

Headache:

a 'suitable case' for behavioural treatment in primary care?

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ABSTRACT

Headache is a health problem with considerable impact at personal, social, and financial levels in terms of distress, disability, and cost. In the past, many studies have investigated the use of various behavioural treatment modalities for headache. Literature reviews consistently support the effectiveness of behavioural therapeutic approaches for the treatment of the most common primary headaches, namely migraine and tension-type headache. This article recommends that behavioural headache therapies should be developed, tested, and integrated into primary care practice, where most patients with headache are seen and treated. The large population seen in general practice, most of whom have uncomplicated primary headaches, could represent the ideal target for testing behavioural therapies.

Keywords

behaviour; headache; migraine; primary care; tension-type headache; therapy.

INTRODUCTION

Headache affects 91% of males and 96% of females at some point during their lifetime.¹ The majority of headaches are benign: less than 0.1% of the lifetime prevalence of headache is associated with life-threatening brain lesions.² In a Danish study, Rasmussen reported that the 1-year period prevalence of migraine was 6% in males and 15% in females; for tension-type headache it was 63% in males and 86% in females.²

Headache disorders were first comprehensively classified in 1988 with the first edition of the International Classification of Headache Disorders (ICHD-1).³ The second edition, ICHD-2, was published in 2004.⁴ This new classification, forming the basis for clinical diagnosis and research, differentiates headaches that are 'secondary' to organic disorders from those that it classifies as 'primary'.

Primary headaches are among the most common benign conditions affecting the general adult population.⁵ Migraine and tension-type headache are the two main classifications of primary headache and represent the two most prevalent headache subtypes that frequently affect the general population. Chronic headaches — the third headache subtype in terms of prevalence — affect about 5% of the general population.⁶ Any headache with an incidence or occurrence of 15 or more days per month has been defined as chronic headache.⁷ This arbitrary definition covers a wide spectrum of headaches⁷ that have a daily or near-daily impact.

Many of those with headaches do not seek medical care, remaining without a diagnosis and without access to systematic treatment,^{8,9} despite that they are likely to be experiencing considerable functional impairment and, consequently, personal distress.¹⁰ Estimates from 1992 suggest that in the UK 18 million working days are lost every year because of migraine.¹¹ The World Health Organisation's Global Burden of Disease Study ranked severe continuous migraine in the highest disability class,^{12,13} alongside conditions such as active psychosis and dementia. This disability is reflected in the cost of migraine to

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the total US workforce, which was estimated by Hu *et al*¹⁴ at approximately US\$13 billion per year in terms of missed work days and lost productivity. Furthermore, they estimated the direct medical costs for migraine care in the US at US\$1 billion per year.¹⁴ There has been no recent estimate of these costs for the UK.¹⁵

The lack of effective care for many of those prone to headaches is a significant public health problem.¹⁶⁻¹⁸ One in two patients with migraine discontinues seeking care, partly because of dissatisfaction with treatment.¹⁹ Data from a survey of health consumers' perceptions show that those with headaches are among the most dissatisfied of all patients.²⁰

Some patients with headache have coexisting psychological symptoms.²¹ In support of this, Ridsdale *et al* have reported significant impact and disability among patients consulting their GP with headaches: a third of these patients had coexisting anxiety and/or depression.²² Ridsdale *et al* found that patients with headaches who were referred to neurologists consulted more frequently, attributed more symptoms to headache, and had stronger emotional representations (being more anxious and worried about their headache symptoms) than patients who were not referred.²²

Drug therapies are the primary management strategy for headache, with clinically well-established approaches to acute treatment and prophylaxis. For migraine, pharmacological interventions aimed at preventing recurring attacks include β -blockers, antidepressants, calcium-channel blockers, and anticonvulsants.¹⁹ The treatment of acute episodes includes analgesics, non-steroidal anti-inflammatory drugs (NSAIDs), and triptans.²³ Regarding tension-type headache, well-established treatments include the tricyclic antidepressant amitriptyline for preventative therapy and simple analgesics and NSAIDs for acute attacks.²⁴ Some important limitations of the pharmacological therapies include:²⁵

- high costs related to medication use or overuse;
- medical contraindications;
- medication intolerance;
- patient preference; and
- medication effectiveness and/or efficacy.

The need for non-pharmacological, alternative, or adjuvant treatments that take account of the conceptualisation of headache as a psychophysiological disorder seems to be well recognised,²⁶ but they are not currently applied in general practice. This article approaches headache as a complex condition, including stress and illness,

with significant impact on individuals and the community. Focusing on behavioural interventions for adult headache, it offers insights into the development and integration of headache behavioural treatments into primary care settings.

NON-PHARMACOLOGICAL HEADACHE TREATMENTS

Behavioural therapies and physical treatment approaches are among the non-pharmacological interventions for use in headache management. The first descriptions of behavioural treatments for headache were reported over 30 years ago. Behavioural treatments can be used as alternatives or adjuncts to pharmacological treatment and are based on the concept that patients should have a personal, active involvement in their treatment. In behavioural approaches, the locus of control for managing symptoms is transferred from the healthcare provider to the patient. Considering emotional, mental, and social parameters that could influence the headache condition, these treatments are aimed at enabling those with headaches to handle pain and symptoms associated with their headaches more effectively.²⁷

Behavioural interventions are based on strategies that aim to identify and change possible headache-precipitating factors or to develop physiological autoregulation abilities with the potential to prevent and manage headache episodes. The interventions may lead to less headache-related disability.²⁸

Physical therapy, massage, chiropractic therapy, osteopathic manipulation, and other physical interventions for headache represent non-pharmacological approaches that are commonly sought by patients experiencing a range of primary headache disorders.²⁹ There is a lack of evidence regarding the efficacy of these treatments in decreasing headache frequency, intensity, duration, and disability in clinical practice.²⁹ Therefore, the current focus is on behavioural approaches for which there is evidence of efficacy.

How this fits in

GPs are consulted by 4% of their adult patients for headache each year. Drug therapies are costly, have side effects, and may lead to harm through analgesic overuse. This paper reviews evidence for the effectiveness of behavioural treatment interventions in headache management, most of which comes from the US. It opens a debate about testing, shifting, and integrating behavioural therapies in British primary care.

Overview of behavioural headache treatment approaches

Behavioural strategies include relaxation training, biofeedback training, cognitive behavioural therapies, or some combination of these. A variety of novel forms of behaviour therapy delivery have been developed that include minimal therapist contact treatments, group treatments, 'home-based' treatments, and internet-based treatments. These delivery models of behavioural therapy are linked with the issues of cost and efficiency.

Relaxation training. Relaxation approaches for headache are the most common in literature and in clinical practice. Andrasik reports progressive muscle relaxation, autogenic training, diaphragmatic breathing, meditation, and guided imagery as examples of relaxation treatment.³⁰ The ability to relax seems to enable those with headaches to decrease their overall sympathetic arousal, with a concomitant reduction of processing peripheral sensory inputs.³¹ In addition, reduction of anxiety may increase pain tolerance.

Relaxation techniques, however, are more likely to play a palliative and prophylactic role: those with headaches often report results such as a shortening of the expected duration of attack.³⁰ A relaxation training protocol may include several sessions (for example, 10 or more). After experience has been gained, relaxation techniques can be recalled rapidly or even automatically.²⁶

Biofeedback training. Biofeedback is based on the principle of monitoring physiological processes that are not usually under voluntary control – such as pulse, blood pressure, peripheral blood flow, and muscle tension – then feeding this information back to the patient via a visual or auditory signal.^{30,32} With this technique patients can learn to gain and enhance control over physiological processes. Andrasik³⁰ dichotomises biofeedback training as general or specific. General biofeedback is similar to relaxation in approach, but can give rise to a more intensive generalised condition of relaxation. Physiological response systems, such as electromyographic activity (muscle tension of head, neck, shoulders), electrodermal activity (sweat gland response), and peripheral temperature, which are responses to sympathetic activity, can be easily monitored, elaborated, and fed back to the patient.³⁰

Specific biofeedback (blood volume pulse, electroencephalographic and Doppler blood-flow feedback) is targeted at regulating dysfunction in the underlying response system, as this could be the triggering mechanism for the painful

Table 1. Behavioural migraine treatment meta-analytic data:⁴⁰ summary of effect-size scores.^a

Type of intervention	Effect size	95% CI
No treatment (control)	0	–
Placebo	0.16	–0.31 to 0.63
Relaxation training	0.55	0.14 to 0.96
Thermal biofeedback	0.38	–0.18 to 0.94
Thermal biofeedback with relaxation	0.40	0.01 to 0.79
Electromyographic biofeedback	0.77	0.24 to 1.30
Cognitive behavioural therapy	0.54	0.13 to 0.94
Cognitive behavioural therapy with biofeedback	0.37	–0.23 to 0.97

^aThese data are from studies that permitted the calculation of effect size estimates as variance data were available. Greater effect size is presumed to be related to greater clinical benefit. Effect size may be considered statistically significant if its 95% CI excludes 0.

symptoms.^{33–35} Specific biofeedback requires highly specialised technological instruments and has been studied less.

Biofeedback training protocol for headache consists of 12 or more sessions, and daily exercise involvement is required.²⁶

Cognitive behavioural therapies

Cognitive behavioural therapies enable patients with recurrent headaches to handle headache-related stress and any concomitant psychological condition more effectively.³⁶

Cognitive behavioural treatment essentially attempts to modify behavioural patterns related to reactions to certain events, thoughts, and interpretations, by recognising the interconnections between stress, coping, and headache conditions.^{37–39} Patients can learn to recognise cognitive and behavioural factors that have a definitive impact on the onset of headache or its worsening.

Cognitive behavioural therapies also 'negotiate' with issues such as negative automatic thoughts, avoidance or behaviour reinforcement, patients' control over a condition, and re-attribution through a process of assessing patients' inappropriate models of causation. Treatment requires from three to 12 or more sessions.²⁶

Cognitive behavioural therapy, relaxation, and biofeedback approaches are generally combined in clinical practice.

Effectiveness of behavioural headache interventions

In the past, several meta-analytic reports of the behavioural literature have included data from all available sources, without employing inclusion or exclusion criteria related to the methodology, design,

Table 2. Behavioural tension-type headache treatment meta-analytic data:⁴³ summary of effect-size scores.^a

Type of intervention	Effect size	95% CI
No treatment (control)	0	–
Placebo	0.15	–0.12 to 0.41
Relaxation training	0.64	0.37 to 0.90
Cognitive behavioural therapy	0.64	0.46 to 0.82
Electromyographic biofeedback	0.70	0.46 to 0.94
Electromyographic biofeedback with relaxation training	0.84	0.40 to 1.40

^aThese data are from studies that permitted the calculation of effect size estimates as variance data were available. Greater effect size is presumed to be related to greater clinical benefit. Effect size may be considered statistically significant if its 95% CI excludes 0.

or publication status of the identified studies.²⁶ The meta-analyses of the literature on behavioural treatment for migraine and tension-type headache mentioned below, represent the most recent reports in this field and they have included only randomised and controlled, carefully designed trials.

Without ignoring the risk of 'intrinsic or reporting weaknesses', the findings of those meta-analyses suggest strongly that the behavioural interventions are effective for the management of the most common primary headaches, migraine and tension-type headache. These interventions are focused on the prevention of headache episodes.

Migraine. In 1999, Goslin *et al* published a meta-analysis of the literature on behavioural and physical interventions for migraine, prepared for the Agency for Health Care Policy and Research.⁴⁰ This technical review, employing conservative inclusion criteria, included reports of prospective, controlled, randomised trials of behavioural treatments for migraine in adult populations.⁴⁰ Based on composite headache-index and headache-frequency measures, outcomes were evaluated using summary 'effect-size estimates', whenever their calculation was possible, and average percentage improvement (before and after treatment).

Behavioural treatments yielded a reduction in migraine occurrence of approximately 32–49%, with only 5% reduction achieved for no treatment controls. Recent reports, commenting on these meta-analytic findings, highlight that relaxation training, thermal biofeedback with relaxation training, electromyographic biofeedback, and cognitive behavioural therapy were all significantly superior in terms of effectiveness when compared with waiting-list control groups (Table 1).^{26,41,42} Although too few data permit direct comparisons of behavioural and pharmacological therapies for migraine,⁴² Penzien *et al* emphasise that some available data support a potentially similar improvement in migraine with

propranolol, flunarizine, and relaxation with biofeedback training.⁴¹

The US Headache Consortium has recommended that relaxation training, thermal biofeedback combined with relaxation training, electromyographic biofeedback, and cognitive behavioural therapy be considered as treatment options for the prevention of migraine (grade A evidence) and that behavioural therapy be combined with preventive drug therapy to achieve added clinical improvement (grade B evidence).⁴²

Tension-type headache. McCrory *et al*, with funding from the US Agency for Healthcare Research and Quality and the Foundation for Chiropractic Education and Research, conducted a meta-analysis of the literature on behavioural interventions for tension-type headache.⁴³ Penzien *et al*^{41,44} emphasise the highly selective study inclusion criteria followed by McCrory *et al* for this meta-analysis. McCrory *et al*⁴³ used the same metric measures as Goslin *et al*⁴⁰ for the calculation of treatment outcome data.

Behavioural interventions yielded a reduction in tension-type headache occurrence of approximately 37–50%. A 2% reduction was described for the no-treatment groups.⁴³ The extracted effect-size scores of the applied behavioural interventions (relaxation training, electromyographic biofeedback training, their combination, and cognitive behavioural therapy) were statistically more effective when compared with waiting-list controls (Table 2).⁴³ Three studies were included in this meta-analysis testing of amitriptyline for the prevention of tension-type headache with an effect size score of 0.51 (95% confidence interval [CI] 0.27 to 0.72) and a reduction in headache activity of approximately 33%.⁴³

The therapeutic gains of the behavioural treatment seem to endure over time, which represents a significant clinical advantage for this type of therapy.^{45,46} These improvements appear to be sustained over time in long-term studies based on biofeedback/relaxation treatments, regardless of whether further contacts (booster sessions) were applied.⁴⁵ Blanchard *et al* reported a sustained significant improvement 5 years later in 91% of those with migraine and 78% of those with tension-type headache following behavioural intervention.⁴⁶

The use of behavioural treatment as a standalone intervention for headache management (prevention of attacks) is well recognised.^{40–44} Additional factors that may make behavioural therapies a preferred option for treatment include patient preference, poorly tolerated drug therapy, drug contraindications, insufficient response to drugs, pregnancy, planned pregnancy, breast feeding, history of frequent or

excessive use of analgesic or other acute medication that can aggravate the headache, and the presence of stress or absence of stress-coping abilities (US Headache Consortium recommendation).⁴²

CURRENT HEADACHE MANAGEMENT IN THE UK AND INITIATIVES FOR CHANGE

Currently, most headache management is self-care and 97% of medical management takes place in general practice.⁴⁷ GPs in the UK see approximately one patient with a new episode of headache every week.⁴⁷ Because headache is so common, referrals to hospital specialists for headache account for over 30% of new neurology appointments,⁴⁸ which is a substantial burden considering that few are sinister. Patients' beliefs and concerns seem to be associated with GPs' decisions to refer headache patients to specialists.²² This evidence, in relation to the underdiagnosis and undertreatment of migraine and other headaches in the UK,⁴⁹ suggests a need for new approaches to headache management.

Incorrect diagnosis and poor treatment may lead to significant effects on the relationship between the patient and the primary care physician in terms of trust. Healthcare professionals, including GPs in particular, need to possess the skills to handle the range of their patients' needs.⁵⁰ This knowledge can be used to shape clinical practice and to develop and promote patient education interventions adapted to 'the patients' coping and problem-solving strategies and their willingness to change'.⁵⁰

Initiatives are important for improving headache management in primary care. There is a new screening algorithm, based on International Headache Society criteria,⁴ which recognises the need for more simple, flexible, and user-friendly diagnostic criteria for headache diagnosis in primary care settings.⁵¹⁻⁵³

The exclusion of secondary (sinister) headaches in primary care — a crucial step to marginalise danger — requires use of simple criteria and algorithms. Aspects indicating potentially life-threatening secondary or sinister headaches requiring patients' referral include new-onset, acute headache episodes with symptoms such as rash, neurological deficit, vomiting, or concomitant conditions such as head injury, infection, or hypertension, and non-resolving neurological deficit when the patient is pain-free between headache episodes.^{52,53}

Recommendations made by organisations or groups need a critical and careful approach. The management of migraine needs to be personalised due to the heterogeneous nature of migraine attacks,⁵⁴ the individual needs of each patient related to lifestyle, and the wide range of available therapies,

both pharmacological and non-pharmacological.⁵¹

The integration of behavioural treatments into primary care settings, where most people with headache are seen and treated, could offer further therapeutic possibilities and new challenges. 'Synchronised' shifts in the area of headache management at the interface between pharmacological and non-pharmacological strategy, and from secondary care to primary care services may have a significant impact on patients' beliefs and doctors' concerns.

Behavioural interventions for headache in primary care

As behavioural treatments are underused and have not been integrated into primary care, many of those with headache have no access to these therapies through their GP.⁴¹ Behavioural interventions for headache are most often available in specialised mental health environments from mental healthcare providers, such as clinical psychologists, and tend to be administered within specific healthcare programmes.⁴¹

Various novel delivery models based on low-cost information vectors, such as the internet, may increase accessibility. Further research is needed to establish whether those models are safe and effective, especially if we consider challenges such as the management of emergencies or crises.⁴¹ Similarly, for certain age, social, or ethnic groups e-technology could be an obstacle to delivery due to difficulties with access, skills, or knowledge.

In primary care settings the larger population with common primary headaches could represent the ideal target for behavioural treatments. The optimum 'shape' and structure of behavioural interventions in a primary care environment, that will maintain effectiveness while minimising staff time involvement and costs, remains to be established.

In this field, Silberstein highlights the example of a pilot educational programme and its evaluation undertaken by the Kaiser Permanente group in California.⁵⁵ In this programme, nurse practitioners who are trained in headache help to educate and treat patients in a primary care environment under the supervision of a headache expert.⁵⁵ A randomised study in this context has been designed by Duke University, Kaiser Permanente, and the Jefferson Headache Center. Patients attending primary care settings at each of these institutions would be randomised either to standard care or specialised care provided by a nurse practitioner, under the supervision of an expert and using the US Headache Consortium guidelines. Outcome measures and evaluation of this delivery model are being developed.⁵⁵ How best to achieve improved

outcomes with limited resources remains to be established. The application of the self-management model to headache is a reasonable option considering possible interactions between headache and a patient's illness behaviour. The self-management paradigm for chronic illness consists of interventions focused on skill acquisitions of managing an illness condition with the collaborative assistance of a healthcare professional.^{44,56}

CONCLUSION

Headache is the most frequent new neurological condition presenting in primary care.⁵⁷ It is only rarely associated with underlying space-occupying lesions, such as brain tumours, but concerns about 'missing' a tumour often trigger the use of health care at primary and secondary care levels.⁵⁸ Patients need to be reassured and GPs need to provide effective and integrated care, once they have eliminated the possibility of sinister causation.

Literature supporting the efficacy of behavioural therapies may be influenced by different methodological, design, and reporting limitations. The limited number of the participants included in several studies, the use of waiting-list controls, the lack of blinding for practical reasons, and the possible absence of variance data to allow calculation of effect-size scores, represent factors that make the trials on behavioural treatments more prone to bias.⁴³

The available evidence from an extended amount of research, evaluating behavioural treatments for headache within secondary care, makes behavioural interventions attractive as a therapeutic option. However, some important issues for consideration are:

- how these therapies can be shifted to primary care use;
- which headache subtypes and patients are most likely to be responsive in general practice; and
- how the dynamics of the consultation in primary care could be influenced.

Future efforts should be directed at developing and evaluating methods for improving headache management.⁵⁹ Developmental work needs to be undertaken to determine the most promising behavioural interventions for headache in primary care. Randomised trials must then be designed to ensure there is 'no foreknowledge of the random treatment allocations, no bias in patient management, unbiased outcome assessment, and no post-randomisation exclusions'.⁶⁰

Initiatives such as the acquisition of skills in neurology and, especially, in headache on the part of GPs; the application of management guidelines; open access to scanning services; encouraging GPs

to exercise rational clinical judgements through a cost-effective decision-making process and a new delivery model of behavioural interventions in general practice could create new perspectives in terms of more efficient and effective headache management in primary care settings

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