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

LINDA J. HARRISON
Charles Sturt University, Australia

RAMESH MANOCHA
University of New South Wales, Australia

KATYA RUBIA
Institute of Psychiatry, King's College, London, UK

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,

Clinical Child Psychology and Psychiatry 1359–1045 (200410)9:4 Copyright © 2004 SAGE Publications (London, Thousand Oaks and New Delhi) Vol. 9(4): 479–497; DOI: 10.1177/1359104504046155 www.sagepublications.com

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,

---

ACKNOWLEDGEMENTS: The authors gratefully acknowledge the contribution of Alice Bhasale, Robert Hutcheon, Kim Pearce, Liallyn Fitzpatrick, Ione Docherty and other Sahaja Yoga instructors who provided training for the participants on a voluntary basis. Sarah Yates' help with data entry is gratefully acknowledged. We also thank the Royal Hospital for Women, University of New South Wales, for providing facilities for running the meditation clinic. Importantly, we thank the developer of Sahaja Yoga meditation, Mrs Nirmala Shrivastava (Shri Mataji Nirmala Devi), for her advice and permission to evaluate her technique. We acknowledge that, as a matter of principle, Sahaja Yoga is always taught free of charge.

LINDA HARRISON is a Senior Lecturer in the School of Teacher Education, Charles Sturt University, where she teaches child development and early childhood practice. Her research has focused on children's attachment relationships with parents and teachers and how these explain socio-emotional adjustment over time. Currently involved in the design and implementation of large research projects investigating family and childcare predictors of children's development, health and well-being, including the Longitudinal Study of Australian Children, the Sydney Family Development Project and the New South Wales Child Care Choices study.

RAMESH MANOCHA is a general practitioner and researcher who currently holds the Barry Wren Research Fellowship at the Royal Hospital for Women and the School of Women's and Children's Health, Faculty of Medicine, University of New South Wales, Sydney, Australia where he is involved in scientific evaluation of complementary and alternative medicines. In 1998 he established the Meditation Research Programme (MRP). Since that time, the MRP has conducted exploratory clinics, physiological evaluations and several high-quality randomized controlled trials. In 2002 the MRP was approached by members of the community to explore the potential of Sahaja Yoga meditation for children with ADHD and thus the 'Meditation for ADHD Clinic' was initiated. Dr Manocha is a recipient of the Bernard Lake Memorial Prize for complementary medicine research.

CONTACT: Natural Therapies Unit, Royal Hospital for Women, Locked Bag 2000, Randwick, NSW 2031, Australia. E-mail: r.manocha@unsw.edu.au

KATYA RUBIA is a Senior Lecturer in Cognitive Neuroscience in the Dept of Child Psychiatry, Institute of Psychiatry, King's College, London. Her work has focused on the cognitive neuroscience of executive and attention functions and in determining the neurobiological basis of ADHD by use of functional magnetic resonance imaging (fMRI). She is currently investigating the specificity of the neurobiological basis of executive dysfunctions in major developmental disorders such as ADHD, conduct disorder, obsessive-compulsive disorder, depression and autism.

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, Dresel, 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.[1] 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

Health, n.d.). 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 $M_{pre} = 22.54$, $SD = 4.61$, to $M_{post} = 14.62$, $SD = 5.15$. The average mean decrease in reported ADHD symptoms was 7.91 points ($SD = 4.91$, 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 ($M_{reduction} = 10.18$, $SD = 4.79$) than for the 9 who had maintained the same level of medication ($M_{reduction} = 5.22$, $SD = 3.83$; $t = 2.51$, $p = .022$). 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

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

	Commencement (Week 1)			*Final Point (Week 6)*			*Symptom Change (Week 1 to 6)*		
	n	M_{pre}	*SD*	*n*	M_{post}	*SD*	*n*	$M_{reduction}$	*SD*
Medication Status[1]									
No medication	6	22.33	5.57	6	14.50	1.52	6	7.83	5.15
Receiving medication	20	22.60	4.45	20	14.65	5.86	20	7.95	4.97
t-value[2] (*p*)		–.12 (*ns*)			–.06 (*ns*)			–.50 (*ns*)	
Reduced dosage[3]	11	24.00	4.90	11	13.81	7.11	11	10.18	4.79
No change of dose	9	20.89	3.33	9	15.67	4.03	9	5.22	3.83
t-value[4] (*p*)		1.62 (*ns*)			–.69 (*ns*)			2.51 (.02)	

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.

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

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, rs(19) = .47 and .47, respectively (ps < .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 ($M_{pre} = 22.62$, Ms$_{post} = 15.94$ and 16.25, ts = 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 ($M_{pre} = 3.24$, Ms$_{post} = 3.69$ and 3.73, ts = –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

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*	
							Time 1–3	*Time 1–6*
	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.

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

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, & Pulvermuller, 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

Aftanas, L.I., & Golocheikine, S.A. (2001). Human anterior and frontal midline theta and lower alpha reflect positive state and internalised attention: High-resolution EEG investigation of meditation. *Neuroscience Letters, 310*, 57–60.

Aftanas, L.I., & Golocheikine, S.A. (2002). Non-linear dynamic complexity of the human EEG during meditation. *Neuroscience Letters, 330*, 143–146.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: American Psychiatric Press.

Anderson, V. (1997). Attention deficit-hyperactivity disorder: Neuropsychological theory and practice. In J. Bailey & D. Rice (Eds.), *Attention deficit/hyperactivity disorder: Medical, psychological and educational perspectives* (pp. 19–48). Sydney: Australian Association of Special Education.

Arnold, L.E. (2001). Alternative treatments for adults with attention-deficit hyperactivity disorder (ADHD). *Annals of the New York Academy of Science, 931*, 310–341.

Barkley, R.A. (1997). *ADHD and the nature of self-control.* New York: Guilford Press.

Barry, R.J., Clarke, A.R., & Johnstone, S.J. (2003). A review of electrophysiology in attention-deficit/hyperactivity disorder: I. Qualitative and quantitative electroencephalography. *Clinical Neurophysiology, 114*, 171–183.

Barry, R.J., Johnstone, S.J., & Clarke, A.R. (2003). A review of electrophysiology in attention-deficit/hyperactivity disorder: II. Event-related potentials. *Clinical Neurophysiology, 114*, 184–198.

Bowlby, J. (1982). *Attachment and loss: Vol. 1 Attachment.* New York: Basic Books. (Originally published 1969.)

Burnett, P.C. (1994). Self-concept and self-esteem in elementary school children. *Psychology in the Schools, 11*, 164–171.

Burnett, P.C. (1996). Gender and grade differences in elementary school children's descriptive and evaluative self-statements and self-esteem. *School Psychology International, 17*, 159–170.

Burnett, P.C. (1998). Measuring behavioural indicators of self-esteem in the classroom. *Journal of Humanistic Education and Development, 37*, 107–116.

Canter, P.H. (2003). Editorial. The therapeutic effects of meditation. *British Medical Journal, 326*, 1049–1050.

Cara, J.D. (2002). *Update on attention deficit/hyperactivity disorder*. Report on the American Academy of Pediatrics National Conference & Exhibition, October 19–23, 2002.

Castellanos, F.X., Lee, P.P., Sharp, W., Jeffries, N.O., Greenstein, D.K. et al. (2002). Developmental trajectories of brain volume abnormalities in children and adolescents with attention deficit/hyperactivity disorder. *Journal of the American Medical Association, 9*, 1740–1748.

Chan, E. (2002). The role of complementary and alternative medicine in attention-deficit hyperactivity disorder. *Journal of Developmental and Behavioural Pediatrics, 23,* S37–S45.

Chan, E., Rappaport, L., & Kemper, K. (2003). Complementary and alternative therapies in childhood attention and hyperactivity problems. *Journal of Developmental and Behavioural Pediatrics, 24,* 4–8.

Cheon, K.A., Ryu, Y.H., Kim, Y.K., Namkoong, K., Kim, C.H., & Lee, J.D. (2003). Dopamine transporter density in the basal ganglia assessed with [I-123]IPT SPET in children with attention deficit hyperactivity disorder. *European Journal of Nuclear Medicine and Molecular Imaging, 30*, 306–311.

Clarke, L., Ungerer, J., Chahoud, K., Johnson, S., & Stiefel, I. (2002). Attention deficit hyperactivity disorder is associated with attachment insecurity. *Clinical Child Psychiatry and Psychology, 7,* 179–198.

Committee on Children and Young People. (2002). *Issues Paper No. 5. The use of prescription drugs as a mental health strategy for children and young people*. Parliament House, Sydney, NSW. Available: http://www.kids.nsw.gov.au/files/issuespaper5mentalhealth.pdf

Conners, C.K., Sitarenios, G., Parker, J., & Epstein, J. (1998). The Revised Conners' Parent Rating Scale (CPRS-R): Factor structure, reliability, and criterion validity. *Journal of Abnormal Child Psychology, 26,* 257–268.

Dougherty, D.D., Bonab, A.A., Spencer, T.J., Rauch, S.L., Madras, B.K., & Fischman, A.J. (1999). Dopamine transporter density in patients with attention deficit hyperactivity disorder. *Lancet, 354,* 2132–2133.

Dunn, L.M., & Dunn, L.M. (1997). *Peabody Picture Vocabulary Test – Third edition (PPVT-III)*. Circle Pines, MN: American Guidance Services.

Gage, J.D., & Wilson, L.J. (2000). Acceptability of attention-deficit/hyperactivity disorder interventions: A comparison of parents. *Journal of Attention Disorders, 4,* 174–182.

Ghodse, A.H. (1999). Dramatic increase in methylphenidate consumption. *Current Opinion in Psychiatry, 12*, 265–268.

Goldman, L.S., Genel, M., Bezman, R.J., & Slanetz, P.J. (1998). Diagnosis and treatment of attention-deficit/hyperactivity disorder in children and adolescents. Council on Scientific Affairs, American Medical Association. *Journal of the American Medical Association, 279,* 1100–1107.

Harrison, L.J., Bowes, J., Watson, J., Wise, S., Sanson, A., Ungerer, J., & Simpson, T. (2003, April). *When are too many care settings too much? Outcomes for children in multiple and changeable child care*. Paper presented in the symposium 'Doing no harm: New ways of improving child care quality', the 2003 biennial meeting of the Society for Research in Child Development, Tampa, Florida.

Hoza, B., Pelham, W.E., Milich, R., Pillow, D., & McBride, K. (1993). The self-perceptions and attributions of attention deficit hyperactivity disordered and nonreferred boys. *Journal of Abnormal Child Psychology, 21,* 271–286.

Keown, L., & Woodward, L. (2002). Early parent–child relations and family functioning of preschool boys with pervasive hyperactivity. *Journal of Abnormal Child Psychology, 30,* 541–553.

Kjaer, T.W., Bertelsen, C., Piccini, P., Brooks, D., Alving, J., & Lou, H.C. (2002). Increased

dopamine tone during meditation-induced change of consciousness. *Cognitive Brain Research, 13*, 255–259.

Krause, K.H., Dresel, S.H., Krause, J., Kung, H.F., & Tatsch, K. (2000). Increased striatal dopamine transporter in adult patients with attention deficit hyperactivity disorder: Effects of methylphenidate as measured by single photon emission computed tomography. *Neuroscience Letters, 285*, 107–110.

Lazar, S.W., Bush, G., Gollub, R.L., Fricchione, G.L., Khalsa, G., & Benson, H. (2000). Functional brain mapping of the relaxation response and meditation. *NeuroReport, 11*, 1581–1585.

Lou, H.C., Kjaer, T.W., Friberg, L., Wildschiodtz, G., Holm, S., & Nowak, M. (1999). A ^{15}O-H_2O PET study of meditation and the resting state of normal consciousness. *Human Brain Mapping, 7*, 98–105.

Lutzenberger, W., Preissl, H., & Pulvermuller, F. (1995). Fractal dimensions of electroencephalographic time series and underlying brain processes. *Biological Cybernetics, 73*, 477–482.

Manocha, R., Marks, G.B., Kenchington, P., Peters, D., & Salome, C.M. (2002). Sahaja Yoga in the management of moderate to severe asthma: A randomised controlled trial. *Thorax, 57,* 110–115.

Molle, M., Marshall, L., Pietrowski R., Lutzenberger, W., Fehm, H.L., & Born, J. (1995). Dimensional complexity of indicates a right fronto-cortical locus of attentional control. *Journal of Psychophysiology 9,* 45–55.

Morgan, A. (2001). Sahaja Yoga: An ancient path to modern mental health? *Transpersonal Psychology Review, 4*, 41–49.

National Institute of Child Health and Development (NICHD) Early Child Care Research Network. (n.d.). *The NICHD study of early child care and youth development*. Available: http://www.secc.rti.org/summary.cfm

National Institute of Mental Health. (n.d.). *Conners Parent–Teacher Questionnaire*, Form Approved OMB 68-R965.Washington, DC: U.S. Government.

National Institute of Mental Health. (1998). *NIH consensus statement: Diagnosis and treatment of attention deficit hyperactivity disorder*. Washington, DC: U.S. Government.

Olson, S. (1996). Developmental perspectives. In S. Sandberg (Ed.), *Hyperactivity disorders of childhood. Cambridge Monographs in Child and Adolescent Psychiatry* (pp. 149–194). Cambridge: Cambridge University Press.

Panjwani, U., Gupta, H.L., Singh, S.H., Slevamurthy, W., & Rau, U.C. (1995). Effect of Sahaja Yoga practice on stress management in patients with epilepsy. *Indian Journal of Physiology and Pharmacology, 39*, 111–116.

Panjwani, U., Selvanurthy, W., Singh, S.H., Gupta, H.L., Thakur, L., & Rai, U.C. (1996). Effect of Sahaja Yoga practice on seizure control and EEG changes in patients of epilepsy. *Indian Journal of Medical Research, 103,* 165–172.

Pelham, W., Gnagy, E., Greiner, A., Hoza, B., Hinshaw, S., Swanson, J., Simpson, S., Shapiro, C., Bukstein, O., Baron-Myak, C., & McBurnett, K. (2000). Behavioural versus behavioural and pharmacological treatment in ADHD children attending a summer treatment programme. *Journal of Abnormal Child Psychology, 28,* 507–525.

Pelham, W., Wheeler, T., & Chronis, A. (1998). Empirically supported psychosocial treatments for attention deficit hyperactivity disorder. *Journal of Clinical Child Psychology, 27,* 190–205.

Pianta, R.C. (1990). *The Student–Teacher Relationship Scale.* Unpublished manuscript, University of Virginia.

Pianta, R.C., & Steinberg, M. (1992). Teacher–child relationships and the process of adjusting to school. In R.C. Pianta (Ed.), *Beyond the parent. The role of other adults in children's lives. New directions in child development, Vol. 57* (pp. 61–80). New York: Jossey-Bass.

Rai, U.C., Setji, S., & Singh, S.H. (1988). Some effects of Sahaja Yoga and its role in the prevention of stress disorders. *Journal of International Medical Sciences*, 19–23.

Ramirez, P.M., Desantis, D., & Opler, L.A. (2001). EEG biofeedback treatment of ADHD. A viable alternative to traditional medical intervention? *Annals of the New York Academy of Sciences, 931*, 342–358.

Rice, D., & Richmond, C. (1997). Attention deficit-hyperactivity disorder and the family. In J. Bailey & D. Rice (Eds.), *Attention deficit/hyperactivity disorder: Medical, psychological and educational perspectives* (pp. 88–107). Sydney: Australian Association of Special Education.

Rubia, K., Overmeyer, S., Taylor, E., Brammer, M., Williams, S.C.R., Simmons, A., Andrew, C., & Bullmore, E.T. (1999). Hypofrontality in attention deficit hyperactivity disorder during higher order motor control: A study with FMRI. *American Journal of Psychiatry, 156*, 891–896.

Rubia, K., & Smith, A. (2001). Attention deficit-hyperactivity disorder: Current findings and treatment. *Current Opinion of Psychiatry, 4,* 309–316.

Rubia, K., Taylor, E., Smith, A., Oksanen, H., Overmeyer, S., & Newman, S. (2001). Neuropsychological analyses of impulsiveness in childhood hyperactivity. *British Journal of Psychiatry, 179*, 138–143.

Schachar, R.A., & Tannock, R. (1993). Childhood hyperactivity and psycho-stimulants. A review of extended treatment studies. *Journal of Child and Adolescent Psychopharmacology,* 3, 81–97.

Srivastava, N.D. (1997). *Meta modern era.* New Delhi: Ritana Press.

Srivastava, Shri Mataji Nirmala Devi (n.d.). *Sahaja Yoga Meditation.* Available: www.freemeditation.com

Steifel, I. (1997). Can disturbance in attachment contribute to attention deficit hyperactivity disorder? A case discussion, *Clinical Child Psychology and Psychiatry, 2*, 45–64.

Stubberfield, T., & Parry, T. (1999). Utilisation of alternative therapies in attention-deficit hyperactivity disorder. *Journal of Pediatric Child Health, 35,* 450–453.

Treuting, J.J., & Hinshaw, S.P. (2001). Depression and self-esteem in boys with attention-deficit/hyperactivity disorder: Associations with comorbid aggression and explanatory attributional mechanisms. *Journal of Abnormal Child Psychology, 29*, 23–39.

Vaidya, C.J., Austin, G., Kirkorian, G., Ridlehuber, H.W., Desmond, J.E., Glover, G.H., & Gabrieli, D.E. (1998). Selective effects of methylphenidate in attention deficit hyperactivity disorder: A functional magnetic resonance study. *Proceedings of the National Academy of Sciences of the USA, 95*, 14494–14499.

Vance, A.L.A., & Luk, E.S.L. (2000). Attention deficit hyperactivity disorder: Current progress and controversies. *Australian and New Zealand Journal of Psychiatry, 34*, 719–730.

Vimpani, G.V. (1997). Prescribing stimulants for disruptive behaviour disorders: Sometimes against the best interests of the child? *Journal of Paediatrics and Child Health, 33,* 9–11.

de Wolff, M., & van IJzendoorn, M. (1997). Sensitivity and attachment: A meta-analysis on parent antecedents of infant attachment. *Child Development, 68,* 571–591.

Yardi, N. (2001). Yoga for control of epilepsy. *Seizure – European Journal of Epilepsy, 10*, 7–12.

Zametkin, A.J., & Ernst, M. (1999). Current concepts: problems in the management of attention-deficit-hyperactivity disorder. *New England Journal of Medicine, 7*(340), 40–46.