At the Royal Hospital for Women in Sydney, a Meditation Research Program has been in progress, under Ramesh Manocha in the hospital’s Natural Therapies Unit. Using the sahaja yoga technique of meditation, the research has shown promising results for the treatment of asthma, headache, menopause and depression.
Dr Ramesh Manocha graduated in medicine from the University of New South Wales. After a number of years in clinical practice he became interested in the clinical applications of meditation. He is now Barry Wren Fellow at the Royal Hospital for Women, Sydney, where he initiated the Meditation Research Program.

The ancient tradition of yoga and meditation began in Indian prehistory as a system of mental, physical and spiritual exercises. In approximately 500 BC the physician and sage Patanjali formalised this tradition into a science with four major and four lesser branches involving ethical restraint, self-discipline, mental focus, physical exercise and meditation. The entire system was used in an integrated fashion and directed at the attainment of a unique state of spontaneous, psychological integration. Modern psychologists have described this state as “individuation” or “self-actualization” and it has been traditionally termed “self-realisation”.

Many studies of meditation and yoga have been conducted over the past 50 years with variable results. The advent of Transcendental Meditation in the 1960s and 1970s gave scientists an opportunity to study a standardised technique. Many interesting results were obtained in multifaceted studies; however problems with methodology and interpretation of data have been noted. Similarly, other techniques have been assessed giving results which are often remarkable but, unfortunately, inconsistent and difficult to reproduce. The cultic connotations of many of these techniques and the organisations that promote them are also of considerable and justifiable concern and have, no doubt, hampered research in this area.

Yet the health practitioner continues to intuitively recognise the role of stress in clinical illness, particularly in relation to the so-called “psychosomatic” diseases.

Despite the tremendous advances in modern medicine we are still to develop truly effective strategies to deal with the common public health problems that cause most of the mortality and morbidity in the wider community. The use of stress reduction has been shown to be beneficial in many diseases, as it improves psychological and physical health and lifestyle awareness. Importantly the utilisation of stress-reducing techniques brings us closer to the ideal of a holistic, integrated health care strategy.

Several mechanisms have been proposed to...
explain the way in which psychological stress translates into physical disease. Some of the mystery has been explained by the “general adaptation syndrome” in which stressors induce psycho-hormonal changes. In an acute context these changes result in emergency adaptation of physiological function. In a context of chronic stimulation these changes, rather than maintaining psychological homeostasis, ultimately result in physical debilitation of body systems. The “parasympathetic response”, or “relaxation response”, is another mechanism worthy of investigation. It is the physiological opposite to that of the “fight or flight” reaction that we are all familiar with. It involves a slowing of the heart rate, reduced rate of respiration and relaxation of the muscles, in association with a reduction in circulating stress hormones and alpha brain wave activity. This physiological reaction is mediated by the autonomic nervous system, a complex set of nerves that governs all the automatic systems of the body that are essential for life. The role of the hypothalamic pituitary axis, which is the main controlling centre for the hormonal activities of the body, is also worth considering. Regardless of the underlying theories, the majority of clinicians recognise that stress is a major contributor to disease and that a simple stress management technique, such as meditation - once scientifically proven and clinically evaluated - could be widely applied in the clinical setting.

SAHAJA YOGA

About fifteen years ago in India, Professor U.C. Rai accomplished some pioneering work with a technique of meditation called sahaja yoga. He was head of the Department of Physiology at Maulana Azad Medical College in Delhi. He himself had suffered serious angina attacks and was surprised to find that this technique of meditation - once scientifically proven and clinically evaluated - could be widely applied in the clinical setting.

ANDREW: TAMING THE BRAINSTORM

So when "Andrew" arrived in our clinic one day, we were not unaccustomed to challenges. Andrew was a young man of about twenty years of age when his mother brought him to the meditation clinic at Blacktown, a working class suburb in Sydney’s outer west. Two years before this, he had contracted encephalitis, a viral infection of his brain tissue which put him in hospital for several weeks; his condition so critical at one stage that he was transferred into the intensive care unit. Although Andrew did survive, the viral attack on his brain had left subtle scars on this most sensitive of organs. It caused the neurons to "short circuit" and produce overpowering waves of electrical signals that spread across his entire brain. This “brainstorm” resulted in severe epileptic seizures. While the viral infection of Andrew’s brain was over, it had left behind permanent damage which condemned him to a life of violent epilepsy.

Epilepsy is a well recognised complication of brain infection. In this case it had taken a promising and talented student and turned him into an invalid. Andrew’s fits were so frequent - sometimes up to two or three times per day - that he could neither resume his schooling nor keep a job. He was dependent on his parents for everything, and so their lives had also become considerably restricted by their son’s illness.

As with the other patients in the Mind-Body Meditation Clinic, we advised Andrew that his response to the technique would mostly be
It so happened that Professor Rai had also looked at the effect of meditation on asthma during his investigation into the sahaja yoga effect. So we decided to use his results along with our accumulated experience at the meditation clinic as a basis for an asthma trial here in Australia.

In consultation with a number of respected asthma researchers a strategy was devised to compare the effect of meditation against a simple relaxation technique. We wanted to know whether there really was something unique about this process or if it was simply like any other relaxation technique. Our plan involved selecting a large group of people with severe asthma whose condition did not properly respond even to maximum levels of medication. These people were divided into two groups. One group received regular instruction in sahaja yoga meditation while the other group was taught a popular relaxation technique. Before, and then after, about 16 sessions, the patients were assessed and the two groups compared to see if there was a difference between the two techniques. The Royal Australian College of General Practitioners funded the project and after 18 months it was completed.

The results were surprising! Most of us expected to see no difference at all between the relaxation and meditation groups. Yet the results clearly showed that while both groups did appear to bring about improvements in the way the patients felt, the meditation also showed improvements in the severity of the disease process itself! This effect was not seen at all in the relaxation group and it suggested that meditation can actually influence the disease process.

DAVID: A BREATH OF FRESH AIR

There were many remarkable individual stories within the Asthma project. One of them is "David’s". A typical 42 year old "Aussie battler", he had suffered asthma since infancy, which had greatly frustrated both his career and his sporting ambitions. When we assessed him prior to his entry to the trial his asthma determined by his own motivation to meditate regularly. We were not the healers in the clinic, rather Andrew was going to learn how to awaken an innate and spontaneous healing power within himself. This energy would work inexorably through his meditation to improve his physical, mental and spiritual health.

Professor Rai’s epilepsy research showed that patients who practised the technique consistently experienced reductions in the amount and severity of the fits that they were experiencing. This gave us confidence that Andrew could use this technique to his benefit.

Andrew learned the sahaja yoga technique quickly and practiced it diligently. The first changes we noticed were in Andrew’s face; his eyes lost their usual dullness; they looked clear and bright. When we first saw this 19 year old boy he looked like an old man: hunched over, drawn face and dark rings under his eyes. Now he started to look young again and the dark shadow that seemed to hang over him had gone. After a few weeks he would even come to the class with a smile where usually there was only a frown. Andrew’s progress was obvious to us and it was not too much of a surprise to hear from his parents that his fits were reducing in frequency.

After several weeks his mother came to the clinic to invite us home for dinner. Andrew had not had a major fit in four weeks, they were planning to go away for the weekend and for the first time in many years life was starting to look normal for them!

A study of sahaja yoga meditators using a Quantitative Electro Encephalo Gram, demonstrated widespread changes in brainwaves, with prominent theta wave activity at the precise moment that the meditators reported a state of complete mental silence and “oneness”.

ASTHMA RESEARCH

Successful cases like Andrew’s and many of the other patients were inspiring for us all, but single case histories, no matter how remarkable, do not constitute scientific proof. The medical science establishment demands a standard of scientific rigour in order to establish the authenticity of any new form of treatment. So after more than two years of the meditation clinic we had enough confidence and had gathered sufficient evidence to embark on a proper attempt to scientifically evaluate the sahaja yoga technique.

DAVID: A BREATH OF FRESH AIR

...
was in the severest of categories. Simply blowing into the spirometer, a machine used to test lung capacity, caused his asthma to worsen! After sixteen weeks of meditation, which he took to like fish to water, he returned for reassessment.

At the lung function laboratory we saw a changed man. David’s lung function had increased, his symptoms reduced massively and the standard tests that initially placed him in the severest of asthma categories now indicated that his asthma was one of the mildest! David told us that his asthma had improved so much that he was sleeping through the night rather than being woken with symptoms; that he was playing sport; and that he had saved more than $1,500 in medication expenses since he started the program!

HOT FLUSHES

Hot flushes are a common problem amongst women in their menopausal years. In fact 90% of women can expect to experience menopausal symptoms of which the hot flush is the most common. It is an experience characterised by flushing of the skin of the upper part of the body, sweating, a sensation of heat and associated feelings of unwellness.

"What a great thing it would be if we in our busy lives could restore into ourselves each day for at least a couple of hours and prepare our minds to listen to the voice of the great silence. The divine radio is always singing if we could only make ourselves ready to listen to it, but it is impossible to listen without silence."

Mahatma Gandhi

Interestingly, the hot flush can be worsened or brought on by stress. In fact many women report that high-pressure situations greatly worsen the number and severity of the flushes that they experience. Also, women report that their flushes improve somewhat when they are calm and relaxed.

With this in mind we set up a pilot trial of hot flushes for menopausal women. Ten women were enrolled into an eight-week program. The frequency and severity of their hot flushes and other menopausal symptoms were recorded using standard methods before and after the 8 week program. The results were very impressive with all women experiencing improvement in their condition. In fact 9 out of the 10 women reported at least 50% reductions in the frequency of their hot flushes. Six of these women had a 65-70% improvement in their hot flushes which, after eight weeks of meditation "treatment", is comparable to that seen in conventional
hormone replacement therapy! In addition, standard measures of quality of life and symptom profiles showed similar degrees of improvement.

We are now planning a larger, randomised, controlled trial to more conclusively determine the potential for meditation in this troublesome problem.

**HOW DOES IT WORK?**

How does meditation bring about these effects? The "sahaja yoga hypothesis" is that meditation triggers a process within the autonomic nervous system, a complex set of nerves that governs the function of all the organs of our body. Imbalance within this system, says the hypothesis, is the cause of both physical and psychological illness. The process of meditation rebalances this system thereby allowing our natural healing processes to revitalise and rejuvenate diseased organs.

The ancient yoga tradition explains the inner healing process in terms of seven subtle energy centres (called "chakras") that exist within our body. Each of these centres governs a specific set of organs, and aspects of our psychology and spirituality. Imbalanced function of these centres results in abnormal function of any aspect of our being (physical, mental or spiritual) that relates to the imbalanced centre.

Meditation is said to be a specific process that involves the awakening of an innate, nurturing energy called "kundalini". The awakening of the kundalini causes it to rise from its position in the sacrum bone and pierce through each of the chakras, causing each of them to come into a state of balance and alignment (like a string threading through a series of beads). In this way the chakras are rejuvenated and nourished by the kundalini’s ascent. As the kundalini reaches the brain and the chakras within it, mental tensions are neutralised. An inner state of mental calm is established. This inner silence becomes a source of inner peace that neutralises the stresses of daily life, enhancing creativity, productivity and self-satisfaction.

**BRAIN WAVES**

In order to try and understand what it is about meditation that makes it special we have turned to some sophisticated brain imaging technology. A pilot study of advanced sahaja yoga meditators using a QEEG (quantitative electro encephelogram) has yielded some very interesting results. This method is able to produce two-dimensional maps of the electrical changes in the brain as the meditator enters into the state of meditation. Our study was conducted on a small group of meditators who were each asked to meditate while wearing a QEEG headcap designed to pick up the tiny electrical signals produced by the brain.

They were instructed to sit quietly for some time, then to commence meditation and signal when they had definitely entered into the meditative state called "thoughtless awareness". The findings were fascinating: all three of the meditators displayed widespread changes in brainwave activity that became more intense as they meditated.
Widespread, intense “alpha wave” activity occurred initially. Alpha wave activity is associated with relaxation and is thought to be a beneficial state. In fact, alpha activity has been observed in a number of different forms of meditation. The remarkable thing, however, is that as the meditators signalled that they had entered into the state of mental silence, or “thoughtless awareness”, another form of brain wave activity emerged which involved “theta waves” focused specifically in the front and top of the brain in the midline.

Precisely at the time that the theta activity became prominent, the meditators reported that they experienced a state of complete mental silence and “oneness” with the present moment, a state which characterises the sahaja yoga meditative experience.

There are several remarkable features about this pilot study which warrant further investigation. First, very few meditation techniques have shown this kind of consistent change in the theta range suggesting that the technique may have a unique effect on the brain. We were only able to find one other study, out of several dozen published in the scientific literature, that showed changes of this nature. This study involved a group of Japanese Zen monks.

Practitioners of sahaja yoga often claim to feel the chakras (energy centres) within the head open up as the meditative experience intensifies. They assert that it is this experience which is the essence of true meditation and that very few other meditation techniques enable the subject to repeatedly access this experience. The fact that the theta activity is relatively unusual and that it was observed in coincidence with the meditators’ reported experience does suggest that there may be something unique and authentic about the sahaja yoga method and its claims.

Second, it is very significant that the changes observed in the brain images occurred at the moment that the meditators reported experiencing the meditative state. This suggests that the QEEG method may make it possible to directly study mystical states of consciousness! The fact that these changes occurred within minutes rather than hours or longer suggests a relatively effortless or spontaneous process (as suggested by the name of the technique - “sahaja” is Sanskrit for “effortless”).

Third, the focus of theta activity at the front of the head and top of the head, both in the midline, suggest that structures deep within the brain, possibly the limbic system, are being activated. The limbic system is responsible for many aspects of our subjective experiences, such as emotion and mood, so it is no surprise that meditation, which is traditionally associated with blissful states, might involve this part of the brain.

Finally, in speculation, the two areas of theta activity coincidentally correspond to the two main chakras in the brain, according to yogic tradition. The forehead chakra called “agnya” or “third eye” is located in the centre of the forehead while the chakra at the top of the head, is called “sahasrara” or “crown chakra” and is traditionally associated with the limbic system.

**VIBRATIONAL ENERGY**

Many practitioners in the complementary health field subscribe to the idea of “vibrational medicine”. This idea essentially suggests that complementary therapies such as homoeopathy and therapeutic touch, as well as other therapeutic phenomena such as the placebo effect, therapeutic contact, bedside manner, and spiritual healing, act on a subtle energetic level to achieve cure or promote wellness. The difficulty has been that we are unable to detect this “subtle energy” and so scientific verification of this concept is difficult to achieve. However Kirlian photography, new research technology such as SQUID (“superconducting quantum interference device”), and aura imaging all offer clues to the puzzle.

The yogic explanation is simple: all therapeutic modalities act in one way or another on the subtle system of chakras and kundalini. This idea is difficult to directly verify but while doing background work and interviews for our research program a number of sahaja yoga practitioners described unusual sets of photographs that had been taken of sahaja yoga meditators. There appeared to be a wide variety of these photographs displaying, for the most part, rays and streaks of light around people.

One series of photographs, which included a group of meditators sitting with the founder of the sahaja yoga meditation technique, Shri Mataji Nirmala Devi, was taken...
particularly interesting. It consisted of a series of photographs in which the “vibrational energy” emitted by the individuals was recorded in the photographs, progressively becoming more intense with each photograph. Remarkably, these photographs were allegedly taken well before the age of digital photography. Of even greater interest was that the people who owned this fascinating evidence were not particularly fussed as to whether or not it should be publicised. When I expressed my surprise at their apparent diffidence, they replied that photographic evidence was irrelevant to them as the primary goal of their technique was personal meditative experience rather than the collection of physical artefacts - no matter how remarkable.

THE EASTERN VIEW OF STRESS

Meditation is an eastern tool that offers western health practitioners a new way of looking at health. The role of stress in disease is well recognised by modern medical researchers but, despite the progress that has been made in this field, there remains some very fundamental yet unanswered questions. One of those question is, “What exactly is stress?”. Few of us can easily come up with a good definition of “stress”, yet while we don’t know exactly what it is, we intuitively recognise that

while we can think about events in the past (even a few moments ago), or events scheduled in the future (even milliseconds in the future), it is impossible to actually think about the present moment which we are continuously experiencing and is ever changing.

Now think about the stress that we all experience from time to time. Despite the huge variety of situations that “stress” us they all have one thing in common: we have to think about the events before they can reduce our sense of wellbeing. In other words thought itself is the final common pathway by which all events create stress within us!

The past, comprised of events that have already occurred, no longer exists. Similarly the future, comprised of events that have yet to occur and are therefore undetermined, does not yet exist. However, paradoxically, we human beings exist only in the present. The mind (and its thoughts), since it is comprised only of stuff from the past or future, is therefore not real and so the stress that it generates is also not real!

If we are beings that exist in the present, and we realise that the stress and angst of life emanate from a mind which is the product of past/future, we acknowledge also that the antidote for the mental illusions that cause stress is to reign in our attention and focus it on the present moment.

In a trial of sahaja meditation, 9 out of 10 menopausal women reported at least 50% reduction in frequency of their hot flushes, and the overall improvement in their condition was comparable to that seen in hormone replacement therapy

it is a factor that affects almost every aspect of our lives!

The eastern explanation of “stress” is probably one of the most commonsense and practically useful ones. While you read this see if you can "look inside" and apply this perspective to yourself. Stress, says the eastern perspective, is the by-product of thought. If we examine the nature of the thoughts that each of us experiences from moment to moment we will find that they all relate to one of two broad categories: (1) events that have occurred in the past or (2) events that we anticipate will occur in the future. Whether the event was an argument with a friend yesterday (past), an unpaid bill (future), a deeply troubling childhood experience that has become part of our subconscious (past) or anxiety about the share market (future) we will find that all of these troubling thoughts, and the resulting stress that they cause us, to have arisen from only the past or future!

Take the exercise a little further. If the vast majority, if not all, our thoughts emanate from events in the past or future, is it possible to think about the absolute present moment? Most of us will admit that,
While, for most of us, focusing on the absolute present moment is virtually impossible, it is this razor’s edge of “thoughtless awareness” that the easterner seeks to cultivate and sustain in meditation. The vast inner silence of the thoughtless state leaves the mind uncluttered. By existing in that “space-between-the-thoughts” one is neither enslaved to one’s past nor confined to a predetermined future. The inner silence of meditation thus creates a naturally stress-free inner environment.

**LIVING IN THE MOMENT**

Is it possible for humans to live in the present moment? Yes, it is, and most of us encounter living examples of it regularly!

Observe closely the next small child you encounter. They have no worried lines on their faces, are almost always playing and enjoying themselves, and rarely complain about bills, jobs, chores, etc. If one happens to have an unpleasant experience it is quickly forgotten and life goes on. They are naturally balanced, living-in-the-present, stress-free beings. Who has seen a toddler hold a grudge, worry about the next meal or even think about what they did yesterday or will do tomorrow? They are so focused on the present moment that they are entirely spontaneous, unpretentious and usually very happy. They are in a constant state of effortless meditation.

Living in the moment is not, however, a regression to immaturity. It is an evolutionary step in which we return to our childlike innocence and simplicity but in full awareness of ourselves, our place in society and our moral role and responsibility.

How does one tap into and sustain a connection with the present moment? How does one escape the brainstorm of mental stress that we all experience?

We would all agree that more research needs to be done to try to understand how the “sahaja yoga effect” occurs. Does it work via the autonomic nervous system? Is it really the result of an energy that exists within each of us called kundalini? Is it possible to examine the most ancient of traditions with modern science? The Meditation Research Program at the Royal Hospital for Women will continue to delve into these important questions.13 Suffice to say for now that sahaja yoga meditation appears to offer a method by which each of us can tame the brainstorm, realise a state of peace and tranquillity and begin to heal our body, mind and spirit.

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Why meditation?

BACKGROUND While many general practitioners perceive meditation as an acceptable, even mainstream, health care strategy, it is paradoxically a poorly understood discipline.

OBJECTIVE To define meditation, outline the broad types of meditation and give an overview of the extent and validity of available evidence for its efficacy.

DISCUSSION The basic question of what constitutes meditation and what separates it from relaxation therapy has been an impediment to formulating quality studies in order to research meditation techniques. Examining the literature using evidence-based criteria reveals that, while meditation does appear to have therapeutic potential, there is a great need for further research before definitive conclusions can be made. Researchers have yet to systematically compare different techniques of meditation to compare their profiles.

Meditation is seen by a number of researchers as potentially one of the most effective forms of stress reduction. While stress reduction techniques have been cultivated and studied in the West for approximately 70 years, the data indicates that they are not consistently effective.

Meditation, however, has been developed in Eastern cultures and has a documented history of more than several thousand years. Eastern meditative techniques have been developed, trialed and refined over hundreds of generations with the specific intention of developing a method by which the layperson can regularly attain a state of mental peace and tranquillity, i.e., relief from stress. It is a strategy that can easily be adapted to the needs of clinicians and their patients in the West.

A US study for example, showed that a short course of behaviour modification strategies that included meditation led to significantly fewer visits to physicians during the six months that followed. The savings were estimated at over $200 per patient. A study of insurance statistics showed that the use of medical care was significantly less for meditators compared to nonmeditators.

The growing emphasis on:
- quality of life outcomes
- concepts such as psychoneuroimmunology or mind-body medicine, and
- reducing healthcare costs
suggest that stress reduction and improving mental health are becoming increasingly relevant to healthcare.

The need for an evidenced based approach
A recent survey of Australian general practitioners showed that while GPs perceived meditation as an acceptable, even mainstream, health care strategy, it is paradoxically a poorly understood discipline. In view of this, the authors concluded that well designed trials and education are urgently needed to inform GPs' decision making.

Meditation vs relaxation
Implicit in the fact that the term 'meditation' exists separately from that of 'relaxation' suggests that there should be clear differences between the two phenomena. However, there is as yet insufficient evidence to draw a clear distinction. Moreover, researchers have yet to systematically compare different techniques of meditation to determine whether or not these techniques use different or similar mechanisms or have differing effect profiles.

Lack of quality research
Despite the breadth of information available on meditation, a report of the US National Research Council (NRC) on meditation raised concerns about weak methodology and poor definition of the process.

Examining the literature using evidence-based criteria reveals that while meditation does appear to have therapeutic potential, there is a great need for further research before definitive conclusions can be made. The body of knowledge currently suggests that not all meditation techniques are the same; most techniques are
probably elaborate relaxation methods while there are others that may well involve physiological processes unique to meditation.

The Meditation Research Program (MRP) is one of the ongoing activities of the Natural Therapies Unit at the Royal Hospital for Women in Sydney. The MRP is committed to thorough scientific evaluation of meditation, its physiological effects and its potential for healthcare.

What is meditation?

There are many forms of meditation, ranging in complexity from strict, regulated practices to general recommendations. If practised regularly, meditation is thought to help develop habitual, unconscious microbehaviours that can potentially produce widespread positive effects on physical and psychological functioning. Meditation even for 15 minutes twice a day has been shown to bring beneficial results.

How does meditation work?

Parasympathetic response

Most theories are based on the assumption that meditation is a sophisticated form of relaxation involving a concept called the parasympathetic response. Psychological stress is associated with activation of the sympathetic component of the autonomic nervous system which, in its extreme, causes the ‘fight or flight response’. Meditation and any form of rest or relaxation acts to reduce sympathetic activation by reducing the release of catecholamines and other stress hormones such as cortisol, and promoting increased parasympathetic activity which in turn slows the heart rate and improves the flow of blood to the viscera and away from the periphery.

Other neurophysiological effects

Other proponents claim that meditation involves unique neurophysiological effects; however, this remains to be proven. Research at the MRP suggests the limbic system may be involved in Sahaja yoga meditation (SYM) since significant effects involving mood state have been consistently observed.

Defining what we mean by meditation

The most important issue that must be addressed in this field of research is to clearly define meditation and then subject that definition to scientific testing.

Meditation is popularly perceived to be any activity in which the individual’s attention is primarily focused on a repetitious cognitive activity. This very broad definition is, in the opinion of the MRP, the main cause for much of the inconsistent outcomes seen in meditation research.

‘Thoughtless awareness’

If one closely examines the authentic tradition of meditation it is apparent that meditation is a discrete and well defined experience of a state called ‘thoughtless awareness’. This is a state in which the excessive stress producing activity of the mind is neutralised without reducing alertness and effectiveness.

A authentic meditation enables one to focus on the ‘present moment’ rather than dwell on the unchangeable past or undetermined future. It is this state of equipoise that is said to be therapeutic both psychologically and physically and which fundamentally distinguishes meditation from simple relaxation, physical rest or sleep.

Reducing ‘background mental noise’

According to this perspective, stress is the inevitable byproduct of an overactive mind. The unsilenced mind is responsible for almost continuous ‘background mental noise’ the content of which is mostly unnecessary and unproductive. Yet it is this ‘mental noise’ that impinges on our otherwise natural tendency toward psychological, mental and spiritual health.

Quasi-meditation

Most commercialised meditation techniques do not reliably give the key experience of mental silence or ‘thoughtless awareness’ hence they can more precisely be described as ‘quasi-meditative’. These include methods that use constant repetition of syllables (such as mantras), visualisations or other thought forms.

This does not mean they may not be useful as they do encourage relaxation by reducing or simplifying mental activity or focusing attention. However, well designed physiological and clinical trials have, on the whole, shown little difference between these techniques and physical rest or relaxation.

Types of meditation

There are many meditation techniques available to consumers. Three notable examples include trans-cendental meditation, mindfulness and Sahaja yoga.
Transcendental meditation

Transcendental meditation (TM) is the commonest form of mantra meditation. It aims to prevent distracting thoughts by use of a mantra. Students are instructed to be passive and, if thoughts other than the mantra come to mind, to notice them and return to the mantra. A TM student is asked to practise for 20 minutes in the morning and again in the evening.

Transcendental meditation is said to be associated with clinical outcomes such as blood pressure reduction and physiological changes such as lowered blood cortisol levels.

Adverse effects

There are however, a number of case reports in the mainstream medical literature describing occasional adverse psychological and physical effects that appear to be causally related to the technique. These adverse events range from mild to severe and warrant further systematic investigation.

Cost issues

The technique is taught using a commercial system in which one begins by purchasing a mantra. Further instruction entails an escalating system of fees that can be cost prohibitive. Moreover, the TM organisation has on occasion been implicated in unethical and cultic practices. In light of this information, medical practitioners have no choice but to recommend caution with regard to this method.

Mindfulness and Vipassana meditation

Mindfulness is a general method that serves as a basis for techniques such as Vipassana meditation. It aims to use focused attention (often by using a physical sensation such as the breath) to cultivate mental calmness. Regular practice enables one to objectively observe one’s thoughts and therefore enhance one’s self understanding. Mindfulness approaches have been shown to be effective in certain clinical applications such as chronic pain.

Vipassana is both a general term referring to a specialised form of mindfulness meditation and also a specific brand name. The following information refers to the latter. Vipassana is taught in Australia via a number of Vipassana retreats and centres. The retreats involve up to 10 days of intensive meditation, several hours per day, and other strict observances such as not talking and encouragement to maintain strict postures for long periods of time. There is no fee for these retreats but ‘recommended donations’ are described. These retreats are unsuitable for the average person, particularly those unfamiliar with meditation, due to the extreme physical and psychological demands. Adverse events associated with Vipassana have been described although it is unclear as to which form these reports refer.

Sahaja yoga meditation

Sahaja yoga meditation (SYM) is the technique of choice in the MRP. Sahaja yoga meditation aims to promote the experience of ‘thoughtless awareness’ based on the original meditative tradition. Meditators in the MRP consistently describe the ability to achieve this experience. They are encouraged to practise twice daily for approximately 15 minutes. Sahaja yoga meditation is well suited for the general population and for research, because it is easy to learn and is taught free of charge. Sahaja yoga meditation is currently used in three Sydney hospitals for patients, staff and public. Feedback from management teams and anecdotal reports from patients and carers are favourable. As yet no adverse effects have been reported in the MRP’s trials, clinics or in the literature.

The MRP has conducted a number of small and large trials on SYM which have generated promising results in Australian conditions. A randomised controlled trial of meditation for moderate to severe asthma compared SYM to a relaxation control. SYM was more effective in a number of objective and subjective endpoints.

A number of locally conducted pilot studies examining the effect of SYM suggest that it may have a beneficial role in menopausal hot flushes, severe migraine and psychological stress. Randomised controlled trials are underway in order to obtain definitive data. Studies in India suggest that SYM is more beneficial than mimicking exercises in the treatment of epilepsy and hypertension.

 Recommending meditation techniques to patients

General practitioners must exercise commonsense and discrimination when recommending meditation to their patients as they have a duty of care to ensure the safety of their patients’ health and finances. Meditation is contraindicated in those suffering from psychosis and should only be applied with great caution in those with severe psy-
chological problems. The medicolegal implications of recommending a technique that leads to an adverse event have not been explored.

A simple and effective rule of thumb when choosing or recommending a meditation technique is to assume that ‘the best things in life are free’. Organisations involved in the commercialisation and marketing of often costly ‘meditation’ techniques, courses and ‘master classes’ are least likely to be selling an authentic method. Unfortunately in these situations the welfare of the individual and the community usually become secondary to profit or fame.

References
Making sense of meditation

Dr Ramesh Manocha considers the effectiveness of meditation as a treatment.

MEDITATION is becoming increasingly popular with Western consumers. A recent survey of Australian GPs found that almost 80% had recommended meditation at least once,1 and a survey of Australian consumers found that about 10% of the population had tried or were currently practising it.2

Within scientific literature, meditation is a poorly defined and heterogeneous collection of methods aimed at achieving states of relaxation and better well-being by using structured exercises to focus attention and modify thinking activity. Consumers perceive meditation to be uniquely effective, and researchers have investigated meditation to determine whether these specific effects exist.

MEDITATION RESEARCH

The Natural Therapies Research Unit (NTU) at the Royal Hospital for Women in Sydney recently completed a systematic review of the scientific evidence for meditation. Of more than 3200 articles on meditation in peer-reviewed literature, less than 100 (about 3%) were randomised controlled trials (RCTs).

While the majority of these RCTs reported positive effects of meditation, most of the outcomes failed to properly address the placebo effect – the most important confounder in medical research. People are understood to respond similarly to almost any behaviour therapy, even sham therapies, simply because the therapies involve non-specific effects such as regular contact with a therapist, the simple effects of rest and relaxation, and the natural tendency to get better, not to mention pressure from researchers to report improvements. All of these factors contribute to the placebo effect.

MEDITATION EFFECTIVENESS

A statistically significant pattern emerged when the RCTs were rated according to the credibility of control method. While almost all trials using inactive and non-credible controls reported positive effects, those using more credible and active controls reported considerably less favourable outcomes. In fact, most trials that compared genuine meditation techniques with elaborately designed and executed sham procedures did not report any significant differences. However, some trials have shown exceptions.

SAHAJA YOGA

Sahaja yoga is noted as a promising technique, with positive results demonstrated in pilot studies in India. Recently, the NTU conducted an RCT that compared sahaja yoga with a credible stress management program for people with moderate to severe asthma on prestabilised treatment, but who remained symptomatic. Both groups experienced similar improvements in a number of outcome measures, but the yoga group demonstrated significantly greater improvements in key measures of emotional health and quality of life. Most importantly, the meditation approach generated significant changes in airway hyper-responsiveness, suggesting that this technique may actually impact on pathophysiological processes.4

Further, the NTU has just concluded a large, independently funded RCT in which sahaja yoga was compared with a generic form of meditation for stress and anxiety. Sahaja yoga was found to be significantly more effective than the generic approach in reducing stress, anxiety and depressive symptoms. The critical difference between the approaches is thought to be the ability of the sahaja technique to elicit a specific state of ‘mental silence’ in which the mediator is fully alert and aware but does not experience unnecessary mental activity.

Brain imaging studies have shown that this approach to meditation is associated with reproducible patterns of brain activity that correlate with subjective experience of mental silence.5,6

INDICATIONS

Meditation is indicated in any scenario when stress and anxiety may be contributing factors. It is ideally suited to conditions that cause suboptimal quality of life and well-being, such as work stress, primary insomnia and mild anxiety. Also, it is useful as an adjunct in the management of severe, chronic or terminal illness.

CONTRAINdications and Side-EFFects

Meditation is contraindicated in patients with severe mental illness, particular if there is a risk of psychosis, and should be supervised closely if used by anyone with mild or moderate mental illness. There is evidence of adverse effect, mostly associated with commercialised methods.7

CONCLUSION

If faced with a choice between user-pays meditation lessons and regular time out to sit quietly in a comfortable chair or to enjoy a pastime, scientific evidence suggests the latter is equally efficacious, cheaper and more accessible. However, it is a patient’s keen to try meditation, recommend a technique that has genuine evidence of efficacy, and is learned easily, such as sahaja yoga.

Dr Ramesh Manocha is a Barry Wren Fellow at the Natural Therapies Unit, Royal Hospital for Women, Sydney.

Associate Professor John Eden, MBBS, MD, MRCP, FRANZCOG, FRACOG, CRE), is director of the Sydney Manoeuvre Centre and Natural Therapies Unit, Royal Hospital for Women, Sydney.

References available from www.medicalobserver.com.au

Meditation is held to be uniquely effective, and researchers have investigated whether specific effects exist.

Osteoarthritis and homeopathy study

QUEENSLAND researchers are looking for patients with osteoarthritis to participate in a study looking at the effectiveness of a homeopathic treatment for the condition.

The trial, conducted by the Southern Cross University School of Natural and Complementary Medicine, aims to establish whether homeopathy can provide safe and effective relief of symptoms in patients with arthritis.

“Sufferers of osteoarthritis are desperately looking for effective treatments to reduce their pain and other symptoms,” PhD student and research coordinator Don Baker said. More than 60% of Australians used some form of alternative therapy, Mr Baker said.

And a feature of the homeopathic treatment was that it did not appear to have the negative side-effects sometimes associated with more conventional treatments.

The researchers are looking for people diagnosed with osteoarthritis of the hip or knee, aged between 18 and 85 years, who are otherwise healthy and who are willing to cease all other arthritis treatment for eight weeks. The study will involve an initial four-week period without treatment, followed by four weeks of treatment, involving a one-off dose of homeopathic pills, followed by an oral spray three times a day for a month.

Volunteers are expected to attend a clinic at the Southern Cross University’s Lismore or Gold Coast campus on three occasions.

For further details, contact Mr Baker in the Southern Cross University School of Natural and Complementary Medicine on 1300 78 55 89.
Sahaja yoga in the management of moderate to severe asthma: a randomised controlled trial

R Manocha, G B Marks, P Kenchington, D Peters, C M Salome

Background: Sahaja Yoga is a traditional system of meditation based on yogic principles which may be used for therapeutic purposes. A study was undertaken to assess the effectiveness of this therapy as an adjunctive tool in the management of asthma in adult patients who remained symptomatic on moderate to high doses of inhaled steroids.

Methods: A parallel group, double blind, randomised controlled trial was conducted. Subjects were randomly allocated to Sahaja yoga and control intervention groups. Both the yoga and the control interventions required the subjects to attend a 2 hour session once a week for 4 months. Asthma related quality of life (AQLQ, range 0–4), Profile of Mood States (POMS), level of airway hyperresponsiveness to methacholine (AHR), and a diary card based combined asthma score (CAS, range 0–12) reflecting symptoms, bronchodilator usage, and peak expiratory flow rates were measured at the end of the treatment period and again 2 months later.

Results: Twenty one of 30 subjects randomised to the yoga intervention and 26 of 29 subjects randomised to the control group were available for assessment at the end of treatment. The improvement in AHR at the end of treatment was 1.5 doubling doses (95% confidence interval [CI] 0.0 to 2.9, p=0.047) greater in the yoga intervention group than in the control group. Differences in AQLQ score (0.41, 95% CI –0.04 to 0.86) and CAS (0.9, 95% CI –0.9 to 2.7) were not significant (p>0.05). The AQLQ mood subscale did improve more in the yoga group than in the control group (difference 0.63, 95% CI 0.06 to 1.20), as did the summary POMS score (difference 18.4, 95% CI 0.2 to 36.5, p=0.05). There were no significant differences between the two groups at the 2 month follow up assessment.

Conclusions: This randomised controlled trial has shown that the practice of Sahaja yoga does have limited beneficial effects on some objective and subjective measures of the impact of asthma. Further work is required to understand the mechanism underlying the observed effects and to establish whether elements of this intervention may be clinically valuable in patients with severe asthma.

Methods
Study design
A parallel group, double blind, randomised controlled trial was conducted. After a 2 week baseline assessment period, subjects were randomly allocated to Sahaja yoga and control intervention groups. Both the yoga and the control interventions required the subjects to attend a 2 hour session once a week for 4 months. Subjects were informed that the project aimed to assess the relative effectiveness of two alternative relaxation techniques for the management of asthma. Outcome assessments were undertaken at the conclusion of the 4 month intervention period and again 2 months later.

Allocation to groups was by randomised permuted blocks with a block size of four. The allocation for each successive subject was contained within a sealed envelope.

The study protocol was approved by the Institutional Ethics Committees of the South Western Sydney Area Health Service and the Central Sydney Area Health Service. Informed consent was obtained from subjects prior to randomisation.

Subject selection
The aim was to select adult patients with asthma who remained symptomatic on moderate to high doses of
inhaled steroids and who were amenable to the idea of a non-pharmacological stress management intervention.

Subjects were recruited by newspaper advertisement (n=850 responses), review of asthma clinic records (n=200 reviewed), and through local general practitioners (n=30 referrals). Subjects with asthma were eligible for inclusion in the study if they were aged 16 or over and had a history of asthma symptoms for at least 1 year. Other inclusion criteria were: at least moderate to severe asthma as evidenced by a combined asthma score of 7 or more out of 12 (see below); airflow hyperresponsiveness (PD20FEV1 <12.2 µmol methacholine) or >15% FEV1, bronchodilator response; daily inhaled treatment with ≥1500 µg beclomethasone, 1200 µg budesonide or 750 µg fluticasone for at least the preceding 6 weeks; and stable asthma treatment for the preceding 6 weeks. Subjects were recruited by newspaper advertisement, review of asthma clinic records, and through local general practitioners (n=30 referrals). Subjects who did not have severe airflow obstruction (genotyping) in subjects who did not have severe airflow obstruction (genotyping).

### Sahaja yoga intervention

The key experience of Sahaja yoga meditation is a state called “thoughtless awareness” or “mental silence” in which the meditator is fully alert and aware but is free of any unnecessary mental activity. The Sahaja yoga session was conducted by an experienced instructor who taught subjects how to achieve this state by use of silent psychological affirmations.

The weekly sessions involved meditation, instructional videos, personalised instruction, and discussion of problems in relation to improving the experience of meditation. Subjects were encouraged to achieve this state of mental silence for a period of 10–20 minutes twice each day.

### Control intervention

The control intervention included relaxation methods, group discussion, and cognitive behaviour therapy-like exercises. Relaxation methods involved positive affirmations such as “I can breathe easily and without restriction”, progressive muscle relaxation, and visualisation. Group discussion was semi-formal, and cognitive behaviour therapy-like exercises were designed to give the subject insight into the way in which their thoughts, feelings, and reactions to stress influenced the severity and perception of their illness. This approach was based on a workbook on relaxation and stress management techniques called Learning to Unwind.11 The sessions were conducted by an experienced instructor. Subjects were encouraged to practise the techniques at home for 10–20 minutes twice daily.

Both the yoga and control techniques were practised with the subject seated. Treatment with inhaled steroids, long-acting β2 agonists, and/or theophylline was continued unchanged throughout the study period.

### Outcome measurements

Outcome assessments at baseline, at the end of the intervention, and 2 months after the end of the intervention were undertaken by an investigator who was blind to the group allocation of the subjects.

Subjects kept written diary cards to record twice daily PEF rates, symptoms, and bronchodilator use for 2 week periods at each assessment. Each of these was scored as shown in table 1. The combined asthma score,12 the sum of these three components, was then calculated for each subject for each assessment period. The possible range of scores was 0–12. In addition, mean morning peak flow (am PEF) and lowest peak flow as a percentage of the highest peak flow (low%high) were calculated for each diary card.

At each assessment subjects completed a questionnaire to assess changes in medication compared with baseline. Disease specific asthma quality of life questionnaire (AQLQ, University of Sydney)13 and a measure of mood states, the Profile of Mood States (POMS),14 were also administered. Total AQLQ scores and subscale scores for breathlessness, mood disturbance, social disruption, and concerns for health were calculated on a scale of 0 (no impairment of quality of life) to 4 (maximum impairment). POMS scores for tension, depression, anger, vigour, fatigue, confusion, and a summary mood score were calculated.

Spirometric function was measured at least 4 hours after the last dose of short acting bronchodilator and 12 hours after the last dose of long acting bronchodilator. A methacholine challenge test was performed to assess airway responsiveness in subjects who did not have severe airway obstruction (generally, FEV1 >60% predicted15) at baseline. The challenge was performed by the rapid method using a hand held Devilbiss No 45 nebuliser to administer cumulative doses of methacholine in the doses of 0.1–12.2 µmol. The provoking dose required to cause a 20% reduction in FEV1, from the post-saline value (PD20FEV1) was measured by linear interpolation on a log-dose response curve or by linear extrapolation to a maximum of twice the final dose administered. All extrapolated values greater than this were assigned a value of twice the final cumulative dose. Values of PD20FEV1 were log-transformed for analysis. Change in PD20FEV1 was expressed in units of doubling doses.

### Data analysis and sample size

Analysis was by intention to treat. Primary outcome variables were the combined asthma score, the AQLQ (Total) score, and PD20FEV1. All other outcomes were secondary outcome variables.

All outcomes measured at the conclusion of the intervention and 2 months later were expressed as changes from baseline. Between group differences in these changes were calculated, together with 95% confidence intervals. The changes were compared by the unpaired (two sample) t test. For non-normally distributed data Wilcoxon’s non-parametric test was used to check the results of the parametric analysis.

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**Table 1** Scoring key for diary card recordings of symptoms, bronchodilator usage, and peak expiratory flow (PEF) rates

<table>
<thead>
<tr>
<th>Score</th>
<th>Symptoms</th>
<th>Bronchodilator usage</th>
<th>Min morning PEF as % of best*</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Nil</td>
<td>Nil</td>
<td>&gt;93%</td>
</tr>
<tr>
<td>1</td>
<td>No night symptoms; daytime symptoms ≤2 times but ≤10 times</td>
<td>Used on ≤2 days (in 2/52)</td>
<td>&gt;85 and ≤93%</td>
</tr>
<tr>
<td>2</td>
<td>No night symptoms; daytime symptoms &gt;2 times but ≤10 times</td>
<td>Used on &gt;2 days but ≤10 days (in 2/52)</td>
<td>&gt;78 and ≤85%</td>
</tr>
<tr>
<td>3</td>
<td>Night symptoms ≤2 times (in 2/52) OR daytime symptoms &gt;10 times</td>
<td>Used on &gt;10 days, average 1–2 times/day</td>
<td>&gt;70 and ≤78%</td>
</tr>
<tr>
<td>4</td>
<td>Daytime symptoms every day OR night symptoms &gt;2 times (in 2/52)</td>
<td>Used on &gt;10 days, average 3 times or more per day</td>
<td>≤70%</td>
</tr>
</tbody>
</table>

**“Best” includes clinic spirometric tests and all PEF records.**
Details of subjects’ record of attendance at the Sahaja yoga and control group sessions were quantified to assess compliance.

We estimated that a sample size of 25 in each group would allow us to detect a difference between groups in PD_{20} of one doubling dose with 80% power ($\alpha = 0.05$). This sample size would also be sufficient to detect a clinically meaningful difference in AQLQ scores between the groups. To ensure 25 subjects were available for evaluation we planned to randomise 30 subjects into each group.

**RESULTS**

**Subjects**
Of 120 subjects who appeared suitable for the study on the basis of initial telephone interview, 59 eligible subjects were finally randomised: 30 to the Sahaja yoga intervention and 29 to the control arm. Nine subjects randomised to the yoga intervention and three subjects randomised to the control group withdrew before the end of treatment assessment. No outcome data are available for these subjects. The reasons for withdrawal are shown in table 2. Differences at baseline between the randomisation groups and between those who did and did not complete the end of treatment assessment are shown in table 3. Subjects in the yoga group had slightly higher (worse) scores on the mood subscale of the AQLQ and higher PEF values (low%high) than those in the control group. Five subjects in each group were using long acting $\beta_2$ agonists and one subject in each group was taking theophylline.

Of the 21 subjects in the yoga group who had the end of treatment assessment, five did not have a methacholine challenge at baseline (all because of a pre-test FEV$_1$ of <60% predicted), four did not have a challenge at the end of treatment (two because of a pre-test FEV$_1$ of <60% predicted), and six did not have a challenge at end of the 2 month follow up period (four because of a pre-test FEV$_1$ of <60% predicted). Of the 26 control group subjects who had the end of treatment assessment, one was lost to follow up before the 2 month follow up assessment and one did not complete the diary cards or questionnaires at the end of the treatment period or the 2 month follow up period. In addition, seven did not have a methacholine challenge test at baseline (six because of a pre-test FEV$_1$ of <60% predicted), eight did not have a challenge at the end of the treatment period (seven because of a pre-test FEV$_1$ <60% predicted), and nine of the continuing participants did not have a challenge at the end of the 2 month follow up period (eight because of a pre-test FEV$_1$ of <60% predicted).

**Adherence to the intervention**
Twenty of the 21 subjects in the yoga intervention group who had the end of treatment assessment attended at least eight of the 16 yoga sessions. Seventeen of these attended 12 or more sessions and five attended all 16 sessions. In the control group 19 of the 26 who had the end of treatment assessment attended at least eight sessions, 17 attended 12 or more sessions, and 12 attended all 16 sessions.

**Principal outcome measures**
At the end of the treatment period the level of AHR had improved by 1.6 doubling doses (95% confidence interval (CI) 0.6 to 2.7) in the yoga intervention group and by 0.2 doubling doses (95% CI −0.8 to 1.2) in the control group ($p=0.047$ for between group difference). The difference between the groups was no longer significant 2 months after the end of treatment (fig 1, table 4).

The exclusion of data for occasions when methacholine challenge tests could not be performed because of low lung function potentially could have biased this analysis of change in AHR. In a sensitivity analysis the change in PD$_{20}$FEV$_1$ was re-calculated with PD$_{20}$FEV$_1$ assigned to a value of 0.1 µmol (equivalent to severe AHR) for those occasions when a challenge was not performed because the pre-test FEV$_1$ was <60% predicted. The findings of this sensitivity analysis were similar to those of the primary analysis. This analysis showed that, at the end of treatment, the improvement in AHR was 1.9 doubling doses greater in the yoga intervention group than in

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### Table 2 Reasons for withdrawal of subjects from the study

<table>
<thead>
<tr>
<th>Reason</th>
<th>Sahaja yoga</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social/work changes</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Illness unrelated to intervention</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Disliked the intervention</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Changed management regimen</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

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### Table 3 Baseline demographic and clinical characteristics of study subjects

<table>
<thead>
<tr>
<th></th>
<th>Yoga</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Randomised</td>
<td>Complete*</td>
</tr>
<tr>
<td>Number</td>
<td>30</td>
<td>21*</td>
</tr>
<tr>
<td>Mean age (years)</td>
<td>36</td>
<td>37</td>
</tr>
<tr>
<td>Female (n)</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>Ex-smokers (n)</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Duration of asthma (years)</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Mean inhaled steroid dose (µg)†</td>
<td>2458</td>
<td>2274</td>
</tr>
<tr>
<td>Mean FEV$_1$/FVC ratio</td>
<td>0.70</td>
<td>0.71</td>
</tr>
<tr>
<td>Mean AQLQ Total score</td>
<td>1.7</td>
<td>1.5</td>
</tr>
<tr>
<td>Mean AQLQ Breathlessness score</td>
<td>1.5</td>
<td>1.4</td>
</tr>
<tr>
<td>Mean AQLQ Mood score</td>
<td>1.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Mean AQLQ Social score</td>
<td>1.4</td>
<td>1.2</td>
</tr>
<tr>
<td>Mean AQLQ Concerns score</td>
<td>1.9</td>
<td>1.7</td>
</tr>
<tr>
<td>Mean morning peak flow</td>
<td>369</td>
<td>372</td>
</tr>
<tr>
<td>Peak flow (low % high)</td>
<td>76%</td>
<td>77%</td>
</tr>
<tr>
<td>CAS‡ (max 12)</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>PD$_{20}$FEV$_1$, (µmol)</td>
<td>1.20 (n = 22)</td>
<td>1.51 [n = 16]</td>
</tr>
</tbody>
</table>

FEV$_1$ = forced expiratory volume in 1 second; FVC = forced vital capacity; AQLQ = asthma related quality of life questionnaire; CAS = combined asthma score; PD$_{20}$FEV$_1$ = dose of methacholine provoking a fall in FEV$_1$ of 20% or more. *Subjects who had outcome assessments performed at the end of the treatment period. †Daily dose of inhaled steroids in beclomethasone µg equivalents. These were calculated on the assumption that beclomethasone 2000 µg = budesonide 1600 µg = fluticasone 1000 µg. ‡Median values.
the control group (95% CI 0.7 to 3.4, p=0.004). At the end of the 2 month follow up period the improvement in AHR, estimated in this sensitivity analysis, was 1.2 doubling doses greater in the yoga intervention group than in the control group (95% CI –0.4 to 2.8, p=0.1).

The improvement in AQLQ score at the end of the treatment period was 0.41 units greater in the yoga group than in the control group. This difference just failed to reach statistical significance (p=0.07). There was no between group difference in the change in AQLQ scores 2 months after the intervention was completed (table 4). There was no difference between the two groups in the CAS either at the end of the treatment period or at the 2 month follow up assessment.

**Secondary outcome measures**

Examination of the subscale scores from the AQLQ reveals that the major impact of yoga was on the “mood” subscale (fig 2). At the end of treatment there was significantly greater improvement in this subscale in the yoga group than in the control group. A slightly lesser difference, which just failed to reach statistical significance (p=0.07), was still evident 2 months after the end of treatment. The “breathlessness” subscale tended to reflect greater benefits from the yoga intervention than the “social” or “concerns” subscales.

At the end of the intervention period the yoga group had greater beneficial changes in POMS tension and fatigue scales and in the summary mood measure than the control group (fig 2). However, at the follow up examination, although there were similar trends in these scales, the differences were no longer significant.

**Figure 1** Changes in airway responsiveness to methacholine. PD_{20}FEV₁ (µmol methacholine) at baseline, at the end of the intervention, and 2 months after the end of the intervention in the yoga group (triangles, solid line) and the control group (circles, broken line) are shown. The reference line indicates a value of 12.2 µmol, the maximum dose of methacholine administered during the challenges. Values above this line were calculated by extrapolation.

**Figure 2** (A), (B) Changes in Asthma Quality of Life Questionnaire score (AQLQ) and (C), (D) Profile of Moods States (POMS) at the end of the intervention (A and C) and 2 months after the intervention (B and D) in the yoga group (filled circles) and the control group (open circles). The diamond indicates the mean difference between the two groups (change in yoga group – change in control group) and the error bars represent the 95% confidence interval around the mean difference. A positive change in the AQLQ score indicates an improvement in quality of life. A positive change in the POMS component scores indicates a reduction in the attribute (that is, an improvement in all scales except vigour). A positive change in the total POMS score indicates an improvement in mood.
There were no significant changes in lung function as measured by spirometric tests during clinic visits or as measured by peak flow at home (table 4).

**DISCUSSION**

Sahaja yoga improved AHR and some aspects of impairment of AQLQ and mood in patients with asthma who had remained symptomatic despite treatment with moderate to high dose inhaled steroids for at least 6 weeks. The benefits of yoga on these outcomes were greater than the benefits of relaxation alone. The magnitude of the beneficial change in AHR due to the yoga intervention in this study was approximately equivalent to that attributed to inhaled corticosteroids in patients with asthma in previous studies. However, these improvements were not accompanied by changes in lung function or symptoms recorded by diary card and appeared to wane over a period of 2 months after the intervention ceases.

The conclusions of this study are generalisable to subjects with symptomatic asthma who express interest in the non-pharmacological therapies but may not be applicable to patients who are antipathetic to this form of treatment. Although the use of complementary treatments for asthma is not frequently reported to treating doctors, their use was common among members of the UK’s National Asthma Campaign in which 30% of respondents reported that they had used breathing techniques to relieve symptoms. However, these improvements were not accompanied by changes in lung function or symptoms recorded by diary card and appeared to wane over a period of 2 months after the intervention ceases.

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The higher than expected dropout rate in the yoga treatment group does introduce a potential problem with bias due to selective withdrawal of subjects who were not benefiting from the intervention. However, most of these withdrawals occurred soon after randomisation and are therefore unlikely to be related to the effectiveness of the intervention.

Among those who did reach the end of treatment assessment, compliance with the yoga and control treatments was good. Most subjects attended most of the sessions. However, we do not have any quantitative data on adherence to yoga practices between the actual sessions or during the post-intervention follow up period. We have anecdotal evidence to suggest that there was poor maintenance of meditation practices after the end of the intervention period. It is likely that this explains the lack of efficacy at the follow up assessment.

The findings reported here lend some support to the conclusions of a previous small randomised controlled trial of

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**Table 4:** Change from baseline in outcome measures

<table>
<thead>
<tr>
<th>End of intervention</th>
<th>n</th>
<th>Yoga</th>
<th>Control</th>
<th>Difference * (95% CI)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined Asthma Score (max score 12)</td>
<td>46</td>
<td>2.9</td>
<td>2.0</td>
<td>0.9 (0.94 to 2.8)</td>
<td>0.3</td>
</tr>
<tr>
<td>AQLQ (Total) (max score 4)</td>
<td>46</td>
<td>1.05</td>
<td>1.65</td>
<td>-0.6 (0.04 to 0.86)</td>
<td>0.07</td>
</tr>
<tr>
<td>FEV1 (doubling dose)</td>
<td>32</td>
<td>-1.64</td>
<td>-0.18</td>
<td>-1.46 (1.00 to 2.8)</td>
<td>0.04</td>
</tr>
<tr>
<td>FVC (percentage predicted)</td>
<td>44</td>
<td>0.05</td>
<td>0.05</td>
<td>0.00 (0.00 to 0.02)</td>
<td>0.5</td>
</tr>
<tr>
<td>FEV1/FVC ratio</td>
<td>47</td>
<td>-0.008</td>
<td>0.003</td>
<td>0.01 (0.00 to 0.02)</td>
<td>0.9</td>
</tr>
<tr>
<td>Morning PEF (l/min)</td>
<td>46</td>
<td>-4.5</td>
<td>4.5</td>
<td>-0.0 (1.0 to 2.0)</td>
<td>0.9</td>
</tr>
<tr>
<td>PD20FEV1 (dose of methacholine provoking a fall in FEV1 of 20% or more)</td>
<td>46</td>
<td>-0.008</td>
<td>0.003</td>
<td>0.01 (0.00 to 0.02)</td>
<td>0.9</td>
</tr>
</tbody>
</table>

AQLQ = asthma related quality of life questionnaire; FEV1 = forced expiratory volume in 1 second; FVC = forced vital capacity; PD20FEV1 = dose of methacholine providing a fall in FEV1 of 20% or more.

*Change in yoga group – change in control group, differences tested by one sample t test.
the effectiveness of Sahaja yoga in the management of asthma in adult women. In nine patients randomised to the intervention group the FEV1/FVC ratio increased from 48% at baseline to 66% at the conclusion of the 4 month intervention period. Over the same period the spirometric ratio did not change in nine control subjects (p<0.001). Subjects in the intervention group had an average of 5.8 “acute attacks” during the treatment period compared with 12.9 “acute attacks” over the same period in the controls (p<0.001).

Meditation is designed to help the individual develop a state of mind which is positive or benevolent towards oneself and others. The ideal state of mind has been described as “Sahaja”, meaning spontaneous or effortless. The experience of meditation is essentially the Sahaja state. The yogic tradition encourages aspirants to pursue the awakening of an energy, traditionally known as “kundalini”, that facilitates the achievement of the Sahaja state. The meditative experience is characterised by a sensation of normal, or even heightened, alertness in conjunction with a state of complete mental silence. This is associated with a sense of relaxation and positive mood and a feeling of benevolence towards oneself and others. Meditation by the Sahaja yoga technique is, according to tradition, an innately therapeutic process which is beneficial for all chronic diseases, mental or physical, including asthma.

There are alternative explanations for the observed benefit. Many yoga and meditation practices include exercises designed to alter the pattern of breathing. Subjects in this study were given no explicit instructions about controlling their breathing pattern and we did not measure ventilation. However, previous studies have shown that tidal volume and frequency may be reduced during and following a period of meditation. Mild hypoventilation has a number of physiological consequences which could have affected our results. Proponents of the Buteyko breathing technique claim that asthma is associated with chronic hyperventilation and consequent hypoponopia, and propose that exercises which reduce minute ventilation are likely to be beneficial. In the only published controlled trial of the Buteyko breathing technique ‘asthmatics receiving active treatment had significant reductions in β2 agonist use, suggesting that the breathing exercises reduced asthma symptoms. However the breathing exercises had no effect on end tidal carbon dioxide pressure, suggesting that the mechanism of the effect is unlikely to be via a reduction in hypoponopia.

An alternative hypothesis may be that altering the pattern of breathing alters AHR by a direct effect on the dynamics of airway smooth muscle. Recent observations have led to the suggestion that the shortening velocity of airway smooth muscle may be an important determinant of AHR. In addition, there is in vitro evidence which suggests that airway smooth muscle shortening velocity may be affected directly by the volume of tidal breathing. In this model, decreasing tidal volume decreases the amplitude of force fluctuations acting on the smooth muscle and leads to reductions in actin-myosin crossbridge cycling rates and shortening velocity of the muscle, with a subsequent reduction in the amount of airway narrowing for a given stimulus. This model has not been tested in humans but provides a plausible explanation whereby changes in breathing pattern might alter AHR.

In conclusion, this randomised controlled trial has shown that, in patients who express an interest in non-pharmacological treatments for asthma, the practice of Sahaja yoga does have limited beneficial effects on some objective and pharmacological treatments for asthma, the practice of Sahaja yoga in the management of asthma 115

Sahaja yoga in the management of asthma 115

Support: Royal Australasian College of General Practitioners (Trainee Scholarship and Research Fund)
Sahaja yoga in asthma

Since the publication of our paper on Sahaja yoga in the management of moderate to severe asthma we have received a large number of enquiries. One issue that has been raised about the technique used in the study warrants clarification and further acknowledgement.

The Sahaja yoga meditation technique used in the study was not developed by the authors. The technique was taught to subjects in the intervention group by experienced Sahaja yoga practitioners free of charge. The technique itself was developed by yoga expert H H Shri Mataji Nirmala Devi and she permitted the investigators to conduct the study on the following reasonable conditions: (1) that no part of the technique be misrepresented, misappropriated or commercialised by the investigators; (2) that the founder and practitioners of the process be appropriately acknowledged as the true source and custodians of the technique and its associated knowledge; and (3) that it be made clear that the Sahaja yoga technique is, as a matter of policy and philosophical conviction, always made available free of charge.

The authors sincerely regret any misunderstanding that may have led readers or members of the public to believe otherwise. They sincerely and gratefully acknowledge the important and crucial role played by HH Shri Mataji Nirmala Devi and the Sahaja yoga practitioners of Australia in the execution of this study, and sincerely regret not having made more appropriate acknowledgements in the original article.

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Reference
A Pilot Study of a Mental Silence Form of Meditation for Women in Perimenopause

Ramesh Manocha · Barbara Semmar · Deborah Black

Abstract Menopausal symptoms often feature or are worsened by psychological and psychosomatic factors. As there is limited research into the potential role of psychological interventions, especially meditation, for the treatment of these symptoms the current study adopted an AB case series design with a follow-up phase. Fourteen women who were experiencing hot flashes and other menopausal symptoms and receiving no treatment for them attended meditation classes twice weekly for 8 weeks and practiced daily at home. A mental silence orientated technique of meditation called Sahaja Yoga (SYM) was taught. The Hot Flash Diary, Kupperman Index, MENQOL, Greene’s Climacteric Scale and STAI, were administered at baseline, mid treatment (4 weeks), post-treatment (8 weeks) and at 8 weeks follow-up. Substantial improvements in all measures occurred at post treatment. Changes in vasomotor symptoms, especially hot flashes, were most prominent as a significant decrease of 67% at post-treatment and 57% at follow-up ($\chi^2 = 11.7, p < .003$) were noted and Kupperman’s Index score decreased by 58% at post-treatment and 40% at follow-up ($\chi^2 = 11.7, p < .005$). All other symptom measures improved substantially from baseline to post-treatment, non-parametric analysis indicating that most of these changes were significant. These findings tentatively suggest that menopausal symptoms, especially vasomotor symptoms, and particularly hot flashes, might be substantially improved by using meditation.

Keywords Meditation · Hot flashes · Menopausal symptoms · Menopause · Mental silence · Sahaja Yoga · Behavior therapy

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A total of 70% of women experience symptoms during perimenopause (MacKinlay & Jeffreys, 1974), a period which begins a few years prior to cessation of menstruation and continues for some years afterwards, typically lasting about 5 years. The most commonly-experienced menopausal symptom is the hot flash, which can occur unexpectedly and randomly. Hot flashes can be detrimental to quality of life (Daly et al., 1993), are sometimes overwhelming, and can affect social life, ability to work, sleep patterns, and general perception of health (Greendale, Lee, & Arriola, 1999; Roberts, Chambers, Blake, & Webber, 1992; Stein, Jacobsen, Hann, Greenberg, & Lyman, 2000).

Women with severe menopausal symptoms often seek pharmacological management. The most widely-used strategy is hormone replacement therapy (HRT). This is effective, but many women are concerned about its potential side effects (Hill, Weiss, & La Croix, 2000), which can be short term, such as PV bleeding, or long term, such as an increased risk of certain cancers. Recent revisions to menopausal management guidelines (Women’s Health Initiative Investigators, 2002) and associated media attention has led to increased consumer interest in more ‘natural’ options. For instance, a North American Menopause Society survey (1997) of women aged 45–60 found...
that 80% of respondents had used nonprescription therapies to manage short-term disturbances or prevent long-term consequences of menopause. Interest seems particularly strong among women in whom HRT is contraindicated, such as those with a history of breast cancer (Newton, Buist, Keenan, Anderson, & LaCroix, 2002).

Simple lifestyle changes directed at modifying the physiological environment can be effective. There is evidence that regular exercise (Ivarsson, Spetz, & Hammar, 1998), elimination of smoking (Starapoli, Flaws, Bush, & Moulton, 1998), and avoiding stress (Gannon, Hansel, & Goodwin, 1987; Swartzman, Edelberg, & Kermann, 1990) can reduce the impact of hot flashes. One study even reported that hot flashes ceased immediately following exposure to cold (Casper & Yen, 1985), implying that hot flashes may be linked to irregular hypothalamic regulation of core body temperature. Consequently, strategies such as taking cold drinks, reducing the intake of spicy foods, and providing room air circulation may be effective.

Complementary and alternative therapies include herbs, vitamin and nutritional supplements, and behavior therapies (Barton, Loprinzi, & Ko, 2002; Kronenberg & Fugh-Berman, 2002). Behavioral therapies are particularly attractive to both consumers and clinicians as they are non-invasive and do not involve the consumption of exogenous agents. As part of a preliminary assessment for an interventional study (described in further detail below), Hunter and Liao (1995) surveyed menopausal women who were seeking help for menopausal symptoms, and found that 60% of respondents preferred psychological treatment to HRT. Their reasons included wanting to avoid the side effects of HRT and use natural options while at the same time gaining broader skills in managing stress and enhancing self-efficacy.

Previous psychological treatments studied have included breathing exercises, relaxation (Freedman & Woodward, 1992; Wijma, Melin, Nedstrand, & Hammar, 1997), cognitive behavioral therapy (Hunter & Liao, 1996), biofeedback, hypnosis (Younus, Simpson, Collins, & Wang, 2003) and mindfulness meditation (Carmody, Crawford, & Churchill, 2006). These studies are summarized for the reader (see Table 1). In summary, change in average hot flash frequency was quite variable, ranging from 35% to 70%, and the degree and scope of changes in ancillary symptoms also varied considerably.

Of particular relevance is the preliminary study by Carmody in which mindfulness based stress reduction (MBSR) was taught to 15 women. Participants experienced a reduction of approximately 40% in the frequency of hot flashes. Mindfulness meditation is a technique of meditation that involves observation of thoughts and feelings, a kind of meta-cognitive process, with the aim of making the

<table>
<thead>
<tr>
<th>Author (year)</th>
<th>Design</th>
<th>N</th>
<th>Duration</th>
<th>Main intervention</th>
<th>% Change in frequency of HF at end of intervention</th>
<th>Other measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stevenson and Delprato (1983)</td>
<td>SCD</td>
<td>4</td>
<td>12</td>
<td>Multicomponent</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Germaine and Freedman (1984)</td>
<td>RCT</td>
<td>12</td>
<td>6</td>
<td>Progressive muscle relaxation</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>Freedman and Woodward (1984)</td>
<td>RCT</td>
<td>33</td>
<td>8</td>
<td>Paced respiration</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Hunter and Liao (1995)</td>
<td>NRT</td>
<td>61</td>
<td>6–8</td>
<td>Cognitive behavioral therapy</td>
<td>30</td>
<td>Mood; anxiety</td>
</tr>
<tr>
<td>Irvin, Domar, Clark, Zuttermeister, and Friedman, (1996)</td>
<td>RCT</td>
<td>33</td>
<td>10</td>
<td>Relaxation response</td>
<td>35*</td>
<td>STAI; profile of mood states; hot flash intensity</td>
</tr>
<tr>
<td>Wijma et al. (1997)</td>
<td>SCD</td>
<td>6</td>
<td>12</td>
<td>Applied relaxation</td>
<td>56</td>
<td>Kupperman Index; Symptom Check List 90, Brief Fatigue Inventory</td>
</tr>
<tr>
<td>Younos et al. (2003)</td>
<td>SCD</td>
<td>14</td>
<td>4</td>
<td>Hypnosis</td>
<td>65</td>
<td>Quality of Life Questionnaire-C30, Brief Fatigue Inventory</td>
</tr>
<tr>
<td>Carmody et al. (2006)</td>
<td>RCT</td>
<td>15</td>
<td>7</td>
<td>Mindfulness</td>
<td>34</td>
<td>Women’s health initiative insomnia rating scale, Symptom Check List 90R, perceived stress scale</td>
</tr>
</tbody>
</table>

Note: *Non-significant; HF, Hot Flash; SCD, Single case design; RCT, Randomized control trial; NRT, Non-randomized trial; STAI, State Trait Anxiety Inventory; MENQOL, Menopause Specific Quality of Life Questionnaire
practitioner calmer and less likely to engage in negative thinking when faced with stressful events. MBSR includes coaching in certain mental attitudes and beliefs about the relationship between thoughts, feelings the mind and sense of self and other exercises (Kabbat-Zinn, 1990). Questions remain as to whether or not mindfulness is a meditation technique, a relaxation method or a more complex form of behavioral therapy. While meditation and relaxation are overtly similar researchers such as Manocha, Marks, Kenchington, Peters, and Salome (2002) provide empirical evidence for a distinction between “classical” meditation (with its emphasis on the mental silence experience), and meditation as a method of relaxation and generic stress management strategies. A separate assessment of the clinical potential of mental silence orientated meditation is therefore warranted.

This exploratory study examined the effects of SYM as a management strategy for menopausal symptoms, particularly hot flashes using a “classical” definition of meditation which features a state of ‘mental silence’ or ‘thoughtless awareness’ (Devi, 1997). Sahaja Yoga is a technique that emphasizes the importance of this classical approach and practitioners describe experiencing the state of mental silence as a key part of the meditative experience. It can be characterized by the following features: Elimination of unnecessary, especially negative thought activity; focusing attention effortlessly on the ‘present moment’ experience; and remaining alert and aware (sometimes more aware, but not hyperactive) and in full control of one’s faculties.

Method

A single cohort prospective, observational interventional study using an AB design with a follow-up phase with assessments at baseline, weeks 4, 8, and 16 was utilized.

Participants

Fourteen women with menopausal symptoms were enrolled into a specifically-designed, 8-week-long instructional program conducted at the Sydney Menopause Centre, Royal Hospital for Women, Sydney, Australia.

Referrals were made by clinical staff at the Sydney Menopause Centre of individuals who were attending the center for assessment and treatment of menopausal symptoms. Inclusion/exclusion criteria for this trial were: last menstrual period over 6 months prior; no other treatment, alternative or conventional, for menopausal symptoms for the past 8 weeks; no history of breast cancer; age between 40 and 60; no history of significant psychological or physical illness; nonsmoker; and less than two standard alcohol drinks per day. Subjects did not have a surgically/medically induced menopause; or unwillingness to comply with treatment guidelines of the study. Participants experienced a minimum of five hot flashes a day, as measured by a hot flash diary.

Eighteen women originally agreed to be contacted by the researcher. Four women were excluded because they were unable to make the necessary commitment to attend classes. Fourteen women gave informed consent and four women dropped out before the end of the intervention phase of the study and one woman was lost to follow-up. Mean age was 55 years. Thirteen of the subjects were either married or in de facto relationships.

The study was approved by the South Eastern Area Health Service Ethics Committee.

Procedure and Measures

The meditation group attended the Sydney Menopause Centre two evenings per week for 8 weeks where they received structured classes on the practice of SYM. The technique is based on a “classical” understanding of meditation and uses a simple series of silent affirmations based on a traditional understanding of yogic psychophysiology.

The instructor was a health professional with expertise in SYM instruction. Each instructional session lasted one and a half hours. All participants began the program simultaneously. Instructional audiotapes were given, as well as written guidelines on how to cultivate the meditation experience.

Each class began with an attendance role, followed by a brief instructional talk on the principles of meditation to be learned that day (focused on methodology such as breathing techniques, attentional focusing skills and designed to enhance the experience of mental silence), a question-and-answer session on any difficulties participants were experiencing, two guided meditation sessions separated by a short break, and a second, brief question time.

Participants were introduced to the idea that most menopausal symptoms could be spontaneously corrected by the practice of regular meditation. The idea that the state of mental silence was the crucial therapeutic component of the experience was impressed upon them.

During meditation subjects were encouraged to sit quietly in a chair or in a comfortable position that facilitated their meditation experience. The instructional sessions were specifically focused on helping participants achieve the experience of “mental silence” and each week informal feedback was sought by instructors regarding each participants’ progress with regard to this. They were encouraged.
to practice the techniques that they learned at home for 15 min twice each day.

**Measures**

At the first visit and at weeks 4, 8, and 16, participants completed a battery of self-report questionnaires and a hot flash diary:

- The Flash Count Diary requires that subjects tally each hot flash as it occurred throughout a 7-day period (Sloan et al., 2001).
- The Kupperman Index of Menopausal Symptoms, the oldest menopausal self-report instrument, is a validated menopause-specific symptom measure (Kupperman, Blatt, Wiesbader, & Filler, 1953; Kupperman, Wetchler, & Blatt, 1959) that focuses primarily on symptomatic relief.
- The Menopause Specific Quality of Life Questionnaire (MENQOL) is a validated questionnaire assessing the impact of menopausal symptoms on quality of life and is designed to detect changes as a result of treatment (Hilditch et al., 1996).
- The State Trait Anxiety Inventory (STAI) has been widely used in a variety of research settings and is one of the most popular assessment tools used in research into meditation (Spielberger, Gorsuch, & Lushene, 1968).
- The Greene’s Climacteric Scale is a self-report scale measuring the severity of three common types of menopausal symptoms: psychological, somatic, and vasomotor (Greene, 1998).

**Statistical Analysis**

The most conservative approach in the handling of missing values was taken, with no attempt being made to estimate missing values, and each analysis used all available scores.

Non-parametric analysis was the most appropriate way to handle the data because of the small sample size. These results are presented in Table 2. Response rates were compared between pre-intervention, post-intervention, and at follow-up to determine any change in hot flash frequency. To facilitate discussion in this paper as well as comparison with other studies Table 3 summarizes the percentage change for each measure, between baseline and post-intervention and baseline and follow-up.

**Results**

**Vasomotor Symptoms**

There was a clear improvement in vasomotor symptoms, particularly hot flashes. Hot flash frequency is best assessed by determining responder rate, with a reduction of 50% or more regarded as a positive response (MacLennan, Lester, & Moore, 2001). Eight out of ten participants exhibited a positive response, and this response was maintained at 16 weeks follow-up. By post-treatment, hot flash frequency was an average 67% below baseline, and at follow-up it was still 57% below baseline. Non-parametric analysis of hot flash frequency across the entire study showed that the changes were significant.
The Kupperman Index fell to a level 58% below baseline, with only some loss of benefit at the follow-up assessment, (compared to Wijma et al. (1997) average 43% reduction in severity scores, which was however maintained at follow-up). Non-parametric analysis showed the changes in the Kupperman’s Index to be significant.

Similarly, the vasomotor subscale of Greene’s Climacteric Scale improved an average 71% post-treatment. At follow-up, scores returned to 53% below that of baseline. Analysis of this subscale showed these changes to be significant. The MENQOL’s vasomotor subscale scores were 53% better at post-treatment, and remained unchanged at follow-up however on statistical analysis these changes were not significant.

Informal feedback from participants indicated most subjects did not continue meditating with the same intensity after cessation of the program.

Other Symptoms and QOL Domains

Non-vasomotor symptom scores did not change as impressively. For instance, the Psychometric and Depression subscales of the Greene’s Climacteric Scale and the Physical subscale of the MENQOL, despite their impressive changes at post-intervention were not maintained at follow-up. Consequently, analysis showed that these changes were not significant across the full duration of the study.

Table 3 Descriptive summary of changes, baseline to post-intervention, to follow-up

<table>
<thead>
<tr>
<th>Measure</th>
<th>Post-intervention</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Change</td>
<td>% Change</td>
</tr>
<tr>
<td>Hot flush frequency</td>
<td>67.2</td>
<td>56.2</td>
</tr>
<tr>
<td>Kupperman Index</td>
<td>58.2</td>
<td>40.4</td>
</tr>
<tr>
<td>Greene Climacteric Scale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vasomotor</td>
<td>71.1</td>
<td>52.4</td>
</tr>
<tr>
<td>Somatic</td>
<td>80.8</td>
<td>29.3</td>
</tr>
<tr>
<td>Anxiety</td>
<td>77.5</td>
<td>32.9</td>
</tr>
<tr>
<td>Psychometric</td>
<td>74.3</td>
<td>21.4</td>
</tr>
<tr>
<td>Depression</td>
<td>69.1</td>
<td>2.1</td>
</tr>
<tr>
<td>MENQOL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vasomotor</td>
<td>46.7</td>
<td>46.7</td>
</tr>
<tr>
<td>Psychosocial</td>
<td>45.9</td>
<td>37.2</td>
</tr>
<tr>
<td>Physical</td>
<td>53.0</td>
<td>31.7</td>
</tr>
<tr>
<td>Sexual</td>
<td>56.2</td>
<td>33.3</td>
</tr>
<tr>
<td>STAI-state</td>
<td>25.8</td>
<td>26.6</td>
</tr>
<tr>
<td>STAI-trait</td>
<td>26.4</td>
<td>23.0</td>
</tr>
</tbody>
</table>

Note: MENQOL, Menopause Specific Quality of Life Questionnaire; STAI, State Trait Anxiety Inventory

The mechanism of the menopausal hot flash is not yet fully understood although a neuroendocrine pathway is thought to have a primary role (Barton et al., 2002). It has been proposed that a psychophysiological, neuroendocrine pathway exists in which estrogen withdrawal leads to a decrease in endorphin and catecholamine levels, which culminates in increased hypothalamic norepinephrine and serotonin release. The change in these two factors then lowers the set point in the thermoregulatory nucleus of the brain: heat loss mechanisms are triggered and consequent increases in peripheral blood flow remove heat.

Discussion

Notwithstanding the obvious limitations of this small, uncontrolled trial those participants who completed the program and were followed up appeared to experience substantial improvements in a wide range of symptomatology. The most remarkable response was related to vasomotor symptoms, particularly hot flashes. Analysis by either frequency or responder rate indicated that the improvement was both statistically and clinically significant and more or less sustained even at the follow-up phase. There was no significant change in frequency in the follow-up phase, indicating that, even without professional supervision and formal classes, participants were able to maintain the health advantage that they achieved in the formal phase of the treatment program.

Clinically significant improvements also occurred in a number of the other measures, many of which were also statistically significant. The Kupperman Index, the Vasomotor, Somatic and Anxiety subscales of the Greene’s Climacteric Scale, the Psychosocial and Sexual subscales of the MENQOL all exhibited statistically significant changes across the entire assessment period. This is not to say that the other changes seen in the other scales, such as in both state and trait subscales of the STAI or the vasomotor subscale of the MENQOL, were negligible. In fact Table 3 shows that the changes in these measures were substantial however the power of the analysis is limited by the small sample size. More fine grained analysis, say, between baseline and post-intervention, was deemed inappropriate given the small sample size and exploratory nature of the study.

The loss of benefit indicated in some of the scales at follow-up may be explained by reduced compliance in the follow-up phase. By the same token, this also suggests that even partial compliance with the treatment program may be sufficient to maintain some benefits.

The improvements reported here compare favorably with previous studies (see summary Table 1) suggesting that the SYM approach may be more effective than a simple relaxation approach, but may not necessarily be more effective than multimodal approaches.

Table 3
from the body, producing both a hot flash and associated vasomotor phenomena (Shanafelt, Barton, Adjei, & Loprinzi, 2002).

Consequently, SYM may be helpful in mitigating the experience of hot flashes via a number of possible pathways. Studies in the area have implicated the stress response via reduction in physiological arousal (Panjwani, Gupta, Singh, Selvamurthy, & Rai, 1995), creation of a change in the levels of circulating stress hormones (Panjwani et al., 1995) or in reductions in cortisol releasing factor (Harte, Eifert, & Smith, 1995). However, Swartzman et al. (1990) in a study on stress-induced hot flashes, suggested simple reduction in arousal may not be the only explanation. Using objective measurements, these researchers found menopausal women exposed to various experimental stressors experienced more frequent and more distressing symptoms, but the additional hot flashes did not occur during stress and were not associated with elevated sympathetic arousal. This suggests the effects may be mediated by a slower neuroendocrine pathway other than the sympathoadrenal axis which supports the stress response. For example, stress and, inversely, stress reduction may alter hypothalamic release of estrogen, which in turn changes the firing threshold of hypothalamic thermoregulatory neurons. The negative emotions of stress are processed in the limbic system, and some experiments involving stimulation of the hippocampus have been shown to change thermosensitivity of preoptic neurons (Shanafelt et al., 2002). This might explain why stress potentiates rather than precipitates hot flashes and why meditation might be effective not only in reducing the severity of hot flashes but also preventing them.

From a psychobehavioral perspective Borkovec et al. (1987), and many others have found that CBT leads to a reduction in the physiological and psychological elements of anxiety in normal populations and clinical populations. However, in the present study, more robust effects were observed in scales assessing physical symptoms rather than psychological ones. This suggests that SYM’s primary effect was via alteration of physiological function rather than cognition and that the significant changes in psychological measures may be a consequence secondary to changes in physiological activity.

The small sample size in the current study means small, but real, treatment effects may not have been identified. This may explain why some changes in psychological measures, such as that seen in the vasomotor scale of the MENQOL, failed to reach significance in the non-parametric analysis despite their impressive numerical changes and the clinical improvements that they imply. Further studies using larger samples are needed to more fully explore this.

Of the 14 participants for whom baseline measures were taken, only 10 continued with the study. Selection bias may, therefore, have inflated the apparent effect of the intervention. Selection bias is especially important in studies such as this which involve intense commitment from participants and hence considerable expectation of benefit as well as selection through attrition of those that are experiencing positive outcomes. On the other hand, our drop out rate is similar to that seen in many other lifestyle modification studies, and similar rates would probably be seen in real life. Furthermore, while the drop-out phenomenon introduces bias by selecting for those most motivated, or those experiencing most benefit, it also allows researchers to look at the efficacy of such treatments in those participants most likely to try them in the community.

The absence of a control group makes it difficult to identify the magnitude of nonspecific factors, such as the placebo effect, expectancy, demand, practice effect, and regression to the mean. It is well recognized that these phenomena can have potent effects in psychophysiological symptoms such as the vasomotor phenomena associated with the perimenopause; for example, flashing responds to suggestions of improvement (Clayden, Bell, & Pollard, 1974). A number of reviews have suggested that placebo effect can be substantial for vasomotor symptoms (Shanafelt et al., 2002). MacLennan et al. (2001) systematic review of estrogen versus placebo effects for the management of menopausal symptoms found that, while HRT was clearly more effective than placebo, subjects in the placebo groups experienced up to 50% improvement in hot flash frequency from baseline to the end of the study.

In our study, the responder rate was 80%, and the mean reduction in hot flashes was 67%. This suggests that the observed effect is unlikely to be due to placebo or other nonspecific factors alone. The fact that hot flashes, compared with affective phenomena such as anxiety or depression, improved to a greater degree supports the idea that the observed effect is not simply due to a change in subjective perception. Similarly, while it is possible that participants may have experienced an unrelated, spontaneous improvement as part of the condition’s natural history, the usual time span for such regression to the mean is several years, whereas the improvements in this study occurred over several weeks and were maintained for some months afterwards.

The improvements in the psychological dimensions are consistent with effect magnitudes seen in studies using CBT or other psychotherapy, although our intervention did not include any formal counseling. A number of studies clearly suggest that meditation can have an effect similar to (West, 1987) or greater than (Manocha et al., 2002) that of other behavioral techniques. There is also some evidence to
suggest that the effect of meditation, and some other behavior therapies, extends beyond subjective experience and into the physical parameters of illness itself (Manocha et al., 2002).

Carmody et al.’s (2006) study which used mindfulness meditation reported similar levels of completion by participants but considerably smaller effects on hot flash frequency (35% at the end of the intervention period and 45% at the follow-up phase). The apparently larger response observed in our study may be due to the fundamental differences between the two approaches vis a vis the emphasis on mental silence in the SYM technique versus the emphasis on mental observation in the MBSR. The comparative effects of these two approaches warrant further investigation.

Admittedly, the heuristic nature of this study has its limitations. But its value is significant because, first, it suggests that a potent effect may be available from an easily learned behavioral method. Second, this method is concerned with a relatively unique idea that the meditative “state of consciousness” is responsible for its therapeutic effect. Third, no other behavioral method has explicitly connected this notion with health outcomes and yet the apparent magnitude of effect is one of the largest so far reported in the literature. Fourth, other RCTs of the same method suggest that this conceptual approach to meditation, unlike other approaches, is yielding evidence of specific effects. Therefore this study is not only significant to clinicians looking for promising behavioral therapies but will also be useful to those researchers looking for ways to understand and study meditation.

In conclusion, this preliminary assessment of meditation for menopausal hot flashes and other menopausal symptoms showed SYM has demonstrated promising effects. These effects seem comparable if not possibly greater than that seen in studies of other behavior therapies. Further investigation is needed using RCT methodology with apparent magnitude of effect is one of the largest so far. The comparative effects of these two approaches warrant further investigation.

Admittedly, the heuristic nature of this study has its limitations. But its value is significant because, first, it suggests that a potent effect may be available from an easily learned behavioral method. Second, this method is concerned with a relatively unique idea that the meditative “state of consciousness” is responsible for its therapeutic effect. Third, no other behavioral method has explicitly connected this notion with health outcomes and yet the apparent magnitude of effect is one of the largest so far reported in the literature. Fourth, other RCTs of the same method suggest that this conceptual approach to meditation, unlike other approaches, is yielding evidence of specific effects. Therefore this study is not only significant to clinicians looking for promising behavioral therapies but will also be useful to those researchers looking for ways to understand and study meditation.

In conclusion, this preliminary assessment of meditation for menopausal hot flashes and other menopausal symptoms showed SYM has demonstrated promising effects. These effects seem comparable if not possibly greater than that seen in studies of other behavior therapies. Further investigation is needed using RCT methodology with adequate sample size and proper strategies to control for non-specific effects associated with behavior therapies to determine whether or not these effects are real and specific to this particular intervention. As demand from consumers for information on non-pharmacological approaches to controlling menopausal symptoms increases, the imperative for such exploration grows.

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References


Sahaja Yoga Meditation as a Family Treatment Programme for Children with Attention Deficit-Hyperactivity Disorder

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ABSTRACT
The use of complementary and alternative medicine (CAM) as a treatment for children diagnosed with attention deficit-hyperactivity disorder (ADHD) is widespread, but little is known on the effectiveness of many such therapies. This study investigated meditation as a family treatment method for children with ADHD, using the techniques of Sahaja Yoga Meditation (SYM). Parents and children participated in a 6-week programme of twice-weekly clinic sessions and regular meditation at home. Pre- and post-treatment assessments included parent ratings of children’s ADHD symptoms, self-esteem and child–parent relationship quality. Perceptions of the programme were collected via parent questionnaires and child interviews. Results showed improvements in children’s ADHD behaviour, self-esteem and relationship quality. Children described benefits at home (better sleep patterns, less anxiety) and at school (more able to concentrate, less conflict). Parents reported feeling happier, less stressed and more able to manage their child’s behaviour. Indications from this preliminary investigation are that SYM may offer families an effective management tool for family-oriented treatment of childhood ADHD.

KEYWORDS
attention deficit-hyperactivity disorder (ADHD), child–parent relationships, complementary and alternative medicine (CAM), meditation

THE MOST COMMONLY used treatment for attention deficit-hyperactivity disorder (ADHD) in North America and Australia continues to be psycho-stimulant medication (Goldman, Genel, Bezman, & Slanetz, 1998; Rubia & Smith, 2001; Vance & Luk, 2000), which has been found to improve the core behavioural and cognitive features of ADHD,
such as behavioural inhibition and concentration, as well as co-morbid symptoms such as poor academic achievement, in about 80% of the children (Barkley, 1997; Cara, 2002; Gage & Wilson, 2000). In the last 10 years, a five-fold increase in methylphenidate prescription and consumption has been seen, with as many as 30–40% of children in some American schools receiving stimulant medication (Ghodse, 1999). Similar trends have been seen in Australia. From 1990 to 2000, the rate of children receiving stimulant medication for ADHD increased in the order of nine times (Committee on Children and Young People, 2002). This, among other factors, has made community concerns about possible over-prescription and side effects of methylphenidate grow (Vimpani, 1997).

Common physiological short-term side effects of stimulant medication are insomnia, appetite loss, stomach-aches, dizziness and daytime drowsiness, in addition to emotional and motor symptoms, such as mood lability and tics (Vance & Luk, 2000). In addition,

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psycho-stimulants can produce abuse and dependency (Goldman et al., 1998) and the potential long-term side effects of lengthy treatments are not known (National Institute of Mental Health, 1998; Schachar & Tannock, 1993). As such information becomes more widely available to the public, it is not surprising that large numbers of parents seek complementary and alternative medicine (CAM) therapies (Chan, Rappaport, & Kemper, 2003; Stubberfield & Parry, 1999) as a response to their concern about the physiological and psychological effects that the drugs may have on their children (Rice & Richmond, 1997, p. 93). Support for CAM has also come from clinicians who argue that an emphasis on medical therapy alone draws attention to the control of symptoms, rather than attending to the need for children to acquire important behavioural and social skills (Zametkin & Ernst, 1999).

The issue of community concern relating to the escalating use of stimulants in the management of ADHD symptoms, treatment acceptability, side effects, potential long-term effects, danger of drug abuse and dependency, and consumer and parent preference of non-pharmacological treatment, compels researchers to explore other treatment options. According to Rice and Richmond (1997), the most promising interventions are those that work with the whole family system and use medication in association with non-medical interventions. Non-medical interventions for ADHD include a variety of behavioural treatments, such as cognitive-behaviour therapy, as well as complementary and alternative treatments, such as dietary modification, biofeedback, relaxation training and meditation (for reviews of CAM and ADHD see Arnold, 2001; Chan, 2002; Pelham, Wheeler, & Chronis, 1998). Arnold’s review of alternative approaches to the management of ADHD noted that meditation was one of a number of promising strategies and warranted further systematic assessment. However, to date there have been only two unpublished dissertations suggesting that meditation may improve impulsiveness at home and in the classroom in children with ADHD (Arnold, 2001).

Meditation is classified by Chan (2002) as one of a number of ‘lifestyle/mind–body therapies,’ which elicit the relaxation response and reduce hyperarousal to stress. Reviews tend to present meditation and relaxation training methods conjointly (Canter, 2003; Chan, 2002); however, some authors see meditation as different to relaxation. For example, Manocha, Marks, Kenchington, Peters, and Salome (2002) describe meditation as a self-management strategy for acquiring personal awareness and self-control. Although meditation may not be well understood or defined by western therapeutic models, the eastern definition is very clear: Meditation is a state of ‘mental silence’ characterized by the elimination of unnecessary thought, effortless attention on the present moment and alert awareness (Srivastava, 1997). There are many different meditation techniques currently taught in the west, including ‘listening to the breath, repeating a mantra, or detaching from the thought process, to focus the attention and bring about a state of self awareness and inner calm’ (Canter, 2003, p. 1049). Of these, Sahaja Yoga Meditation (SYM), which is based on scientific principles introduced by the founder, Shri Mataji Nirmala Devi Srivastava, has shown promise in a number of clinical trials. SYM claims to relax the sympathetic nervous system by activating parasympathetic–limbic pathways that relax body and mind (Srivastava, 1997). Clinical treatment studies of SYM have reported physiological and psychological benefits for patients with asthma (Manocha et al., 2002), stress disorders (Rai, Setji, & Singh, 1988), depression (Morgan, 2001) and epilepsy (Panjwani, Gupta, Singh, Slevamurthy, & Rau, 1995; Panjwani et al., 1996; Yardi, 2001). Direct physiological effects of SYM include indicators of increased parasympathetic activity such as a decrease in blood pressure, decreases in heart, respiratory and pulse rates, and an increase in galvanic skin resistance (indicator of decreased sympathetic activity) (Rai et al., 1988). In electrophysiological investigations, SYM has
been associated with reduced complexity of electroencephalogram (EEG) patterns and increases in the medium frequency and low-beta ranges suggestive of increased attentional control (Aftanas & Golocheikine, 2001, 2002). Alteration in beta/theta waves by means of biofeedback, however, has been shown to correlate with improvement in ADHD symptoms (for an overview see Ramirez, Desantis, & Opler, 2001). It is thus possible that the mechanisms of action of yoga meditation resemble theta/beta biofeedback techniques by enhancing overall alertness, attentional focus and relaxation. This background of neurological, physiological and psychological research, as well as the practical experience of teachers and yoga practitioners who have noted that SYM helps to focus attention, enhance concentration and memory, and improve children’s performance at school (Srivastava, 1997), suggests that SYM is a useful alternative treatment for children with ADHD.

Core symptoms of childhood ADHD, according to the DSM-IV (American Psychiatric Association, 1994), are inattention, impulsivity and hyperactivity. Associated symptoms are academic underachievement and impaired self-esteem (Cara, 2002; Treuting & Hinshaw, 2001). The typical pattern is thus one of a highly energetic, impulsive, delay-aversed, unfocused and behaviourally poorly controlled child who demands constant attention and redirection. The central problem of the disorder is difficulty in self-regulating own behaviour (Anderson, 1997; Barkley, 1997; Rubia et al., 2001). Structural studies have related ADHD to abnormalities in the frontal cortex and the basal ganglia (Castellanos et al., 2002). Electrophysiological studies have pointed to functional deficits in the brain as correlates of poor regulatory control in hyperactive children (e.g. Barry, Clarke, & Johnstone, 2003; Barry, Johnstone & Clarke, 2003) and modern functional imaging studies have associated abnormal activation of frontal brain areas with deficits of inhibitory and attentional control (Rubia et al., 1999, 2001; Vaidya et al., 1998). Neurotransmitter abnormalities, such as dopamine dysregulation, have also been linked to ADHD (reviewed in Rubia & Smith, 2001); notably, dopamine transporter (DAT) levels are elevated in the striatum of children (Cheon et al., 2003) and adults with ADHD (Krause, Dreisel, Krause, Kung, & Tatsch, 2000).

In considering a psychological aetiology of this disorder, authors have looked to transactional models that explain poor self-regulatory behaviour within the wider context of family dynamics and parent–child relationships. Certainly, research shows that an ADHD child may unduly strain these relationships. Cara (2002) notes that parents often feel frustrated, anxious and angry that parenting techniques effective for other children appear useless in the child with ADHD, who seems not to understand the consequences of inappropriate behaviour or to learn from punishment. When oppositional, non-compliant behaviour is characteristic, parents may be less appreciative of their children’s efforts, less willing to reward them, and more negative, directive and controlling (Rice & Richmond, 1997). An alternate interpretation suggests that deficits in self-regulation may be related to insecure parent–child attachment relationships (Olson, 1996; Steifel, 1997), which are characterized by a pattern of conflicted, angry parent–child interchanges (Bowlby, 1969/1982). To date, few studies have examined attachment status in children with ADHD. Researchers in New Zealand have reported that maternal responsiveness and synchronous interaction (which are known predictors of attachment security, e.g. de Wolff & van IJzendoorn, 1997) were significantly lower in ADHD mother–child dyads than in a matched control group (Keown & Woodward, 2002). In Australia, Clark, Ungerer, Chahoud, Johnson, and Stiefel (2002) noted consistent associations with insecurity in children with ADHD across three different representational assessments of attachment. ADHD was linked to heightened emotional expression and out-of-control affects, suggesting an insecure–ambivalent or disorganized attachment relationship with the parent.
We sought to assess the contribution of Sahaja Yoga Meditation (SYM) to a more effective management of the main problems experienced by children with ADHD, such as stability of attention and concentration, motor activity, problems of inhibition and easily frustrated mood, as well as associated problems such as poor self-esteem and difficulties at school. By presenting SYM as a family practice and encouraging parents to meditate regularly with their child, we sought to assess the extent of individual benefits for parents as well as any improvement in the security of the parent–child relationship. It was expected that SYM would be an adjunct to children’s on-going medical therapy and would provide a means of working with the whole family. The aims of the programme reflected the goals for appropriate treatment identified by the American Academy of Pediatrics (Cara, 2002); that is, to improve core symptoms of ADHD, reduce associated symptoms and improve functional outcomes. These aims were tested in a voluntary clinic provided at the Royal Hospital for Women, Sydney, Australia with the help of a team of experienced instructors in SYM.

Method

Recruitment
The SYM trial treatment programme was approved by the Human Ethics Committee of the South Eastern Sydney Area Health Service. The programme was publicized by a newspaper article and an introductory lecture, which was open to parents of school-age children with ADHD. Interested parents were invited to participate with their child in a 6-week programme of twice-weekly sessions teaching SYM as a potential non-drug adjunctive intervention for children with ADHD. Inclusion criteria were that the child had a formal diagnosis of ADHD, that is, met the DSM-IV criteria made by a paediatrician or child psychiatrist (National Health and Medical Research Council, 1996). Although it was clear from comments made by a number of parents at the recruitment session that they were looking for alternatives to medication, at no point in the SYM programme were parents advised or asked to reduce their child’s pharmacological treatment for ADHD. The introductory session, information sheet and discussions with parents during the programme made no recommendations about medication, except that parents should monitor and adjust their children’s medication as they normally would, in conjunction with their doctor or psychologist. Parents gave written consent for themselves and their child to participate.

Participants
General information on the children’s age, diagnosis of ADHD and medication was collected prior to the commencement of the meditation training, along with parent-reported ADHD symptoms. Only those children who scored above threshold for ADHD were included in the study (i.e. a score of 15 and over on the Conners Parent–Teacher Questionnaire; see later). Forty-eight children (41 boys, 7 girls), including four sets of siblings, met the criteria for inclusion in the programme. The majority of children (n = 31) were receiving medication (e.g. ritalin, dexamphetamine), 14 were not medicated, and medication information was not provided for the other 3 children. Demographic information showed that families represented a diverse population. About three-quarters of the 44 families were in couple relationships and one-quarter comprised single parents or guardians. Adult participants who provided personal data included 38 mothers, 22 fathers and 1 grandmother. Mothers ranged in age from 27 to 50 years (M = 38.8, SD = 5.9); fathers were slightly older than mothers (range: 35–55 years, M = 43.1, SD = 5.2). Education levels for both mothers and fathers ranged from less than
secondary school to doctoral studies, with the majority having completed tertiary level studies (mothers, 62%; fathers, 73%). Parent ethnicity was less diverse: 95% of participants identified themselves as white/Caucasian.

Because of the requirement for personalized training in the SYM programme, it was necessary to separate the children into two groups and run two sequential treatment programmes. Group 1 comprised older children (19 boys, 1 girl) and their parents (age range: 8–12 years, \( M = 10.09, SD = 1.13 \)). There was also a 6-year-old female sibling who was included in this group. The group 1 treatment programme began at the end of the summer holidays and continued into the first term of school. Children in group 2 were more diverse in age (range: 4–12 years, \( M = 7.4 \) years, \( SD = 2.0 \)). Participants included 15 ‘waiting list’ children whose parents attended the initial recruitment session, and a further 12 children whose parents joined at the commencement of the second programme. Group 2 treatment began during the Easter school holidays and continued into the second school term.

**Sahaja Yoga Meditation programme**

The intervention programmes were conducted over a 6-week period, using Sahaja Yoga Meditation (SYM) techniques developed and described by Shri Mataji Nirmala Devi Srivastava (n.d.). SYM uses a simple meditation method that can be easily taught to children and adults. The treatment programme consisted of twice-weekly 90-minute clinics, held in large meetings rooms at the hospital. For the first 3 weeks, the clinic consisted of guided meditation sessions, with parents attending one group and the children another. The meditation process involved practising techniques whereby participants were helped to achieve a state of thoughtless awareness. Instructors directed participants to become aware of this state within themselves by becoming silent and focusing their attention inside. Parents were also asked to conduct shorter meditation sessions at home twice a day.

In the clinic, there were usually two periods of meditation of 5–15 minutes each, supplemented by information about how to meditate and sharing of experiences. The parent sessions had one to two instructors, but the child sessions had a higher instructor-to-child ratio (normally, one instructor for every three children). From week 4 to week 6, one of the weekly sessions was conducted as a joint parent–child meditation. This enabled instructors to train parents in guiding their child’s meditation. Children and parents were asked to meditate regularly at home and to record their progress in a diary, which was checked each week to encourage compliance.

**Assessment procedures**

Children and parents contributed to a range of data collection procedures, which drew on three sources: child self-report questionnaires, parent-rated questionnaires and examiner testing and interviews. Assessments were conducted at three points: recruitment or commencement of the meditation programme (week 1), midway point of the programme (week 3) and the end of the programme (week 6). The full schedule of assessments was completed for group 1. The second treatment programme, group 2, used fewer measures and assessments were only completed at the commencement (week 1) and end of the programme (week 6).

**Child assessment measures: Parent report**

**Conners Parent–Teacher Questionnaire** ADHD symptoms were assessed via parent report, using the Conners Parent–Teacher Questionnaire (National Institute of Mental
Conners parent-rated checklists, which are shorter versions of the 93-item original, are commonly used tools in research and clinical practice (reviewed in Conners, Sitarenios, Parker, & Epstein, 1998). The measure chosen for our study presents 10 behavioural descriptors (e.g., excitable/impulsive; fails to finish things/short attention span) that parents rate on a 4-point scale (0 = not at all, 1 = just a little, 2 = pretty much, 3 = very much), and one overall question ‘How serious a problem do you think the child has at this time?’ (0 = none, 1 = minor, 2 = moderate, 3 = severe). These 11 items achieved a high level of internal reliability. Coefficient alphas ranged from .74 to .86. Ratings on the 11 items were summed to give a total score for ADHD symptoms at each assessment point (possible range 0–33).

**Perceived outcomes of SYM for the child** At the mid- and endpoints of the programme, parents were asked to complete a short questionnaire asking whether they felt the meditation had benefited the child, and whether it had made a change to the relationship they had with the child. Simple 5-point rating scales were used to obtain information on the level of benefit (1 = little; 5 = a lot) for the child in the areas of emotions (anxiety, anger, able to manage negative feelings), self-esteem (confidence), attention (memory, able to settle down) and sleep. Additional questions were included at the final point about benefits for the child’s schoolwork, e.g., positive attitudes about going to school, social relations with the teacher and other children, and attention to schoolwork and homework.

**Psycho-stimulant medication** At the mid- and endpoints of the programme, parents were asked about any changes they may have made to their child’s level of medication. The question asked was ‘have you been able to reduce your child’s level of medication and still maintain an acceptable level of behaviour?’ If medication had been reduced, parents were asked to report the proportion; that is, less than half, half or more than half.

**Biobehavioural Indicators of Self-Esteem** We used Burnett’s (1998) 13-item Biobehavioural Indicators of Self-Esteem questionnaire, which asks parents to rate their child’s behaviour over the previous 2 weeks on a 5-point scale. Statements assess social interaction, confidence and involvement. Internal consistency was high; alphas ranged from .81 to .94. Ratings were combined to give a mean score for indicators of self-esteem.

**Child assessment measures: Child self-report**

**Burnett Self-Scale** An abbreviated version of Burnett’s (1994) 40-item self-evaluation and self-description measure was used to assess child self-esteem. For the present study, only the areas of peer relations, relations with mother and father, and learning self-concept were selected. Internal consistency of the modified scale was high; coefficient alpha = .95.

**Child assessment measures: Examiner testing and interviews**

**Peabody Picture Vocabulary Test – Third edition** Cognitive ability was assessed using the Peabody Picture Vocabulary Test – Third edition (PPVT-III; Dunn & Dunn, 1997). The PPVT measures receptive language and has been shown to provide a good measure of verbal comprehension and to correlate highly with measures of academic performance.

**Child interviews** Audio-taped interviews were conducted individually with children at the end of the 6-week meditation programme. Questions focused on the children’s
experience of the meditation programme, whether they liked meditation, what they liked about it, whether they felt it had helped them and how it had helped.

**Parent assessment measures**

**Perceived outcomes of SYM for the parent**  Parents were asked to report on their own experiences of the meditation programme and whether they felt it had been beneficial to them, by rating the extent to which they felt happier, less stressed, more able to manage stress, less angry and more able to manage anger on a 5-point rating scale (1 = little benefit, 5 = a lot of benefit). At the end of the programme, parents were also asked to provide written examples of recent positive and negative interactions with their child.

**Child–Parent Relationship Scale**  Parents completed the 30-item Child–Parent Relationship Scale (CPRS), which assesses the quality of the parent–child relationship. The CPRS is an adaptation of Pianta’s (1990) Student–Teacher Relationship Scale, which has been used extensively in studies of relationship quality in Australia (Harrison et al., 2003) and the US (National Institute of Child Health and Development Early Child Care Research Network, n.d.; Pianta & Steinberg, 1992). Items on the CPRS tap four dimensions of child–parent attachment, warmth, conflict, dependence and open communication, on a 5-point rated scale. Internal consistency for the total scale score was high, coefficient alpha = .84 and .86 at weeks 1 and 6, respectively.

**Results**

Results are presented in four sections. First, children’s baseline ADHD data are described in relation to family demographic characteristics. This section also reports SYM programme retention and completion rates for the two treatment programmes, and baseline ADHD data for ‘waiting list’ children. Second, the impact of SYM on changes in ADHD symptoms, along with medication status and perceived child outcomes are examined. In the third section, SYM effects are examined in relation to a wider range of psychological assessments, including cognitive ability, self-esteem and parent–child relationship quality. Finally, results of the SYM programme for parent participants are presented. Because of the small sample size, analyses were descriptive; *t*-tests were used for group comparisons.

**Baseline ADHD symptoms: Demographic factors**

Data from parent reports at the initial recruitment or commencement stage of the SYM programme showed that children’s baseline ADHD symptoms were moderately high (*M* = 22.65), and varied across the 48 participants (*SD* = 4.36; range: 15–30). Initial comparison of means, using *t*-test analysis, showed that there were no differences in baseline ADHD symptoms for children allocated to group 1 vs group 2 (*Ms* = 23.00 and 22.37, respectively, *t* = .24, *ns*) or for boys vs girls (*Ms* = 22.59 and 23.00, respectively, *t* = .05, *ns*). Children from couple families had significantly lower ADHD symptom scores (*M* = 21.25, *SD* = 3.88) than children from single-parent families (*M* = 25.58, *SD* = 3.68, *t* = 11.19, *p* < .01). Children whose parents had completed tertiary education had lower scores (*M* = 21.23, *SD* = 4.34) than the children of non-tertiary educated parents (*M* = 24.13, *SD* = 4.09, *t* = 5.17, *p* < .05).

Retention rates for the two 6-week SYM programmes were reasonably good, especially considering that many families travelled long distances to attend the hospital clinic and that children attended outside-school activities that competed with the clinic.
times and home meditation expectations. For group 1, 16 of 21 children completed the full 6-week programme – a retention rate of 76%. For group 2, 19 of 27 children completed the treatment – 70% retention. Unfortunately, owing to organizational problems in the final week, endpoint data were provided by only 10 of the 19 group 2 children. Therefore, the combined studies provided pre- and post-treatment data for 26 children. Comparisons of mean ADHD scores, using \( t \)-test, showed that there were no differences between the participants who provided complete data (\( N = 26 \)) and those who did not (\( N = 22 \)), on any of the demographic measures (child’s age and sex, mother’s and father’s age and education, family marital status) or in the proportion of children receiving medication.

The sequential administration of the SYM programme provided an opportunity to assess baseline ADHD symptoms for children who were placed on the ‘waiting list’ on two occasions prior to treatment – at the initial recruitment stage and several months later at the commencement of the second programme. These children provided a quasi-control group for group 1 children, in that they did not receive treatment during the first session. Analyses using correlation and comparison of means tests showed that children’s ADHD scores were consistent across these two occasions, \( r(12) = .68, p = .015 \), and had remained at a similar level (\( M_1 = 22.08, SD = 4.72; M_2 = 21.17, SD = 4.69; t = .84, ns \)).

**Change to ADHD-related symptoms: Pre- and post-SYM treatment programme**

Results for the 26 children who provided pre- and post-treatment data showed a marked improvement in ADHD symptoms as measured on the Conners Parent–Teacher Questionnaire over the course of the meditation programme. Mean scores decreased from \( M_{\text{pre}} = 22.54, SD = 4.61 \), to \( M_{\text{post}} = 14.62, SD = 5.15 \). The average mean decrease in reported ADHD symptoms was 7.91 points (\( SD = 4.91, \text{range 0–19} \)), which represented an improvement rate of 35%. Statistical analysis using paired samples \( t \)-test showed that the difference in pre- and post-treatment scores was highly significant (\( t = 8.23, p < .001 \)).

Because of the possibility that the improvement in behaviour may have been due to the medication children were receiving rather than the SYM programme, further comparisons were made to assess whether medication status may have contributed to this change. Results presented in Table 1 (lines 1 and 2) show a similar reduction in ADHD symptoms for the 20 children who were receiving medication compared with the 6 who were not, mean reduction scores = 7.83 (\( SD = 5.15 \)) and 7.95 (\( SD = 4.97 \)), respectively (\( t = -.50, ns \)). This result suggests that the reduction in ADHD symptoms was not related to children’s pharmacological treatment.

It was also noteworthy that, in a number of cases, parents stated that they had been able to reduce their child’s medication during the course of the SYM programme. Of the 20 children who were receiving medication when they started the programme, 11 had reduced the dose during SYM treatment – two by less than half, six by half, and three by more than half – and nine did not change the dose. Table 1 (lines 3 and 4) presents the change in ADHD symptoms data for these two subgroups. Comparison of means indicated that the improvement in the level of ADHD symptoms was significantly greater for the 11 children who had reduced their medication (\( M_{\text{reduction}} = 10.18, SD = 4.79 \)) than for the 9 who had maintained the same level of medication (\( M_{\text{reduction}} = 5.22, SD = 3.83; t = 2.51, p = .022 \)). These findings suggest that SYM treatment not only contributed to the reduction in children’s ADHD behaviour scores, but also had the added benefit of helping children manage their own behaviour with a reduced level of medication.

Post-treatment interviews with the children showed that being able to stop or reduce daily medication was seen as a positive outcome of the SYM programme. A child who
had stopped his medication completely said he ‘felt great’, adding ‘I used to hate having to be on my medication’. The children identified a number of other benefits of SYM, not only during meditation itself, which was described as ‘easy’, ‘relaxing’ and like being ‘in your own bubble, where no-one else can stop you from doing what you’re doing at the time’, but also in other situations at home or at school. One child said meditation ‘helps me with my headaches’; another said he was ‘getting into less of a panic’; another that meditation ‘gave him more energy, but not energy to get “hyped-up”’. Many children said they were able to get to sleep more easily. Benefits for attention at school were also given; for example, children commented that ‘it keeps me focused on my work’; ‘it’s made me smarter’; ‘I seem to be able to concentrate more’; ‘if my friends are talking around me, now I can bring my mind straight back to my work’. Children also mentioned having fewer social problems, such as ‘not getting into trouble’ or being able to ask the teacher for help instead of retaliating when children were teasing them.

Parent perceptions of the outcomes of SYM for their child confirmed these findings. When asked if they felt their child had benefited from the SYM programme, 92% agreed that they had. Particular benefits for the child that were rated highly (> 3 on a 5-point scale) by parents were ‘more confident in him/herself’ (M = 3.35, SD = .93), ‘improved sleep patterns’ (M = 3.27, SD = 1.42) and ‘more cooperative’ (M = 3.18, SD = 1.01). High ratings for benefits related to school included ‘less difficulty with the teacher’ (M = 3.64, SD = .92), ‘more able to manage schoolwork’ (M = 3.56, SD = 1.03), ‘more able to manage homework’ (M = 3.47, SD = 1.33), and ‘positive about going to school’ (M = 3.43, SD = 1.09).

As a further test of the effectiveness of the SYM treatment in reducing ADHD symptoms, child and family factors were tested as covariates in six repeated measures analyses. Child factors were sex, age and medication status (receiving medication vs no medication); family factors were mother’s age, mother’s education (secondary vs tertiary education) and marital status (single parent vs couple families). Results showed that none of the child or family factors contributed significantly to the model. Although these

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**Table 1.** Children’s ADHD symptoms during the meditation programme by medication status

<table>
<thead>
<tr>
<th>Medication Status1</th>
<th>Commencement (Week 1)</th>
<th>Final Point (Week 6)</th>
<th>Symptom Change (Week 1 to 6)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Mpre</td>
<td>SD</td>
</tr>
<tr>
<td>No medication</td>
<td>6</td>
<td>22.33</td>
<td>6.57</td>
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<tr>
<td>Receiving medication</td>
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<td>22.60</td>
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<td>11</td>
<td>24.00</td>
<td>4.90</td>
</tr>
<tr>
<td>No change of dose3</td>
<td>9</td>
<td>20.89</td>
<td>3.33</td>
</tr>
</tbody>
</table>

Note. ADHD symptoms were measured using the Conners Parent–Teacher Questionnaire.
1 Medication status as reported by parents at week 1 of the treatment programme.
2 t-Test analysis compared mean scores for the 20 children receiving medication with those for the 6 children not receiving medication.
3 Of the 20 children who were receiving medication at week 1, 11 reduced the dose over the 6-week programme and 9 did not change the dose.
4 t-Test analysis compared mean scores for the 11 children who reduced dosage with those for the 9 children who had no change of dosage.
analyses were limited by the small sample size, they support the conclusion that the reduction in children’s ADHD behaviour scores was attributable to the SYM treatment, and not to medication status, child or family characteristics.

Changes in ADHD-associated symptoms: Pre- and post-SYM treatment programme

Results presented in this section are based on group 1 children only. Standardized scores on the PPVT indicated that there was wide variation in children’s cognitive ability (range: 48–139, $M = 94.79, SD = 23.43$). Eight children had moderately low to extremely low scores (< 85), seven were average (85–115) and four had moderately high to extremely high scores (> 115). Parent ratings of behavioural indicators of child self-esteem ranged from low (2.31) to high (4.54), with the mean score for the sample ($M = 3.23, SD = .75$) being mid-range, according to Burnett’s (1998) descriptions. Children’s self-descriptive and self-evaluative ratings of themselves were within normal range ($M = 4.18, SD = .46$, range: 3.47–4.94) in comparison with the range of scores reported by Burnett (1996) for children of a similar age. Quality of child–parent attachment, as measured by Pianta’s Child–parent Relationship Scale (CPRS), ranged from low (2.33), which indicates insecurity in the relationship, to moderately high (4.03), which shows secure aspects. The overall mean score for the 30-item scale was midway on a 5-point scale ($M = 3.05, SD = .44$) suggesting that, as a group, there were both insecure and secure qualities in children’s relationships with their parents. Examination of the subscale scores showed that scores on the 13-item conflict subscale were elevated ($M = 3.47, SD = .80$), indicating that the nature of the insecurity centred on angry, difficult and unpredictable interactions. This is consistent with the insecure–ambivalent or insecure–disorganized model of attachment reported by Clarke et al. (2002) for children with ADHD. Scores for open communication (3-item subscale, $M = 3.60, SD = .73$) and warmth (8-item subscale, $M = 4.03, SD = .48$), were moderate-to-high, indicating that dimensions of security were also evident in the child–parent relationship.

Correlation analysis showed that children who were rated by their parents as having higher self-esteem, and who rated themselves more highly in their self-descriptions and self-evaluations, had more secure attachment relationships with their parents, $r_s(19) = .47$ and .47, respectively ($p_s < .05$). ADHD symptoms were not significantly related to parent–child relationship quality or child self-esteem. There was no relationship between PPVT scores and ratings of ADHD symptoms, child self-esteem or parent–child relationship quality.

Post-treatment scores showed that SYM was associated with significant improvements in all of the parent-rated measures. Results are presented in Table 2. For each measure, mean pre- and post-treatment scores were compared using paired sample t-test analysis. ADHD symptom scores at the mid-point and final point were significantly lower than the baseline score ($M_{pre} = 22.62, M_{post} = 15.94$ and 16.25, $t_s = 5.81$ and 5.65, respectively, $p < .001$). A similar improvement was seen in parents’ reports of their children’s confidence and social behaviour, with average scores increasing by a half-point at the mid- and endpoints of the meditation programme ($M_{pre} = 3.24, M_{post} = 3.69$ and 3.73, $t_s = -3.06$ and $-3.62$, respectively, $p < .01$). Child–parent relationships also improved during the course of the SYM treatment, rising by one-third of a point ($M_{pre} = 3.06, M_{post} = 3.35, t = -3.34, p < .01$). Examination of the subscale components of the CPRS showed that this change was accounted for by lower scores for relationship conflict ($M_{pre} = 3.37, M_{post} = 2.94, t = 3.08, p < .01$).

As a further check of the effectiveness of the SYM intervention, we tested whether the observed changes in ADHD symptoms, self-esteem and relationship quality from
weeks 1 to 6 were related to individual child differences in cognitive ability, using repeated measures analyses with baseline PPVT scores entered as a covariate. Results for ADHD and self-esteem showed no significant contribution of children’s PPVT scores, suggesting that the observed improvements were not explained by differences in children’s cognitive ability.

Scores for children’s self-description and self-evaluation ratings of self-esteem did not change significantly from the commencement to the end of the meditation programme (see Table 2). It should be noted, however, that the average scores were fairly high at both points (4.2 and 4.3 on a 5-point scale), which may partly explain the lack of significant change. Children with ADHD have been known to inflate self-reported self-esteem (Hoza, Pelham, Milich, Pillow, & McBride, 1993).

Final analyses examined the inter-relationships among the three parent-rated measures by computing ‘improvement’ scores from the difference between pre- and post-treatment scores, and comparing these using correlation analysis. Results showed no relationship between improvement in child self-esteem and changes in ADHD symptoms or changes in CPRS scores. However, a decrease in ADHD symptoms was strongly correlated with an increase in CPRS scores, that is, less conflicted (more secure) parent–child interaction ($r(14) = –.67, p < .01$). Interestingly, the relationship between ADHD symptoms and relationship quality at the commencement of the programme was not significant ($r(14) = −.41, ns$), but at the end of the treatment the outcome scores on these measures were strongly correlated ($r(14) = −.66, p = .01$), suggesting a change in family functioning processes during the treatment programme.

**Parent responses to SYM**

The SYM intervention was designed as a family treatment programme, which was expected to impact on parents as well as children. At the end of the programme, 92% of parents agreed that the programme had been personally beneficial. The overall benefit

| Table 2. Changes in child outcomes and parent–child relationship quality during the meditation programme |
|----------------------------------|----------------------------------|----------------------------------|----------------------------------|------------------|------------------|
| Measure                         | Commencement (Week 1)            | Mid-Point (Week 3)               | Final Point (Week 6)              | Paired Samples t-tests |
|                                 | M      | SD    | M      | SD    | M      | SD    | t      | t                |
| 1. Child Outcomes               |        |       |        |       |        |       |        |                  |
| **Parent-rated**                |        |       |        |       |        |       |        |                  |
| ADHD symptoms                   | 22.62  | 4.06  | 15.94  | 4.99  | 16.25  | 5.48  | 5.81***| 5.65***         |
| Indicators of self-esteem       | 3.24   | 0.78  | 3.69   | 0.37  | 3.73   | 0.48  | −3.06**| −3.62**         |
| Child self-report               |        |       |        |       |        |       |        |                  |
| Rating of self-esteem           | 4.28   | 0.43  | 4.24   | 0.63  | 0.43   |       |        |                  |
| 2. Parent–Child Outcomes        |        |       |        |       |        |       |        |                  |
| Child–parent relationship       | 3.06   | 0.45  | 3.35   | 0.42  | −3.34**|       |        |                  |
| Conflict subscale               | 3.37   | 0.81  | 2.94   | 0.73  | 3.08**|       |        |                  |
| Warmth subscale                 | 3.93   | 0.38  | 4.00   | 0.39  | −0.82 |       |        |                  |
| Open subscale                   | 3.55   | 0.71  | 3.71   | 0.70  | −1.20 |       |        |                  |

*** p < .001; ** p < .01.

**Note.** ADHD symptoms were assessed using the Conners Parent–Teacher Questionnaire; parent-rated indicators of self-esteem were assessed using Burnett’s (1998) Biobehavioural Indicators of Self-Esteem; child-rated self-esteem was assessed with Burnett’s (1994) Self-Scale; child–parent relationship was assessed using Pianta’s Child–Parent Relationship Scale.
was rated at 4 \((M = 3.91, SD = .92)\) on a 1 (low) to 5 (high) scale. Specific benefits rated highly (> 3 on a 5-point scale) were ‘more able to manage stress’ \((M = 3.79, SD = .93)\), ‘less stressed’ \((M = 3.67, SD = .96)\), ‘happier’ \((M = 3.45, SD = 1.01)\), ‘more able to manage anger’ \((M = 3.37, SD = 1.25)\) and ‘less angry’ \((M = 3.29, SD = 1.23)\). Parents were also asked to rate the extent to which they felt that SYM had benefited the relationship they had with their child. Mean scores on a 5-point scale showed a consistent pattern of benefit, specifically for ‘more open communication’ \((M = 3.83, SD = .72)\), ‘less exhausting’ \((M = 3.50, SD = .91)\), ‘more able to manage conflict’ \((M = 3.42, SD = .67)\) and ‘less conflict’ \((M = 3.33, SD = .78)\). A number of parents commented that participating in the programme had made a positive change to their relationship with their child. A father mentioned his pleasure at being able to laugh with his son for the first time in years. One mother wrote ‘I truly understand how me meditating and becoming more relaxed has helped my son 150% because he feeds off a calmer mum.’ Parents also said they had used meditation at home to help deal with difficult situations. One mother commented ‘I’m now able to get N... to calm down (using meditation). He is then able to focus and carry on with his day.’ Another wrote about how she dealt with a difficult time: ‘We had a good meditation and he went off to bed quite calm and relaxed and went straight to sleep.’

**Discussion**

The results of this trial programme indicate that Sahaja Yoga Meditation has potential as a promising therapy for children with ADHD, when offered via a family treatment approach and in combination with existing medical treatment. Although results are limited by the small number of children for whom complete data were available, the consistency of the findings, which drew on different measures of child outcomes, two treatment groups, and both parent and child respondents makes a good case for the benefits of the treatment programme. The results were in keeping with the three aims of the study. First, core symptoms of ADHD were improved: parent ratings on the Conners Parent–Teacher Questionnaire, which assesses attention, hyperactivity and impulsivity, were significantly reduced over the course of the programme. Children also reported that they felt calmer, less panicky and more relaxed. Second, associated symptoms of ADHD, such as anxiety and poor confidence, were reduced; parent ratings of child self-esteem showed significant improvements in children’s confidence, social abilities and involvement. Third, functional benefits were noted, child–parent relationship quality improved through a significant reduction in the level of conflicted interactions. Parents reported that the children’s approach to school and homework had improved during the SYM programme, and the children themselves said that they were more able to concentrate at school. Improved sleep was another positive outcome reported by parents and children.

The study design, as a clinical treatment trial, did not include a formal control group, but the ‘waiting list’ children provided a quasi-control group that provided evidence for the effectiveness of the SYM intervention, over other possible contributors. For this group, baseline ADHD scores at recruitment and at week 1 of the treatment programme (several months later) remained the same, and then decreased significantly over the 6-week SYM programme. Statistical evidence for the benefits of SYM was also demonstrated in a series of repeated measures analyses, which entered child and family factors as covariates. These tests showed that the reduction in ADHD symptoms and the improvements in self-esteem and child–parent relationship quality were not explained by child age, sex, medication status or cognitive ability, or by family structure, mothers’ age or education.

This initial investigation of SYM for managing ADHD was not able to include the
design features of a clinical trial, which would allow allocation and comparison of treatment groups such as SYM in combination with pharmacological treatment and SYM alone. The children who entered the programme also varied in the severity of their ADHD symptoms and use of medication. Three-quarters of the children were receiving psycho-stimulant drugs at the commencement of the programme and combined this with the SYM treatment, whereas the non-medicated children used only SYM. Although the numbers in the latter group were very small, it was noteworthy that the observed reduction in ADHD symptoms did not differ by children’s initial medication status. Further evidence that the improvements were attributable to the SYM intervention (and not to medication) comes from the fact that over half of the children who were taking prescribed medication had been able to reduce their medication during the course of the treatment, and these children also showed significantly greater improvements in ADHD-related behaviours than the children who maintained their initial level of medication. The fact that the SYM effects occurred regardless of concurrent medication suggests an interesting corollary to reports from the Multimodal Treatment (MTA) study of children with ADHD that ‘intensive behavioural treatments are a viable alternative to medication in treatment of ADHD’ (Pelham et al., 2000, p. 523). In the current study, the treatment was not behavioural, but it was intensive in design, involving parents and children in twice daily meditation sessions at home and regular clinic sessions with trainers. Like the MTA findings, the SYM results are encouraging for parents and communities seeking ways to minimize child medication.

Despite these promising results, the study is not without its limitations. The small sample size has been mentioned. Also, this study was a within-group design and we did not include a control group. A replication including a control group and larger numbers of participants will be essential to replicate the observed findings. It is also possible that the findings of the study are biased by the relatively high drop-out rate (26 and 30% for groups 1 and 2, respectively). It is conceivable that some of those parents who did not continue the treatment were also those who did not notice an improvement. Another criticism is that significant findings relied solely on parent-rated questionnaires and that the reported improvements in child outcomes and child–parent relationship might be ascribed to parents wanting to present themselves and their child in the best light. If this were the case, however, one would expect to see similar levels of change across the three parent-rated questionnaires, whereas results showed that improvement in ratings of self-esteem were independent of improvements in ADHD symptoms and relationship quality. This suggests that parents were not reporting a non-discriminate or overly positive picture of their child, but were giving an accurate report based on observed behaviour. We also note that other studies have shown that parents’ ratings of their children’s improvements are similar to ratings by teachers and counsellors (Pelham et al., 2000). Furthermore, endpoint interviews with the children provided many examples of the benefits they had experienced from the SYM programme, which supports the accuracy of their parents’ reports. Child-rated scores on our self-report measure of child self-esteem did not show any change over the 6-week intervention. We noted, however, that self-report scores had been relatively high at both points, which is in keeping with previous research suggesting that children with ADHD may inflate self-rated measures of self-esteem (Hoza et al., 1993). This would make it difficult to interpret child scores reliably. It may also be that the measure used in the present study, which was not designed for clinical samples (Burnett, 1994, 1998), does not adequately tap the problems of self-esteem that children with ADHD suffer. Future study designs will have to use valid and reliable outcome measures of child functioning, and draw on a range of sources including data provided by teachers, as well as parents and the children themselves.
Questions remain about the underlying processes that may account for the success of the SYM intervention. The strong association between decreased ADHD symptoms and greater security in the child–parent relationship over the course of the SYM programme points to a transactional model of effects. The observed interrelationship between ADHD symptoms and conflict in the child–parent relationship is consistent with Keown and Woodward’s (2002) finding that ‘boys who experienced less synchronous interactions (which are characteristic of insecure relationships) with their mothers were 8 times more likely to be hyperactive than comparison children’ (p. 549). Interactional synchrony, they argue, is more likely when parents are more able to manage their child’s behaviour. Because the benefits of the SYM treatment reported by parents included being more able to manage stress, angry feelings, and conflict in relationships with their child, it is not implausible to suggest that an important outcome of the meditation programme was parents’ sense of being more relaxed and competent in dealing with their child’s ADHD-related problems. Relationship benefits may also be linked to the nature of the intervention, which provided instruction for parents in SYM techniques that they could use with their child at home.

Although the mechanism of action of SYM in managing ADHD has yet to be identified, a neural regulatory mechanism also seems likely. Recent modern functional imaging studies have shown that the reduction of thoughts in the meditation process reduces activity in frontal and other cortical brain regions (thought to originate thought processes), whereas increasing activation in limbic brain areas (Lazar et al., 2000; Lou et al., 1999). High-resolution EEG studies have shown that SYM leads to increased alpha and theta power over anterio-frontal and fronto-central brain regions, and to reduced complexity of EEG patterns (Aftanas & Golocheikine, 2001, 2002). Because decreased complexity of the EEG from fronto-cortical regions is correlated with increased attentional control over cognitive processing (Lutzenberger, Preissl, & Pulvermüller, 1995; Molle et al., 1995), it has been suggested that reduced complexity of EEG patterns during meditative experience in SYM may reflect switching off irrelevant networks for the maintenance of focused internalized attention and inhibition of inappropriate information (Aftanas & Golocheikine, 2002). It is thus possible that the causal mechanism underlying the positive effect of SYM on the improvement of ADHD symptoms occurs via changes on frontal brain activation in ADHD children during the meditation. Because frontal dysfunction is the most consistent finding in ADHD (Rubia & Smith, 2001), a change in frontal brain activation during the 6 weeks of SYM may well have been the cause for symptom improvement.

Other possible, yet unexplored mechanisms of action, could be a balancing effect of meditation on neurotransmitter systems. In fact, a recent study using positron emission tomography has shown that meditation increases endogenous levels of dopamine in the striatum by as much as 65%, which correlated with an increase in EEG theta activity (Kjaer et al., 2002). As ADHD has been associated with elevated dopamine transporter (DAT) levels (Cheon et al., 2003; Dougherty et al., 1999; Krause et al., 2000), a meditation-induced change in endogenous striatal dopamine levels could, in fact, be a plausible hypothetical mechanism for the amelioration of ADHD symptoms. Further research using modern imaging techniques will be necessary to explore the mechanisms of action of SYM.

In sum, this is the first study investigating the effect of Sahaja Yoga Meditation as treatment for ADHD behaviours. The study aimed to investigate SYM as an additional family-oriented treatment, alongside any conventional medical treatment that was received by the children, and the design of the study was not meant to compete with medication treatment. Preliminary findings provide initial evidence of the benefits of SYM in alleviating
the behavioural symptoms of children diagnosed with ADHD, confirmed through parent report and children’s own evidence. According to the children, these benefits extended beyond the immediate environments of the home into the classroom. Future directions in SYM research would be well served by larger studies that involve teachers as well as parents in following children’s progress, and longer term studies with follow-up assessments to examine the longevity of the treatment method. Furthermore, the fact that confirmatory analyses provided evidence that medication did not add significantly to the changes observed with SYM, it may be of interest for the future to compare the meditation effects in medication-free and medicated children, or even to compare SYM with other behavioural treatments for ADHD. Rigorously controlled clinical trials on larger and more homogenous populations would be needed to provide the necessary rigour to assess the relative effect of SYM as an alternative or complementary treatment for ADHD. However, the indications are that SYM may offer families an effective management tool for family-oriented treatment of childhood ADHD.

Notes

1. Of the 15 children placed on the ‘waiting list’ at recruitment, 12 returned to commence the second treatment programme.

References


SAHAJA YOGA: AN ANCIENT PATH TO MODERN MENTAL HEALTH?

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SAHAJA YOGA: AN ANCIENT PATH TO MODERN MENTAL HEALTH?

Abstract

The present study looks to evaluate the effectiveness of the meditative practice of Sahaja Yoga as a treatment for the symptoms of anxiety and depression. It compared a ‘waiting list’ control group, a cognitive-behavioural (CBT) based stress management group and a Sahaja Yoga meditation group.

The results show that, compared to controls, the participants in the Sahaja Yoga group reported significant reductions on all measures of symptomology, however, the CBT based group showed no such reductions. Limitations of the study, barriers to the use of Sahaja Yoga in mental health services and the need for future research are considered.
SAHAJA YOGA: AN ANCIENT PATH TO MODERN MENTAL HEALTH?

Introduction

The Practice of Meditation

In the broadest sense meditation is a religious discipline in which the mind is focused upon a single point of reference (Concise Columbia Encyclopaedia, 1991), thus it encompasses the more Christian practices of contemplation of a spiritual theme, question or problem as well as Eastern practices of focused attention (ibid.). Wherever meditation is practised it’s aim is to enlighten and ultimately to confer a state of emancipation, or transcendence of suffering, upon the practitioner.

The promise of liberation from suffering, or a realm beyond and above ‘typical’ human awareness and endeavour, forms an essential and persistent theme that runs through all religious writing. Each religious tradition has a name for such a realm, Christian tradition calls it ‘The Kingdom of Heaven’, Buddhist and Hindu traditions ‘Nirvana’, the Sikh tradition ‘Sahaja Samahdi’.

Within the Eastern traditions in general the generic term for the path towards freedom from suffering is yoga (Mascaro, 1965), a Sanskrit word meaning union. Meditation is seen as an essential tool in the practice of yoga (ibid.) and hence in the achievement of ‘Nirvana’ (see De Silva, 1990) and thus the transcendence of suffering.

Indeed some authors have argued that religious notions of transcendence, can be considered to be ‘ideals of mental health’ (see Neki, 1975).

Trails into the efficacy of mediation upon mental health

The contemporary trials that have been published (e.g. Kabat-Zinn et. al., 1992; Putai, 1992; Pearl and Carlozzi, 1994; Miller et. al., 1995; Astin, 1997) indicate that a practice of meditation is effective in reducing anxiety. However of these studies only that of Kabat-Zinn et. al., (ibid.) uses a clinical population.
Teasdale et. al. (1995) have presented a theoretical paper arguing that meditation could also prove effective in the prevention of depressive relapse arguing that meditation prevents people from floating away into the “…elaborate, ruminative thought streams” (ibid., p.34) seen to generate depressive states.

Furthermore Emavardhana and Tori (1997) found that following seven day Vipassana meditation retreats, compared to controls, meditators showed significant positive gains in self-esteem.

Overall there would, therefore, appear to be a range of support for the assertion that a practice of meditation can be an effective means of improving ‘mental health’.

**Contemporary explanations of meditation**

Within contemporary psychology most ‘mainstream’ attention has tried to explain meditative practice using cognitive and/or behavioural models. For example Teasdale et. al. (1995) and Astin (1997) suggest that mindfulness meditation influences affect via its effect upon information processing, whilst De Silva (1984; 1990) draws parallels between Buddhist practices and cognitive behavioural psychology, claiming that a range of contemporary techniques have been foreshadowed by Buddhist tradition. One common explanation of the therapeutic effect of meditation is that it is a form of systematic desensitisation, allowing exposure to traumatic material to occur whilst in a relaxed state (see Delmonte, 1990; Epstein, 1990).

Psychoanalytic frameworks have also been suggested (see De Silva 1990; Delmonte, 1990; Epstein, 1990; Haartman, 1994) with these often focusing on the concept of the ‘ego’ and its place within a healthy psyche. This would appear to be an ‘issue’ due to the striving of meditators to achieve a state of egolessness in search of the Ultimate, a practice that appears rather unwise when considered from a psychoanalytic viewpoint

**Sahaja Yoga**
Sahaja Yoga is principally a method of meditation that was founded in 1970 by Shri Mataji Nirmala Devi. In what follows I shall attempt to briefly present Sahaja Yoga as a set of propositions.

**The ‘subtle body’**

The first proposition made by Sahaja Yoga is that within us there exists a ‘subtle body’ of seven ‘Chakras’ (centres of awareness), three ‘Nadis’ (left, right and central ‘channels’), and the ‘Kundalini’ (a Divine feminine power). Descriptions of this system can be found within a variety of traditions, see for example Arabi (1982), ‘Sabiquun’; Bhagavad Gita, Ch. 14; Descieux (1998); Jnaneshwari, Ch.6; Surah Nuh (Noah), v15-16: Koran; Surah Ar-Ra’d (The Thunder), v 2: The Koran; Zechariah, chapter 4, v2-3: Old Testament; see also Rai (1993).

The objective of Sahaja Yoga meditation is to awaken the Kundalini so that She rises up through the subtle system to bestow the state of Yoga upon the meditator.

**The seven Chakras**

The Chakras can be thought of as types of awareness that correspond to certain qualities and are said to physically lie along the spinal column. Briefly, starting at the bottom Chakra and moving upwards, the qualities are described as;

1) Innocence (freedom from corruption)
2) ‘True’ knowledge (freedom from ignorance)
3) Satisfaction (freedom from desire)
4) Security (freedom from fear)
5) ‘Collectivity’ (freedom from ‘identity’)
6) Forgiveness (freedom from anger/resentment)
7) Joy (freedom from suffering).
Through the awakening of Kundalini these qualities of being are said to blossom within the individual.

Kundalini

Kundalini is described within Eastern religious, or spiritual, tradition as an indwelling Divine feminine energy that can be awakened in order to purify the subtle system and ultimately to bestow the state of Yoga, or Divine Union (e.g. see Rai, 1993; Jnaneshwari Ch. VI). This awakening involves the Kundalini moving up the central channel, piercing the Chakras along the way, to reside within the Sahasrara Chakra above the head (see for ex. Jnaneshwari Ch. VI). This movement of Kundalini is felt by the presence of a cool or, in the case of imbalance, a warm breeze across the palms of the hands or the soles of the feet. Such a phenomenon can be seen to be described in a diverse array of scripture (see Aquarian Gospel of Christ, ch. 44, v19, ch. 161, v35, ch. 162, v4; Jnaneshwari, ch.6; Ezekiel, ch. 37, vs. 5-6: Old Testament; John, ch. 14 vs. 15-17 & 25: New Testament; Koran, sura 24, vs. 24; sura 35, vs. 9; sura 36, vs. 64; see also Descieux, 1998iii.). It is through attention to these sensations that areas of difficulty can be identified and ‘worked on’ in order to strengthen the meditation.

Once ‘Kundalini awakening’ has taken place and is established through meditation the Kundalini is said to automatically purify the subtle body and thus dispel all mental, physical and spiritual ‘dis-ease’iv.

So far a range of studies examining the physical health benefits of its practice have returned encouraging results (Rai et al., 1988, Gupta et al., 1991; Rai, 1993; Panjwani et. al., 1995; 1996 and Chugh, 1997), however, as yet, no studies have looked at the effect of its practice upon mental health problems.

Summary

The present study, comprises of a clinical trial into the effectiveness of Sahaja Yoga meditation in the alleviation of mental distress. The trial was conducted at the
Methods

Design

The present study uses a ‘quasi-experimental’ comparison of 3 independent groups; a Sahaja Yoga meditation group, a CBT group and a waiting list control group. Due to the lack of random allocation to treatment group pre-treatment measures were used to check for initial non-equivalence between groups.

Participants

Selection and allocation

Participants were chosen from referrals to the Victory Centre and came from a variety of sources, including GP’s, Clinical Psychologists and Psychiatrists as well as internal referrals and reviews.

All participants were assessed to be primarily suffering from recognised symptoms of ‘anxiety’, with or without symptoms of depression as well.

Participants were allocated to treatment group on the basis of assessed suitability. In practice this meant that staff made efforts to refer more ‘introspective’ people into the Sahaja Yoga group and more ‘outward looking’ people into the CBT group. This procedure was an attempt to prevent ‘clinically inappropriate’ mismatches between participant ‘style’ and treatment type, which was a concern of assessors at the Victory Centre.

Sample composition

24 participants completed the study, of these 24 eight were in the Sahaja Yoga group, 10 in the control group and six in the CBT group. The gender distributions, mean ages, standard deviations and ranges, in years, for each group are shown in table
Ethical procedures

Local ethical committee approval for the present study was sought and, after some changes to the treatment protocol (see below under ‘Procedure’), received.

Measures

In order to evaluate changes in ‘symptom severity’ both the Hospital Anxiety and Depression scale (HADs; Zigmond and Snaith, 1983) and the twelve item General Health Questionnaire (GHQ-12) (see Goldberg, 1978), were used.

The HADs produces two scores, one for depression and one for anxiety (see Snaith and Zigmond, 1994). The GHQ-12 was chosen as a supplement to the HADs as it is a reliable general indicator of clinically significant non-psychotic mental disorder.

Procedure

Symptom severity was measured both before the start of treatment and post treatment, with the control group participants being posted the questionnaires at the appropriate times. All three groups ran concurrently with data being collected within the same 10 day period at both pre and post-treatment intervals. Each group is described below;

a.) Anxiety management (CBT) group

The anxiety management group consisted of a six week, two hour long group that uses a cognitive-behavioural approach to helping people cope with the symptoms of anxiety.

b.) Sahaja Yoga meditation group

This group also consisted of a two hourly six week program and aimed to teach Sahaja Yoga meditation. However due to the medical ethics committee’s concerns about the possibly ‘quasi-religious’ nature of the group the meditation was taught as a
‘technique’ with all explicit references, and contextual material, related to religion removed. Thus this group concentrated on teaching participants the ‘skill of meditation’ using an internal motherly energy (Kundalini) and seven inner qualities (Chakras).

c.) Control group

The control group consisted of individuals who had already been referred into a pre-existing treatment group and were waiting for this group to begin.

**Results**

**Pre-treatment comparisons**

There were no significant differences between groups for age (one way ANOVA $F(2,21)=0.20$, $p=0.82$), or gender (Chi-squared (Pearson)=$2.47$, d.f.$=2$, $p=0.29$) nor a preponderance of one gender in the sample as a whole (Chi-squared (Pearson)=$0.67$, d.f.$=1$, $p=0.41$).

Equally no significant pre-treatment differences between groups for any of the ‘symptom severity’ measures were found (one way ANOVA, HADs anxiety $F(2,21)=0.40$, $p=0.68$; HADs depression $F(2,21)=0.15$, $p=0.86$; GHQ-12 $F(2,21)=0.85$, $p=0.44$). The means, standard deviations and ranges of each of these variables is shown below in table 2.

**Analysis of treatment effects**

Treatment effects were analysed using both MANOVA and repeated measures ANOVA tests. No significant violations of the statistical assumptions of these tests (see Howell, 1997; Maxwell and Delaney, 1990; Tabachnick and Fidell, 1989) were found.

A MANOVA, including all the pre- and post-treatment variables showed there to be a non-significant main effect of ‘group’ $F(6,38)=1.46$, $p=0.22$, significant main effect of
Repeated measure ANOVAs (one for each individual variable) were conducted to identify which variables were responsible for this effect. All three ANOVAs showed the same pattern of results as the MANOVA, i.e. a non-significant main effect of ‘group’ (HADs anxiety $F(2,21)=1.37$, $p=0.28$; HADs depression $F(2,21)=1.25$, $p=0.31$; GHQ-12 $F(2,21)=2.73$, $p=0.09$), a significant main effect of ‘time’ (HADs anxiety $F(1,21)=28.79$, $p<0.0005$; HADs depression $F(1,21)=9.42$, $p=0.06$; GHQ-12 $F(1,21)=43.30$, $p<0.005$) and a significant ‘group by time’ interaction (HADs anxiety $F(2,21)=5.84$, $p=0.01$; HADs depression $F(2,21)=3.46$, $p=0.05$; GHQ-12 $F(2,21)=7.13$, $p=0.004$).

On inspection these results show that there is a significant reduction in symptom severity (main effect of time) and furthermore that this reduction differs significantly between groups (significant group by time interaction effect). Independent sample t-tests were used to further examine this effect.

All t-tests showed the same pattern of results; the Sahaja Yoga group showed a significant improvement as compared to the control group (HADs anxiety $t=3.20$, d.f.=16, $p=0.006$; HADs depression $t=2.46$, d.f.=16, $p=0.026$; GHQ-12 $t=4.33$, d.f.=16, $p=0.001$), however the CBT group did not show a significantly greater improvement than the control group (HADs anxiety $t=1.44$, d.f.=14, $p=0.17$; HADs depression $t=1.15$, d.f.=14, $p=0.27$; GHQ-12 $t=1.32$, d.f.=14, $p=0.21$).

There was no significant difference between the two treatment groups (HADs anxiety $t=1.77$, d.f.=12, $p=0.10$; HADs depression $t=1.31$, d.f.=12, $p=0.21$; GHQ-12 $t=1.85$, d.f.=12, $p=0.089$), although the HADs anxiety and GHQ-12 results are indicative of a trend in the data ($p=0.10$ and $p=0.089$ respectively).
Discussion

The above results lend support to the hypothesis that participants in the Sahaja Yoga meditation group would show a significant reduction on measures of symptom severity, over and above that which could be expected due to spontaneous remission. Surprisingly, they do not lend support to the hypothesis that participants in the CBT based stress management group would show a similar reduction, however the CBT group was by far the smallest and thus suffers from significantly reduced statistical power.

Interpreting the results

Like most therapy outcome studies the present one falls short of experimental ideals in many ways, however despite this it would seem reasonable to conclude that there is at least encouraging evidence in support of the statement that participation in the Sahaja Yoga meditation group did result in significant reductions in levels of reported symptomology over and above that which could be expected from spontaneous remission.

The present study is, however, not able to shed light upon therapeutic process. It is still the case that identifying the precise mechanisms responsible for outcome, in psychotherapy process research, remains an elusive and frustrating task (see Erwin, 1994). As many others have said before, attempting to assess such factors remains an important task for future research.

The present research in context

The available research literature into the therapeutic efficacy of Sahaja Yoga is very small indeed (see Rai et al., 1988, Gupta et al., 1991; Rai, 1993; Panjwani et. al., 1995; 1996 and Chugh, 1997) with this being the first study to be conducted into its efficacy as a treatment for mental health problems. Thus it forms an important addition
to this small literature and adds cautiously to the evidence already available in support of
the hypothesis that Sahaja Yoga is generally ‘therapeutic’. Compared to those studies
already published the present research is of similar size and methodology.

Outside of this literature, as described earlier, there are an equally small number
of published contemporary studies (see for example Kabat-Zinn et. al., 1992; Pearl and
Carlozzi, 1994; Miller et. al., 1995; Astin, 1997) that show the practice of meditation,
usually ‘mindfulness’ meditation, to be of significant therapeutic value in the treatment of
anxiety. Of these studies, however, only Kabat-Zinn et. al., (1992) uses a clinical
population. The present study is, therefore, something of a rarity in its use of a clinical
population and also derives a certain value here as a result.

Sahaja Yoga in ‘clinical’ practice?

I believe that the practice of Sahaja Yoga could be valuable in services that aim
to alleviate mental distress. For example Teasdale et. al., (1995) argue that meditation
has many advantages over cognitive therapy, especially in relation to relapse prevention
because it can be practised in the absence of distress and in any situation. In support of
this suggestion Miller et. al., (1995) present three year follow-up data on participants
from the Kabat-Zinn (1992) study and show a maintenance of gains in all 18 subjects
who were contacted.

One difficulty for Sahaja Yoga is that it would be necessary Sahaja Yoga
‘teachers’ to be practitioners themselves (see Prakash, 1997). Perhaps a more
problematic barrier, however is the nature of its ‘theory’. In ‘Western’ healthcare
services the ideas that Sahaja Yoga presents are unconventional and controversial, and
it is no surprise that all the published studies that are available are to be found in Indian
journals.

Indeed the present research encountered considerable resistance during its
implementation related largely to the nature of the ‘theory’ of Sahaja Yoga. Having said
this, a set of proposals were eventually agreed upon which maintained, to some degree, the essential aspects of the practice. I am also aware of an, as yet unpublished, study into Sahaja Yoga that has been conducted within the University of New South Wales Faculty of Medicine in Australia, further suggesting that Western Institutions can be open to its use.

**Future research**

Apart from replicating the present study and addressing its shortfalls it would be interesting to try and evaluate individual elements of the practice of Sahaja Yoga, however it would be extremely difficult to experimentally verify hypothesised events such as Kundalini awakening. One way forward might be to use a mixture of qualitative and quantitative methods. For example subjective accounts of the sensations that people experienced during meditation could be collected from two groups, a Sahaja Yoga meditation group and a relaxation ‘control’ group. Whilst this would clearly not experimentally ‘prove’ Kundalini awakening, it would at least be interesting if it turned out that only the Sahaja Yoga group felt a ‘cool breeze’, or other similar sensations during meditation. Another option could be to compare the subjective accounts of meditating upon this cool breeze (i.e. concentrating on it) as compared to meditating upon ones heart beat, or breath. Such studies, designed to look at the experience of ‘Kundalini awakening’, would not necessarily need to use clinical populations, which may ease their implementation.

**Conclusion**

In conclusion the present study adds to the existing literature suggesting that Sahaja Yoga in particular, and meditation in general, has therapeutic value. Whilst it would seem that Sahaja Yoga could form a valuable part of service provision there are problems to be overcome before this becomes a reality.
References


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<th>CBT</th>
<th>Control</th>
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<td>Mean Age (years)</td>
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<td>39.17</td>
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<tr>
<td>Standard deviation</td>
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<td>2.56</td>
<td>7.60</td>
</tr>
<tr>
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<tr>
<td>Male (n)</td>
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Table 1. Means, standard deviations, range of ages and gender N’s, by group.
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<th>CBT</th>
<th>Control</th>
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<tr>
<td><strong>HADs anxiety</strong></td>
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<tr>
<td><strong>HADs depression</strong></td>
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<td>mean score</td>
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Table 2. Means, standard deviations and ranges of pre-treatment scores, by group.

Acknowledgements

I would like to thank all the staff from the Clinical Teaching Unit at the University of Plymouth, particularly Dr. Tony Carr and Dr. Reg Morris, for supporting this research through some fairly difficult times.

Secondly I would like to thank all the staff at the Victory Centre, in Exeter, for all the effort that they put into actually making it happen.

Thirdly I would like to thank Russell and Leela Howard, and Clive Reid for all their input into running the Sahaja Yoga meditation group, and for making it such an enjoyable experience.

Finally I would offer my thanks to Shri Mataji Nirmala Devi for her continued effort in teaching Sahaja Yoga to those who are interested, without this effort Sahaja Yoga wouldn’t be available to study.
The study by Miller et. al., (1995) reports follow up data from Kabat-Zinn et. al., (ibid.) and is thus not a different study.

Psychosis is often seen by psychoanalytically orientated theory to be the end result of removing ‘ego boundaries’ (see Epstein (1990) and Hartman (1994) for a discussion of these issues).

Many more references exist, too many to list exhaustively here.

A more detailed description of the method and theory of Sahaja Yoga is available from the author at the address given earlier.

The CBT group is, therefore, statistically too small and thus has insufficient statistical power.

The only exception here was the presence of an outlier. As recommended by Tabachnick and Fidell (1989) this case was changed and assigned a score “… one unit larger (or smaller) than the next most extreme score in the distribution.” (ibid., p. 70). However this change had no significant effect on any of the results and thus the data point is left unchanged as an outlier in this analysis.


All the published studies report comparisons to control subjects, however the papers that I have direct access to do not detail whether or not randomisation was used.

In the original study there were 22 participants, of which 20 showed a maintenance of gains at three month follow-up. Of the four people for whom data are not available, one declined to participate, one was unreachable and two were ‘non-compliant’ with attempts to schedule interviews.
Human anterior and frontal midline theta and lower alpha reflect emotionally positive state and internalized attention: high-resolution EEG investigation of meditation

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Abstract

EEG spectral power and coherence estimates in the individually defined delta, theta, alpha-1, alpha-2, and alpha-3 bands were used to identify and characterize brain regions involved in meditative states, in which focused internalized attention gives rise to emotionally positive ‘blissful’ experience. Blissful state was accompanied by increased anterior frontal and midline theta synchronization as well as enhanced theta long-distance connectivity between prefrontal and posterior association cortex with distinct ‘center of gravity’ in the left prefrontal region (AF3 site). Subjective scores of emotional experience significantly correlated with theta, whereas scores of internalized attention with both theta and alpha lower synchronization. Our results propose selective associations of theta and alpha oscillating networks activity with states of internalized attention and positive emotional experience. © 2001 Elsevier Science Ireland Ltd. All rights reserved.

Keywords: EEG; Emotion; Attention; Theta; Alpha; Coherence; Frontal midline theta; Meditation

According to recent investigations, theta and alpha oscillations defined in narrow frequency bands are regarded reflecting activity of multifunctional neuronal networks, differentially associated with orienting, attention, memory, affective, and cognitive processing (e.g. [1,2,4,5,7,12]). In this respect it is tentative to reveal how complex functions of attention and emotional processing are interwoven with these oscillations in meditation as in a model of conscious mental process, characterized by internalized attention and emerging emotionally positive experience [15].

In the model of Sahaja Yoga meditation that involves mental states of internalized attention and emotionally positive experience of ‘bliss’ [15] the high-resolution EEG was recorded, and spectral powers along with EEG coherence estimates were analyzed in narrow EEG frequency bands. Subjects (Ss, n = 27) were right-handed volunteers regularly practicing meditation. Participants were assigned to 2 experimental groups: (1) short-term meditators (STM) having lesser then 1/2 year of practice (n = 11, five males, six females, age: M = 35.18); long-term meditators (LTM) having 3–7 years of practice (n = 16, seven males, nine females; age: M = 35.00). After recording the eyes closed rest, the Ss had to go through three consecutive phases: (1) income phase; (2) deep meditation phase in which thought appearance is suppressed and yet self awareness is maintained (‘thoughtless awareness’); (3) outcome phase [15]. The EEG was recorded throughout all the three phases. Ss were rated on scales of unipolar (0–9) scales with the following questions: (1) Please estimate the extent of thought appearance during the meditation phase?; (2) How blissful did you feel during the meditation phase?; (3) To what extent have you felt uneasy, restless, and anxious during the meditation phase?

Scan 4.1.1 software, 128-channel ESI System (ESI-128, NeuroScan Labs.) and 64-channel QuikCap with imbedded Ag/AgCl electrodes (NeuroSoft, Inc.) were used to record EEG from 62 active scalp sites referenced to the tip of the nose along with both vertical and horizontal electrocolumograms (EOGs). The EEG and EOG signals were sampled at 500 Hz and digitally filtered at 0.3–50 Hz (−6-dB gain, ≥ −12-dB/octave slope). After EOG correction (both VEOG and HEOG) [16] and visual inspection three artefact free EEG segments by 8.192 s were selected for each phase. Since fixed frequency bands blur the specific relationships

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between cognitive performance and power measurements (e.g. [8]), frequency bands were individually defined in relation to the individual alpha frequency (IAF) which was used as a cut-off point for the lower and upper alpha band. The bandwidth too, was determined individually and was calculated as a percentage (20%) of IAF [2,8]. Averaged by groups IAF was significantly lower for LTM (M = 9.42 Hz) than for STM (M = 10.04 Hz) (P < 0.005). The respective cut-offs for analyzed bands are reported in Fig. 1. Each EEG segment was epoched into two 4096 ms (i.e. 2048 points) epochs, fast Fourier transformed (FFT) and averaged in the frequency domain using a Parzens window. The FFTs were then grouped into individually defined bands, log-transformed, and averaged across three EEG traces. Electrodes were collapsed into 12 electrode-clusters. This procedure resulted in six regional means for each hemisphere: anterior temporal (AT); frontal (F); central (C); parietotemporal (PT); parietal (P); and occipital (O) (for details see Ref. [2]). The average power values across the respective electrode sites were calculated for these regional means. The same EEG segments were subjected to coherence analysis. Coherence was calculated between all electrode pairs.

For each frequency band, spectral power values for symmetrical cortical regions were subjected to 3-way ANOVAs (GR(2): STM, LTM) × HEM(2: left, right) × PHASE(2: eyes closed rest, meditation)) with repeated measurements on within-group factors. For midline regions 2-way ANOVAs (GR(2) × PHASE(2)) were applied for each cortical lead, belonging to AM (AFz, Fz) and PM (Pz, POz, and Oz) zones. All between-group analyses were followed by planned comparisons and separate within-group ANOVAs. Degrees of freedom were Greenhouse–Geisser corrected where appropriate. Coherence changes between eyes closed and meditation conditions were estimated using Student’s t-test for STM and LTM.

At subjective level meditative experience of LTM vs. STM was accompanied by significantly more intense feelings of bliss (5.54 vs. 3.56, P < 0.014) and lower thought appearance rates (1.19 vs. 2.82, P < 0.025). Moreover, STM reported elevated scores of uneasiness and restlessness whereas LTM did not (3.22 vs. 0.54, P < 0.000) (Student’s t-test).

ANOVA of band power values from symmetrical regions revealed significant interaction GR × PHASE for F regions in theta (F1,25) = 6.48, P < 0.017) and alpha-1 (F1,25) = 5.13, P < 0.033) bands. In the alpha-2 band this interaction was significant throughout the cortical plane involving AT (F1,25) = 9.27, P < 0.005), F (F1,25) = 6.76, P < 0.015), PT (F1,25) = 6.39, P < 0.018), P (F1,25) = 7.06, P < 0.014), and O (F1,25) = 7.05, P < 0.014) leads. Inspection of respective means of these interactions (Fig. 1) indicates that in meditation LTM increased theta and alpha-1 power over F region, alpha-2 power over AT and F regions, whereas STM were characterized by alpha-2 desynchronization over P, PT, and O leads (the lowest P < 0.028). Finally, alpha-3 band happened to be ‘silent’ during meditation in both groups.

As for the AM zone, the significant GR × PHASE interactions in the theta (AFz: (F1,25) = 7.47; P < 0.011; Fz: F1,25 = 7.04; P < 0.014), alpha-1 (AFz: F1,25 = 5.57; P < 0.026; Fz: F1,25 = 6.79; P < 0.015), and alpha-2 (AFz: F1,25 = 6.15; ) bands show that during meditation phase LTM yielded power increases in these bands whereas STM revealed no power changes (Fig. 1). By contrast, in the PM region, significant GR × PHASE interactions were obtained only for alpha-2 band (Pz: F1,25 = 5.40, P < 0.029; POz: F1,25 = 6.64, P < 0.016; Oz: F1,25 = 5.57, P < 0.026), stemming from desynchronized activity in STM during the meditation phase (Fig. 1).

According to statistical analyses, only theta coherence revealed sensitivity to meditation experience (Fig. 2). LTM were characterized by increased theta synchronization between prefrontal and posterior association cortex with distinct ‘center of gravity’ in the left prefrontal region (i.e. AF3 site) along with less pronounced intra- and interhemispheric coherence decreases over posterior brain regions.

Correlational analyses revealed that intensity of blissful experience positively correlates with theta power (range from r = +0.44 to r = +0.55) in anterior frontal and frontal midline leads. In turn, thought appearance rates negatively correlated with theta power (range from r = −0.43 to

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Fig. 1. Spectral power changes between eyes closed and meditation conditions in the short-term (STM) and long-term (LTM) mediators in the theta, alpha-1, and alpha-2 bands.
general theta activity, a distinction is made for the frontal midline theta rhythm (FM theta). It appears during concentrated performance of mental tasks or meditative concentration in normal subjects, reflects focused attentional processing and correlates with autonomous activity (e.g. [9,13]). Recent findings from high resolution EEG and MEG investigations suggest that attentional networks of anterior frontal lobes including anterior cingulate cortex (ACC) are involved in the generation of this activity and that FM theta during consecutive mental tasks reflects alternating activities of the medial frontal cortex and ACC [3]. The revealed theta power increase in LTM over anterior midline electrodes falls into categories of both general theta and FM theta processes. It may reflect recruitment of theta oscillating networks in memory, focused attention, and positive emotional experience mechanisms, associated with meditative process. The absence of midline theta synchronization in STM may be explained by excessive alertness and anxious/frustrative feelings at subjective level, due to inability to reach and reliably retain the desired meditative state. These findings are in line with earlier observation according to which the FM theta correlates negatively with anxious experience [9].

A possible interpretation of alpha power changes during meditation may be ascribed to both functional heterogeneity of different alpha frequency bands and peculiarities of meditative state. As it was shown in a variety of experimental paradigms, desynchronization in the lower and medium alpha bands is associated with processes of external attention such as alertness/vigilance (lowest alpha) and expectancy (medium alpha) whereas desynchronized upper alpha reflects enhanced cognitive processing (e.g. [11,12]). One may assume that successful meditative experience of LTM is mediated by switching off mechanisms of external attention as indexed by alpha-1 and alpha-2 synchronization over anterior cortical regions. In turn, unsuccessful attempts of STM in reaching target state may prompt enhanced expectancy processes, reflected by posterior alpha-2 desynchronization. It is also indicative that during period of suppressed cognitive activity alpha-3 band [12] turned out to be insensitive to meditative experience for both groups.

There is general agreement that coherence changes can be considered as an indicator of information flow along local and/or distant cortico-cortical projections (interconnecting pathways) [14]. Increased long-distant theta connectivity between prefrontal and posterior association cortical regions in LTM group may be regarded, on the one hand, as a more general phenomenon occurring when task demand increases and more efficient information processing is required (e.g. [14,17]). On the other, a prevailing activation of long-distant fibers, i.e. connecting of farther distant prefrontal and posterior association cortex regions seems to be required for positive emotional experience. Few investigations on EEG coherence also suggest enhanced long-distant connectivity during experience of positive vs. negative emotions [1]. As for the ‘center of gravity’ of coherence
increases (e.g. [14]), lateralized to the left prefrontal region, it may be related to emotionally positive experience [6]. This suggestion may be partly supported by recent findings from our laboratory indexing that emotionally positive stimuli favor larger left than right anterior prefrontal theta synchronization [2].

The revealed differential associations of theta and alpha activity in narrow EEG frequency bands with states of internalized attention and positive emotional experience land additional support to general theories on multiple functions of these oscillations.


Can meditation reduce work stress?
By Dr Ramesh Manocha of Sydney’s Royal Hospital for Women

Scientific studies have consistently found that meditation does not give better results than taking a short nap, listening to pleasant music or thinking pleasant thoughts. However, according to recent research, the application of a new definition of meditation involving "mental silence" appears to have effects substantially greater than this, especially with regard to the impact of stress.

Although more than 3,000 scientific studies exist on meditation within the major scientific databases, only about 4% are reports on randomised controlled trials (RCTs) — the only way to reliably exclude the placebo effect. Researchers who have systematically evaluated these RCTs consistently find that meditation, as it is practised and defined in western society (eg relaxation, attention focusing and mindfulness), is little more than a sophisticated way of generating a placebo effect. Descriptions of the meditative experience that originated in ancient India, however, reveal that a key feature of meditation is the experience of mental silence. Western definitions have not emphasised this feature.

Currently, the Royal Hospital for Women’s Meditation Research Program (MRP) is systematically evaluating the mental silence perspective of meditation. Over the past nine years, a multifaceted evaluation program has been conducted to evaluate the effect of mental silence on a variety of health and behavioural factors, especially stress.

Key studies
In 2000, a health and wellbeing survey of 348 long−term meditators who used a single, homogenous form of meditation called Sahaja Yoga (SYM), which focuses on the experience of mental silence, demonstrated that these meditators had better mental and physical health than the general population. It also showed that a consistent relationship existed between health, especially mental health, and how often meditators reported experiencing mental silence.

An RCT of SYM for asthma demonstrated that mental silence meditation not only was significantly more effective at improving psychological factors and quality of life when compared to a standardised stress management strategy, but also showed that it reduced levels of stress hormones, blood pressure, etc. However, our study indicates that mental silence may do more than this.

The reduction in work−related stress in the SYM group was 27%, compared to 15% in the non−mental silence group and 7% in the untreated group. Depressive symptoms improved by 66%, 39% and 10% respectively. Standard statistical analyses demonstrated that these changes were significant, thus confirming that mental silence has an effect greater than a placebo and probably greater than conventional, non−mental silence approaches to meditation.

It has been generally assumed that meditative interventions reduce stress by mitigating its physiological effects, that is, by reducing levels of stress hormones, blood pressure, etc. However, our study indicates that mental silence may do more than this. While both active interventions reduced somatic arousal, the SYM group also appeared to alter participants’ cognitions and perceptions, suggesting that changes in the way they thought and felt contributed to their reduction in stress.

For example, further analyses demonstrated that the participants in the SYM group improved their personal coping resources.
(such as their ability for self care and coping skills). Similarly, participants in the SYM group also reduced their trait anxiety levels. Participants in the other groups, however, did not demonstrate these changes. Since the major differentiating feature of SYM is mental silence, it is reasonable to conclude that this experience might somehow modify the way that we think and feel about the various factors in our environment that contribute to stress. Thus this approach to meditation, and the state of consciousness called mental silence, not only mitigates the physiological impact of stress but also alters cognitive behavioural style (ie the "way people think") and hence the propensity to be stressed. (This will be the major focus area for future research.)

Based on the research outcomes, a flexible, evidence–based meditation strategy for work stress has been developed and implemented in a variety of settings, including corporate offices, healthcare institutions and government departments. Clients include Caltex, IBM, law firms and a number of public hospitals. Two case studies are provided below.

Case study 1: top tier law firm

Stage 1 was a one–hour combined lecture (45 minutes) and hands–on meditation workshop (15 minutes). The aim of Stage 1 was to familiarise participants with the rationale and benefits of meditation, followed by actual instruction in a basic meditation technique that participants could then use at home or in the workplace in conjunction with a resource kit (CD, instruction card, etc) given to each participant at the end of the session. Designed to occupy a single lunch hour, the event was advertised internally by HR and attracted 250 legal and administrative staff across three offices (Sydney, Melbourne and Brisbane).

Stage 2 was a three–week follow–up program providing 30–minute in–house lunchtime meditation sessions twice per week at each office, facilitated by experienced instructors. Stage 2 aimed to teach workers more advanced meditation skills. One hundred and twenty staff participated, most attending once per week for the full three weeks. Attendance was voluntary, with approximately 25% attrition by the end of the program. Outcomes were quantified at each stage.

Assessment of the impact of Stage 1 using visual analogue scales indicated that 73% of participants experienced a significant degree (ie greater than 25%) of "mental silence", 80% of participants experienced a significant improvement in "calm and peacefulness", and 62% of participants experienced a significant improvement in "stress, anxiety and tension". There was a strong correlation between participants’ ratings of the "mental silence experience" and their "sense of reduced stress" and increased sense of "calm and peacefulness".

Participants who completed Stage 2 demonstrated improvements in resilience and stress of between 55% and 65% (p < 0.05). This was assessed using the Positive and Negative Affect Schedule (PANAS), a standardised measure designed to assess positive feelings (associated with better attitude to work) and negative feelings (associated with stress and burnout). Qualitative feedback indicated that participants found the initiative both enjoyable and beneficial. The law firm has requested similar programs in its remaining Australian offices.

Case study 2: general practitioners

Health professionals, especially GPs, are among the most highly stressed professional groups, and yet stress and its consequences can lead to reduced ability to make important, sometimes life–saving, decisions.

Stage 1 was an afternoon workshop involving lectures on stress, work–life balance and meditation. The lectures were followed by three meditation sessions designed to teach participants basic, intermediate and advanced skills. Recognising that many GPs are too time poor and/or isolated to access ongoing support and advice in their workplace, Stage 1 aimed to impart sufficient skills, experience and familiarity to allow GPs to practise meditation at home in a relatively self–sufficient manner. Three hundred and twenty GPs participated in Stage 1, in two events (Sydney and Melbourne).

Stage 2 was a self–directed two–week home practice program. Participants were required to document their twice–daily practice as well as their meditative experience and psychological state.

The program was endorsed by the Royal Australian College of General Practitioners so that participants could earn professional development points essential for their medical registration. Completion of Stage 1 earned 10 points and completion of Stage 2 earned an additional 40 points.

Outcomes were quantified at each stage. The Stage 1 event, as with Case study 1, was assessed using visual analogue scales. Within these, 93% of subjects experienced a reduction in their "usual mental activity", in line with the aims of the meditation technique. Specifically, 40% experienced a greater than 50% reduction of mental activity and 18.3% experienced a greater than 70% reduction in mental activity; 96% of subjects experienced an increase in their sense of "calm and peacefulness", and 53% experienced a greater than 50% increase in "calm and peacefulness". Further, 93% of subjects experienced a reduction in their sense of "tension and anxiety", and 46% experienced a greater than 50% reduction in "tension and anxiety". Again, the improvement correlated with the experience of mental silence.

The Stage 2 component used the Kessler 10 (K10), a well–known psychological distress measure. One hundred and eleven participants who attended the event completed the home–based meditation tasks and provided pre– and post–K10 data.

At the beginning of the skilling program, 54% of the GPs were in the elevated risk category. The Australian population by comparison has only 36% in this category. At the end of the two–week home–based program, however, 28.6% of the sample
was in the elevated risk category, that is, one quarter of the participants had improved sufficiently to shift into the low risk category (p < 0.001).

Qualitative feedback was very positive, with 98.8% of respondents indicating that their learning needs had been fully (53.5%) or partly (45.3%) met, and 97.5% felt that the event was fully (56.0%) or partly (41.5%) relevant to their professional life. These pilot study outcomes have led us to begin designing an official program to be rolled out in the capital cities across Australia during the latter half of 2009.

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