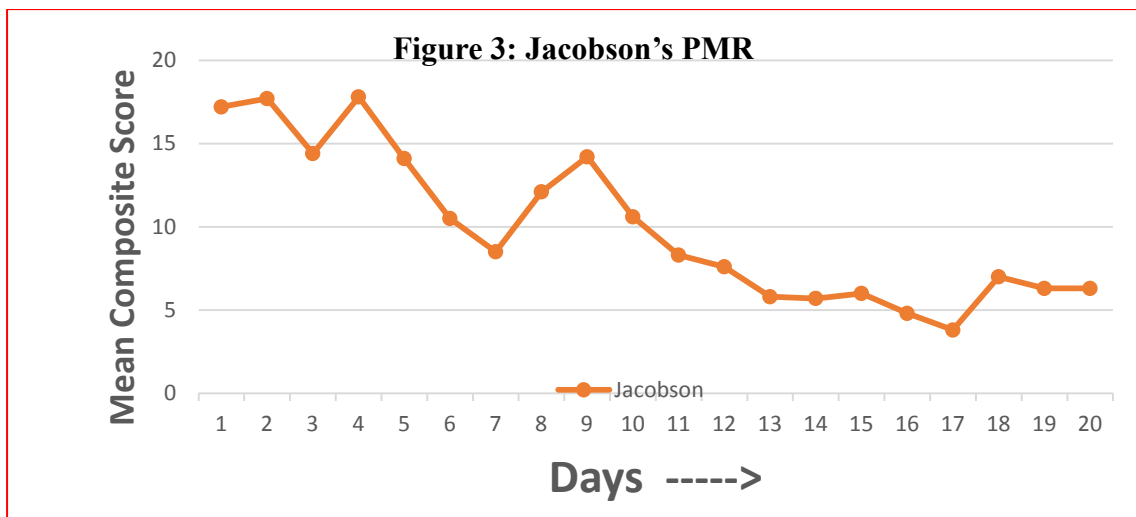
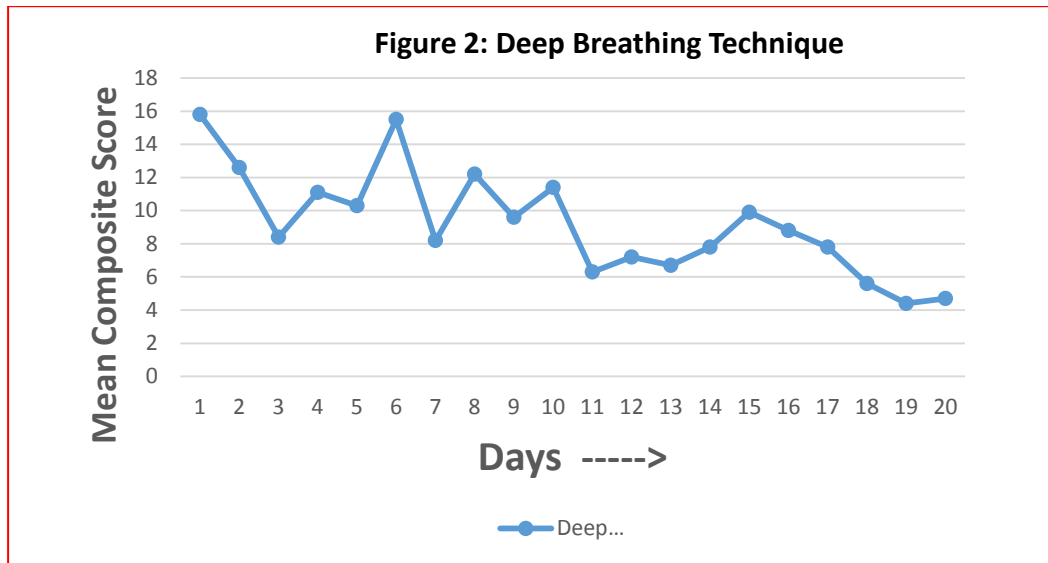
a_1 : deep breathing

a_2 : Jacobson relaxation

a_3 : control group

b_1 : pre relaxation composite score

b₂: post relaxation composite score
Composite score = intensity*duration



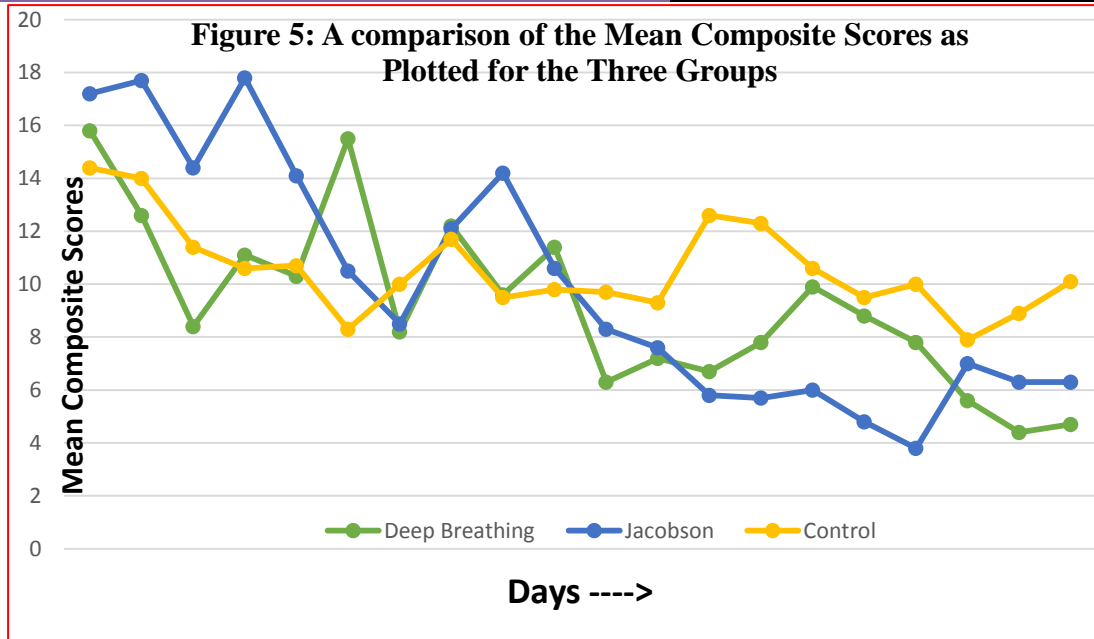


Table 3: Summary of ANOVA for the 3 Groups of Factor A & 2 Levels of Factor B

Source of Variation	SS	df	MS	F
Between Ss A	916.01	29	17.67	0.542
Ss within group (error between)	35.33	2	32.62	
Within Ss B (Condition)	842.95	30	645.84	**316.54
AB	645.84	1	71.08	**34.84
B*Ss within group (error within)	142.16	2	2.04	
	54.95	27		

** $F(1,27) = 7.68$

** $F(2,27) = 5.49$

Table4: Summary of Anova for Simple Effects of b

Source of Variation	SS	df	MS	F
b for a_1	167.05	1	167.05	** 81.89
b for a_2	570.39	1	570.39	** 219.6
b for a_3	50.56	1	50.56	** 24.78
B*Ss (error)	54.95	27	2.04	
** $F(1,27) = 7.68$				

12. Discussion

Hypothesis I states that deep breathing and Jacobson's PMR will effectively reduce the duration, intensity and frequency of TTH as compared to the control group. This hypothesis has been partially proved. The duration and intensity of headache reduced with relaxation but there has been no effect on the frequency of headache.

The duration of headache was multiplied by the intensity of headache to get a composite score. The composite scores of the first five days were taken as pre relaxation scores and the last five days as the post relaxation scores. We see that marked and consistent reduction has taken place after the 11th day. The control group shows reduction too. Had the study been designed to give relaxation for 10 days, there would have been no significant results relaxation is not effective for TTH patients. We can see this from figures 2, 3, 4 and 5. Data has been analyzed by taking the composite scores using 3*2 factorial experiments with repeated measures on the second factor as the design. Results show that condition B i.e. the difference between pre and post relaxation scores was highly significant at 0.01 levels, as seen in Table 3.

The AB interaction condition was also found significant, $F(2,27)34.84$; $P < .01$

Simple effects of B for a1, a2 and a3 was also calculated. Simple effect of b for a2 was highly significant. It showed that Jacobson PMR was very effective in reduction of headache. It was found that b for a1 and a3 was also significant. The difference between pre and post relaxations scores is maximum for Jacobson PMR and minimum for control group. Studies by Holroyd et al (1991) support these findings.

Hypothesis II states that the physiological symptoms of TH will decrease with relaxation.

The symptoms of tension headache are also reduced after giving them relaxation. The reduction of symptoms is maximum for the group given Jacobson's PMR and least for the control group. As seen in figure 1, there is more reduction in symptoms than anxiety. This is because there is somatization of anxiety. The anxiety gets converted into more desirable physical symptoms. Somatization is more common in Asians. Studies by Blanchard et al (1986) Lacroix et al (1986) support these findings.

Hypothesis III states that Jacobson PMR will be more beneficial than Deep Breathing. Results of present study verify this hypothesis. The symptom checklist show highest reductions as already stated earlier with Jacobson PMR. The intensity and duration graph also show highest reductions with Jacobson PMR group. So the overall results suggest that this technique has been the most efficient in the management of TH. It employs steps specially for the relaxing of the muscles of the head and neck regions. Almost half of the time is taken to relax these muscles. We know that TTH is associated tensed and contracted muscles of the head and neck region. Thus it is justified that this technique is most effective. Studies by Francois et al (1984) Hatch and Moore et al (1982) support the above findings.

As muscles tense they contract generating volleys of neural impulses that are directed to the brain. There are complex CNS events which follow this. Neural impulses return by motor control fibers to the muscles. These complex circuits involving muscle - small nerves - brain - small nerves muscles, are referred to as neuromuscular circuits. By relaxing the skeletal muscles state of tranquillity is brought to all the components of these neuromuscular circuits including the brain itself. In conclusion, we can say that relaxation is an effective tool to reduce TTH. In the present study, a comparison of medicine intake has not been made. It would be very interesting to show the pharmacological remedies are unnecessary at times.

The relaxation method of Jacobson triggers of triggers of the trophotropic cells around the hypothalamus creating biological recuperating mechanism producing calmness reducing stress sublimating tension, anxiety and fear.

13. Drawbacks

- Medicine intake chart has not been maintained in the present study to see any decrease in the intake of medicines after relaxation training.
- For STAI, the trait checklist was not evaluated separately.
- Headache diary was not maintained.
- No CBT was given. It would prove effective to combine CBT with relaxation.
- Those of us who have been interested in relaxation have been too ready to attribute the therapeutic gains we observe to the learnt control of physiological activity that we so painstakingly teach during treatment. We seldom measure any other variables. Thus, it would be very apt to suggest that the therapeutic effects of biofeedback or relaxation are not understood fully unless more attention is paid to the ways clients are actually coping with the stresses they are confronting in their lives.
- Ways of coping with stress can influence our health. There is no particular coping response that is appropriate in all contexts. Muscle relaxation may often be helpful. In other instances assertive behavior, withdrawal, rational reevaluation of environmental demands or other coping activities may be more appropriate. Therefore treatments that ignore the demands of particular headache eliciting situations and provide clients with only one set of coping responses. Example, muscle relaxation may prove less effective than treatments that provide clients with a more flexible set of coping skills.
- No follow-up was done in the present study. Follow ups are necessary in order to determine whether treatment effects persist.

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