

# **Systematic review of the effectiveness of interventions to promote mental wellbeing in primary schools**

## **Report 1: Universal approaches which do not focus on violence or bullying**

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## Glossary table

Term	Definition
<b>American school grades</b>	-Education is divided into 3 levels: elementary school, junior high (or middle) school and high school -Grade 1 to 5 Elementary School (6-11 years) -Grade 6 to 8 Middle School (11-14 years) -Grade 9 to 12 High School (14-18 years)
<b>Attrition bias</b>	Systematic differences between comparison groups in withdrawals or exclusions of participants from the results of a study. For example, participants may drop out of a study because of side effects of an intervention, and excluding these participants from the analysis could result in an overestimate of the effectiveness of the intervention, especially when the proportion dropping out varies by treatment group.
<b>Baseline characteristics</b>	Values of demographic, clinical and other variables collected for each participant at the beginning of a trial, before the intervention is administered.
<b>Bias</b>	A systematic error or deviation in results or inferences from the truth. In studies of the effects of health care, the main types of bias arise from systematic differences in the groups that are compared (selection bias), the care that is provided, exposure to other factors apart from the intervention of interest (performance bias), withdrawals or exclusions of people entered into a study (attrition bias) or how outcomes are assessed (detection bias). Reviews of studies may also be particularly affected by reporting bias, where a biased subset of all the relevant data is available.
<b>Blinding</b>	The process of preventing those involved in a trial from knowing to which comparison group a particular participant belongs. The risk of bias is minimised when as few people as possible know who is receiving the experimental intervention and who the control intervention. Participants, caregivers, outcome assessors, and analysts are all candidates for being blinded. Blinding of certain groups is not always possible, for example surgeons in surgical trials. The terms single blind, double blind and triple blind are in common use, but are not used consistently and so are ambiguous unless the specific people who are blinded are listed.
<b>Cluster randomisation</b>	A trial in which clusters of individuals (e.g. schools, classes), rather than individuals themselves, are randomised to different arms. In such studies, care should be taken to avoid unit of analysis errors.
<b>Effect size</b>	A dimensionless measure of effect that is typically used for continuous data when different scales are used to measure an outcome and is usually defined as the difference in means between the intervention and control groups divided by the standard deviation of the control or both groups.
<b>Emotional literacy</b>	The ability to recognise, understand, handle and appropriately express emotions
<b>Emotional writing</b>	Emotional writing, or what is often called expressive writing, is a specific intervention to write about the deepest thoughts and feelings of the most traumatic events in people's lives about things that perhaps people have never shared with anyone else, to really dig deeply inside yourself and put that on paper. This form of expressive writing is typically done very acutely for three or four different sessions over a one-week period of time.
<b>Intention to treat analysis</b>	A strategy for analysing data from a randomised controlled trial. All participants are included in the arm to which they were allocated, whether or not they received (or completed) the intervention given to that arm. Intention-to-treat

	analysis prevents bias caused by the loss of participants, which may disrupt the baseline equivalence established by randomisation and which may reflect non-adherence to the protocol. The term is often misused in trial publications when some participants were excluded.
<b>Mastery of Learning</b>	Mastery Learning is an instructional method that presumes all children can learn if they are provided with the appropriate learning conditions. Specifically, mastery learning is a method whereby students are not advanced to a subsequent learning objective until they demonstrate proficiency with the current one. Mastery learning includes many elements of successful tutoring and the independent functionality seen in high-end students. In a mastery learning environment, the teacher directs a variety of group-based instructional techniques, with frequent and specific feedback by using diagnostic, formative tests, as well as regularly correcting mistakes students make along their learning path.
<b>Self - esteem</b>	Generally thought of as a global, relatively stable evaluative construct that reflects the extent to which an individual feels positively towards him/herself.
<b>Systematic review</b>	A review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review.
<b>Targeted school approach</b>	This approach is to target activities focus on particular types of behaviour or particular groups of students with particular conditions.
<b>Unit of analysis error</b>	An error made in statistical analysis when the analysis does not take account of the unit of allocation. In some studies, the unit of allocation is not a person, but is instead a group of people. Sometimes the data from these studies are analysed as if people had been allocated individually. Using individuals as the unit of analysis when groups of people are allocated can result in overly narrow confidence intervals. In meta-analysis, it can result in studies receiving more weight than is appropriate.
<b>Whole school approaches</b>	These approaches encompass how to use school policies, systems and structures to create an ethos and environment that promotes mental wellbeing.

## Abbreviations

Abbreviation	Term
ADH	Attention Deficit Hyperactivity
AWPBI	Ability to Work with Problem Behaviour Inventory
BDI	Birleson Depression Inventory
BRSSF-Scale	Devereux Behaviour Rating Scale-School Form for ages 5 through 12
BSI	Brief Symptom Index
CAS	Child anxiety Scale
CAT	California Achievement Test
CBCL	Child Behaviour Checklist
CCPRG	Conduct Problems Preventive Research Group
CCT	Controlled trial
CDI	Child Depression Inventory
CIS	Children's Somatisation Inventory
CPD	Child Development Project
CSE-Scale	Children's Self-Efficacy Scale
CTBS	Comprehensive Test of Basic Skills
C-TRF	Caregivers Teacher Report Form
DISC-IV.	Diagnostic Interview Schedule for Children (Computerised version)
FAST	Family And School Together
GBG	Good Behaviour Game
I CAN DO	13-session programme designed to teach children general coping skills
IAR	Intellectual Achievement Questionnaire
ITT	Intention to treat
KAI-R	Kusche Affective Interview
KINDL-Questionnaire	Children's quality of life questionnaire
LEQ	Life Events Questionnaire
LIFT	Linking the Interests of Family and Teachers
ML	Mastery Learning
MSPAP	Maryland School Performance Assessment Program
ODD	Oppositional Defiant Disorder
PATHS	Promoting Alternative Thinking Strategy
PCSC	Perceived Competence Scale for Children
PI	Psychologist-led Intervention
PPVT-III	Peabody Picture Vocabulary Test, Third Edition
QoL	Quality of Life
RCMAS	Revised Children's Manifest Anxiety Scale
RCT	Randomised controlled trial
RECAP	Reaching Educators, Children and Parents
RHC-Workshop	Raising Healthy Children (workshop)
SAS-C	Stress Assessment Scale- Child
SAS-T	Stress Assessment Scale- Teacher
SC	Standard Curriculum
SCAS	Spence Children's Anxiety Scale
SCH	School-Home Co-ordinator
SDM	Skill Development Matrix (4-point teacher-rated scale)
SDQ	Strengths and Difficulties Questionnaire
SEQ	Stress Education Questionnaire (for Teachers)

Abbreviation	Term
SPMT	School Planning and Management Team
SSDP	Seattle Social Development Project
TI	Teacher-led Intervention
TOCA-R	Teacher Observation of Classroom Adaptation
TRF	Teacher Report Form
WAPBI	Working Alliance Problem Behaviour Inventory



## EXECUTIVE SUMMARY

### Objectives

This review was undertaken to support the development of NICE guidance on promoting the mental wellbeing of children in primary education.

It provides a systematic review of the published literature on the effectiveness of school based interventions that aim to promote mental wellbeing amongst children in primary education and that:

- take a universal approach
- are not primarily focused on the prevention of violence or bullying

Other related reviews supporting this NICE guidance will assess the effectiveness of

- targeted and indicated interventions
- interventions that focus primarily on the prevention of violence and bullying

In addition, work is being undertaken to examine the cost effectiveness of these different interventions and approaches.

### Background

There is a variety of definitions of mental health. For the purposes of this review, the definition of mental wellbeing<sup>1</sup> is adopted, encompassing:

- emotional wellbeing (including happiness and confidence, and the opposite of depression/anxiety)
- psychological wellbeing (including resilience, mastery, confidence, autonomy, attentiveness/involvement and the capacity to manage conflict and to problem solve)
- social wellbeing (good relationships with others, and the opposite of conduct disorder, delinquency, interpersonal violence and bullying)

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<sup>1</sup> Scope for NICE public health guidance on promotion of the mental wellbeing of children in primary education (2006).

Mental health in childhood is important for health and wellbeing throughout the life course. It has important consequences for social and educational attainment in primary and secondary school, and occupational success in adulthood. .

## **Methods**

The methods for the review are based on the NICE methods for the development of public health guidance. The NICE technical team coordinated the search strategy for this and the related reviews concerned with the mental wellbeing of primary school aged children. Fifteen databases and five websites were searched for reviews, randomised controlled trials, and controlled non-randomised trials that have been published since 1990. Two reviewers independently screened the titles and abstracts for the reviews and trials for relevance for this and related reviews. Full paper screening by two reviewers (Warwick team) was conducted to identify the studies concerned with the evaluation of whole school/universal approaches for the promotion of mental wellbeing of children in primary education (excluding interventions concerned with prevention of violence and bullying). Data extraction and quality assessment of each study was undertaken independently by one reviewer and checked for accuracy by a second reviewer. Each study was graded based on the extent to which the design and execution of the study minimised the potential sources of bias. Studies were coded according to the content of the interventions and the intervention impact a qualitative synthesis of results was undertaken. The results are presented in tables and described.

## **Review of effectiveness**

Thirty one studies were included in this review – 15 RCTs and 16 CCTs. The studies covered a diverse range of interventions including the following alone and in various combinations:

- Changes in school ethos, policies and environment
- Classroom-based intervention
- Parent involvement including support for parenting
- Wider community component

## Results

The impact of a wide variety of universal intervention to promote mental health have been investigated in primary school settings. The quality of studies is limited by the subject matter but some robust studies have been carried out. The highest quality evidence relates to multi-component programmes covering classroom curricula and school environment, together with programmes for parents. The former are typically offered by teachers who have received a significant degree of training and have access to ongoing supervision. Training typically covers the new curriculum including components relating to mental health and emotional and social development, as well as behaviour management and child teacher relationships. Parent components vary but most aim to improve parenting skills and parent child relationships. These multi-component programmes are typically long term involving children for over a year and in some cases up to three years.

Uni-component interventions including those enabling children to learn to relax and cope with stress, those teaching conflict resolution and involving peer mediation and those teaching social skills and emotional literacy have also been investigated and show promise; they need investigating in good quality trials.

## Evidence statement

There is good evidence to support the implementation of multi-component programmes, which include significant teacher training and development and support for parenting. Most of these programmes have been researched and developed in the US and may need adapting for the UK use. Interventions with similar characteristics are available in the UK but have not been the subject of robust trials. While the majority of these programmes were implemented over a year or more, further research is needed to establish the optimum content and length as well as the appropriate level of teacher training and support and support for parenting.

Boyle (1999) RCT++

CPPRG (1999) RCT++

Barrett (2001) RCT+

McClowry (2005) RCT+

McDonald (2006) RCT+

Reid (1999) RCT+

Han 2005 CCT+

Weiss 2003 CCT+

2. There is some evidence that short term stress and coping programmes delivered by psychologists are effective in the short term. Effectiveness may be enhanced by addition of a programme for parents. More evidence is needed on sustainability and effectiveness of psychologists versus teachers in providing such interventions.

Henderson (1992) RCT+

Dubow (1993) RCT+

Witt (2005) CCT+

Omizo (1992) CCT-

3 There is reasonable quality evidence that short term conflict resolution programmes delivered by teachers and involving peer mediation are effective in the short term

Stevahn (2000) RCT+

Johnson (1995) CCT-

4. There is reasonable quality evidence that long term programmes covering social problem solving, social awareness and emotional literacy, in which teachers reinforce the classroom curriculum in all interactions with children are effective in the long term even when delivered alone.

Greenberg (1995) RCT++

Elias (1991) CCT+

5. There is some evidence that the Good Behaviour Game programme implemented over a year is effective in reducing problem behaviour but not depression

van Lier (2004) RCT+

Kellam (1994) RCT-

6. There is evidence to support further trials of programmes in which retired volunteers are recruited to help in schools

Rebok (2004) RCT+

7. No evidence of effectiveness in improving mental health was identified for the “Mastery of Learning” programme, “Emotional Writing” or involvement in “Community Service” when used alone in improving mental health.

Kellam (1994) RCT-

Reynolds (2000) RCT+

Wang (1997) CCT-

8. The evidence relating to the mental health promoting effect of programmes combining heart health and mental health is equivocal

McIntyre (1996) CCT+

9 .There was insufficient evidence to make recommendations relating to the optimum balance of universal and targeted approaches, but there was some evidence that the combination may be effective.

Catalano (2003) RCT ++

Rebok (2004) RCT+

Nelson (2002) RCT++

Haynes (1990) CCT+

Weiss (2003) CCT+

10. There are no trials identified in this systematic review to show differential effects according to age, gender, ethnic or social groups.

## **Recommendations for research**

- There is a need for further secondary research on the content and process of delivery of the interventions which can be recommended for implementation as a result of findings in this review (including the content and approach to teacher training and parenting support, barriers and facilitators to implementation), to ensure that they are effective in roll out.
- Primary research should be undertaken to assess the optimum length of programmes
- Research should be undertaken to assess the cross cultural applicability of recommended programmes
- Primary research should be undertaken on brief programmes to develop coping skills and reduce stress and anxiety. These should include long term follow up, investigation of the relative effectiveness of delivery by teachers and others and a wider range of outcomes
- Primary research is needed on other short term class-based programmes (e.g. conflict resolution) to assess long term effectiveness
- Good quality CCTs of programmes adopting a health promoting school approach to mental health promotion should be undertaken in the UK using a range of robust outcome measures positive as well as negative and measuring long term impact.
- Research should be undertaken to define the most effective combination of targeted and universal approaches
- There is a need for further secondary research to update reviews of measures of child mental health and primary research to develop measures which fill gaps in availability

## The trials included in this review

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## **1. INTRODUCTION**

### **1.1 Aims and objectives**

This review was undertaken to support the development of NICE guidance on promoting the mental wellbeing of children in primary education.

It provides a systematic review of the published literature on the effectiveness of school based interventions that aim to promote mental wellbeing amongst children in primary education and that:

- take a universal approach
- are not primarily focused on the prevention of violence or bullying

Other related reviews supporting this NICE guidance will assess the effectiveness of

- targeted and indicated interventions, and
- universal interventions that focus primarily on prevention of violence and bullying

In addition, work is being undertaken to examine the cost effectiveness of these different interventions and approaches.

### **1.2 Research questions**

The primary research question addressed is:

- What are the most cost effective ways of promoting the mental wellbeing of children aged 4-11 years in schools using universal approaches?

Subsidiary research questions are:

- What type of intervention content is most effective?
- What are the frequency, length, and duration of an effective intervention?
- Is it better if a teacher or a specialist delivers the intervention?
- What is the role of parents?
- What are the barriers to – and facilitators of – effective implementation?

- What are the most effective and appropriate interventions for different groups of children and young people (for example, from different social or ethnic groups)?
- Does the intervention lead to any adverse or unintended effects?

## **2. BACKGROUND**

### **2.1 Definition and terminology**

#### ***2.1.1 Mental health and mental illness***

Mental health has been recognised for sometime as representing more than the absence of mental illness, (Huppert 2004) but there has been some debate both in the academic literature and in policy circles as to the nature of the construct of ‘positive mental health’ or, as it is also referred to, ‘mental wellbeing’. The World Health Organisation sees positive mental health as a unified state which allows individuals to realise their abilities, cope with the normal stresses of life, work productively and fruitfully and make a contribution to their community (WHO 2004). The capacity for mutually satisfying and enduring relationships is widely recognised as another important component (WHO 2001). Some researchers have suggested, from a psychometric point of view, that the construct of mental wellbeing is independent of the construct mental illness. Their findings, which are based on statistical analyses of empirical data, fit with the observation that people with a diagnosis of mental illness may have variable levels of mental wellbeing and that sizeable proportions of the general population who do not have mental illness, lack mental wellbeing (Keyes 2005; Huppert 2004; Hu 2007). While few studies have shown the constructs to be entirely independent, they may well represent separate but correlated dimensions of health.

The academic literature presents at least two distinct perspectives on mental wellbeing:- the hedonic perspective which focuses on the subjective experience of happiness and life satisfaction (Diener 1993), and the eudaimonic perspective, which focuses on psychological functioning and self realisation (Ryan & Deci, 2001). The latter perspective, labelled ‘psychological wellbeing’, (Ryff and Keyes 1995) includes constructs such as resilience, autonomy, mastery, self acceptance, confidence and purpose in life, but not happiness per se. These two perspectives have informed distinct bodies of research in positive mental health. However, they are less obvious in the literature relating to poor mental health. Here, items measuring affect (feeling happy/sad) are often combined with

items measuring psychological functioning (playing a useful part in things, making decisions) (Goldberg & Williams, 1988) in the same scales, and this suggests that poor mental health at least is accepted as involving limitations in both eudaimonic and hedonic wellbeing. Positive mental health is recognised as having major consequences for health and social outcomes (Huppert & Wittington, 2004) but is under-researched partly because of the lack of appropriate population-based measures (Hu 2007).

### ***2.1.2 Mental wellbeing in children***

The literature relating to concepts of positive mental health and wellbeing in children suggests subtle distinctions from the concept as related to adults. The Mental Health Foundation (2000) has suggested that children who are mentally healthy will have the ability to:

- Develop psychologically, emotionally, creatively, intellectually and spiritually
- Initiate, develop and sustain mutually satisfying interpersonal relationships
- Use and enjoy solitude
- Become aware of others and empathise with them
- Play and learn
- Develop a sense of right and wrong
- Resolve (face) problems and setbacks and learn from them

Most of those writing on positive mental health agree on the centrality of positive interpersonal relationships and, in the literature relating to children, the concept of emotional intelligence (also called emotional literacy) is often cited (Weare 2000). This relates to the capacity for emotional awareness, emotional regulation, the use of emotional insight in interpersonal negotiations and empathy. (Salovey 1990; Sarni 1997) and is therefore the key to the establishment and maintenance of healthy relationships.

The policy literature relating to children uses the terms 'emotional and social development', 'emotional and social competence', and 'emotional and social wellbeing' in the context of mental health promotion (DfEE 1998; Dept of Health 2004 a and b –Every Child Matters). The components of emotional and social wellbeing in childhood that have been well researched include prosocial behaviour, healthy peer relationships, and self esteem (Weare 2000). The latter covers competence and worthiness and has both cognitive and affective elements (Mruk 1999).

### **2.1.3 Mental illness in children**

In research terms, because of the paucity of instruments relating to mental wellbeing, the concept is often operationalised as the absence of mental health problems. The diagnosis of mental health problems in childhood is made on the basis of a constellation of symptoms and behaviours which occur from time to time in most children but which are distinguished by their persistence and severity. Among the commonest mental disorders presenting to child psychiatrists is conduct disorder, a syndrome which covers aggressive, antisocial behaviour and defiance. Some of the characteristic behaviours such as destruction of property and theft are dependent on developmental age and in young children the constellation of behaviours which map onto and often develop into conduct disorder is known as Oppositional Defiance Disorder. Both of these disorders commonly occur in association with the second most common disorder, Attention Deficit Hyperactivity Disorder, which covers a constellation of behaviours suggested by the name. These two problems are described collectively as ‘externalising disorders’. Internalising disorders, including anxiety and depression, are regarded as less common in that they present less often to psychiatrists, possibly because they are less obvious and less of a problem to the adults caring for or teaching children with these problems. Anxiety most commonly presents in young children as phobias – for example, school phobia. Depression is regarded as very rare in primary school children, but may occur in association with externalising disorders. Eating disorders, which become common in the secondary school age group, are also rare in primary school. Autism is another rare condition which presents as a severe disability in interpersonal relationships.

Teachers and others working with children recognise mental health problems which indicate lack of wellbeing but fall short of diagnostic criteria for mental illness. These are variously labelled as behaviour problems, behavioural disorder, emotional and behavioural problems and antisocial behaviour. Different professional and disciplinary groups tend to favour different labels.

### **2.1.4 Mental wellbeing**

For the purposes of this review an eclectic definition of mental wellbeing has been adopted, covering both eudaemonic and hedonic perspectives. We have defined mental wellbeing as encompassing:

- emotional wellbeing (including happiness and confidence, and the opposite of depression and anxiety)
- psychological wellbeing (including resilience, mastery, confidence, autonomy, attentiveness/involvement and the capacity problem solve)
- social wellbeing (good relationships with others, emotional intelligence, the capacity to manage conflict and the opposite of conduct disorder, delinquency, interpersonal violence and bullying)

This definition is drawn from current work commissioned by NHS Scotland, which relates to surveying of population mental wellbeing (NHS Scotland 2006).

## **2.2 Prevalence**

Whilst clearly of interest to a wide range of academics and professionals working with children, attempts to measure the prevalence of mental wellbeing in childhood are few and far between. This is largely because reliable, valid and widely accepted instruments have not been available. Those that have been developed (Stewart-Brown and Edmunds 2003) tend to cover a broad spectrum of functioning and include negative as well as positive aspects of mental health. None have yet been widely accepted. There has been considerable research into defining clinical cut offs for mental illness, and this has enabled data derived from continuous measures to provide prevalence estimates. However, there are as yet no such agreed cut offs between optimal and normal mental health and there are strong arguments for suggesting that such cut offs would be inappropriate. . Relevant data therefore tend to relate to mental health problems and disorders.

Surveys of mental disorders in childhood show prevalence to be higher in boys than girls, affecting 10.4% of 5-10 year olds (5.9% of girls in this age group) (Meltzer 2000). The commonest mental disorder in the 5-10yrs age group is conduct disorder (6.5% boys and 2.7% girls) followed by emotional disorders (3.3% in both sexes) and hyperkinetic (attention deficit hyperactivity) disorders (2.6 % boys 0.4% girls).. Behaviour problems which fall short of the diagnosis of conduct disorder may affect over 10% of the population (Offord 1986) . Most children with mental health problems do not find their way to mental health services and in the majority the problem is not recognised by the parents (Meltzer 2000). Calls to Childline reveal the extent to which mental health problems are under

diagnosed in older children, but calls from primary school age children are less common than those in older age groups (McConville 2001).

There are marked variations in measures of mental health by social circumstance and ethnicity. In 2004, the prevalence of mental disorders was greater among:

- children in disrupted families (lone parent, reconstituted)
- children with parents who have no educational qualifications
- children in poorer families and those living in disadvantaged areas (ONS 2004)

A slightly higher proportion of black children (12%) than white children (10%) had mental health problems. Among Asian children, 8% of Pakistani and Bangladeshi children and 4% of children of Indian origin had mental health problems (ONS 2004).

Looked After Children have very high levels of mental health problems:- Looked After Children aged between 5 and 10 were five times more likely than children in the general population (42% versus 8%) to have mental health problems (ONS 2004). The major contributor to the increased risk of mental health problems among children in care relates to conduct disorders. Almost one in three children in local authority foster care were assessed as having conduct disorder, as were 60% of those in residential care homes.

### **2.3 Mental health outcome measures**

It follows from the above that suitable measures that capture changes in mental wellbeing attributable to interventions are few and far between. Most programme evaluations depend on measures that focus on mental health problems. The most common measures used require teachers or parents to rate the frequency with which they observe various components of children's behaviour on a 3-5 point Likert scale. These measures have evolved over the course of the last 20 years from those which focus entirely on undesirable behaviours (eg Eyberg Child Behaviour Inventory) to those which cover undesirable behaviours but have a subset of items devoted to social skills, social competence or prosocial behaviour (e.g. Child Behaviour Checklist, (CBCL) Achenbach:2001 or Goodman Strengths and Difficulties Questionnaire (SDQ) (Goodman 1997) (School Social Behaviour Scales (SSBS); Merrell's Social Skills Rating Scale Gresham and Elliot 1990; and to those



which focus entirely on positive skills and behaviours (Behavioural and Emotional Rating Scale (BERS Epstein 1997).

Other available measures aim to capture specific mental health problems, including clinically validated measures of depression and anxiety. Such measures, with their focus on clinical disorders, are unlikely to be sensitive to change in studies of programmes offered on a universal basis. More useful measures focus on specific attributes of positive mental health (Self Esteem, Self Concept, Self Efficacy), or on specific positive behaviours (Coping Strategies or Problem Solving Strategies).

## **2.4 Time trends**

Statistical trends over time depend on stable definitions of disease problems and on robust survey data. Both these factors are issues for studying trends of mental health problems in children. However, current studies support the impression of those providing services to children that the incidence of mental health problems in childhood rose between 1974 and 1999 (Collishaw 2004). This upward trend may have been halted during in the early part of the 21 century (ONS 2004).

## **2.5 Risk and Protective Factors**

The determinants of mental wellbeing and mental illness are complex and these operate at different levels (individual, family, community, policy). (See the Table 1 below.) The idea of risk and protective factors is an important focus for exploring the relationship between determinants of mental health, and interventions and outcomes. Policies, programmes and interventions may be viewed in terms of the extent to which they remove/decrease risk factors or foster protective factors.

Evidence suggests that the more the risks in a child's life are reduced - for example, by improving parents' family management and parenting skills, increasing support for children with learning difficulties, and effectively treating mental disorders, - the less vulnerable that child will be to subsequent health and social problems, as reported in 2.6 below. Protective factors, such as good family relationships, good parenting and academic competence, enable the development of resilience and coping skills which help to safeguard young

people from mental health problems'. Table 1 shows the risk and protective factors for mental health in children.

**Table 1 Risk and protective factors for Mental Illness and Mental Wellbeing childhood and adolescence**

	<b>Individual</b>	<b>Family</b>	<b>Community</b>
<b>Risks</b>	Male Learning disability Physical illness <b>Academic failure</b> <b>Low self esteem</b> Developmental delay Communication problems	Parental conflict Maternal sensitivity and attunement Family breakdown <b>Poor parenting including inconsistent/unclear discipline, hostility, lack of supervision</b> Physical, sexual or emotional abuse Parental mental illness Criminality or substance addition Death or loss including 'being looked after'	Socio-economic disadvantage Homelessness Disaster Discrimination Parental unemployment <b>Poor school ethos</b> <b>Bullying</b>
<b>Protective Factors</b>	Female <b>Self esteem</b> Sense of identity <b>Self efficacy (mastery)</b> <b>Good communication &amp; social skills</b> <b>School success</b>	<b>At least one good relationship with an adult either in the family or outside</b> <b>Authoritative discipline</b> <b>Support for education</b> Good inter-parental relationships	Wider support networks <b>Access to sport &amp; leisure opportunities</b> High standard of living <b>Schools with strong academic and non-academic opportunities</b> <b>Supportive school ethos</b> <b>Good relationships with peers</b> Good housing

Factors potentially under the influence of schools are identified in "**bold**". In some cases – for example most of those in the Community Factors column – these factors are directly under the control of schools. In others – for example self esteem, academic success, communication and social skills – schools have a powerful influence and can to some extent protect children from the effect of risk factors outside school. For yet other factors – parenting skills – schools have a potentially valuable role to play in offering parenting education and support.

## **2.6 Mortality and morbidity associated with childhood mental health problems in childhood**

Mental health problems in childhood double the risk of life threatening disorders such as burns, accidental ingestion and severe head injury and increase risk of fractures by 15-20%. Children with these problems also experience a 50% increase in risk for other specific health problems such as bedwetting, coordination, speech and language, and soiling. As yet there have been no studies relating childhood mental health problems to overall health related quality of life, but the above statistics suggest that this is likely to be affected.

Childhood mental health problems have an impact on parents, siblings and peers [17]. Parents and other family members with a child with mental health problems have double the risk of 'caseness' on the General Health Questionnaire – an instrument which captures the common mental disorders of anxiety and depression. These statistics need to be interpreted with care. Parental mental illness is a risk factor for childhood mental health problems and this association may represent both cause and effect.

### ***In adulthood***

Childhood behaviour problems track through into adult life and predict a range of deleterious outcomes. In one study conduct problems predicted ten psychiatric disorders, these included obsessive compulsive disorder, depression, alcohol and drug use disorders and antisocial personality in both sexes; the strength of prediction also increased as the number of conduct problems increased (Price and Robins 1991). In another study (Caspi 1996), behavioural problems at age 3 predicted a range of problems at age 21. Under-controlled children – those most likely to develop conduct disorder at school - were more likely to be diagnosed with antisocial personality disorder (OR: 2.9), to be involved in crime (OR: 2.2) and violence (OR: 4.5), and to have reported suicide attempts (OR 16.8) or alcohol dependence (OR: 2.2) at 21 years. Inhibited children– those most likely to develop internalising symptoms during school – were at increased risk of attempted suicide (OR: 6.5). Boys with internalising symptoms were also at increased risk of violent offences (OR: 5.7) and alcohol problems. Childhood onset conduct problems are more predictive of future problems than are adolescent onset conduct problems, and roughly half of all children with problems in the preschool period have problems at the age of 18 (Moffitt 1996). Children

with aggressive and alienated personalities are most at risk of conduct disorder and have an increased risk not only of violent crime but also of unsafe sex, dangerous driving habits and substance misuse (Caspi 1995). Children with Conduct Disorder are much less likely to make supportive relationships in adulthood (Quinton 1993) and therefore less likely to be able to establish the social networks and emotional support which protects against heart disease (Morgan 2004).

Childhood depression recurs in three quarters of cases (Harrington 1992) and depressive symptoms in adolescence increase the risk of depression, psychiatric hospitalisation, heavy cigarette smoking, tranquilliser use, accidents, and problems in relationships with the opposite sex in early adult life (Kandel 1986). Mental health problems in childhood predict of self reported health at age 23 years (Power *et al* 1991) accounting for some of the life course effect of social inequalities in health. They also predict social mobility and unemployment at 23 and 33 years. (Power *et al* 1991)

Most studies concentrate on the future impact of mental health problems in childhood, but a small number examine the impact of indicators of wellbeing. Zimmerman *et al* found high self esteem in adolescence to protect against later alcohol misuse as well as school failure and susceptibility to peer pressure (Zimmerman 1997). In a further two very long term studies, psychosocial health in adolescence was shown to predict psychosocial health between 30 and 62 years of age (Jones and Meredith 2000) and longevity (Schwartz, 1995).

## **2.7 Health Promotion in Schools**

There are almost eight million children and young people in primary and secondary schools in the UK, therefore schools offer an important opportunity for public health initiatives. They have been a popular setting for implementing universal, targeted, and indicated health promotion programmes for over half a century. Universal programmes are those delivered to all pupils in the school regardless of need. Targeted programmes are delivered to children at high risk for developing health problems, and indicated programmes are restricted to those who have already developed a problem. The latter may be delivered in the clinical environment of a school health service. Half a century of research has delivered valuable information on effective approaches to health promotion in schools. Starting from

a model of classroom instruction, programmes have evolved on the basis of this research to encompass multi-component approaches. These have included changes to the school environment, which enable everyone within the school to live and work in healthier ways, and the involvement of the wider community, particularly family members. At the same time, class-based programmes have become more imaginative and have incorporated the sort of experiential learning which enhances skill development alongside knowledge acquisition.

During the 1990s, backed by the WHO in Europe, the concept of the health promoting school emerged (WHO 2005). Such schools aim to develop health- promotion programmes by extending the teaching beyond that of health knowledge and skills, by encompassing the school's social and physical environment, and by developing links with the community. Guidelines were developed which covered the following six areas: school health policies, the physical and social environment of the school, school community relationships, the development of personal health skills, and school health services.

In Europe and Australia the concept of the 'whole school approach' has been emphasized in the context of implementing health promoting school initiatives (Piette 1995). Whole school approaches demand changes to the school ethos and culture – the whole atmosphere of the school, including disciplinary codes, standards of behaviour, attitudes adopted by staff towards pupils and the values implicitly asserted by its mode of operation. Subsequent guidelines on health promoting schools (Parson Stears 1996) have emphasised related issues such as the development of good relationships within the school, the promotion of staff health and wellbeing, the promotion of self-esteem among pupils, and the consideration of staff exemplars in health-related issues. In line with the Alma Ata declaration (WHO 1978), the health promoting school initiative stresses participative approaches. School commitment and involvement is regarded as the key to success, and schools are encouraged to develop programmes in accordance with their own strategies and timetables.

The Health Promoting School initiative is popular in many parts of the world. Thirty seven countries have participated in the European Network of Health Promoting Schools since 1997 (St Leger 1999), and a survey in England, UK in at the end of the 1990s showed that three quarters of Local Authorities were running a health promoting schools scheme

(Health Education Authority 1997). In the UK, the Department for Education and Skills, together with the former Health Development Agency, developed a National Healthy Schools Standard (NHSS) based on the health promoting schools approach. Current requirements for achieving National Healthy Schools Status – A guide for schools ([http://www.wiredforhealth.gov.uk/PDF/NHSS\\_A\\_Guide\\_for\\_Schools\\_10\\_05.pdf](http://www.wiredforhealth.gov.uk/PDF/NHSS_A_Guide_for_Schools_10_05.pdf))

developed jointly by the DfES and the DH in England include the promotion of positive emotional health and wellbeing with the aim of helping pupils understand and express their feelings and build confidence and emotional resilience.

## **2.8 Mental health promotion programmes**

Early school based health promotion programmes focused on physical health and this remains the focus of the majority of programmes offered today (Lister Sharpe 1999). More recently, school based programmes to prevent mental illness and to promote mental health have begun to emerge (Stewart-Brown 2006). Such programmes come in many guises. Amongst the universal programmes, which are the subject of this report, many focus on emotional and social development and aim to equip children with the necessary skills to help prevent mental health problems in the future. Skills that are taught include problem solving, conflict management, emotional literacy, and coping with stress. Many programmes focus solely on the prevention of aggression and violence, and these programmes are the subject of a companion review. Other school mental health promotion programmes focus on the development of self esteem, or offer children techniques to cope with stress. Some interventions adopt whole school approaches and target the way staff interact with children when managing difficult behaviour, or when motivating success. Initiatives to reduce bullying often demand such approaches. Some of these adopt the principles of the health promoting schools, and involve the parents and the wider community. Parents may be involved in policy development, or they may be offered programmes to support parenting – a major risk factor for poor mental health in childhood.

## **2.9 English Government policy on mental health promotion in schools**

Health, and specifically mental health, is the integral concern of a broad set of educational, social, and economic policies relating to children.

The green paper *Every Child Matters* (HM Government 2003) and the Children Act 2004 have stimulated considerable progress in the coordination and integration of services for children and young people. *Every Child Matters* defined five aspects of wellbeing in childhood to which all developments in policy for children and young people must demonstrably contribute: - being healthy, staying safe, enjoying and achieving, making apposite contribution, and achieving economic wellbeing. .

*Every Child Matters: Change for Children* (HM Government 2004) built on the green paper and legislation by developing the Change for Children Outcomes Framework. The outcomes framework facilitates coordinated performance management of children's services by breaking the five outcomes for children down into detailed aims, targets, indicators of progress, and inspection criteria.

From an NHS point of view, the key policy document on children's health in England is the National Service Framework for Children, Young People and Maternity Services (the children's NSF) (Department of Health 2004), and includes standards for promoting children's mental health and treating mental health problems. The children's NSF is an integral part of the Change for Children programme. *Choosing Health: making healthy choices the easier choices* (2004), the most recent policy guidance on public health in England draws attention to the childhood antecedents of adult health problems. It singles out emotional health and wellbeing and the building of effective relationships as areas for intervention, and schools as an important setting for the delivery of programmes to achieve this.

The specific key policies and documents that are relevant to the promotion of mental wellbeing of children in schools include:

- *Every Child Matters*, including the 2003 green paper, *Every Child Matters: Change for Children* (HM Government 2004), and the children's NSF (Department of Health 2004)
- *Higher Standards, Better Schools for All* (DfES 2005)
- *Promoting Children's Mental Health within Early Years and School Settings* (DfES 2001), *Mental health and social exclusion* (SEU 2004), and the 2005 Ofsted report on promoting emotional health and wellbeing in schools

- *Bullying – A Charter for Action* (DfES 2003), and a 2003 Ofsted report on effective action in secondary schools
- *Higher Standards, Better Schools for All* (DfES 2005), *The Respect Action Plan* (Home Office 2006), and the 2006 report of the Practitioners' Group of School Behaviour and Discipline
- *Healthy living blueprint for schools* (DfES 2004), *Choosing Health* (Department of Health 2004), and *National Healthy School Status – A guide for schools* (DfES 2005)
- *Our health, our care, our say* (Department of Health 2006)
- *Making it possible: Improving Mental Health and Wellbeing in England* (NIMHE 2005)
- *Aiming High* (DfES 2003), *Promoting the health of looked after children* (Department of Health 2001), *A better education for children in care* (SEU 2003), and *Managing pupil mobility* (DfES 2003)
- *National Health Schools Status: a guide for schools DfES DH 2005*

## **2.10 Social and Emotional Aspects of Learning-SEAL**

The promotion of mental wellbeing is an important aspect of the national primary education strategy, especially through the vehicle of *Social and Emotional Aspects of Learning: SEAL*. Primary SEAL offers a whole-school framework for promoting the social and emotional aspects of learning: Self-awareness, managing feelings, motivation, empathy and social skills. Primary SEAL is a universal programme that provides curriculum work for all children; and is organised into seven themes which can be covered within a school year. Each theme is designed for a whole-school approach and resources are organised at four levels: Foundation Stage, Years 1 and 2, Years 3 and 4 and Years 5 and 6.

The implementation of different aspects of SEAL is currently being evaluated within the context of the *Behaviour and Attendance Strategy*. The evaluation of the pilot stage was conducted in a sample of 25 local authorities. It showed that SEAL implementation was variable (Hallam et al 2006). Teachers perceived a positive impact on different aspects of children's behaviour and wellbeing. It also identified a range of factors that contributed to positive outcomes.



## 2.11 Existing Reviews of Mental Health Promotion in Schools

A range of systematic reviews and reviews of reviews on mental health promotion in schools have been published. Most of these existing systematic reviews are broadly based, covering both primary and secondary schools and both universal and targeted programmes. Some reports have reviewed school based programmes alongside other mental health promotion programmes for children.

Among the reviews of at least reasonable quality that focus on school programmes is the meta-analysis conducted by Kraag et al (2006): They covered a heterogeneous group of programmes that target stress management and coping skills, and they tentatively concluded that social-emotional development programmes, relaxation programmes and combined programmes could be effective in reducing stress. High quality studies also suggested an effect on coping. Wells et al (2003) examined controlled studies of universal programmes in schools and, based on a qualitative synthesis of 17 studies of another heterogeneous group of interventions, concluded that programmes could be effective, and that effectiveness was increased for interventions that adopt longer time frames and for whole school approaches that include parental involvement and environmental change alongside classroom programmes. Rones and Hoagwood (2000) considered a qualitative synthesis of 47 studies that covered both universal and targeted interventions, and they concluded that interventions impacted on a range of emotional and behavioural problems. Aspects of programmes that increased effectiveness included involvement of parents, teachers and peers, integration of programmes into the classroom curriculum, and consistent programme implementation. Harden et al (Eppi Centre 2001) focused on the promotion of self esteem and the prevention of depression and suicide in a review of seven systematic reviews and five primary studies that had not been included in existing reviews. They concluded that primary preventive interventions were most effective and that these showed medium to large effects, that self esteem programmes were less effective, and that knowledge based programmes were ineffective. Included programmes were very heterogeneous.

Among reviews of reasonable quality that examine the effects of school based programmes as part of broader reviews of mental health promotion programmes for children is the meta-analysis by Durlak and Wells (1997). They reviewed all programmes

that aim to reduce adjustment problems in childhood and they found that most programmes affect functioning in multiple domains, both increasing competencies and reducing problems. Programmes that targeted 2-7 year olds were found to be more effective than those that targeted older age groups. Merry et al (2004) focused on depression and found that there were more studies of psychological interventions than of educational interventions. Although some results were positive, the evidence was insufficient to recommend implementation at present. Two reviews examined the effectiveness of interventions to improve self esteem in children of all ages. Ekeland (2004) focused on physical activity and found a moderate short term effect on self esteem. Haney and Durlak (1998) found that targeted programmes were more effective than universal interventions, and that programmes which focused exclusively on promoting self esteem were more effective than those which considered this alongside other interventions.

Overall, this literature points to the potential for universal interventions at all ages to have a beneficial effect on children's mental health, but two points stand out. First the heterogeneity among both interventions and studies was commented on by most reviewers. Mental health covers a range of attributes, and programmes often aim to influence only one of two of these attributes. Many reviewers have also commented on the variation that exists in study quality and particularly on the inadequacies of research designs and the limitations that these inadequacies pose when interpreting results. School based mental health promotion programmes, particularly those multi-component whole school interventions that are conducted over a long period, do not lend themselves easily to the randomised controlled, double blind, objectively assessed approach to evaluation. Some 'inadequacies' may therefore be unavoidable. Avoidable problems which reviewers have commented on include failure to take cluster effects into account in analyses of studies based on randomisation at the level of the school or class, inadequate descriptions of the intervention, lack of assessment of programme implementation, and failure to report all outcomes.

The second point which stands out from reviewers' reports on the literature is the lack of consistency in results. Most reviewers concluded that interventions could be effective but that their effectiveness could not be relied upon. Several reviewers strove to identify characteristics of interventions or studies that predicted effectiveness. Among the universal

interventions, greater effects were attributed to multi-component and whole school approaches where classroom components were integrated into the curriculum, involved parents, and were implemented consistently over a longer period of time. There was no consistency for identifying the most effective age group to target, or for determining whether universal or targeted interventions were more effective. The promotion of self esteem and the prevention of depression seemed to be less easy to influence than anxiety or behaviour.

## **2.12 The need for guidance**

This scope defines mental wellbeing as emotional, and psychological health, including the ability to interact socially. It is taken from the NHS Scotland report on monitoring positive mental health (NHS Scotland 2006). This definition is set out further in section 2.1 and in 'outcomes' (see section 4.3).

- (a) There is limited national data on how to promote mental wellbeing among children of primary school age.
- (b) In 2004, one in ten (10%) of children and young people aged between 5 and 16 years had a clinically diagnosed mental disorder (ONS 2004). Older children (aged 11–16 years) were more likely than younger children (aged 5–10 years) to have a mental disorder (12 % compared with 8%).
- (c) Mental health problems among young people increased between 1974 and 1999 (Collishaw *et al.* 2004). However, the most recent national survey of 5–16 year olds suggests that this upward trend was halted between 1999 and 2004 (ONS 2004).
- (d) Mental health problems in childhood have implications for health, mental physical and social in adulthood.
- (e) In 2004, boys were generally more likely to have a mental disorder than girls, and the prevalence of mental illness was greater among:
  - children in disrupted families (lone parent, reconstituted)
  - children with parents who have no educational qualifications

- children from poorer families and those living in disadvantaged areas (ONS 2004)

(f) Data on the levels of mental disorder among children of different ethnic groups is difficult to interpret. However, children aged 5–10 who are white, Pakistani or Bangladeshi appear more likely to have a mental health problem than black children. Indian children are least likely to have a mental health problem (ONS 2004).

(f) Looked after children aged 5–10 were at least five times more likely than children in the general population to have mental health problems (42% versus 8%). Among 11–15 year olds, the contrast was slightly less marked (49% versus 11%), (ONS 2004).

### **3. METHODOLOGY**

#### **3.1 Search strategy**

An initial single search strategy was designed and undertaken to support all the reviews that were commissioned to inform the development of NICE guidance on the promotion of mental wellbeing among children in primary education. This process was coordinated by the NICE technical team.

The search strategy was developed by the NICE technical team, the Warwick team and the NICE Collaboration Centre for Information (the Centre for Reviews and Dissemination at York University-CRD). A single search strategy was used, and this encompassed the following reviews:

- universal approaches (including violence prevention interventions)
- targeted/indicated activities
- cost effectiveness reviews

The literature search for the development of reviews was carried out by CRD in January 2007.

The search strategy used for Medline is provided as an example in the appendix. The subject headings used in this strategy were adapted accordingly for the searches conducted in the other databases. The following databases and websites were searched between 3 and 11 June 2007.

**Table 2 Databases searched (1990 to date)**

<b>Bibliographic databases</b>	<b>Websites</b>	<b>Economic databases</b>
MEDLINE EMBASE ERIC CINALH Sociological Abstracts ASSIA Psycinfo Cochrane Database of Systematic Reviews DARE CENTRAL SIGLE	CASEL EPPI Centre Community Guide-Guide to community preventive services Search Institute Joseph Rowntree Trust	Health Economics Evaluation Database (HEED) NHS EED (NHS Economics Evaluation Database) Econlit

Bibliographies of reviews and studies known to the research team and provided through personal communication were searched to identify additional studies that might be suitable for inclusion. .

### **3.2 Inclusion and exclusion criteria for this review**

#### **3.2.1. Population**

Studies were eligible for inclusion if they included children aged between 4 and 11 years and were based in the following primary education settings:

- state sector maintained schools and independent schools
- special education environments

Studies covering children aged over 11 years and children not in school were excluded. Where studies spanned primary and secondary school age groups they were included if the mean age was below 12 years or more than 50% of children were aged under 12 years.

### **3.2.2. Interventions**

Studies were eligible for inclusion if they adopted universal approaches. Relevant interventions included:

- Use of school policies, systems and structures to create an ethos and an environment that promotes mental wellbeing. For example, these factors may include the physical environment, links with parents and the community, and the management, development and support of teachers
- Curriculum-based programmes and other activities aimed at developing the mental health or social and emotional wellbeing of all children.

### **3.2.3 Comparators**

Studies were eligible for inclusion if they compared the intervention of interest against a no intervention control or against another intervention approach.

### **3.2.4 Outcomes**

Studies were eligible for inclusion if they reported changes in aspects of 'mental wellbeing' and the outcomes considered encompassed the following broad areas:

- emotional wellbeing (including happiness and confidence, and the opposite of depression/anxiety)
- psychological wellbeing (including resilience, mastery, confidence, autonomy, attentiveness/involvement and the capacity to manage conflict and problem solve)
- social wellbeing (good relationships with others, and the opposite of conduct disorder, delinquency, interpersonal violence and bullying)

### **3.2.5 Excluded studies**

This review excluded studies that were concerned with targeted or indicated interventions and also excluded interventions whose primary aim was the prevention of violence and bullying. Related reviews cover these types of interventions. Studies which examined interventions with both universal and targeted components were included.

### **Exclusion criteria:**

- Out of range of primary school age If the analysis combined different age groups then the study was included if 50% or more of the participants were in the primary school age-range or if the mean age of the students was below 12 years.
- Studies that did not include a control group (e.g. time series analyses )
- Trials published in any other language other than English
- Trials carried out in developing countries. Countries were designated as either 'developed' or 'developing' according to the World Bank and IMF classifications.
- Trials published before 1990

The appendix 3 shows a list of excluded studies and the reasons for exclusion.

### **3.2.6 Study design**

Primary studies (RCTs and CNRTs) that compared a school-based intervention against no intervention or another type of intervention were considered for inclusion in this study. Systematic reviews were considered for the purpose of identifying potentially relevant primary studies.

### **3.3 Data extraction strategy**

Data relating to both study design and quality were extracted by one reviewer and independently checked for accuracy by a second reviewer. Disagreements were resolved through consensus and if necessary by a third reviewer. These data are presented in the tables in the appendixes.

### **3.4 Quality assessment strategy**

One reviewer assessed the quality of individual studies and coded studies according to the schema, see Tables 3,8 and 9. The second reviewer independently checked the accuracy of the quality assessment. Disagreements were resolved through consensus and if necessary a third reviewer was consulted. The quality of the studies was assessed according to the criteria set out in the NICE Centre for Public Health Excellence Methods



Manual. The process of grading studies, including the grading criteria, is described in full in section 4.

### ***Quality criteria of the included studies***

1. The study addressed an appropriate and clearly focused question
2. The assignment of participants to intervention groups is reported as randomised (if RCT)
3. An adequate allocation concealment method is used
4. Investigators are kept 'blind' about intervention allocation
5. The intervention and control groups are similar at the start of the trial
6. The only difference between groups is the intervention under investigation (pragmatic<sup>2</sup> trials can get full marks)
7. All relevant outcomes are reported/measured using valid/tested scores
8. Percentage of the participants or clusters recruited into each arm of the study dropped out before the study was completed? [Those with drop out rates of 30% were routinely downgraded].
9. The use of ITT analysis
10. If the study is carried out at more than one site, are the results comparable across sites?
11. Reporting the power of trials to detect a difference (study will not be downgraded for not stating the power if the sample size was considered large enough)
12. Adequate cluster analyses and subgroups stated. Two problems recur frequently in this literature a) failure to take into account design effects in the analysis – so randomised at the level of the school and analysed at the level of the individual – this can overestimate the effect size and b) unplanned, 'post-hoc' subgroup analyses.

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<sup>2</sup> Pragmatic trials are trials which compare interventions as offered in routine practice rather than in centres of excellence; they do not aim to tease out the relative effectiveness of different components or delineate the 'placebo' from the intervention effect. Here, we are interested in the combined effect of the intervention and attention because the quantity and quality of the attention is part of the intervention. These trials therefore differ from pharmaceutical trials in which researchers seek to identify the most active chemical ingredient. Placebo effects include those in which subjects gain from positive attention from researchers.

**Table 3 Quality coding strategy**

Code	NICE quality criteria	Additional criteria
++	All or most of the criteria have been fulfilled. Where they have not been fulfilled the conclusions of the study or review are thought very unlikely to alter.	-At least 8 out of 12 for RCTs or 7 out 10 in CCTs questions are well covered or adequately addressed  -and attrition rate must be less than 30%
+	Some of the criteria have been fulfilled. Those criteria that have not been fulfilled or not adequately described are thought unlikely to alter the conclusions.	-At least 5 of the criteria have been well covered or adequately addressed  -and attrition rate must be less than 50%
-	Few or no criteria fulfilled. The conclusions of the study are thought likely or very likely to alter.	- Any trial explicitly reporting attrition rate higher than 50%

### 3.5 Assessing applicability

All of the studies that were considered in this report were conducted outside of the UK. Applicability to the UK setting was therefore considered for each individual study by examining the populations and the interventions that were implemented as well as the relevant political and environmental contexts in which each trial was conducted. The extent to which each of these factors could be transferred to the UK-context was then considered, and graded according to the following statements based on the NICE Methods Manual. Applicability was graded according to the criteria (a, b, c or d). These are shown in Table 3.

**Table 4 Applicability coding:**

Code	Code Description
a	Intervention has been delivered in UK settings
b	Intervention has been delivered in similar populations but might need adaptation
c	Intervention is has been delivered in specific cultural groups represented in the UK population but might need adaptation
d	Intervention has been delivered in an entirely different population to UK

Decisions about which grade to assign to studies were made taking into account setting, population, study quality and whether there was an adequate description of the intervention which would make replication possible. However, it should be acknowledged that there may be still a certain amount of subjectivity about the applicability grading.

### **3.7 Methods of analysis / synthesis**

The interventions evaluated by the studies were classified according to content. (see Tables 5 and 10). The potential for using forest plots to summarise the effects of interventions was considered. However, the great heterogeneity in interventions as well as in study outcomes and in measurement instruments rendered the use of forest plots inappropriate for this review.

Quantitative synthesis was also precluded by intervention and study heterogeneity. A qualitative analysis was therefore undertaken.

### **4.4 Classifications of the content of the interventions**

Studies were coded according to the content of the intervention (Tables 5 & 10). We aimed to code the key components e.g. classroom, whole school and parent/community involvement. For common components (e.g. curricula) it has been possible to code more detailed contents.

Most interventions included a classroom component which was usually part of the taught curriculum for children, but could involve classroom management. Many interventions included a component for parents; the most common approach to parental involvement was to offer group sessions to parents aiming to enhance their parenting skills, but some interventions included written communications to parents only. Some interventions with whole school approaches involved parents in the development and management of the interventions. A small number of studies investigated interventions that involved changes to the school ethos or environment – whole school approaches - and a very small number involved the wider community. The description of the content of the programmes varied from very thorough to brief summaries. Several papers described the theoretical standpoint from which the programmes had been developed. Space constraints in journal articles clearly limit the extent to which very complex multi-component programmes can be

described in full. Where possible prior publications have been accessed to check on content, but time constraints precluded doing this in a systematic way. The content of the classroom programmes was better described than that relating to, for example, parenting support, or the training teachers received to offer programmes.

**Table 5 intervention codes**

Intervention code	Intervention type
1	Changes to the school ethos / environment
2	Children receiving either a). Additions or changes to the curriculum b). Changes in classroom/student management
3	Parent component a). Parenting support b). Information and advice sent home to parents c) Involvement of parents in intervention development/management
4	Wider community component

As there were a relatively large number of studies covering classroom interventions it was also possible to group studies according to the focus of the classroom intervention.

**Table 6 Classifications of the included studies according to the focus/and the aim of interventions**

Code	Focus of Classroom intervention
I	Disruptive behaviour; delinquency
II	Social skills/ competence conflict resolution, problem solving
III	Emotional literacy
IV	Anxiety; coping; stress management
V	Self-concept/self-esteem/
VI	Depression
VII	Other

**Table 7 Coding frame for intervention impact**

Code	Study impact was coded as:
A	Positive impact (all or most measures proved significantly positive in favour of intervention)
B	Possible positive impact (less than half of the measures proved significantly positive in favour of the intervention)
C	Impact unlikely (no statistically significant findings in favour of the intervention)
D	Negative impact (the intervention proved harmful compared with the control)

### 3.8 Summary of study identification

(Refer to Figure 1)

The initial search results were downloaded using Reference Manager and were sorted into three separate databases: These were categorised as ‘trials’, ‘reviews’, and ‘other primary studies’. Relevant systematic reviews were assessed by the Warwick Team through reference tracking to identify any additional potentially relevant primary studies. .

A total of 3687 trial studies and 1637 reviews abstracts were downloaded. Two members of the NICE technical team conducted the initial screening by referring to the study titles and abstracts and by using the specific screening criteria that have been set for this review (refer to ‘Screening tool’, Appendix 5). Any disagreements were resolved through discussion.

A number of issues were encountered during the electronic search and screening process. The Warwick Team identified a small number of papers through reference tracking which had not been included the initial electronic search results for trials and reviews. Some of these papers were found within the ‘other primary studies’ file as the titles and abstracts did not contain the relevant key words, and others had not been indexed in the bibliographic databases.

The Reference Manager database with ‘other primary studies’ covered non trial evaluations and contained over 35,000 results, and it was judged that potentially useful intervention papers which had not been formally categorised as trials or reviews may have been contained within this database. It was agreed that a subset of the “other primary studies” file should be scrutinised to identify any further relevant intervention studies. This search was done in Reference Manager using the following keywords in the titles and abstracts:

- Intervention\$
- Strateg\$
- Initiative\$
- Program\$
- Evaluat\$

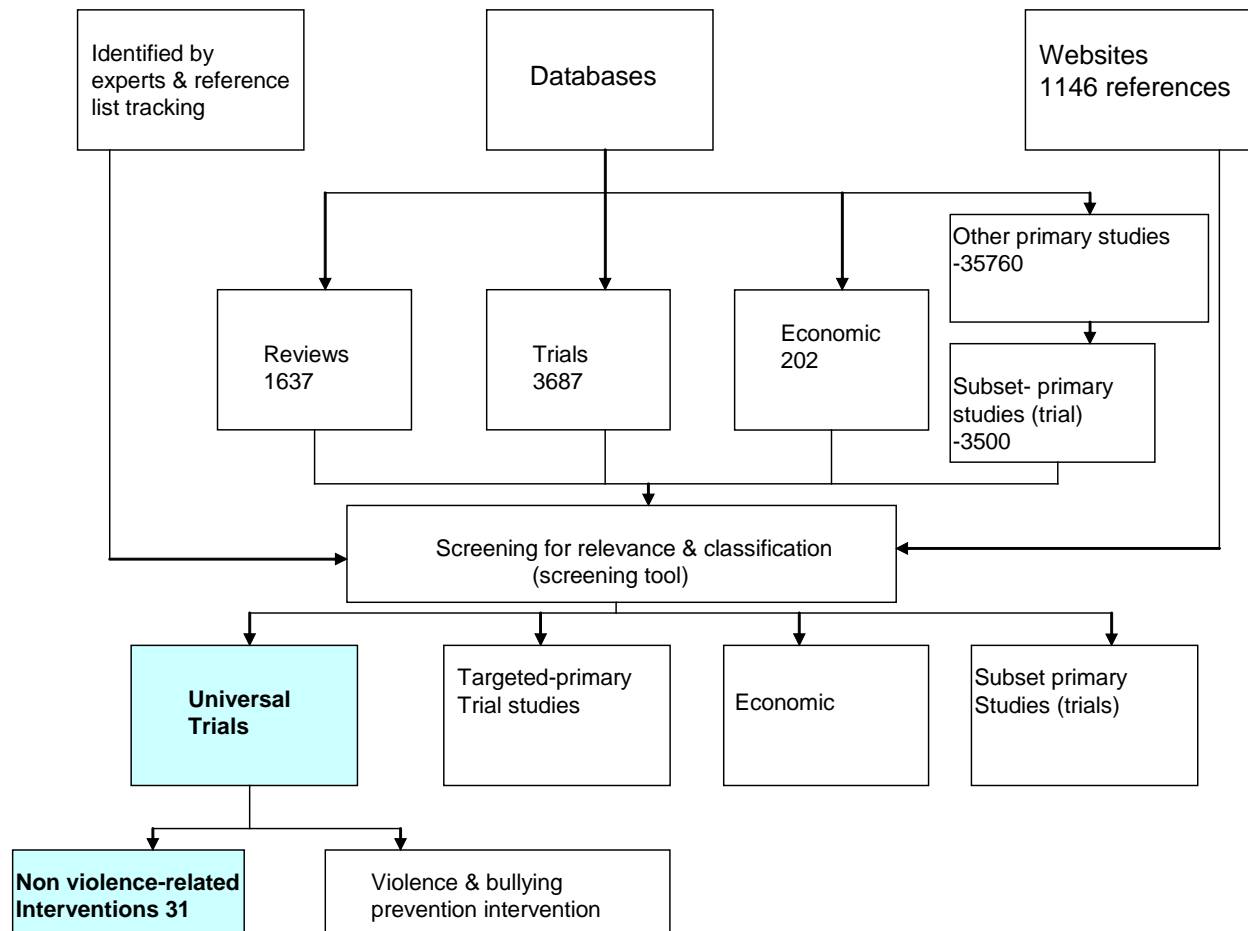
- Effect\$
- Impact\$.

A small number of additional studies were identified in this way. A final full paper screening was conducted by the Warwick team.

Following these screening processes, 31 trial studies were found to meet the inclusion criteria for the review of universal approaches to promote child mental wellbeing in primary education.

Consultation on initial drafts of this report brought further studies to the attention of the group. Some of these had been considered for inclusion in the lists of titles and abstracts but excluded because apparently out of age range or because the programmes were targeted or focused on violence prevention. The only studies identified at this stage which were potentially relevant for inclusion covered the age range 10-14 years, but did not provide a mean age. A decision was taken that these studies should be reviewed with studies of mental health promotion programmes in secondary schools. Data extraction sheets relating to these studies are included in the appendix to this report.

**Figure 1. Process of study identification**



## **4. RESULTS OF EFFECTIVENESS REVIEW**

### **4.1 Quantity of the evidence available**

The combined search strategies identified 31 trials that met the criteria for inclusion. The majority of the trials were conducted in the USA (23 trials), with two in Australia, three in Germany, and one each from Canada, the UK and the Netherlands.

There were 15 RCTs and 16 CCTs, with an overall sample size for the combined RCT studies totalling 15,631, with over 14,000 participants in the CCT studies.

#### ***4.1.1 Populations and settings***

The review was restricted to interventions which were offered to all children in a class or school (universal approaches). However, some of the interventions combined a universal approach with a targeted approach (Weiss 2003; Catalano 2003; Rebok 2004, Nelson 2002).

All the studies investigated the impact of interventions on children of primary school age (4-11 years). In some studies participants outside the age range were included in the trial and it was not possible to analyse the data separately for the younger age group. Witt 2005, Johnson 1995, Lohaus 2000, Reynolds 2000 all included some children over the age of 11 years. They were included in this review rather than in a companion review of mental health promotion interventions for secondary school children if the average age of participants was or appeared to be <12 years of age or if more than half were in primary school. Other studies focused on the younger age group with Han 2005 confined to 4-5 year olds, Kellam 1994 to first grade children and McClowry 2005 and van Leir 2004 to first and second graders.

Most studies were carried out in 'ordinary schools'; a few were set in schools serving disadvantaged communities (McClowry 2005; McDonald 2006; Nelson 1996; Haynes 1990; Elias 1991; Omizo 1992; Weiss 2003) or high crime areas (Hawkins 2005). McDonald 2006 confined their analyses to Latino children.



## 4.2. Quality of the trials of wellbeing in school children

Details of study quality are shown in tables 6 and 7 below.

Out of 15 **RCTs**, the description of randomisation was reported only in one trial (Kellam 1994), and

intention to treat (ITT) analysis reported in only (4/15). No trials reported double blinding or blinding of the assessor.

The extent of loss to follow up was stated in 9/15 RCTs and was either not reported or not clear in the remainder. Some baseline characteristics about age, gender, ethnic origin were reported in most RCTs but the details reported varied between trials. In 2/15 RCTs and 2/16 CCTs reported cluster design into account. In RCTs, 9/16 reported loss to follow up but in CCTs only 3/16 reported intention to treat analysis.

Only 4/15 **RCTs** rated high quality, scoring [++], the rest: 11/15 scored [+]. Out of the 16 controlled trials included, two scored [++], ten trials scored [+] and four trials scored [-] using the grading score suggested by NICE methodology document, see Table 2.

We have used this coding scheme in preference to Jadad's scale, which is commonly used in health technology assessment of clinical trials of pharmaceutical treatment. Jadad's scale was considered unsuitable for use in this review as double blinding is impossible, most trials used no treatment as the control arm and the maximum points the included RCTs could score was therefore 3/5.

In all the studies in this review children were allocated to intervention and control conditions on the basis of the class or school which they were attending. In such cluster designs independence of subjects cannot be assumed and analyses should be conducted taking school and class effects into account. If they are not impact may be over investigated. Only two studies did so (Boyle 1999; CPPRG 1999).

Several studies carried out apparently post hoc subgroup analyses, some reporting the trial as positive if subgroups showed change (e.g. McDonald 2006; Lohaus 1997). We have only taken positive results pertaining to the whole intervention and control groups as

showing impact. Some researchers used statistical techniques such as discriminant analysis and growth curve modelling to investigate the impact of the interventions.

#### ***4.2.1 The main limitations to trial quality were:***

**Randomisation:** In the great majority of studies randomisation was undertaken at the level of the school or classroom, but only in two studies (see above) was cluster design taken into account in the analyses. Study size ranged from 7560 children in 378 classrooms (CPPRG 1999), to 62 students in 2 classrooms. (Omizo 1992) Many studies randomised only a small number of units.

**Concealment of allocation:** One study (Kellam 1994) reported that assignment of schools to each arm was made by the toss of a coin. It seems unlikely that this was concealed, and no other studies reported concealed allocation.

**Blinding:** None of the trials reported blinding. Blinding of participants is not possible in mental health promotion interventions, but the assessors can be blind to treatment groups.

**Active control/placebo control:** almost all trials used “no intervention” arm as a control in both RCTs and CCTs.

**Baseline differences:** In RCTs 12/15 studies reported similar groups at baseline, 2/15 reported gender or other differences at baseline. In contrast to CCTs, 6/16 reported some baseline characteristics.

**Attrition rate:** Six RCTs reported attrition rates clearly in contrast 3/16 in CCTs clearly reported the attrition rates. The data of any trial can be reanalysed should the attrition rates are reported in the arms of the trials.

**Analysis methods:** Allocation to control or intervention group was made on the basis of school or class but very few studies took this cluster design effect into account in the analysis. Most trials (13/15 in RCTs, 3/16 in CCTs) did not undertake an intention to treat analysis.



**Table 8 Quality assessment, RCTs**

Codes: [√√√] Well covered, [√√] Adequately covered, [0] Poorly covered/ Not addressed / Not reported / Not applicable

Trial	1	2	3	4	5	6	7	8	9	10	11	12	Quality Rating
Barrett (2001) Aus	√√√	√√	0	0	√√	√√	√√	-19.1%(PI) -3.8%(TI) -38.7%(SC)	0	√√	√√	0	+
(Boyle 1999; Hundert 1999) Canada	√√√	√√√	0	0	√√√	√√	√√	-11%  (follow-up of random samples only)	0	√√	√√√	0	++
Catalano (2003) USA	√√√	√√	0	0	√√√	√√	√√√	3.2%	0	√√	√√	0	++
CPPRG (1999) USA	√√	√√	0	0	√√	√√	√√√	9%	√√	√√√	√√√	√√	++
Dubow (1993) USA	√√√	√√	0	0	√√√	√√	√√	27.2% (immediate intervention) 31.8% (delayed intervention)	0	√√	0	0	+
Greenberg (1995) USA	√√√	√√	0	0	√√	√√	√√√	0	√√	√√	√√	0	++
Henderson (1992) USA	√√√	√√	0	0	√√	√√	√√	0	0	0	0	0	+
Kellam (1994) USA	√√√	√√√	0	0	0	√√	√√	36.10%	0	√√	√√	0	+
McClowry (2005) USA	√√	√√	0	0	√√	√√	√√	0%	√√	√√	0	0	+
McDonald (2006) USA	√√√	√√	0	0	0 Gender differences	√√	√√√	13%	√√√	0	0	√√	+
Rebok (2004) USA	√√	√√	0	0	√√	√√	√√	0	0	√√	√√	0	+
Reid (1999) USA	√√	√√	0	0	Significant Differences reported	√√	√√	0	0	0	√√	0	+
Reynolds (2000) UK	√√	√√	0	0	√√	√√	√√	0	0	0	0	0	+

Trial	1	2	3	4	5	6	7	8	9	10	11	12	Quality Rating
Stevahn (2000) USA	√√	√√	0	0	√√	√√	√√	1.25%	0	0	0	0	+
van Lier (2004) USA	√√	√√	0	0	√√√	√√	√√	13.80%	0	0	√√	0	+

**Table 9 Quality assessment, CCT**

Codes: [√√√] Well covered, [√√] Adequately covered, [0] Poorly covered/ Not addressed / Not reported / Not applicable

Trial	1	2	3	4	5	6	7	8	9	10	11	12	Quality Rating
Battistich (1996)	√√	NA	NA	0	0	0	0	Two thirds lost to follow up 67.7%	0	0	√√	0	-
Elias (1991) USA	√√	NA	NA	0	0	√√	√√	0	0	√√	0	0	+
Han (2005)	√√	NA	NA	0	0	√√	√√	10.2% (NB those lost to FU were not actually included in Pretest data)	0	0	0	0	+
Hawkins (2005)	√√√	NA	NA	0	√√	√√	√√√	0	√√	√√	√√	√√	++
Haynes (1990)	√√	NA	NA	0	√√	√√	0	0	√√	√√	0	0	+
Johnson (1995)	√√	NA	NA	0	0	0	0	0	0	0	√√	0	-
Lohaus (1997)	√√	NA	NA	0	0	√√	√√	4.1%	0	√√	0	0	+
Lohaus (2000)	√√	NA	NA	0	0	√√	√√	13%	0	√√	√√	0	+
McIntyre (1996)	√√	NA	NA	0	0	√√	√√	0	0	0	√√	0	+
Nelson (1996)	√√	NA	NA	0	√√	√√	√√	0	0	√√	0	0	+
Nelson (2002)	√√	NA	NA	0	√√	√√	√√	0% for schools as clusters	0	0	√√	√√	++

Trial	1	2	3	4	5	6	7	8	9	10	11	12	Quality Rating
Omizo (1992)	√√	NA	NA	0	0	0	0	15.6% experimental, 16.7% control (16.1% total)	0	0	0	0	-
Sawyer (1997)	√√	NA	NA	0	0	√√	√√	30.4% target, 31.4% control (30.9% total)	0	0	√√	0	+
Wang (1997)	√√	NA	NA	0	0	0	0	0	0	0	0	0	-
Weis (2003)	√√	NA	NA	0	√√	√√	√√	4.3%	0	0	0	0	+
Witt (2005)	√√	NA	NA	0	√√	√√	√√	0%	√√	0	0	0	+

### 4.3 Outcome measures

The majority of outcomes (Table 10) used in these studies aimed to measure children's behaviour either antisocial or prosocial. Measures used varied from detailed observation of children's behaviour (e.g. Boyle 1999, Catalano 2003; CPRG 1999), through school level statistics such as exclusions or disciplinary action (eg Nelson 1996, 2002, Rebok 2004) to self-report measures by parents, children or teachers. The latter were the most common approach. While most of the measures were validated, some were adapted from validated measures or developed for the study with no prior validation. The most common outcome measure was the Child Behaviour Checklist (Achenbach) used in six studies; this is an inventory based on negative behaviours which has a parent, teacher and child report form. The second most common was the Social Skills Rating Scale (Gresham and Elliot) used in three studies; this also has a teacher, parent and child report form and has three scales – social skills, behaviour problems and academic competence. The social skills scale has both positive and negative components. Some studies that used parent, teacher and child reports on the same scale, the CBCL scale: (Sawyer 1997; Weiss 2003; Catalano 2003; Han 2005) reported positive outcomes relating to one observer (usually the teacher) and not the other. Parent and teacher reports are usually correlated to a significant degree but are not expected to agree 100% and evaluation of children's behaviour in a range of settings, and from a range of perspectives is now regarded as good measurement practice (Stewart-Brown and Edmunds (2003). It is reasonable, for example, to expect that programmes which aim to change relationships and ethos at school to have a stronger effect on school behaviour than behaviour at home. However it might also be expected that an enduring impact on the child's mental health might be manifest in all settings.

No other single measure was used in more than two studies. Outcomes in other studies included self concept (Elias 1991; Haynes 1990), self esteem (Omizo 1992; Wang 1997), self efficacy (Dubow 1993) and peer relationships (Sawyer 1997; Weiss 2003; CPPRG 1999 ). Some studies used vignettes or simulated situations to assess conflict management or problem solving (Stevahn 2000; Dubow 1993; Johnson 1995), some also assessed children's knowledge of stressors (Dubow 1993). Further studies assessed stress, and anxiety (Barrett 2001; Lohaus 2000; Henderson 1992), depression (Barrett 2001; Kellam 1994) and emotional literacy (Greenberg 1995). Some of the studies also reported outcomes not relevant to this

review for example academic achievement or drug and alcohol use. These outcomes have not been extracted.

The stated aim of the intervention and the outcomes selected for measurement of effect did not always coincide. Thus in one study, the PATHS curriculum a comprehensive class-based programme with a variety of facets was evaluated using measures of observed behaviour (CPPRG 1999). In another the same programme was evaluated using a measure designed to assess emotional literacy (Greenberg 1995). Both outcomes could be improved by the programme, and both would be valuable. Henderson 1992 investigated a programme designed to reduce stress and increase coping and evaluated impact on self concept as well as locus of control. Some complex multi-component whole school programmes (Battistich 1996) reported only one outcome related to delinquent behaviour.

**Table 10 Typology, focus of intervention, outcome measures, impact, applicability and quality scores**

Author/ Year	Typology of Interventions	Typology of classroom interventions	Outcomes measured (scales used) Scale(s) used	Impact Score (Table 7)	Applicability Score (Table 4)	Quality score
Barrett 2001	2a 3a	IV	Anxiety -child report (SCAS, RCMAS) ; Depression child report (CDII)	A	b	+
Boyle 1999	2a 3b	II	-Playground and classroom behaviour- observation (CISSAR)  Social skills- teacher report (SSRS)	A	b	++
Catalano 2003	2b, 3a		Behaviour-teacher & parent (CBCL adapted ) & child report (antisocial scale and social competency  Teacher observation (TOCA-R)	B	b	++
CPPRG 1999	2a, 2b 3b	I, II, III, V	Classroom behaviour – Teacher Observation	B	b	++



Author/ Year	Typology of Interventions	Typology of classroom interventions	Outcomes measured (scales used) Scale(s) used	Impact Score (Table 7)	Applicability Score (Table 4)	Quality score
			(TOCA-R and Social Health – teacher report (SHP)			
Dubow 1993	2a	IV	Self efficacy –child report (6 items from Wheeler and Ladd)  Problem solving – child report. (adapted from Dubow and Tisak 1989)  Facts/attitudes to stressors – (child report)  Social network score	A	b	+
Greenberg 1995	2a	II, III	-Emotional literacy – child report. (Kusche affective interview: revised (KAI-R)	B	b	++
Henderson 1992	2a	II IV	-Self-Concept –child report (Piers-Harris Children's Scale)  -Stress and Coping Questionnaire - child report (Dickey and Henderson 1989)  Locus of control – child report. (Intellectual Achievement Responsibility Questionnaire (IAR)	A	b	+
Kellam 1994	2a	VI	Depression -child report (CDI)	C	b	+
McClowry 2005	2a, 3a	II III	-Behaviour – parent report (PDR)	A	b	+
McDonald 2006	3a	I, II	-Behaviour - teacher report (CBCL),  -Social Skills– teacher report (SSRS).	A	d	+

Author/ Year	Typology of Interventions	Typology of classroom interventions	Outcomes measured (scales used) Scale(s) used	Impact Score (Table 7)	Applicability Score (Table 4)	Quality score
Rebok 2004	1, 2b,	I	- Self-Efficacy of teacher -teacher report -Office referrals for classroom misbehaviour, -Teacher perception about seniors in the classroom. -School climate questionnaires – teacher report	B	b	+
Reid 1999	1, 2a, 3a	I, II	-Behaviour-observation & parent and teacher report -Peer relations – child and classmates report Family management skills Family Assessment -Social competence and school adjustment – teacher report (Walker-McConell)	A	b	+
Reynolds 2000	2a	VII	-Depression- child report (BDI) -Anxiety – child report (SCAS) -Somatisation – child report (CSI) -Behaviour – child report (SDQ) -	C	b	+
Stevahn 2000	2a	II	-Conflict management scenario responses– child report -Response to conflict simulation – observed	A	b	+

Author/ Year	Typology of Interventions	Typology of classroom interventions	Outcomes measured (scales used) Scale(s) used	Impact Score (Table 7)	Applicability Score (Table 4)	Quality score
			Playground behaviour -teacher observation			
van Lier 2004	2a	I	-Behaviour - teacher report (CBCL) - teacher report (PBSI):- ADH Problem Scale,- ODD Problem Scale	B	b	+
<b>Control trials</b>						
Battistich 1996	1, 2a, 2b, 3a	I, II, III	Delinquent Behaviour- child report	B	b	-
Elias 1991	2a	II	- National Youth Survey (NYS) of anti-social and delinquent behaviour  - Youth Self Report (YSR) rating scale  - Perceived Competence Scale for Children (PCSC) component of YSR	A	b	+
Han 2005	2a, 2b, 3a	II	-Parents and Teacher report: (CBCL and SSRS)	B	b	+
Hawkins (2005)	2a, 2b, 3a	II, III	-Self reported emotional mental health and crime at age of 21 y.	A	b	++
Haynes 1990	1, 3c	V	Measurement by 'Piers-Harris Self Concept Scale' with 6 dimensions:  -Behaviour;  -Intellectual & School status;  -Physical appearance & attributes;  -Anxiety;  -Popularity;	A	b	+

Author/ Year	Typology of Interventions	Typology of classroom interventions	Outcomes measured (scales used) Scale(s) used	Impact Score (Table 7)	Applicability Score (Table 4)	Quality score
			-Happiness & satisfaction			
Johnson 1995	2a	II	-Written measure -Interview measures -Video-tape observation of a simulated conflict situation 4-5 months after the training had ended.	A	b	-
Lohaus 1997	2a	IV	-SSK Questionnaire – Lohaus et al. 1996) -HAVEL Questionnaire – Wagner 1981	C	b	+
Lohaus 2000	2a	IV	-Child and Parent Questionnaires -Long term effects stress symptoms, coping skills and parental scales	C	b	+
McIntyre 1996	1, 2a, 3c	IV, V	DHPS Self- administered Survey Instruments and Test of Aerobic Fitness: Domains covered through survey instruments: -Anxiety-proneness -Self-esteem -Enjoyment of learning classroom atmosphere- -Nutrition, physical activity, smoking -Food-frequency -Aerobic physical fitness	C	b	+
Nelson 1996	1, 2a, 2b	I	-BRSSF Scale -Skill Development Matrix (SDM)	B	b	+

Author/ Year	Typology of Interventions	Typology of classroom interventions	Outcomes measured (scales used) Scale(s) used	Impact Score (Table 7)	Applicability Score (Table 4)	Quality score
			-School climate, -teachers report -WAPBI -AWPBI -ESI -Consumer satisfaction for teacher in the intervention group			
Nelson 2002	1, 2a, 2b, 3a	I, III	Disciplinary actions (suspensions etc) BERS child and teacher report  Consumer satisfaction teacher report	B	b	++
Omizo 1992	2a	IV	-General Self Esteem Scale  -Child Anxiety scale (CAS)  -Wellness knowledge test(WNT)	A	b	-
Sawyer 1997	2a	II	-Teacher and parent report CBCL  child report social skills (IPSIC)	C	b	+
Wang 1997	2a, 4	V	-Coopersmith self- esteem inventory  -school-academic subscales	C	b	-
Weiss 2003	1, 2a, 2b, 3a	I	-Child behaviour – teacher, parent and child report (CBCL) -  Child behaviour - peer report (PMIEB)  -Parent psychopathology – parent report (BSI)	A	b	+

Author/ Year	Typology of Interventions	Typology of classroom interventions	Outcomes measured (scales used) Scale(s) used	Impact Score (Table 7)	Applicability Score (Table 4)	Quality score
			-			
Witt 2005	2a	IV	-Teacher and parent child behaviour measures. Child report QoL (Kindl0 Questionnaire  -Parents and teachers questionnaires score and mean differences calculated between baseline and on completion of the trial.  - assessments of QoL  - assessed parent for well being score	B	b	+

#### **4.4.1 Interventions common to more than one study**

Only two studies examined the impact of the same intervention. The PATHS curriculum was assessed in one large RCT involving 7560 children (CPPRG 1999) and one smaller trial with 286 children (Greenberg 1995). However the first of these included a parent component and the second did not; the first measured changes in classroom behaviour and the second the development of emotional literacy. Three studies included the Good Behaviour Game, but in one study it was delivered in combination with other approaches and so was not comparable. Kellam 1994 used the Good Behaviour Game as a control intervention in an RCT focusing on the Mastery of Learning programme with 685 children and measuring depression. van Lier 2004 ran a straightforward RCT of the Good Behaviour Game versus no intervention control in the Netherlands with 666 children. Reid 1995 used a modified version of this intervention as part of a programme which also involved classroom skills programmes and parenting support in an RCT with 671 children. Two CCTs investigated the RECAP programme, but Han 2005 investigated a prekindergarten version for 4-5 year olds, and Weiss 2003 investigated an elementary and middle school version which had a very significant targeted element. The remaining 24 studies all examined different interventions.

#### **4.4.2 Classroom based interventions**

In 11 of the remaining 24 studies (4 RCTs and 7 CCTs) the intervention was confined to the classroom (or special study class) as it was in one of the PATHS studies and two of the Good Behaviour Game studies discussed above. The three German CCTs all examined classroom interventions to reduce anxiety; the two Lohaus studies (2000 and 1997) focused on relaxation, the second also including sessions on problem solving; the Witt 2005 study offered children 20 minutes of Qi Gong practice twice weekly. Qi Gong is a meditative movement practice based dating back 5000 years and based on Chinese medicine. Among the three anxiety prevention classroom only studies conducted in the USA, Henderson 1992 investigated a stress management programme adapted from Coping with Kids in a small RCT; in this intervention children were taught relaxation techniques including Yoga as well as time management, problem solving and assertiveness skills; Dubow 1993 assessed the I Can Do coping skills programme in a small RCT, and Omizo 1992 investigated the effect of teaching children how to be well with lifestyle and stress management advice in a small CCT.

Of the other classroom based interventions with no added components, one medium sized Australian CCT addressed problem solving (Sawyer 1997); one medium size American CCT social

skills development (Elias 1991); and one large CCT (Johnson 1995); and one small RCT (Stevahn 2000) conflict management. There is some overlap in content between these programmes as conflict is a problem needing social skills as a solution. One UK study (Reynolds 2000) examined the impact of a very brief emotional disclosure intervention (writing about feelings) in a medium size RCT. Most of these classroom only programmes were short term lasting for one term or less. Elias (1991) and van Lier both studied programmes which had been offered to students for up to two years. Sawyer 1997 and Kellam 1994 investigated programmes lasting up to two terms.

#### ***4.4.3 Classroom approaches combined with other approaches***

Some studies investigated classroom based interventions that included a component for parents alongside problem solving (Weiss 2003), problem solving combined with empathy and respect development (McClowry 2005), and social skills training (Boyle 1999); social skills training and classroom management (Han 2005). None of these used the same intervention. A moderately sized RCT (Barrett 2001) investigated a cognitive behavioural approach combined with a stress management component and a relaxation component. One study investigated the impact of elderly volunteers in the school who supported school activities and helped children with reading. This intervention thus had a whole school as well as classroom component (Rebok 2004). McIntyre 1996, using a moderately size CCT in the USA, investigated a comprehensive health promoting programme including heart health, self esteem promotion and stress management which combined classroom teaching with a whole school approach involving parents and including changes to the school environment.

#### ***4.4.4 Programmes focusing on or including parenting support***

Several of the studies already mentioned (Reid 1999 combining with Good Behaviour Game; CPPRG 1999 combining with PATHS; Barrett 2001, McClowry 2005, Weiss 2003, Boyle 1999 Han 2005 combining with a class based curriculum) offered parenting support. Of these Boyle 1999 and CPPRG 1999 sent information to parents but the others all ran group-based parenting programmes. In addition, Catalano 2003 investigated a parenting programme combined with summer camp for children with problems and social skills training in the classroom and McDonald 2006 delivered a structured package to groups of families (parents and children together) after school with no other components. Most of the parenting programmes lasted between five and eight weeks and covered principles of behaviour management and good relationships with children. Five of these studies were RCTs (Reid 1999; CPPRG 1999; Barrett 2001; McClowry 2005; Boyle 1999) and three CCTs (Han 2005; Weiss 2003; McDonald 2006)



In several studies parents were offered payment for participating; in some studies this payment was offered for provision of data in others (McDonald 2006; McClowry 2005; Weiss 2003 ) for attending programmes. In other studies parents were supported in kind, for example by the offer of taxis, child care and snacks to attend the programme (Weiss 2003)

#### ***4.4.5 Whole school approaches***

Five studies evaluated interventions using whole school approaches (Battistich 1996, Hawkins 2005 Haynes 1990, Nelson 1996 and 2002) involving changes to the school ethos/environment. These were very comprehensive programmes developed over one or two years in which much preparation and discussion went on in schools with teachers and administrators. All but one of these interventions (Nelson 1996) also engaged with parents in various ways. Hawkins 2005 and Battistich 1996 by offering parenting support and Haynes 1990 and Nelson 2002 by sending information home to support parenting. All but one (Haynes 1990) included class-based programmes involving both curricular components and classroom management. All these studies were CCTs conducted in the USA, and all but one (Haynes 1990) was at least moderately large.

#### ***4.4.6 Length of study***

Studies varied in length and intensity from programmes offering two or three sessions with some homework (Reynolds 2000) or five sessions in the classroom (Lohaus 2000) to those involving all staff in the school and implemented over a period of two or more years (Battistich 1996, Elias 1991, Nelson 2002)

#### ***4.4.7 Delivery of intervention***

The great majority of programmes were delivered by teachers. In some studies teachers were offered several days training together with supervision and support during implementation (e.g. CPPRG 1999; Hawkins 2005). Four studies investigated interventions delivered by teachers and another professional (usually mental health) (Catalano 2003; Weiss 2003; Reid 1999; Haynes 1990). Six studies were delivered by mental health professionals or graduate students alone (Dubow 1993, McDonald 2006, Reynolds 2000, Lohaus 1987 and 2000, and Henderson 1992). In one study the intervention was delivered by retired volunteers (Rebok 2004) and in one by community workers (Wang 1997) Only one study compared the effectiveness of two different programme deliveries (Barrett 2001).

#### **4.4 8 Interventions combining a universal and targeted approach**

Some interventions combined a universal approach with a targeted approach.

Catalano (2203) included a summer camp for children with problems. Rebok (2004) investigated the impact of volunteers in the classroom who focused much of their attention on children with poor reading and behaviour problems. In the whole school intervention investigated by Haynes (1990) the mental health team were active in supporting children with problems. In Nelson (2002) the parenting programme was only offered to families in which children were experiencing problems. In Weiss (2003) a considerable component of the intervention was targeted on children screened as high risk; these children were offered additional training.

#### **4.5 Intervention Impact**

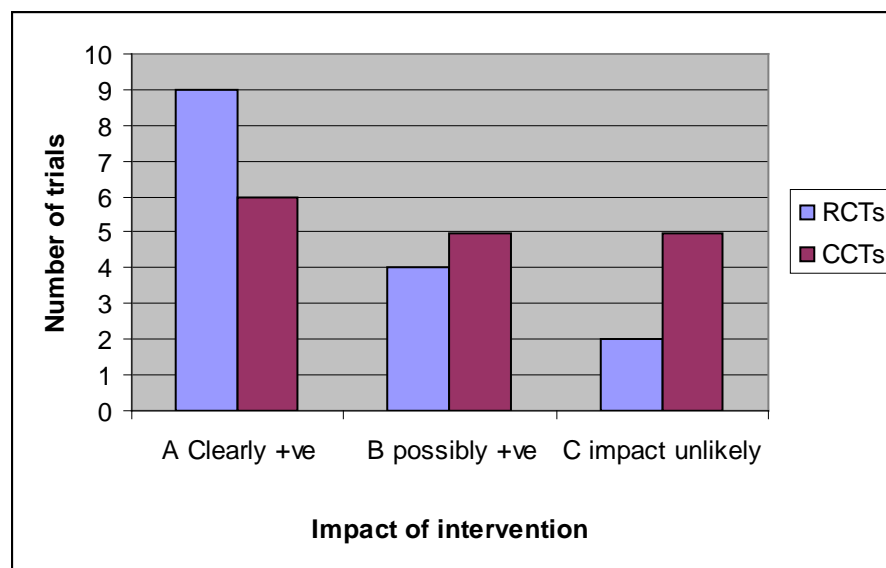
Heterogeneity of interventions and approaches made meta-analysis of results inappropriate. In its place we have attempted a qualitative synthesis looking first at overall impact in different study designs and in studies of different quality and length. Where numbers permitted we have also looked at the impact of studies related to the different types of intervention. In order to compare studies with very different outcomes we have coded impact as shown in Table 4 page 62 below. The distinction between code A and code B is made on the basis of the proportion of the measures on which a significant impact was recorded. If only one outcome was measured and this demonstrated impact the study scored A. If multiple measures were taken and impact was demonstrated on less than half the study scored B. This approach to coding relies on authors reporting all their results in the papers. Studies in which an impact was demonstrated only in one subgroup in post hoc analyses have been coded as showing no overall impact.

No studies scored a D, that is demonstrating an overall adverse effect. Only two studies recorded any side effects and these both demonstrated some overall positive impact on measures of mental health. These studies were Witt 2005 –the German study of Qi Gong in schools - where children in the intervention group reported more nightmares at the beginning of the study and Barrett 2001 who investigated an anxiety prevention programme delivered by teachers and psychologists; this study recorded a possible negative effect on depression in children allocated to class based programme run by teachers as opposed to psychologists, but there was an overall positive effect on anxiety.

#### 4.5.1 Impact of intervention by type of study

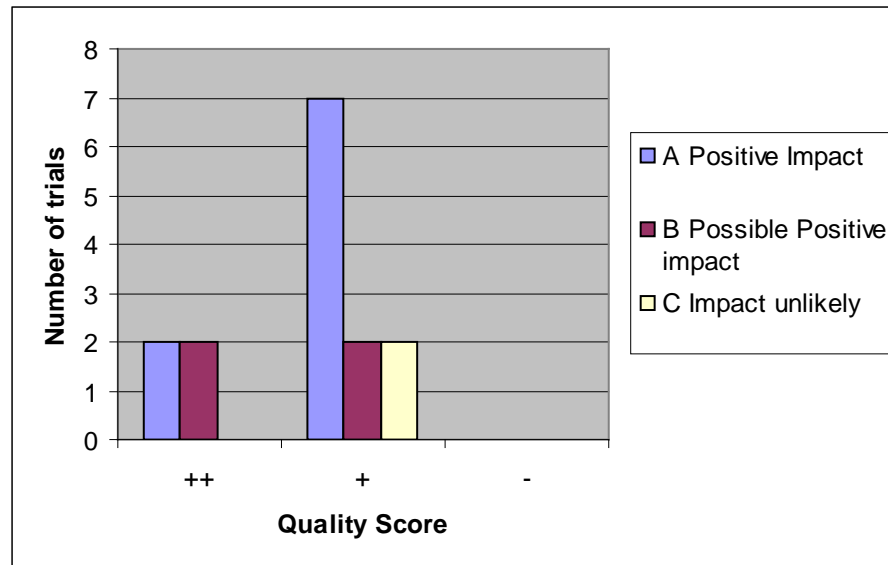
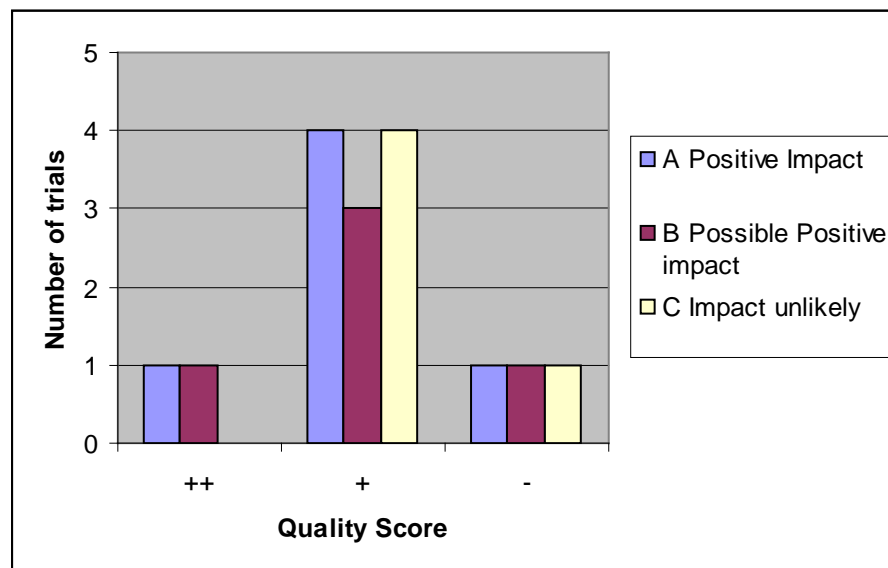
Among the 15 RCTs, nine showed positive impact, four probable impact (Catalano 2003; Greenberg 1995; Rebok 2004; van Lier 2004) and two no likely impact (Kellam 1994; Reynolds 2000). Among the 16 CCTs, six were positive, five probable (Battistich 1996, Han 2005; Nelson 1996 and 2002; Witt 2005) and five unlikely (Lohaus 1997 and 2000, McIntyre 1996; Sawyer 1997; and Wang 1997). These findings are unexpected in the light of experience from trials of clinical interventions where on average impact estimated from controlled trials exceeds that estimated from RCTs.

**Figure 2 Impact RCTs vs CCTs**



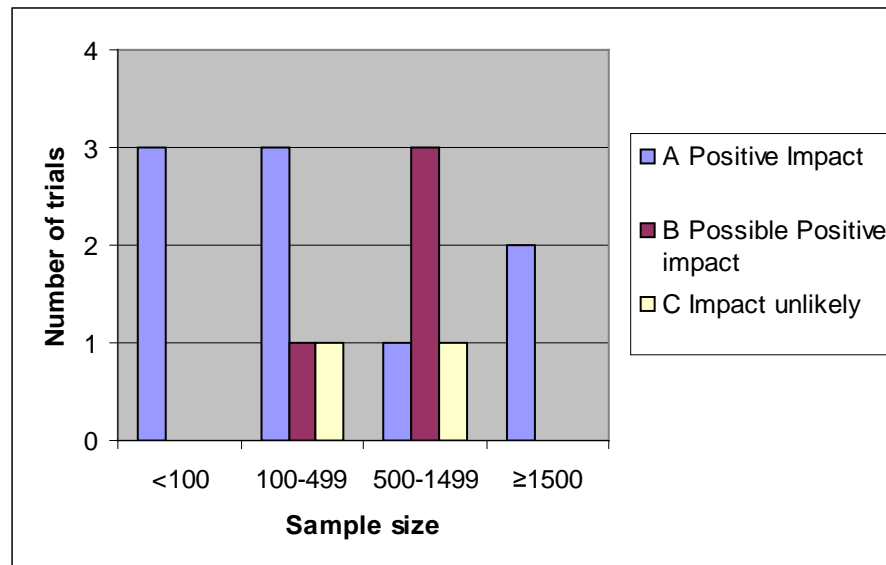
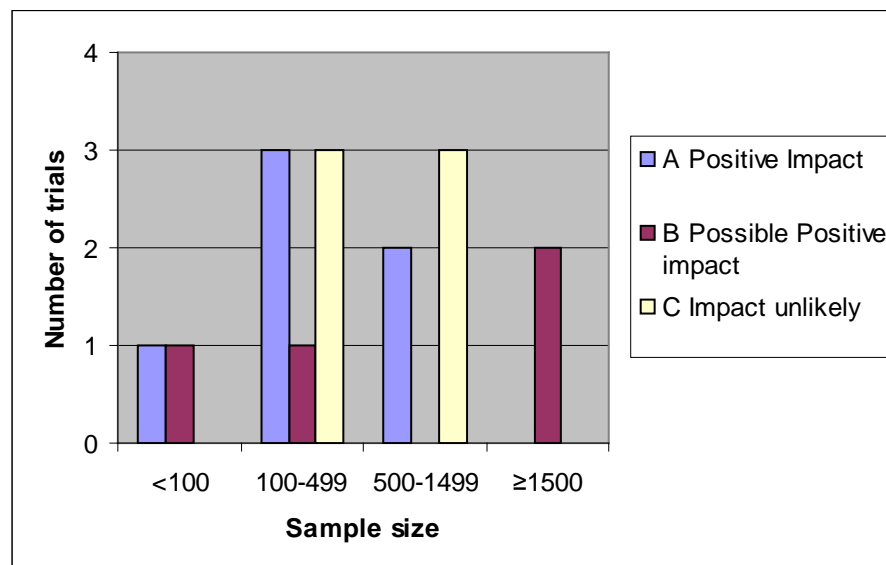
#### 4.5.2 Impact of intervention and quality of study

Figures 3 and 4 illustrate the spread of these results by quality scores within study design. Among the good quality studies impact was probable or likely for all four RCTs and both CCTs. Most of the studies in the moderately good quality RCTs showed positive impact, two probable and two no likely impact. Among the CCTs, four moderate quality studies showed no likely impact but the majority were positive or likely to be positive. There was thus no tendency for poorer quality studies to show more impact. The intensity and sophistication of the interventions studied was not related to the quality of the studies and this unexpected finding could be attributable to the investigation of good quality interventions in poor quality studies and vice versa.

**Figure 3 Impact and quality of study: RCTs****Figure 4 Impact and quality of study Controlled trials**

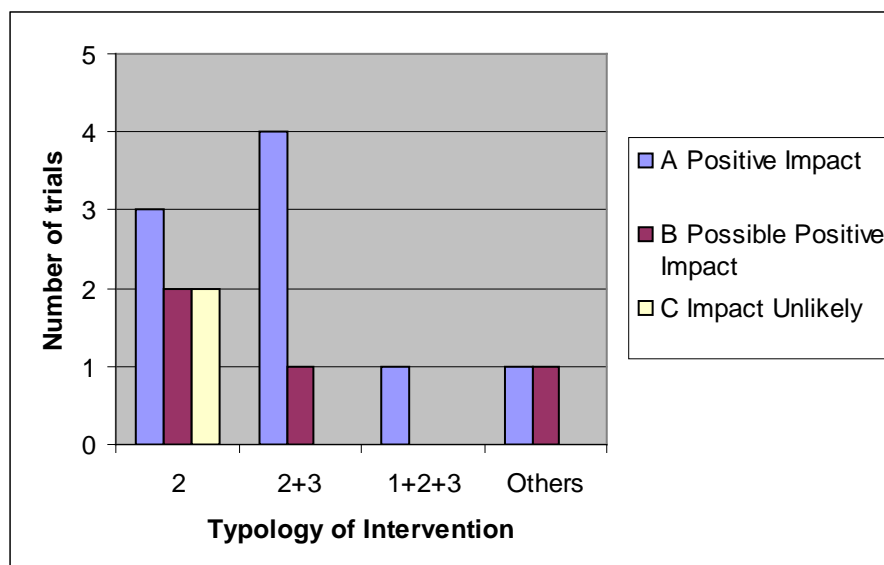
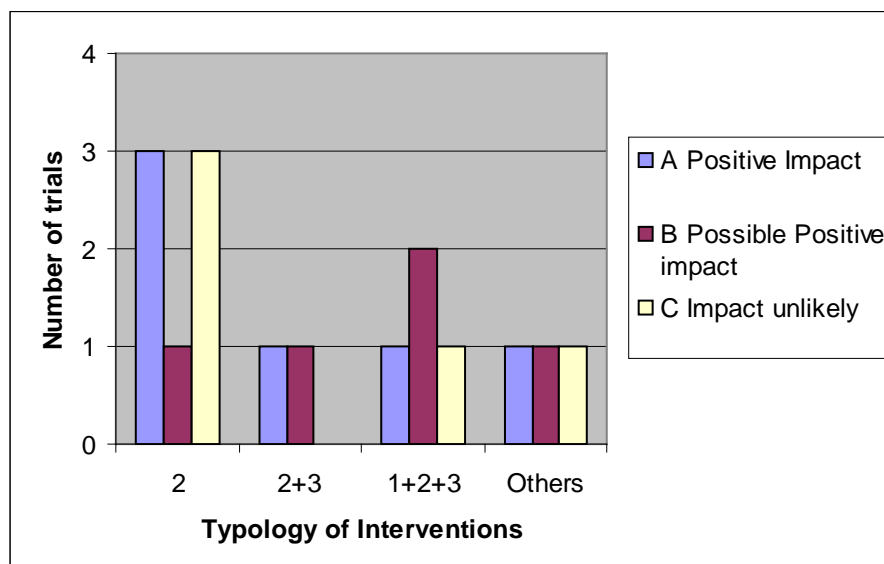
#### ***4.5.3 Impact of intervention and sample size***

Figures 5 and 6 illustrate the relationships between sample size and intervention impact. No clear trends were discernible in these analyses. From a methodological point of view, more impact would be expected from studies with larger sample sizes where type 2 errors were less likely. However from the point of view of implementation of complex multi-component interventions over long periods of time, intervention quality is likely to be easier to ensure in small studies.

**Figure 5 Impact and sample size RCTs****Figure 6 Impact and sample size Controlled trials**

#### ***4.5.4 Impact of intervention by type of intervention***

Figures 7 and 8 illustrate the relationship between intervention content and impact. . Three types of intervention were represented with sufficient frequency to investigate their collective impact. These were interventions limited to the classroom, classroom interventions combined with a component involving parents in some way and interventions which had environmental components (in which some aspect of the school culture ethos or environment was changed) combined with classroom and parent components.

**Figure 7 Impact and Intervention type in RCTs****Figure 8 Impact and Intervention type in controlled trials**

#### ***4.5.4.a Programmes which combined a parenting component with a classroom component (2a+/- 2b with 3a+/-3b)***

The most striking finding in these figures relates to the positive impact of programmes involving both parenting and classroom components (Barrett 2001; Boyle 1999; Catalano 2003; CPPRG 1999; McClowry 2005; Han 2005; Hawkins 2005). Five (4 RCTs and 1 CCT) of these were positive and two (one RCT one CCT) probably positive. Three were high quality (Boyle 1999, CPPRG 1999, Hawkins 2005) and the remainder moderate quality.

None of the studies showed no impact. In all but two of these programmes the component for parents involved some face to face interaction with parents in groups most often for between five and eight sessions. In the other two studies information and activities were sent home to the parents (CPPRG 1999; Boyle 1999). In all but one study (Catalano 2003) the parenting programme was combined with a curricular component. In Catalano 2003 as well as Han 2005 and Hawkins 2005, classroom management was included. All of these parent components aimed to support parenting, some focusing on behaviour management and some on family relationships, but the description of the parent interventions is relatively sparse. None of the studies reported the proportion of parents who attended these sessions, nor the number of sessions attended and in one study (Weiss 2003) the parenting programme was only offered to parents of children who were in difficulty.

The results of four other studies that investigated interventions including a parenting component are described elsewhere. Three of these (Battistich 1996; Nelson 2002; Weiss 2003) are described under health promoting school approaches because they included an environmental component alongside the classroom component and parenting component. One (McDonald 2002) is described under other approaches as the intervention in this study focused on parenting and had no other components. Two of these studies showed impact and two probable impact. Overall therefore, all interventions involving a parenting component showed some evidence of effectiveness.

In three interventions (Weiss 2003; McClowry 2005 and McDonald 2006) parents were paid for attending the sessions.

#### ***4.5.4.b Stand alone Classroom interventions (2a/2b)***

A rather more mixed message emerged with regard to uni-component curricular interventions. Whilst the overall picture was positive with 3 RCTs and 3 CCTs showing positive impact and 2 RCTs and 1 CCT showing probable impact, results of five studies suggested that the interventions were unlikely to be effective.

The most frequent focus of classroom interventions was anxiety, stress and coping. Although there were similar components to some of these interventions none were the same. One feature common to four studies (Lohaus 1997 and 2000; Henderson 1992 and Dubow 1993) was delivery by trained psychologists, rather than teachers and interventions

which were delivered over the course of one school term or less. In one further study a supervisor instructed the class for one term and after that the teacher took over (Witt 2005). All the studies investigating these interventions were of moderate but not strong quality. One very brief intervention (5 sessions of 10 mins) offering relaxation skills (Lohaus 2000) and one short intervention (8 sessions of 90 mins) combining relaxation skills with problem solving (Lohaus 1997) both investigated in CCTs with less well known outcome measures were ineffective. One RCT (Henderson 1992) investigating another short intervention (9 sessions over 4 weeks ) offering Yoga instruction together with time management, handling anger, problem solving, expressing feelings and assertiveness training was effective in improving self concept and coping skills, and 13 sessions of coping skills training in relation to life events was effective in another RCT (Dubow 1993). A longer intervention (20 mins Qi Gong twice weekly for six months) investigated in a CCT (Witt 2005) showed probable impact and a small poor quality CCT (Omizo 1992) gave a positive result for a short (10 sessions of 45 mins) programme focusing on wellness nutrition exercise and stress management).

One anxiety prevention programme which was offered in combination with a parenting component (described above) was shown to have positive impact in an RCT (Barrett 2001). This was a 12 session programme involving cognitive behavioural therapy and relaxation.

There was some tendency for interventions which were evaluated immediately after the end of the programme (Henderson 1992) to show greater impact than those evaluated after a longer interval (Lohaus 1997 and 2000), but the effects of the I Can Do intervention (Dubow 1993) were observed at five months post intervention.

With regard to other types of curricula interventions, two studies focused on conflict resolution and showed positive or probably positive results. Stevahn 2000 examined a conflict resolution programme lasting 9 hours over four weeks with 5-6 year olds in a moderate quality RCT. Johnson 1995 presented results of a series of moderate quality controlled trials of the Peacemakers programme covering 9-15 hrs of teaching relating to communication and interactive bargaining. Both these programmes trained children to be



peer mediators and both were delivered by teachers. Both measured skills development and self concept or self efficacy. Details relating to the training of teachers were sparse.

Three studies examined longer classroom curricula only programmes. Elias 1991 investigated a two year curriculum and reported positive results on behaviour at 6 years in a moderate quality CCT. This programme focused on children in their last two years of elementary school and offered social competence training covering social decision making, problem solving, and social awareness. Teachers were trained to offer formal and informal reinforcement and their performance was monitored in an ongoing way. Greenberg 1995 investigated the impact of the PATHS curriculum (see below) over two terms in a good quality RCT and showed a probable impact on emotional literacy at the end of the school year. On the other hand, Sawyer investigated the Rochester Social Problem Solving programme covering emotional literacy and problem solving (34 lessons over 2 terms) in a moderate quality CCT. Teachers were trained and provided with ongoing support. They reinforced the approaches outside class. Observations were made in class to examine fidelity. Follow up at one year showed no evidence of effect on child behaviour or peer relations. This was an Australian trial and the possibility of cultural differences in acceptability of this American programme need to be considered.

Two studies examined the effectiveness of the Good Behaviour Game. This is an approach to behaviour management (2b) rather than a curriculum. Teachers receive training to offer this programmes which starts as a game which the children play for 10 minutes twice a week. The frequency of playing is increased until the positive approach to interaction between teachers and children is generalised. van Lier 2004 examined the programme delivered over two years in Dutch 6 and 7 year olds. This moderate quality RCT showed a positive effect on one aspect of behaviour (ADH type) symptoms at the end of two years. Kellam 1994 in another moderate quality RCT used the GBG as one of two control arms in a study of the impact of the Mastery of Learning (a reading support programme) on depression and showed no effect after two terms.

The final study in this group was able to show no impact of a low intensity emotional writing programme in a very short moderate quality RCT (Reynold 2000).

#### **4.5.4.c Health Promoting School Interventions (1+2+3)**

The final significant group of studies examined interventions involving three components:-

- changes to the whole school environment, ethos or culture, combined with a classroom and parent component. These are interventions that can be regarded as taking a health promoting school approach. Only one of these interventions was investigated in an RCT (Reid 1999). This intervention included a social skills training programme combined with a modified version of the Good Behaviour Game plus a playground behavioural intervention and a parenting group. The intervention was short involving 20 hours over ten weeks and the 'school' ethos component relatively insignificant. The study was of reasonable quality and moderate size and the intervention was shown to be effective in changing behaviour. The other four HPS approach interventions were more substantial. The Child Development Programme (Battistich 1996) was implemented over three years and focused on building warm stable relationships at school and home and giving attention to social and ethical learning alongside intellectual. There was a community building component to this programme as well. This CCT was of relatively poor quality with only 30% follow up and one outcome focused on delinquent behaviour, but the result suggested probable impact. Nelson 2002 investigated a comprehensive programme implemented over 2 years and focusing on discipline. Conflict resolution skills were taught in the classroom combined with individualised behavioural interventions and a video based family management programme for high risk families and many changes to the school ecology. Although this study also had a high attrition rate, probable positive impact was based on school level statistics which would not have been subject to this bias. Weiss 2003 investigated a programme implemented over one academic year which included a classroom component involving all children, teacher training in behaviour management and a significant targeted programme for children with problems covering coping skills and problem solving. This CCT was small but of reasonable quality and impact was demonstrated on the whole school population. The last health promoting school (intervention (McIntyre 1996 was a comprehensive programme implemented over 3 years covering heart health self esteem and stress with a whole school approach to planning involving parents, planned activities in grades 4,5 and 6, and involvement of the school health service. There was no 'parenting support' component to this intervention. The study was of reasonable size and quality, but there was no effect on mental health outcomes.

#### **4.5.4. d Other approaches**

Further studies investigated a range of other interventions and combinations of interventions. One (Haynes 1990) investigated, in a moderate quality CCT, an intervention which aimed to change the school ethos and environment. It delivered a comprehensive programme of school planning and management involving the schools mental health team and parents, with the aim of improving the school climate and a range of other outcomes. This programme was effective in improving self concept after one year. Nelson 1996 investigated an intervention which involved changes to the school ethos and environment alongside improvements in classroom management practices and individual behaviour programmes for children with problems. This was a moderate quality CCT and there was some evidence of effect on numbers of disciplinary interventions.

A moderate quality RCT investigated the impact of volunteers who worked with children with reading problems and were available to support all children throughout the school in play times and in the library. (Rebok 2000) . This programme showed a possible effect on discipline problems but not self efficacy.

McDonald 2006 investigated an intervention in which parents and children met together after school and family culture was celebrated and parenting support provided. This RCT was of moderate quality because the analyses were confined to one subgroup (Latino children) and the overall results are not presented.

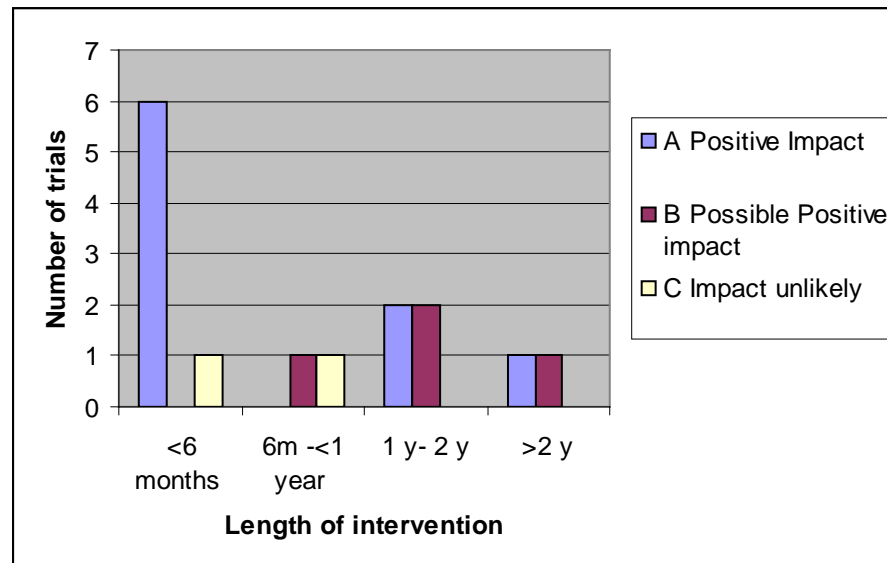
Wang (1997 ) showed no effect on self esteem of a programme in which children were encouraged to undertake community service in a poor quality CCT.

#### **4.5.5 Impact and intervention length**

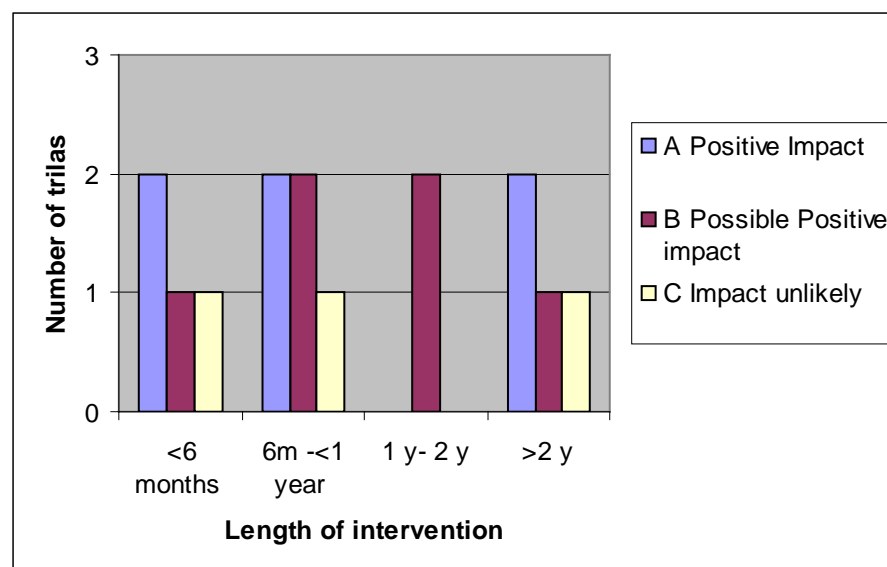
Most of the health promoting school programmes and some of the school social development programmes represented long term investment in contrast to most of the class-based only programmes which were of short duration. It is perhaps not surprising given this association that an analysis of impact relative to length of intervention shows no consistent trends. The largest number of positive trials were of short duration, but this is to be expected as majority of studies focused on such interventions and there were some positive results for studies of all lengths. One comprehensive programme (the LIFT

programme Reid ) was implemented for a relatively short time (10) weeks and still proved effective.

**Figure 9 Impact and intervention length RCTs**



**Figure 10 Impact and intervention length Controlled trials**



#### **4.5.6 Impact and person delivering**

We aimed to investigate the relative merits of programmes offered by teachers in comparison to those offered by outsiders. The great majority of interventions were offered by teachers. Six were offered by outsiders (Dubow 1993, McDonald 2006, Reynolds 2000).

Lohaus 1997 and 2000, Henderson 1992); these outsiders were mostly mental health professionals; in one study outsiders were described as ‘graduates. Half of these studies showed positive impact and half no impact. In four studies (Catalano 2003, Weiss 2003, Reid 1999 and Haynes 1990) specialists or professionals worked alongside parents to deliver the programme. Three of these studies were positive and one probably positive. Only one study aimed to compare the performance of teachers and outsiders (Barrett 2001). Both were effective in reducing anxiety, but depression scores increased in the teacher group suggesting a possible non-clinical level adverse effect.

A small number of other studies referred to above involved other outsiders eg volunteers, community workers. The small number of these studies makes it difficult to comment on the effectiveness of different deliverers, but the volunteer programme (Rebok 2004) warrants repetition.

#### ***4.5.7 Intervention impact by age gender ethnic group and social circumstances***

Very few studies investigated differential effects by gender. Results do not allow conclusions to be drawn. Whilst several of the studies were set in schools with high proportions of minority ethnic children (Afro-Caribbean and Latino) and others in high crime or poor neighbourhoods these studies do not allow differential effects by ethnic or social group to be identified. Several interventions were restricted to specific age groups. Studies of the Good Behaviour Game were restricted to first and second graders, and studies of school transitions programmes to the last two years at elementary school these studies do not permit comparison of effects by age.

#### ***4.5.8 Impact of interventions in which universal and targeted components were combined.***

Two of the five studies examining interventions which combined universal and targeted approaches were RCTs one (Catalano 2003) of good quality, the other of moderate quality (Rebok 2004). One of the CCTs was of good quality (Nelson 2002) and the others (Hanes 1990, Weiss 2003) of moderate quality. Two showed positive impact (Haynes 1990, Weiss 2003) and the remainder probable positive impact. Whilst suggesting that this combination

is effective, these studies do not make comparisons and do not allow statements to be made about whether the combination is more effective than either component alone.

#### **4.5.9 Good quality studies of effective interventions**

The wide range of heterogeneous interventions combined with the variable quality of studies and the inappropriateness of quantitative synthesis make it possible to identify clear pointers to effectiveness but difficult to reach crisp conclusions about effectiveness from this range of studies. In this situation it is appropriate to examine the good quality studies focusing on those which have reported positive results and therefore provide a reasonable degree of certainty relating to impact.

There were three good quality studies all involving over a1000 children - which showed a clear impact. One RCT (Boyle1999 – the Tri-Ministry Study) offered social skills training to the children and updates and tips to parents in a two year programme. Teachers underwent significant training with ongoing supervision and support. This study showed a positive impact on antisocial behaviour and social skills with effect sizes ranging from 0.15-0.30. In another RCT the CPPRG investigated PATHS, an intensive intervention involving 57 lessons covering emotional literacy, problem solving, social competence and peer relation. Teachers receive a 2-5 day training and ongoing weekly support. Their performance in class was monitored once a week to ensure programme fidelity. They were trained to deliver the curriculum but also to model pro social behaviour, self control and problem solving. Parents received updates and tips on behaviour management and supporting their children's development. Results were demonstrated on observational measures of children's behaviour. In the third study which began as an RCT but lost the random element for all students at a later date and so has been classified as a CCT, Hawkins 2005 investigated the impact of the Seattle Social Development Project. This was a programme with a significant 'educational' component which involved proactive classroom management, a social skills curriculum and parenting support. Children who had received the programme for a total of four years showed positive benefit when assessed at long term follow up (21 years) covering social functioning, emotional and mental health and crime involvement.

Two further good quality studies showed probable effects. Greenberg 1995 also investigated PATHS, but in this study there was no parent component. The 60 lessons were offered over 9 weeks. This was a relatively small RCT and investigated impact only on emotional literacy many but not all aspects of which improved significantly. Nelson 2002 investigated a health promoting school programme (described above) in a good quality CCT and also showed a probable positive result with an impact on school level referrals for discipline problems.

These results give confidence that comprehensive mental health programmes implemented over a significant period of time in which teachers receive significant training and ongoing support, parents receive support for parenting and students receive support for the development of the sort of skills necessary for mental health are effective.

There were no good quality [++] RCTs or CCTs of clearly ineffective interventions.

#### **4.6. Applicability**

All trials but one (McDonald 2006 scored D) scored B on applicability score that shows there is a need for adapting to UK cultural and demographic settings.

#### **4.7. Size of effects in positive trials**

Overall effect sizes were calculated for only four of the studies, one good quality RCT:- 0.15 and 0.30 (Boyle 1999); two moderate quality RCTs:- 0.37 (McClowry 2005) and 0.25 (McDonald 2006); and one moderate quality CCT:- 0.27 and 0.18 (Witt 2005) suggesting small to medium effects on mental health.

## 5. DISCUSSION

This review searched for studies from 1990 onwards and does not include studies published before that date. A small number of studies, however, reported long term follow up or more detailed analyses of interventions whose original impact was reported before 1990. These have been included.

Whilst the electronic searches were comprehensive, a large proportion of papers – 7 out of the 31 included trials were identified from lists of references in other reviews and from personal communication. This points to the relative inadequacy of electronic databases and of the database coding of school mental health promotion studies. This is a common problem in public health systematic reviews. Much attention has been paid over the last 20 years to the proper coding of clinical RCTs on electronic databases, but public health and educational databases lag somewhat behind. The possibility of missing studies needs to be born in mind in assessing the results of this review. There is also a possibility of publication bias with researchers undertaking studies showing no impact failing to report their findings.

During consultation period on the initial draft of this report we were notified of several further studies which might be relevant. Most of these turned out to have been identified and excluded because they did not meet the inclusion criteria, most commonly because they were targeted interventions or the children were out of the included age range. Studies of two interventions, however, deserve mention. These were trials of the PENN Resiliency Programme (PRP) (Gillham and Reivich 1999) and the FRIENDS programme (Lowry-Webster 2001 and 2003), see Appendix 6&7 . Both of these programmes are currently being trialled in Europe, one in the UK. Both have targeted as well as universal applications, but reasonable quality trials of their universal application exist. They had been excluded from our searches because they were carried out in middle schools and were therefore regarded as out of range. Whilst none of the studies gave a mean age or reported the proportion of children aged 12 years and under, we gained the impression that the majority of children in these trials were aged over 12 years and should therefore be included in future companion reviews covering programmes for older children. Both were classroom only programmes offering cognitive behavioural approaches to the prevention of anxiety and depression. Although the latter approach was common among studies included in the companion review of targeted approaches (Review 2), only one study (Barrett 2001)



in this review included cognitive behavioural approaches. The latter also included relaxation exercises and parenting support, so was not strictly comparable. Both these programmes showed some promise in the prevention of anxiety and depression.

## **5.1 Focus of interventions and outcomes measured**

We identified studies of wide range of interventions relevant both to the prevention of mental health problems and the promotion of wellbeing. Whilst the predominant focus of these studies was the prevention of antisocial behaviour, the interventions aimed to promote a range of the aspects of positive mental health and wellbeing identified in the background to this report including aspects of psychological wellbeing (self efficacy, locus of control), confidence (self concept, self esteem) emotional wellbeing (anxiety stress and depression, coping skills) and social wellbeing (good relations with others, emotional literacy, antisocial and prosocial behaviour, social skills). Interventions also addressed one of the important risk and resilience factors for mental health – parenting and parent child relations. Interventions to prevent another key risk factor – bullying are being assessed in a companion review.

Within this context however, it should be noted that most of the studies focused on the outcome of antisocial behaviour. This is a key mental health outcome for children, schools and society. It is, however, a measure of negative mental health. Only a minority of studies measure positive outcomes and even the content of some apparently positive measures (e.g. SSRS and some measures of peer relationships) have a significantly negative orientation. Most studies that did include positive measures focused on self concept, self efficacy and self esteem. Some key components of positive mental health outlined in the background to this report were not addressed in any studies. Indeed the good behaviour required to score high on measures like the CBCL may imply a lack of development of some aspects of mental wellbeing for example autonomy.

Some programmes were evaluated with different measures in different studies. For example the Good Behaviour Game was probably effective using measures of behaviour, but not using measures of depression. This is perhaps not surprising since antisocial behaviour rather than depressions is the clear goal of this intervention. The PATHS curriculum, on the other hand, is seen as an intervention to promote positive mental health

particularly emotional literacy. The study of the PATHS programme combined with an intervention for parents which focused on antisocial behaviour demonstrated effectiveness, whereas the results of that focusing on emotional literacy in which there was no parenting component were more equivocal. This may be related to the robustness of the measures or the effectiveness of the interventions.

It is important to develop greater understanding of which programmes are effective in promoting which aspects of mental wellbeing and to ensure that the development of some aspects is not compromised in the goal of preventing antisocial behaviour. There is room for the use (and possibly development) of measures of mental health in childhood which focus on the positive and cover a broader range of components.

## **5.2 Content of interventions**

The studies in this review covered a very wide range of interventions and programmes and it has not been possible to study the interventions in great detail. The more successful multi-component programmes, interventions involving whole school approaches and the various parenting programmes have been developed over the course of many years on the basis of iterative research relating to process and content as well as delivery. Reviews of this research would optimise the chances of successful implementation of such programmes in the UK,. Whilst this is true of programme descriptions in general there was, in particular, not enough description of the content and approaches to teacher training, parenting programmes or peer mentoring to be sure what went on. Weare and Gray 2003 have identified the development of teacher's emotional and social skills and their own mental wellbeing as important components of successful programmes. None of the studies measured these outcomes and it is not possible from the description of studies to know whether such effects are likely. A few studies reported on aspects barriers or facilitators to intervention, but this process evaluation may have been reported in non trial studies. Such process information is important for proper evaluation of programmes and may account for some of the differences in findings between studies – for example those focusing on social skills development.

### **5.3 Assessment of impact**

We developed a simple qualitative scoring system for assessing impact. Quantitative meta-analyses have been undertaken in trials of school mental health promotion programmes but such analyses would have violated rules regarding heterogeneity in this review. The coding system worked reasonably well but is subject to some anomalies. Complex long term health promoting schools approaches to mental health promotion have the potential to influence a wide range of mental health outcomes and warrant multiple outcome measures. Some such studies have only reported a single outcome. If this was negative the study impact has been coded as negative, if positive as showing definite impact. Other studies have used a range of outcome measures, assessing several aspects of mental health which might possibly be affected by the intervention. With multi-component interventions single or 'primary' outcomes may not be appropriate (some children may become less anxious others better at problem solving), but the more results reported the more likely studies are to report some negative findings and so to be coded as possibly effective rather than effective. In some studies coded like this the outcomes which were positive may have been the most important, in others the least. However multiple testing increases the possibility of chance findings and needs to be taken into account in assessing study results. It is also important to note that for the purpose of this review we have extracted data from the studies relating to mental health. Some of the included studies have assessed outcomes such as drug and alcohol misuse, violence, and educational achievement. Studies using the former outcomes are the subject of separate reviews and studies using the latter, whilst highly relevant to schools, have been excluded because it is not an indicator of mental health.

### **5.4 Assessment of Study Quality**

The study quality scoring system we have used is more basic than that applied to clinical trials, but there are good reasons for this. Some of the criteria which need to be applied to clinical trials cannot be applied in the public health situation. For example participants cannot be blind to the intervention and it is rare for assessors to be able to be 'blind'. Most outcomes are reported by parents, teachers or children all of whom know whether or not children are in an intervention arm. Even outside observers assessing children's behaviour in schools are likely to be able to spot the signs of 'intervention' in schools. Scores relating

to cluster design and analysis are rarely relevant to clinical trials but are of importance in school health promotion trials. The movement of children between classes and schools as occurs in the real world interferes with follow up and creates unavoidable contamination and makes intention to treat analyses more difficult to take into account. The carrying out of good quality RCTs in this field is therefore much more of a challenge than for RCTs of clinical interventions.

Perhaps for this reason it is striking that only one of the studies investigating a health promoting school approach to mental health promotion (one involving changes to the school environment and involvement of parents as well as classroom changes ) was evaluated in an RCT. This was unusual in being a relatively brief intervention. The more typical health promoting school approach programmes involving significant teacher training, and change in school ethos and culture were all evaluated in CCTs and few of these were of good quality. Health promoting school approaches should involve the active participation of the school and ideally schools should develop a feeling of ownership of the programme ensuring long term commitment. This is difficult to achieve when schools are randomly allocated to control and intervention especially if a 'waiting list' design is not available because of the length of the intervention and study. The majority of good quality RCTs investigated relatively brief classroom only interventions which lend themselves more easily to this design. It may be that the level of evidence required of clinical interventions cannot be achieved with the most complex and potentially effective public health interventions.

## **5.5 What works?**

Some investigators had managed to undertake high quality RCTs and from these studies it is possible to have a high degree of confidence that some universal school mental health promotion programmes do work among primary school children. The programmes whose effect was demonstrated in these trials vary but adopt common principles. Although much important detail is lacking from reports of these studies, the teachers are clearly well trained and supervised. They are usually trained both in the new curriculum to be offered and in behaviour management. Their teaching is observed and ongoing training and support is on offer. Children receive a comprehensive curriculum in the development of skills which enable resilience to mental health problems including social skills, emotional literacy and problem solving. The best known of these programmes is the US developed

PATHS curriculum, the others investigated were the Seattle Social Development Project from the US and the Tri Ministry Study from Canada. The PATHS programme is known in the UK and has been implemented in a number of schools in Flintshire.

The other key finding in this review related to studies involving parenting support. All studies which included a parenting component, most, but not all of which also included a classroom curricular programme, showed positive impact or were probably positive. It is possible to recommend on the basis of these studies that school mental health promotion programmes should include a component which aims to support parenting. The aspects of support for parenting go beyond some of the interventions common in British schools which aim to engage parents in supporting the development of their children's academic skills – literacy and numeracy – and increase parental involvement in and support for school life. These are laudable goals but not ones which have been shown to promote mental health in this review. Those which had positive impact in this review, usually in combination with a classroom component, included behaviour management and relationship building strategies. Although the description of the parenting component of these interventions was often inadequately described, what was said accorded with what is known in the UK with regard to the components of parenting interventions which are likely to be effective (Hutchings 2004) some of which are currently being trialled in schools in the Pathfinders Early Intervention Pilot.

Whilst evidence is best for comprehensive interventions, some of the short-term approaches warrant further investigation. In this respect the programmes focusing on anxiety prevention and coping with stress are interesting. There is some evidence to suggest that all three approaches cognitive, behavioural and affective are useful and that these approaches can be combined. In particular trials of relaxation training including Qi Gong and Yoga would be relatively inexpensive to carry out and the interventions are relatively inexpensive to implement. These approaches warrant investigating in UK based RCTs in the near future. It is interesting to note that trials of this type of intervention were common in Europe where there have in general been few studies of mental health promotion in schools. The overwhelming majority of studies have been carried out in the USA with a small number from Australia and Canada and Europe. Given cultural

differences between these countries and the sensitivity of mental health to cultural norms it is important that trials are set up and run in the UK.

The studies investigating programmes which adopted a health promoting school approach suggested as have other studies that this is a good approach but fall short of demonstrating greater effect than other approaches. The 'quality' of studies in this area is constrained by the nature of the interventions which do not lend themselves to the RCT approach. One study investigated changes to the school environment without changes to the curriculum and community components and this study also gave encouraging but not definitive results.

## **5.6 Implications for Policy**

The results of this review broadly support current policy development in the UK. They provide the evidence base for primary SEAL which offers curriculum work organised into themes relevant to the promotion of emotional and social wellbeing within a whole school framework (see page 30). The results are also supportive of the adoption of a health promoting schools approach to health promotion. Review findings however suggest that these programmes would be enhanced by the provision of support for parenting. Whilst targeted approaches to parenting support are now being trialled in English schools in the context of the Pathfinders Early Intervention Parenting project and the Parent Support Advisors initiative, few schools are offering universal support for parenting. It is also apparent that the extent of teacher training and support described in the successful programmes exceeds that currently available in the implementation of the SEAL programme.

## **5.7 Areas where insufficient evidence was identified**

This review did not find sufficient evidence to compare the effectiveness of teachers with outsiders in delivering mental health promotion in schools. The one study which assessed this found no difference between the two. In practical terms the long term interventions that we have identified as most likely to be effective have to be delivered by classroom teachers. The review was also unable to provide evidence to assess the relative impact of combined targeted and universal approaches, nor the extent to which one or other

component should dominate. It did however find evidence that combined approaches are successful. It was also not possible to assess the age at which programmes are most successful. Studies were carried out in all age groups. The two interventions focusing on the youngest children 4-5 years both had a significant parenting component. There was no evidence to suggest that these universal interventions would should be targeted at specific ethnic or social groups or children of different genders.

The results of this review, which covers similar but not identical literature, are consistent with many of the findings of previous reviews. These recommended parental involvement and parenting support. They have also recommended the adoption of class-based social and emotional development programmes and suggested that these could be combined with relaxation programmes to combat stress. While this review cannot substantiate claims that long term programmes are more likely to be effective than short term ones, the most robust evidence of effectiveness came from studies of programmes lasting a year or more.

## 5.8 Evidence statement

There is good evidence to support the implementation of multi-component programmes which include significant teacher training and development and support for parenting. Most of these programmes have been researched and developed in the US and may need adapting for the UK use. Interventions with similar characteristics are available in the UK but have not been the subject of robust trials. While the majority of these programmes were implemented over a year or more, further research is needed to establish the optimum content and length as well as the appropriate level of teacher training and support and support for parenting.

Boyle (1999) RCT++

CPPRG (1999) RCT++

Barrett (2001) RCT+

McClowry (2005) RCT+

McDonald (2006) RCT+

Reid (1999) RCT+

Han 2005 CCT+

Weiss 2003 CCT+

2. There is some evidence that short term stress and coping programmes delivered by psychologists are effective in the short term. Effectiveness may be enhanced by addition of a programme for parents. More evidence is needed on sustainability and effectiveness of psychologists versus teachers in providing such interventions.

Henderson (1992) RCT+

Dubow (1993) RCT+

Witt (2005) CCT+

Omizo (1992) CCT-

3 There is reasonable quality evidence that short term conflict resolution programmes delivered by teachers and involving peer mediation are effective in the short term



Stevahn (2000) RCT+  
Johnson (1995) CCT-

4. There is reasonable quality evidence that long term programmes covering social problem solving, social awareness and emotional literacy, in which teachers reinforce the classroom curriculum in all interactions with children are effective in the long term even when delivered alone.

Greenberg (1995) RCT++  
Elias (1991) CCT+

5. There is some evidence that the Good Behaviour Game programme implemented over a year is effective in reducing problem behaviour but not depression

van Lier (2004) RCT+  
Kellam (1994) RCT-

6. There is evidence to support further trials of programmes in which retired volunteers are recruited to help in schools

Rebok (2004) RCT+

7. No evidence of effectiveness in improving mental health was identified for the “Mastery of Learning” programme, “Emotional Writing” or involvement in “Community Service” when used alone in improving mental health.

Kellam (1994) RCT-  
Reynolds (2000) RCT+

Wang (1997) CCT-

8. The evidence relating to the mental health promoting effect of programmes combining heart health and mental health is equivocal

McIntyre (1996) CCT+

9 .There was insufficient evidence to make recommendations relating to the optimum balance of universal and targeted approaches, but there was some evidence that the combination may be effective.

Catalano (2003) RCT ++

Rebok (2004) RCT+

Nelson (2002) RCT++

Haynes (1990) CCT+

Weiss (2003) CCT+

10. There is no trials identified in this systematic review to show differential effects according to age, gender, ethnic or social groups.

## 5.9 Recommendations for research

- There is a need for further secondary research on the content and process of delivery of the interventions which can be recommended for implementation as a result of findings in this review (including the content and approach to teacher training and parenting support, barriers and facilitators to implementation), to ensure that they are effective in roll out.
- Primary research should be undertaken to assess the optimum length of programmes
- Research should be undertaken to assess the cross cultural applicability of recommended programmes
- Primary research should be undertaken on brief programmes to develop coping skills and reduce stress and anxiety. These should include long term follow up, investigation of the relative effectiveness of delivery by teachers and others and a wider range of outcomes
- Primary research is needed on other short term class-based programmes (eg conflict resolution) to assess long term effectiveness
- Good quality CCTs of programmes adopting a health promoting school approach to mental health promotion should be undertaken in the UK using a range of robust outcome measures positive as well as negative and measuring long term impact.
- Research should be undertaken to define the most effective combination of targeted and universal approaches
- There is a need for further secondary research to update reviews of measures of child mental health and primary research to develop measures which fill gaps in availability.

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## 7. APPENDICES

## Appendix 1 Results &amp; details of the included trials

Table 11 RCTs findings

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length and duration of intervention/ Follow up	Comments / Methodology / Barriers or facilitators reported/ Applicability to UK- context (a, b, c, d) see Table 4
<p>Barrett 2001</p> <p><b>Design:</b> RCT</p> <p><b>Objective(s):</b> effectiveness of prevention of anxiety symptoms</p> <p><b>Setting:</b> primary schools</p> <p><b>Country of trial:</b> Australia</p> <p><b>Sample size</b> n=489 children in 10 schools</p> <p><b>Quality grading +</b></p>	Primary school children	<p>Two interventions to prevent anxiety symptoms: 12 sessions of cognitive behavioural intervention including relaxation skills.</p> <p><b>Who deliver(s):</b> either by</p> <ul style="list-style-type: none"> <li>-Psychologist-led or</li> <li>-Teacher-led</li> </ul> <p>Compared to standard curriculum</p> <p>Four Psychoeducational evening group sessions for parents re programme and parenting</p>	Usual care (standard curriculum)	<p>-Spence Children anxiety scale (SCAC) Child report</p> <p>-RCMAS Child report</p> <p>-CDI Child report</p> <p>Cluster design not taken into account</p> <p><b>Finding:</b></p> <ul style="list-style-type: none"> <li>-Significant decrease in anxiety on both scales and in both conditions compared to the standard curriculum.</li> <li>-No significant difference between the psychologist lead and teacher lead intervention on anxiety scales</li> <li>-Significant main effect for gender . Girls reported higher levels of anxious symptomatology than boys at pre and post intervention.</li> </ul> <p><b>Reported adverse effects:</b></p> <p>Significant deterioration in CDI scores in teacher led compared to control and</p>	<p>10 weeks</p> <p>Each session lasts 75 minutes</p> <p>Two booster sessions at 1 and 3 months after the final session.</p> <p>Follow up not reported</p>	<p>Significant decrease in anxiety compared to the standard curriculum in both psychologist led and teacher led intervention .</p> <p>But potential negative effect on depression in teacher led</p> <p><b>Barriers/facilitators:</b></p> <p>All teachers who were group leaders took one day off for training</p> <p><b>Applicability (b)</b></p> <p>Anglo-Saxon children who have dual parents (75%) as the participants in this study</p>

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length and duration of intervention/ Follow up	Comments / Methodology / Barriers or facilitators reported/ Applicability to UK- context (a, b, c, d) see Table 4
				psychologist led		
<p>Boyle 1999</p> <p><b>Design:</b> RCT</p> <p><b>Objective(s):</b> Evaluating three universal programmes, Social skills, partner reading programme and a combination of both.</p> <p><b>Setting:</b> Primary schools</p> <p><b>Country of trial:</b> Canada</p> <p><b>Sample size</b> n=60 primary schools with 2439 children</p> <p><b>Quality grading ++</b></p>	Primary school children	<p><i>Both</i> -Class wide Social skills (SS) and Partner Reading Programme (RE) to reduce and prevent behavioural maladjustment among children</p> <p>Conditions SS , RE, SS+RE,</p> <p>Parents sent updates on programme and tips on parenting – eg praise</p>	<p>Two active controls</p> <p>- (SS)</p> <p>- (RE)</p>	<p>-Annual survey of teachers and principals</p> <p>-Screening to classify children at risk for emotional or behavioural problems Ontario Child Health Study (OCHS-R)</p> <p>Outcomes assessed</p> <p>Wider range Achievement Test (WRAT),</p> <p>(CISSAR) for observations of classroom and playground behaviour,</p> <p>(SSRS) for social skills</p> <p>Externalising problems – 35 item scale designed to identify DSM III-R disorders</p>	<p>The maximum Length (pre-to post intervention was ) was 3.5 years</p>	<p>Social Skills intervention effective and appeared more effective when offered alone than when combined with Partner Reading</p> <p>Multilevel modelling taken cluster design into account</p> <p><b>Barriers/facilitators:</b></p> <p>Facilitators to coach teachers and to assist in the implementation of both programme from staff in special education, psychology, childrens mental health agencies.</p>

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length and duration of intervention/ Follow up	Comments / Methodology / Barriers or facilitators reported/ Applicability to UK- context (a, b, c, d) see Table 4
		<p>Unit of allocation = THE SCHOOL.</p> <p>SS: Children received classwide social skills program, which teaches 22 skills to children in grades 1-3, and 5 social skills to kindergarten children. Social skills taught using modelling, practice, &amp; feedback</p> <p>Random allocation of 1 or 2 schools in each school board to implement intervention(s)</p> <p>RE: Children received 'Connections' = a classwide partner reading program, which consists of a universal program divided into 2 cycles, one lasts 12</p>		<p>Analyses not intention to treat.</p> <p><b>Findings</b></p> <p>Obs of prosocial behaviour in playground sign improved in both intervention groups compared to control.</p> <p>Obs of classroom behaviour worsened in all conditions except SS alone where sign improvement</p> <p>Teacher rating of externalising problems – no sig difference</p> <p>Parent rating of externalising problems improved in all conditions and sign greater in SS alone</p> <p>Some evidence of reduction but not significant difference in teacher &amp; parent rated social skills in SS &amp; RE and in SS alone.</p> <p>Effect sizes 0.15 to 0.30</p>		<p><b>Applicability (b)</b></p> <p>Adherence to program implementation guidelines monitored by teacher- and facilitator- completed checklists</p> <p>NO attempts made to restrict comparison schools from offering reading/social skills programmes other than those under investigation</p>

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length and duration of intervention/ Follow up	Comments / Methodology / Barriers or facilitators reported/ Applicability to UK- context (a, b, c, d) see Table 4
		weeks, the other 8 weeks. Involves partner reading between students at school and between family members at home. Purpose is to provide meaningful experiences with stories and to support reading strategies developed at school				
<p>Catalano 2003</p> <p><b>Design:</b> RCT</p> <p><b>Objective(s):</b> effectiveness of (RHC)</p> <p><b>Setting:</b> Elementary schools</p> <p><b>Country of trial:</b> USA</p> <p><b>Sample size</b> n=938 children in 10 elementary schools</p> <p><b>Quality grading</b> ++</p>	Elementary schools	<p>Raising Healthy Children programme (RHC) focused on classroom management parenting programme and summer camp for students with problems</p> <p><b>Delivery by:</b></p> <p>Classroom teachers, specialists with experience in providing services to parents and families</p>	No intervention control	<p>Teachers, parent and child reports on child social competency skills and antisocial behaviour</p> <p>Antisocial behaviour scale: items taken from CBCL and TOCA.</p> <p>Cluster design not taken into account</p> <p><b>Findings</b></p> <p>-Significant increase in social competence on teacher report</p> <p>-significant decrease in antisocial behaviour on teacher report</p>	<p>18 months length of intervention, data were collected four times during this period</p>	<p>-Teacher report on unvalidated scales suggest programme effective in school but not at home</p> <p>Nb targeted component alongside universal</p> <p><b>Barriers/facilitators</b></p> <p>\$10.00 incentive for parents and teachers were compensated by hourly rate for completion the survey</p> <p><b>Applicability (b)</b></p>



Study details/ Quality grading (++, ++, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length and duration of intervention/ Follow up	Comments / Methodology / Barriers or facilitators reported/ Applicability to UK- context (a, b, c, d) see Table 4
				<p>No differences on parent report and child report</p> <p>Significantly higher increase in prosocial skills in female compared to males. Antisocial behaviour did not differ across gender.</p>		
<p>CPPRG 1999</p> <p><b>Design:</b> RCT</p> <p><b>Objective(s):</b> The effectiveness of fast Track PATH curriculum</p> <p><b>Setting:</b> Primary schools</p> <p><b>Country of trial:</b> USA</p> <p><b>Sample size</b> n=7560 children from 378 classrooms</p> <p><b>Quality grading</b> ++</p>	Primary school children	<p>57 lessons of Fast Track Promoting alternative Thinking Strategies (PATH) curriculum that include social competence intervention on self control, emotional awareness, peer relations and problem solving.</p> <p>Teachers encouraged to generalising of approaches across school day</p> <p>Parents sent updates and suggestions for ways to promote social competence</p>	No intervention control	<p>-Teacher report using TOCA-R and Social Health Profile and Sociometric assessment</p> <p><b>Findings</b></p> <p>- Observer ratings of peer aggression, peer hyperactivity and peer social status; plus quality of classroom atmosphere</p> <p>Peer report of likeability, prosocial behaviour, hyperactive disruptive behavioural and aggression.</p> <p>Sociometric assessment: Intervention effect sign on</p>	<p>113 teachers used PATH for 1 year, 47 for 2 years and 54 for 3 years.</p> <p>.</p>	<p>Significant effects of intervention as assessed by both peers and observers.</p> <p>This is the largest sample size trial. Analyses take cluster design into account</p> <p><b>Barriers/facilitators</b></p> <p>2.5 day training workshop and received weekly consultation</p> <p><b>Applicability (b)</b></p>

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length and duration of intervention/ Follow up	Comments / Methodology / Barriers or facilitators reported/ Applicability to UK- context (a, b, c, d) see Table 4
				aggression (0.03) hyperactive disruptive (0.02), but not on prosocial behaviour  Teacher ratings of behaviour not significant  Observer ratings favoured intervention group on all measures and 4/10 ratings sign different  The analysis used the classroom rather than the student as a unit of analysis		
Dubow 1993 <b>Design:</b> RCT <b>Objective(s):</b> effectiveness of coping skills prevention <b>Setting:</b> primary school children <b>Country of trial:</b> USA <b>Sample size</b> n= 88 school children <b>Quality grading</b> +	Primary school children	Immediate intervention group :  I CAN DO programme of 13 sessions on school based primary prevention programme to teach children coping skills.  <b>Delivered by:</b>  graduate psychologists, supervised by author  Children learn to	Delayed intervention group	All child report measures Developed for programme -Facts/attitudes related to stressors  -Self efficacy (items by Wheeler and Ladd)  -Problem solving (P-S Composite)  Social support network size  Analysis does not take cluster design into account  <b>Findings:</b>	13 session programme in the fall, 45 min per session  Follow up testing was 5 months	Program showed greater improvement in ability to form effective solutions to stressful situations compared with those not receiving program.  No effect on knowledge or facts about the stressors or size of children's support network.  <b>Barriers/facilitators</b>  Close working relationship with the classroom teachers was the key for success of the programme  <b>Applicability (b)</b>

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length and duration of intervention/ Follow up	Comments / Methodology / Barriers or facilitators reported/ Applicability to UK- context (a, b, c, d) see Table 4
		practice skills in relation to 5 different life events: parents divorce/separation, loss of loved one, move home or school, spending time without adult, and feeling different. Films and shot stories were used.		Sign improvement in problem solving total score <0.01  Self efficacy: significant difference on two of five items but not on total score  No difference in social support network size score or facts/attitudes		
Greenberg 1995 <b>Design:</b> RCT <b>Objective(s):</b> effectiveness of PATH in promoting emotional competence <b>Setting:</b> management of conflict <b>Country of trial:</b> USA <b>Sample size</b> n=30 classrooms with 286 children of 4 schools  <b>Quality grading ++</b>	Primary school children	60 lessons of PATH curriculum module given as 3 times /week each lesson lasts 20-30 minutes  35 lessons for feeling and relationship  -self control  -understanding emotions  -problem solving  Delivered by specially trained teachers	No intervention control	--Kusche affective interview: revised (KAI-R) involving general questions about feelings, emotional experiences, awareness and cues ; display rules for feelings and changing feelings  Did not take cluster design into account  <b>Findings</b>  Intervention group significantly better than control on 8 out of 18 components of KAI - R  Results more positive in	PATH lessons 60 lessons curriculum model, 36  Evaluation at one year	Intervention likely to be effective in improving emotional literacy  <b>Barriers/facilitators</b>  Teachers attended 3 –days training workshop and received weekly consultation and observation from project staff. Acceptability for the lengthy sessions from teachers and students was not discussed.  <b>Applicability (b)</b>

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length and duration of intervention/ Follow up	Comments / Methodology / Barriers or facilitators reported/ Applicability to UK- context (a, b, c, d) see Table 4
				high risk children Theoretical basis of the intervention is discussed		
<p>Henderson 1992</p> <p><b>Design:</b> RCT</p> <p><b>Objective(s):</b> Effectiveness of stress control programme on children's Locus of control, self-concept and coping.</p> <p><b>Setting:</b> Primary school children</p> <p><b>Country of trial:</b> USA</p> <p><b>Sample size</b> n=65 children</p> <p><b>Quality grading +</b></p>	Primary school children randomised individually	<p>Stress control Programme adapted from Coping with Kids offered outside the classroom</p> <p>9 sessions over 4 wks conducted by 2 graduate students</p> <p>Relaxation techniques Yoga. Time management, problem solving, assertiveness handling anger, expressing feelings seeking social support problem solving</p>	No intervention control	<p>-Stress and Coping Questionnaire</p> <p>-Self concept measure</p> <p><b>Findings</b></p> <p>Analysis of post test differences for measures where there were no pre-test inter- group differences favoured intervention group for:</p> <p>Locus of control (&lt;0.01) Behaviour scores on self concept measure (&lt; 0.05) and number of coping strategies (&lt;0.0001)</p>	5 weeks	<p>Significant differences in favour of the intervention on a range of relevant measures</p> <p><b>Applicability (b)</b></p>
<p>Kellam 1994</p> <p><b>Design:</b> RCT</p> <p><b>Objective(s):</b> investigate the hypothesis that depressive symptoms would improve by Mastery Learning (ML)</p> <p><b>Setting:</b> Elementary schools</p> <p><b>Country of trial:</b> USA</p> <p><b>Sample size</b> n= 685</p>	1 <sup>st</sup> grade school children	<p>-Mastery of Learning (ML)</p> <p>A group based approach to the mastery of reading</p>	<p>No intervention</p> <p>Good Behaviour Game (GBG) classroom management to reduce aggressive and shy behaviour</p>	<p>- CDI as a depression rating measure</p> <p>analysis based on mediation model, results only applicable in subgroups</p> <p><b>Findings</b></p>	<p>Evaluation was carried out after two school terms.</p> <p>Baseline comparison information not provided on demographics between intervention and</p>	<p>No overall effects of ML on depressive symptoms</p> <p><b>Applicability (b)</b></p>

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length and duration of intervention/ Follow up	Comments / Methodology / Barriers or facilitators reported/ Applicability to UK- context (a, b, c, d) see Table 4
Quality grading -					control groups	
<p>McClowry 2005</p> <p><b>Design:</b> RCT of 5 elementary schools</p> <p><b>Objective(s):</b> Evaluation of the effects of (INSIGHTS)</p> <p><b>Setting:</b> first and second grade children</p> <p><b>Country of trial:</b> USA</p> <p><b>Sample size</b> n=148</p> <p>Quality grading +</p>	Inner city first and second grade children	<p>INSIGHTS (3 schools)</p> <p>This is a comprehensive</p> <p>Temperament – based intervention for primary school age children, family and teachers.</p> <p>Empathy skills , respect and problem solving for children</p> <p>Respect and behaviour management for parents</p> <p>Intervention delivered by teachers with 30hrs training.</p>	Read Aloud attention control programme (2 schools)	<p>Child Behaviour Problems: Parent daily report (PDR)</p> <p>Repeated measures Ancova using PDR Adjusted for maternal depression</p> <p><b>Findings</b></p> <p>Results shown with and without disruptive disorders assessed by Diagnostic Interview Schedule for Children (DISC-IV). parent report</p> <p>Significant reduction in PDR scores for intervention group compared to control (&lt;.001)</p> <p>ES for Insights .37 and for Read aloud .15</p> <p>Greater effect on children with clinical level problems &lt;0.4)</p> <p>Cluster effects not considered</p>	<p>Two hours a week for 10 weeks for parents</p> <p>Parents paid \$150 if attended all sessions</p> <p>One hour a week for 10 weeks for children</p>	<p>The INSIGHTS intervention was more effective than the read-aloud intervention in reducing problem-behaviours at home. effects more marked in children with clinical level behaviour problems</p> <p><b>Applicability (b)</b></p>
McDonald 2006	Urban	Families and	Family Education	Teacher Report Form	At 2 years, 87%	Differences favoured

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length and duration of intervention/ Follow up	Comments / Methodology / Barriers or facilitators reported/ Applicability to UK- context (a, b, c, d) see Table 4
<b>Design:</b> RCT <b>Objective(s):</b> effectiveness of FAST vs FAME <b>Setting:</b> elementary schools with high proportion of Latino children <b>Country of trial:</b> USA, <b>Sample size n=</b> 130  <b>Quality grading +</b>	elementary schools of low – income, urban subgroup Latino children.	Schools Together (FAST), an after school, multifamilies support group  Structured package of interactive processes to enhance relationships based on children and parents having fun and experiencing compliance requests	(FAME) of 8 behavioural parenting pamphlets with active follow up	(TRF), Child behaviour Checklist (CBCL), Social Skills Rating System (SSRS).  Hierarchical linear modelling for cluster effects and intention to treat analysis,  <b>Findings</b>  Difference favouring intervention group on 2 of 3 relevant teacher report measures SSRS (<0.05), externalising behaviour (<.001) but not internalising behaviour  Effect sizes about 0.25	of Latino families were followed as a subgroup.	assignment to FAST rather than FAME on classroom behaviour and social skills.  Results based on subgroup analysis of larger trial which may indicate significant bias  <b>Applicability (d)</b>
Rebok 2004 <b>Design:</b> pilot RCT <b>Objective(s):</b> effectiveness of older adult volunteers to reduce disruptive classroom behaviour <b>Setting:</b> Elementary schools <b>Country of trial:</b> USA <b>Sample size n=</b> 1194 children of 6 schools	Public elementary schools in Baltimore	Experience Corps Baltimore programme  Retired adults 60 years or older volunteer to support the school; are trained work for >15 hrs 3-4 days a week one to one or in small groups with children in	No intervention control  (3 schools)	Office referrals for classroom misbehaviour, Inventories developed for the study relating to:  Teacher self efficacy measure.  Teacher perception about volunteers in the classroom.  School Climate	1 academic year	Programme goals were primarily academic/. Mental health impacts likely but not clearly demonstrated. .  Intervention included a significant targeted component  <b>Applicability (b)</b>

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length and duration of intervention/ Follow up	Comments / Methodology / Barriers or facilitators reported/ Applicability to UK- context (a, b, c, d) see Table 4
Quality grading +		<p>need of support using:</p> <ul style="list-style-type: none"> <li>-Bound for Reading Programme</li> <li>-Partners in Play programme conflict resolution programmes</li> </ul> <p>Also provided library support and support to school ethos (3 schools)</p>		<p><b>Findings</b></p> <p>Referrals for classroom misbehaviour dropped by 50% in two intervention schools and 34% in the third. 'No change' in control schools (no stats presented)</p> <p>Teachers had favourable attitudes towards senior volunteers, difference was not significant</p> <p>No difference in school climate or teacher efficacy</p>		
<p>Reid 1999</p> <p><b>Design:</b> Population based RCT</p> <p><b>Objective(s):</b> impact of prevention conduct problems</p> <p><b>Setting:</b> elementary schools</p> <p><b>Country of trial:</b> USA</p> <p><b>Sample size</b> n=671 children of 12 elementary schools</p> <p><b>Quality grading +</b></p>	Primary school children	<p>The Linking the Interests of Families and teachers (LIFT) prevention programme for oppositional defiant disorder (ODD) and conduct disorder(CD):</p> <p>Classroom-based social skills programme plus modified version of Good Behaviour Game plus playground behavioural</p>	No intervention control	<p>Parents and children interviewed and completed questionnaires regarding parenting practices child behaviour and child peer relationships</p> <p>Observed parent child interaction tasks</p> <p>Parent report on child behaviour in 4 brief telephone interviews</p> <p>Global ratings from each staff member</p> <p>Walker-McConnell scale of Social Competence and</p>	10 weeks	<p>The intervention was effective in improving children's observed and teacher report behaviour . Most difficult children changed most</p> <p>Changes in parenting only in most aversive mothers</p> <p><b>Applicability</b> (b)</p>

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length and duration of intervention/ Follow up	Comments / Methodology / Barriers or facilitators reported/ Applicability to UK- context (a, b, c, d) see Table 4
		<p>programme</p> <p>20 hour long sessions over 10 weeks</p> <p>Parent training group based once a week for 6 weeks</p> <p>and communication between teachers and parents.</p> <p>Intervention fidelity assessed</p>		<p>Peer nominations</p> <p>Observations in playground</p> <p>-Interpersonal process code (IPC) index of maternal aversive behaviour and child physical aggression to peers</p> <p><b>Findings</b></p> <p>Inter class correlations assessed and were negligible</p> <p>Teaching rating of behaviour ef .14 <math>p &lt; 0.05</math></p> <p>Observed physical aggression in child ef .11 (<math>p &lt; 0.001</math>)</p> <p>Mothers aversive behaviour: no main effect but group by pre-intervention effect ; the most aversive mothers changed more</p>		
<p>Reynolds 2000</p> <p><b>Design:</b> RCT, factorial design.</p> <p><b>Objective(s):</b> effectiveness of emotional disclosure</p> <p><b>Setting:</b> four urban and suburban primary and</p>	<p>Primary school children aged (8-11 and secondary children aged (12-13). The proportion of</p>	<p>Emotional writing group</p>	<p>Two control groups</p> <p>-(1)non-emotional writing control</p> <p>-(2)non-writing</p>	<p>-BDI</p> <p>-SCAS</p> <p>-CSI</p> <p>-SDQ Teacher &amp; child report)</p>	<p>Follow up for 2 months after the intervention, which lasted for 4 days, each was up to 20 minutes writing</p>	<p>Despite successful implementation of procedures designed to promote emotional disclosure, there was little evidence of the effect</p> <p>Negative results could be</p>



Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length and duration of intervention/ Follow up	Comments / Methodology / Barriers or facilitators reported/ Applicability to UK- context (a, b, c, d) see Table 4
secondary schools <b>Country of trial:</b> UK <b>Sample size</b> n= 192 children divided into 12 equal groups of 16  <b>Quality grading:</b> +	each age group is not stated		control	<b>Findings:</b>  - Emotional writing group did not differ significantly from either control groups on any measure.  reduction in symptom measures occurred in all groups  -Qualitative data suggest that children liked the intervention and found it useful.  Significantly more life events in the control.	time.	attributable to measures used (self and teacher report) or to intervention (may not have elicited enough detailed processing of emotions )  <b>Applicability</b> (b)
Stevahn 2000 <b>Design:</b> RCT <b>Objective(s):</b> effect of conflict resolution training <b>Setting:</b> kindergarten schools <b>Country of trial:</b> USA <b>Sample size</b> n=80 kindergartners  <b>Quality grading</b> +	kindergarten schools	9 hours conflict resolution training integrated into a curriculum taught daily for 4 consecutive weeks	No intervention control	Child response to scenarios measuring: Conflict Management  -Conflict strategies theory  -Negotiation steps  -Concepts of friendship concept  -Observation of response to conflict simulation and of playground behaviour  <b>Findings</b>  Significant differences on post test results (<.005 for	10 weeks	Differences on a range of measures show improvement in knowledge and performance between trained and untrained children in favour of the programme  <b>Applicability</b> (b)

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length and duration of intervention/ Follow up	Comments / Methodology / Barriers or facilitators reported/ Applicability to UK- context (a, b, c, d) see Table 4
				all) between trained and untrained children in knowledge and performance on all scales		
<p>van Lier 2004</p> <p><b>Design:</b> RCT</p> <p><b>Objective(s):</b> effectiveness of universal classroom GBG for prevention of disruptive behaviour</p> <p><b>Setting:</b> Population-based of 31</p> <p><b>Country of trial:</b> Netherlands</p> <p><b>Sample size:</b> Classrooms n = 31, Children n = 666</p> <p><b>Quality grading +</b></p>	First and second grader (6-8)y of 31 schools in Rotterdam and Amsterdam	<p>Good behaviour game</p> <p>Classrooms n = 16</p> <p>Children n = 363</p>	<p>No treatment control</p> <p>Classrooms n = 15</p> <p>Children n = 303</p>	<p>Teacher report:</p> <p>Child behaviour - (CBCL)</p> <p>Problem Behaviour at School Interview (PBSI)</p> <p>- ADH Problem Scale</p> <p>- ODD Problem Scale</p> <p><b>Findings</b></p> <p>Significant difference on ADH scores favouring intervention (<math>p &lt; .01</math>) In children with medium levels of Disruptive Behaviour. at baseline. A positive impact of intervention was also found for conduct problems.</p>	2 years assessment	<p>Intervention had positive impact on development of all disruptive behaviour problems in children with intermediate levels of these problems at baseline. Effect sizes of mean difference s at outcome were medium to small.</p> <p><b>Applicability (b)</b></p>

**Table 12 controlled trial findings**

Study details/ Quality grading (++, +, -)	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length of intervention/ follow up/ Comments	Comments / methodology / generalisability to a similar UK population  Applicability to UK- context (a, b, c, d)  see Table 4
<b>Controlled Trials</b>						
Battistich 1996 <b>Design:</b> Quasi-experimental <b>Objective(s):</b> <b>Setting:</b> elementary schools in different areas <b>Country of trial:</b> USA <b>Sample size</b> n= 4769  <b>Quality grading +</b>	24 elementary schools in 6 geographically diverse school districts around the USA	Child Development Program (CPD): A comprehensive programme involving changes to the school ethos and environment and parental involvement  Has 5 interrelated dimensions: 1. building stable, warm, and supportive relationships 2. Simultaneous attention to social, ethical, and intellectual learning 3. Teaching for understanding 4. Meaningful, challenging, learner-centred curriculum 5. Fostering intrinsic motivation	12 intervention schools, 12 control schools	Variables: -Delinquent behaviour-children report  Ran away from Home; Skipped School; Damaged Property; Stolen Money/Property; Carried a Weapon; Threatened Someone; Harmed Someone; Stolen a Car; Been in a Gang-Fight;  <b>Findings:</b> By the end of the 2nd intervention year, only one out of 10 delinquent behaviours (vehicle theft) significantly different between groups (<.01). Significant reduction in 3 / 10 delinquent behaviours in schools where implementation was best.  Significant changes in substance use reported among students in intervention schools compared to control	Intervention phased in over a 3-year period	CDP program was associated with modest but reliable reductions in drug-use and some evidence of reduction in delinquent behaviours  Reductions greater in high implementation schools  Only 1/3 of those consented were evaluated  <b>Applicability (b)</b>

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length of intervention/ follow up/ Comments	Comments / methodology / generalisability to a similar UK population  Applicability to UK- context (a, b, c, d) see Table 4
		<b>The programme has:</b> -teaching strategy -curriculum materials -community building activities -parental involvement in children's education through "homeside" activity				
Elias 1991 <b>Design:</b> Retrospective CT <b>Objective(s):</b> To determine the long term impact of an intensive 2-year elementary school-based primary prevention program on social competence (aim = to help children cope with transition from elementary school) <b>Setting:</b> elementary schools <b>Country of trial:</b> USA <b>Sample size</b> n= 136 at last follow up, start not clear  <b>Quality grading:</b> +	Students of 4 elementary schools that fed into one middle school in a community of predominantly white, multiethnic, working class town of @ 15,000 – Central New Jersey	2 year curriculum conducted by classroom teachers Program geared at promoting social competence through -critical social decision-making -self-control -group participation -social awareness skills Up to 2 years	Study conducted through 'cohorts': 2 intervention cohorts, one control cohort	Behaviour – child report 1. National Youth Survey (NYS) of anti-social and delinquent behaviour 2. Youth Self Report (YSR) rating scale 3. Perceived Competence Scale for Children (PCSC) = component of YSR Discriminant analysis  <b>Findings:</b> Overall difference favouring intervention (<.03) Self efficacy (PCSC) favoured intervention	Intervention conducted over 2 years Follow up 6 years later	Most findings favoured the intervention group. Gender differences in outcomes observed The study was retrospective: Student-evaluation was conducted 6 years post intervention when students in grades 10 and 11. Cohort membership determined through obtaining elementary school history <b>Applicability (b)</b>

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length of intervention/ follow up/ Comments	Comments / methodology / generalisability to a similar UK population  Applicability to UK- context (a, b, c, d) see Table 4
				<p>(&lt;.001)</p> <p>More children with clinical level problems in control than intervention group (&lt;.05)</p> <p>Depression and self destructive /identity problems favoured intervention group n boys (&lt;.03) 2/2 variables</p> <p>Social competence favoured intervention in girls &lt;.001)</p> <p>Overall findings suggest that students receiving 2-year social decision-making and problem-solving program in elementary school showed higher levels of positive pro-social behaviour and lower levels of antisocial, self-destructive and socially disordered behaviour on follow-up over 4-6 years in comparison to controls</p>		
<p>Han 2005</p> <p><b>Design:</b> Controlled trial</p> <p><b>Objective(s):</b></p> <p><b>Setting:</b> 4-5 years old classes</p> <p><b>Country of trial:</b> USA</p> <p><b>Sample size</b> n=166 students in</p>	Pre-kindergarten children aged ( 4-5 years old)	<p>The pre-K RE-CAP programme delivered universally</p> <p>Classroom behaviour management system</p>	Non treatment comparison group	<p><b>Outcomes:</b></p> <p>Parents report: (CBCL and SSRS)</p> <p>Teacher report : (CBCL and SSRS)</p> <p><b>Findings:</b></p>	<p>September-May</p> <p>149/166 (90%) completed the study.</p>	<p>Short term improvement attributable to the programme in behaviour and social skills as recorded by teachers but not parents</p> <p>Schools in low income areas.</p>

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length of intervention/ follow up/ Comments	Comments / methodology / generalisability to a similar UK population  Applicability to UK- context (a, b, c, d)  see Table 4
12 class rooms of children recruited  Quality grading: +		Teacher administered social skills training  Group parent training  8 month programme  Teachers trained and supported during intervention		Total problem scores on CBCL teacher rating and both externalising and internalising scales favoured intervention groups <.01, <.01, <.01)  Total social skills scales favoured intervention group (<.01)  Parent report findings not significant		Generalisable to UK similar age groups  Applicability (b)
Hawkins 2005  <b>Design:</b> Originally an RCT. Late intervention allocated non randomly <b>Objective(s):</b> to determine the long term effects of the Seattle Social development Project intervention in promoting positive adult mental health  <b>Setting:</b> 18 elementary schools  <b>Country of trial:</b> USA  <b>Sample size</b> n= 605  Quality grading ++	Sex balanced multiethnic sample in high crime area. Programme offered grades 1- 6	Seattle Social Development Project  Intervention comprised 3 components:  1. Teacher-training  2. Child social and emotional skill development  3. Parent-training   Full intervention group:  5 days in-service training to teachers in each year during grades 1-6 –	No treatment control	Self reported emotional and mental health (Inc self efficacy, emotional regulation) , social functioning and crime involvement measures; some developed for study  DIS schedule  Crime records at age of 21 y.  <b>Findings</b>  Cluster design effects considered but not significant.  Sign effects on 8/8 measures of social functioning, 5/8 measures of emotional and mental health and 4/8 measures	6 years intervention (grade 1-6) 2 years after, and at 21y.	Significant effects on emotional and mental health were found in this long term follow-up for those who had had the full intervention. Fewer significant effects on crime and substance use.  Late intervention only relatively ineffective  Trial conducted in high crime area – may not be relevant to socially advantaged areas  Intention to treat analysis carried out  Applicability (b)

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length of intervention/ follow up/ Comments	Comments / methodology / generalisability to a similar UK population  Applicability to UK- context (a, b, c, d) see Table 4
		<p>included</p> <ul style="list-style-type: none"> <li>-pro-active classroom management</li> <li>-interactive teaching</li> <li>-Cooperative learning</li> <li>-Additional instruction in use of cognitive and training social skills curriculum for Grade 1 Teachers</li> </ul> <p>Late intervention group:</p> <p>Same 5-day training to teachers teaching students in grades 5 &amp; 6</p> <p>In grade 6, study consultant provided 4 hours training to children on recognising and resisting (problematic) social influences</p> <p>Parents of children</p>		<p>of crime in group which had intervention 1-6 yrs.</p> <p>4 /24 results positive in late intervention only group</p> <p>The 8 measures related to school/work were as follows:</p> <ol style="list-style-type: none"> <li>1. Constructive engagement</li> <li>2. High school Graduate (= dichotomous variable)</li> <li>3. 2 or more years college (dichotomous variable)</li> <li>3. Degree of integration at school</li> <li>4. Employment status in past month, and job responsibility for those employed</li> <li>5. Constructive self-efficacy</li> </ol>		

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length of intervention/ follow up/ Comments	Comments / methodology / generalisability to a similar UK population  Applicability to UK- context (a, b, c, d) see Table 4
		<p>in full intervention offered 7 sessions on voluntary child behaviour management skills</p> <p>+ 4 session curriculum on supporting child's academic development during grades 1-3</p> <p>5-session curriculum for parents in late and full intervention group to tackle problem behaviour, plus drug and alcohol use</p> <p>(43% attended 1+class)</p>		<p>6. Poor emotional regulation</p> <p>7. Any crime in past year</p> <p>8. Substance use &amp; extent to which this interferes with everyday activities/life</p>		
<p>Haynes 1990</p> <p><b>Design:</b> CCT</p> <p><b>Objective(s):</b> To determine the impact of Social Development Program (SDP) on students' students affective, intrapersonal and motivational states</p> <p><b>Setting:</b> Schools in low income neighbourhoods</p> <p><b>Country of trial:</b> USA</p> <p><b>Sample size</b> n= 174 School children</p>	<p>Children selected in grades 4-6: Schools in low income neighbourhoods, matched by achievement status (California Achievement Tests), SES (% receiving free lunches), &amp; attendance patterns</p>	<p>SDP introduced into experimental schools at start of school year (September).</p> <p>3 components to SDP program:</p> <ol style="list-style-type: none"> <li>1. School planning &amp; management team (SPMT)</li> <li>2. Mental Health Team (MHT)</li> <li>3. Parent</li> </ol>	<p>Random selection from 4 schools: 2 SDP-schools, 2 control-schools</p>	<p>Measurement by 'Piers-Harris Self Concept Scale' with 6 dimensions: Behaviour; Intellectual &amp; School status; Physical appearance &amp; attributes; Anxiety; Popularity; Happiness &amp; satisfaction</p> <p><b>Findings:</b></p> <p>Results on all six dimensions and total scale</p>	<p>Intervention = 1 academic year</p> <p>Follow-up to end of intervention</p>	<p>SDP was effective in fostering positive self-concept</p> <p>Students randomly selected from each school using stratified procedure. Gender &amp; grade level = stratification variables. Number of students in each sample = proportionate to number in grade at same school</p>



Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length of intervention/ follow up/ Comments	Comments / methodology / generalisability to a similar UK population  Applicability to UK- context (a, b, c, d) see Table 4
Quality grading: +		involvement Program  The 3 components together create 'good school climate' and school becomes 'well functioning system' for addressing children's developmental needs.		favoured intervention schools SDP was effective in fostering positive self-concept among students in the following 6 dimensions: behaviour, intellectual + school status, physical, anxiety, popularity, happiness+ satisfaction.		Applicability (b)
Johnson 1995  <b>Design:</b> Combined results presented of <b>seven</b> studies in two countries: RCTs CCTs and before after studies combined  <b>Objective(s):</b> effects of management of conflict before and after peer mediation training.  <b>Setting:</b> Primary schools  <b>Country of trial:</b> USA and one other country (not specified)  <b>Sample size</b> n=731  <b>Quality grading</b> -	Primary school children (one trial in secondary schools)	Teaching Students to be Peaceamakers programme. 9-15 hours of teaching  Conflict management	No intervention control in most studies	-range of different measures created for the different studies involving -written response to scenarios  -Interview measures  -Video-tape measures placed a Simulated Conflict Situation 4-5 months after the training had ended.	Results reported all positive, but difficult to relate to individual studies . no negative findings reported  The lengths of interventions varied  Overall positive results reported on a range of different measures and programmes. Popular with staff and students.	Results suggest low intensity conflict resolution training is effective, but quality of reporting poor.  <b>Applicability</b> (b)
Lohaus 1997	Primary school children	Stress management	Control group with delayed	- knowledge about stress symptoms	Length of follow up is 6 months	Results compared different programmes only. No

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length of intervention/ follow up/ Comments	Comments / methodology / generalisability to a similar UK population  Applicability to UK- context (a, b, c, d)  see Table 4
<p><b>Design:</b> CT</p> <p><b>Objective(s):</b> to evaluate the stress management programme in primary school children</p> <p><b>Setting:</b> primary schools</p> <p><b>Country of trial:</b> Germany</p> <p><b>Sample size</b> n=170 children</p> <p>Of (8-11) years</p> <p><b>Quality grading:</b>++</p>		<p>8 sessions of 90 mins each with 4 groups</p> <p>-Knowledge oriented version with or without parents involvement,</p> <p>-Problem solving oriented version with or without parents,</p> <p>-Relaxation oriented version with or without parents.</p> <p>Combined</p>	training	<p>- level of stress / mood experience by the participants</p> <p>- behavioural changes in stress situations</p> <p>instruments used : SSK-questionnaire, HAVEL questionnaire,</p> <p><b>Findings</b></p> <p>Analysis of intervention of no rx control not undertaken</p> <p>-Problem solving was the most favourable of the active approaches with regard to knowledge increases followed by knowledge and relaxation orientated (&gt;.05)</p> <p>- Knowledge orientated most favourable with regard to known coping strategies followed by combined and problem solving</p> <p>Parent (&lt;.05) and child (&lt;.01) assessment of stress most favourable in problem solving group</p> <p>Parental involvement lead to no measurable effects for any criteria either directly or after 6 months</p>	<p>following the intervention which consisted of two trainings.</p> <p>Training versions consisted of the training of 90 minutes each.</p>	<p>assessment of effectiveness of not intervention.</p> <p><b>Applicability</b> <b>(b)</b></p>

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length of intervention/ follow up/ Comments	Comments / methodology / generalisability to a similar UK population  Applicability to UK- context (a, b, c, d) see Table 4
Lohaus 2000 <b>Design:</b> Quasi-Experimental study design <b>Objective(s):</b> to evaluate relaxation training to improve the coping of children with stress situations <b>Setting:</b> Primary and secondary city schools <b>Country of trial:</b> Germany <b>Sample size n=</b> 826 children  <b>Quality grading: +</b>	Schools located in two measure cities in Germany with the mean age is likely to be less than 11 years old. n=543	Five training sessions lasting 10 mins by audiotape of different relaxation techniques  Sensoric training, imaginative training, combined.	1-non-tension production stories (n=178) 2-no intervention (105)	at 1 week post int: Mood and somatic symptoms questionnaire child report  BP and pulse rate  At 2 mths  Stress experiences somatic symptoms and coping strategies questionnaire:- parent and child report  Children who attended 2 or less sessions excluded  <b>Findings</b>  Overall differences observed but differences between groups not significant:  -	Length of follow up 2 months after the five sessions	No effects of the different trainings demonstrated in comparison to control groups.  Analysis not intention to treat  <b>Applicability (b)</b>
McIntyre 1996 <b>Design:</b> Longitudinal Quasi-Experimental design with qualitative research arm <b>Objective(s):</b> To determine whether coordinating instruction for school health with health services, and a healthful environment has a positive impact on the heart health and mental health of children	300 intervention-children in each of 2 cohorts in grades 4-6 attending 9 trial schools (+ 600 comparison-children)	The Co-ordinated Approach 'A' comprehensive programme of health promotion including heart health, self esteem and stress  Whole school approach to planning with parental	600 comparison-children in 10 comparison schools in Dartmouth and in 9 distal comparison schools	DHPS Self-administered Survey Instruments and Test of Aerobic Fitness: Domains covered through survey instruments: -Anxiety-proneness -Self-esteem -Enjoyment of learning classroom atmosphere- -Nutrition, physical	Longitudinal study with implementation over 3 years and further follow-up at end of Year 4	Although the programme was well liked no significant effects demonstrated.)  <b>Applicability (b)</b>

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length of intervention/ follow up/ Comments	Comments / methodology / generalisability to a similar UK population  Applicability to UK- context (a, b, c, d) see Table 4
<p><b>Country of trial:</b> USA</p> <p><b>Sample size</b> n= 900 (300[Intervention] +600[control])</p> <p><b>Quality grading:</b> +</p>		<p>involvement.</p> <p>'Series of planned activities in grades 4, 5, and 6 that combined school health program components in Heart-Health and Mental-Health</p> <p>School health service component</p>		<p>activity, smoking</p> <p>-Food-frequency</p> <p>-Aerobic physical fitness</p> <p>Additional Classroom-unit analyses (averages):</p> <p>-VO2-Max</p> <p>-Attendance records</p> <p>-(+ each questionnaire subscale)</p> <p><b>Findings:</b></p> <p>No treatment effects found when classroom averages were used as units of analyses</p> <p>For individual student-scores, some significant differences found between intervention and comparators, but no consistency in these results were found</p>		
<p>Nelson 1996</p> <p><b>Design:</b> CT</p> <p><b>Objective(s):</b> to evaluate a school-wide programme to prevent disruptive or externalising behaviour</p>	Elementary schools with large number of disadvantaged students	<p>The programme includes:</p> <p>-school organizational practices and physical environment</p>	Two matched elementary schools	<p>- Disciplinary actions n of suspensions, removals office referrals</p> <p>-Behavioural and Emotional Rating Scale child report -</p>	2 years study	<p>Overall effects on numbers of disciplinary actions in intervention schools – but statistical significance uncertain trial.</p> <p>No overall effects on social adjustment or school</p>

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length of intervention/ follow up/ Comments	Comments / methodology / generalisability to a similar UK population  Applicability to UK- context (a, b, c, d)  see Table 4
<b>Setting:</b> <b>Country of trial:</b> USA <b>Sample size</b> n= 2360, 4 elementary schools <b>Quality grading:</b> +		-school-wide classroom management – consistent behavioural expectations and effective discipline  -individual behavioural programme  -advisory board		Consumer satisfaction for teacher in the intervention group  Teacher stress scale (ESI)  <b>Finding:</b>  -Strong positive effect on all 3 disciplinary actions of the schools (no statistics)  No effect on school climate.-Positive effect on the teachers' perception to deal with disruptive behaviour  -externalising differences but not internalising behaviour differences was statistically significant.  -for stress scale , no significant different in ESI		climate.  Students with problem behaviour improved more than those without.  <b>Applicability</b>  <b>(b)</b>
Nelson 2002 <b>Design:</b> Controlled trial  <b>Objective(s):</b> to evaluate a comprehensive school wide programme which includes 5 elements for preventing disruptive behaviour  <b>Setting:</b> elementary schools of one district in  <b>Country of trial:</b> USA	7 Elementary schools in one USA district	school wide discipline programme  - one to one tutoring  -conflict resolution skills  -video-based family management programme for high	28 elementary schools as non- participating schools	<b>Outcomes:</b>  Disciplinary actions: - suspensions, emergency removal and office referrals  Social skills of target cohort with problems (BERS) child report  Consumer satisfaction – teacher rept	The intervention was for 2 years.  The attrition rate was high. For one outcome measure WASL attrition was 26%. For other outcomes , no report of attrition rates.	Intervention effective in reducing one indicator of mental health problems in the schools,  Result could have occurred because teachers better able to manage behaviour in classroom rather than change in student mental health

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length of intervention/ follow up/ Comments	Comments / methodology / generalisability to a similar UK population  Applicability to UK- context (a, b, c, d)  see Table 4
<b>Sample size</b> n= 35 elementary schools  <b>Quality grading:</b> ++		risk families  -individualised function-based behavioural interventions and supports  Large number of classes with adjustment made to the school's ecological arrangement		<b>- Findings:</b>  -suspensions, emergency removal and office referrals were all significantly in favour of the intervention group (<.01, .05, .01)  -School climate , no statistical difference compared with the control.  Target cohort improved more than high achievers		The stability was not verified over time.  <b>Applicability (b)</b>
Omizo 1992 <b>Design:</b> CT <b>Objective(s):</b> the effect of wellness promotion guidance activity <b>Setting:</b> elementary school students ages (10-11) <b>Country of trial:</b> USA <b>Sample size</b> n= 62 students from 2 classrooms  <b>Quality grading:</b> -	Fifth grade (10-11) students  Lower to middle socioeconomic background	(32) students given 10 weekly sessions lasted between 45 and 60 minutes, lectures, role play , active participation ,  work sheet and discussion to promote wellness by improving lifestyles: nutrition, exercise, stress management	A class (30) no intervention control from the same school	-General Self Esteem Scale – child report (SEI) -Child Anxiety scale (CAS) child report -Wellness knowledge test(WNT)  <b>Findings:</b> Post test differences favouring the intervention group on self esteem and wellness knowledge (<.01) no difference on anxiety scale No pre test differences	12 weeks	Small sample size trial  Intervention appeared effective in improving self esteem  <b>Applicability (b)</b>
Sawyer 1997 <b>Design:</b> CT <b>Objective(s):</b> to evaluate the effectiveness of the Rochester	Primary school children mean age 8.2 y, 8.4 y for control.	Rochester Social Problem solving Programme aimed at developing social skills, delivered by	No treatment control	Child Behaviour teacher and parent report ( CBCL) -IPSIC for social skills  -Peer relationships	At one year follow up .  The programme	Little evidence that the programme reduced the prevalence of childhood emotional problems reported by the teacher or

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length of intervention/ follow up/ Comments	Comments / methodology / generalisability to a similar UK population  Applicability to UK- context (a, b, c, d)  see Table 4
<p>Social Problem solving Programme to reduce emotional and behavioural problems</p> <p><b>Setting:</b> Primary school children</p> <p><b>Country of trial:</b> Australia</p> <p><b>Sample size</b> n=188, 2 primary schools,</p> <p><b>Quality grading:</b> +</p>		teachers.		<p>assessed by peer sociometrics – peer report</p> <p>Social skills child report IPSIC</p> <p><b>Findings:</b></p> <p>Significant change in peer relationships favouring intervention immediately post intervention – not maintained at long term FU</p> <p>No difference in social skills or childhood behaviour</p> <p>.</p>	is for 34 lessons	<p>parents</p> <p><b>Applicability</b></p> <p><b>(b)</b></p>
<p>Wang 1997</p> <p><b>Design:</b> CCT</p> <p><b>Objective(s):</b> to assess enhancement of student self-esteem in a service learning programme.</p> <p><b>Setting:</b> elementary and secondary schools</p> <p><b>Country of trial:</b> USA</p> <p><b>Sample size</b> n=187 school students</p> <p><b>Quality grading:</b> -</p>	Elementary and secondary school children with unknown proportion of secondary students.	<p>The CHALLENGE Service –Learning Programme.</p> <p>Community service integrated into curriculum: three different approaches</p> <p>The <i>elementary</i> school children were split into treatment and control groups based on their involvement in <i>greenhouse</i></p>	Control group were identified equivalent to the treatment group, who did not participate in the programme.	<p>-Coopersmith self-esteem inventory</p> <p>-school-academic subscales</p> <p><b>Findings:</b></p> <p>One approach Zoophonics tutoring increased self esteem (&gt;.05) but not the other programmes.</p> <p>-Longer programme and older students were associated with better results.</p>	2 months duration for greenhouse construction.	<p>There is lack of important details as this paper is presented at the annual meeting of the American Educational research association Chicago.</p> <p><b>Applicability</b></p> <p><b>(b)</b></p>

Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length of intervention/ follow up/ Comments	Comments / methodology / generalisability to a similar UK population  Applicability to UK- context (a, b, c, d) see Table 4
		<i>construction project.</i>				
<p>Weiss 2003</p> <p><b>Design:</b> CCT</p> <p><b>Objective(s):</b> to evaluate the RECAP programme</p> <p><b>Setting:</b> elementary /or middle schools</p> <p><b>Country of trial:</b> USA</p> <p><b>Sample size</b> n=113 families of three elementary /or middle schools</p> <p><b>Quality grading +</b></p>	<p>Elementary /or middle schools of high risk population 70% of students on free lunch.</p> <p>94 participants were 4 grade children</p>	<p>RECAP</p> <p>Manualised programme delivered by social worker and psychiatric nurse with 2 days training and supervision</p> <p>Much of the intervention targeted on children screened as high risk</p> <p>Programme for these children (a). Coping skills training, (b). Problem solving skills, (c). Parent training.</p> <p>Universal classroom component with peers and teacher classroom management</p>	No intervention control	<p>-Child Behaviour- parent, teacher, child report (CBCL) report of child</p> <p>-Parent mental health – parent report (BSI) self report</p> <p>-Child self report</p> <p>-Peer report of child- (PMIEB)</p> <p>Findings</p> <p>Using complex analysis of mixed hierarchical linear models (HLM) analysis indicated improvement on 7 of 10 measures favouring intervention group covering both internalising and externalising problems</p>	<p>9 months academic year</p> <p>Participants were randomly distributed to treatment or control by the principals. Methods of randomisation and concealment of allocation were not described.</p>	<p>Programme effects demonstrated in whole classes although much of intervention targeted.</p> <p>No separate analysis done for elementary or secondary school</p> <p>70% of participants on free lunch programme therefore the result can be transferable to deprived population</p> <p>originally an RCT but some allocation 'non random'.</p> <p><b>Applicability (b)</b></p>
<p>Witt 2005</p> <p><b>Design:</b> Controlled trial</p> <p><b>Objective(s):</b></p> <p>to evaluate the effect of qigong lessons on social behaviour</p>	<p>Two second grade classes (7-8)y at an elementary school</p> <p>&amp; Two eighth</p>	<p>20 minutes qigong lessons twice weekly. For 6 months</p>	<p>Similar age group from the same school received no intervention</p>	<p><b>Outcomes:</b></p> <p>Behaviour Parents and teachers questionnaires.</p> <p>Children - QoL (KINDAL) score</p>	<p>6-months.</p> <p>There may be a selective bias as those wanting to</p>	<p>Trial involved secondary as well as primary school pupils and the sample size is too small to analyses separately.</p> <p>Whilst only 3 out of 15</p>



Study details/ Quality grading (++, +, -) see Table 3	Population(s)	Intervention(s)	Comparator(s)	Outcome measure(s) reported/ Main finding(s)	Length of intervention/ follow up/ Comments	Comments / methodology / generalisability to a similar UK population  Applicability to UK- context (a, b, c, d)  see Table 4
<b>Setting:</b> school children 7-8, and <b>Country of trial:</b> Germany <b>Sample size n=:</b> 90 participants, from second grade classes, and 2 eight- grade classes.  <b>Quality grading: +</b>	grade classes of (13-14) y of a high school,. the mean age in both the intervention and the control were 10.7±03, 10.4±03 respectively.	Two additional classes at two elementary schools were evaluated by qualitative research by semi- standardised interviews		<b>Findings:</b> -Overall behaviour scale (ES.18) and 'appropriate behaviour' subscale (ES .42)assessed by teacher improved significantly in intervention arm compared to control assessed by teachers  -No significant differences for children's assessments of QoL on overall score, but significant difference favouring intervention of psychological wellbeing score. (ES .27)  -No statistical difference on parent report scales for well being score  Frequency of reporting nightmares increased in some children in intervention arm in first few weeks of programme	participate (teachers) were trained in qigong.	scales positive, those which were are most relevant to mental health in schools  Qualitative study suggested a calming and relaxing effect on students  The results in this trial are generalisable to UK similar age groups. <b>Applicability</b> <b>(b)</b>



## Appendix 2 Included studies analysed in this systematic review

1. Barrett P, Turner C. Prevention of anxiety symptoms in primary school children: preliminary results from a universal school-based trial. *British Journal of Clinical Psychology* 2001;**40**:399-410.
2. Battistich V, Schaps E, Watson M, Solomon D. Prevention Effect of the Child Development Project: Early Finding From an Ongoing Multisite Demonstration Trial. *Journal of Adolescent Research* 1996;**11**(1):12-35.
3. Boyle MH, Cunningham CE, Heale J, Hundert J, McDonald J, Offord DR, *et al.* Helping children adjust - A Tri-Ministry Study: I. Evaluation methodology. *Journal of Child Psychology & Psychiatry & Allied Disciplines* 1999;**40**(7):1051-1060.
4. Catalano RF, Mazza JJ, Harachi TW, Abbott RD, Haggerty KP, Fleming CB. Raising Healthy Children through Enhancing Social Development in Elementary School: Results after 1.5 Years. *Journal of School Psychology* 2003;**41**(2):143-164.
5. Conduct Problems Prevention Research Group (CPPRG).I Initial impact of the Fast Track prevention trial for conduct problems: II. Classroom effects. Conduct Problems Prevention Research Group. *Journal of Consulting & Clinical Psychology* 1999; **67**(5):648-657.
6. Dubow EF, Schmidt D, McBride J, Edwards S, Merk FL. Teaching Children to Cope With Stressful Experiences: Initial Implementation and Evaluation of a Primary Prevention Program. *Journal of Clinical Child Psychology* 1993;**22**(4):428-440.
7. Elias MJ, Gara MA, Schuyler TF, Branden-Muller LR, Sayette MA. The promotion of social competence: longitudinal study of a preventive school-based program. *American Journal of Orthopsychiatry* 1991;**61**(3):409-417.
8. Greenberg MT, Kusche CA, Cook ET, Quamma JP. Promoting emotional competence in school-aged children: The effects of the PATHS curriculum. *Development and Psychopathology* 1995;**7**(1):117-136.
9. Han SS, Catron T, Weiss B, Marciel KK. A teacher-consultation approach to social skills training for pre-kindergarten children: Treatment model and short-term outcome effects. *Journal of Abnormal Child Psychology* 2005;**33**(6):681-693.
10. Hawkins JD, Kosterman R, Catalano RF, Hill KG, Abbott RD. Promoting positive adult functioning through social development intervention in childhood: long-term effects from the Seattle Social Development Project.[erratum appears in Arch Pediatr Adolesc Med. 2005 May;159(5):469]. *Archives of Pediatrics & Adolescent Medicine* 2005;**159**(1):25-31.
11. Haynes NM, Comer JP. The effects of a school development program on self-concept. *Yale Journal of Biology & Medicine* 1990;**63**(4):275-283.
12. Henderson PA. Effects of a Stress-Control Program on Children's Locus of Control, Self-Concept, and Coping Behavior. *School Counselor* 1992;**40**(2):125-130.
13. Johnson DW, Johnson RT. Teaching students to be peacemakers: Results of five years of research. *Peace and Conflict: Journal of Peace Psychology* 1995;**1**(4):417-438.
14. Kellam SG, Rebok GW, Mayer LS, Ialongo N. Depressive symptoms over first grade and their response to a developmental epidemiologically based preventive trial aimed at improving achievement. *Development and Psychopathology* 1994;**6**(3):463-481.

15. Lohaus A, Klein h. Coping in childhood: A comparative evaluation of different relaxation techniques. *Anxiety, Stress & Coping* 2000;**13**(2):187-211.
16. Lohaus A, Klein-Hebling J, Shebar S. Stress Management for Elementary School Children: A comparative Evaluation of Different Approaches. *European Review of Applied Psychology* 1997;**47**(2):157-161.
17. McClowry SG, Snow DL, Tamis-LeMonda CS. An evaluation of the effects of INSIGHTS on the behavior of inner city primary school children. *Journal of Primary Prevention* 2005;**26**(6):567-584.
18. McDonald L, Moberg DP, Brown R, Rodriguez-Espiricueta I, Flores NI, Burke MP, *et al.* After-school multifamily groups: a randomized controlled trial involving low-income, urban, Latino children. *Children & Schools* 2006;**28**(1):25-34.
19. McLntyre L, Belzer EG, Jr., Manchester L, Blanchard W, Officer S, Simpson AC. The Dartmouth Health Promotion Study: a failed quest for synergy in school health promotion. *Journal of School Health* 1996;**66**(4):132-137.
20. Nelson JR, Martella RM, Marchand Martella N. Maximizing Student Learning: The Effects of a Comprehensive School-Based Program for Preventing Problem Behaviors. *Journal of Emotional and Behavioral Disorders* 2002;**10**(3):136-148.
21. Nelson JR. Designing Schools to Meet the Needs of Students Who Exhibit Disruptive Behavior. *Journal of Emotional and Behavioral Disorders* 1996;**4**(3):147-161.
22. Omizo MM, Omizo SA, D'andrea MJ. Promoting Wellness Among Elementary School Children. *Journal of Counseling & Development* 1992;**71**(2):194-198.
23. Rebok GW, Carlson MC, Glass TA, McGill S, Hill J, Wasik BA, *et al.* Short-term impact of Experience Corps participation on children and schools: results from a pilot randomized trial. *Journal of Urban Health* 2004;**81**(1):79-93.
24. Reid JB, Eddy JM, Fetrow RA, Stoolmiller M. Description and immediate impacts of a preventive intervention for conduct problems. *American Journal of Community Psychology* 1999;**27**(4):483-517.
25. Reynolds M, Brewin CR, Saxton M. Emotional disclosure in school children. *Journal of Child Psychology & Psychiatry & Allied Disciplines* 2000;**41**(2):151-159.
26. Sawyer MG, MacMullin C, Graetz B, Said JA, Clark JJ, Baghurst P. Social skills training for primary school children: a 1-year follow-up study. *Journal of Paediatrics & Child Health* 1997;**33**(5):378-383.
27. Stevahn L, Johnson DW, Johnson RT, Oberle K, Wahl L. Effects of conflict resolution training integrated into a kindergarten curriculum. *Child Development* 2000;**71**(3):772-784.
28. van Lier PA, Muthen BO, van der Sar RM, Crijnen AA. Preventing disruptive behavior in elementary schoolchildren: impact of a universal classroom-based intervention. *Journal of Consulting & Clinical Psychology* 2004;**72**(3):467-478.
29. Wang J, Greathouse B, Falcinella VM. An Empirical Assessment of Self-Esteem Enhancement in A CHALLENGE Service-Learning Program. *Annual Meeting of the American Educational Research Association* 1997.

30. Weiss B, Harris V, Catron T, Han SS. Efficacy of the RECAP intervention program for children with concurrent internalizing and externalizing problems. *Journal of Consulting & Clinical Psychology* 2003;**71**(2):364-374.
31. Witt C, Becker M, Bandelin K, Soellner R, Willich SN. Qigong for schoolchildren: a pilot study. *Journal of Alternative & Complementary Medicine* 2005;**11**(1):41-47.

### Appendix 3 Excluded studies and reasons

Author, Year	Reason for Exclusion
<p>Adler-Nevo G, Manassis K. Psychosocial treatment of pediatric posttraumatic stress disorder: The neglected field of single-incident trauma. <i>Depression &amp; Anxiety</i> 2005; <b>22</b>(4):177-189.</p> <p>Anderson LM, Shinn C, Fullilove MT, Scrimshaw SC, Fielding JE, Normand J, <i>et al.</i> The effectiveness of early childhood development programs: A systematic review. <i>American Journal of Preventive Medicine</i> 2003; <b>24</b>(3 SUPPL.):32-46.</p> <p>Andrews G, Wilkinson DD. The prevention of mental disorders in young people. <i>Medical Journal of Australia</i> 2002; <i>177 Suppl: S97-S100.</i></p> <p>Beardslee WR, Gladstone TRG. Prevention of childhood depression: Recent findings and future prospects. <i>BIOLOGICAL PSYCHIATRY</i> 2001; <b>49</b>(12):1101-1110.</p> <p>Gillham JE, Hamilton J, Freres DR, Patton K, Gallop R. Preventing depression among early adolescents in the primary care setting: a randomized controlled study of the Penn Resiliency Program. <i>J Abnorm Child Psychol</i> 2006; <b>34</b>(2):203-219.</p>	<p>Not a school-based study</p> <p>Primary care setting and for the age group</p>
<p>Bain A, Houghton S, Williams S. The effects of a school-wide behaviour management programme on teachers use of encouragement in the classroom. <i>Educational Studies</i> 1991; <b>17</b>(3):249-260.</p> <p>Evans SW, Axelrod J, Langberg JM. Efficacy of a School-Based Treatment Program for Middle School Youth With ADHD: Pilot Data. <i>Behavior Modification</i> 2004; <b>28</b>(4):528-547.</p> <p>Wyn J, Cahill H, Holdsworth R, Rowling L, Carson S. MindMatters, a whole-school approach promoting mental health and wellbeing. <i>Australian &amp; New Zealand Journal of Psychiatry</i> 2000; <b>34</b>(4):594-601.</p> <p>De Wolfe A, Saunders AM. Stress reduction in Sixth-Grade Students. <i>Journal of Experimental Education</i> 1995; <b>63</b>(4):315-329.</p>	<p>No control group</p>
<p>Bosworth K, Espelage D, DuBay T, Daytner G, Karageorge K. Preliminary Evaluation of a Multimedia Violence Prevention Program for Adolescents.</p>	<p>Out of age-range</p>

<p><i>American Journal of Health Behavior</i> 2000; <b>24</b>(4):268-280.</p> <p>Carty L. Working With Groups: Group Counseling and the Promotion of Mental Health. <i>The Journal for Specialists in Group Work</i> 1993; 18 (1): 29-39.</p> <p>Evans SW, Axelrod J, Langberg JM. Efficacy of a School-Based Treatment Program for Middle School Youth With ADHD: Pilot Data. <i>Behavior Modification</i> 2004; <b>28</b>(4):528-547.</p> <p>Farrell AD, Meyer AL, Dahlberg LL. Richmond youth against violence: A school-based program for urban adolescents. <i>American Journal of Preventive Medicine</i> 1996; <b>12</b>(5 Suppl):13-21.</p> <p>Farrell AD, Meyer AL, Sullivan TN, Kung EM. Evaluation of the Responding in Peaceful and Positive Ways (RIPP) seventh grade violence prevention curriculum. <i>Journal of Child and Family Studies</i> 2003; <b>12</b>(1):101-120.</p> <p>Jaycox LH, Reivich KJ, Gillham J, Seligman ME. Prevention of depressive symptoms in school children. <i>Behaviour Research &amp; Therapy</i> 1994; <b>32</b>(8):801-816.</p> <p>Keogh E, Bond FW, Flaxman PE. Improving academic performance and mental health through a stress management intervention: outcomes and mediators of change. <i>Behaviour Research &amp; Therapy</i> 2006; <b>44</b>(3):339-357.</p> <p>Klingman A, Hochdorf Z. Coping with distress and self harm: The impact of a primary prevention program among adolescents. <i>Journal of Adolescence</i> 1993; <b>16</b>(2):121-140.</p> <p>Lindsay P. Conflict Resolution and Peer Mediation in Public Schools: What Works? <i>Mediation Quarterly</i> 1998; <b>16</b>(1):85-99.</p> <p>Margalit M. Promoting classroom adjustment and social skills for students with mental retardation within an experimental and control group design. <i>Exceptionality</i> 1991; <b>2</b>(4):195-204.</p> <p>Metzler CW, Biglan A, Rusby JC, Sprague JR. Evaluation of a Comprehensive Behavior Management Program To Improve School-Wide Positive Behavior Support. <i>Education and Treatment of Children</i> 2001; <b>24</b>(4):448-479.</p> <p>Murray NG, Kelder SH, Parcel GS, Frankowski R, Orpinas P. Padres Trabajando por la Paz: a randomized trial of a parent education intervention to prevent violence among middle school children. <i>Health Education Research</i></p>	
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<p>1999; <b>14</b>(3):421-426.</p> <p>Orpinas P, Kelder S, Frankowski R, Murray N, Zhang Q, McAlister A. Outcome evaluation of a multi-component violence-prevention program for middle schools: The Students for Peace project. <i>Health Education Research</i> 2000; <b>15</b>(1):45-58.</p> <p>Quayle D, Dziurawiec S, Roberts C, Kane R, Ebsworthy G. The effect of an optimism and lifeskills program on depressive symptoms in preadolescence. <i>Behaviour Change</i> 2001; <b>18</b>(4):194-203.</p> <p>Reid MJ, Webster-Stratton C, Baydar N. Halting the development of conduct problems in head start children: the effects of parent training. <i>Journal of Clinical Child &amp; Adolescent Psychology</i> 2004; <b>33</b>(2):279-291.</p> <p>Roberts C, Kane R, Thomson H, Bishop B, Hart B. The prevention of depressive symptoms in rural school children: a randomized controlled trial. <i>Journal of Consulting &amp; Clinical Psychology</i> 2003; <b>71</b>(3):622-628.</p> <p>Roberts C, Kane R, Bishop B, Matthews H, Thomson H. The Prevention of Depressive Symptoms in Rural School Children: A Follow-up Study. <i>International Journal of Mental Health Promotion</i> 2004; <b>6</b>(3):4-16.</p> <p>Sandy SV, Boardman SK. The peaceful kids conflict resolution program. <i>International Journal of Conflict Management</i> 2000; <b>11</b>(4):337-357.</p> <p>Shaffer D, Garland A, Vieland V, Underwood M, Busner C. The impact of curriculum-based suicide prevention programs for teenagers. <i>Journal of the American Academy of Child &amp; Adolescent Psychiatry</i> 1991. <b>30</b>(4):588-96.</p> <p>Short JL. Evaluation of a substance abuse prevention and mental health promotion program for children of divorce. <i>Journal-of-Divorce-and-Remarriage</i> 1998; <b>28</b>(3-4):139-155.</p> <p>Skroban SB, Gottfredson DC, Gottfredson GD. A School-Based Social Competency Promotion Demonstration. <i>Evaluation Review</i> 1999; <b>23</b>(1):3-27.</p> <p>Simons-Morton B, Haynie D, Saylor K, Crump AD, Chen R. Impact analysis and mediation of outcomes: the Going Places program. <i>Health Education &amp; Behavior</i> 2005; <b>32</b>(2):227-241.</p> <p>Stevahn L. The Impact of a Cooperative or Individualistic Context on the Effectiveness of Conflict Resolution Training. <i>American Educational Research</i></p>	
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<p><i>Journal</i> 1996; <b>33</b>(4):801-823.</p> <p>Stevens V, de Bourdeaudhuij I, Van Oost P. Bullying in Flemish schools: an evaluation of anti-bullying intervention in primary and secondary schools. <i>British Journal of Educational Psychology</i> 2000; <b>70</b>(Pt 2):195-210.</p> <p>Verduyn CM, Lord W, Forrest GC. Social skills training in schools: an evaluation study. <i>Journal of Adolescence</i> 1990; <b>13</b>(1):3-16.</p> <p>Wise KL. Social Skills Training for Young Adolescents. <i>Adolescence</i> 1991; <b>26</b>(101):233-241.</p> <p>Cardemil, E.V., Reivich, K.J., &amp; Seligman, M.E.P. (2002). The prevention of depressive symptoms in low-income minority middle school students. <i>Prevention &amp; Treatment</i> (LINK: <a href="http://journals.apa.org/prevention/volume5/pre0050008a.html">http://journals.apa.org/prevention/volume5/pre0050008a.html</a>)</p>	
<p>Carpenter ES. Preschool children's awareness of others' needs: Prosocial responses toward children with and without disabilities. <i>Purdue University</i> 1994; Unpublished dissertation</p> <p>Moriarty B, Douglas G, Punch K, Hattie J. The importance of self-efficacy as a mediating variable between learning environments and achievement. <i>British Journal of Educational Psychology</i> 1995; <b>65</b>(1):73-84.</p> <p>Ross SM, Smith LJ, Madden NA, Slavin RE. Improving the Academic Success of Disadvantaged Children: An Examination of Success for All. <i>Psychology in the Schools</i> 1997; <b>34</b>(2):171-180.</p> <p>Mevarech ZR, Kapa E. The effects of a problem-solving based Logo environment on children's information processing components. <i>British Journal of Educational Psychology</i> 1996; <b>66</b>(2):181-195.</p>	<p>Focus is academic achievement</p>
<p>Colvin G, Sugai G, Good RH, III, Lee YY. Using Active Supervision and Precorrection to Improve Transition Behaviors in an Elementary School. <i>School Psychology Quarterly</i> 1997; <b>12</b>(4):344-363.</p> <p>Dumas JE, Prinz RJ, Smith EP, Laughlin J. The EARLY ALLIANCE prevention trial: an integrated set of interventions to promote competence and reduce risk for conduct disorder, substance abuse, and school failure. <i>Clinical Child &amp; Family Psychology Review</i> 1999; <b>2</b>(1):37-53.</p>	<p>Not a Controlled Trial or Systematic Review</p>

<p>Gould MS, Greenberg T, Velting DM, Shaffer D. Youth suicide risk and preventive interventions: A review of the past 10 years. <i>Journal of the American Academy of Child &amp; Adolescent Psychiatry</i> 2003; <b>42</b>(4):386-405.</p> <p>Greenberg MT, Kusche CA. Building social and emotional competence: The PATHS curriculum. <i>Jimerson, Shane R (Ed); Furlong, Michael (Ed)</i> 2006; (2006). Handbook of school violence and school safety:From.</p> <p>Reid JB, Eddy JM. Preventive efforts during the elementary school years: The Linking the Interests of Families and Teachers Project. <i>Reid, John B (Ed); Patterson, Gerald R (Ed); Snyder, James (Ed)</i> 2002; (2002). Antisocial behavior in children and adolescents:A.</p> <p>Tingstrom DH, Sterling-Turner HE, Wilczynski SM. The good behavior game: 1969-2002. <i>Behavior Modification</i> 2006; <b>30</b>(2):225-253.</p> <p>Wentzel KR. Understanding classroom competence: the role of social-motivational and self-processes. <i>Advances in Child Development &amp; Behavior</i> 2004; <b>32</b>:213-241.</p>	
<p>Conduct Problems Prevention Research G. Merging universal and indicated prevention programs: the Fast Track model. Conduct Problems Prevention Research Group. <i>Addictive Behaviors</i> 2000; <b>25</b>(6):913-927.</p> <p>Pietrucha CA. A social-cognitive intervention program: Toward the reduction of children's aggressive behavior through modification of social goals. <i>Dissertation Abstracts</i></p> <p>Twemlow SW, Fonagy P, Sacco FC. Modifying social aggression in schools. <i>Journal of Applied Psychoanalytic Studies</i> 2003; <b>5</b>(2):211-222.</p>	<p>Insufficient information/lacking data</p>
<p>DiGiuseppe R, Kassinove H. Effects of a rational-emotive school mental health program on children's emotional adjustment. <i>Journal of Community Psychology</i> 1976; <b>4</b>, 382-387.</p> <p>Schulman R C, Ford R C, Busk P. A Classroom Program To Improve Self-Concept.. <i>Psychology in the Schools</i>, 1973; 10 (4), 481-486.</p>	<p>Out dated study</p>
<p>Dirks S, Klein-Hessling J, Lohaus A. Entwicklung und Evaluation eines Stressbewaeltigungsprogrammes fuer das Grundschulalter. 1994 (gedruckt; Zeitschriftenaufsatz)</p>	<p>Reported in language other than English</p>

<p>Grantham-McGregor S. Can the provision of breakfast benefit school performance? <i>Food &amp; Nutrition Bulletin</i> 2005; <b>26</b>(2 Suppl 2):S144-S158.</p> <p>Meece JL, Anderman EM, Anderman LH. Classroom goal structure, student motivation, and academic achievement. <i>Annual Review of Psychology</i> 2006; <b>57</b>:487-503.</p> <p>Mukoma W, Flisher AJ. Evaluations of health promoting schools: a review of nine studies. <i>Health Promotion International</i> 2004; <b>19</b>(3):357-368.</p> <p>Rohrbeck CA, Ginsburg Block MD, Fantuzzo JW, Miller TR. Peer-Assisted Learning Interventions with Elementary School Studies: A Meta-Analytic Review. <i>Journal of Educational Psychology</i> 2003; <b>95</b>(2):240-257.</p> <p>Romney DM, Samuels MT. A meta-analytic evaluation of Feuerstein's Instrumental Enrichment program. <i>Educational and Child Psychology</i> 2001; <b>18</b>(4):19-34.</p> <p>Smith PK. Bullying and harassment in schools and the rights of children. <i>Children and Society</i> 2000; <b>14</b>(4):294-303.</p> <p>Sutherland KS, Wehby JH. Exploring the relationship between increased opportunities to respond to academic requests and the academic behavioral outcomes of students with EBD: A review. <i>Remedial and Special Education</i> 2001; <b>22</b>(2):113-121.</p> <p>Sutherland KS, Singh NN, Conroy M, Stichter JP. Learned Helplessness and Students with Emotional or Behavioral Disorders: Deprivation in the Classroom. <i>Behavioral Disorders</i> 2004; <b>29</b>(2):169-181.</p> <p>Yu, D.L. &amp; Seligman, M.E.P. (2002). Preventing depressive symptoms in Chinese children. <i>Prevention &amp; Treatment</i>,. (LINK: <a href="http://journals.apa.org/prevention/volume5/pre0050009a.html">http://journals.apa.org/prevention/volume5/pre0050009a.html</a> )</p>	<p>Not relevant</p>
<p>Gullo DF, Maxwell CB. The effects of different models of all-day kindergarten on children's developmental competence. <i>Early Child Development and Care</i> 1997; <b>139</b>:119-128.</p> <p>Sutherland KS, Singh NN, Conroy M, Stichter JP. Learned Helplessness and Students with Emotional or Behavioral Disorders: Deprivation in the</p>	<p>Age not stated</p>

Classroom. <i>Behavioral Disorders</i> 2004; <b>29</b> (2):169-181.	
Guneri OY, Coban R. The Effect of Conflict Resolution Training on Turkish Elementary School Students: A Quasi-Experimental Investigation. <i>International Journal for the Advancement of Counselling</i> 2004; <b>26</b> (2):109-124.	Developing Country

## Appendix 4 Search Strategy

### Medline search strategy

1	aggression/
2	Anger/
3	Antisocial Personality Disorder/
4	anxiety/
5	conduct disorder/
6	Crime/
7	depression/
8	juvenile delinquency/
9	mental disorders/
10	Social alienation/
11	suicide/
12	violence/
13	exp Child Abuse/
14	aggressive\$.ti,ab.
15	alienation.ti,ab.
16	anti-social behaviour.ti,ab.
17	anti-social behavior.ti,ab.
18	behavior disorder\$.ti,ab.
19	behaviour disorder\$.ti,ab.
20	behavior problem\$.ti,ab.
21	behaviour problem\$.ti,ab.
22	bullying.ti,ab.
23	conflict.ti,ab.
24	delinquency.ti,ab.
25	dysfunctional famil\$.ti,ab.
26	educational delay.ti,ab.
27	(impulsiveness or impulsivity).ti,ab.
28	isolation.ti,ab.
29	mental health problems.ti,ab.
30	parental absence.ti,ab.
31	parental permissiveness.ti,ab.
32	((peer adj influence) or (peer adj pressure)).ti,ab.
33	poor mental health.ti,ab.
34	poor parenting.ti,ab.
35	psychological problems.ti,ab.
36	exclusion.ti,ab.
37	truancy.ti,ab.
38	achievement/
39	assertiveness/
40	decision making/

41	<i>happiness/</i>
42	<i>health education/</i>
43	<i>health promotion/</i>
44	<i>parent-child relations/</i>
45	<i>personal autonomy/</i>
46	<i>problem solving/</i>
47	<i>self concept/</i>
48	<i>self efficacy/</i>
49	<i>social adjustment/</i>
50	<i>social behavior/</i>
51	<i>anti-bullying.ti,ab.</i>
52	<i>(academic success or achievement).ti,ab.</i>
53	<i>assertiveness.ti,ab.</i>
54	<i>attentiveness.ti,ab.</i>
55	<i>autonomy.ti,ab.</i>
56	<i>communication skills.ti,ab.</i>
57	<i>conflict resolution.ti,ab.</i>
58	<i>(coping adj (behaviour\$ or behavior\$ or skill or skills or mechanism\$ or ability or abilities)).ti,ab.</i>
59	<i>discipline.ti,ab.</i>
60	<i>(emotional adj (adjustment or skills or learning or competence)).ti,ab.</i>
61	<i>empowerment.ti,ab.</i>
62	<i>happiness.ti,ab.</i>
63	<i>(health adj promoting).ti,ab.</i>
64	<i>good relation\$.ti,ab.</i>
65	<i>mental health.ti,ab.</i>
66	<i>parenting program\$.ti,ab.</i>
67	<i>parenting skill\$.ti,ab.</i>
68	<i>problem solving.ti,ab.</i>
69	<i>safe environment.ti,ab.</i>
70	<i>(self-confidence or self-determination or self-esteem or self-identity).ti,ab.</i>
71	<i>(social adj (adjustment or behaviour or behavior or skills or integration or learning)).ti,ab.</i>
72	<i>((well adj being) or wellbeing).ti,ab.</i>
73	<i>resilience.ti,ab.</i>
74	<i>(reduc\$ stress or minimi\$ stress).ti,ab.</i>
75	<i>involvement program\$.ti,ab.</i>
76	<i>involvement strat\$.ti,ab.</i>
77	<i>((promot\$ or increas\$) adj safety).ti,ab.</i>
78	<i>or/1-77</i>
79	<i>schools/</i>
80	<i>(pupil or pupils or schoolchildren).ti,ab.</i>
81	<i>((primary adj school) or (primary adj schools)).ti,ab.</i>
82	<i>((elementary adj school) or (elementary adj schools)).ti,ab.</i>
83	<i>classroom\$.ti,ab.</i>
84	<i>((junior adj school) or (junior adj schools)).ti,ab.</i>

85	<i>or/79-84</i>
86	<i>78 and 85</i>
87	<i>review.ab. or review.pt.</i>
88	<i>meta-analysis.ti,ab,pt.</i>
89	<i>(letter or editorial or comment).pt.</i>
90	<i>(87 or 88) not 89</i>
91	<i>86 and 90</i>
92	<i>animals/ not (humans/ and animals/)</i>
93	<i>91 not 92</i>
94	<i>limit 93 to (english language and yr="1990 - 2007")</i>
95	<i>clinical trial.pt.</i>
96	<i>(randomized or randomised).ti,ab.</i>
97	<i>placebo.ti,ab.</i>
98	<i>randomly.ti,ab.</i>
99	<i>trial.ti,ab.</i>
100	<i>or/95-99</i>
101	<i>86 and 100</i>
102	<i>animals/ not (humans/ and animals/)</i>
103	<i>101 not 102</i>
104	<i>limit 103 to (english language and yr="1990 - 2007")</i>
105	<i>86 not (91 or 101)</i>
106	<i>animals/ not (humans/ and animals/)</i>
107	<i>105 not 106</i>
108	<i>limit 107 to (english language and yr="1990 - 2007")</i>
109	<i>from 94 keep 1-372</i>
110	<i>from 104 keep 1-709</i>
111	<i>from 108 keep 1-3852</i>

## Appendix 5 Screening tool for studies of interventions for promoting the mental wellbeing of children

Author & date				
Checked by				
	Selection criteria	Yes	No	Not clear (order a full paper)
1	Is the article concerned with evaluation of the effectiveness of approaches/interventions designed to promote the mental wellbeing of children in primary school (education settings)			
2	Are the intended outcomes of the approaches /interventions clearly specified covering: a) Knowledge, skills of children b) Behaviours (eg bullying) and mental health conditions; and indicators of wellbeing c) Changes in parents, teachers, school support staff or other groups d) School systems & environment (note: scope definition of mental wellbeing <sup>3</sup> )			
3	Is the article based on review-level evaluative research that includes a minimum of: a) named database searched b) dates other which it was searched c) search term used			
	Is the article based on trial evaluation using a) randomised control design b) non-randomised control design			
	Are the approaches/interventions targeted at individual children who are 'at risk' or who have a mental health condition or problem (note: this can include children in transition to primary education, or in transition to secondary education)			
	Are the approaches /interventions addressing the whole school population and covering aspects of the school systems and environment (note: includes universally offered class-room interventions)			
	Are the article/s concerned with the cost effectiveness of the approaches/interventions			
4	Are the approaches interventions Focused on children preschool, or secondary school age Set in developing countries In language other than English Focused on pharmacological interventions			

<sup>3</sup> Mental wellbeing outcomes:

- emotional wellbeing (including happiness and confidence, and the opposite of depression)
- psychological wellbeing (including autonomy, problem solving, resilience, attentiveness/involvement)
- social wellbeing (good relationships with others, and the opposite of conduct disorder, delinquency, interpersonal violence and bullying).



	To be included the article should meet: 1 and 2, any element of 3. It is excluded if any of 4 is met.			
5	Is the article relevant to the development the guidance: specify			

## Appendix 6 PENN and FRIENDS studies.

1. Lowry-Webster HM, Barrett P.M, Dadds MR. A universal prevention trial of anxiety and depressive symptomatology in childhood: Preliminary data from an Australian study. *Behaviour Change* 2001;**18**:36–50.
2. Lowry-Webster HM, Barrett PM, Dadds MR. A universal prevention trial of anxiety symptomatology during childhood: Results at one-year follow-up. *Behaviour Change* 2003;**20**:25–43.
3. Gillham, JE & Reivich KJ. Prevention of depressive symptoms in schoolchildren: A research update. *Psychological Science* 1999;**10**:461-462.  
(LINK: <http://www.blackwell-synergy.com/toc/psci/10/5>)

Details/finding	Lowry-Webster <i>et al</i> (2001, 2003) The FRIENDS programme	Gilliam and Reivich (1999) The Penn Resiliency Program (PRP)
Design	RCT	Controlled studies with a pretest-posttest design.
Location	Brisbane Metropolitan area in Australia	USA
Objective	Evaluation of universal prevention of anxiety and depression symptomatology	To evaluate the Penn Resiliency Program (PRP) is a school-based intervention curriculum designed to build resilience, promote adaptive coping skills, and teach effective problem solving.
Sample size	594 children	118 children
Typology (See Table 5)	2a, 3c	2a
Quality grading (See Table 3)	+	+
Population	-Children aged 10-13 years (grades 5-7). -No information on the % of students who are ≤12 y -47% males -Catholic schools in Brisbane Metropolitan area	Fifth and sixth graders. This inevitably means that there is a proportion of students who are at Middle school i.e. not in a primary school (inclusion criteria for including a trial is the population is 50% of the population aged less than 12 y. This study is included because we have no specific information of the age of the students.
Intervention	-The intervention is based on cognitive behavioural intervention (CBT) programme FRIENDS.  - Pre intervention assessment took place in class time and done by postgraduate psychology students	-The PRP is a manual-based intervention comprised of 90-minute group sessions, for 10 weeks.  -The curriculum teaches cognitive-behavioural and social problem-solving skills

Details/finding	Lowry-Webster <i>et al</i> (2001, 2003) The FRIENDS programme	Gilliam and Reivich (1999) The Penn Resiliency Program (PRP)															
	with standard instructions. They read aloud the instruction and the questions to all participating children. - A ten session implemented as part of the school curriculum. - Teacher training involved an intensive full day workshop. - Trained classroom teachers conducted three parents sessions in the schools, at a separate time of children programme	- Students are encouraged to identify and challenge negative beliefs, use evidence to make more accurate appraisals of situations and events, and to use effective coping mechanisms when faced with adversity. In addition to the cognitive-behavioural component, students learn techniques for assertiveness, negotiation, decision-making, and relaxation.															
Comparator(s)	The comparison groups received no intervention but were told they would be contacted for monitoring in 10 weeks and at 1 year.	No intervention comparator															
Outcome measure(s) reported and validity of the measures	Self reports and diagnostic interviews at pre and post intervention. - Spence Children Anxiety Scale (SCAS) - Revised Children's Manifest Anxiety Scale (RCMAS) - Children Depression Inventory (CDI) - Child Behaviour Checklist (CBCL) to complete by parents	- Children Depression Inventory (CDI) - Composite negative score (CN) - Children Attributional Style Questionnaire (CASQ)															
Duration of intervention Length and /Follow up	Post intervention and twelve months follow up	36 months follow up after the intervention that lasted 10weeks.															
Findings	- Diagnostic interviews: (85%) of children in intervention who score above the clinical cut off point for anxiety and depression were diagnosis free in the intervention at 12 months compared with (31.2%) in the control $p < .01$ . - Positive acceptability of children, parents and teachers. - No significant effects were found on parents rated CBCL internalising scale from pre to post. - Risk status at 12 months on SCAS from pre to 12 months follow up control 12.2% (control) v 3.8% (intervention), $p < 0.01$ . - Reporting the results is not clear. Checking the results with the authors is needed. Probable effect on anxiety in the universal analysis and also an effect on high risk groups.	<table> <tr> <th></th><th><u>Intervention</u></th><th><u>Control</u></th></tr> <tr> <td>- <b>Explanatory style</b> Baseline for CN Mean (SD)</td><td>7.49 (2.63)</td><td>8.28 (2.76)</td></tr> <tr> <td>- <b>Explanatory style</b> 36 months for CN Mean (SD)</td><td>7.51 (3.33)</td><td>10.21 (3.57)</td></tr> <tr> <td>- <b>Depressive symptoms</b> Baseline for (CDI)</td><td>9.1 (6.68)</td><td>10.1 (6.92)</td></tr> <tr> <td>% scoring &gt;14</td><td>24%</td><td>24%</td></tr> </table>		<u>Intervention</u>	<u>Control</u>	- <b>Explanatory style</b> Baseline for CN Mean (SD)	7.49 (2.63)	8.28 (2.76)	- <b>Explanatory style</b> 36 months for CN Mean (SD)	7.51 (3.33)	10.21 (3.57)	- <b>Depressive symptoms</b> Baseline for (CDI)	9.1 (6.68)	10.1 (6.92)	% scoring >14	24%	24%
	<u>Intervention</u>	<u>Control</u>															
- <b>Explanatory style</b> Baseline for CN Mean (SD)	7.49 (2.63)	8.28 (2.76)															
- <b>Explanatory style</b> 36 months for CN Mean (SD)	7.51 (3.33)	10.21 (3.57)															
- <b>Depressive symptoms</b> Baseline for (CDI)	9.1 (6.68)	10.1 (6.92)															
% scoring >14	24%	24%															

Details/finding	Lowry-Webster <i>et al</i> (2001, 2003) The FRIENDS programme	Gilliam and Reivich (1999) The Penn Resiliency Program (PRP)
		<p><b>Depressive symptoms</b></p> <p>36 months for 7.7 (6.11) 9.2 (7.48) (CDI)</p> <p>% scoring &gt;14 18% 22%</p> <p>Significant differences in favour of the intervention in explanatory style were reported in both short and long-term follow up. A significant difference effect in favour of the intervention was reported only in short term.</p>
Reported adverse effect Reported	-	-
Barriers/Facilitators/Advantages/ Disadvantages of the programme	<ul style="list-style-type: none"> <li>- No significant departures from the programme were noted following random videotaping demonstrating the programme was reasonably implemented.</li> <li>-Acceptability was measured in children, parents (who attended) and teachers which proved positive in all and particularly in teachers.</li> <li>-No information about the cost of implementing the programme.</li> <li>-No differences found between males and females.</li> <li>-The study reported that due to high cost associated with diagnostic interviews, only those at risk for both anxiety and depression were conducted.</li> <li>-Parents attendance was very low.</li> <li>-It was reported that data would have been better collected not by those involved in the trial to avoid bias.</li> </ul>	The cost of implementing a 90-minute group sessions, for 10 weeks was not considered. Teachers satisfaction with the programme was not stated.
Impact A,B,C,D (see Table 7)	B	B
Applicability a,b,c,d (SeeTable 4)	b	b
Authors' conclusion of the of the trials	Positive benefits of a CBT based programme when implemented by existing school staff (trained	Improvement in explanatory style for negative events was only significant at 12 month follow-up.

Details/finding	Lowry-Webster <i>et al</i> (2001, 2003) The FRIENDS programme	Gilliam and Reivich (1999) The Penn Resiliency Program (PRP)
	teachers) to reduce levels of anxiety and depression. At 12 months follow up. Intervention gains were maintained as measured by self reports and at interviews. In the intervention group 85% of children who were scoring above the clinical cut-off for anxiety and depression were diagnosed free in the intervention group compared to only 31.2% of the children in the control group.	Depressive symptoms decreased significantly from pre-intervention to post-intervention in the intervention group relative to the control group.

## Appendix 7 Quality assessment

Trial	1	2	3	4	5	6	7	8	9	10	11	12	Quality Rating
Lowry-Webster (2001 and 2003)	√√√	√√√	0	0	√√	√√	√√		0	√√	√√√	0	+
Gilliam and Reivich (1999)	√√√	NA	0	0	√√	√√	√√	42% in intervention 45% in control*	0	√√	0	0	+

\* However, no significant difference of differential attrition was found between the intervention and the control groups on demographic variables and questionnaire scores obtained at baseline.