

A Study on
the Effects of Therapist Contact on
Progressive Muscular Relaxation Training
for Mixed Migraine and Tension Headaches

by

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Lakehead University

August 30, 1993

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ISBN 0-315-86164-9

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Acknowledgements

I would like to thank the department of psychology at McKellar General Hospital, Thunder Bay for the use of their facilities as the therapeutic relaxation environment for the present study. Also, Dr. W.T. Melnyk's and Dr. J. Tan's guidance and support were greatly appreciated. Martin Thomas at the Sunnybrook Health Science Centre, Toronto, also deserves a note of thanks for the use of their Analgesic Index.

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Abstract

The effectiveness of home-based relaxation and therapist-contact relaxation treatment for headaches were evaluated in comparison to a waiting list control group. A group of 30 subjects diagnosed as suffering mixed migraine without aura and episodic tension headache were randomly assigned to one of three treatment conditions: home-based progressive muscular relaxation, therapist-contact progressive muscular relaxation, or waiting list control. Results indicated that there was no significant effect of treatment for any of the groups on objective measures of headache severity, frequency, and duration. Subjects also subjectively rated changes in their headaches, and it was found that there was no difference between any of the three groups on subjective ratings of changes in headache severity or duration. However, on subjective ratings of changes in headache frequency and a global rating of headache, the therapist-contact relaxation group rated themselves as significantly more improved than either of the remaining two groups. These findings were discussed in terms of treatment and cost effectiveness.

Introduction

"I've got a splitting headache!" This phrase has been heard and said countless times, by millions of people. Estimates for headaches range from it being the 14th (Teders et al., 1984) to the 3rd (Blanchard & Andrasik, 1982) most frequent problem reported by individuals seeking outpatient medical care. It has also been estimated that from 14% to 31% of males and 28% to 44% of females suffer from severe headaches (Leviton, 1978). Greater than 30 million people in the United States alone are believed to suffer from the agony of recurring head pain (Saper & Magee, 1981), and Andrasik, Holroyd, and Abell (1979) found that greater than 50% of a large college population admitted to headaches at least once or twice per week.

As Saper and Magee (1981) so emphatically state, The impact of frequent and severe headaches is as extraordinary as it is underestimated. Many headache victims suffer not only discomfort but also the frustrations and isolation that accompany recurring and incapacitating pain... .. Marital discord, depression, fear, isolation, drug abuse, a feeling of helplessness, and even suicide are only

a few of the consequences characterizing a headache-possessed existence. (p. 16)

It is a vast problem, crossing all socio-economic boundaries, and finding a sufficient and cost effective treatment for severe headaches is of grave concern.

The International Headache Society recognizes many classifications of Headache (Appendix A), but the present study will focus only on migraine without aura and episodic tension-type headache.

Migraine Headache

There have been many attempts to define the term migraine, but the most widely accepted is that of the Ad Hoc Committee on Classification of Headache (1962) which describes migraine as recurrent attacks of headache, widely varied in intensity, frequency, and duration. The attacks are commonly unilateral in onset, are usually associated with anorexia (loss of appetite) and, sometimes, with nausea and vomiting; in some are preceded by, or associated, with, conspicuous sensory, motor, and mood disturbances; and are often familial. (p.127)

As mentioned by Olesen and Edvinsson (1988), there does not exist a specific laboratory measurement for migraine and thus its diagnostic criteria must remain clinical.

The term "migraine" is of French origin, but was derived from a Greek term meaning an affliction of half of the head (hemicrania) (Saper & Magee, 1981). However, greater than 30% of migraines may be bilateral, or generalized (Olesen & Edvinsson, 1988).

The most distinguishing feature of migraine is its throbbing or pulsating pain in time with one's pulse. This feature is not however always present and can also occur in other types of headache. Therefore it alone can not be used to define or diagnose migraine. The essential distinguishing features of migraine are that it is episodic and that it terminates within a specified time (usually a few hours to a few days). Also, greater than 90% of migraines are associated with gastro-enterological problems: usually nausea, sometimes vomiting, occasionally diarrhoea but nearly always anorexia (loss of appetite). Heightened sensitivity to visual (photophobia), auditory (phonophobia) or olfactory (osmophobia) stimuli may also occur. In addition it has been estimated by Olesen and Edvinsson (1988) that a positive family history occurs in

70% of migraine cases. It is obvious that migraine is very difficult to define specifically, or diagnose. This difficulty has led the headache classification committee of the International Headache Society to develop a classification and diagnostic criteria for headache disorders (1988). This diagnostic criteria is presently the most widely accepted, and the portion of it which is pertinent to this study is included in Appendix B.

Due to the difficulty with defining and diagnosing migraine, estimates of its occurrence vary widely. Waters and O'Connor (1975) however, concluded that between 23% and 29% of women and 15% and 20% of men, in the general population suffer from migraine. Nearly all studies agree that the female to male ratio is between three to one and three to two, and that most patients present in the second or third decades of life with migraines starting after the age of 50 being very rare (Olesen & Edvinsson, 1988).

Olesen and Edvinsson (1988) describe a prototypic migraine as a headache that usually begins as a dull headache with a feeling of pressure and only later as it spreads over the cranium does it become throbbing, boring or burning in quality. The later characteristic may be absent, or evident when bending down or with more severe attacks. The

headache tends to start in the morning, on waking or soon after, and generally increases in intensity, taking an hour or two to reach its maximum severity, and then remaining at a plateau for several hours before slowly diminishing, or sometimes rapidly after vomiting, or after a sleep, particularly if deep. The headache is aggravated by movement and when severe the sufferer is obliged to lie down and, because of the photophobia, in a darkened room.

The pain may start at the back of the head and spread forward unilaterally to focus over one eye. More often it starts in one temple and spreads over that side, not infrequently to become generalized.

Unilateral headaches often start behind or around the eye and radiate to the fronto-temporal region. There may be residual sequelae, e.g., the headache returns if the head is shaken and the patient may feel generally 'washed out', tired or irritable with considerable malaise.

Olesen and Edvinsson (1988) remind us that nausea often comes on within an hour of onset of the headache and may proceed to vomiting, which often provides relief, to the extent that a sufferer may well self-induce vomiting by stimulating the back of the throat. Vomiting tends to be more likely in the more severe attacks.

The face is pale, the patient looks distressed and the temporal artery may be enlarged and the scalp tender. The hands and feet are cold during an attack. Thought, concentration and memory may be impaired and this is why the patient often complains of dizziness, meaning not true vertigo, but light-headedness.

The frequency of migraine attacks vary from one per year to several per week, with greater than 40% lasting longer than 24 hours (Olesen & Edvinsson, 1988). The most common story is that they begin in the second decade of life, and last two to three decades.

Migraines are classified into two main types, common and classic, which are now referred to as migraine without aura and migraine with aura, respectively. The two are distinguished by the presence of focal neurological features in the latter. This consists of a warning, called the aura, 10 to 60 minutes before the headache, which is usually visual, characteristically a homonymous, spreading, scintillating scotoma (fortification spectrum, techopsia), but may be sensory, either pins and needles (positive phenomena) or numbness (negative phenomena), in the hand and ipsilateral cheek, and sometimes in the tongue and circumorally. The least common aura is motor weakness except in the

rare familial hemiplegic migraine. This aura should be distinguished from premonitory symptoms, such as hunger or euphoria, which can begin as long as twenty four hours before the headache.

Recent research into the etiology of migraine headaches has focused on changes in regional cerebral blood flow (rCBF). Olesen et al. (1990) in a 10 year study, determined that the first observable event in a migraine headache was a decrease of rCBF posteriorly in one cerebral hemisphere. Aura symptoms occurred once the decrease had become more severe. While rCBF remained low, the headache began, and continued unchanged regardless of the fact that the rCBF changed to an abnormally high level. The researchers believe that their results suggest a simple model for migraine attacks: A pathological disturbance in one cerebral hemisphere causes the aura symptoms and after a time delay, it also causes the headache by stimulating local vascular nociceptors (pain receptors). They suggest that bilateral headache caused by a unilateral cerebral disturbance may be explained by very recent neuroanatomical and neurophysiological studies which indicated that there exists a certain bilaterality of innervation of the middle cerebral artery, the sagittal sinus, the anterior cerebral arteries and the posterior cerebral arteries (Arbab,

Delgado, Wiklund, & Svendgaard, 1988; Mayberg, Zervas, & Moskowitz, 1984; Ruskell, & Simons, 1987; Uddman, Edvinsson, & Hara, 1989).

Despite this model, previous studies have not found a significant difference in rCBF between non-migraine and migraine subjects (Andrasik, Blanchard, Arena, Saunders, & Barron, 1982).

Recently, Olesen and Edvinsson (1988) proposed a threshold model for the etiology of migraines which is now becoming highly accepted. Anderson (1992) simplified this model by stating that migraine headaches are a result of the brain and blood vessels responding to challenge. Theoretically, migraine sufferers are believed to be genetically placed at an extreme end of some type a physiological spectrum. At this end there exists a threshold which, when exceeded, will cause a migraine headache. Factors such as age, gender, menstrual cycle, pregnancy, drugs, chronic stress and psychological factors "prime" the threshold. The headache process can then be activated by many different variables such as diet, acute stress, trauma and glare.

As mentioned with respect to the threshold theory of migraine headaches, variables or "trigger factors" are not the cause of migraine,

but simply provoke an attack in a susceptible person. The factor itself does not produce the attack, and more than one factor may be required for an attack to occur. Their importance in the management of migraine headaches is therefore very evident.

Olesen and Edvinsson (1988) discussed five of these factors:

1. **Stress:** Mental or physical stress is by far the commonest precipitating factor. It is also not uncommon for attacks to occur when the stress is over, e.g. on holidays or weekends. In the latter case, it may be due to sleeping longer since the attacks may not occur if patients get up at their usual time (Wilkinson, 1986).
2. **Diet:** Up to 20% of migraine patients give a history of certain foods precipitating their attacks. There are many types of food reactions and many different foods involved. Fasting may also produce attacks. It is also well known that alcohol, particularly red wine, can act as a trigger factor.
3. **Climate:** Migraine sufferers often complain that weather may provoke an attack, however research findings on this

matter are inconsistent. Osterman, Lundberg, Lovstrand, and Muhr (1981), reported the results of three studies on the relationship of weather on migraine attacks, and they found no correlation with wind velocity, relative humidity, cloudiness, precipitation or amount of sunlight. There was, however, a correlation between headache frequency and the barometric pressure measured one to five days later, with a higher pressure and a higher temperature being associated with an increased headache frequency.

4. Hormonal: Migraine is more common in women, after puberty only, and therefore sex hormones are considered to play a role.

5. Drugs: Drugs that can produce migraine include oestrogen, indomethacin, calcium blockers and withdrawal from ergotamine or caffeine, as well as histamine, nitroglycerin, reserpine and dopaminergic agents. (pp. 6-7)

This threshold model is far from explaining the exact etiology of migraine headaches, but it does however allow for the inclusion of a multitude of biochemical and morphological findings in this field of study.

Tension Headache

The most widely accepted definition of tension headache is that proposed by the Ad Hoc Committee on Classification of Headache (1962). It describes tension headache as

an ache or sensation of tightness, pressure or constriction, widely varied in intensity, frequency and duration, sometimes long-lasting and commonly sub-occipital. It is associated with sustained contraction of skeletal muscles in the absence of permanent structural change, usually as part of the individual's reaction during life stress. (p.128)

As stated by Olesen and Edvinsson (1988), this definition is very unprecise and non-operational. In routine practice the diagnosis of tension headache is to some extent an exclusion diagnosis, i.e., very often headache patients without migraine characteristics and without any other recognizable cause for their headache are diagnosed as having tension headaches.

Nikiforow (1981) found tension headache to be the most prevalent form of headache. In the majority of patients the headache is so mild that they do not consult a physician, but rely on over the counter

medication for relief. It is believed to affect approximately 35% of the population. In a survey of the general population in Northern Finland, about one third suffered from tension headache and 5% to 10% of the population had it once a week or more often (Nikiforow, 1981; Nikiforow & Hokkanen, 1978). In a survey involving 1152 headache patients referred to a neurological clinic, 466 (41%) had tension headache compared to 612 (53%) who had migraine (Lance, Curran, & Anthony, 1965). This distribution may reflect the fact that tension headache patients less commonly seek care, than do migraine sufferers.

It has been found by Friedman, Von Storch, and Merritt (1964) that tension headache is somewhat more common in females than in males, but the difference is not as big as for migraine. It has also been found that tension headache is unaffected by geographical and cultural factors. The same is true for migraine headaches.

Blanchard and Andrasik (1982) describe the prototypic tension headache as having a slow onset and resolution and being experienced as a dull, but steady bilateral ache. This vague description helps to identify the problems in examining research on tension headaches prior to the International Headache Society's classification system. There was

no general agreement about etiology or pathophysiology at a scientific level, and no systematic attempt had been made to precisely define the clinical characteristics of tension headache. As mentioned by Olesen and Edvinsson (1988) we were in essence left with the experiences and non-quantitative descriptions of previous authors.

Such a lack of a precise definition has caused tremendous difficulties and has hampered the study of tension headaches. It may be the major cause for the lack of quality studies in the area (Olesen & Edvinsson, 1988). As earlier mentioned, the International Headache Society, headache classification committee (1988) has now developed a classification and diagnostic criteria for headache disorders. This very widely accepted system uses the classification and diagnosis 'tension-type headache' and subdivides into an episodic and a chronic form (Appendix A and B). Episodic tension headaches come in discrete episodes separated by headache-free intervals. In the majority of patients the episodes last less than 12 hours (Waters & O'Connor, 1971), but in more severe cases the headache may last for one or several days. In comparison, the majority of chronic tension headache sufferers complain of headache day and night for months or years

without interruption. In a smaller fraction, the continuous headache is occasionally interrupted by one or two headache-free days. With the presence of such a diagnostic system, it is possible that research on tension headaches will improve in quality and quantity. This diagnostic criteria will be used for the present study.

Most often a tension headache is bilateral, but can be unilateral (Olesen & Edvinsson, 1988). Generally headache location varies much more so in tension headaches than in migraine headaches. Olesen and Edvinsson (1988) mention that the pain is usually described as dull and aching, implying mild to moderate intensity. The character of pain is non-pulsatile, pressing and, in typical cases, often compared to wearing a tight hat, having a tight band around the head or wearing a heavy burden on the head. Patients often spontaneously mention a feeling of constriction in neck or chewing muscles, but others are completely unaware of such sensations. In most cases pain is the only symptom, but a minority of patients also complain of mild hyperirritability, and increased sensitivity to light or dizziness. Patients rarely feel sick, as they do in migraine attacks, and physical activity rarely increases the pain. Patients usually continue their work or other activities during

headaches.

The previous description of symptomatology holds true for both episodic and chronic tension headaches. However, some differences do exist. According to Olesen and Edvinsson (1988), more chronic tension headache patients suffer from holocrania rather than localized pain. Their pain is generally scored as more severe, and there are more associated symptoms such as photophobia, irritability, anorexia or nausea which, however, are still not as marked as in migraine. Also, according to Olesen and Edvinsson (1988) with chronic tension headache the tendency for overuse or abuse of drugs is great, and quite often the headache is aggravated by drugs.

The vast majority of chronic tension headache patients have had episodic tension headaches for years before it became chronic. Others have suffered from migraine which gradually became associated with more and more tension-type headache and finally transformed into a chronic tension-type headache without migraine characteristics (Mathew, Stubits, & Nigam, 1982).

Olesen and Langermark (1988) make an important analogy. They state that

in all other parts of the body pain serves as a warning signal indicating trauma, inflammation, tumour or other disease....It is tempting to suggest that tension headache serves to protect the head and its most important content: the brain....(However), in the vast majority of headaches there is nothing organically wrong. It therefore seems more likely that tension headaches serve the purpose of protecting us mentally. If we live under emotionally unsatisfactory conditions, act against our conscience, are under too much stress, feel depressed or anxious, a headache often helps us to realize it. The headache may thus cause an individual to change personal relationships or life style, and one often sees patients whose headache has improved following such action. (p. 457)

This statement truly appears to fit episodic tension headaches in their mild form, and it would probably be unproductive to society to eliminate these headaches. However, in their more severe forms and in the case of chronic tension headaches, one must regard them as an abnormality and they must be treated.

It still holds, however, that even the more severe tension headaches may be a result of a purely behavioral problem, a purely physical problem, or most often, a combination of both. Literature on tension headache identifies little correlation between levels of muscle tension and tension headache. With this in mind, there exists several models for the etiology of tension headaches. It is beyond our scope to examine all of these in depth. However, it should be mentioned that the most accepted models hold in common the idea that chewing and/or neck muscles or their cranial insertions respond to physical strain, psychosocial stress, an emotional confrontation, or a combination of these, by tightening. Prolonged maintenance of this involuntary tightening may produce nociception (pain reception), thus causing the tension headache.

Treatments

Pharmacological Treatment Approaches for Migraine Headaches

According to Saper and Magee (1981), migraine patients most often receive medicine in order to achieve the maximum possible relief from their headaches. The general categories of drugs used to treat headache include analgesics, mood-altering drugs, and specific agents

for migraine and other headaches. Some drugs are designed to be taken to stop the occasional headaches (these are called 'abortive medications'), while others are used daily to prevent the frequent headaches from beginning (hence, they are called 'preventative medications').

Saper and Magee (1981) outline the advantages and disadvantages of both methods. They state that the abortive approach holds the advantage that it requires the use of medications only when the attack occurs. The disadvantage of this approach, however, is that the drugs cannot be taken frequently. Furthermore, the pre-headache phase of the migraine with aura escapes control with the abortive approach. The preventive approach, on the other hand, is best for frequently occurring attacks. The advantage of this therapy is that when successfully employed, the migraine is prevented from developing. The disadvantage is that medication must be taken daily.

When attacks become very frequent, abortive medications are no longer safe due to the side effects. The preventative approach then becomes justifiable, as these medications can be taken daily without the same risks associated with daily use of abortive medications, although

these drugs do possess some potential hazards.

Pharmacological Treatment Approaches for Tension Headaches

Tension headaches are commonly treated with the abortive approach. Analgesics and tranquilizers give temporary relief, however, regular use often leads to an abuse of the medication.

Saper and Magee (1981) point out that the more severe chronic tension headaches are best treated by preventative measures, particularly with antidepressants. For such headache sufferers, abortive medications are often over-used and quickly abused.

Non-pharmacological Treatment Approaches

There have been two primary, non-pharmacological approaches to the treatment of headache: relaxation training and biofeedback training (Adams, Feuerstein, & Fowler, 1980; Blanchard, Ahles, & Shaw, 1979). According to Blanchard and Andrasik (1982), in the treatment of both tension and migraine headaches three basic types of relaxation training have been employed: abbreviated forms of Jacobson's (1939) progressive-relaxation training, passive relaxation and meditation, and autogenic training (Schultz & Luthe, 1969). Blanchard and Andrasik (1982) also state that biofeedback treatment of tension headache nearly

exclusively follows the procedures of Budzynski, Stoyva, Adler, and Mullaney (1970), wherein subjects are taught to reduce the tension levels of muscles in and around the forehead and neck.

Within biofeedback approaches for migraine headaches, Blanchard and Andrasik (1982) state that there have been three primary regimens described: (a) thermal biofeedback, in which the surface temperature of some site on the fingers or hand is monitored and the patient is asked to warm his or her hands with the assistance of biofeedback, (b) autogenic feedback training (Sargent, Green, & Walters, 1972) in which training in the use of autogenic phrases is combined with thermal biofeedback training, and (c) biofeedback training in which the vasomotor activity of the external temporal artery is monitored and the patient is asked to constrict this artery with the assistance of the feedback signal. More recently there has also been the use of frontal electromyographic (EMG) biofeedback for the treatment of migraine and tension headaches.

According to Barrios and Karoly (1983),

Biofeedback therapy has as its purpose teaching persons with psychosomatic disorders how to achieve greater

control over their physiological functions. This is based on previous research that shows providing persons with a machine which magnifies their physiological processes (heart rate, blood pressure, skin temperature) enables them to gain voluntary control over these processes and regulate them through their own efforts. This is accomplished by having patients sit down with one of these machines, usually attaching electrodes to their bodies to pick up the signals from their bodies, and then having the patients monitor a signal (a light, a tone, or a dial) that tells them how they are doing. With practise, most persons can learn how to regulate their bodies to some extent. (p. 62)

Effectiveness of biofeedback. Studies have differed with respect to conclusions as to the effectiveness of different types of biofeedback on migraine and tension headaches. Andrasik and Holroyd (1983) and Reading (1984) found no difference between EMG biofeedback and thermal biofeedback for tension or migraine headache sufferers on measures of electrophysiology. Also, Chapman (1986) found no difference between EMG biofeedback and thermal biofeedback for

tension or migraine headache sufferers on objective measures of headache intensity, duration, and frequency. One study reported that thermal biofeedback leads to better improvements in migraine headache patients on objective measures of headache frequency, although improvement was still found with the EMG biofeedback (Lacroix et al., 1983). A study by Sargent, Green, and Walters (1973), which used subjective ratings of headache severity, found thermal biofeedback useful for treating migraine but not for treating tension headaches. Finally, a study by Holmes and Burish (1983) examining changes in headache intensity and duration found neither thermal or temporal artery pulse biofeedback to be effective for treating migraines, but did find EMG biofeedback effective for treating tension headaches.

The exact effect which biofeedback may be having on headache sufferers has also been questioned. A study by Borgeat, Hade, Larouche, and Gauthier (1984) determined that the effect of EMG biofeedback was dependent on the therapist-patient interaction, and thus some of the effect being found may have been due to therapist variables. Another study by Holroyd et al. (1984) examined the effects of false EMG feedback on tension headache patients. They determined that the

effectiveness of the EMG biofeedback training may have been mediated by cognitive changes induced by performance feedback and not primarily by reductions in EMG activity. Thus, it may not be the decreased muscular activity, *per se*, which is causing the improvement, but rather a patient's 'feeling' of success in their treatment program.

Effectiveness of relaxation training. Barrios and Karoly (1983) have stated that

...relaxation training is based on the observation that persons who suffer from psychosomatic disorders usually show greater physiological arousal than normal in response to stress. The purpose of relaxation training then, is to teach people to lower their arousal levels when faced with stress by teaching them how to achieve deep muscular relaxation. This is accomplished by having the patient sit in a comfortable chair, close her (or his) eyes, and begin a series of exercises....The patient is then taught to do this (relax) whenever she (or he) encounters stress in everyday life. (p. 61)

In Pikoff's (1984) review of the literature, he concluded that the

majority of studies support the efficacy of autogenic relaxation training for the treatment of migraine headaches. This finding has been demonstrated even in the treatment of childhood migraine when examining changes in objective measures of headache intensity, duration, and frequency (Labbe & Williamson, 1984). However, on similar measures, progressive muscular relaxation has been found to be effective, not only with tension headache sufferers (Arena, Hightower, & Chong, 1988; Blanchard, Andrasik, Evans et al., 1985; Rangaswamy & Kalpana, 1988), but also with migraine patients (Blanchard, Andrasik, Evans et al., 1985; Williamson et al., 1984).

The debate as to which type of relaxation training is better for each type of headache, has been ongoing. Phillips and Hunter (1981) examined tension headache sufferers and found no difference between autogenic and progressive relaxation techniques. However, Janssen and Neutgens (1986) found progressive relaxation to be more successful than autogenic relaxation in treating tension headaches. Interestingly, they also found no difference between the two types of relaxation training for treating migraine headaches.

Biofeedback versus relaxation training. There has existed an ongoing debate as to which type of non-pharmacologic therapy is better, biofeedback or relaxation training, and for which type of headache. Eufemia and Wesolowski (1983) compared EMG biofeedback and relaxation training on a subject with tension headaches. They determined that there were no significant differences in terms of muscular activity or decreases in headache activity between the two treatment methods. Several other studies have attempted to compare the effects of biofeedback and relaxation training for sufferers of tension headaches. Janssen (1983) found that there were no differences, on headache measures, between biofeedback therapy and relaxation combined with biofeedback therapy. Lacroix, Clarke, Bock and Doxey (1986) found no differences on physiological or headache symptomatology measures, between biofeedback, relaxation, and a biofeedback with relaxation therapy. Similar results were also found by Gada (1984). In their review of the literature Holmes and Burish (1983) determined that biofeedback training was not more effective than relaxation training.

Lacroix et al. (1983) compared the two treatment approaches with

respect to changes in an objective measure of headache frequency for migraine patients. They did find that thermal biofeedback led to more improvements in headache than did relaxation training. However, Attfield and Peck (1979) had found no difference between the two methods examining subjective ratings of changes in headache intensity.

More recent studies examining this issue for both migraine and tension headache patients have continued the difference of opinions. Blanchard et al. (1988) found that on objective measures of headache intensity, frequency, and duration, biofeedback and/or relaxation training had similar effects for both migraine and tension headache sufferers, and that the improvements were similarly maintained, regardless of the treatment method. However, on similar measures, Hart (1984) concluded that relaxation training was significantly more effective than biofeedback training, regardless of whether the patient suffered from tension or migraine headaches.

Litt (1986) identified mediating factors in the non-medical treatment of migraine headaches. He determined that successful outcome in these non-pharmacological treatments was dependent on specific control of vascular activity, general reduction of autonomic

arousal, biochemical changes, cognitive, affective, and behavioral change, therapist contact and support, and credibility and placebo expectancy. It remains important to keep in mind these mediating factors for the success of non-pharmacological treatments, when such treatments are discussed.

Comparative Effectiveness of Pharmacological versus Non-Pharmacological Treatments

There is a large body of research comparing pharmacological with non-pharmacological treatment methods. Holroyd et al. (1988) compared the effectiveness of a home-based behavioral intervention (relaxation training and thermal-biofeedback) with an abortive pharmacological intervention (ergotamine tartrate) for treating recurrent migraine and mixed migraine and tension headaches. The two treatments were found to yield similar reductions in headache activity. Non-pharmacological treatments have also been shown to be effective for reducing headaches in geriatric patients (ages 60 to 77) (Kabela, Blanchard, Applebaum, & Nicholson, 1989). Holroyd and Penzien (1990), in their meta-analytic review of pharmacological versus non-pharmacological treatment of recurrent migraine, found that both propranolol and relaxation/biofeedback

have yielded a 43% reduction in migraine headache activity in the average patient. They suggest that there is no support for the contention that the two treatments differ in effectiveness.

Holroyd et al. (1989) presented the first prospective comparison of the long-term maintenance of reductions in recurrent migraine headaches achieved with (abortive) pharmacological and non-pharmacological (combined relaxation training and thermal biofeedback training) treatments. Their findings show that improvements achieved with non-pharmacological treatment are more likely to be maintained without additional treatment than are similar improvements achieved with abortive pharmacological treatment.

With the debate between the effectiveness of pharmacological and non-pharmacological treatments of headaches (both migraine and tension) currently progressing, it remains important to remember that with research showing non-pharmacological treatment as, or more effective than pharmacological treatment, one must turn to issues of cost effectiveness and the increasing abuse and dependence on medication that is occurring with drug therapy. With such issues in mind, one can not help but weigh more heavily on the non-pharmacological side.

Home-based versus Clinical-contact Non-pharmacological Treatment

With the increasing costs of health care many have begun to examine the effectiveness of home-based, non-pharmacological treatment approaches for headaches as opposed to clinical-contact, non-pharmacological treatments.

In terms of biofeedback, three studies have found no significant difference between the effectiveness of a home-based and a clinical-contact treatment program (Blanchard, Andrasik, Applebaum et al., 1985; Burke & Andrasik, 1989; Guarnieri & Blanchard, 1990). All three of these studies used headache diaries to produce objective measures of headache intensity, duration, and frequency, with which they measured the effectiveness of their programs. A fourth study (Williamson et al., 1984), using similar measures, found a home-based biofeedback treatment approach to be effective, but not as effective as a clinical-contact treatment approach. It should be noted, however, that the home-based treatment groups in these studies did receive some clinical-contact during their treatment. Amounts of clinical-contact during treatment for these studies ranged from 2.5 hours to 4 hours. With this amount of contact, it is difficult to determine if the effects seen in the home-based

treatment groups were due to the treatment, the clinical-contact, or a combination.

Four studies examining the difference between a clinical-contact and a home-based relaxation treatment program found no significant differences between the two groups (Attanasio, Andrasik & Blanchard, 1987; Blanchard, Andrasik, Appelbaum et al., 1985; Larsson, Daleflod, Hakansson & Melin, 1987; Teders et al., 1984). Effectiveness of the programs was based on objective measures of headache intensity, duration, and frequency, developed from headache diaries. Again, the home-based treatment groups received between 2 and 3 hours of clinical contact during their treatment. Thus, it is difficult to determine exactly what caused the improvements observed.

The combination of biofeedback and relaxation training has also been used to examine the home- versus clinic-based treatment issues. Jurish et al. (1983) contrasted the efficacy of a traditional clinic-based relaxation training and thermal biofeedback treatment to a comparable minimal-therapist-contact, largely home-based program. On objective measures of headache frequency, duration and intensity, developed from headache diaries, they found the home-based condition to be at least as

efficacious as the clinic-based treatment. However, it again should be noted that this study involved a 'largely' home-based condition, i.e. an average of 2.59 hours of therapist contact was still present.

Summary

Vast research has demonstrated the importance and efficacy of non-pharmacological treatments for migraine and tension headaches. However, the exact method with which these treatments work has only begun to be examined.

Relaxation training has been found to be as good or better than biofeedback training for both tension and migraine headaches (Attfield & Peck, 1979; Chapman, 1986; Hart, 1984; Holmes & Burish, 1983; Lacroix et al., 1986). It has also been found that the effects seen with biofeedback, may not be due to the biofeedback per se but rather to therapist variables such as absence or presence, and competence (Anderson & Voros, 1992; Borgeat et al., 1984; Borgeat, Hade, Larouche & Bedwani, 1980; Holroyd et al., 1984).

With such a fact in mind, studies have examined the effects of clinical contact on non-pharmacological treatments for tension and migraine headaches (Attanasio et al., 1987; Blanchard, Andrasik,

Appelbaum et al., 1985; Burke & Andrasik, 1989; Jurish et al., 1983; Larsson et al., 1987; Radnitz, Appelbaum, Blanchard, Elliott, & Andrasik, 1988; Teders et al., 1984). Several of these studies have raised the issue of cost-effective treatment for migraine and tension headaches. They have found programs which consist of a minimum amount of contact with a therapist (minimal-contact programs), to be as effective as programs in which there is a significant amount of therapist contact (clinic- or therapist-contact programs). Hence, they conclude that we should be looking towards moving non-pharmacological headache treatments out of the clinic and into the home. This would appear to provide a partial solution for the ever-growing costs of mental health care.

Aims of the Present Study

The purpose of the present study is to compare the effectiveness, in terms of both objective and subjective headache measures, of therapist-contact versus home-based progressive muscular relaxation (PMR) training for mixed migraine and tension headache sufferers. To date, previous studies investigating this issue have a methodological drawback in that they failed to keep home-based treatment groups

completely home-based. In all studies reviewed, the home-based subjects experienced some degree of clinical contact during their treatment. With such a flaw, it is difficult to determine exactly how effective a home-based treatment for headaches can be, and exactly what role clinical contact is playing in affecting a person's headaches or the subjective ratings of their headaches. The methodology of the present study is designed to overcome these methodological limitations by having the home-based subjects receive no clinical contact during treatment. In addition, some previous studies have used objective measures of changes in headache, while others have used subjective ratings to determine the effectiveness of their programs, thus making them difficult to compare. In the present study the effectiveness of the programs will be compared in terms of both objective measures of headache and subjective ratings of headache change. This will allow for a comparison of how therapist contact may actually be affecting a person's headaches, with how it may be affecting their perceptions of their headaches.

The decision to use PMR as the treatment modality is based on the evidence that PMR works for both migraine and tension headaches.

As previously mentioned, Janssen and Neutgens (1986) demonstrated that PMR works better than autogenic relaxation for tension headaches, and that both relaxation techniques are equally effective for migraine headaches.

General Expectations

It is hypothesized that therapist contact will not affect the objective headache measures. Thus, the therapist-contact relaxation treatment group and the home-based relaxation treatment group are expected to show similar improvement on objective measures of headache, both improving more than the waiting list control group. It is also hypothesized that therapist contact will affect the subjective ratings of changes in headache. Thus, the therapist-contact relaxation treatment group is expected to rate themselves as more improved on the subjective measures of headache than both the home-based treatment group and the waiting list control group.

Method

Subjects

Subjects for the present study were recruited through advertising in the general community and from the Introductory Psychology subject

pool at Lakehead University. All subjects that were used in the study were required to meet the criteria for migraine without aura and episodic tension headache according to the criteria of the International Headache Society (1988) (see Appendix B). Only those subjects who reported suffering at least two headache days per month, for a period of at least two years were included. Also, any subjects who were using preventative medications for their headaches were not included. Subjects were randomly divided into three treatment groups, a therapist-contact relaxation treatment group, a home-based relaxation treatment group, and a waiting list control group, controlling for gender.

Materials

Objective Measures

Subjects were asked to keep records according to a procedure originated by Blanchard, Theobald, Williamson, Silver and Brown (1978), which was later validated (Blanchard, Andrasik, Neff, Jurish & O'Keefe, 1981). The following information was recorded throughout the study:

- (1) HEADACHE SEVERITY - subjects rated their headache pain four times daily: in the morning, at lunch, dinner, and before bedtime. Pain severity ratings were based on a scale of 0 - 5, where each

possible rating was specifically defined as to the severity of headache pain (see Appendix C). A score of 0 was assigned if the subject was headache-free during the time period, and a score of 5 indicated a very severe and incapacitating headache. The total amount of all of the subject's headache severity pain ratings for each week (with 4 ratings per day ranging from 0 to 5, the maximum measure for headache severity for one week would be 140) were used as objective measures for the dependent variable of headache severity.

- (2) HEADACHE FREQUENCY - the number of non-zero headache severity pain ratings for each week, from the above information, was used as objective measures for the dependent variable of headache frequency.
- (3) HEADACHE DURATION - subjects recorded the duration of each headache they experienced in number of hours (see Appendix C). The total number of headache hours recorded for each week was used as objective measures for the dependent variable of headache duration.
- (4) MEDICATION USAGE - subjects recorded their medication intake

four times daily: medication from midnight until breakfast, breakfast to lunch, lunch to dinner, and dinner until bedtime (see Appendix C). Medication use was calculated using an Analgesic Index (AI), developed at the Bio-Behavioral Treatment and Research Unit, Sunnybrook Health Science Centre, Toronto (see Appendix D). To calculate an AI value, subjects multiplied the number of tablets taken by a potency rating associated with that medication (see Appendix D). The total of all of the analgesic index ratings for each week was used as an objective measure for the dependent variable of medication usage. This measure of medication usage was used to determine if the differences observed between groups may have been due to a difference in the amount of analgesic medication used.

- (5) RELAXATION PRACTICE/STRESS RATINGS - subjects in both treatment groups were given a twenty-minute progressive muscular relaxation tape. Those in the home-based relaxation group were asked to listen to the tape a minimum of five times per week. Subjects in the therapist-contact group were asked to listen to the tape a minimum of three times per week, as they spent two,

20 minute sessions per week with the therapist reading them the same script that is on the tape. Subjects were also asked to record their stress levels before and after listening to the tape, or doing a session with the therapist, on a scale of 0 - 10 (very relaxed to extremely stressed) (Appendix E). These stress level ratings formed three dependent variables, 1) the total number of relaxations performed over the 4 treatment weeks (this allowed for determining if the differences between the groups was a function of the amount of relaxation), 2) an average of all of the subjects' pre-relaxation stress ratings, and 3) an average of all of the subjects' post-relaxation stress ratings (these two measures allowed for determining if the differences between the groups was a function of the subjects' stress levels before or after relaxation practice).

Subjective Measures

Subjects were administered a brief questionnaire at the end of the treatment phase of the study. This questionnaire included 4 measures for which the subjects were asked to subjectively rate their perceptions of any qualitative changes in their headaches over the 6 weeks of the study

(see Appendix F). The questions required rating headache severity, frequency, duration and a global rating using a visual analogue scale (ie. subject must rate their level along a continuum. Scores ranged from 0.0 mm - "much worse" to 64.0 mm - "about the same" to 128.0 mm - "much improved"). These scores were used for the following four dependent variables: 1) subjective headache severity, 2) subjective headache frequency, 3) subjective headache duration, and 4) subjective headache global rating. This questionnaire allowed for comparing between groups the subject's perceptions of the changes in their headaches.

Procedure

Baseline Phase

At an introductory meeting, subjects were given verbal and written instructions for recording two weeks of baseline information. This information included Headache Severity, Headache Duration, and Medication Usage.

Treatment Phase

All subjects were required to continue keeping records of Headache Severity, Headache Duration, and Medication Usage for the four weeks of the treatment phase. At a second meeting, following the

baseline recording period, subjects in both treatment groups were given a progressive muscular relaxation tape and instructions for practise and record-keeping (Appendix G).

Home-based relaxation treatment group. The components of the home-based treatment group included home relaxation tape practice and record-keeping. All subjects in the home treatment group had no contact with the therapist during the treatment phase.

Therapist-contact relaxation treatment group. In addition to the home-based relaxation tape practice and record-keeping, the subjects in the therapist-contact treatment group were required to attended two relaxation sessions per week, over the four week treatment phase. During these sessions a therapist read the same script that is on the relaxation tape, to the subjects. The subjects were encouraged to relax themselves as much as possible, and their performance was discussed after each session.

Waiting list control group. The control group engaged only in record keeping through-out the entire treatment phase. All subjects in this group had no contact with the therapist during the treatment phase. After the 6 week study was complete, subjects in this group were given

a copy of the relaxation tape and instructed in its practise and possible benefits.

Post-Treatment

Three days following the four treatment weeks, all subjects completed the brief questionnaire of subjective ratings of qualitative changes in headache. All records were collected from the subjects.

Ethical Considerations

At all stages of the research subjects were informed of the nature of the research and any risks/benefits they may have incurred from participating in it (see Appendix H). Participants in the present research project were voluntary at the onset and throughout the study. They were made aware of this fact (see Appendix H).

Data Analysis

Data analyses were conducted to determine if there were any differences between the three groups on both the objective and subjective measures.

Analysis of variance was used to determine if there were any differences between the two groups on the three relaxation measures of 1) total number of relaxations, 2) average pre-relaxation stress rating,

and 3) average post-relaxation stress rating. Repeated measures analysis of variance was also performed to determine if there were any significant differences between the pre-relaxation and the post-relaxation stress ratings. This was in order to determine the efficacy of relaxation practice as a function of treatment group.

As earlier mentioned, for each of the six weeks of the study, four objective measures were obtained from the record keeping of each of the subjects. 1) a measure of headache severity - this was the total amount of all of the subject's pain ratings for each week (with 4 ratings per day ranging from 0 to 5, the maximum measure for headache intensity for one week would be 140), 2) a measure of headache frequency - this was the number of non-zero pain rating entries for each week (with 4 pain ratings per day the maximum measure for headache frequency for one week would be 28), 3) a measure of headache duration - this was the total number of headache hours recorded for each week, and 4) a measure of medication use - this was the total of all of the analgesic index ratings for each week. Repeated measures analysis of variance was used to determine if there were any differences between the 3 groups over the 6 weeks of the study on each of the four objective

measures.

The four subjective dependent variables from the post-treatment questionnaire of headache severity, frequency, duration and global rating were analyzed using analysis of variance to determine if any significant differences occurred between the treatment groups.

Results

Table 1 shows the mean ages for the therapist contact relaxation, the home-based relaxation, and the waiting list control groups (see Table 1). Analysis of variance revealed that these ages did not differ significantly. A similar analysis indicated that the ratio of females to males also did not differ significantly between the 3 groups.

Analysis of variance of the total number of relaxations performed, the pre-relaxation stress ratings, the post-relaxation stress ratings, and the analgesic index (medication use) (see Table 2), between the two groups yielded no significant main effects.

Repeated measures analysis of variance of change in stress level from pre- to post-relaxation (see Table 2) yielded a significant difference between the pre- and post-relaxation stress ratings, $F(1,14) = 75.46$, $p < 0.001$. Stress ratings significantly decreased from pre- to post-relaxation.

There was no significant difference between the two treatment groups.

Neither the assumption of homogeneity of dispersion matrices or the assumption of sphericity were violated in the repeated measures analysis of variance of the objective measures of headache severity ($F(1,14) = 0.42, p = \text{n.s.}$) and headache frequency ($F(1,14) = 0.39, p = \text{n.s.}$). No significant effects were found between the three groups over time (see Table 3).

In the repeated measures analysis of variance for the objective measure of headache duration (see Table 3) between groups over time (the six study weeks) both the assumption of homogeneity of dispersion matrices and the assumption of sphericity were violated ($F(42,1397) = 1.66, p < 0.01$ and $F(1,14) = 0.09, p < 0.001$, respectively). By using a Greenhouse-Geisser correction a significant main effect of time was found, $F(5,110) = 2.72, p < 0.05$. The effect of time was analyzed and a significant quadratic relationship was found between the objective measure of headache duration and time, $F(1,21) = 11.23, p < 0.01$ (see Figure 1). Post-hoc analysis revealed that mean headache durations, collapsed over treatment groups, significantly decreased between the first and the third week of the study ($t(26) = 2.54, p < 0.05$) and then

significantly increased again by the end of study ($t(25) = 2.11, p < 0.05$) (see Figure 2). There was also no significant difference in the mean headache durations, collapsed over treatment groups, between the first and the last week of the study ($t(25) = 0.29, p = n.s.$). No other significant effects were found.

The analysis of variance of the subjective ratings of headache severity (see Table 4) and headache duration (see Table 4) between groups yielded no significant effects (Figure 3) ($F(2,27) = 1.48, p = n.s.$, and $F(2,27) = 2.95, p = n.s.$, respectively). However, analysis of variance of the subjective rating of headache frequency (see Table 4) between groups yielded a significant difference between groups, $F(2,27) = 5.50, p < 0.01$. Post-hoc Newman-Keuls comparisons revealed that the therapist contact relaxation group rated themselves as significantly more improved than the waiting list control group, and from the home-based relaxation group (Figure 4).

The analysis of variance of the subjective global rating of headache (see Table 4) between groups yielded a significant difference between groups, $F = 6.36, p < 0.01$. Post-hoc Newman Keuls comparisons revealed that the therapist contact relaxation group

significantly differed from the home-based relaxation group and from the waiting list control group (Figure 4). The therapist contact group rated themselves as significantly more improved than either of the remaining groups.

Discussion

In the present study, some differences (as will later be discussed) were observed between the treatment groups on objective and subjective measures. However, these differences can not be attributed to the progressive muscular relaxation training that the groups received.

Although analysis did indicate that the progressive muscular relaxation was working, i.e. collapsed over the two treatment groups, stress levels after a relaxation session were significantly decreased from stress levels before relaxation, the home-based relaxation group, and the therapist-contact relaxation group did not differ significantly on the number of relaxation sessions they underwent, nor on the pre- or post-relaxation stress ratings. Thus, it is not possible to attribute the difference between these two treatment groups to the progressive muscular relaxation.

Although none of the subjects in the present study were using preventative medications, they were recording their use of abortive

analgesics. Determining an Analgesic Index for each subject's medication use allowed for comparison between groups, even though subjects were taking different medications. Analysis revealed that the home-based relaxation group, the therapist-contact relaxation group, and the waiting list control group did not differ on their use of abortive analgesic medications. It is therefore not possible to attribute any differences observed between the three groups to medication usage.

The analysis of the objective headache measures yielded interesting findings. No differences were found between the three groups in terms of headache severity or frequency. Furthermore, no difference was found on these measures over time. Thus, although as earlier mentioned, the relaxation training did significantly decrease stress levels, this had no effect on any of the subjects' headaches in terms of severity or frequency. However, as shown in Figure 1, headache duration did have a significant effect of time, i.e. the length that subjects' headaches lasted did significantly change over the course of treatment by decreasing in the middle of treatment and then increasing again near the end (see Figure 2). This change, however, did not differ between any of the three groups. It was even experienced by the waiting list

control group. Thus, one can not attribute this change to the relaxation therapy. It may be attributed to some extraneous variable that was not measured. One may hypothesize that life stress was part of this extraneous variable, or, it may be more likely that the effect is a false positive. This false positive may be attributable to an initial improved sense of self control that is derived by subjects when they engage in record keeping behaviour for their headaches. The improved sense of control may contribute to a general reduction in anxiety and perhaps an associated decrease in headache activity (Thomas, 1993).

In terms of the subjective ratings of changes in headache given by the subjects, there were also some interesting findings. Headache severity and duration, as shown in Figure 3, were ranked similarly improved, though not very strongly improved, by all three groups (see Figure 3). As shown in Figure 4, subjective rating of headache frequency however, did differ between the three groups. The therapist-contact relaxation group ranked themselves as significantly more improved than either the home-based relaxation group or the waiting list control group, who ranked themselves as only slightly improved (see Figure 4). A similar result was present with respect to the subjective

global headache rating. Again, as shown in Figure 4, the therapist-contact relaxation group ranked themselves as significantly more improved than either the home-based relaxation group, who ranked their headaches as slightly worse, or the waiting list control group, who ranked their headaches as slightly improved (see Figure 4). The only difference between these groups was whether there was contact with the therapist during treatment. Therefore, one may attribute this observed effect to that contact. Subjects in the therapist-contact group seemed to have subjectively perceived that their headaches became less frequent and had generally improved. Such a strong improvement was not observed with the other groups and thus we attribute this difference in perception to the therapist contact.

It is interesting to note that the only real change in headache found on the objective measures was in headache duration, which decreased in the middle of the study and then increased near the end (see Figure 2). This pattern was found for all three groups. However, only the group which experienced contact with the therapist during treatment perceived themselves as having improved significantly.

Janssen and Neutgens (1986) demonstrated the efficacy of

progressive muscular relaxation for migraine and tension headaches. However, the findings of the present study do not allow us to confirm this since the only objective difference observed, that of changes in headache duration, was also observed for the waiting list control group. Thus, similar changes in headache were found without any relaxation training. Also, no clear conclusions as to the effectiveness of progressive muscular relaxation as a home-based treatment approach may be drawn.

What can be concluded from the findings of the present study is that there is a clear difference between what objectively changes with respect to a person's headaches, and what a person subjectively perceives has changed. Also, this subjective perception appears to be strongly affected by contact with a therapist.

With such differences between objective changes in headaches and the subjective perception of these changes existing, it is important to realize that one must be cautious when comparing studies. It may not be possible to effectively compare studies which used objective measures of changes in headaches with studies that used subjective ratings of changes in headaches. Furthermore, with such differences,

one must question the efficacy of subjective ratings of headache changes.

The present study demonstrates the importance of clinical or therapist contact on a headache sufferer's perceptions. Although, largely home-based treatment programs have been shown to be a cost effective treatment for headaches, the present study helps to demonstrate that the effectiveness of largely home-based treatment programs in previous studies may have been a result of the limited clinical contact that these subjects received. Further research in this area should examine the comparison between subjective and objective measures and determine the effect that changing a person's subjective perceptions of headaches, actually has on their headaches.

An alternative explanation is not that perceptions were changed, but rather that demand characteristics were operating. In the present study, since the subjective dependent measures are global ratings done at the end of the study, it is probable that the subjects who had contact with the therapist would not want to disappoint the therapist. Consequently, they may have rated themselves as somewhat more improved than they really were. The home based and the waiting list

control groups did not have this therapist contact and so presumably would not have demonstrated this demand characteristic.

Future research may wish to compare a more interactive therapist/client treatment with a less interactive therapist/client treatment with a no therapist home based program. This may help to further identify the affect of the presence of a therapist. It may also be helpful to use a more homogeneous headache group, for example, subjects suffering only migraine without aura.

It is also important to note that although some measures on the present study have been referred to as objective measures of headache, as they are in much of the literature, truly they are objectified subjective measures since subjects were determining their own levels. In the absence of true physiological data, it is not possible to know whether the subjects were actually experiencing a reduction of stress at the physiological level, they could be maintaining the same degree of arousal or perhaps even higher levels of arousal. This is also an important consideration for future research. It may be very beneficial to include a physiological measure like hand skin temperature recordings, to compare with measures similar to those used in the present study.

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Table 1

Group Sex Ratios and Mean Ages

Group	Sex	n	Mean Age
Therapist-contact	Male	2	37.0
	Female	8	33.1
Home-based	Male	2	39.0
	Female	8	31.5
Waiting List Control	Male	1	52.0
	Female	9	29.6

Table 2
Means for Dependent Variables

	Treatment Group					
	Home-based		Therapist Contact		Collapsed	
	Mean	s.d.	Mean	s.d.	Mean	s.d.
# of relaxations	13.60	8.56	17.50	5.84	15.55	7.40
Pre-relaxation	4.27	2.04	4.72	1.36	4.52	1.64
Post-relaxation	2.20	1.64	2.30	1.39	2.26	1.46
Medication Use	52.60	54.73	59.60	53.22	56.10	53.98

Note. N = 20. The # of relaxations is the total number of relaxation sessions completed during the four treatment weeks. Pre-relaxation is the average stress rating score on a scale of 0 to 10 before a relaxation session. Post-relaxation is the average stress rating score on a scale of 0 to 10 after a relaxation session. Medication Use is the total Analgesic Index for all six weeks of the study.

Table 3

Means for Objective Headache Measures

	Treatment Groups							
	Home-Based		Therapist Contact		Waiting List Control		Collapsed Over Group	
	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
S.	20.77	17.00	16.42	11.44	18.38	15.22	18.52	14.33
D.	20.30	18.41	15.28	15.41	17.43	15.45	17.66	15.87
F.	8.72	5.98	6.73	4.50	8.92	7.93	8.12	6.16

Note. N = 30. "S." is the objective headache severity measure. "D." is the objective headache duration measure. "F." is the objective headache frequency measure.

Table 4

Means for Subjective Headache Ratings

Treatment Groups								
Home-Based		Therapist Contact		Waiting List Control		Collapsed Over Group		
Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.	
S.	70.55	21.67	81.15	27.19	65.40	9.88	72.37	21.21
D.	71.55	31.84	90.65	29.50	64.15	4.27	75.45	26.82
F.	68.85	9.41	101.05	30.20	64.65	9.41	78.18	30.75
G.	62.78	29.04	98.50	27.64	65.95	14.92	76.19	28.83

Note. N = 30. "S." is the headache severity rating scale. "D." is the headache duration rating scale. "F." is the headache frequency rating scale. "G." is the global headache rating. All headache ratings are based on a continuum scale ranging from 0.00 mm - "much worse", to 128.00 mm - "much improved", with 64.00 mm - "about the same".

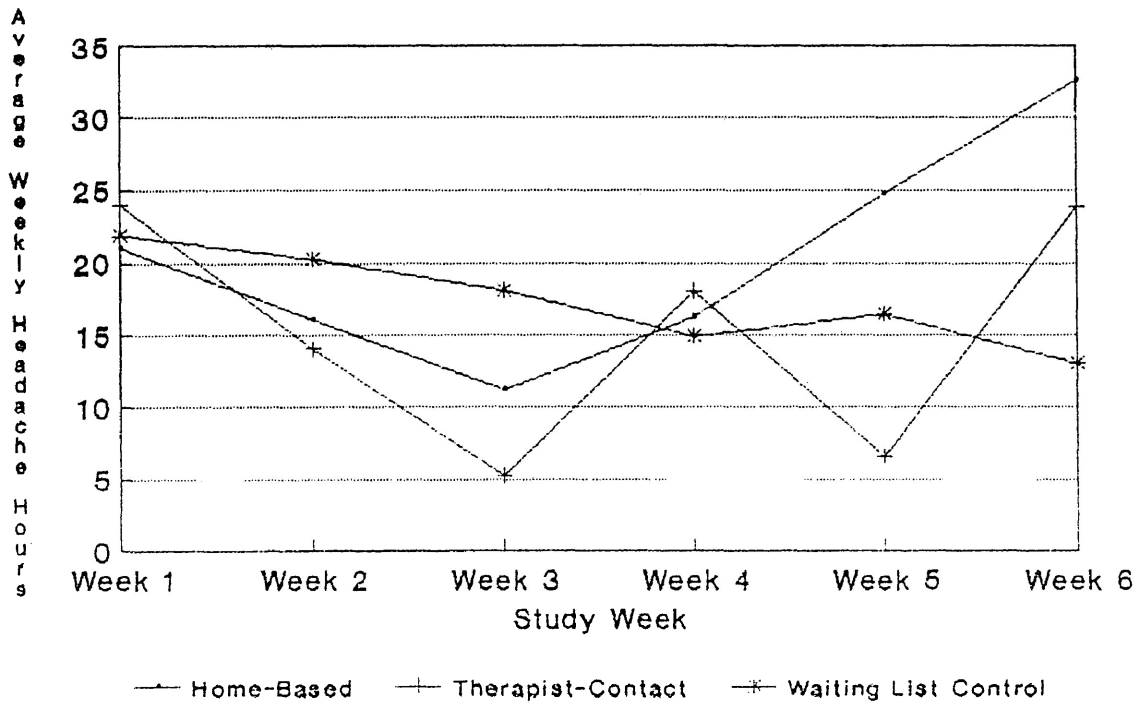


Figure 1. Headache duration changes over the six study weeks.

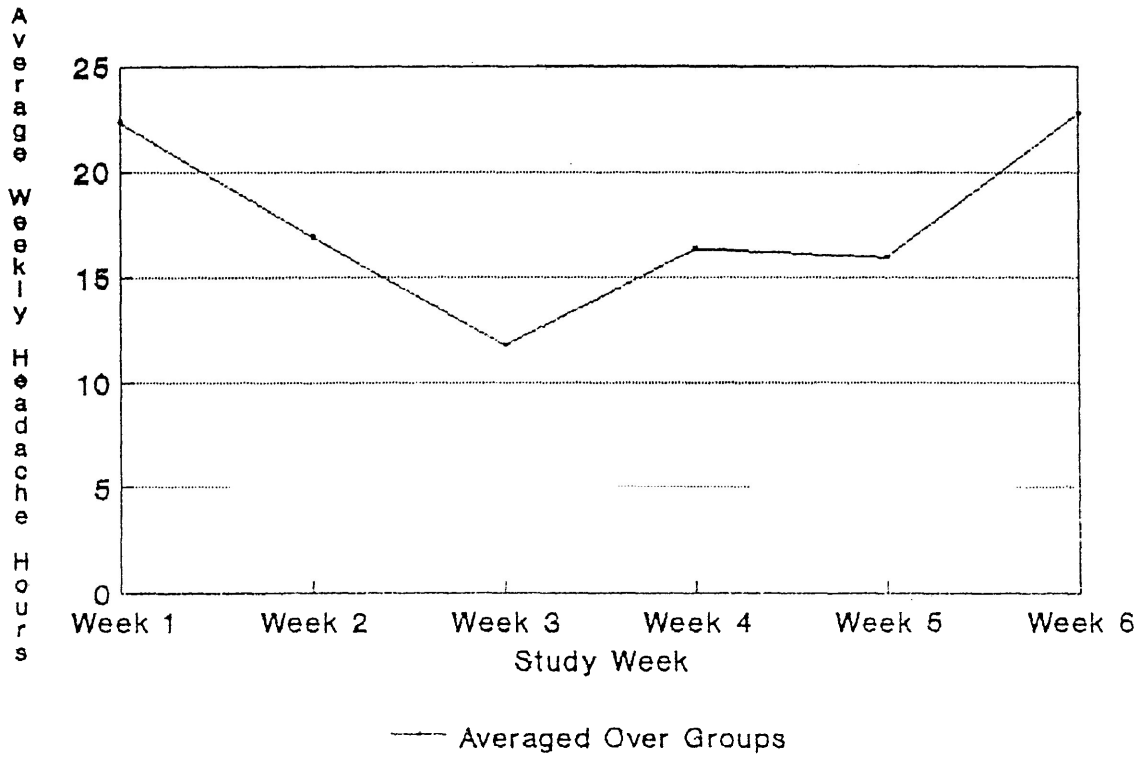


Figure 2. Headache duration changes over the six study weeks, collapsed over the three groups.

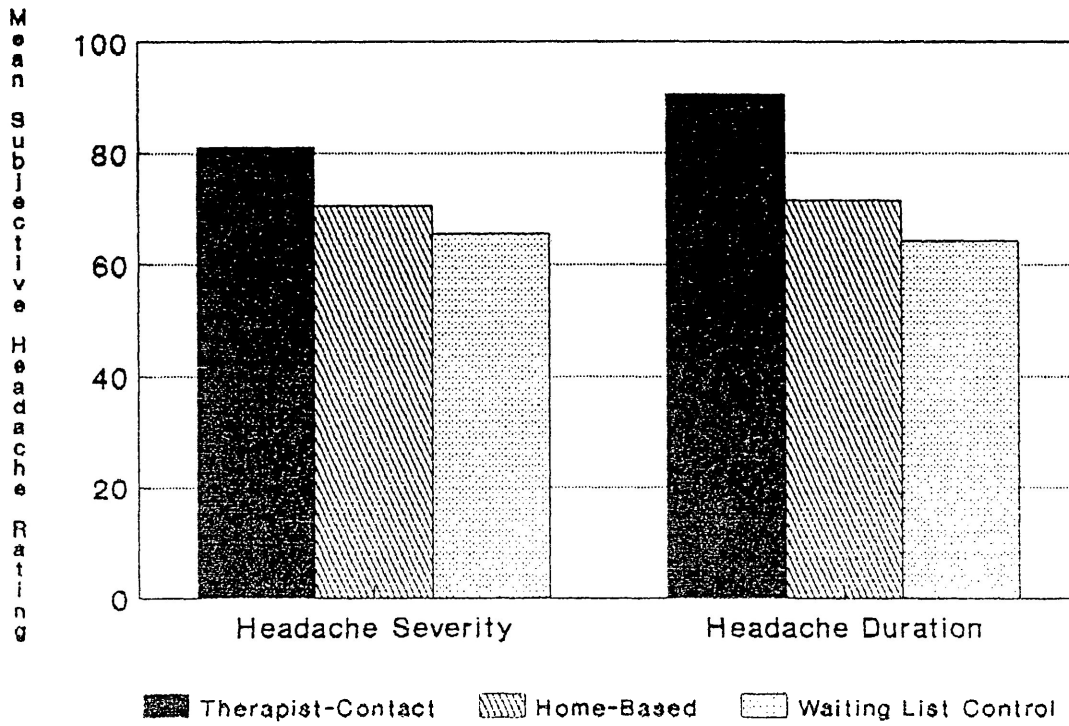


Figure 3. Mean subjective headache severity and duration ratings. Ratings ranged from 0.00 mm - "much worse", to 128.00 mm - "much improved", with 64.00 mm - "about the same".

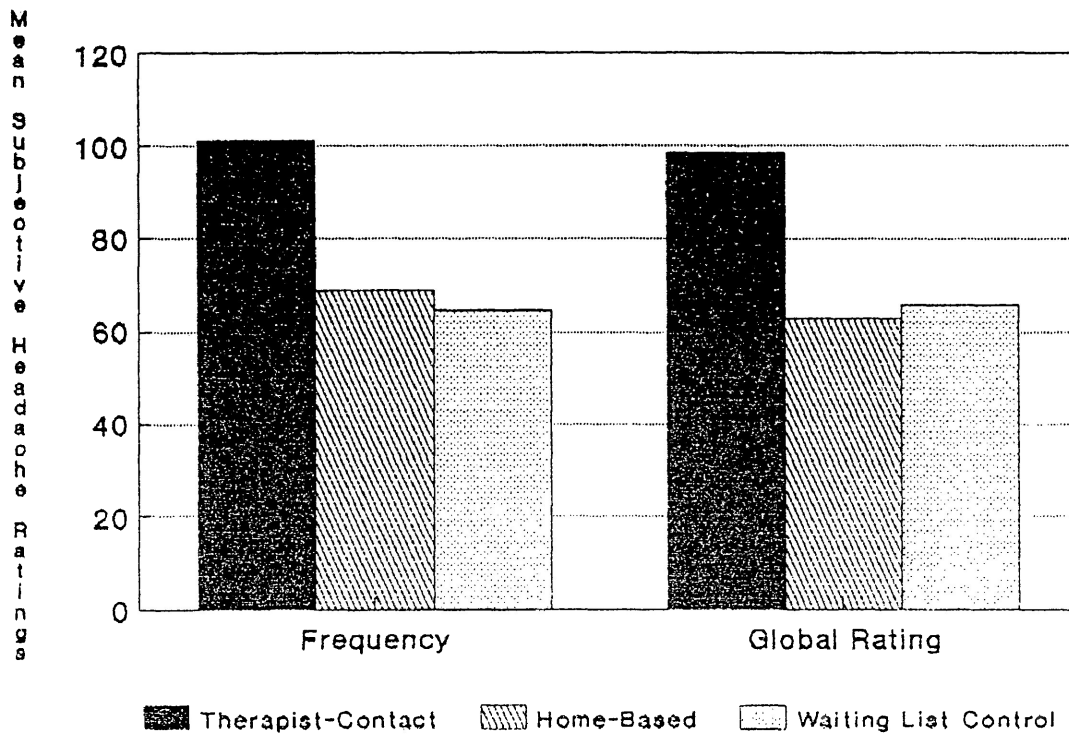


Figure 4. Mean subjective headache frequency and global ratings. Ratings ranged from 0.00 mm - "much worse", to 128.00 mm - "much improved", with 64.00 mm - "about the same".

APPENDIX A
International Headache Society
Classification of Headaches

1. MIGRAINE:

- 1.1 Migraine without aura
- 1.2 Migraine with aura
 - 1.2.1 Migraine with typical aura
 - 1.2.2 Migraine with prolonged aura
 - 1.2.3 Familial hemiplegic migraine
 - 1.2.4 Basilar migraine
 - 1.2.5 Migraine aura without headache
 - 1.2.6 Migraine with acute onset aura
- 1.3 Ophthalmoplegic migraine
- 1.4 Retinal migraine
- 1.5 Childhood periodic syndromes that may be precursors to or associated with migraine
 - 1.5.1 Benign paroxysmal vertigo of childhood
(Basser's syndrome)
 - 1.5.2 Alternating hemiplegia of childhood
- 1.6 Complications to migraine
 - 1.6.1 Status migrainosus
 - 1.6.1.1 No drug overuse
 - 1.6.1.2 Drug overuse for migraine
 - 1.6.2 Migrainous infarction

1.7 Unclassifiable migraine-like disorder

2. TENSION-TYPE HEADACHE:

2.1 Episodic tension-type headache

2.1.1 Episodic tension-type headache associated with
disorder of pericranial muscles

2.1.2 Episodic tension-type headache unassociated
with disorder of pericranial muscles

2.2 Chronic tension-type headache

2.2.1 Chronic tension-type headache associated with
disorder of pericranial muscles

2.2.2 Chronic tension-type headache unassociated with
disorder of pericranial muscles

2.3 Tension-type-like headache not fulfilling above criteria

APPENDIX B

International Headache Society

Diagnostic Criteria

1. MIGRAINE:

1.1 Migraine without aura:

- A. At least 5 attacks fulfilling B-D.
- B. Headache attacks lasting 4-72 hours (untreated or unsuccessfully treated).
- C. Headache has at least two of the following characteristics:
 - 1. Unilateral location
 - 2. Pulsating quality
 - 3. Moderate or severe intensity (inhibits or prohibits daily activities)
 - 4. Aggravation by walking stairs or similar routine physical activity
- D. During headache at least one of the following:
 - 1. Nausea and/or vomiting
 - 2. Photophobia and phonophobia
- E. At least one of the following:
 - 1. History, physical- and neurological examinations do not suggest one of the disorders listed in groups 5.1.1
 - 2. History and/or physical- and/or neurological

examinations do suggest such disorder, but
it is ruled out by appropriate investigations

3. Such disorder is present, but migraine attacks
do not occur for the first time in close
temporal relation to the disorder

2. TENSION-TYPE HEADACHE:

2.1 Episodic tension-type headache:

- A. At least 10 previous headache episodes fulfilling
criteria B-D listed below. Number of days with
such headache < 180/year (<15/month).
- B. Headache lasting from 30 minutes to 7 days
- C. At least 2 of the following pain characteristics:
 1. Pressing/tightening (non-pulsating) quality
 2. Mild or moderate intensity (may inhibit, but
does not prohibit activities)
 3. Bilateral location
 4. No aggravation by walking stairs or similar
routine physical activity
- D. Both of the following:
 1. No nausea or vomiting (anorexia may occur)
 2. Photophobia and phonophobia are absent, or

one but not the other is present

E. At least one of the following:

1. History, physical- and neurological

examinations do not suggest one of the disorders listed in groups 5.1.1

2. History and/or physical- and/or neurological

examinations do suggest such disorder; but it is ruled out by appropriate investigations

3. Such disorder is present, but migraine attacks

do not occur for the first time in close temporal relation to the disorder

5. HEADACHE ASSOCIATED WITH HEAD TRAUMA

5.1 Acute post-traumatic headache

5.1.1 With significant head trauma and/or confirmatory signs

A. Significance of head trauma documented by at least

one of the following:

1. Loss of consciousness

2. Post traumatic amnesia lasting more than 10 minutes

3. At least two of the following exhibit relevant abnormality: clinical neurological

examination, X-ray of skull, neuroimaging,
evoked potentials, spinal fluid examination,
vestibular function test,
neuropsychological testing

- B. Headache occurs less than 14 days after regaining
consciousness (or after trauma, if there has been
no loss of consciousness).
- C. Headache disappears within 8 weeks after regaining
consciousness (or after trauma, if there has been
no loss of consciousness).

APPENDIX C

Headache and Medication Diary

HEADACHE AND MEDICATION DIARY

DATE	PAIN RATING (0-5)				LENGTH (HRS)	MEDICATION INTAKE			
	AM	1200	1800	PM		AM	1200	1800	PM

PAIN RATING SCALE (0-5)

- 0 = NO HEADACHE
- 1 = VERY MILD HEADACHE, AWARE OF IT ONLY WHEN ATTENDING TO IT
- 2 = MILD HEADACHE, COULD BE IGNORED AT TIMES
- 3 = MODERATE HEADACHE, PAIN IS NOTICEABLY PRESENT
- 4 = SEVERE HEADACHE, DIFFICULT TO CONCENTRATE, CAN DO UNDEMANDING TASKS
- 5 = EXTREMELY INTENSE HEADACHE, INCAPACITATED

APPENDIX D
Analgesic Index

ANALGESIC INDEX (AI)

<u>RATING</u>	<u>DRUG</u>
1	ASA, Bufferin, Tylenol, 217, Darvon
2	Empirin compound, 222, Tylenol #1, Fiorinal, Darvon compound
3	Tylenol #2, 282, 282 Mep
4	Tylenol #3, 292, Fiorinal 1/4 c, Codeine 30 mg
5	Tylenol #4, 294, Fiorinal 1/2 c, Codeine 60 mg
6	Talwin, Percodan, Demeral oral
7	Demeral, or any other IM analgesic

$$\text{AI} = (\text{NUMBER OF TABLETS}) \times (\text{RATING})$$

APPENDIX E
Relaxation Practice

RELAXATION PRACTISE

DATE	TIME	PRE-STRESS (0-10)	POST-STRESS (0-10)

DATE	TIME	PRE-STRESS (0-10)	POST-STRESS (0-10)

STRESS RATINGS: 0 - VERY RELAXED
 10 - EXTREMELY STRESSED

APPENDIX F

Questionnaire

NAME: _____

PLEASE INDICATE/RATE THE FOLLOWING CHANGES IN YOUR HEADACHE
ACTIVITY: (for the past six weeks)

Intensity X-----X-----X
 much worse about the same much better

Frequency X-----X-----X
 much worse about the same much better

Duration X-----X-----X
 much worse about the same much better

**Global
rating** X-----X-----X
 much worse about the same much better

ADDITIONAL COMMENTS:

Appendix G

Relaxation Practise Instructions

RELAXATION PRACTISE

- 1) Record the **date** and **time** you listen to your tape.
- 2) Record your **pre-stress** level, using a scale from **0** (very relaxed) to **10** (extremely stressed).
- 3) Make yourself comfortable. Loosen any tight clothing and sit in a comfortable chair or lie down. You should try to avoid any possible distractions -take your phone off the hook, have someone else watching the children, etc.
- 4) After listening to your tape, record your **post-stress** level using the same scale from **0** to **10**.

Relaxation practise is something that hopefully will become habit-forming and be something that you look forward to doing daily. It is important that you take twenty minutes out of your day to do something good for yourself.

Appendix H

Study Information and Consent Form

Dear Participant,

I would like to request your participation in a study that I, Peter Voros, am conducting. I am a graduate student at Lakehead University, and the proposed study is being completed in partial fulfilment of my Masters degree in Clinical Psychology. The purpose of the study is to assess the efficacy of a non-drug treatment method for tension and migraine headaches. This is part of an attempt to provide headache sufferers with a more cost-effective, non-pharmacological alternative, and to further the knowledge and understanding of non-pharmacological treatment approaches for headaches.

The study will begin with all participants recording headache and medication usage information for two weeks. At this time, participants will be randomly divided into three groups. The groups will, on top of continuing with their record keeping, learn varying degrees of relaxation training. Some participants may be required to attend two, twenty minute sessions per week for the four treatment weeks. Also, at various times throughout the study, participants will be asked to complete several personality measures and questionnaires regarding their headaches and views of the treatment program.

This study poses no potential risk to you as a participant. However, research has shown that you may benefit from such a non-pharmacological treatment by having a decrease in the frequency and/or intensity of your headaches.

I would like to emphasize that this study concerns the effectiveness of a non-pharmacological treatment for headaches in **general**. Each participants experience and results will be kept completely confidential, and the findings will be reported only in terms of **group data**.

Please fill-out the attached form, indicating whether you are willing to participate in the study. Should you have any questions, I would be more than willing to answer them; please contact me at 343-8476 or 626-9564. If you would like to receive a summary of the results of this study, please include your address on the attached form.

Yours sincerely,

Peter Anthony Voros
M.A. Candidate
Psychology Department
Lakehead University

I, _____ agree to participate in the research undertaken by Peter A. Voros. By giving my consent I realize and accept the following: (1) the research involves assessing the efficacy of a non-pharmacological treatment for tension and migraine headaches; (2) this will involve the completing of personality and views questionnaires; (3) this will involve recording my headaches and medication usage for a period of six weeks; and (4) I may be required to attend relaxation sessions two times per week, for a period of four weeks. Furthermore, by giving my consent I understand that all of my results will be confidential, and will be reported in terms of group data only. Also, I may withdraw from the study at any time, and I may decline to answer any question.

Signed: _____

If you wish to have a report of the findings forwarded to you, please print your name and address below.
