Evidence for the Impact of Mindfulness on Children and Young People

Katherine Weare
Emeritus Professor, Universities of Exeter and Southampton
skw@soton.ac.uk

.b

The Mindfulness In Schools Project

In association with:

UNIVERSITY OF EXETER

Mood Disorders Centre

April 2012

Executive Summary

Amongst adults there is **reasonably strong evidence for the positive impact of mindfulness** on a wide range of mental and physical health conditions, on social and emotional skills and wellbeing, and on learning and cognition. There is also **good evidence from neuroscience and brain imaging** that mindfulness meditation reliably and profoundly alters the structure and function of the brain to improve the quality of both thought and feeling.

Research with children and young people is not yet as extensive as with adults, and the studies carried out so far have some methodological limitations, most notably small numbers, and limited use of control groups or randomisation. Conclusions must therefore be tentative. Nevertheless, work is growing rapidly and the results are promising which suggests that mindfulness in schools is well worth doing.

Two recent systematic reviews and twenty individual studies of mindfulness interventions with school aged children, all with reasonable numbers of participants, have been published in reputable peer reviewed scientific journals. The interventions involved all age ranges, both volunteers and 'conscripts', children without problems and children with a range of mental and physical health problems, and took place in school, clinical and community contexts. The weight of evidence from these studies concludes that:

- Mindfulness for young people is **easy to carry out**, fits into a wide range of contexts, is **enjoyed** by both students and teachers, and does no harm.
- Well conducted mindfulness interventions can **improve the mental, emotional, social and physical health and wellbeing of young people** who take part. It has been shown to reduce stress, anxiety, reactivity and bad behaviour, improve sleep and self-esteem, and bring about greater calmness, relaxation, the ability to manage behaviour and emotions, self-awareness and empathy.
- Mindfulness can **contribute directly to the development of cognitive and performance skills and executive function**. It can help young people pay greater attention, be more focused, think in more innovative ways, use existing knowledge more effectively, improve working memory, and enhance planning, problem solving, and reasoning skills.

The studies also show that **adolescents who are mindful**, either through their character or through learning, **tend to experience greater well-being**, and that being more mindful tends to accompany more positive emotion, greater popularity and having more friends, **and less negative emotion and anxiety**.

Mindfulness is therefore likely to have beneficial effects on the emotional wellbeing, mental health, ability to learn and the physical health of school students. Such interventions are relatively cheap to introduce, have an impact fairly quickly, can fit into a wide range of contexts and are enjoyable and civilising, for pupils and staff.

Research with children and young people is now growing from the fertile ground of the substantial and convincing work with adults, and, although still much less developed than research with adults, is coming to much the same conclusions. It may therefore be of interest to review briefly the evidence on adult mindfulness before looking more specifically at the young.

Mindfulness in Adults

The research base for the usefulness of mindfulness in improving the physical and psychological health and wellbeing of adults is reasonably strong.

Mindfulness has been shown to address **physical health** problems directly, and is effective in **reducing pain, high blood pressure, in improving the symptoms of physical conditions such as psoriasis and fibromyalgia**.

Mindfulness has also clearly been shown to be effective in **improving mental health** too, addressing problems such as **substance abuse, stress, anxiety and recurrent depression, and to improve sleep** (Baer 2003). Meta-analyses which bring together and summarise the findings of many different pieces of research report overall medium effect sizes (d = .50–.59) on a wide range of outcomes measuring physical and psychological health (Grossman et al, 2003).

Attitudes and skills in adults

As well as its impact on specific problems, mindfulness has been shown to be capable of having effects on very useful **underlying emotional and social skills.** These include **the ability to feel in control, to make meaningful relationships, to accept experience without denying the facts, to manage difficult feelings, and to be calm, resilient, compassionate and empathic** (Baer 2003; Salmon et al, 2004).

Mindfulness has been shown to have an impact too on **intellectual skills, improving sustained attention, visuo-spatial memory, working memory, and concentration** (Jha et al, 2007; Chambers et al, 2008; Zeidan et al, 2010).

Changing the structure of the brain

These changes are not all in the imagination of the meditator. Brain imaging studies on adults are showing that **mindfulness meditation reliably and profoundly alters the structure and function of the brain to improve the quality of both thought and feeling**. It produces greater blood flow too, and a thickening of, the cerebral cortex in areas associated with attention and emotional integration (Davidson, 2008). Although the most striking changes are observable in long term meditators, brain changes are clearly observable in people who have only been meditating for eight weeks for an average of under half an hour a day.

In these subjects, imaging showed increased grey-matter density in the hippocampus, known to be important for learning and memory, and in structures associated with self-awareness, compassion and introspection. Participant-reported reductions in stress were also correlated with decreased grey-matter density in the amygdala, which is known to play an important role in anxiety and stress (Hozel et al, 2011). Although studies have not yet been done on children's brains there is no reason to suppose the changes would not be similar.

Mindfulness for Children and Young People

Research on the effects of mindfulness on young people is not yet as extensive as work with adults but it is now growing rapidly. There is a growing research base both in schools and in clinical settings, and with a wide range of ages and numbers of participants, which suggests that mindfulness training is well worth doing.

Two recent systematic reviews in the field, that bring all the studies together, have concluded that the results of the work that have taken place are feasible and promising (Burke 2009; Harnett and Dawe, 2012). The consensus is that **interventions are generally acceptable and well-liked by the participants,** and there have been **no reports that any of them caused harm** (so called 'adverse effects').

Naturally, and as is usual in a new field, many of the studies that have taken place have been pilot studies, and have a range of 'methodological difficulties' such as small numbers of participants, not much use made of control groups or random allocation of participants,

as yet no standardised measures, a good deal of reliance on self report, and often biases created by having participants who volunteer rather than being chosen. This means that conclusions have to be tentative. However the results of a wide range of studies in different contexts consistently suggest that **children and young people enjoy and appreciate the courses and that the processes and the effects of mindfulness on the young are very similar to the positive changes observable in adults**.

Well conducted mindfulness interventions have been shown to be capable of addressing the problems of the young people who take part, and **improve their wellbeing, reduce worries, anxiety, distress, reactivity and bad behaviour, improve sleep, self esteem, and bring about greater calmness, relaxation, and self-regulation and awareness**. Adolescents who are mindful, either through temperament or training, tend to experience greater well-being; and mindfulness correlates positively with positive emotion, popularity and friendship-extensiveness, and negatively with negative emotion and anxiety (Miners, 2008).

Mindfulness has also been shown to contribute directly to the development of **cognitive and performance skills in the young**. When children and young people pupils learn to be more 'present' and less anxious, they often find they can pay attention better and improve the quality of their performance, in the classroom, on the sports field, and in the performing arts for example. They often become **more focused, more able to approach situations from a fresh perspective, use existing knowledge more effectively, and pay attention.**

Summaries of some key recent pieces of research

The following is a brief summary of the main work on mindfulness that is most relevant to schools. It excludes work which is purely qualitative (i.e. based on interviews), with very small numbers of children and with preschool children. It should be emphasised that some of these studies are small scale and not always conducted to the highest standards – nevertheless they add up to an increasingly convincing and growing body of evidence.

Studies in school contexts which focused on
Emotional Wellbeing

This section reports on eight studies which have taken place in school contexts, including one unpublished study on .b, plus one study from a summer camp, all of which focus on wellbeing.

Napoli, Krech & Holley (2005) reported the results of integrated mindfulness and relaxation work with 225 children with high anxiety, aged between **5 - 8** taking part in the 'Attention Academy Program' in a school context. The intervention constituted 12 sessions of 45 minutes each. The children showed **significant decreases in both test anxiety and ADHD behaviors and also an increase in the ability to pay attention**. The study was reasonably strong methodologically, being a randomized control trial (RCT) with a large sample, and the use of objective measures of attention.

Wall (2005), in a small study, outlined effort programme to teach MBSR and Tai Chi in a mainstream school to **11-13** year olds in the US, which brought perceived benefits such **improved well-being, calmness, relaxation, improved sleep, less reactivity, increased self-care, self-awareness, and a sense of connection with nature**.

The "Learning to BREATHE" curriculum is an MBSR-derived mindfulness programme was evaluated by **Broderick and Metz (2009)**. Their study, conducted with a year group of **17 to 19** year-old students in an American independent girls' school showed **decreases in negative affect, and increases in calm, relaxation, self-acceptance, emotional regulation, awareness and clarity.**

Huppert and Johnson (2010) reported the outcomes of the Mindfulness in Schools Project's (hereafter MiSP) pilot mindfulness programme with **14 to 15** year-old male students. Conducted in two English independent boys' schools, a four-week mindfulness training produced significant effects on **mindfulness, ego-resilience or well-being among students who regularly did 10 minutes of home practice a day and smaller changes among those who did not**.

Hennelly (2011) looked at sixty eight adolescent students aged between **14 and 16** from typical, mixed-gender secondary schools who followed the full .b eight week course. There were significant differences between participant and control groups' **mindfulness, resilience and well-being**, with longer term effects being even greater than immediate effects. Students, teachers and parents also reported **subjective improvements in students' motivation and confidence, competence and effectiveness**.

Schonert-Reichl and Lawlor (2010) investigated a mindfulness-based program, delivered by teachers, involving 10 lessons and three times daily practice of mindfulness meditation. Overall, there was a significant increase in scores on self-report measures of **optimism and positive emotions.** Teacher reports showed an **improvement in social and emotional competence** for children in the intervention group, and **a decrease in aggression and oppositional behaviour**.

Joyce et al (2010) report pre- and post-group differences in children aged **10 to 13** years on measures of behaviour problems and depression. The 10 week program delivered by teachers lead to a significant **reduction in self-reported behavioural problems and depression** scores, particularly in pupils with clinically significant levels of problem before the intervention.

Liehr and Diaz (2010) carried out a small randomized trial comparing a mindfulness-based intervention with another approach. Eighteen minority and disadvantaged children recruited from a summer camp were randomly assigned to either a mindfulness-based intervention in which they went to ten 15 minute classes on mindful breathing and movement for two weeks, or to a heath education group, both interventions focusing on depression and anxiety. There was a significant **reduction in depression** symptoms for those in the mindfulness group and a **reduction in anxiety** for both groups, in the immediate post-treatment follow up.

Lau and Hue (2011) carried out a pilot controlled trial assessing preliminary outcomes of a mindfulness-based programme in schools in Hong Kong for twenty four **14 to 16**-year-old adolescents with low academic performance from two secondary schools, with similar size control groups. There was a significant **decrease in symptoms of depression and a significant increase in wellbeing** among the young people who received the intervention.

Studies in school contexts which focused on

Learning

This section reports on five studies in a school setting where the particular focus of interest was learning and associated cognitive processes, such as attention, focus and executive function (an umbrella term for the higher order mental processes that govern tasks such as working memory, planning, problem solving, reasoning and multi-tasking).

Semple et al. (2010) assessed the impact of a 12-week group program based on MBCT in **9 to 13** year old children who were struggling academically. Significant improvements were found on measures of **attention and reductions in anxiety and behaviour problems** compared to those who had not yet had the programme.

Saltzman and Goldin (2008) reported an 8-week MBSR intervention with 31 children, aged **9 to 11**, who participated with their parents. The teachers were experienced mindfulness instructors. Analysis indicated feasibility, and improvements for children and parents in **attention, emotional reactivity and some areas of meta-cognition,** based on self and parent report measures, and objective measures of attention.

Beauchemin, Hutchins and Patterson (2008) looked at the feasibility of, attitudes toward, and outcomes of a 5-week mindfulness meditation intervention administered to 34 adolescents diagnosed with learning difficulties. All outcome measures showed significant improvement, with participants who completed the program demonstrating **decreased state and trait anxiety, enhanced social skills, and improved academic performance**. The authors hypothesised that **mindfulness meditation decreases anxiety and negative self belief, which, in turn, promotes social skills and academic outcomes.**

Schonert-Reichl and Hymel (2007) reviewed the "MindUP" programme which fosters the development of well-being traits using social, emotional, attentional and self-regulation strategies, including mindfulness exercises. Teachers noticed improvements in **9 to 13** year-olds' **behaviour, attention and focus**.

Flook et al (2010) reviewed the "Inner Kids" mindfulness-skills programme which has been taught around the world. Evaluation with **7 to 9** year-olds produced parent and teacher-rated **improvements in so called 'executive function'** (which refers to the ability to problem solve, plan, initiate and control and monitor one's own actions, to pay attention, be mentally flexible and multi-task, and to employ verbal reasoning). Those with lower pre-course self-regulation were observed to experience greatest improvements in **behavioural regulation, meta-cognition and executive function**.

Studies in clinical contexts which focused on

Mental Health

Some studies have taken place with young people in clinical (e.g. psychological and psychiatric) contexts rather than in schools. This section reports on the six most relevant that were conducted with reasonable numbers of children.

Bogels et al (2008) evaluated the impact of mindfulness on a group of adolescents diagnosed with attention and behaviour-control deficits. They reported **significant increases in personal goals, sustained attention, happiness and mindful awareness**; changes that were ratified by their parents.

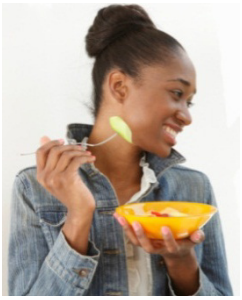
Zylowska (2008) reported the results of a pilot study of 8 adolescents with ADHD who took part in a mindfulness course and showed **improvements on tasks measuring attention and cognitive inhibition, and in externally observed and self reported anxiety and depressive symptoms.**

Biegel et al (2009) studied the effects of a modified 8 week MBSR course for 4 to 18 year olds with a wide range of diagnoses. When compared with a control group, the young people who received MBSR self-reported significantly **reduced symptoms of anxiety, depression, and somatic distress, global assessment of functioning and increased self-esteem and sleep quality.**

Mendelson et al. (2010) employed a mindfulness-based intervention to improve the ability to self regulate in nine and ten year olds from disadvantaged backgrounds. The intervention included yoga-based physical activity, breathing techniques and guided mindfulness practice designed to help children manage arousal and stress levels. Some significant reductions were found on measures of involuntary response to **stress** and there was a trend for **greater trust in friends**.

Bootzin and Stevens (2005) investigated the impact of a mindfulness intervention with 55 adolescents aged between 13 and 19 years who received treatment for substance abuse and had sleep problems. It constituted a 6 session intervention that included components of Mindfulness Based Stress Reduction (MBSR) and insomnia treatment. There were significant **reductions in mental health distress and improvements in sleep,** both in quality and time for young people who completed the course. Although substance use increased during the intervention for all who took part, after 12 months those who completed the course showed **decreased substance use** while those who did not continued to increase substance use.

Studies which focused on
Physical Health



Gregoski et al (2011) in a randomized trial looked at the effect of mindful breathing meditation in the context of a summer camp with 166 Afro-American adolescents who were at risk of cardiovascular disease. The students experienced a twelve week mindfulness intervention during regular health education classes. Breathing awareness meditation produced greater **reductions in systolic blood pressure** than did regular Life Skills Training or Health Education programmes. Participants taught breathing meditation also showed greater **reductions for 24 hr diastolic blood pressure and heart rate** compared to the Life Skills group.

The impact of
Social and Emotional Learning

Mindfulness programmes can be seen as a subset of social and emotional learning (SEL) programmes, with which they very much share goals and to some extent techniques**. SEL programmes generally attempt to develop students' social and emotional skills, attitudes and capacities**, including self-awareness, the ability to manage the emotions, optimism, persistence and resilience, empathy and the ability to make relationships, all of which are also goals for mindfulness, through providing a spiral curriculum of explicit learning opportunities.

SEL has been shown clearly to 'work' in many contexts. Durlak et al (2011) calculated that the effect sizes from the **207 SEL interventions they reviewed averaged out to an 11% improvement in achievement tests, a 25% improvement in social and emotional skills, and a 10% decrease in classroom misbehaviour, anxiety and depression,** compared with pupils who received no programme, effects which held up on average for at least six months after the interventions.

Conclusion

The nineteen studies described briefly here are not without their flaws and caveats, but do offer a solid set of promising results that, taken together, and with the strong support from the substantial work with adults and on social and emotional learning more generally, suggest that **for schools to engage in mindfulness is likely to have beneficial results on the emotional wellbeing, mental health, ability to learn and even the physical health of their students**. Such interventions are relatively **cheap** to introduce, have an **impact fairly quickly**, can fit into a wide range of contexts and above all are **enjoyable and civilising, for pupils and staff**.

References

Baer, R.A. (2003) Mindfulness training as a clinical intervention. A conceptual and empirical review. *Clinical Psychology: Science and Practice.* 10 (2), 125-43.

Beauchemin, J., Hutchins, T.L. & Patterson, F. (2008) Mindfulness meditation may lessen anxiety, promote social skills and improve academic performance amongst adolescents with learning difficulties. *Complementary Health Practise Review, 13,* 34-45.

Biegel, G.M., Brown, K.W. Shapiro, S.L., & Schubert, C.M. (2009) Mindfulness-based Stress Reduction for the treatment of adolescent psychiatric outpatients: a randomized clinical trial. *Journal of Consulting and Clinical Psychology , 77(5),* 855-866.

Bogels, S., Hoogstaf, B., Van Dun, L., De Schutter, S. & Restifo, K. (2008) Mindfulness training for adolescents with externalizing disorders and their parents. *Behavioural and Cognitive Psychotherapy 36(2),* 193-209.

Bootzin, R.R., & Stevens, S.J. (2005). Adolescents, substance abuse, and the treatment of insomnia and daytime sleepiness. *Clinical Psychology Review, 25*, 629–644.

Broderick, P.C., & Metz, S. (2009) Learning to BREATHE: A pilot trial of a mindfulness curriculum for adolescents. *Advances in School Mental Health Promotion, 2(1),* 35- 45.

Burke, C.A. (2009) Mindfulness-based approaches with children and adolescents: a preliminary review of current research in an emergent field, Retrieved 23 December 2009 from *Journal of Child and Family Studies,* http://www.springerlink.com/content/e1638088141n327m/

Chambers, R., Chuen Yee Lo, B., & Allen, N.B. (2008) The impact of intensive mindfulness training on attentional control, cognitive style, and affect. *Cognitive Therapy and Research*, *32*, 303-322.

Flook, L., Smalley, S.L., Kitil, M. J., Galla, B.M., Kaiser-Greenland, S., Locke, J., Ishijima, E., & Kasari, C.(2010) Effects of Mindful Awareness Practices on Executive Functions in Elementary School Children. *Journal of Applied School Psychology, 26(1)*, 70-95.

Davidson, R. and Lutz, A. (2008) Buddha's brain: neuroplasticity and meditation. *IEEE Signal Process Mag*. 25(1): 176–174. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2944261/ accessed 30th January 2012.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D. and Schellinger, K. (2011) The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions.

Flook, L., Smalley, S.L., Kitil, M. J., Galla, B.M., Kaiser-Greenland, S., Locke, J., Ishijima, E., & Kasari, C.(2010) Effects of Mindful Awareness Practices on Executive Functions in Elementary School Children. *Journal of Applied School Psychology, 26(1)*, 70-95.

Gregoski, M.J., Barnes, V.A., Tingen, M.S., Harshfield, G.A., & Treiber, F.A. (2011). Breathing awareness meditation and LifeSkills Training programs influence upon ambulatory blood pressure and sodium excretion among African American adolescents. *Journal of Adolescent Health*, 48, 59–59.

Grossman, P., Neimann,L., Schmidt, S., & Walach, H. (2003) Mindfulness-Based Stress Reduction And Health Benefits: A Meta-Analysis. *Journal of Psychosomatic Research (57)*, 35-43.

Harnett, P.S. and Dawe, S. (2012) Review: The contribution of mindfulness-based therapies for children and families and proposed conceptual integration. *Child and Adolescent Mental Health* (accepted for publication).

Hennelly, S. (2010) *The immediate and sustained effects of the .b mindfulness programme on adolescents' social and emotional well-being and academic functioning.* Thesis submitted for Master of Research in Psychology, Oxford Brookes University (unpublished).

Hölzel et al (2011) Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Research Neuoroimaging* 191 (1): 36 DOI: 10.1016/j.pscychresns.2010.08.006.

Huppert, F.A. & Johnson, D.M. (2010) A controlled trial of mindfulness training In schools; the importance of practice for an impact on well-being. *The Journal of Positive Psychology, 5(4),* 264-274.

Jha, A.P., Krompinger, J., & Baime, M.J. (2007) Mindfulness training modifies subsystems of attention. *Cognitive Affective and Behavioural Neuroscience*, *7*, 109-119.

Joyce, A., Etty-Leal, J., Zazryn, T., Hamilton, A., & Hassed, C. (2010). Exploring a mindfulness meditation program on the mental health of upper primary children: A pilot study. *Advances in School Mental Health Promotion,* 3, 17–17.

Liehr, P., & Diaz, N. (2010). A pilot study examining the effect of mindfulness on depression and anxiety for minority children. *Archives of Psychiatric Nursing*, 24, 69–71.

Mendelson, T., Greenberg, M.T., Dariotis, J.K., Gould, L.F., Rhoades, B.L., & Leaf, P.J. (2010) Feasibility and Preliminary Outcomes of a School-based Mindfulness Intervention for Urban Youth. *Journal of Abnormal Child Psychology, 38(7),* 985-994.

Miners, R. (2008) Collected and Connected: Mindfulness and the early Adolescent. *Dissertations Abstracts International: Section B. The Sciences and Engineering, 68,*9.

Napoli. M., Krech, P.R., & Holley, L.C. (2005) Mindfulness Training for Elementary School Students. *Journal of Applied School Psychology, 21(1),* 99 – 125.

Salmon, P., Sephton, S., Weissbecke, I, Hoover, K., Ulmer, C. & Studts, J. I. (2004) 'Mindfulness meditation in clinical practice'. *Cognitive and Behavioural Practice'.* 11 434-46.

Saltzman, A., & Goldin, P. (2008). Mindfulness based stress reduction for school-age children. In S. C. Hayes & L. A. Greco (Eds.), *Acceptance and mindfulness interventions for children adolescents and families* (pp. 139–161). Oakland, CA: Context Press/New Harbinger.

Schonert-Reichl, K.A. and Hymel (2007) Educating the heart as well as the mind: why social and emotional learning is critical for students' school and life success. *Education Canada,* 47, 20-25.

Schonert-Reichl, K.A. and Lawlor, M.S. (2010) The effects of a Mindfulness-Based Education Program on Pre- and Early Adolescents' Well-Being and Social and Emotional Competence. *Mindfulness, 1(3)*, 137-151.

Semple, R.J., Reid, E.F.G., & Miller, L. (2005) Treating anxiety with mindfulness: An open trial of mindfulness training for anxious children. *Journal of Cognitive Psychology, 19*, 379-392.

Semple, R., Lee, J., Dinelia, R., & Miller, L. (2010) A Randomized Trial of Mindfulness-Based Cognitive Therapy for Children: Promoting Mindful Attention to Enhance Social-Emotional Resiliency in Children. *Journal of Child and Family Studies, 19(2),* 218-229.

Wall, R.B. (2005). Tai Chi and mindfulness-based stress reduction In a Boston public middle school. *Journal of Paediatric Health Care.* 19 (4), 230-237.

Zeidan, F., Johnson, S.K., Diamond, B.J., David, Z., & Goolkasian, P. (2010) Mindfulness meditation improves cognition: evidence of brief mental training. *Conscious Cognition, 19(2)*, 597-605.

Zylowska, L. (2008) Mindfulness meditation training in adults and adolescents with ADHD: A feasibility study. *Journal of Attention Disorders* 2008;11 (6) 737-746.