RECURRENT HEADACHES IN A PEDIATRIC POPULATION: THE APPLICABILITY OF A COGNITIVE-BEHAVIOURAL TREATMENT PROGRAM FOR PREADOLESCENTS

MARILYN LOUISE HILL

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BY

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Abstract

Despite a burgeoning interest in the treatment of pediatric pain, few studies have evaluated cognitive-behavioural treatment approaches for recurrent pain in young children. The present study describes the development of a pain clinic for preadolescents with recurrent headaches in St. John's, Newfoundland. The goal of this study was to determine how successfully the preadolescents referred to the clinic could use cognitive-behavioural skills to reduce their headache activity, as well as to isolate any symptom or treatment-related variables associated with treatment success. Lack of referrals and problems eliciting parental cooperation made it impossible to address these goals with any confidence. During a 12 month trial period only 15 referrals were received, 5 of whom began the treatment program. Once in the program, adherence to record keeping was high (86%), as was compliance with the assigned relaxation practice. All 5 children were able to significantly reduce their tension levels using relaxation, and 2 children were able to adapt and personalize the relaxation approach to fit certain stress inducing situations. Clearly, these children were able to use cognitive-behavioural strategies to combat stress. As a group, the children showed reductions following treatment in headache frequency, intensity, and medication use. Three of the subjects showed improvements in overall headache symptomatology of 93-99% and were largely headache-free post-treatment. One subject was moderately improved (42%) following treatment, while the final subject remained unimproved. These results suggest that young children are able to use cognitive-behavioural skills to reduce headache symptomatology, although many practical problems may make it difficult to establish regular treatment sessions with this age group. Several of the problems faced during the course of this study are outlined, and suggestions are made regarding both the source of these difficulties and possible approaches to improve treatment availability for these young children.

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Personal and special thanks to Stevan and Shelley for sharing the nightmare. Let's hope that we are heading into more prosperous times! To Mom and Dad, you can breathe a sigh of relief now that it's done, but it isn't over yet. I'm starting the next one tomorrow...

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Recurrent Headaches in a Pediatric Population: The Applicability of a Cognitive-Behavioural Treatment Program for Pre-adolescents.

Despite the fact that pain in the form of migraines, tension headaches or combination headaches affects a significant proportion of the pediatric population, the area has stimulated little interest within the health services industry. Studies have shown that by the age of 7, 40% of all children will have experienced headaches, a figure which increases to 75% by the age of 15 (Bille, 1962; Lavigne, Schulein & Hahn, 1986). Close to 11 percent of children suffer from recurrent headaches, and yet treatment of these syndromes lags far behind the efforts directed to relieve these same symptoms within the adult population (Bille, 1962; Sillanpaa, 1983).

Few differences have been found between the experience of headache pain in adults and children. For vascular headache sufferers for example, the qualitative experience is comparable: both the location and type of pain, and the accompanying symptoms seem similar. Any differences which occur appear quantitative: children's migraines are generally of shorter duration, but occur more often than do those of adults (Hoelscher & Lichstein, 1984).

Although there are more similarities than differences in the headache experiences of the two migraine populations, comparatively little attention has been paid to children. One reason for this is that headaches, pediatric migraines in particular, had previously been considered a transient condition. Recent literature, however, suggests that a majority of pediatric migraineurs will continue to experience their headaches into adulthood. Bille (1981), for example, found that 60% of his pediatric migraine sample still suffered at a twenty-three year follow-up. Similarly, Sillanpaa (1983) found that 73% of pediatric migraineurs were still experiencing migraines after seven years. The resultant reconceptualization of pediatric headache

as a long-term condition did much to foster an awareness of the need for headache treatments in a young population.

Awareness of pediatric tension / muscle contraction headaches is poorer still. While it has been implied that most recurrent headaches in preadolescents are of the migraine type, prevalence rates dispute this (Gascon,1984). Bille (1962) for example, found that of the 11% of the population which were recurrent headache sufferers, only 4% experienced headaches of the migraine type, while the remaining 7% experienced non-migrainous headaches grouped into an unspecified "other" category. Although studies confirm the important role of emotional issues in childhood headache, there is no prevalence data for pediatric tension headaches (Barlow, 1984).

Presently, the most common treatment approach for pediatric headaches is pharmacologic - either analgesic or, in cases of vascular headache, prophylactic (propranolol, anticonvulsants) or abortive (ergotamine) (Hoelscher & Lichstein,1984; Masek, Fentress & Shapiro, 1984). Despite the popularity of pharmacological treatment, several concerns inhibit its widespread use. First, data on the efficacy of drugs for the pediatric population are lacking. Research in the field has not used the group outcome designs, objective measures or control groups necessary to discount the possibilities of spontaneous remission and / or placebo effects (Hoelscher & Lichstein, 1984). Second, even the most commonly used drugs have certain side effects associated with them (e.g. aspirin increases the risk of gastritis and platelet dysfunction) (Shannon & Berde, 1989). Third, due to the chronic nature of headaches, the potential for habituation, drug dependence, and abuse in later life is high (Shinnar & D'Souza, 1982). Hence, the risks arising from the chronic medication of children, along with the success of non-pharmacologic treatments for adult headache sufferers, have prompted research into the use of behavioral methods with pediatric headache patients.

Several behavioral methods have been shown to result in significant headache improvement in adults. Skin temperature biofeedback, blood volume pulse biofeedback, relaxation training and coping skills training all seem to be effective behavioural treatments for adult headache sufferers. Despite the relatively new interest in the treatment of pediatric headache, many of these techniques have been used in preliminary single case studies of children, with promising results. Larger studies have investigated the effectiveness of relaxation alone (Larsson & Melin, 1986; Larsson, Daleflod, Hakansson & Melin 1987; Richter, McGrath, Humphreys, Goodman, Firestone & Keene, 1986), or with biofeedback (Werder & Sargent, 1984; Labbé & Williamson, 1984; Fentress, Masek, Mehegan & Benson,1986), of self hypnosis (Olness, MacDonald & Uden, 1987) and of cognitive training (Richter et al, 1986). In general, the above forms of behavioural treatment seem to be effective in combatting pediatric headache pain; in no study were any detrimental effects of behavioural methods noted.

One issue which must be addressed when treating children is the possibility of differential treatment effectiveness due to developmental level. Despite the practical need for such knowledge, the influence of age on the effectiveness of behavioural treatments for headaches has been largely ignored. In the literature, child studies are freely compared to those using adolescents, and in several studies subjects ranging in age from 4 to 20 years of age are grouped as one entity. The single study which looked at the effects of age did so post hoc by comparing the treatment success of children above and below 10 years of age; in this case, no differences were found (Werder & Sargent, 1984). In order to clarify the status of research to date, the following studies are reviewed according to the age of subjects utilized.

Adolescents

Several large scale studies have investigated the use of relaxation to combat headache activity in adolescents. Wisniewski, Gienshaft, Mulick, Coury and Hammer (1988) for example, found that adolescents given relaxation training showed a greater decrease in global headache activity than did those in a waiting list control group, results which were stable over a one month follow-up period. A second study by Emmen and Passchier (1987) compared the use of progressive muscle relaxation with a placebo group using concentration exercises, a design which allowed for the control of treatment effects due to attention. At post treatment, the relaxation group had reduced the duration of their headaches; both headache frequency and intensity remained unchanged. Follow-up data were not available to determine the stability of this treatment effect.

Larsson and his colleagues have investigated the effectiveness of relaxation training in a series of school based studies with an adolescent population, all of which included both attention and waiting list controls, as well as short term and long term follow-ups. The initial study investigated the comparative effectiveness of relaxation and two "nontreatment" control groups: an information contact group and a waiting list control group. In this case, the experimental group achieved significant decreases in overall headache activity (a sum of all headache ratings per week) and headache frequency, as well as a significant increase in the number of headache free days relative to the control groups. Differences between the groups remained significant, but had diminished slightly at the six month follow-up (Larsson & Melin, 1986). The authors' 1987 study added the use of a placebo control, in the form of a problem discussion group. The experimental group showed a significant decrease in headache frequency, intensity and duration when compared to the placebo group. Unlike their

previous study, subjects in the experimental group continued to improve over time (Larsson, Melin, Lamminen & Ullstedt, 1987). Larsson et al's short-term follow-ups, five to six months post-treatment, indicated a maintained improvement in various headache parameters following behavioural intervention. It must be noted, however, that improvement was also seen in the attention control group; at both the short-term and the long-term follow-ups results showed headache improvement to be statistically equivalent for the experimental and control groups. An investigation of clinical, versus statistical, improvement of headache symptoms revealed a difference between relaxation training and attention controls at four years post-treatment; a significantly higher proportion of subjects treated with relaxation training had achieved a 50% reduction of headache than subjects in either of the control groups (Larsson & Melin, 1989). To conclude, the use of relaxation techniques seemed to bring about clinically significant reductions in headache activity for an adolescent population, although further investigation of long-term treatment effects are warranted.

Mixed Ages

Several studies have investigated the effects of treatment on a combined group of children and adolescents. Engel and Rapoff (1990) have compared various types of relaxation (autogenic, progressive, and combined) with a waiting list control in subjects 7 years or older. Those subjects receiving some type of relaxation training showed reduced headache frequency and intensity compared to the control group as well as to their own baseline levels at both treatment end and at a 4 year follow-up (Engel & Rapoff, 1990; Engel, Rapoff & Pressman, 1992). Comparisons have also been made between relaxation and other treatment approaches. Richter et al (1986), for example, compared the effects of relaxation training, cognitive coping and a placebo treatment in children ranging in age from nine to eighteen years. The placebo, a psychotherapy treatment labeled "stress reduction training", involved the

acquisition of a set of sham coping skills. Results post-treatment showed that subjects in both the relaxation and cognitive skills groups evidenced a large reduction in headache frequency as compared with those in the placebo condition, improvements which were maintained at a fourteen week follow-up. In contrast, McGrath et al's (1988) study included a placebo control that did not necessitate the acquisition of sham skills. This study compared the effectiveness of relaxation training with two credible, but passive (inactive) placebos: psychotherapy and an "own best efforts" group which discussed headache triggers following a headache diary analysis. McGrath et al's results suggest the importance of nonspecific treatment effects as all three groups displayed significant headache improvement; no significant differences were found between the three groups at either post-treatment or at the one year follow-up assessment.

Several studies of biofeedback assisted relaxation have used a mixed group of children and adolescents as their subjects. A number of uncontrolled studies have shown a positive treatment effect, with observed reductions in the mean number of headache hours per week (Werder & Sargent, 1984), as well as in both headache frequency and intensity (Warranch & Keenan,1985; Womack, Smith & Chen,1988; Labbé & Williamson, 1983); improvements in headache frequency and intensity were maintained during a 4 year follow-up of the Womack et al (1988) study (Smith, Womack & Chen, 1990). Labbé and Williamson's (1984) controlled study using children aged seven to sixteen years of age replicated these positive findings. Children receiving skin temperature biofeedback and autogenic relaxation experienced greater reductions in headache frequency, intensity and duration as compared to a waiting list control group.

Preadolescents

As previously mentioned, studies focusing on preadolescents are rare in the treatment literature, although it has long been established that children as young as seven years of age are capable of mastering relaxation and biofeedback techniques with little difficulty (Hoelscher & Lichstein, 1984). A study by Fentress et al (1986) was the single investigation of behavioural treatments which used a preadolescent population. In this study, eighteen children aged eight to twelve were assigned to one of three groups: relaxation training, relaxation plus EMG biofeedback or a waiting list control. Both treatments were associated with significant decreases in global headache activity and total headache hours as compared to the control group. Although these results are promising, it is apparent that further investigations are required in order to determine if young children can succesfully use various behavioral approaches to reduce pain associated with recurrent headaches. At the present time, it is impossible to conclude with any confidence that behavioural treatments work with equal effectiveness for all age groups. The aim of the present study was to evaluate the effectiveness of a combined relaxation/stress management program for children between the ages of 7 and 13.

Correlates of Treatment Success

In general, the implementation of behavioural treatments to combat headache pain in adults leads to a short-term reduction in headache activity in about 40-80% of clients (Blanchard, Andrasik, Ahles, Teders & O'Keefe, 1980). Success rates are not available in the pediatric literature but inspection of the studies to date seem to fall within this range. Regardless, not all clients will be improved through any one treatment approach. It would, consequently, be of clinical interest to isolate any

differences between those subjects who are treatment successes and those who are treatment failures. Such information may enable clinicians to tailor treatment regimens to individual client characteristics. Past literature has isolated several possible features differentiating groups of subjects in terms of treatment effectiveness. These include differences in quantitative and qualitative headache symptoms, degree of treatment adherence and the acquisition of specific treatment skills.

Headache Symptoms The term "headache" is used as a label to encompass a very broad spectrum of complaints. Headaches may of course differ in terms of the location of head pain, on the nature of pain experienced and on the accompanying symptomatology, reflecting the different physiological processes which form the basis for medical diagnosis. These features of headache pain are termed qualitative symptoms. Qualitative symptoms may contribute to treatment effectiveness; recent work suggests that migraine, tension and combined headaches show differential responses to various treatment approaches (Blanchard et al, 1982; Blanchard, 1987).

In addition to the specific, qualitative variations in headache type, the headache experience may differ in a general quantitative way, in terms of degree. Quantitative symptoms include the frequency, duration and intensity of headaches, any of which may be related to treatment success. For example, studies have shown that subjects with a low global headache severity, a combination of frequency, duration and intensity, did not improve with behavioural treatment (Burke & Andrasik, 1989; Larsson & Melin, 1988, 1989; Richter et al., 1986). Larsson and Melin (1989) also noted that the best predictor of outcome at the four year follow up was pretreatment headache severity. The authors suggested that behavioural therapy may have a "floor effect", a level of severity below which patients do not benefit. An alternate explanation for these results, of course, may be that patients with less severe

headaches have lower motivation levels; such individuals may be discouraged by the imbalance between the amount of time and effort needed for change to occur and the actual time spent in suffering from headaches (Burke & Andrasik, 1989). If these results are shown to constitute a generalized behavioural treatment pattern, the preferential intervention for low severity headache sufferers may be occasional analgesic use.

Treatment adherence. Within the general area of behavioural medicine it is a commonly held assumption that the effectiveness of various behavioural interventions is dependent upon the amount of home practice conducted by the client. Recent research using an adult population, however, has proved this relationship to be tenuous at best. Some of the confusion within the area may be a direct result of the measure of home practice used. Past research has focused on the quantity of practice, with the assumption that more frequent practice led to increased treatment effectiveness. It may be, however, that the important dimension of practice is its quality which, in relaxation research, would be the degree of change in stress levels during each session. Solbach, Sargent & Coyne (1989) addressed this question in their study of non-drug headache treatments. When both quantity and quality of practice of biofeedback and relaxation treatments were included in the analysis, treatment effectiveness was found to be independent of adherence measured in terms of the number of practice sessions, but positively correlated with the average degree of change brought about in the target area during practice sessions.

A related question concerns the mechanism of behavioural interventions: Do they have specific physiological effects related to headache reduction or do they act primarily by giving patients a feeling of control over their pain? Due to the basic nature of its procedure, the biofeedback literature has been particularly plagued by this question. The relationship between biofeedback success and pain reduction is far

from clear. While some investigators have found a relationship between changes in biofeedback "target" areas and headache improvement in adults (Solbach et al, 1989), others have found either no correlation (Mullinix, Norton, Hack & Fischman, 1978; Reading, 1983), or one opposite to that expected by theory (Gauthier, Bois, Allaire & Drolet, 1981; Kewman & Roberts, 1980; Largen, Mathew, Dobbins & Claghorn, 1981). In the child headache literature, much less has been done in this particular area. Burke and Andrasik (1989), however, found that their nine subjects could not produce consistent changes in hand temperature through biofeedback, although several were successful in lowering their headache activity.

Several hypotheses have been put forward to explain this observed treatment effect without the acquisition of "required" changes in state. First, it has been suggested that the important element is a stabilization of vascular activity rather than the previously supposed directional change (Gauthier et al, 1981). A second explanation is that biofeedback works solely as an instrument for bringing about relaxation. If this is so, those patients who become more relaxed, through whatever means, should show greater treatment benefits. Unfortunately, biofeedback studies have failed to record the subjective relaxation levels attained by their subjects. Similarly, most relaxation studies have related the amount of practice to treatment effectiveness, but have not compared subjects who are succesful at reducing their stress levels with those who are not. Should there be no differences between the two groups, one might postulate that relaxation training does not work as a direct result of a change in bodily state, but rather by providing the client with a feeling of control over their negative symptoms. The present study will attempt to compare treatment successes and failures with respect to the relaxation levels they attain.

In order to further clarify the relative contribution of relaxation to the treatment program, the relaxation and stress management aspects of the program will

be divided into two completely separate sections. In this way, the two halves of the program can be manipulated such that half of the subjects receive relaxation training first and stress management second while the other half of the subjects complete the program in reverse order. The object of this design is to look for patterns of symptom changes across treatment phases, something which has not been done in past work.

Methodological Problems

The study of headache pain is plagued by many methodological problems, the most fundamental of which is the accurate recording of headache activity. Headache activity may be monitored using one of several different formats: hourly ratings, ratings at specified times of the day and the simple recording of discrete headache episodes. Each method results in a different type of information with certain associated benefits and costs. Continuous hourly ratings, for example, may yield the most complete data collection in that minor head pains and small variations in intensity are more likely to be represented with frequent sampling. Unfortunately, this method also places very high demands on the patient and may therefore be associated with increased attrition rates.

Restricting the frequency of headache ratings helps to reduce demands on the client, particularly if rating times are scheduled so as to be easily remembered, such as at mealtimes. This procedure does not affect headache intensity estimates. However, accurate calculations of both the frequency and duration of headache episodes are no longer possible as the onset and termination of headaches cannot be determined (Blanchard & Andrasik, 1985). As a result, the use of this method requires one to infer the values of these parameters based on the presence or absence of headache activity in adjacent rating periods.

The final procedure, recording discrete headache episodes, asks clients to record the onset time of each headache, it's intensity and the time of headache termination. Although the lack of regularly scheduled ratings allows for fairly accurate measurements of all three parameters, it may also increase the incidence of noncompliance and retrospective ratings. A second, more serious problem, arises simply because clients are asked to note headache episodes versus levels of pain. Clients differ dramatically in their definition of a full-blown headache; while some consider only severe pain to constitute a headache, others define a headache as any head pain, regardless of intensity. Data will be more consistent if subjects are asked to record pain intensity levels at regularly scheduled times. As pain is a subjective experience, individual differences in pain ratings are unavoidable; an intensity rating of three, for example, may mean something very different from one subject to another. This problem is circumvented, however, if analyses are restricted to changes in headache ratings within individual subjects.

The present study will require each child to rate his / her headache activity four times per day; at mealtimes and before bed. This will eliminate the problem of varying "definitions" of headache, as the children will be asked to note the presence of any head pain, mild or severe. Headache duration will be measured in units of consecutive ratings (Blanchard & Andrasik, 1985). For example, presence of a head pain at breakfast, lunch and supper will be recorded as a headache with a duration of 3. An evening headache, followed by a head pain rating the following morning, will be considered two separate episodes with durations of one. A headache episode then, is defined as one or more consecutive ratings of pain in the span of a day, both preceded and followed by a headache free period.

Previous research has been limited to the direct measure of self-reported headache activity using the methods outlined above. In order to fully describe a

child's headache experience, however, one should also assess the presence or absence of pain-related behaviours such as attention seeking, rewards for headache pain and escape from aversive events. The present study used the Children's Headache Assessment Scale (Budd & Kedesdy, 1989), a parental rating form which measures the environmental events and situations impacting on a child's headaches, to assess any changes in pain related behaviours corresponding to the behavioural intervention for headache pain (See Appendix A).

Ethical Considerations

The combination of clinical practice and research results in several ethical dilemmas which are by no means easy to resolve. Such an issue involves the clinician's ethical responsibility to ensure both a client's confidentiality and anonymity. The problem arises when one considers that clinical research necessarily involves the use of information from a client's personal file. It is essential in such research that the client be fully aware that portions of his / her files will be disclosed, with the reassurance that identifying information will not be released. Such a procedure ensures that while confidentiality is not strictly being adhered to, anonymity is guaranteed.

The client's agreement to treatment under these terms leads to further ethical considerations. While research may be an integral component of the program, treatment must not be made contingent upon research participation. The current study guaranteed treatment to all children referred to the clinic, but assigning priority to those children willing to participate in the research component of the program.

Summary

The previous review provides considerable support for the use of behavioral treatment strategies for the reduction of pain associated with recurrent pediatric headaches. Unfortunately, past research has neglected to investigate the relationship between age and treatment effectiveness. While work with adolescents shows that behavioral treatments, particularly relaxation procedures, have been effective for headaches, a lack of studies using a preadolescent population prevents this conclusion from being generalizable to a younger age group. The present study was an attempt to evaluate the utility of a relaxation/stress managment program for preadolescents.

Hypotheses

The hypotheses of the current study are as follows:

(1) In a sample of children, aged seven to thirteen, suffering from recurrent headaches, the implementation of a behavioural treatment program using both relaxation and stress management techniques will coincide with a reduction in headache frequency.

(2) Several variables will serve to differentiate between those children classified as treatment successes and those for whom treatment fails. It is proposed that those showing significant reductions in headache activity will:

a. have a higher global headache severity pretreatment.

b. evidence a greater increase in relaxation following home practice of relaxation techniques.

c. show greater treatment adherence by completing significantly more home practice sessions.

d. show greater changes in the environmental conditions surrounding their headaches, as measured by the CHAS.

Method

Subjects

The subjects of the present study were referred to the program by their family physicians, by their school guidance counsellor, or by a parent following media coverage of the program. Referrals were accepted for children between the ages of 7 and 13. The criteria for inclusion in the study consisted of: (1) a minimum of one headache episode per week determined by child and / or parental report, (2) a lack of organic impairment and (3) discontinuation of any prophylactic medications. The use of abortive analgesics was not restricted. Children with daily unremitting headaches were not included in the study, as pharmacological interventions are often necessary for improvement in such cases (Holroyd et al, 1988). Prospective subjects were screened using a structured interview.

The program received referrals for 19 children during the study period, 7 of whom did not attend the screening session. Of the 12 children who completed the assessment, 2 children failed to meet the inclusion criteria for minimum headache activity and 2 children exceeded the age requirement; these children were excluded from the study. The subjects of the present study were 8 children between the ages of 7 and 14, 3 of the subjects were females, 5 were males. 1 child dropped out of the study during baseline recording and 2 others during the early weeks of treatment, leaving 5 children who completed treatment. These 5 children ranged in age from 9 to 13, with a mean age of 11. Three of the subjects were female, 2 were male.

Measures of Headache Activity

Self-report Measure. Self-report measures of headache activity were obtained using a daily headache diary which required ratings four times daily: at mealtimes and at bedtime. At these times, children were asked to note the presence of

any head pain, using the following six point scale: 0 = no headache, 1 = very mild headache, 2 = mild headache, 3 = moderate headache, pain is noticeably present, 4 = severe headache, difficult to concentrate and 5 = extremely intense headache, incapacitated. When the presence of head pain was indicated (intensity score of one or more), subjects were asked to record possible causes of the headache episode, the amount and type of medication ingested, and symptoms experienced secondary to head pain (See Appendix B). Although the above format has been adapted from the adult literature and has been modified for a younger population, such measures have been shown to have some reliability and validity with respect to the self-report of headache symptomatology in children (Andrasik, Burke, Attanasio & Rosenblum, 1985; Labbé, Williamson & Southard, 1985; Richardson, McGrath, Cunningham & Humphreys, 1983). In addition, work with both adults and children suggest that patient daily recordings are a more conservative estimate of improvement than global ratings of headache activity provided by the patient, parent or clinician (Andrasik et al, 1985; Nash, Holroyd, Cordingley, Pingel, Jerome & Martin, 1990).

Parental ratings. In order to identify any environmental factors contributing to a child's headaches, parents were asked to complete the thirty item Children's Headache Assessment Scale (CHAS) (Budd & Kedesdy, 1989)(See Appendix A). The CHAS requires parents to rate the frequency with which various situations and events occur in relation to their child's headache episodes. This is done using a six point Likert scale with ratings as follows: 0 = never, 1 = almost never, 2 = seldom, 3 = half the time, 4 = usually, 5 = almost always, and 6 = always. The items on the CHAS compose six categories of environmental factors: stress antecedents, physical antecedents, attention consequences, escape consequences, coping responses and medication use. It should be noted that as of yet, studies of reliability and validity for

this scale have not been completed. As such, the data obtained from the instrument must be interpreted with caution.

Procedure

Treatment Introduction/Screening Procedures. The initial contact with prospective clients was made by telephone, at which time parents were given a brief description of the program's aims, procedures and requirements, and interested parties were asked to schedule an appointment for themselves and their child. The goal of the first session was twofold: to obtain an assessment of headache symptomatology and to provide information regarding the rationale behind the program.

The investigation of headache symptomatology began with a detailed headache history, which was obtained using the structured interview format outlined in Blanchard and Andrasik (1985)(See Appendix C). Minor modifications to the interview format improved its use with children as well as allowing for collaboration between parent and child in answering questions. During the interview, subjects and their parents were asked about the age of headache onset, symptom type and frequency, family history of headaches and treatments tried to date. Information gathered from the structured interview was used to determine each child's headache diagnosis following the criterion for headache diagnosis published by the Ad Hoc Committee on the Classification of Headache (1962) (See Appendix D). In addition to providing information for headache diagnosis, the headache history served as a screening instrument to select those children suitable for inclusion in the program.

The information portion of the session began with a brief explanation of the physiology of migraine/tension headaches followed by a detailed description of the role stress plays in headache exacerbation. Clients were then introduced to the rationale behind the use of stress management and relaxation as techniques to both prevent

headaches and to more effectively manage headache pain. Strong emphasis was placed on the importance of home assignments and reliable record keeping to treatment success. Those clients interested in the program were asked to read an information sheet outlining the research component of the program and procedures for the release of information, following which both parent and child were asked to sign a consent form (See Appendix E). Parents were given the parental questionnaire (CHAS) to complete at their leisure and return by mail. Each subject's first treatment session was scheduled subsequent to a four week baseline period.

During this four week lag, parents were asked to have their child examined by a general practitioner and were given an information sheet for said doctor describing the treatment program and the criterion for headache diagnosis published by the Ad Hoc Committee on the Classification of Headache (1962) (See Appendix F). Each doctor was asked to sign a consent form, certifying that his/her patient could safely complete the program. In addition, doctors were asked to indicate the diagnosis of headache type utilizing the outlined criterion, providing a second, independent diagnosis for each client assessed. These forms were returned to the examiner by mail and were a prerequisite for the initiation of treatment.

Baseline Recording. All clients were asked to record headache activity on a daily basis for a one month period before the implementation of treatment. In order to increase adherence to the keeping of a headache diary, patients were required to submit all records on a weekly basis. During the four week baseline and follow-up periods stamped, preaddressed envelopes were provided in order to facilitate weekly submission. As an accurate description of headache activity is necessary for any conclusion regarding treatment effectiveness, regular symptom recording was a prerequisite for inclusion in the program. Before beginning the treatment sessions clients must have completed 80% of the daily baseline ratings. That is, during the four

week baseline period, 90 of the possible 112 ratings must have been completed. Any clients not fulfilling this criteria were required to continue baseline recording until this standard was met.

Treatment Procedures. Upon completion of the baseline recording period, all children were randomly assigned to one of two treatment groups. Half of the children were taught the relaxation portion of the treatment regime, followed by stress management. For the other half of the children, this presentation was reversed. The overall treatment package was identical in all other respects; all children received four sessions of stress management, three sessions of relaxation training and a 'wrap up' session which reviewed the use of both behavioral skills in the prevention/reduction of headache episodes. The behavioral package utilized in this study follows the stress management / relaxation procedures outlined by McGrath, Cunningham, Lascelles & Humphreys (1990) in their Help Yourself program for pediatric migraineurs (See Appendix G). All of the children were seen on an individual basis.

Relaxation Training. The relaxation portion of the treatment program was carried out in three consecutive sessions. The first relaxation session began with a discussion of tension; what it was, how the body signals tension and how to become more aware of these signals. Relaxation was then introduced as a method of reducing bodily tension, and clients were taught the procedure for progressive muscle relaxation. The assigned work for the following week included daily practice of progressive muscle relaxation using the tape provided for this purpose, as well as to become more aware of their body's unique signals for tension. Session two began with a review of the prior week's material and a discussion of any factors which might have reduced the effectiveness of the child's daily practice sessions. Following this, subjects were taught to relax without the use of muscle tension. Homework for the second week was to practice relaxing without muscle tension. The third session introduced two new

relaxation exercises: relaxation using imagery and mini-relaxation, again, all subjects were asked to practice these new skills on a daily basis for one week. During this time period, each subject was asked to record his/her relaxation levels both prior to and after assigned practice sessions (See Appendix H). Post-practice ratings were then subtracted from pre-practice ratings to give units of change. These change units were averaged over a week's practice sessions for a qualitative measure of treatment effectiveness. Alternatively, the quantitative measure of relaxation adherence was defined as the average number of practice hours per week.

Stress Management Training. The stress management portion of the program began with a discussion of what stress is, and how to become aware of it. All children were asked to identify stressors particular to their own situations, and were taught that different things are stressful for different people as a result of how people evaluate different situations. The behavioral coping strategies for week one focused on becoming aware of negative thoughts and teaching ways to change these to positive, constructive thoughts. Week two began with a review of the role of negative thoughts in stressful situations and led to a discussion of unrealistic beliefs as a contributor to negative thoughts and worry. Homework assignments for the week included: identifying unrealistic beliefs that may be underlying stress and trying to change these to reasonable beliefs. In week three subjects were introduced to 'attention games' designed to help deal with feelings of stress: attention-focusing, thought-stopping, imagery, and mental games. The final week of stress management concentrated on increasing communication skills to help avoid stressful situations; skills reviewed in this session included assertiveness in refusing a request, making a request and expressing anger.

Follow-up Recording. Following their final treatment session, all clients were asked to continue recording headache activity on a daily basis for a one month

period. As with the baseline period, preaddressed envelopes were provided in order to facilitate weekly submission. During this time period, parents were again asked to complete the CHAS and return it by mail.

Follow-up contact was also made with the parents of the 10 children who met study requirements but did not participate in the program. Questionnaires were administered by mail in order to determine factors which may have led to withdrawal (See Appendix I).

Statistical Treatment of Data

Data Transformations. The information contained in the clients daily pain intensity ratings produced several headache parameters:

1) Headache Intensity - The average of the intensity ratings recorded during headache episodes.

2) Headache Frequency - The total number of discrete headache episodes per week, with a headache episode being one or multiple consecutive ratings of pain rated two or higher, both preceded and followed by a headache free period.

3) Headache Duration - The average length of discrete headache episodes, calculated as an average of the number of successive pain ratings of two or greater.

4) Headache Sum - The sum of all 28 intensity ratings recorded per week.

5) Peak Intensity - The highest intensity recorded each week.

6) Headache-free days per week - The number of days per week with four intensity ratings below two.

7) Medication Index - Designed to equate drug dosages of various medications, it is calculated by multiplying the number of pills taken per week by the potency rating of the particular drug being used (Blanchard & Andrasik, 1985; Coyne, Sargent, Segerson & Obourn, 1976) (See Appendix J).

Results

Group Data - Headache Activity

During the baseline assessment period, the subjects experienced an average of 4.0 headaches per week (sd = 2.49), with an average duration of 2.2 rating periods (sd = 1.28). Headaches ranged in intensity from 2 to 5, with an average intensity rating of 3.4 (sd = 0.94). All five children experienced at least one headache during the course of the program which was described as incapacitating (5). The average headache sum during the baseline period was 33.8, with a range from 8.25 to 76.2.

During the treatment portion of the program, the mean number of headaches experienced by the subjects dropped to 2.3 per week (sd = 2.95; $t(52) = 2.17$, $p < .05$). The duration of the group's headaches increased from baseline to an average length during treatment of 3.1 rating periods (sd = 1.26; $t(158) = 4.45$, $p < .001$). The range of headache intensities experienced by the children did not change during treatment, however, the average pain intensity during headache episodes reduced significantly, with a mean intensity during treatment of 3.0 (sd = 0.72; $t(437) = 4.94$, $p < .01$). The average headache sum (22.6), which is based on all 28 intensity ratings per week, did not show a significant decrease over the treatment period.

As only 3 of 5 subjects submitted headache diaries during the follow-up, group statistical analyses were not completed on the headache data. However, all three of the subjects who completed follow-up records maintained clinically significant improvements in headache sum scores from baseline to follow-up, with improvements ranging from 92.6% to 98.9%.

Medication Use

In general, overuse of pain medication was not a problem for this group of children, although concerns about analgesic use were often raised by the parents (e.g. regarding the appropriateness of administering aspirin to a young child). The mean weekly medication index during baseline was 2.6 (sd = 4.13), which is the equivalent of 2.5 aspirin per week or one dose of a low potency prescription drug for pain, such as Fiorinal (See Appendix J). The use of medication for pain during treatment was essentially stopped, with a mean medication index of 0.02 (sd = 0.16; $t(58) = 4.05$, $p < .001$).

Environmental Factors Associated with Headache Episodes

The CHAS yields information on both the antecedents and consequences of headache episodes for each subject. In order to determine if certain antecedents and consequences occurred more frequently for these children, a single factor within subjects ANOVA was performed. Differences between the CHAS subgroup means were found to be significant ($F(5,30) = 9.80$, $p < .001$), therefore three planned comparisons were performed using the comparison subgroup x subject interaction as an error term (Keppel, 1982). As a group, the subjects' headaches were preceded more often by stress antecedents than by physical antecedents ($F(1,5) = 7.04$, $p < .05$). Headache episodes most often resulted in attention and escape consequences, with coping responses occurring significantly less frequently ($F(1,5) = 11.74$, $p < .025$). The use of medication during a headache was also less frequently reported; it did not differ in frequency of endorsement from coping responses (See Figure 1).

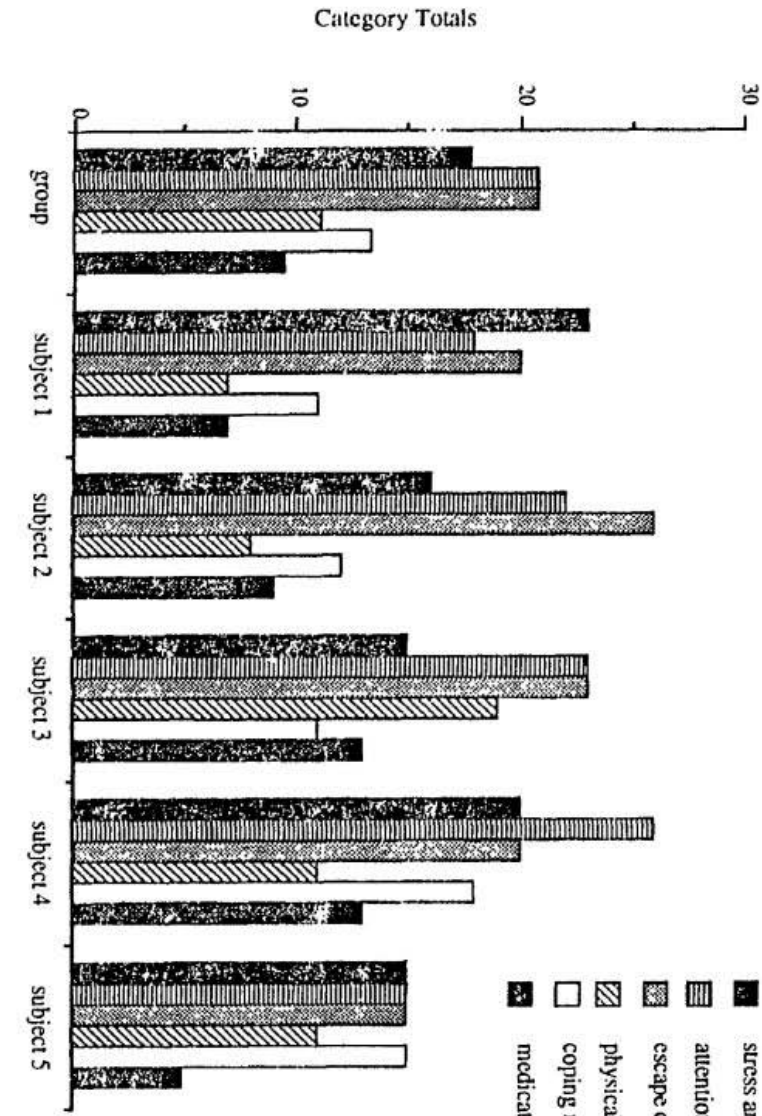

Figure 1. Environmental factors associated with headache episodes

Treatment Compliance

Despite the lack of follow-up data for two of the subjects, group compliance for record keeping was high, with 86.03% of records completed overall. Missing records followed a distinct pattern. The children did not forget to record occasional rating periods; if records were received for the week, they were perfectly done. Missing records invariably took the form of a full week's worth of data, most often due to loss of records rather than due to the child's noncompliance. Compliance to homework assignments followed a similar pattern, practice was done very regularly, but records were often misplaced, often due to parental error. It is interesting to note that 4 of the 5 children had arranged to give completed diaries and homework assignments to their parents for safe keeping on appointment day.

Parental cooperation to the treatment program were notably poor in this study: (1) appointments were missed in several cases, (2) completion of the CHAS required frequent prompting during baseline, while 4 of 5 parents did not return the follow up CHAS despite several reminders, and (3) in two cases, follow-up records were never returned. In addition, based on initial phone conversations with parents of prospective subjects, several children were lost from the study because weekly appointments were considered too taxing. Questionnaires sent to those parents to determine the exact reason for withdrawal despite referrals to the treatment program were never returned.

Individual Data - Headache Activity

Subject 1. Subject #1 (Greg) was a 13-year-old male presenting at baseline with an average of 1.3 headaches per week (sd = 1.26). His headaches ranged in intensity from 2 to 5, with a mean intensity of 4.4 (sd = 1.08). Headache episodes ranged in length from 1 to 4 consecutive rating periods, with a mean duration of 2.4 (sd

= 1.14). Greg's mean weekly headache sum over baseline was 13.5 (sd = 21.2)(See Figure 2).

During the eight weeks of treatment, Greg experienced a single headache, which rated a maximum intensity score of 5 and which lasted for two consecutive rating periods. This reduced his mean headache frequency over the treatment phase to 0.2 headaches per week (sd = 0.71) and his headache sum to 1.2 (sd = 3.54), neither of which represent a statistically significant change from baseline.

Greg was headache-free during the four week follow-up period. His mean weekly headache sum over this time period was 1.0 (sd = 0.82), due to a few mild head pains (rated 1), which are not categorized as a headache. Although the headache data did not achieve a statistically significant decrease over time, Greg's headache sum showed a clinical improvement of 92.6% from baseline to follow-up, which is categorized as "much improved". Greg's medication use decreased from a mean weekly dose of 3 based on Coyne's scale to a complete lack of medication use during treatment and follow-up.

Greg completed 100% of his headache diary records, but was less compliant with respect to relaxation homework. For his first 2 weeks, Greg practiced nightly, but did not continue regular exercise after this point as he was not having headaches. During his two weeks of practice, Greg successfully reduced his tension levels from a pre-relaxation level of 1.4 (sd = 0.99) to a post-relaxation level of 0.29 (sd = 0.46)($t(27) = 3.841$, $p < .001$)(See Table 1).

Subject 2. Subject 2 was an 11-year-old female (Natalie), who presented at baseline with an average of 1.5 headaches per week (sd = 1.3), and a mean intensity of 2.8 (sd = 1.30) during her headache episodes. These episodes lasted no longer than 2 consecutive rating periods, with an average length of 1.5 ratings (sd = 0.55). Natalie's mean weekly headache sum during baseline was 8.25 (sd = 7.89) (See Figure 3).

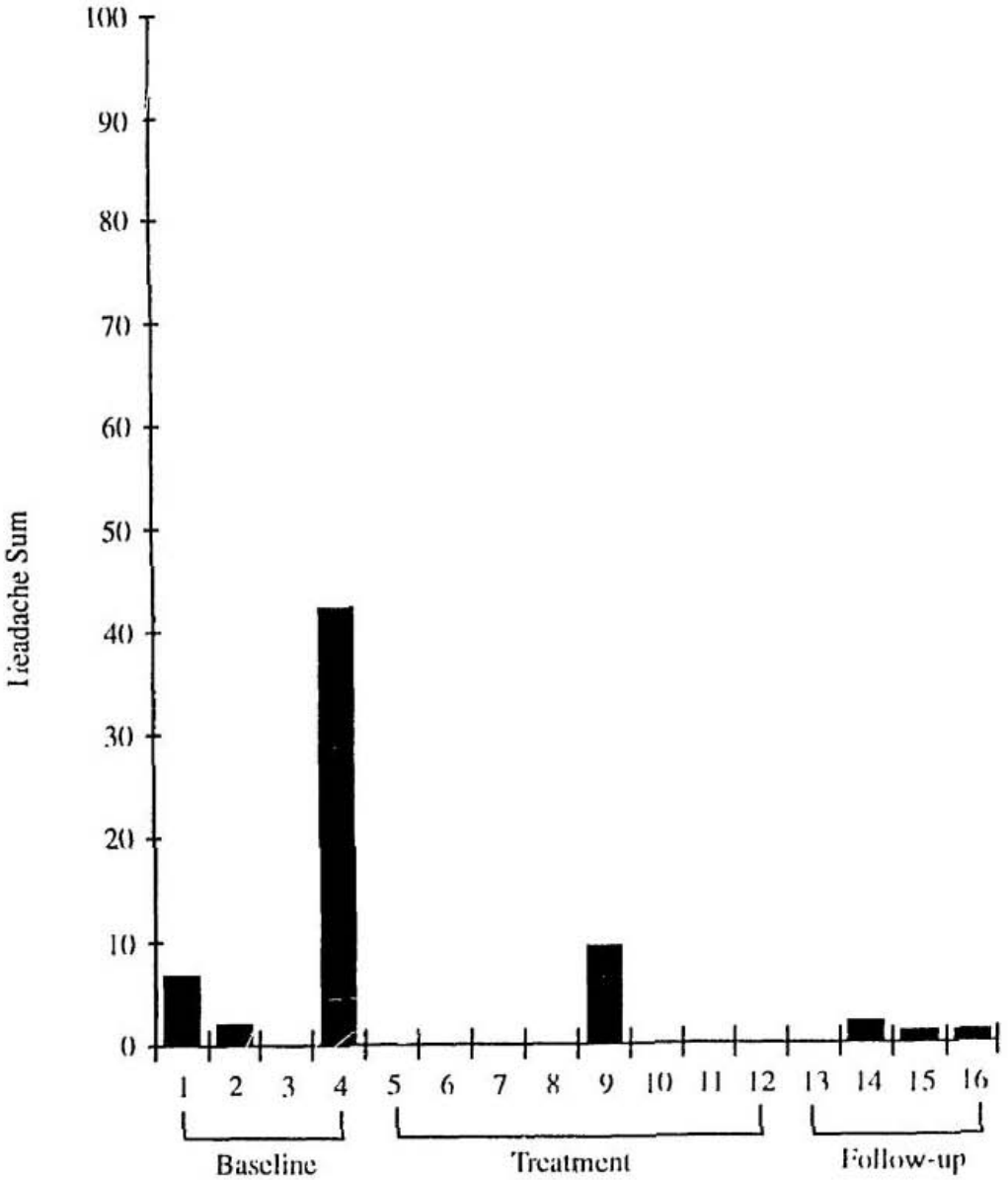

Figure 2. Weekly Headache Sum for Subject 1.

Table 1

Average changes in tension level associated with relaxation exercises

	week of training	# of practices	Mean tension before relaxation	Mean tension after relaxation	Mean change in tension
Subject #1	1	7	1.6	0.1	1.4
	2	7	1.3	0.4	0.9
	3	0			
	4	0			
Subject #2	1	5	2.6	0.6	2.0
	2	4	1.5	0.3	1.2
	3	3	4.0	1.0	3.0
	4	4	2.8	1.5	1.2
Subject #3	no data				
Subject #4	1	7	5.0	0.6	4.4
	2	3	5.0	0.7	4.3
	3	7	6.1	0.4	5.7
	4	7	3.3	0.6	2.7
Subject #5	1	5	5.8	0.8	5.0
	2	6	0.8	0.2	0.7
	3	no data			
	4	no data			

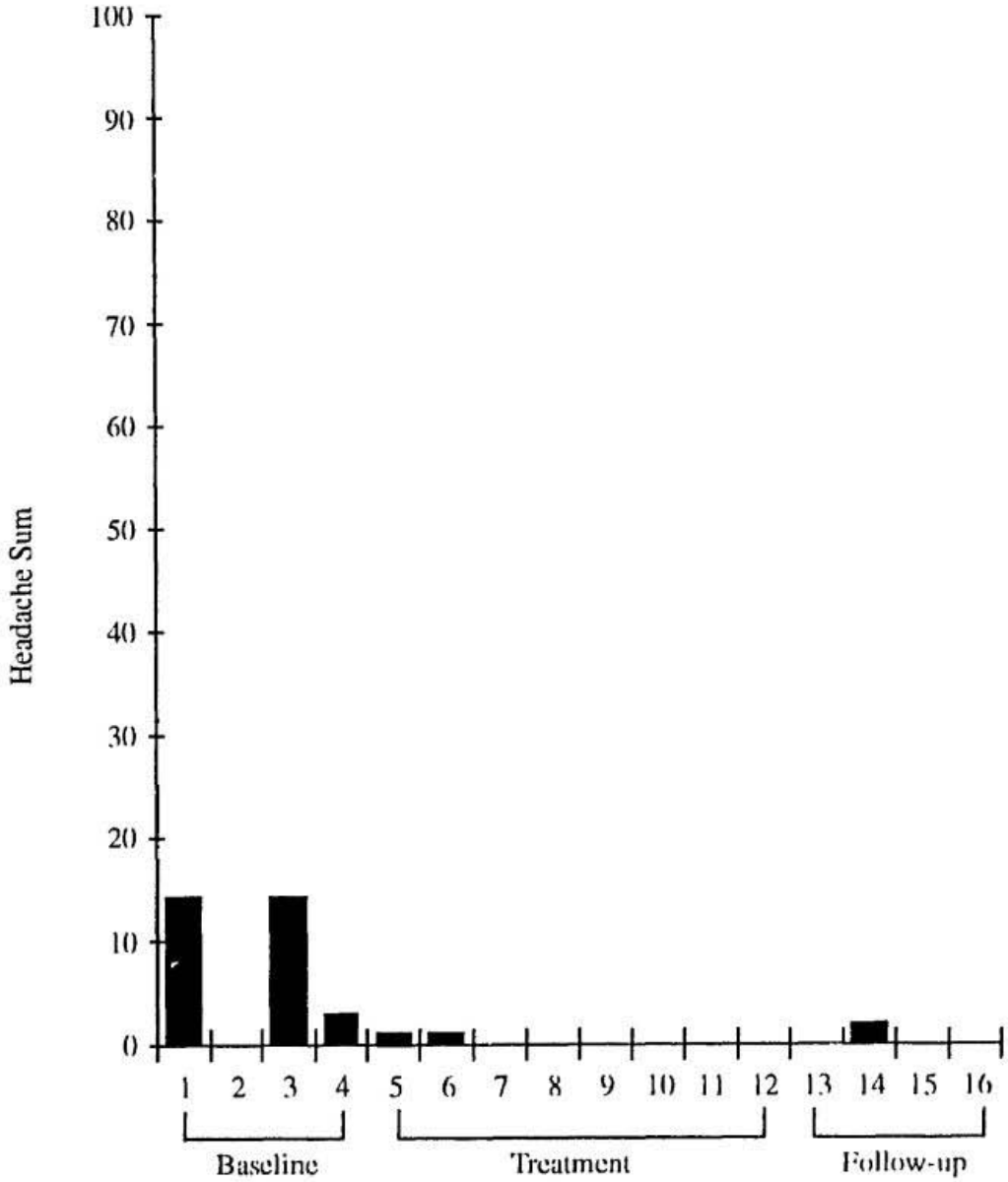

Figure 3. Weekly Headache Sum for Subject 2.

During the treatment period Natalie was headache-free, with a headache sum of 0.25 (sd = 0.46), representing a significant improvement over baseline ($t(10) = 3.011$, $p < .05$).

Within the four week follow-up period, Natalie experienced a single headache with an intensity rating of 2 which lasted for a single rating period. Her headache sum for this period was 0.50 (sd = 1.00), which doesn't show statistical improvement over baseline. Natalie's clinical improvement from baseline to follow-up, however, was 93.9%.

Natalie's compliance was fairly good. Headache records were completed 100% of the time and she completed assigned relaxation home exercises on average 4 times per week. During her practices, she was able to reduce her tension levels from a mean level of 2.6 (sd = 1.02) before practice to 0.8 (sd = 0.75) after practice ($t(30) = 5.71$, $p < .001$)(See Table 1). In addition, she was one of two subjects to spontaneously modify and use relaxation skills outside of regularly scheduled practice sessions.

Subject 3. Subject 3 was an 11-year-old female (Sarah), who presented with a total of 19 headaches over the baseline period for an average of 4.8 headaches per week (sd = 1.5). Headache episodes had a mean duration of 1.15 (sd = 0.37), with a mean intensity of 2.82 (sd = 0.91). Her mean weekly headache sum over baseline was 24.0 (sd = 5.72) (See Figure 4).

Sarah showed little improvement over 5 weeks of treatment. Decreases in headache sum, frequency, and intensity failed to reach statistical significance while duration also showed no change from baseline to week 6 of treatment. Although Sarah did complete the treatment sessions, records are missing for the remainder of treatment due to lost diary and practice records. Calculations of clinical improvement in Sarah's

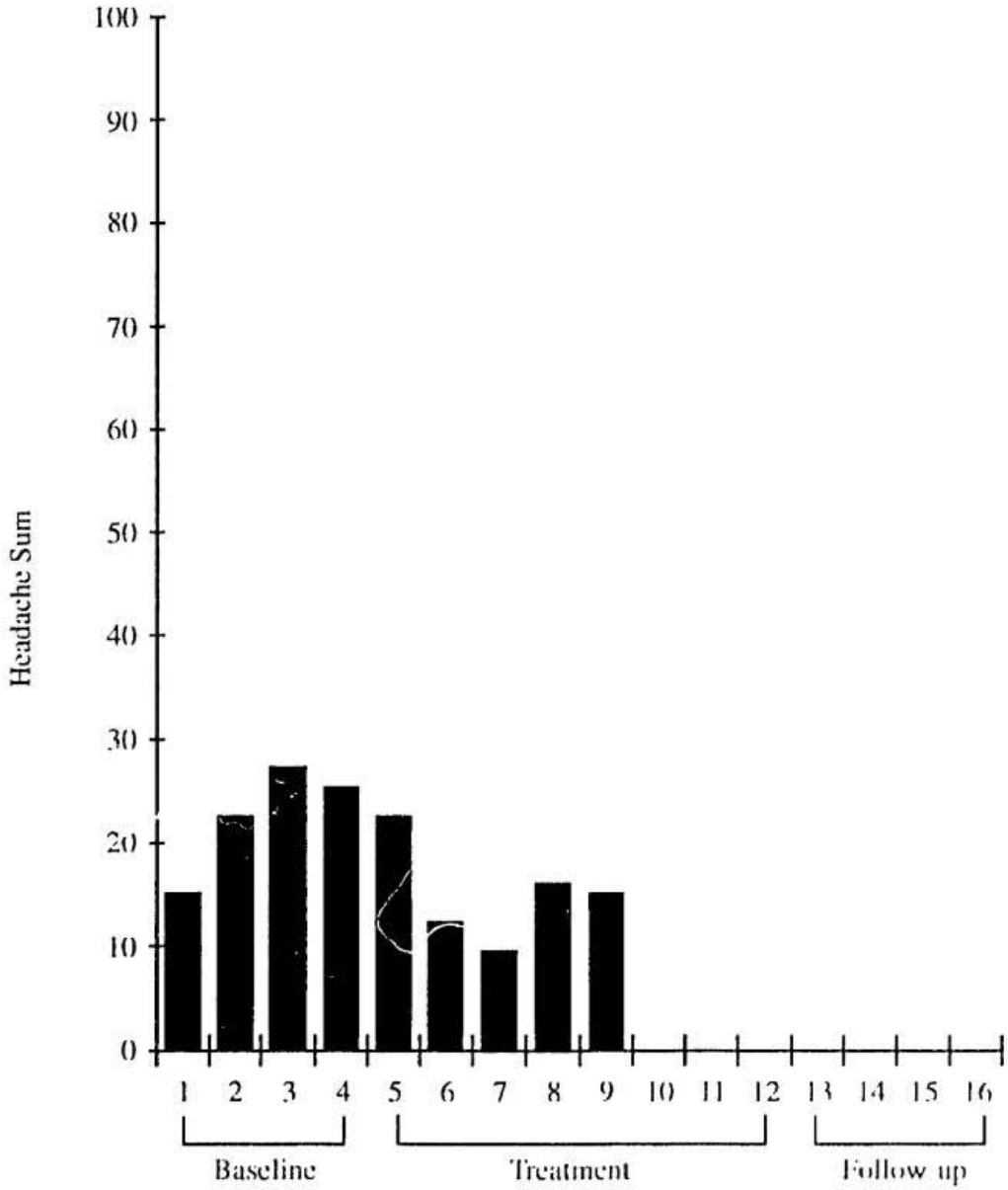

Figure 4. Weekly Headache Sum for Subject 3.

headache sum from baseline to week 6 of treatment place her in the moderately improved category, with a percent improvement of 41.7%.

Sarah was the single subject who returned CHAS data for both baseline and follow-up, and although data analyses were not performed, visual inspection of the data suggests that changes in headache consequences may have coincided with the completion of treatment. Following treatment, Sarah showed some decreases in attention and escape responses, and slight increases in coping responses and medication use (See Figure 5).

Subject 4. Subject 4 was a 10-year-old female (Rhonda), who experienced 27 headaches during the baseline period, for an average of 6.8 headaches per week (sd = 0.50). Her headaches ranged from 2 to 5 in intensity, with a mean intensity of 2.92 (sd = 1.07). Rhonda's headaches lasted on average 3.4 rating periods, a large proportion of the day, with headaches ranging in length from 1 to 4 rating periods. Rhonda's headache sum during baseline was 76.2 (sd = 17.76)(See Figure 6).

Rhonda did not show any significant changes in her headache episodes during treatment. Headaches during this time period occurred just as often, with an average of 7.2 per week; these headaches did not differ in intensity or duration from those experienced during baseline, with average values of 2.92 (sd = 0.59) and 3.72, (sd = 0.81) respectively. Similarly, her headache sum (80.38) did not differ from that during baseline (sd = 7.09); percent clinical improvement based on the last four weeks of treatment was 0.65%. Rhonda's headaches during treatment differed only in terms of peak intensity; Rhonda did not experience any headaches which rated the description "incapacitating (5)" but ranged in intensity from 2 to 4.

Rhonda's greatest improvement was in medication use, which had been identified by her parents as a concern. Rhonda's baseline weekly medication index was

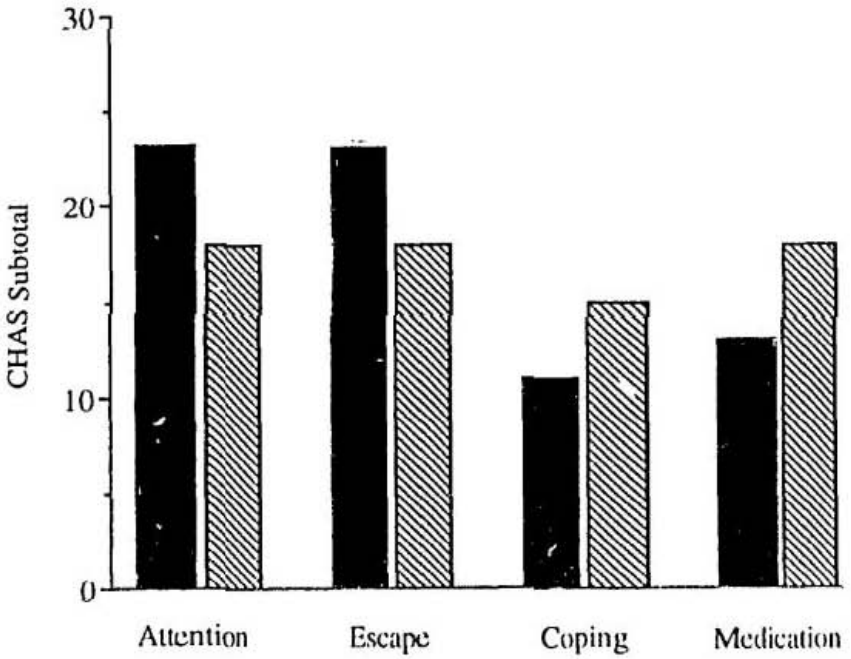

Figure 5. Subject #3: Headache consequences (CHAS) before and after treatment.

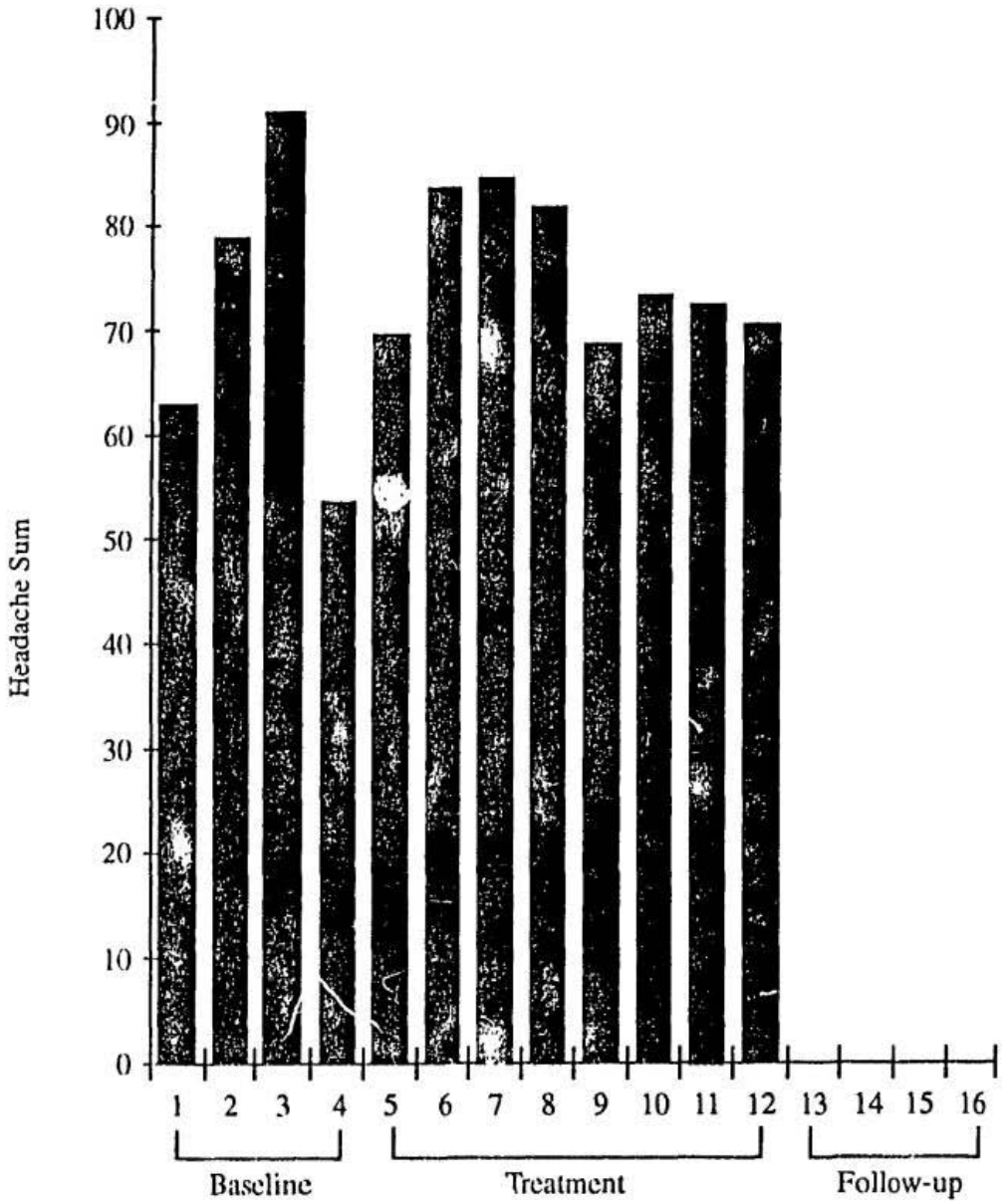

Figure 6. Weekly Headache Sum for Subject 4.

6.0, which corresponds to an average of 6 aspirin per week or 3 doses of a low potency prescription drug per week (e.g. Fiorinal). As evidenced by the standard deviation of 6.05 for the baseline medication index, Rhonda's weekly medication use was extremely variable. During her worst week, Rhonda recorded the consumption of 5 doses each of prescription drugs and aspirin. During the treatment phase of the program, Rhonda did not take any medication, despite experiencing headaches with similar intensities and durations.

Rhonda's compliance to the assigned relaxation exercises was very high; she practiced, on average, 6 times per week. Her pre-relaxation levels were considerably higher than the other children's, with a mean of 4.8 (sd = 2.28), but she was able to consistently lower her tension levels to a post-relaxation level of 0.5 (sd = 0.54) ($t(46) = 8.94$, $p < .001$).

Subject 5. Subject 5 was a 7-year-old male (Tommy), who experienced a total of 24 headaches during the baseline recording period, for an average of 5.8 headaches per week. During this time, his headaches ranged in intensity from 2 to 5, with a mean pain intensity of 3.7 during his headache episodes (sd = .97). Each headache lasted, on average, for 2.0 ratings, the equivalent of a half day, with a range of duration from 1 to 4 rating periods. Tommy's headache sum during baseline was 46.8 (sd = 25.4).

During the eight weeks of treatment, Tommy experienced 3 headaches of mild intensity and 3 consecutive high intensity headaches associated with a concussion (See Figure 6). Despite the inclusion of head injury pain in the headache diary ratings, Tommy's mean headache frequency over this phase decreased to 0.8 (sd =1.16) headaches per week ($t(10) = 8.06$, $p < .001$). As a result of the injury, however, the mean intensity and duration per headache episode did not decrease during treatment (M

= 4.1, sd = 1.26; M = 2.2, sd = 1.47). Tommy's headache sum during treatment was 7.1 (sd = 16.6), which represents a significant drop from the baseline measure ($t(10)=3.288$, $p < .01$)(See Figure 7).

Tommy experienced a few mild head pains during follow-up, but was headache-free, with a mean weekly headache sum of 0.5 (sd = 1.00); thus, he maintained his improvement over baseline ($t(6)=3.632$, $p <.05$). Based on his weekly headache sum, Tommy achieved a clinical improvement of 98.9% from baseline to follow-up. Tommy's medication use was low throughout the program, taking an average of 1 dose per week during baseline, .4 per week during treatment (due to his concussion) and none during the follow-up period.

Tommy did particularly well; he practiced his relaxation exercises 5 to 6 nights per week and was consistently able to reduce his levels of tension; his mean tension level was 3.09 pre-relaxation (sd = 3.02), dropping to 0.45 post-relaxation based on two weeks of practice data (sd = 0.69; $t(20) = 2.83$, $p< .05$)(See Table 1). Records for Tommy's final two weeks of relaxation practice were misplaced by his mother.

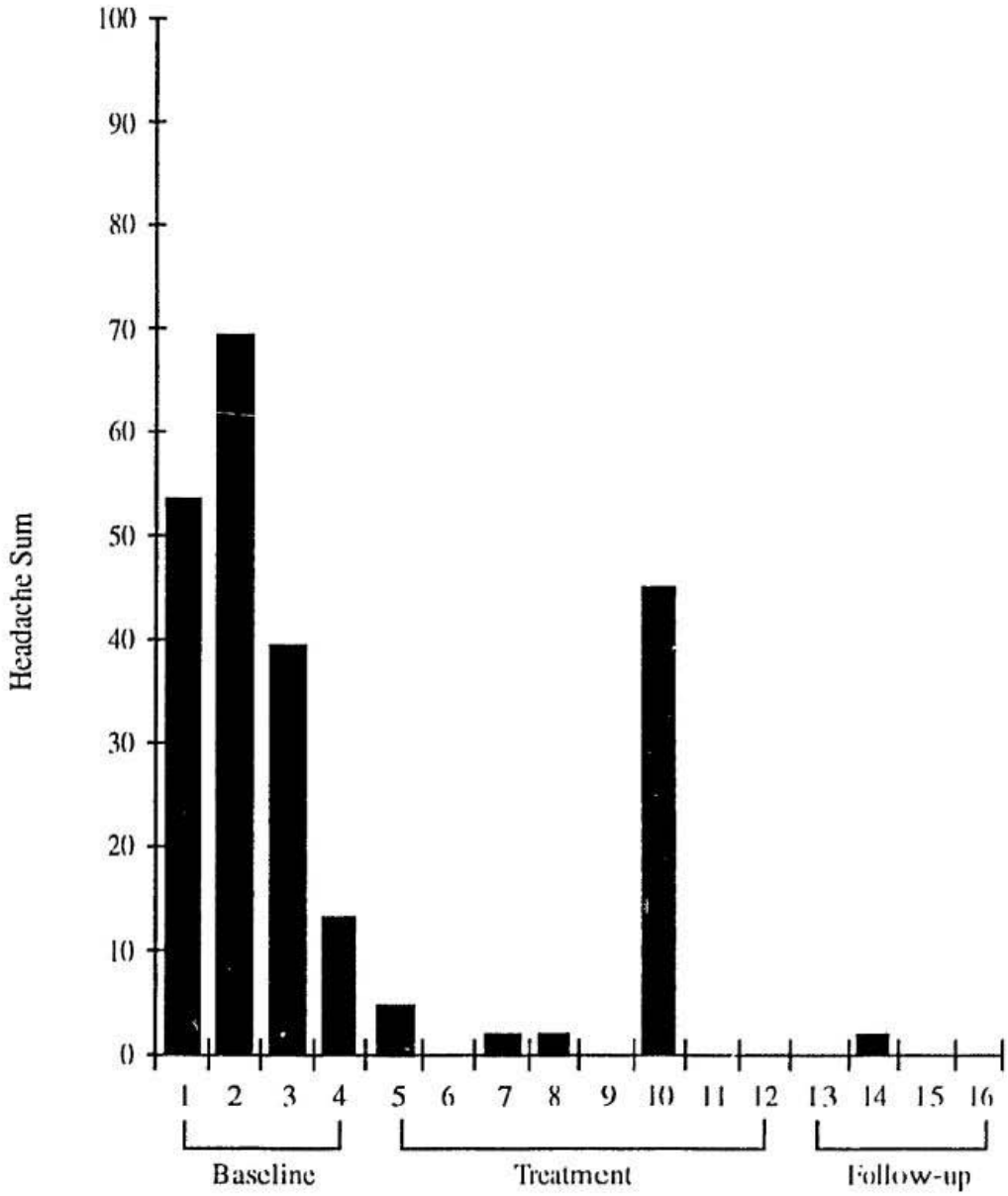

Figure 6. Weekly Headache Sum for Subject 5.

Discussion

Response to Program

Perhaps the most important finding of this study was the lack of response to the new outpatient pain clinic for young children with recurrent headaches. This finding was particularly surprising, as requests from health professionals provided the initial impetus for the development of such a program. The clinic accepted medical referrals for a trial period of 12 months, sending information letters to neurologists and pediatricians at the outset of the program. Effort was also made to reach those children who had not received medical attention for their headaches: letters were written to school guidance counsellors, and advertisements were placed in the local newspaper regarding the clinic. During this time, only 15 children were referred to the clinic.

Two explanations may be proposed to explain this lack of response. The first, and most obvious, is that few children in the region experience recurrent headaches. However, past research has led to the estimation that 11% of all children experience headaches regularly and there is no intuitive reason why this population should be different (Bille, 1962; Sillanpaa, 1983). The initial request by medical professionals for a service focusing in pediatric pain management provides a further argument against a general lack of patients. In addition, the children themselves did not consider their headaches to be unusual; each child in the study knew of at least one classmate or friend who suffered from frequent headaches.

Second, it is possible that misconceptions regarding pediatric headaches may have led parents and physicians to underrate the importance of treating this condition. Although it is now acknowledged that children experience headaches, further information resulting from pediatric headache research may not be incorporated into clinical practice; such a time lag between the acquisition of knowledge and its

practical application is common in health research. Especially resistant to change is the notion that pediatric headache is a transient condition. The prevailing belief that children will outgrow their headaches, along with the knowledge that the recurrent symptoms are relatively benign and not indicative of organic illness, may lead physicians to be rather complacent about the need for intervention. Training in pediatrics tends to reinforce this view; textbooks on pediatric medicine are organized around specific disease entities, giving little attention to symptom-based problems such as pediatric headache (Barlow, 1984).

In addition, the confusion which exists regarding the diagnosis and prevalence of tension headache in childhood means that children who do not present with headaches following the identifiable pattern of classic migraine may remain undiagnosed and untreated, despite the evidence that tension headache seems to have a more favorable prognosis than migraine in children (Bille, 1962; Koch & Melchior, 1969). It was originally thought that children did not experience the tension headaches common in adults because they were not affected by stress and emotional strain as were adults. This is now known to be false; children do experience stress and emotional strain, and epidemiological studies have confirmed the role of emotional issues in pediatric headaches (Barlow, 1984). Pediatric migraines have been shown to be related to stress, therefore, it should not be surprising to realize that children can also suffer from recurrent tension headaches. Practicing clinicians need prevalence data on the various types of headaches experienced by children. Currently available studies, such as Bille's classic 1962 work, have outlined the prevalence of migraine sufferers, but have lumped the remaining non-migrainous headache types into an unspecified "others" category. Also needed are large-scale studies outlining the headache symptoms presented by children of varying ages, as presenting symptoms in infants and very young children suffering from headaches may differ

from those of older children and adults (Elser & Woody, 1990). Up to date information on the prevalence, presenting symptoms, and longevity of pediatric headaches must be disseminated to clinicians in order for available treatment options to be used to their potential. Currently, the need for intervention highlighted by pediatric headache research has not led to treatment options that are readily available to parents of these children.

Subject Population

Description of Headaches. Children in this study suffered from headaches which were of either a migraine or tension type, with one child showing a distinct combined pattern of both types. These children experienced headaches frequently, usually 4 times per week, and the head pain was generally of an intensity which could not be ignored, but which would allow the performance of certain activities. These headaches lasted for approximately one half day.

Environmental Factors. Headaches were most often preceded by stress antecedents; parents identified either worry about an event or a particularly hard day at school as common triggers. Physical antecedents were not as frequent, although bright lights or loud noises were reported to bring on or add to headache pain, a common complaint of migraine sufferers. Prior to treatment, headaches were most often followed by attention or escape consequences, less frequently by coping responses or medication use. Common behaviors used by the children to deal with their headaches included telling their parents about their headaches and receiving comfort. The children did not regularly use coping strategies to help themselves deal with their headaches, but the most commonly used self-help approach was distraction, to continue with normal activities as long as possible. Parents most often tried to help their children by avoiding conflicts and reducing pressures at home or at school.

Medication Use. As a group, the children experienced headaches with a frequency that would likely merit fairly aggressive intervention in an adult population. In contrast, none of these children had been prescribed medication for their headaches, although each child experienced at least one incapacitating headache during baseline which rated the maximum pain intensity level on the scale. In addition, none of the parents were informed about the appropriate use of nonprescription pain medications for their child's headaches. As a result, analgesics were used infrequently and improperly. Parents were very uncomfortable about giving their child analgesics and tended to use them only when their child was in extreme pain. For migraine headache sufferers in particular, this method of administration is ineffective, as analgesics should be used to abort headaches of mild to moderate intensity, before the migraine has fully developed. Often, analgesics given during extreme migraine pain do not remain in the system, as many migraine sufferers will vomit at this stage of the headache.

The undermedication of recurrent pain in these children is not atypical. Historically, there has been a general tendency to undermedicate patients with pain of all types, and recent work has determined that this tendency is particularly pronounced in pediatric populations. Children hospitalized for major surgery receive fewer doses of narcotics and nonnarcotics than do adults with similar diagnoses(Beyer, DeGood, Ashley & Russell, 1983; Schechter, Allen & Hanson, 1986), and although data are not available, it is likely that similar discrepancies in treatment are found in children with chronic and recurrent pain.

There are several possible reasons for this discrepancy. Until recently, it was questioned whether infants and young children could experience pain, due to incomplete myelinization. Although it is still unknown whether children and adults differ biologically in the way they perceive pain, studies investigating infant facial

expressions, cries and physiological responses to invasive medical procedures all report that infants experience pain from birth (Anand & Hickey, 1987; Grunau, Johnston & Craig, 1990). A second concern for physicians was that children and adults might differ in their metabolism of analgesics; fear of improper dosing may have contributed to the practice of not medicating or undermedicating children. Research has shown however, that infants and older children metabolize morphine in the same way, and that children should be medicated on a similar per-kilogram basis as adults (Dahlstrom, Bolme, Feychting, Noack & Paalzow, 1979).

As this information is not new, it is likely that current treatment practices have more to do with prevailing attitudes of health care staff towards children in pain. Surveys have found that both nursing staff and physicians were misinformed about analgesics and tended to undermedicate patients (Weis, Sriwatanakul, Alloza, Weintraub & Lasagna, 1983). However, other studies suggest that these misconceptions are no longer as prevalent, particularly in the younger generation of health care workers (McGrath, Vair, McGrath, Unruh & Schnurr, 1984; Scheehter & Allen, 1986). However, Scheehter and Allen (1986) have found that physicians are still overly concerned about producing addiction in children through the use of narcotics for pain, although studies with adults suggest that the risk of addiction associated with the brief use of medication for pain control is negligible (Porter & Jick, 1980). Unfortunately, the studies described all apply to the treatment of post-operative pain in children. As yet, information on physicians' attitudes and current treatment practices for recurrent and chronic pediatric pain is unavailable.

Effects of Treatment

Headache Symptomatology. As a group, the children participating in this study showed reductions following treatment in both the frequency and intensity of

their headaches. The average headache duration did not show any change following treatment, nor did overall headache sum. This was not surprising, however, since two of the 5 children experienced headaches relatively infrequently. As the headache sum is based on all 28 intensity ratings per week, subjects with few headaches have multiple ratings of 0 and only a small proportion of actual headache intensity ratings, which results in a reduced sensitivity to changes in headache intensities. Similar results have been found in other studies, in that headache duration and headache sum often prove to be resistant to treatment (Duckro & Cantwell-Simmons, 1989; Engel et al., 1992; Richter et al., 1986).

On an individual basis, two subjects did not show any statistically significant improvement in their headache symptomatology, although only one subject was considered clinically unimproved. The remaining three subjects showed changes in headache sum scores which were rated clinically as "much improved"; only one of these subjects showed a statistically significant change in headache sum scores. The two subjects who presented with comparatively low headache frequencies at baseline were either headache-free or experienced a single headache during treatment and during the follow-up period. The final subject showed statistically significant reductions in both headache frequency and headache sum during treatment and was headache -free during follow-up.

The subject who was not improved by the treatment program differed from the other children in two ways. First, Rhonda was experiencing headaches more often and with greater intensity, her headache sum being the highest of the five subjects throughout the program. Past research has found that patients with very frequent headaches were less likely to adhere to the treatment program, preferring to use their headache-free time to its best advantage. Rhonda did practice regularly, but seemed less involved with the exercises than the other children. Second, this child had many

other concerns that needed to be addressed besides her recurrent headaches. She was not doing well in school, was very quiet and withdrawn, extremely clingy and fearful of being left alone. Often she was listless during her appointments and seemed to have difficulties concentrating. Learning to control her headaches seemed more important to her parents than to her.

Environmental Factors. Unfortunately, CHAS data were not available to do group analyses of any changes in antecedents or consequences of the children's headaches corresponding with relaxation and stress management training. However, inspection of Sarah's CHAS data before and after treatment suggest that participation in a cognitive-behavioural treatment program may lead to changes, not only in headache symptomatology, but also in the environmental factors surrounding the child's sickness behaviours. Use of the CHAS in future studies of this type may lead to a description of typical environmental factors surrounding headache events, as well as serving as a method of treatment evaluation which reflects any increases and /or decreases in positive coping strategies.

Medication Use. One focus of the treatment program was to educate both the parents and the children on the appropriate use of medication. The migraine sufferers were taught to recognize their particular "warning signs"; all three children with migraine type headaches experienced physical symptoms which distinguished their full-blown migraine headaches from milder headaches. They were encouraged to practice their preferred coping strategies at this time, and to take a preventative dose of medication. The two younger children were able to use this information particularly effectively; their parents were much more comfortable with the idea of small doses of medication as a preventative measure and were willing to trust the child's judgement of when this was necessary. The youngest child, Tommy, was able to enlist his teacher's help in carrying out his coping strategies; aspirin was stored in

the teacher's desk for him to use as needed. Previously, he was given aspirin only when his headaches were severe, usually just prior to being sent home.

Relaxation Exercises

As expected, the children were easily able to master the assigned relaxation program. Compliance was high, the children practiced fairly regularly and all children were able to reduce their tension levels significantly through relaxation. One subject lost the motivation to practice after the second week of assignments. He was not having any headaches and the benefits did not seem worth it to him, as he was spending more time practicing than he spent suffering from headaches. Other studies have recorded this response from patients experiencing infrequent headaches, the cost benefit ratio does not seem worthwhile to some patients (Burke & Andrasik, 1989, Richter et al, 1986).

With a small subject sample, the quantity and quality of relaxation exercises could not be related to treatment success statistically. However, 2 of the 3 subjects showing large improvements in headache symptomatology reported regular use of relaxation outside of practice times, as well displaying their own personalized variations on the basic exercises which were developed for use in specific places or situations. This may suggest that quality of relaxation use is the more important factor, as all five children showed fairly regular frequencies of practice.

Applicability of program for young children

The results of the present study suggest that young children are able to use cognitive-behavioural strategies to reduce headache symptomatology. The children in this study had little difficulty understanding the physiological mechanisms of their headaches and the rationale behind cognitive-behavioral strategies designed to both

avoid headache episodes and to cope with headache pain. The four children who were able to improve their headache symptoms could see how environmental factors could act as triggers to their headaches and were able to identify a few of their own triggers using their headache diaries.

The children were generally very compliant in completing their headache diaries, although two children did not submit follow-up data. The children did not miss rating periods, the majority of the weekly records were perfectly done. When data were missing, entire weekly blocks would be "forgotten" or "lost", although both parent and child said the work was done. Similar problems were found in a study by Burke and Andrasik (1989).

Parental compliance, by which is meant pursuing referrals to the clinic, attending sessions and mailing in follow-up records, was very poor. Fifteen acceptable referrals were made to the pain clinic during the 12 month period. Of these, only 8 children began treatment, representing a 47% loss of referrals before treatment was begun. The majority of parents seemed to feel that the program demanded too much of their time. Three more children (20%) quit soon after baseline recording was completed, to give a total subject loss of 67%. Although this is a high drop-out rate, it is not uncommon; studies calculating drop-out rates during treatment have subject losses ranging from 27% to 60%, without taking into account any loss of original referrals (Larsson & Melin, 1986; Larsson , Daleflod et al., 1987; McGrath et al., 1988).

Difficulties did not end once a subject was involved in treatment; scheduling problems and no-shows were a common-place occurrence with the subjects in this study. Missed appointments were always rescheduled, but by and large, it was a difficult task to maintain regular appointments. In addition, parental cooperation with various tasks was extremely poor. CHAS questionnaires were not returned for

the follow-up period, nor were headache diaries in two cases, and a questionnaire sent to the parents of all 15 of the original referrals came back unanswered.

Poor adherence to treatment programs is typical of recurrent headache sufferers, for example, studies suggest that 50% of adults and children fail to adhere to prescribed medication regimens (Dunbar, 1983; Packard & O'Connel, 1986). Psychological interventions, which require a greater commitment in terms of boa time and effort, may be even more susceptible to poor adherence by subjects. Problems with adherence may be related to the age of the patient. When treating young children compliance is based not only on the child's behavior, but on the parent's as well. Even in the current program, which had minimal parental involvement, young children were entirely dependent on their parents for transportation to scheduled appointments. Some programs have found higher dropout rates for younger children, and have attributed these results to the additional problems encountered due to parental involvement (Guibert, Firestone, McGrath, Goodman & Cunningham, 1990). Many studies using adolescents circumvent this problem by conducting treatment groups within the high school setting, thereby facilitating attendance(Larsson & Melin, 1986; Larsson , Daleflod et al, 1987; Larsson, Melin et al, 1987). This may also be the solution to treatment programs for nursery school and school age children. Treatment packages such as the one used in this program are easily conducted in group sessions, and if necessary, nonpsychology staff could be trained to conduct portions of the program. Running a treatment group during school hours would eliminate the proportion of non-compliance which can be attributed to parental factors. As an additional bonus, exposure to the use of cognitive-behavioral strategies in a school setting would give children greater freedom to use their newly acquired prevention and/or coping skills during class time.

The present study fell short of its original goals to determine both the success with which preadolescent children could use a cognitive-behavioural program to reduce their headache activity, and to isolate any symptomatic or treatment-related variables associated with treatment success. Five subjects completed the treatment program, four of whom evidenced clinically significant treatment gains. These results suggest that young children are able to master the skills of relaxation and stress management, and may be able to use these skills to target headache symptomatology. However, large scale studies are needed to clarify the relative proportion of subjects helped by a behavioural treatment, as well as to identify any general characteristics of those children termed treatment successes.

The subject loss, general lack of referrals and difficulties with parental involvement encountered during the course of this study highlights the degree to which recurrent pain in a pediatric population is ignored. In terms of research, considerable progress has been made towards the acknowledgement and treatment of acute and procedural pediatric pain. Fewer efforts have targetted the more common experience of recurrent pain in children, but both the present study and past work suggest that cognitive-behavioural approaches would be a viable treatment alternative for preadolescent children with recurrent headaches, particularly as physicians and parents are generally reluctant to prescribe medication to this age group. Conducting treatment sessions for this age group present several challenges to the clinician in terms of adherence and scheduling regular appointments, but the development of school-based programs is a promising alternative.

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Appendix A

Children's Headache Assessment Scale (CHAS)

For this questionnaire, you are to circle a number from 0 to 6 to indicate how often the situation or event occurs in relation to your child's headaches. Rating choices are:

0 = never
1 = almost never
2 = seldom
3 = half the time
4 = usually
5 = almost always
6 = always

1. My child gets headaches during or after unexpected events	0 1 2 3 4 5 6
2. When my child has a headache, he or she finds it helpful to have a warm drink, a favorite food, or some other treat.	0 1 2 3 4 5 6
3. My child's headaches require him or her to come home from school or leave class until they subside.	0 1 2 3 4 5 6

4. Headaches tend to occur on hot days, when the weather changes, or when the child is out in the sun for prolonged periods.	0	1	2	3	4	5	6
5. My child tries to distract his or her thoughts away from the pain as a way of dealing with headaches.	0	1	2	3	4	5	6
6. My child's headaches respond to aspirin or other over-the-counter medications.	0	1	2	3	4	5	6
7. Headaches occur when my child becomes overexcited about something.	0	1	2	3	4	5	6
8. I try to console my child when I learn that he or she has a headache.	0	1	2	3	4	5	6
9. Headaches can keep my child from completing homework, chores, or lessons.	0	1	2	3	4	5	6
10. Bright lights or loud noises set off my child's headaches or make them worse.	0	1	2	3	4	5	6

11. When a headache starts, my child keeps on doing what he or she was doing before the headache.	0	1	2	3	4	5	6
12. My child takes prescription pain-killers when he or she has a bad headache.	0	1	2	3	4	5	6
13. My child worries about things.	0	1	2	3	4	5	6
14. My child likes to have a back rub, neck *rub, or massage to ease the headache pain.*	0	1	2	3	4	5	6
15. I try to reduce the pressures on my child at home or at school to prevent headaches.	0	1	2	3	4	5	6
16. My child's headaches occur after eating certain foods (such as chocolate, chinese food, or citrus fruits).	0	1	2	3	4	5	6
17. My child seems to accept headaches as any other hassle in life that can be managed.	0	1	2	3	4	5	6
18. My child uses medications to *prevent* headaches.	0	1	2	3	4	5	6

19. My child sets high standards and is perfectionistic about things.	0	1	2	3	4	5	6
20. My child tells me when he or she has a headache.	0	1	2	3	4	5	6
21. My child's headaches are so bad that he or she can't get out of bed in the morning.	0	1	2	3	4	5	6
22. *Vigorous exercise or sports activity* precede my child's headaches.	0	1	2	3	4	5	6
23. Taking a few deep breaths and thinking about a calm or pleasant scene seems to help my child deal with headaches.	0	1	2	3	4	5	6
24. My child uses prescription medication at the first sign of a headache to ease or end the pain.	0	1	2	3	4	5	6
25. Headaches seem to come after one or more especially hard days for my child.	0	1	2	3	4	5	6

26. When my child has a headache, I ask where it hurts, when it started, or if there is anything I can do to help.	0	1	2	3	4	5	6
27. When my child has a headache, I try to avoid arguements, conflicts, or other things that might aggravate the headache.	0	1	2	3	4	5	6
28. Hunger or skipping a meal can bring on headaches.	0	1	2	3	4	5	6
29. My child seeks out activities (such as physical exercise or going someplace) when a headache occurs to make it better.	0	1	2	3	4	5	6
30. Medication seems to help in treating my child's headaches.	0	1	2	3	4	5	6

Appendix B

Headache Diary

Intensity Ratings

0 - no headache

1 - Headache - I am only aware of it if I pay attention to it.

2 - Headache - but I can ignore it at times.

3 - Headache - I can't ignore it but I can do my usual activities.

4 - Headache - It is difficult for me to concentrate; I can only do easy activities.

5 - Headache - I can't do anything.

Headache Diary

Name: Week Beginning:

	Time	Intensity	Medication	Other Symptoms	Possible Causes
Day #1	Breakfast				
	Lunch				
	Dinner				
	Bedtime				
Day #2	Breakfast				
	Lunch				
	Dinner				
	Bedtime				
Day #3	Breakfast				
	Lunch				
	Dinner				
	Bedtime				
Day #4	Breakfast				
	Lunch				
	Dinner				
	Bedtime				
Day #5	Breakfast				
	Lunch				
	Dinner				
	Bedtime				
Day #6	Breakfast				
	Lunch				
	Dinner				
	Bedtime				
Day #7	Breakfast				
	Lunch				
	Dinner				
	Bedtime				

Appendix C

Headache History

1. Do you have more than one kind of headache? (if yes, go to #5 for full descriptions, take histories separately)

2. When did headaches first become a problem for you?
   a. When did you first seek medical attention for headaches?
   b. Was the onset of headaches associated with any particular physical event or psychosocial event?
   c. Had you had headaches prior to this time?

3. What has been the history of your headaches?
   a. Have there been periods when headaches were more frequent or less frequent?
   b. What was going on then, psychologically and physically?
   c. Have there been periods of months or years with almost no headaches?
   d. What kinds of treatments and diagnostic work have you recieved for your headaches?
   e. What diagnosis have you been given by physicians of your headaches?

4. What has been the recent frequency of your headaches?

5. Describe your headache for me in detail.

a. Where on your head do they seem to start?

b. how do they change over time?

Time course?

Regularity? (follow a general pattern?)

Description of the pain itself.

Phenomenology? (sensations, perceptions, thoughts, self-statements)

c. How long do they last?

d. What can cause them to stop?

e. What helps ease the pain?

f. What things make them worse? (coughing, muscle straining)

g. What happens during the headache?

- vomiting?

- nausea?

- sensitivity to light?

- dizzinesss?

- blurred vision?

- tearing eyes? etc.

h. Are they associated with your menstrual cycle?

i. Do they start at any particular time of the day?

j. Do you have any kind of warning signs that a headache is about to start?

k. What kind of things happen that bring on a headache?

l. What kinds of thoughts do you have when you know that a headache is beginning?

6. a. When you have a headache, what do you do?

b. Do your headaches ever cause you to go to bed?

c. Do your headaches ever cause you to leave school? How often?

d. Do you headaches ever cause you to slow down or become less efficient?

e. Do you ever have to forgo activities (outings, parties) because of your headaches?

f. Can members of your family (parents, siblings) tell when you have a headache? How can they tell?

g. What do they do when you have a headache?

- express concern?

- do they offer help?

- do they do things for you?

h. Do you do things to try to prevent having headaches?

i. Have your headaches ever interfered with your life in any important way?

7. Have you ever had any major illnesses or operations?

8. Have you ever had any special difficulties with

a. your eyes? Were headaches associated in any way?

b. your ears? Were headaches associated in any way?

c. your throat? Were headaches associated in any way?

d. allergies? Were headaches associated in any way?

9. Are you currently taking any medications for headaches? How much do they help?

10. Are you taking any other prescription drugs regularly?

11. Some kinds of headaches tend to run in families. These next questions are about your family's headaches.

a. Do either of your parents have a problem with headaches?

if yes, were you ever told what kind of headaches?

did he/she ever have sick headaches, that is, headaches so bad that he/she had to go to bed?

b. Did any of your grandparents have a problem with headaches?

What do you know about them?

c. Did any of your aunts and uncles ever have headaches?

d. Do your siblings have problems with headaches? What do you know about them?

12. Now I need some information on your current life situation.

a. Do you have any problems with your parents?

b. Are there any problems with your siblings?

c. Do you have some close friends?

How many?

Have there been any difficulties with friendships?

13. How are you getting along with your school work?

a. Are there any problems? (especially with teachers)

b. How are you handling these problems?

c. Do you feel under a lot of pressure in

school?

d. Does this seem related to headaches? How?

14. Have you ever been very depressed? Are you depressed now?

15. Have you ever had a problem with alcohol or other drugs?

Appendix D

Ad Hoc Committee Classification of Headache

1. Vascular headaches of the migraine type.

Recurrent attacks of headache, widely varied in intensity, frequency and duration. The attacks are commonly unilateral in onset; are usually associated with anorexia and, sometimes, with nausea and vomitting; in some are preceded by, or associated with, conspicuous sensory, motor, and mood disturbances; and are often familial.

Evidence supports the view that cranial arterial distention and dilation are importantly implicated in the painful phase but cause no permanent changes in the involved vessel. Listed below are particular varieties of headache, each sharing some, but not necessarily all, of the above-mentioned features:

Classic Migraine. - Vascular headache with sharply defined, transient visual, and other sensory or motor prodromes or both.

Common Migraine. - Vascular headache without striking prodromes and less often unilateral than classic migraines and cluster headaches. Synonyms are: "atypical migraine" or "sick headche". Calling attention to certain relationships of this type of headache to environmental, occupational, menstrual, or other variables are such terms as: "summer", "Monday", "weekend", "relaxation", "premenstrual", and "menstrual" headache.

Cluster Headache. - Vascular headche, predominantly unilateral on the same side, usually associated with flushing, sweating, rhinorrhea, and increased lacrimation; brief in duration and usually occuring in closely packed groups separated by long remisssions.

Hemiplegic Migraine and Opthalmoplegic Migraine. - Vascular headache featured by sensory and motor phenomena which persist during and after the headache.

Lower-Half Headache. - Headache of possibly vascular mechanism, centered primarily in the lower face.

2. Muscle Contraction Headache.

Ache or sensations of tightness, pressure, or constriction, widely varied in intensity, frequency, and duration, sometimes long-lasting, and commonly suboccipital. 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. The ambiguous and unsatisfactory terms "tension", "psychogenic", and "nervous" headache refer largely to this group.

3. Combined Headache; Vascular and Muscle Contraction.

Combinations of vascular headache of the migraine type and muscle-contraction headache prominently coexisting in an attack.

4. Other.

Appendix E

Parent Information Package

Consent Form

I, _____, agree to have my child, _____, participate in a study on the treatment of pediatric headaches that is being carried out by Marilyn Hill under the supervision of Dr. Christine Arlett of the Department of Psychology, Memorial University of Newfoundland. I understand that the treatment program has not previously been offered in Newfoundland and is being evaluated with the aim of including it into the proposed pain clinic to be set up in the Thomas Anderson Centre.

I understand that this is a 15 week program which requires extensive recording of my child's headache symptoms for the duration of contact. In addition, I understand that I will be asked questions about the situations and events surrounding my child's headaches. I also understand that participation in the program will require approximately 30 minutes of my child's time per day.

It has been made clear that my anonymity is guaranteed and that participation in the study is completely voluntary. As such, I may withdraw at any time. I have been informed that any questions regarding the study may be directed at Marilyn Hill (737-8792) or Dr. Arlett (576-6547). Any complaints about the study may be discussed with Dr. Ross, acting head of the Department of Psychology.

My signature below indicates that I have read this form completely and agree to participate in this experiment.

Signature _____.

Date _____.

Appendix F

Physician's Information Package

Dear _____,

Your patient, _____, has been referred to the behavioural treatment program for pediatric headaches that has been set up at the Dr. Thomas Anderson Centre. The headache treatment being offered is a sixteen week program of training in both relaxation and stress management procedures, an outline of which has been included in this package. The treatment has been shown to be effective for children aged twelve and older and is now being extended to a younger age group. During the course of treatment we require that our clients discontinue any prophylactic medications, although analgesic use will not be restricted.

Prior to beginning our program we request that each client see his/her family doctor for a general check-up. The reason for this is two-fold: first, we wish to ensure that each client is physically sound and that they have the consent of their family doctor to participate in the program, and second, we wish to have a medical diagnosis of the headache type suffered by your patient. Included with this form is the Ad Hoc Committee Classification of Headache which is being used in our program, it would be greatly appreciated if you could inform us of your diagnosis using the abovementioned guidelines. If you have any questions regarding the program, please do not hesitate to contact me at 737-8792 or by leaving a message at the Dr. Thomas Anderson Centre (576-6547).

Sincerely,

Marilyn L. Hill

Outline of Treatment Sessions

week 1: Introduction

- collection of information on headache symptoms.
- description of headaches & the role of stress
- purpose of the program
- assigned exercises
- introducing the headache diary

weeks 2, 3 & 4

- baseline headache activity

weeks 5,6,7,8,9,10,11,12: Treatment

- becoming aware of stress
- stress and positive thinking
- relaxation
- negative thoughts and unrealistic beliefs
- imaging to control stress & lessen pain
- preparing for an upcoming stressful event
- problem-solving
- four stages for handling a headache
- other techniques for dealing with headaches (ie. attitude)
- conclusion

weeks 13, 14, 15 & 16: Follow up

Physician's Consent Form

I, _____, have examined my patient, _____, in order to determine his/her suitability for inclusion in the headache treatment program being offered by the Dr. Thomas Anderson Centre. I feel that he/she may / may not (please circle) safely participate in the program at the present time. A brief description of his/her headache diagnosis is outlined below:

Signature _____.

Date _____.

Appendix G

Outline of Treatment Sessions

week 1: Introduction

- description of migraine & the role of stress
- purpose of the program
- assigned exercises
- introducing the headache diary

weeks 2,3 &4

- baseline headache activity

week 5: Treatment / Chapter 1

- becoming aware of stress
- basic relaxation exercise

week 6: Treatment / Chapter 2

- stress & positive thinking
- becoming aware of & changing negative thoughts
- thinking positively during a headache
- relaxation

week 7: Treatment / Chapter 3

- negative thoughts & unrealistic beliefs
- identifying & changing unrealistic beliefs
- relaxation without tension

week 8: Treatment / Chapter 4

- attention focusing
- thought stopping

- relaxation without tension

week 9: Treatment / Chapter 5

- imaging to control stress & lessen pain

- mental games

- preparing for an upcoming stressful event

- relaxation using imagery

week 10, Treatment / Chapter 6

- assertiveness vs. passiveness vs. aggression

- refusing & making requests, expressing anger

- mini relaxation

week 11: Treatment / Chapter 7

- problem-solving

- relaxation without the tape

week 12: Treatment / Chapter 8

- four stages for handling a headache

- other techniques for dealing with a migraine

weeks 13, 14, 15 & 16

- follow-up headache activity

Appendix H

Relaxation Home Assignment

Before Practice	After Practice
Tension level	Tension level
0 ----------> 10	0 ---------- > 10
none highest	none highest

Day 1

Day 2

Day 3

Day 4

Day 5

Day 6

Day 7

Appendix I

Questionnaire

The Dr. Thomas Anderson Centre is presently conducting a survey to evaluate the programme presently being offered for children with recurring headaches. In addition to questioning the families who participated in the programme, we are also interested in the families who expressed interest in the clinic, but who decided not to have their child attend. Our purpose in doing this is to improve our existing programme by discovering why you felt the clinic was not appropriate for your child. The following questionnaire asks questions about features of the program which you might have found unappealing, as well as about your child's headaches. Thank you in advance for your help in improving our service for children with recurrent headaches.

Please answer yes or no to the following statements about the program.

1. I felt the program was too long. yes no

2. I did not think the treatment sounded right for my child.

yes no

3. My child was too busy to attend the clinic every week.

yes no

4. My child was not interested in the program.

yes no

5. My child was put on medication for the pain.

yes no

6. My child's headaches improved suddenly. yes no

7. My doctor advised us not to participate in the program.

yes no

8. I was not able to bring my child to the clinic once a week.

yes no

9. Keeping daily headache diaries would have taken too much time.

yes no

10. I did not feel I should have to take my child to the doctor for another checkup.

yes no

11. I have been told that my child will grow out of his/her headaches.

yes no

12. Other reasons (please describe):

Appendix J

Relative Potency of Headache Drugs

1	2	3	4	5	6	7
APC	Darvon	Cafergot	Codeine	Demerol	Dilaudid	Morphine
Alka Seltzer	Fiorinal	(Cafregot)	Empirin Compound			Nuvaine
Anacin	Darvocet N	Cynergen	(with Codeine #3)			
Aspirin	Dolene	Flexeril	Leratine			
Bufferin	Soma	Librium	Ponstel			
Cope		Valium	Talwin			
Emperin		Triavil	Percodan			
Midrin		Inderal	Tylenol III			
Nervine		Tranxene	(with Codeine)			
Norgesic		Ergostat	Empracet			
Parafon		Tofranil	Tylenol IV			
Persistin		Elavil	(with Codeine)			
Phenaphen		Propranolol				
Robaxisal		Sansert				
Sinutab		Ergomar				
Tylenol		Zomax				
Vanquish		Dilantin				
Corincidin D		Sinequan				
Cornicider		Endep				
Arthritic Ascription		Seconal				
Actifed						
Phenulin						
Motrin						
Idenal						
Dimetapp						
Sudafed						
Percogesic						
Rondec						