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Title

Non pharmacological interventions for Attention-Deficit/Hyperactivity Disorder (ADHD) delivered in school settings: A systematic review of quantitative and qualitative research

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2. Background

2.1 Description of the condition

Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder characterised by age-inappropriate levels of inattention, hyperactivity and impulsivity[1]. These behaviours are present early in life and cause impairment before age seven years[2]. Historically, this behaviour was considered the result of brain damage or 'minimal brain dysfunction' (MBD). However, research into the causes of behaviour problems in childhood during the twentieth century left this explanation unsubstantiated[3]. Several causal factors have been suggested to contribute to the onset and maintenance of ADHD. These include genetic factors, psychosocial factors, complications in pregnancy and delivery, environmental factors such as prenatal cigarettes or alcohol and diet[4-6]. Heritability is a major factor and appears to contribute approximately 75% of the aetiology of ADHD [7]. No large single gene effect has been isolated but the DRD4 and DRD5 genes appear to be involved[8].

The conception of ADHD as a behavioural disorder has changed over time and differs between locations. In the 1970s, ADHD was known as hyperkinesis; and in the 1980s, as Attention Deficit Disorder (ADD). ADD could be diagnosed with or without hyperactivity. Currently, the condition is referred to as ADHD, although different diagnoses can be made. The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)[9] divides ADHD into three subtypes according to the nature of the symptoms. These are: 1) a predominantly inattentive subtype (ADHD-Inattentive); 2) a predominantly hyperactive-impulsive subtype (ADHD-Hyperactive-Impulsive); and 3) a combined inattentive and hyperactive-impulsive subtype (ADHD-Combined). The International Classification of Diseases (ICD-10) chooses to refer to developmentally inappropriate levels of inattention, hyperactivity and impulsivity as hyperkinetic disorder[10]. The diagnosis for hyperkinetic disorder is more restrictive and inattention, hyperactivity and impulsivity must all be present; so it represents a more extreme subsample of the DSM-IV 'combined-type' ADHD. Still in Europe 'ADHD' has become the diagnostic phrase most commonly used in practice, even when the more restrictive ICD criteria are being used.

Attention-deficit hyperactivity disorder (ADHD) is one of the most common mental health disorders in childhood. The worldwide prevalence of ADHD is estimated at 5% for children under 18 years of age[11], with 3-16% of children displaying symptoms of ADHD[12]. Prevalence in the UK was found to be 3.62% for boys and 0.85% for girls, in a sample of over 10,000 children aged 5-15[13]. Although boys are more commonly identified than girls, the ratio varies between two to nine boys to one girl, depending on the ADHD type[9] and whether prevalence is based on clinical or epidemiological populations[14]. Age differences and socio-economic status have also shown to be associated with prevalence [15]. Although prevalence does decline with age, a significant number of young people will continue to experience symptoms into adulthood[4].

Children with ADHD can have academic impairments, social dysfunction and low self-esteem ([16-17]). ADHD is frequently comorbid with other developmental disorders, including conduct disorder and oppositional defiance disorder[18] and mental health disorders such as anxiety and depression[14,5]. Those with ADHD are more likely to underachieve educationally, are less likely to be employed full time, and more likely to have a low household income than age and gender matched controls[19]. Many children with ADHD have difficulties with social interaction, affecting their relationship with their parents, relatives, and friends, as well as practitioners at school[20]. As many as two in three of all individuals with ADHD in the general population meet criteria for at least two additional DSM-III-R diagnoses, meaning that young children with ADHD often experience several different types of psychiatric/developmental problems[21].

At present, the most common approaches to the treatment of ADHD are medication and/or psychological or behavioural interventions. The most frequently used treatments, and those with the largest evidence-base, are the stimulant medications, methylphenidate and dexamfetamine[22], but they remain controversial[23]. Meta-analyses of stimulant medications have shown them to be effective in decreasing the symptoms of behaviour and inattention although their effectiveness on cognition and achievement are more modest[24-25]. However, the effects do not appear to last once stimulants are no longer used[26] and as many as 30% of children do not respond to stimulants[27]. Stimulants are associated with side effects such as decreased appetite, weight loss, insomnia, stomach ache, headache and irritability[28]. There are also concerns that stimulants may also cause longer term adverse effects such as decreased growth, an increased risk of substance abuse, and may worsen comorbid symptoms such as tics[5]. While it is widely accepted that intervention in ADHD should be based on multimodal treatment[28], some research has suggested that adding psychosocial interventions to medication does not improve outcomes significantly[29-30].

Because of its prevalence and at times refractory course, childhood ADHD results in considerable costs for society[31]. Several studies of the cost effectiveness of pharmacological ADHD interventions have been undertaken. In the United Kingdom, Gilmore and Milne[32] examined the cost effectiveness of different medications from the perspective of the National Health Service (NHS), finding methylphenidate to be the most cost-effective. The UK National Institute of Clinical Excellence (NICE) estimated the cost per quality-adjusted life year (QALY) gained by methylphenidate at £9,200 to £14,600[33]. Cost effectiveness studies have compared medication to behavioural treatment and combined treatments, often finding in favour of medication alone (e.g. ref. 34). By comparison there is a lack of reported cost effectiveness studies of school based non-pharmacological interventions for ADHD.

2.2 Interventions

Non-pharmacological interventions are an important part of any comprehensive plan for the treatment of ADHD[28]. They can take the form of behavioural, cognitive, social skills and academic interventions, and be delivered through the parents, teachers or other professionals or be directly child-focussed.

Large reviews have considered a range of psychosocial ADHD interventions, including the effectiveness of school-based interventions for ADHD. Meta-analysis has shown that contingency management strategies and academic interventions are more effective for behaviour change than cognitive behavioural strategies[35]. SIGN's[36] national clinical guideline reports that short term effects of school interventions are limited to the period when the intervention is in effect. Abramowitz and O'Leary [37] found that a range of educational changes can increase concentration levels in students with ADHD. Although in the short term school-based behavioural interventions can improve targeted behaviours, they have been found less useful in reducing the core symptoms of ADHD, including inattention, hyperactivity or impulsivity[29]. Individual differences in the expression of ADHD across children means that the SIGN guideline recommends individualised school intervention programmes including behavioural and educational interventions [36].

The NICE clinical practice guideline[38], developed after a large systematic clinical review, found that teacher-led interventions, such as giving effective commands, have large beneficial effects on conduct problems of children with ADHD. The guideline recommended that the Department for Education should consider providing more education to trainee teachers about ADHD by working with the Teaching Agency and relevant health service organisations to produce training programmes and guidance for supporting children with ADHD and then teachers who have received training about ADHD and its management should provide behavioural interventions in the classroom to help children and young people with ADHD. NICE recommend further research into the effect of providing training in behavioural management of ADHD for teachers, and the effectiveness of interventions by subtype of ADHD, as well as the identification and referral in schools of children with ADHD-related problems.

DuPaul and Eckert's[35] meta-analysis of school based interventions in ADHD is a rare example of a review focussed specifically on interventions in the school setting. The meta-analysis indicated that school-based interventions for children with ADHD lead to significant behavioural effects, although this review is now very dated. Academic and contingency management interventions appeared to be more effective than cognitive-behavioural interventions for improving classroom behaviour. Pelham and Fabiano's[39] literature review considered psychosocial treatments including those in settings outside of school, such as parent training. The general effectiveness of behavioural treatments in various settings including schools was the subject of a more recent meta-analysis[31]. The majority of included studies were not located in schools. But the meta-analysis concluded that behavioural modification was highly effective. The meta-analysis did not include effect sizes for school based interventions alone and did not give published effect sizes for different outcome measures across all study types. The outcome measure appears to be important in determining the effect of school-based interventions. Pelham et al.[40] compared a contingency management intervention to methylphenidate or both treatments and reported effect sizes that were four to five times greater for the effectiveness of the educational intervention for classroom rule violations than for teacher ratings of ADHD behaviours.

A key concern for this review is to identify the key components of both teacher-delivered and wider non-pharmacological interventions taking place in this setting, and to be able to specify which are most effective, as well as to explore which complex factors within a school can contribute to or limit their success through the explicit systematic inclusion of qualitative research. We aim to produce an overarching narrative synthesis that draws on both quantitative and qualitative research evidence.

2.3 Why is this review important?

Non-pharmacological interventions are an important part of any comprehensive plan for the treatment of ADHD. They can take the form of behavioural, cognitive, social skills and academic approaches, and be delivered through parents, teachers or other professionals. As outlined above, few published reviews have considered the effectiveness of non-pharmacological interventions. Furthermore a gap remains for a systematic review that considers the effectiveness, cost effectiveness and associated factors for such non-pharmacological interventions that are delivered in school settings.

Evidence of the effectiveness and cost-effectiveness of these interventions within a school setting can identify implications for commissioning of appropriate services. Our approach, which will include identification of the contribution, mechanisms and barriers and facilitators of outcome from multi-component interventions, will provide a more specific and valuable basis for the development of policy in this area than has been available before.

The results of this review offer the potential to recommend particular components of interventions for use in particular school contexts. Through a more detailed consideration of the component parts of effective and ineffective interventions,

which has been neglected in the reviews cited above, more informed implications for practice can be given. Through considering relevant qualitative research this review will be able to offer interpretation of why particular interventions are effective and what factors operate as catalysts and barriers to efficacy. The review can also identify any significant areas of uncertainty with regard to school-based interventions for ADHD and recommend future research needed to address them.

3. Objectives and research questions

The aim of this systematic review is to evaluate non-pharmacological interventions delivered in school settings for children with, or at risk of, ADHD and, crucially, to explore the factors that may enhance, or limit, the beneficial delivery of such interventions.

The review will address the following research questions:

1) What are the effects of non-pharmacological interventions for ADHD delivered in the school setting on ADHD behaviour and social and academic functioning in children with or at risk of ADHD?

2) What is the cost-effectiveness of non-pharmacological interventions for ADHD delivered in the school setting?

3) What are the factors that may enhance, or militate against, the success of ADHD interventions in school settings?

4) How do schools best contribute to the effectiveness of non-pharmacological interventions for children with ADHD, in school settings?

5) What are the effects of such interventions on other aspects of social, family or institutional functioning?

4. Organisation of reviews

The project will have five components brought together with an overarching narrative synthesis. There will be four systematic reviews and a mapping exercise. We will undertake two quantitative reviews of the effectiveness and cost effectiveness of relevant interventions, and two reviews of qualitative research to explore the experience of ADHD in school among children, their parents and teachers, and the attitudes and experiences of parents, children, teachers and others involved in delivery, towards specific ADHD interventions in schools. The mapping exercise will consider the nature of included interventions and seek to understand similarities and differences between identified programmes, allowing us to understand the types of components of interventions related to effectiveness.

4.1 Narrative synthesis

We will use formal methods of narrative synthesis outlined by Popay and colleagues[41] to bring together the findings of the qualitative and quantitative reviews. Narrative synthesis is a method of synthesising quantitative and qualitative findings about effectiveness *and* implementation and which relies on text to "tell the story" of such findings[41,42]. A number of possible tools and techniques are offered as mechanisms for manipulating, analysing and comparing the results of studies from studies in a review. We will select the appropriate approaches in response to the identified findings. A 'theory of change', which may be explicit or implicit in the intervention descriptions, will be identified which relates to how, why and for whom an intervention works. The narrative synthesis' focus upon intervention's theory of change can contribute to the interpretation

of both the quantitative and qualitative reviews' findings and will be valuable in assessing how widely applicable those findings may be[41].

A descriptive paragraph on each study may be the starting point for the preliminary synthesis. This is produced so that the same information, recorded in the same order, is given for each study. To facilitate this step, a number of additional strategies may be used, such as grouping the studies according to elements such as study design, the type of intervention under study, its context, populations, type of outcome measures and so on. Tabulation can also assist synthesis, and data extracted from included studies may be tabulated to produce the initial descriptions. For numeric data, information will be presented in a common rubric where possible (for example, all results expressed as odds ratios).

Differences in study results, whether from quantitative or qualitative research, may be explained by heterogeneity in study participants, outcomes or design. The theory of change developed at the beginning of the project may help plausible explanations for such differences to be constructed. For quantitative studies, results may be plotted in a number of different ways to assist the exploration of relationships between findings and study aspects such as population or study design. Traditional tools used to pool data through meta-analysis, such as forest plots (to present individual study, and pooled effect sizes), l'Abbe plots (plotting event rates in the treatment group against those in the control group) and funnel plots (whose plots of study size and treatment effect can be used to explore potential publication bias), are seen as part of this process.

Various techniques can be used to explore within-study and between-study relationships. Visual tools include ideas webbing (spider diagrams) and concept mapping (using diagrams and flow charts to represent relationships between and within studies that are being explored by the reviewer), and textual case descriptions, and triangulation (to consider how methodological and theoretical approaches may have impacted on the outcomes). The exact choices of methods will be developed through the synthesis process and reasons for our choices recorded and reported.

This protocol outlines the methods for the quantitative reviews and qualitative reviews separately. Within the sections below, focussing on the quantitative and qualitative reviews respectively, inclusion criteria are considered separately for each review. The review methods are considered together for the quantitative and qualitative reviews, differences across each individual review being highlighted in these sections.

5. Quantitative reviews

The two quantitative reviews address the research questions:

1) What are the effects of non-pharmacological interventions for ADHD delivered in the school setting on ADHD behaviour and social and academic functioning in children with or at risk of ADHD?

2) What is the cost-effectiveness of non-pharmacological interventions for ADHD delivered in the school setting?

5.1 Methods

Firstly the inclusion criteria for *review 1: The effectiveness of non-pharmacological interventions delivered in the school setting for children with or at risk of ADHD*, is outlined:

5.1.1 Review 1 Inclusion criteria for considering relevance of studies

Study design

Designs that will be included are randomised controlled trials (RCTs), quasi randomised controlled trials, cluster randomised controlled trials and other comparative study designs including within-subjects. Given the barriers to using RCTs in the school-based setting of the interventions and studies we will commence the review with the widest feasible scope in terms of study design.

Population

Children aged between 4 and 18 years, with or at risk of ADHD.

Children and adolescents with ADHD will have been diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) or Hyperkinetic Disorder according to established diagnostic criteria: ADHD or ADD as determined by DSM-III[43-44] or DSM-IV criteria[45,1]; Hyperkinetic Disorder as determined by ICD-9 or ICD-10 criteria[46].

Children and adolescents at risk of ADHD will be defined by scores above a defined cut-off point about a validated, standardised measure such as Conner's rating scale[47], Child behaviour checklist (CBCL[48]), Strengths and Difficulties Questionnaire (SDQ[49]), SNAP ADHD total[50], Dupaul ADHD rating scale[51] and the Rutter A scale[52].

Children with ADHD commonly have co-morbid psychological and learning difficulties. Studies on children with co-morbid difficulties will be included but we may stratify our results if the analysis suggests that impact may vary with co-morbidity. Studies which described participants as having mental retardation (i.e., IQ < 70) or brain damage will be excluded.

Interventions

Non-pharmacological interventions delivered to children with or at risk of ADHD with at least some unique elements delivered in an educational setting. The aim of the intervention will be to affect child-focussed outcomes related to core ADHD symptoms, and socio-emotional and academic competence. Examples of relevant interventions include Incredible Years Classroom Dina course[53], The Good Behaviour Game[54] and Place2Be[55]. Interventions may be received indirectly, for instance teachers may attend training intended to affect their teaching of children with ADHD or curriculum may be altered.

Comparators

Children aged between 4 and 18 years, with or at risk of ADHD as defined above who experience any comparator will be considered e.g. pharmacological, non-pharmacological out of school, treatment as usual, no intervention.

Outcomes

ADHD behaviour, social and academic functioning, effects on parent, carer and teacher outcomes, more specifically:

A change in the child's ADHD symptom-related behaviour as measured by validated scales such as the Conner's rating scale[47], or Strengths and Difficulties Questionnaire (SDQ[49]).

Changes in the child's general behaviour; for example, measured on Child Behaviour Checklist[48] or specific school behaviour, eg expulsions.

Academic achievement of children as measured through school test results or general tests of language or development

Changes in ADHD related behaviour, such as concentration, restlessness etc measured by non-validated methods.

Social skills and emotional competences in school or at home, measured at post-treatment and longest follow-up, by well-established and validated instruments, for example, Social Skills Rating System (SSRS[56]) or Conners' CBRS[57].

Non-validated ratings of ADHD symptoms by parent, carers or teachers.

Other inclusion and exclusion criteria: Language, date, location

No language restrictions will be applied.

Only studies published and unpublished research conducted from 1980s onward will be included. In the third edition of DSM published in 1980[43], the name of the disorder was changed to Attention Deficit Disorder (ADD), and its definition included the assumption that attention difficulties may be independent of impulse problems and hyperactivity. This is also reflected in the subtypes of DSM-IV[45]. Before 1980 the definition of the disorder was more focussed on hyperactivity alone.

All educational settings will be included e.g. mainstream schools, special schools, pupil referral units and specialist educational units within mainstream. However, we will consider the transferability of results from non-UK educational systems and may exclude studies for this reason at the full-text stage if the comparison to UK educational settings is deemed low by experts within the review team.

5.1.2 *Review 2 (The cost-effectiveness of non-pharmacological interventions for children with or at risk of ADHD delivered in the school setting)* Inclusion criteria for considering relevance of studies

Study design

Full cost-effectiveness analyses, cost–utility analyses, cost–benefit analyses and cost–consequence analyses will be included. Stand alone UK cost analysis will also be sought and appraised. Non-randomised studies will be included (e.g. decision-model based analysis or analysis of person-level cost and effectiveness data alongside observational studies).

Research using study designs as specified for review 1 will be included where an element of the analysis considers cost-effectiveness.

Population

As for review 1

Interventions

As for review 1

Comparators

As for review 1

Outcomes

Included studies will measure cost-effectiveness. Given that findings will be synthesised narratively, specific or directly comparable cost-effectiveness measures or additional analyses will not be sought. We will rely on the authors' conclusions in the primary publication regarding the cost effectiveness of particular interventions. Intervention effectiveness outcomes are as for review 1

Other inclusion and exclusion criteria: Language, date, location

As for review 1

5.2 Quantitative reviews search method

Search strategy

A search strategy will be developed, based upon our scoping searches and previous relevant systematic reviews, to access the literature. The strategies will use a mixture of resource specific, controlled syntax (index terms), as well as the use of free-text to capture broader concepts and those themes which are less well defined as a taxonomy. The search strategies will be extensively tested in our suggested portfolio of resources and will be reviewed by experts amongst the review team. See appendix I for latest draft of search strategy.

Relevant papers to inform the quantitative reviews will be identified in the following ways:

Electronic database searches

Citation searches of papers included on full-text screening

Hand searching of key journals (e.g. Journal of Child Psychology and Psychiatry, British Educational Research Journal, Journal of School Psychology, Journal of Attention Disorders, ADHD Attention Deficit and Hyperactivity Disorders)

Personal/Expert contact

References checking on topic specific websites

The search for review 1 and review 2 will occur together, therefore the search will need to include economic evaluation filters and databases that may contain relevant studies of cost effectiveness.

Electronic Databases

Scoping searches have been undertaken to gauge the volume of the literature and to assess the quality of returns. The social science/educational field contains a diverse literature, appearing in various databases and in various states of quality[58].

Accordingly, we propose a search approach which will use a mixture of educational and social science resources, as well as some of the core medical databases to cover the non-pharmacological, but nevertheless medically indexed interventions, relevant for this review. The precise list of resources, and their updating parameters, will be confirmed in consultation with NIHR but based on our scoping searches, we propose:

Applied Social Sciences Index and Abstracts (ASSIA) via CSA

Australian Education Index via Dialog

British Education Index via Dialog

Conference Proceedings Citation Index (CPCI-S) / Conference Proceedings Citation Index- Social Science & Humanities (CPCI-SSH) via ISI

Education Research Complete via Ebsco*

Education Resources Information Centre (ERIC) via Dialog

EMBASE via Ovid

Health Management Information Consortium (HMIC)*

Medline In-process via Ovid

Medline via Ovid

NCJRS (National Criminal Justice Reference Service) via CSA

PsycINFO via Ovid

Science Citation Index Expanded (SCI – Expanded)/ Social Sciences Citation Index (SSCI) via ISI

Social Policy and Practice via Ovid*

Social Service Abstracts via CSA*

Sociological Abstracts via CSA

The Campbell Collaboration*

The Cochrane Library

* denotes a resource with strong access to grey, or hard-to-locate, literature.

The following web-based resources will also be searched to locate grey-literature and unpublished reports, as well as any on-going trials of educational interventions.

ADHD in Practice - http://www.haywardpublishing.co.uk/adhd.aspx

Association for Child and Adolescent Mental Health (formerly Association for Child Psychology and Psychiatry)

BL (British Library) Direct

ClinicalTrial.gov

Current Educational Research in the United Kingdom (CERUK)

Educational Evidence Portal (EEP)

Eppi-Centre database for educational research

Google

Health Services Research Projects in Progress

Institute of Education (IOE) Repository

MetaRegister - http://www.controlled-trials.com/mrct/

National Foundation for Educational Research (NFER)

National Institute for Health Research (NIHR)

National Institute for Health and Clinical Excellence – http://www.nice.org.uk/

Teaching and Learning Research Programme (TLRP)

Finally, we will search the following websites and electronic resources which may include relevant unpublished data, or links to relevant citations:

ADDISS (Attention Deficit Disorder Information and Support Service) - http://www.addiss.co.uk/index.html

ADHD Foundation - http://www.adhdfoundation.org.uk/index.php

American Psychological Association (APA) ADHD topic section - http://www.apa.org/topics/adhd/index.aspx

BL Catalogue - http://catalogue.bl.uk/F/?func=file&file_name=login-bl-list

Centers for disease prevention and control - http://www.cdc.gov/ncbddd/adhd/

Centre for Excellence and outcomes in Children and young People's Services (C4EO) - http://www.c4eo.org.uk/about/default.aspx

Children and Adults with Attention Deficit/Hyperactivity Disorder (CHADD) - http://www.chadd.org/home.htm

Child and Mental Health Observatory - http://www.chimat.org.uk/camhs

CUREE (Centre for the Use of Research and Evidence in Education) - http://www.curee-paccts.com/

Department for Education - http://www.education.gov.uk/

Economic and Social Research Council (ESRC) - http://www.esrc.ac.uk/

George Still Forum (National Paediatric ADHD Network Group) - http://www.georgestillforum.co.uk/

Hyperactive Children's Support Group (HACSG) - http://www.hacsg.org.uk/

Learning Assessment & Neurocare Centre - http://www.lanc.uk.com/

National Children's Bureau (NCB) - http://www.ncb.org.uk/default.aspx

PROSPERO, an international database of prospectively registered systematic reviews - http://www.crd.york.ac.uk/prospero/

Royal College of Paediatrics and Child Health - http://www.rcpch.ac.uk/

Social Care Institute for Social Excellence (SCIE) - http://www.scie.org.uk/

The British Psychological Society - http://www.bps.org.uk/home-page.cfm

Young Minds - http://www.youngminds.org.uk/

For review 2, The cost-effectiveness of non-pharmacological interventions for children with or at risk of ADHD delivered in the school setting, the sources to be searched will be similar to those in *Review 1* but will also include NHS EED and the Health Economics Evaluations Database (HEED).

Grey Literature

We have included resources such as Social Policy and Practice (SPP), a UK based database which indexes over fifty-percent grey literature. SPP aggregates resources such as Childdata and Social Care Online, both of which will be highly valuable in this review. Additional social science resources, noted for their hard-to-locate content, have also been included within the database portfolio. We will locate dissertations though PsycINFO, the educational databases and our web-searches, as well as searching the integrated catalogue of the British Library for any unpublished, report literature. We anticipate these resources being of particular use when searching for qualitative research.

BL Direct, a searchable interface of the British Library, will be searched on a short-date limit as an update search to confirm the currency of data. As the British Library gets advanced copies of journals to index, these will cross-check the currency of our database searches. We have included Medline in Process for similar reasons.

Citation Searches

Citation chases will help us to confirm saturation of our initial searches. We will conduct:

Backwards Citation chasing (1 Generation) from included references

"Forwards" citation chasing on included references using citation databases (Science Citation Index/Social Science Citation Index)

Author contact on the basis of full-text includes

Search Write-up and Data Annex

The searches will be recorded using PRISMA guidelines[59]. This will include the list of databases searched (with their data parameters), recording of the date searched and the strategy as run (or as translated). Limits applied, the results yielded and an accurate recording of the de-duplication process will be annotated in a search annex.

Study selection

References will be uploaded to reference management software (Endnote X4) and duplicates both within and between databases will be removed.

Inclusion and exclusion criteria will be applied to the title and abstract of each identified citation independently by two reviewers with disagreements being settled by discussion with a third. The full text will be obtained for papers that appear to meet the criteria and those for which a decision is not possible based on the information contained within the title and abstract alone. The full text of each paper will be assessed independently for inclusion by two reviewers with disagreements being settled by discussion with a third. Extent of agreement will be measured using the kappa statistic. A PRISMA-style flowchart will be produced to detail the study selection process and reasons for exclusion of each full-text paper will be reported.

This method of study selection will be used for both quantitative reviews. Study selection will be separate for review 1 and review 2.

Quality assessment

For review 1, the effectiveness of non-pharmacological interventions delivered in the school setting for children with or at risk of ADHD, we will use the principles contained within the Cochrane Risk of Bias tool to critically appraise all included papers, regardless of design and will supplement this with other appropriate appraisal tools (e.g. ref. 60) as agreed by reviewers in advance. Quality assessment will be performed by one reviewer and checked by a second, with disagreements being settled through discussion with a third. Where insufficient detail is provided in the published paper to adequately assess the risk of bias, authors will be contacted and asked to provide additional information.

Given review 2's focus on cost effectiveness, papers will be critically assessed using more relevant frameworks, such as Consensus on Health Economic Criteria list questions developed by Evers et al.[61] and those produced by Drummond and Jefferson[62].

Data extraction

A data extraction form will be tailored to the needs of review 1[63] and piloted in advance of collecting data from each included paper. This data extraction form will include fields of particular interest when considering the factors that might moderate the outcomes of interventions, such as: (i) whether medication was already being received by participants; (ii) whether participants had comorbidities; (iii) whether intervention was delivered at school only. Data extraction will be performed by one reviewer and checked by a second, with disagreements being settled through discussion with a third.

The methods and findings from economic evaluations included in review 2 will be summarised in a tabular format, noting the type of evaluation carried out, the setting and perspective. Details of the sources of data and structural approaches of any decision analytic models used to synthesise data for the economic evaluations will be noted. Again, this data extraction will be performed by one reviewer and checked by a second, with disagreements being settled through discussion with a third.

Synthesis

Data for each quantitative review will be tabulated and discussed narratively in the first instance. Data tables will include details of the intervention type and content, the setting and the provider, sample characteristics of the included population and the type of outcomes measured. Studies will be grouped by intervention type, outcome measure, comparator and by co-morbidity if appropriate.

Where there is evidence of limited heterogeneity between studies, meta-analysis will be employed to estimate summary measures of effect on relevant outcomes, based on data from intention to treat analyses in contributing studies. Our approach to meta-analysis will take account of randomisation and non-randomisation by stratification and meta-regression. If data allow, we will explore the impact of study quality factors (e.g. control for potential confounding factors) using meta-regression.

If meta-analysis is conducted it will be carried out using fixed and random effects models, using Review Manager and STATA software. Heterogeneity will be explored through consideration of the study populations, methods and interventions by visualisation of results and, in statistical terms, by the χ_2 test for homogeneity and I^2 statistic and, where possible, using meta-regression.

Findings for review 2 will be synthesised in a narrative review (i.e. we will not quantitatively synthesise ICERs or other summary measures of economic evaluation). This narrative review will pay particular regard to issues relating to generalisability of findings to the UK.

6 Mapping the interventions

Experience with systematic reviews of other complex interventions show that details about components, delivery and methods and intensity of the intervention may be scantily reported (e.g. ref. 64). This means that the actual activity, who delivers it, the frequency and so on, are often poorly reported in papers focussing on intervention effectiveness. We will use additional techniques to identify more detailed descriptions of the interventions. These will involve additional searches in databases and web search tools using the name of the interventions (for example Place2Be[55], Good Behaviour Game[54], Incredible Years[53]) in order to identify appropriate descriptive literature. Where the intervention has a manual or similar guide this will be located. We will also contact authors to try and obtain unpublished project details if they are not available in the published literature. This will be particularly necessary, where the descriptions of interventions are insufficiently clear to allow replication.

These descriptions will allow us to map, in detail, the nature of the interventions and to understand which components are shared or are different between the identified programmes, thereby allowing us to begin to understand underlying elements that support more effective interventions. In other words, we will try to identify the theories behind these interventions, the ways they intend to cause positive change in the individual and/or the institution. However, this mapping exercise will consider all named interventions in the studies included for the first three reviews, therefore can usefully map across those interventions found to be less effective.

We will be guided by methods developed by the Evidence for Policy and Practice Information and Co-ordinating centre (http://eppi.ioe.ac.uk/cms/) and the Medical Research Council's guidance on the development and evaluation of complex interventions[65]. The qualities to be associated with effectiveness would include, but not be confined to: clarity of goal for programme (e.g. mission statement, monitoring arrangements); closeness of collaboration with school (e.g. joint

management or explicit appraisal of school); target subjects (universal vs. targeted groups of children); type of intervention (e.g. counselling, skills learning); delivery of intervention (e.g. whole school, by school staff, or by outside professionals); intensity of intervention; level of training and supervision required by practitioners to deliver the programme competently; and the level of evaluation completed.

By linking the detail of activities to any variation in effectiveness revealed in the quantitative reviews we can begin to map the key elements required for effective interventions in school settings.

6.1 Search strategy

The search for information relating to specific school-based interventions will follow from reviews 1-3. Named interventions will be known once data has been extracted for these reviews and then internet and database searches for these interventions will be made in order to locate information about the interventions and their use.

Data will be extracted and tabulated allowing organisation and comparison across the interventions and with regard to the effectiveness findings.

6.2 Reporting

Findings from this mapping of interventions will be incorporated into the narrative synthesis of review 1 and 2 where relevant and into the overall narrative synthesis for the project as a whole. Findings in terms of the descriptive details of named interventions and their comparison will be written up in a short report.

7 Qualitative Reviews

We plan to review qualitative research to address the following research questions:

3) What are the factors that may enhance, or militate against, the success of interventions for ADHD in school settings?

4) How do schools best contribute to the effectiveness of non-pharmacological interventions for children with ADHD, in school settings?

5) What are the effects of such interventions on other aspects of social, family or institutional functioning?

We will undertake separate reviews of these linked, but distinct areas:

Review 3: The experiences and attitudes of parents, children, peers, teachers and others involved in delivery towards specific ADHD interventions in schools.

Review 4: The experiences of ADHD in school among children, their peers, their parents and teachers.

Review 3 will thus be used to understand specific issues relating to structures, implementation processes and culture which have been identified as influencing the effectiveness of specific ADHD interventions in school, including examples of best practice.

Review 4 will seek to interpret the ways in which attitudes and experiences of children, parents and teachers towards ADHD may present opportunities or barriers to specific designs and approaches. It will also seek information about the way in which support or otherwise for children with ADHD in school may impact on wider social and institutional functioning.

7.1 Methods

7.1.1 Review 3 Inclusion criteria for considering relevance of studies

Study design

Systematic reviews of qualitative research which use a recognised, structured approach to identifying and synthesising studies (including, but not limited to, meta-ethnography, meta-study, meta-synthesis, narrative synthesis, etc).

Primary qualitative research designs which use recognised methods of data collection and analysis (including, but not limited to, observational methods, interviews and focus groups for the former and grounded theory, thematic analysis, hermeneutic phenomenological analysis, discourse analysis etc. for the latter).

Population

Those involved in designing, delivering and managing non-pharmacological interventions for children with, or at risk of, ADHD in a school setting (including teachers, head teachers, therapists and others).

Children with or at risk of ADHD who have experience of a non-pharmacological ADHD intervention in school.

Parents/carers whose children have experience of an ADHD intervention in a school setting.

Peers of children with ADHD who have experience of ADHD, and its management in a school setting.

Interventions

Experiences and perceptions of participants outlined above relating to non-pharmacological interventions delivered to children with or at risk of ADHD with at least some of the elements delivered in school. The aim of the intervention will be to affect child-focussed outcomes related to core ADHD symptoms, and socio-emotional and academic competence. Examples of relevant interventions include Incredible Years Classroom Dina course[53], The Good Behaviour Game[54] and Place2Be[55].

Outcomes

Attitudes, experiences and understandings of practitioners who have delivered non-pharmacological school-based ADHD interventions.

Attitudes, experiences and understanding of children with or at risk of ADHD, who have experienced a non-pharmacological school-based ADHD intervention.

Attitudes, experiences and understanding of parents whose children have experienced a non-pharmacological ADHD intervention in a school setting.

Attitudes, experiences and understanding of peers of children with or at risk of ADHD relating to non-pharmacological ADHD interventions in a school setting.

Other inclusion and exclusion criteria: Language, date, location

Only papers written in English will be included given the focus on experiences and attitudes, which might be lost in translation from studies written in another language.

Only studies published from 1980 onwards will be included.

All educational settings will be included e.g. mainstream schools, special schools, pupil referral units and specialist educational units within mainstream. Given the importance of context for the formation and influence of attitudes and therefore the interaction between interventions and effectiveness, we believe studies from societies and educational systems which are markedly different from the UK will be less informative for this research. We therefore propose including only studies from OECD countries in the review and will carefully consider the applicability of findings to the UK setting in performing the evidence synthesis.

7.1.2 Review 4, *The experiences of ADHD in school among children, their peers, their parents and teachers*, Inclusion criteria for considering relevance of studies

Study design

As for review 3

Population

School staff (including teachers, head teachers, learning support assistants, etc); parents/carers; children aged 4-18 years with or at risk of ADHD; these children's peers.

Interventions

None – these studies will be those which assess the beliefs, attitudes and experiences about children with, or at risk of ADHD.

Outcomes

Practitioners beliefs, attitudes, experiences and understandings of ADHD.

Children with or at risk of ADHD's beliefs, attitudes, experiences and understanding of their condition.

Parents and carers beliefs, attitudes, experiences and understandings of ADHD.

Other inclusion and exclusion criteria: Language, date, location

Studies which focus primarily on the experience of pharmacological treatment of ADHD will be excluded. However, studies that consider the experiences and understandings of the *condition* where a child or children may receive a pharmacological treatment would be included.

Only papers written in English will be included due to the potential loss of subtle emphasis and meaning during translation.

Only studies published from 1980 onwards will be included.

Only studies from OECD countries will be included and we will carefully consider the applicability of findings to the UK setting when screening studies.

7.2 Qualitative reviews search method

Search strategy

It is anticipated that papers of relevance to review 3 will be located during the search for quantitative reviews 1 and 2. Nevertheless a separate search will be conducted filtering for qualitative methodologies relevant to the two qualitative reviews. These reviews will require the exploration of two bodies of literature: i) qualitative research that relates to particular school-based interventions for ADHD and ii) qualitative research that describes and interprets the experience of ADHD in the school setting. The latter search will need to be refined in response to the literature identified; this iterative approach is common in syntheses of qualitative literature[66]. The search will be recorded carefully as it develops.

Study selection

References obtained through the search strategies will be uploaded into reference management software (Endnote X4). Assessment for inclusion will be undertaken initially at title and/or abstract level by two researchers independently. Where the research methods used or type of initiative evaluated are not clear from the abstract, assessment will be based upon reading of the full paper. The full text of any potentially includable papers will be obtained. Full text screening will be done separately for each qualitative review and examined by two reviewers independently. Any disagreement or uncertainty will be resolved through discussion with a third member of the review team as necessary.

Quality assessment

We will use the Wallace checklist for quality assessment[67]. The checklist will be supplemented by critical reading of each study. The quality of studies will be independently quality assessed by two reviewers. Any disagreement will be resolved by consensus and if necessary a third reviewer will be consulted. We also anticipate, however, that the value of each study will be judged through its contribution to the synthesis[68,69].

Data extraction

Details of the studies' methods and findings will be extracted into a pre-designed data extraction form. Key findings will be extracted in the form of quotes, themes and concepts used in the primary research papers. The extraction of data will be conducted by two reviewers independently, and reconciled by discussion. Ongoing discussions within the broader team will ensure that we develop a coherent picture of the body of relevant research. Involvement of more than one reviewer in the extraction of qualitative research allows for alternative readings of the findings to be explored.

Synthesis

Final choices about how to synthesise the included qualitative evidence will be made in response to the information identified. Preliminary analysis will involve reading and re-reading the papers, and the extracted findings, in order to consolidate understandings of the themes and concepts and their relations within and between studies. A structured summary for each paper will also be produced which will aid discussion of the emerging synthesis amongst the review team. Key findings, quotes and concepts from each paper will be listed and tabulated so that they can be explored, compared and juxtaposed based on the mechanisms of data manipulation and juxtaposition[41].

If there is enough conceptual data we will undertake a meta-ethnography[70,68]. The aim of meta-ethnography is to identify where similar themes and concepts from different papers refer to the same concepts (congruent synthesis) or identify opposing findings (refutational synthesis), this process is referred to as 'translation'. Study concepts may also be linked to create a 'line of argument', developing ideas across more than one study. The context of the findings will also be considered in relation to the methods used to collect them and any theories that either drive the research or are produced by it[71]. Such elements may help to explain similarities and differences between study reports. If findings are more descriptive, we will conduct a thematic synthesis.

We anticipate that the two bodies of qualitative research relating to each review, about experiences of specific interventions for ADHD and general attitudes and experience towards ADHD, will be synthesised separately initially as they are likely to cover distinct conceptual areas. The decision on whether to produce a single synthesis from the two qualitative reviews will be taken during the review process once sufficient clarity is obtained on the nature of the evidence being obtained and how it relates to the effectiveness of interventions. For example, if the review of wider attitudes to ADHD identifies important influences that act equally across all interventions, these may be more appropriately presented in a separate synthesis with discussion of the implications for ADHD interventions. However, if there are clear links between attitudes towards ADHD in general and experience of school-based interventions, one synthesis might be appropriate.

8 Service users/Public involvement

8.1 Aims of active involvement

Service user / public involvement was sought at the outset of this project to assist us in refining our questions in order to make them salient to the families of children with ADHD. We also anticipate that the perspective of teachers, parents and families will be valuable in the mapping exercise, the interpretation of the qualitative analysis and the subsequent narrative analysis that will serve to bring the results together. Patient and public involvement will ensure that the results are applicable to those for whom this work is most relevant and that we present and disseminate our findings in a format that is accessible[72].

8.2 Description of patient and public involvement

The parent involvement in this project is enabled through colleagues in the Peninsula Cerebra Research Unit (PenCRU), part of the Child Health Group at the Peninsula College of Medicine and Dentistry. PenCRU involves families of disabled children in all aspects of their research through a retained Family Faculty managed by a dedicated Family Involvement Coordinator.

One of the members of the Family Faculty (Catherine Shotton) is a co-applicant. Catherine has two children who have been diagnosed with ADHD. She has therefore experienced firsthand the diagnosis and treatment of symptoms of ADHD. Catherine also has experience of working with schools as a parent to help manage the symptoms of ADHD. Catherine is a

Level 3 qualified teaching assistant and has experience within the school setting with children who have been diagnosed with ADHD and those who are at risk of ADHD.

The Head of Research and Education at Cerebra (Tracy Elliot) is part of our Expert Advisory group. Cerebra help children with neurological conditions, their parents and carers, and provides e-learning packages. Cerebra are commonly contacted with issues relating to ADHD and Tracy will complement the experience of our parent advisor since she can draw on Cerebra's extensive experience of parental concerns in relation to ADHD. Tracy also brings a 'third sector' perspective, and will contribute to interpretation and dissemination.

It is also important that school practitioners are involved in the research. Will Pritchard is a co-applicant who works as a Professional Lead (Behaviour) at Devon Learning Development Partnership, which brings together a range of professional expertise in educational improvement, enrichment and inclusion services to support improved outcomes for children and young people in Devon. Will has extensive experience of teaching in mainstream and specialist units, and also in supporting schools in implementing interventions.

Throughout the project we will be able to engage with parents and practitioners. We have the above mentioned co-applicants and members of our expert advisory group who will be invited to attend project meetings and will attend two project workshops where the entire project team aim to meet to assist interpretation and understanding. We will also aim to recruit several other regional parents and practitioners who will attend the workshops and be able to meet for focussed discussion in person as the need arises throughout the project. Finally we will have email groups of other interested and potentially more distant parents and school practitioners who we can engage with via email. In developing the search strategy the email group of parents have assisted by identifying known interventions that have been incorporated into search terms. This network of patient and public involvement will play an integral role in identifying interventions, defining and prioritising intervention outcomes, identifying barriers to intervention success, ensuring that the review is readable and relevant and dissemination of findings.

9 Dissemination

Dissemination of our findings to all those working in children's services who come into contact with children who have ADHD is vital. We have detailed plans for reaching the child mental health and the children and young people's services communities and educational practitioners, academics and policy makers. Reports from all five components of the project will be made available to NHS commissioning bodies and we will publish in peer reviewed academic journals to span both education and mental health publications.

Key professional groups in relation to education include, but are not limited to, educational psychologists, behavioural support teachers, head teachers, special educational needs coordinators and learning mentors. In order to engage with these groups, we will offer presentations of our findings at key national and regional meetings, including those of the Association of Educational Psychologists and the British Psychological Society, the British Educational Research Association conference in the UK and the American Academy of Child and Adolescent Psychiatry conference in the US and the National Association of Special Educational Needs and the Social Emotional and Behavioural Difficulties Association conferences in the UK. In addition, we will seek to present through the national network of the Association for Child and Adolescent Mental Health, whose branches are multidisciplinary and include both health and education. We will offer presentations of the findings to voluntary agencies and support groups involved with child mental health, such as Cerebra, Young Minds, the Mental Health Foundation and ADHD support groups.

We will also notify potential service users and referrers via information sources such as the Cerebra and ADHD Foundation websites and notify the findings to CAMHS clinicians via resources such the Royal College of Psychiatrist's e-mail (FOCUS) discussion group, the Association of Child and Adolescent Mental Health and the CAMHS Evidence-based Practice Unit.

The findings may be used to inform the existing e-learning packages for parents and carers provided by Cerebra. In addition, Cerebra are developing a course on neurological conditions aimed at professionals working in the schools, education and childcare sectors with a child friendly version aimed at school children. The aim being to promote understanding, tackle prejudice, promote social inclusion and reduce stigma; the findings from this project will be used to help to inform and develop these materials.

We plan to feed our findings back to the Teaching Agency within the Department for Education, which has a number of initiatives to improve the specialist training of teachers following the Lamb Enquiry Report[73]. One strand of these initiatives focuses on socio-emotional and behavioural difficulties. There are also national training courses for Special Educational Needs Coordinators. Continuing professional development may offer opportunities to engage with education-based practitioners. In most areas there are local academic networks for different educational professional groups, such as special educational needs coordinators, lead behaviour professionals and head teachers that link with regional and national networks and would allow further dissemination of information through meetings, bulletin boards and newsletters. Should the review lead to clear recommendations about what should be provided within schools, we will seek to link with the head of the Schools Inspection Service in order to explore how our findings could lead to the incorporation of appropriate standards into the inspection regime.

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Appendix I – Draft search strategy

Database: Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) <1980 to Present>

Search Strategy:

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1 exp "Attention Deficit and Disruptive Behavior Disorders"/ (19354)
2 ADHD.ti,ab. (11041)
3 ADHS.ti,ab. (387)
4 ADDH.ti,ab. (106)
5 attention deficit.ti,ab. (13928)
6 hyperactiv*.ti,ab. (31832)
7 (hyper adj1 activ*).ti,ab. (323)
8 (Conduct adj3 (problem* or difficult* or disorder* or issue*)).ti,ab. (4948)
9 (Attention adj3 (problem* or difficult* or disorder* or issue*)).ti,ab. (18075)
10 hyperk*.ti,ab. (14593)
11 minimal brain.ti,ab. (723)
12 inattenti*.ti,ab. (3564)
13 impulsiv*.ti,ab. (9463)
14 restless*.ti,ab. (5055)
15 overactiv*.ti,ab. (8668)
16 or/1-15 (83853)
17 school*.ti,ab. (168012)
18 college*.ti,ab. (71618)
19 nurser*.ti,ab. (7095)
20 preschool*.ti,ab. (15826)
21 kindergarten*.ti,ab. (3463)
22 classroom*.ti,ab. (8584)
23 elementary.ti,ab. (15805)
24 education* setting*.ti,ab. (901)
25 ((education* or behavio?r*) adj unit*).ti,ab. (333)
26 education* establishment*.ti,ab. (212)
27 education* system*.ti,ab. (1868)
28 learning environment*.ti,ab. (1865)
29 learning establishment*.ti,ab. (4)
30 teaching environment*.ti,ab. (183)
31 teaching establishment*.ti,ab. (3)
32 teacher*.ti,ab. (25700)
33 early years.ti,ab. (2150)

34 foundation stage.ti,ab. (6)
35 summer treatment program*.ti,ab. (29)
36 breakfast club*.ti,ab. (9)
37 holiday club*.ti,ab. (1)
38 pupil*.ti,ab. (19304)
39 student*.ti,ab. (147939)
40 or/17-39 (388188)
41 intervention*.ti,ab. (444875)
42 strateg*.ti,ab. (467775)
43 program*.ti,ab. (488695)
44 project*.ti,ab. (190437)
45 train*.ti,ab. (276436)
46 support*.ti,ab. (828126)
47 therap*.ti,ab. (1569181)
48 (Behavio?r* adj2 (management or modification* or medicine or treatment*)).ti,ab. (13142)
49 (education* adj2 (management or modification* or treatment*)).ti,ab. (3551)
50 (classroom adj2 (management or modification* or treatment*)).ti,ab. (106)
51 (playground adj2 (management or modification*)).ti,ab. (3)
52 (psychosocial adj2 (management or modification* or treatment*)).ti,ab. (1894)
53 (cognitive adj2 (management or modification* or treatment*)).ti,ab. (3400)
54 behavio?r change technique*.ti,ab. (63)
55 bct*.ti,ab. (1318)
56 exercise*.ti,ab. (172127)
57 (social adj2 play).ti,ab. (529)
58 (free adj2 play).ti,ab. (826)
59 (physical adj2 (education or activit*)).ti,ab. (48135)
60 meditat*.ti,ab. (2358)
61 class* size*.ti,ab. (323)
62 seating.ti,ab. (1533)
63 incredible years.ti,ab. (66)
64 Triple P.ti,ab. (78)
65 good behavio?r game.ti,ab. (32)
66 123 magic.ti,ab. (1)
67 place2be.ti,ab. (0)
68 reinforcement.ti,ab. (20974)
69 punishment*.ti,ab. (4328)
70 response cost.ti,ab. (160)
71 time out.ti,ab. (842)
72 reward*.ti,ab. (26556)

73 prize*.ti,ab. (4884)
74 privilege*.ti,ab. (7414)
75 teacher pupil relationship*.ti,ab. (9)
76 teacher student relationship*.ti,ab. (74)
77 (Family adj2 school adj (partnership* or relationship* or involvement)).ti,ab. (31)
78 (Parent adj2 school adj (partnership* or relationship* or involvement)).ti,ab. (10)
79 (school adj2 parent adj (partnership* or relationship* or involvement)).ti,ab. (10)
80 (home adj2 school adj (partnership* or relationship* or involvement)).ti,ab. (4)
81 rule*.ti,ab. (98359)
82 (routine or routines).ti,ab. (175092)
83 contingent attention.ti,ab. (17)
84 daily report*.ti,ab. (260)
85 think* time.ti,ab. (30)
86 extra time.ti,ab. (416)
87 quiet.ti,ab. (7626)
88 indoor pass.ti,ab. (0)
89 verbal correction*.ti,ab. (9)
90 instruct*.ti,ab. (52509)
91 clear commands.ti,ab. (1)
92 social stor*.ti,ab. (29)
93 (weigh* adj2 (jacket* or vest* or belt*)).ti,ab. (112)
94 (lesson adj2 structure*).ti,ab. (4)
95 (goal* adj3 setting).ti,ab. (2144)
96 (target* adj3 setting).ti,ab. (523)
97 behavio?r book.ti,ab. (0)
98 (peer adj2 (support or tutor*)).ti,ab. (1509)
99 champion*.ti,ab. (2656)
100 mentor*.ti,ab. (6442)
101 counsell*.ti,ab. (16813)
102 coach*.ti,ab. (5135)
103 cwpt.ti,ab. (4)
104 computer*.ti,ab. (207534)
105 ICT.ti,ab. (2083)
106 (information adj2 technology).ti,ab. (6112)
107 social skills.ti,ab. (2566)
108 social problem solving.ti,ab. (314)
109 life skills.ti,ab. (537)
110 (anger adj2 (strateg* or manag* or modification*)).ti,ab. (297)
111 CBT.ti,ab. (3745)

112 cognitive behavio?r*.ti,ab. (12031)
113 worksheet*.ti,ab. (491)
114 timer*.ti,ab. (1261)
115 break*.ti,ab. (179338)
116 headphone*.ti,ab. (669)
117 music.ti,ab. (7560)
118 timetable*.ti,ab. (758)
119 ((individual or screen*) adj3 (desk* or table*)).ti,ab. (309)
120 traffic light*.ti,ab. (225)
121 whole class.ti,ab. (172)
122 breakfast club*.ti,ab. (9)
123 holiday club*.ti,ab. (1)
124 workshop*.ti,ab. (22605)
125 ((self or personal) adj2 organis*).ti,ab. (546)
126 selfmanage.ti,ab. (1)
127 self manage.ti,ab. (261)
128 role play.ti,ab. (749)
129 roleplay.ti,ab. (6)
130 multimodal.ti,ab. (10526)
131 multi agency.ti,ab. (281)
132 (chunk* or chunking).ti,ab. (597)
133 brain gym.ti,ab. (1)
134 (stress adj2 (toy* or ball*)).ti,ab. (31)
135 circle time.ti,ab. (6)
136 transition.ti,ab. (153898)
137 cube box.ti,ab. (1)
138 curriculum.ti,ab. (22413)
139 remedial teaching.ti,ab. (49)
140 or/41-139 (4306031)
141 16 and 40 and 140 (3503)

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