Case Study 1: An Evidence-Based Practice Review Report

Theme: Interventions involving Parents as the agents of change

How effective is the New Forest Parenting Program in reducing symptoms of ADHD in children?

Summary

In the wake of growing concerns around pharmacological treatment for Attention Deficit Hyperactivity Disorder (ADHD), there is a body of evidence to support the use of behavioural interventions. The New Forest Parenting Program (NFPP) is a psychosocial behavioural intervention specialised for children aged 2-11 years with ADHD symptoms. The focus of the intervention is on supporting parents in order to reduce ADHD symptoms and improve parent-child interactions. The intervention is in its infancy, with the original form of the NFPP designed and tested in 2001 and a range of variations on this in recent years. This review aims to investigate whether the NFPP is successful in reducing symptoms of ADHD according to parent reported ratings of ADHD, clinical observations of child behaviour and parent-child interactions. Five studies met the inclusion criteria which included those that were Randomised Controlled Trials published in peer reviewed journals focusing on the NFPP or a suitable variation. Participant's age ranged from 2-11 years, and all displayed symptoms of ADHD above clinical cut-off points. Treatment was either delivered by a specialist trained practitioner, as part of 'routine care', or in a 'self-help' format. Effect sizes ranged from not practically significant to large but a general trend was found towards positive outcomes for improving symptoms of ADHD. Findings demonstrate promising effects of the NFPP which can be used to provide practitioners with evidence to support parents in decision making around appropriate forms of treatment.

Introduction

Background

Attention Deficit Hyperactivity Disorder (ADHD) is characterised in the Diagnostic Statistical Manual IV Edition (DSM-IV) as a 'persistent pattern of inattention and/or hyperactivity-impulsivity'. Essential features of ADHD include hyperactive-impulsive or inattentive symptoms across a range of settings that lead to significant interference with developmentally appropriate functioning in social, academic or occupational realms. The DSM-IV highlights a list of symptoms that must persist to a maladaptive extent for at least six months of the child's life. These include: difficulty sustaining attention, difficult with organisation, often easily distracted by external stimuli, fidgeting with hands or feet, difficulty remaining seating when it is expected, has difficulty engaging in activities quietly and excessive talk.

Rationale and Psychological Basis

According to a large scale systematic review, the prevalence of ADHD is between 5% and 10% of the population (Scahill & Stone, 2000), although estimates can fluctuate between 2% to 17% depending on sampling methods. Regardless, ADHD is of significant enough public health concern to warrant recent action to be taken by the ADHD Guideline Development Group (GDG) which was commissioned and funded by the National Institute for Health and Clinical Excellence (NICE) in 2013. They produced a document highlighting guidelines for assessing, diagnosing and supporting ADHD across the UK and highlighted the important for current research to focus on the most effective modes of supporting families and schools in managing the symptoms of ADHD in children.

Considering the aforementioned characteristics of ADHD, it is evident that parents may have difficulty in managing day-to-day life with a child experiencing such symptoms. Parents and schools or early years settings tend to first notice symptoms of concern and may call upon input from Educational Psychologists (EPs) in order to assess the needs of the child and provide recommendations for managing behaviour and improving outcomes. According to the GDG, a 'tiered approach' to diagnosis and support-seeking should begin with parents attempting 'self-help' treatments and then seeking out 'tier 1' support including professionals such as a GP, teacher or health visitor, through to a diagnosis in 'tier 3' resulting in more specific and specialised mental health and multi-agency support. Most EPs provide support at 'tier 1' and it is important that they have a good knowledge and understanding of the early symptoms of ADHD and a range of different interventions that can be accessed by families and schools. This knowledge can be communicated to the clients on a case by case basis to assist them in making informed decisions about the right type of support that is suitable for the individual child. Therefore, EPs need to stay up to date with the literature on the effectiveness of a range of behavioural interventions.

Methods for managing ADHD have predominantly been pharmacological since 1937, when stimulant drugs were discovered as a form of managing hyperactivity (Bradley, 1937). Psychostimulants such as methylphenidate are frequently used as a short term treatment to reduce behavioural symptoms and improve social or academic performance (Spencer, Biederman & Harding, 1996). However, there are a number of ethical objections to medicating children. Parents and professionals generally agree that pharmacological treatments for ADHD should be used with caution due to the vulnerability and plasticity of the developing brain of the young child (Volkow & Insel, 2003). A large scale study found a high number of adverse side effects, including irritability, difficulties with emotion and sleeplessness (Greenhill et al, 2006). Additionally, the effects of stimulants are only effective

for the period of time that the drug remains in the body (Whalen & Henker, 1991) which could lead to issues with dependency on medication. Finally, research has indicated that there are significant links between family-based issues and symptoms of ADHD such as maternal depression, ineffective parenting or alcohol/drug misuse (Pelham & Gnagy, 1999). The premise of this argument infers that the causes of ADHD will not be addressed by simply 'masking' the symptoms through medication.

An alternative to drug treatment is in psychological intervention, which may be chosen on the basis of many ADHD symptoms having a largely behavioural nature. The aims of psychological interventions are to reduce symptoms and improve the quality of life for children and young people, and there is often an emphasis on improving behaviour and relationships rather than directly targeting the underlying core symptoms (such as inattention and impulsivity). According to the National Institute for Health and Care Excellence (NICE), the three main types of psychological intervention used in the UK are traditional behaviour therapy involving systems of reward and punishment, cognitive therapy, such as the 'Think Aloud' programme by Camp and Bash (1981) and finally, parent training, which is designed to help parents to develop strategies for coping with the behaviours that present as manifestations of ADHD. These psychological interventions all share a common behavioural basis, grounded in principles of classical and operant conditioning, and focus on the antecedents and consequences of the behaviour in order to promote positive changes in behaviour and subsequently reduce negative symptoms. Behavioural treatments have been found to be highly effective modes of treating ADHD (Fabiano & Gregory, 2008).

In 2009, NICE recommended that parent-led behavioural approaches should be a 'first line' treatment in management of symptoms for pre-school and school aged children. Additionally, the Guideline Development Group (GDG) analysis conducted in 2013 indicated that group-based behavioural therapy is the most cost effective treatment over both medication and

combined therapy for children with ADHD. This is particularly pertinent for pre-school children due to the fact that parental reactions to behaviour are less likely to have been deeply ingrained with negativity, and 'bad habits' in the parent-child relationship are less likely to have occurred. Current main modes of delivery for parent training for children with ADHD are group based/individual therapist led programs. These include the 'Incredible Years' (Webster-Stratton, 2003), 'Triple P' (Sanders, 1992) and 'Helping the Noncompliant Child' (McMahon & Forehand,2005) all of which are designed to support parents in managing oppositional/defiant behaviours and behavioural difficulties. However, until the recent emergence of the New Forest Parenting Program, no behavioural program has existed focusing purely on targeting symptoms of ADHD.

The New Forest Parenting Program

The New Forest Parenting Program (NFPP) is a psychosocial intervention specialised for preschool children with ADHD symptoms. It combines behavioural techniques with specialist therapeutic support for parents with the main aim of reducing ADHD symptoms and improving parent-child interactions. The theoretical basis for the program lies in the role of the parent in child development, in particular developing attention and impulse control. For example, Connell and Prinz (2002) found that where parents are sensitive to the needs of the child by engaging in reciprocal interaction and scaffolding positive attributes such as attention and organisation, children tend to show a developmental advantage over their peers. The over-arching goals of the NFPP are around improving parental style through developing communication between parent and child, consistent interactions and management of oppositional behaviours and regulation. Table 1 demonstrates a breakdown of the general principles and how these translate into treatment targets.

Table 1

General Goals and Treatment Targets for the New Forest Parenting Program

General Goals	Treatment Targets	Examples of Techniques Used
Improve parental style	Develop understanding of ADHD Parenting and ADHD Becoming a constructive parent Becoming a positive parent Self-organisation	Linking behaviours with ADHD concepts and theory Matching the programme to the needs of the parent and child
Help parent communicate with child	Listening skills Authoritative talk Clarity and consistency	Eye contact Short sentences Positive praise Brain storming ideas with parent Modelling Introducing 'teachable moments'
Improve management of oppositional behaviour	Behavioural principles Preventative strategies Rewards and sanctions Consistency	Keeping calm Offering choices to the child Developing rules/boundaries Behaviour charts Quiet time/time out
Improve Regulation through interaction	Joint play and interaction Reciprocity Turn taking Scaffolding	Fun play Games with increasing difficulty Scaffolding Reviewing 'homework' targets with parent and adapting Introducing 'teachable moments'

A handbook for the original format of the NFPP was published in the 'Information Manual for Professionals Working With Families With Hyperactive Children Aged 2–9 Years' (Weeks, Thompson & Laver-Bradbury, 1999) and is now available directly from the authors of the program. This contains guidelines for practitioners highlighting clear 'in-session' techniques involving discussion, role-play, modelling, games and observation and feedback on mother-child interaction. Parents are also given 'homework' involving keeping a diary to record their progress, games, modelling positive behaviours learned to their partner and making use of 'teachable moments' in every-day scenarios, where skills taught can be put

into practice. Table 2 indicates the content of the weekly sessions alongside the overarching themes and expectations.

The original format of the NFPP is an 8-week home based intervention. This involves a specialist trained professional (typically a Health Visitor) to make weekly visits to the home (lasting around 1-1.5 hours) to train parents on a variety of different techniques. The nature of these visits allows the therapist to tailor the intervention to the needs of the family if necessary, to ensure consistency in approaches and support any difficulties that may be experienced during the process. Over time, variations of the NFPP have been developed including a 'revised' version (Thompson et al, 2009), a 6 week 'self-help' version (Daley & O'Brien, 2013) and, most recently, a prototype for a 13 week 'adapted' version for difficult to treat children (McEwan et al , 2014).

EPs may be relevant professionals who could deliver the NFPP to parents in a home-setting for children in the Early Years and review progress over time. Additionally, in light of the skill set EPs have in delivering INSET and training, they could be utilised as professionals who could train other practitioners (such as Health Visitors) to deliver this intervention to families. By having a good understanding of the psychosocial principles of the NFPP, EPs are also best placed to offer advice to settings and parents on when this type of intervention may be appropriate on a case by case basis.

Review Question

How effective is the New Forest Parenting Program in reducing symptoms of ADHD in children?

Table 2

Content of Parent Training sessions for the original New Forest Parenting Program categorised into themes and weeks

Psychoeducation		**Parent-Child Play**		**Major Review**	**Parent-Child Task**		**Final Review**
Week 1	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**
Parent	Parent	Parent & Child	Parent & Child	Parent	Parent & Child	Parent & Child	Parent
Discuss characteristics of attention-deficit/hyperactivity disorder, acceptance of child, effectiveness of simple interventions, recruiting attention, and eye contact. Emphasize importance of praise. Introduce behavioural diary.	Reinforce message from week 1. Look at diary and discuss parent's feelings about behaviour during week. Emphasize importance of clear messages, routine, countdowns, reminders, boundaries and limit-setting, and avoiding confrontations.	Reinforce messages from previous weeks. Examine diaries and discuss parent's feelings. Discuss temper tantrums; emphasize firmness and voice control, avoiding threats, and the power of distraction.	Reinforce messages from previous weeks and ensure that they have been implemented. Introduce concepts of time out and quiet time.	Review weeks 1–4, focusing on problems identified and solutions given. Assess parent's ability to implement strategies. Review diaries, isolate examples, and discuss how parents cope.	Observe parents and children in interaction for 15 minutes. Given feedback to parent on observation especially in relation to quality		Reinforce messages from previous weeks. Focus on one or two of the key areas of particular concern for each client. Diaries should be used to identify these and to provide examples of good practice.

Critical Review of the Evidence Base

Literature search

On December 26th 2014 a literature search was conducted using the electronic databases PsychINFO, PUBMED, EMBASE, MEDLINE and SCOPUS. The search terms used were 'New Forest', 'Parent*' and 'ADHD' and the search was refined to 'abstract' and 'title'.

The initial search yielded 27 studies, 20 of which were removed for being duplicates. From the remaining 7 studies an inclusion criteria was applied (see table 3). In order to decide if a paper was suitable the criteria was firstly applied to a review of the title and abstract, and in instances where further clarity was required the full text was reviewed.

An ancestral search was then conducted on the 3 remaining papers, screening for titles that contained appropriate terminology (for example ADHD, Parent Intervention, New Forest, Parenting Program, NFPP, etc).

This search yielded 24 studies, of which a further 22 were removed for duplication and not adhering to the inclusion criteria.

After removal of unsuitable studies, five papers remained and were selected for further critical analysis. Figure 1 provides a visual representation of the complete literature search and table 4 includes the full list of included studies, and the extensive list of excluded studies can be found in Appendix A.

Table 3

Inclusion Criteria with rationale

Criterion	No	Inclusion	Rationale
Participants/ Setting	**1**	Children/Young people must be between ages of 2-12 years	NFPP is an intervention designed for parents of 'young children' aged 3-11 so participants should reflect the target age group (+/- 1 year)
	2	Must already have or be undergoing a diagnosis of ADHD	Focus of the intervention and this review is looking at symptoms of ADHD.
	3	Child must not be receiving any medication for ADHD at the time of study	To assess the effectiveness of a purely behavioural intervention without the impact of medication
	4	Must not have a diagnosis for any other developmental disorder	To focus purely on ADHD symptoms without interference from other issues.
Intervention/ Study details	**5**	Must be using the NFPP or a modified version of the program	Focus of the review is on the NFPP
	6	Must be a Randomised Controlled Trial	To ensure that the programme has been effectively tested, allows for a fair comparison and review between studies
	7	Must collect pre- and post- data focusing on ADHD symptoms and parent feelings of efficacy	As the purpose of the NFPP is a parent intervention for ADHD, both symptoms of ADHD and parent assessment should be conducted
Publication type	**8**	Must be published in a peer reviewed journal	The research should have withstood the scrutiny of peers within the field to ensure research is of a high quality
	9	Must be published after 2001	The NFPP has only been in existence since 2001
	10	Must be written in the English language	The reviewer does not speak any other languages so necessary to reduce cost and time for translating

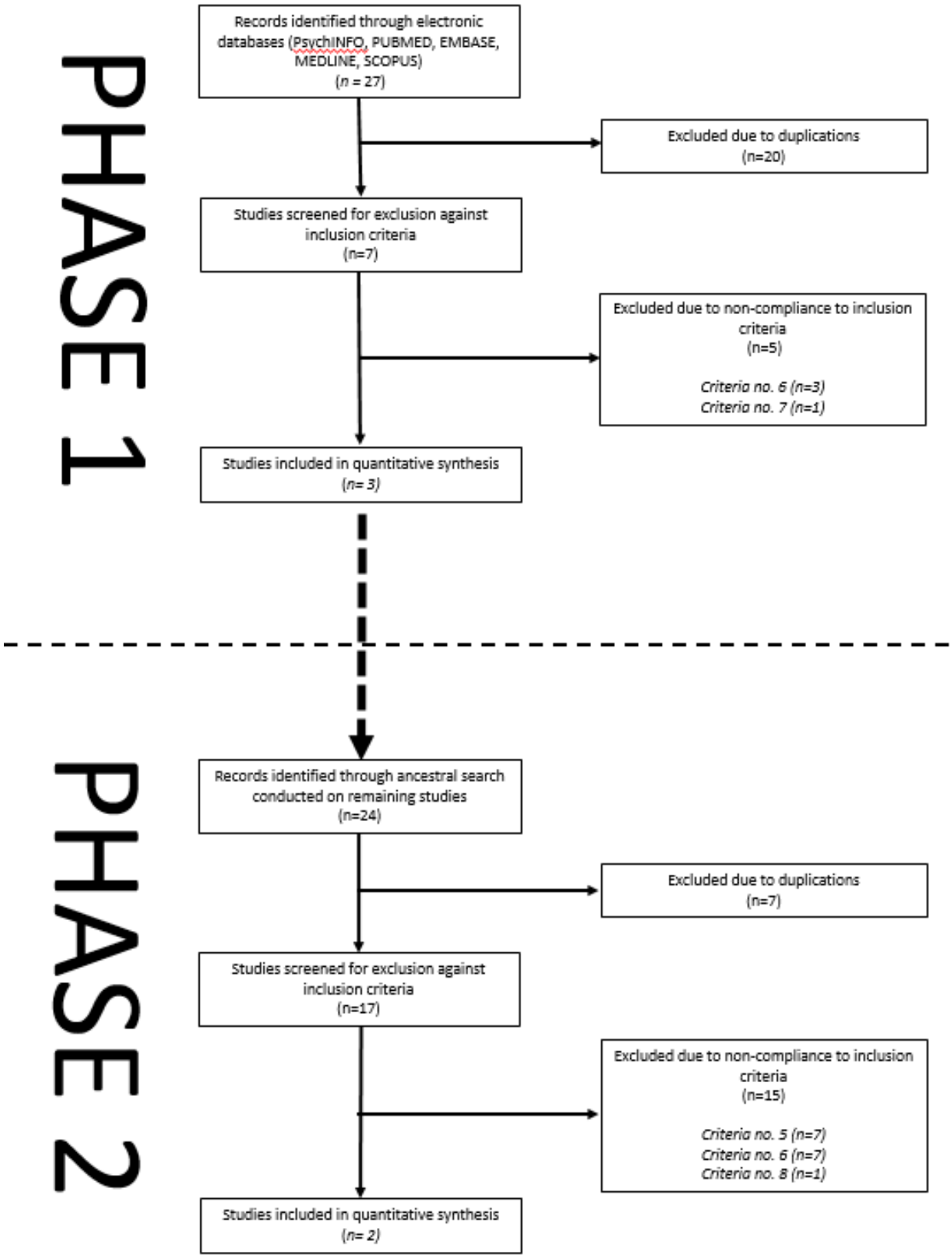

Figure 1. Representation of full literature search conducted on December 26th 2014 including studies removed due to non-compliance to inclusion criteria.

Table 4

Studies included for critical analysis after inclusion criteria applied during systematic literature search

Included Studies
Sonuga-Barke, E.J.S., Daley, D., Thompson, M., Laver-Bradbury, C., & Weeks, A. (2001). Parent-based therapies for preschool attention deficit/hyperactivity disorder: a randomized, controlled trial with a community sample. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*, 402–408.
Sonuga-Barke, E.J.S., Thompson, M., Daley, D., & Laver-Bradbury, C., (2004). Parent training for attention deficit/hyperactivity disorder: is it as effective when delivered as routine rather than as specialist care? *British Journal of Clinical Psychology, 43*, 449–45.
Thompson, M. J., Laver-Bradbury, C., Ayres, M., Le Poidevin, E., Mead, S., Dodds, C., & Sonuga-Barke, E. J., (2009). A small-scale randomized controlled trial of the revised new forest parenting programme for preschoolers with attention deficit hyperactivity disorder. *European child & adolescent psychiatry*, *18*(10), 605-616.
Daley, D., & O'Brien, M., (2013). A small-scale randomized controlled trial of the self-help version of the New Forest Parent Training Programme for children with ADHD symptoms. *European child & adolescent psychiatry*, *22*(9), 543-552.
Abikoff, H. B., Thompson, M., Laver-Bradbury, C., Long, N., Forehand, R. L., Miller Brotman, L., & Sonuga-Barke, E., (2014). Parent training for preschool ADHD: a randomized controlled trial of specialized and generic programs. *Journal of Child Psychology and Psychiatry*.

Comparison of selected studies

The selected studies were then summarised (see table 5) and the methodological quality of each study was rated using a Coding Protocol adapted from the APA Task Force on Evidence Based Interventions in School Psychology (Kratchowill, 2003). For details of the amendments made to the original Protocol and an example of the completed Protocol see Appendices B and C.

Table 5

Summary mapping key information about the selected studies for comparison

Study	Delivery Type	Length (weeks)	Participant details	Groups	Sample	Relevant Measures for ADHD symptoms	Time Intervals	Key Findings
Sonuga-Barke, Daley, Thompson, Laver-Bradbury & Weeks (2001)	NFPP Specialist care (2 health visitors)	8	N= 78 M= 48 F= 30 Range: 3 years to 3 years 11 months	NFPP: 30 WLC: 20 PC&S: 28	Identified at 3 year developmental check from population of 3051 children. 1. Initial screening stage (>20 on WWP) 2. Clinically validated cut off points for PACS 3. Parent concern significantly high EXCLUSION: Children excluded from the trial if parents had a serious mental illness or learning disability	PACS Observation Measure	T1: Pre T2: week 8 T3: week 23	NFPP produced significant reductions in ADHD symptoms according to PACS and observation measures compared to WLC and PC&S. 53% of NFPP, 38% of PC&S and 25% of WLC met the Jacobson and Truax (1991) criteria for recovery by the end of the trial (only significant for NFPP). Effect sizes for NFPP were large and in the range typically found with psychostimulant medication.
Sonuga-Barke, Thompson, Daley & Laver-	NFPP Routine care (16 health visitors)	8	N= 89 Range: 3 years to 3 years 11 months	NFPP: 59 WLC: 30	Identified at 3 year developmental check from population of 3051 children. 1. Initial screening stage (>20 on	PACS WWP	T1: Pre T2: week 8 T3: week 23	There was no significant improvement in ADHD symptoms in either the PT or WLC groups between baseline and 15 weeks post treatment.

Bradbury (2004)					WWP) 2. Clinically validated cut off points for PACS 3. Parent concern significantly high EXCLUSION: Excluded if health visitor reported parental mental illness, severe global delay and previous diagnosis for unrelated condition	Observation Measure	A slight (not significant) deterioration occurred in both groups (more marked in the WLC group).
Thompson, Laver-Bradbury, Ayres, Le Poidevin, Mead, Dodds, Psychogiou, Bitsakou, Daley, Weeks, Brotman, Abikoff, Thompson & Sonuga-Barke (2009)	Revised NFPP Specialist care (2 part time nurses)	8	N= 41 M=31 F=10 Range: 2 years 6 months to 6 years 5 months	NFPP: 17 TAU: 13	Identified over 18 month period via local child and family health clinics, advertisements in local press targeting total population of the island of Guernsey (686 births per year) 1. Initial screening stage (top 30% of population cut off for WWP) 2. Parent concern significantly high according to interview 3. Clinically validated cut off points on PACS (score >16) EXCLUSION: previous or current medication, not fluent in English, parental mental illness, child PDD,	PACS WWP Observation Measure GIPCI-R	T1: Pre T2: week 8 T3: week 15	There were significant and very large effects of the treatment on ADHD behaviours and symptoms reported by parents (average d=1.92). There were smaller effects on more general social and behaviour problems (average d=0.71). There was a trend towards an interaction between time and treatment for WWP (likely due to a drop in scores in ADHD levels between T2 and T3 in the TAU group).

					receptive language impairment, neurological disorder, previous or current social services involvement.			
Daley and O'Brien (2013)	Self Help NFPP	6	N= 43 M=35 F=8 Range: 4 years 1 month to 11 years	NFPP: 24 WLC: 19	Identified through referrals to CAMHS in North Wales for ADHD and were currently undergoing ADHD assessments but not yet medicated 1. Score of >17 on PACS EXCLUSION: Aged older than 11, receipt of medication, parental poor English	PACS DuPaul (Inattention) DuPaul (Hyperactivity) Observation Measure GICPI-R	T1: Pre T2: week 6	There was a significant and large effect of treatment on parent-reported child ADHD symptoms (average d=1.09) according to the PACS (medium effect size) and DuPaul hyperactive/impulsive scales. Improvements in ADHD symptoms according to parent report was not supported by independent behavioural observations. No significant differences were seen between NFPP and WLC on observation or GICPI although small effect size differences were seen (d=0.23) 45% of intervention children showed clinically significant reductions in ADHD symptoms.

Abikoff, Thompson, Laver-Bradbury, Long, Forehand, Brotman, Klein, Reiss, Huo, & Sonuga-Barke (2014)	NFPP Specialist care (2 trained clinicians)	8	N= 164 M= 121 F= 43 Range: 3 years to 4 years 11 months	NFPP: 67 WLC: 34 HNC: 63	Identified through referrals from preschools, daycares, nursery schools, community resources, parent mailings, newspaper ads, website postings. 1.Elevated scores above age and gender norms on CPRS-R & CTRS-R 2. Diagnosis of ADHD on the DISC-IV-YC 3. Psychologist clinical evaluation and standard score >7 on CELF-2 4. IQ > 70 on WPPSI-III EXCLUSION: parent not fluent in English, current medication/behavioural treatment, diagnosis of PDD, psychosis or PTSD, history of physical/sexual abuse or other psychiatric/medical condition.	CPRS-R CTRS-R ADHDRS-PI Observation Measure Delay of Gratification GICPI-R	T1: Pre T2: week 8 T3: Oct/Nov of following school year	Parent rated improvement was seen in both treatment groups compared to control. However, the NFPP was not significantly better than HNC and children who received NFPP were rated worse on total ADHD and hyperactivity at follow up. NFPP was not significantly better with regard to teacher/clinician ratings than HNC. There were no significant differences in children's attention/engagement or ability to delay between treatments. Parents showed significantly improved interactions for both conditions which were stable over time. The parents in the HNC group received significantly better observed parenting results than then NFPP group.

N=number of participants, M=male, F=female, NFPP=New Forest Parenting Program, WLC=Wait List Control, TAU=Treatment As Usual, HNC=Helping the Non-compliant Child, PC&S=Parent Counselling and Support.

Utilising information from the Coding Protocols, the Weight of Evidence (WoE) approach (Gough, 2007) was applied, which provided a criteria to systematically review the studies in line with the research question. The framework is designed to evaluate three key aspects of each study which are highlighted in table 6 below. Appendices D, E, F and G provide further details regarding the criteria specifically used to measure each Weight of Evidence and information on averaging weightings.

Table 6

The Weight of Evidence framework and areas of focus according to Gough (2007)

Weight of Evidence A	**Weight of Evidence B**	**Weight of Evidence C**	**Weight of Evidence D**
Quality of Methodology: Accuracy, coherency and transparency of evidence in relation to other studies of that type	**Relevance of Methodology:** appropriateness of methodology and research design for answering review question	**Relevance of evidence to the review question:** appropriateness of the focus and details of the study for answering review question	**Overall weight of evidence:** the overall average for A, B & C to give the degree to which the study answers the review question

Table 7

Overall Weight of Evidence for selected studies

Study	WoE A Quality of Methodology	WoE B Relevance of Methodology	WoE C Relevance of evidence to the review question	WoE D Overall weight of evidence
Sonuga-Barke et al (2001)	High (2.8)	Medium (2.3)	High (3)	High (2.7)
Sonuga-Barke et al (2004)	Medium (2.2)	Medium (2)	Medium (2)	Medium (2.1)
Thompson et al (2009)	Medium (1.8)	Medium (2)	High (3)	Medium (2.3)
Daley & O'Brien (2013)	Medium (1.8)	Low (1.3)	Low (1)	Low (1.4)
Abikoff et al (2014)	High (2.6)	High (3)	High (3)	High (2.9)

Participants and Sampling

All studies used participants sampled from the UK, except Abikoff et al (2014) who sampled from a population in New York, USA. Of those studies conducted in the UK, both Sonuga-Barke et al (2001) and (2004) sourced from the same population pool drawn from 3,051 children in the Hampshire area. Thompson et al (2009) and Daley and O'Brien (2013) used a population sampled from a community setting in the Guernsey and North Wales areas respectively.

The number of participants sourced varied significantly between studies ranging from 41 (Thompson et al, 2009) to 164 (Abikoff et al, 2014). All but two of the studies (Daley & O'Brien, 2013 and Thompson et al, 2009) were considered to have a sufficiently large 'N' to calculate a large effect size (between 0.7-1.3), which is required to demonstrate a clinically

significant effect in the ADHD treatment population group for traditional forms of treatment such as medication (Swanson, McBurnett & Wigal, 1993).

The NFPP is largely designed to support families with preschool-aged children (under 5 years of age in the UK). Sonuga-Barke et al (2001 & 2004) and Abikoff et al (2014) used a sample of children aged 3 years to 4 years 11 months which was deemed most appropriate. Thompson et al (2009) used a sample ranging from 2 years 6 months to 6 years 5 months, which received a 'medium' weighting. Daley and O'Brien (2013) contained a sample ranging from 4 years 1 month to 11 years which extended the age range beyond what was considered suitable for the original format of the NFPP.

All studies (excepting Sonuga-Barke et al, 2004) gave information about the gender of participants, which was biased towards boys across the studies. This is largely representative of the male to female ratio in diagnoses of ADHD which currently believed to be at 3:1 (Barkley, 2006).

Finally, the sampling procedures were considered. Abikoff et al (2014) used a variety of forms of clinical screening including the Connors Parent and Teacher Ratings Scales (CPRS-R & CTRS-R), diagnostic criteria (DISC-IV-YC) and psychologist clinical evaluation using the Clinical Evaluation of Language Fundamentals (CELF-2). The remaining studies used a combination of 'clinical cut-offs' on the Parental Account of Clinical Symptoms (PACS) and Werry-Weiss-Peters Scale (WWP). Some studies were more stringent in their criteria for selection including IQ according to the WPPSI-III (Abikoff et al, 2014) and reports of parental mental illness (Sonuga-Barke et al, 2001 & 2004, Thompson et al, 2009 and Abikoff et al, 2014).

Measures

A wider range of measures used to assess outcomes was considered to give a more suitable overview of any changes or improvements in symptoms.

ADHD ratings

Table 8 highlights the range of measures used to assess ratings of ADHD and details of the reliability and internal consistency, as reported in the text or more widely reported within current research on ADHD. The measures all showed to have moderate to good reliability and internal consistency with PACS and WWP demonstrating highest ratings across both.

Table 8
Details of measures and respective reliability and internal consistency ratings as reported in text or wider literature.

Measure	Details of Measure	No. of items	Studies	Reliability (Pearson's r)		Internal Consistency
				Test-Retest	Inter-rater	
PACS Parental Account of Childhood Symptoms (Taylor et al, 1991)	Structured Clinical Interview. Assesses the core symptoms of ADHD. Parents describe the severity and frequency of symptoms across a range of situations over the past 6 months. Interviewer then rates these using criteria validated according to clinical practice.	N/A	Sonuga-Barke et al (2001) Sonuga-Barke et al (2004) Thompson et al (2009) Daley & O'Brien (2013)	0.83	0.79-0.96	0.89
WWP Werry-Weiss-Peters Activity Scale (Routh, 1978)	Parent scale rating the frequency of behaviour from 'none' to 'much of the time'. Measures hyperactivity and is generally used to identify the top 15-18% of the population with a cut-off point.	27	Sonuga-Barke et al (2004) Thompson et al (2009)	0.85	0.82	0.88
CPRS-R & CTRS-R Conners Rating Scale (Parent & Teacher versions) Conners et al (1998)	Rating scale scored on a 4 point scale ranging from 0 (not at all) to 3 (very much). Assesses behaviour on 6 scales: oppositional, hyperactivity/impulsivity, inattentive/cognitive, social, anxiety, perfectionism	48[P] 39[T]	Abikoff et al (2014)	0.72[H] 0.47[I]		0.92-0.95[H] 0.87-0.94[I]
DuPaul ADHD rating scale DuPaul et al (1998)	A rating scale in the form of a parent questionnaire based on the DSM-IV diagnostic items. Scored on a 4 point scale from 0(never) to 3 (very often).	18	Daley & O'Brien (2013)	0.75		0.81[H] 0.79[I]
ADHDRS-PI ADHD rating scale IV (clinician administered and scored) Zhang et al (2005)	A rating scale assessing the 18 DSM-IV ADHD symptoms following a parent interview. The number of symptoms alongside frequency and impairment ratings rating from 0 (none) to 3 (severe).	18	Abikoff et al (2014)	0.78-0.89	0.58-0.63	0.80-0.83

P= Parent, T= Teacher, H= Hyperactivity, I= Inattention

Observation of child behaviour

An alternative form of measure was direct observation of the child's behaviour. These measures were developed by Sonuga-Barke et al (2001) and Thompson et al (2009) for the purpose of their research and then either revised (Daley & O'Brien, 2013) or re-used (Abikoff et al, 2014). Additionally, Abikoff et al (2014) used a delay of gratification task which has been widely used and adapted in the literature for ADHD and measures levels of impulsivity. Details of the measures with corresponding reliability ratings are given in table 9 below.

Table 9

Observation measure details including reliability ratings.

Study	Type of activity	Type of observation	Measurement details	Reliability (Pearson's r)	
				Test-Retest	Inter-rater
Sonuga-Barke et al (2001)	Multi-purpose toy including a number of different activity zones 'Fun Park'	10 min	Total time on task/Total number of switches between zones	0.81	0.76
Thompson et al (2009)	Multi-purpose toy including a number of different activity zones 'Farm Yard'	5 min	Score between 1(not at all) to 5(extremely often) on 4 items: 1. Time off-task 2. Fidgeting with body 3. Fidgeting with objects 4. Squirming	0.91	0.48
Daley & O'Brien (2013)	Set of standard toys (play dough animal set, large lego blocks, sets of toy cars and dolls).	10 min	Total time on task/Total number of switches between zones	0.91	0.54
Abikoff et al (2014)	Multi-purpose toy including a number of different activity zones 'Fun Park'	5 min	Total time on task/Total number of switches between zones	0.81	0.76
	Delay of Gratification task: child waits for a 'clap' before taking a treat. Experimenter raises hands ready to clap at the midpoint (e.g. 10 seconds if delay is 20 seconds).	Delay varied between 5-30 seconds	0= not inhibited (child lifts cup and takes treat) 1= partially inhibited (child makes movement toward the cup but does not take the treat) 2= fully inhibited (child waits until after the clap to take treat)	0.64-0.81*	Not known

*See Campbell et al (1982) for details of reliability on this measure. There is limited evidence for the reliability of this particular version of the task.

Parent-child interaction

Some studies also used a measure of parent-child interaction to observe a variety of behaviours in both parties (Thompson et al, 2009, Daley & O'Brien, 2013 and Abikoff et al, 2014). Child behaviours included: respect, destruction, disruptive, noncompliance, social skills, valence, and disconnection. Parent values included: valence, responsiveness, warmth, praise, enjoyment, scaffolding, effectiveness, aggression, criticism and punishment. Details of the measure are highlighted in table 10.

Table 10

Parent-child observation measures including reliability and internal consistency ratings

Measure	**Details of Measure**	**Type of observation**	**Studies**	**Reliability (Pearson's r)**		**Internal Consistency**
				Test-Retest	**Inter-rater**	
GICPI-R Global Impressions of Parent-Child Interactions Revised (Brotman et al, 2005)	Direct observation of mother-child interactions during tasks to give summary global ratings of 1(poor) to 5(very good). Interaction is coded by an external rater.	15 mins including 5 mins of activities: 'jigsaw' 'free play' 'tidy up'	Thompson et al (2009) Daley & O'Brien (2013) Abikoff et al (2014)	0.2[C] 0.5[P]	0.62[C] 0.64[P]	0.84[C] 0.87[P]

C= Child, P= Parent

Design and Analysis

Sonuga Barke et al (2001) and Abikoff et al (2014) used an active comparison group, which enabled them to compare the success of the NFPP against an alternative treatment thus receiving a 'high' weighting. The remaining studies used a Wait List Control (WLC) group, excepting Thompson et al (2009) who used a Treatment As Usual group and offered support

to those families who requested it at the end of the study. Although the most cost effective, this was considered to be ethically compromising and thus received a 'low' weighting.

All studies excepting Daley and O'Brien (2013) conducted a follow up analysis. Follow up ranged from 7 weeks after intervention (Thompson et al, 2009) to the October/November of the following school year (Abikoff et al, 2014). Attrition rate was generally less than 20% between pre- and post- measures and 30% for follow up for most studies. Thompson et al (2009) reported a high attrition rate which was attributed to greater severity of symptoms of ADHD. However, all studies conducted an intent-to-intervene analysis was conducted to account for the drop-outs during analysis.

Application of intervention

As the research on NFPP is largely in its early stages, any changes to the delivery of the program were considered in WoE C. Sonuga-Barke et al (2004) assessed the impact of the NFPP when delivered by non-specialist professionals to parents. Thompson et al (2009) used a 'revised' version of NFPP and a 'self help' version was created specifically for the study conducted by Daley and O'Brien (2013). These amendments may have had an impact on the outcomes of the study and thus were weighted accordingly as of either 'medium' or 'low' relevance to the review question.

Outcomes/Findings

In order to consistently compare results across all studies, effect sizes were calculated using a Pretest-Posttest-Control Group calculation (Morris, 2007). This calculated a Standardised Mean Difference for relevant outcomes between Intervention and Wait List Control (WLC) or Treatment As Usual (TAU) groups between Time 1 (T1) and Time 2 (T2). Mean and

Standard Deviation data were provided for every study. Effect sizes were then interpreted and labelled as small (0.2), medium (0.5) and large (0.8 or greater) in line with Cohen's (1992) recommendations. A negative effect size would indicate that the mean difference between pre- and post- tests of the control group was greater than the mean difference for the pre- and post- tests of the treatment group. In some instances, these scores would be expected (i.e. a higher PACS score would indicate a greater number of ADHD symptoms). As specified in Table 11, for those measures where a negative effect size would be expected, the effect sizes have been recorded with a (-) superscript.

Table 11 shows effect sizes calculated in the following domains: Parent ratings of ADHD symptoms, clinical observations of child behaviour and, finally, parent-child interactions.

Table 11
Effect sizes for outcome measures across selected studies

Outcome	Outcome Measure	Informant	Study	WoE D	Sample Size	Effect Size for T2 measures (d)	Effect Size Descriptor	Effect Size for T3 measures (d)	Effect Size Descriptor
Rating of ADHD Symptoms	PACS	Parent	Sonuga-Barke et al (2001)	High (2.7)	50	-1.54^{-}	Large	-1.44^{-}	Large
		Parent	Sonuga-Barke et al (2004)	Medium (2.1)	89	-0.63^{-}	Medium		
		Parent	Thompson et al (2009)	Medium (2.3)	30	-1.30^{-}	Large	-0.90^{-}	Large
		Parent	Daley & O'Brien (2013)	Low (1.4)	43	-0.73^{-}	Medium		
	WWP	Parent	Sonuga-Barke et al (2004)	Medium (2.1)	89	0.01^{-}	Not Practically Significant		
		Parent	Thompson et al (2009)	Medium (2.3)	30	-1.89^{-}	Large	-1.39^{-}	Large
	Conners Scale	Parent	Abikoff et al (2014)	High (2.9)	101	-0.80^{-}	Large		
		Teacher	Abikoff et al (2014)	High (2.9)	101	-0.31^{-}	Small		
	DuPaul ^{I}	Parent	Daley & O'Brien (2013)	Low (1.4)	43	-0.56^{-}	Medium		
	DuPaul ^{H}	Parent	Daley & O'Brien (2013)	Low (1.4)	43	-1.49^{-}	Large		
	Clinician Rating	Clinician	Abikoff et al (2014)	High (2.9)	101	-1.48^{-}	Large		
Clinical Observation of Child Behaviour	Engagement	Clinician	Sonuga-Barke et al (2001)	High (2.7)	50	0.34^{+}	Small	0.84^{+}	Large
	Engagement	Clinician	Thompson et al (2009)	Medium (2.3)	30	0.85^{+}	Large	0.63^{+}	Medium
	Engagement	Clinician	Daley & O'Brien (2013)	Low (1.4)	43	-0.02^{+}	Not Practically Significant		
	Engagement	Clinician	Abikoff et al (2014)	High (2.9)	101	-0.26^{+}	Small*		
	Delay of Gratification	Clinician	Abikoff et al (2014)	High (2.9)	101	0.00^{+}	No Effect		
Parent-Child Interaction	GIPCI-R	Clinician	Thompson et al (2009)	Medium (2.3)	30	0.46^{+}	Small	0.80^{+}	Large
	GIPCI-R	Clinician	Daley & O'Brien (2013)	Low (1.4)	43	-0.31^{+}	Small		
	GIPCI-R	Clinician	Abikoff et al (2014)	High (2.9)	101	0.52^{+}	Medium		

H = Hyperactivity scale, I = Inattention scale, + = increase in scores is better, - = decrease in scores is better, * = an effect size that is significant in the direction against expected results.

Rating of ADHD Symptoms

Effect sizes calculated were predominantly considered ‘large’ across a range of different measures including PACS, WWP, Conners Scale and DuPaul. This suggests that the intervention in several different forms was generally effective in reducing ratings of symptoms. The ‘small’ effect size came from a teacher rating on the Conner’s scale which may indicate that higher ratings of change are due to parents being more invested in the intervention and expecting a change greater than is visible to an observer. However, one of the largest effect sizes was calculated from a clinician rating in the large scale study conducted by Abikoff et al (2014). In the instances where follow up data was reported, the effect sizes were retained over time.

Clinical Observations

Despite the strong evidence for reduction in ratings of ADHD, the same effect was not found for clinician ratings of child behaviour. Thompson et al (2009) found a large effect size indicating improvement in engagement levels of the children between pre- and post- test. However, the remaining results indicated either a small effect size, one that was not practically significant or an effect size in the direction against predicted change. As previously mentioned, this could be attributed to the fact that an external observer may give less ‘generous’ ratings of change. Additionally, the inter-rater reliability of the observation measures were highly variable, which may have had an impact on the results from the studies. In the original Sonuga-Barke et al (2001) study, clinician ratings were found to increase between post-measure and follow up, improving the effect size from ‘small’ to ‘large’. However, a gradual but significant decrease in effect was found in Thompson et al (2009).

Parent-Child Interaction

A small-medium general effect was demonstrated for improvements in parent-child interaction. Thompson et al (2009) also found that the effect of intervention became stronger over time with effect size increasing from small to large. However, Daley and O'Brien (2013) found a small effect size that was significant in the direction against expected results. If we consider that this study received the lowest rating according to the Weight of Evidence criteria, it could be due to a number of methodological issues that contributed to this particular finding, rather than to the failure of the intervention to initiate change.

Effect of changes to the NFPP

The greatest effect of change to the NFPP appeared to be when it was delivered by non-specialist professionals. Sonuga-Barke et al (2004) demonstrated only a medium effect size for improvement of parent ratings of ADHD according to the PACS and no significant effect of change on the WWP. The self-help version in Daley and O'Brien's (2013) study was found to lead to a medium-large effect size for change in parent ratings of ADHD but no significant effect on engagement and only a small effect size for parent-child interaction. The 'revised' NFPP appeared to lead to the most positive reported effect sizes with large effect sizes for reduction in ADHD ratings, clinical observations of child behaviour and a small effect size for improvement in parent-child interaction. The original NFPP provided varied results from Sonuga-Barke et al (2001) and Abikoff et al (2014) ranging from small to large effect sizes in all 3 areas of focus.

Overall impact of NFPP on ADHD

According to a recent meta-analysis of non-pharmacological interventions for ADHD, behavioural interventions generally show an effect size of d=0.4 (Sonuga-Barke et al, 2013). If we compare this against the effect sizes found generally across all outcome measures in the

selected studies, it is evident that the NFPP shows promising effects on improving ratings of ADHD symptoms. However, the effect sizes reported from the selected studies do vary considerably from 'no effect' to 'large effects' across all areas of focus, which indicates that the results are not consistent in demonstrating positive impact. Daley and O'Brien (2013) and Thompson et al (2009) were both underpowered, which may have increased the chance of a 'type 2 error', demonstrating a false-positive effect. Other factors include the informant for the outcome measure, as it was evident that parent ratings produced a greater effect size than those reported by an external observer such as teacher or clinician.

Conclusion

All studies selected for review were Randomised Controlled Trials, a methodology widely recognised as the most rigorous form of study available to test the impact of an intervention (Akobeng, 2005). The fact that results largely demonstrate a trend towards a positive effect of the NFPP on improving symptoms of ADHD is promising under these methodological circumstances. However, through close analysis of the studies using the coding protocols and WoE Framework it is clear that the studies varied in terms of the methodology used. Only Sonuga-Barke et al (2001) and Abikoff et al (2014) were awarded a high overall WoE, indicating that they had suitable methodology which was relevant and of high quality in answering the current review question. The remaining studies were considered to be of medium or low overall quality. Therefore, when considering the findings it is important to recognise the limitations of these studies.

There does not appear to be a large difference in results between studies conducted on the NFPP in its original or revised format, other than the Sonuga-Barke et al (2004) study which altered the delivery of the program to parents from trained professionals to non-specialist health visitors. They speculated that the lack of change may have been due to the professionals being less skilled at 'holding clients through change', and a lack of counselling

and additional support for parents. However, the self-help intervention, which also did not include a counselling or support element, appeared to demonstrate reasonably high levels of change, with parent reports of ADHD symptoms indicating change of large and medium effect. Therefore, further research should investigate the impact of the support received by parents on feelings of change.

It is important to note that the same group of authors who designed the original program have made contributions to all the selected studies. While this indicates a degree of faith in the progress of the intervention, results should be approached with caution due to the fact that there is an investment in success of the intervention.

Recommendations

Based purely on the evidence gathered from the selected studies, it would be suitable for practitioners such as Educational Psychologists to recommend the use of the NFPP. The research offers promising results to suggest an improvement in symptoms over time. However, as research into the intervention is largely in its infancy any recommendations should be made with caution.

Future research could investigate the impact of parent feelings of efficacy on a change in parent-reported ratings of ADHD symptoms. This may be possible for some of the selected studies who conducted secondary outcome measures from parents, although an interaction between ratings of ADHD and parent feelings of efficacy/well-being have not been explicitly stated.

Additionally, it would be interesting to compare the change in ratings for NFPP against an alternative behavioural intervention. Abikoff et al (2014) demonstrated that the NFPP was not significantly more effective against ‘Helping the Non-compliant Child’ (HNC), and in some instances was less effective. However, Sonuga-Barke et al (2001) found that NFPP was

significantly more effective than a parent counselling alternative intervention. There is clearly more work to be done in comparing the NFPP against other available parent interventions to ensure it is the most effective behavioural treatment available and it is cost effective for professionals to recommend its use with children. A longitudinal study is currently ongoing which will compare the NFPP against Incredible Years (IY) (see McCann et al, 2014 for a study protocol). Finally, it may be of interest to directly compare the efficacy of NFPP against popular pharmacological treatments to enable parents and practitioners to make better informed decisions about the appropriate treatment to suit the individual needs of their child.

References

Abikoff, H. B., Thompson, M., Laver-Bradbury, C., Long, N., Forehand, R. L., Miller Brotman, L., & Sonuga-Barke, E., (2014). Parent training for preschool ADHD: a randomized controlled trial of specialized and generic programs. *Journal of Child Psychology and Psychiatry*.

Akobeng A,K. (2005). Understanding measures of treatment effect in clinical trials. *Archilve of Diseases in Childhood, 90,* 54-56.

American Psychiatric Association, (1994). *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed. Washington, DC.: .

Barkley, R., (2006). *Attention-deficit hyperactivity disorder: a hand-book for diagnosis and treatment*. 3rd ed. New York: Guilford Press.

Bradley, C., (1937). The behaviour of children receiving benzedrine. *American Journal of Psychiatry. 94*(3), 577-585.

Brotman L.M.,, Gouley K.K.,, Chesir-Teran D., Dennis T., Klein R.G., & Shrout,P. (2005). Prevention for preschoolers at high risk for conduct problems: immediate outcomes on parenting practices and child social competence. *Journal of Clinical Child and Adolescent Psychology. 34*, 724–734.

Camp, B. & Bash, M. A. (1981) *Think Aloud: Increasing Social and Cognitive Skills, A Problem-Solving Program for Children: Primary Level.* Champaign, Illinois: Research Press

Campbell, S. B., Szumowski, E. K., Ewing, L. J., Gluck, D. S., & Breaux, A. M. (1982). A multidimensional assessment of parent-identified behaviour problem toddlers. *Journal of Abnormal Child Psychology*, *10*(4), 569-591.

Charach, A., Carson, P., Fox, S., Ali, M.U., Beckett, J., & Lim, C.G. (2013). Interventions for preschool children at high risk for ADHD: A comparative effectiveness review. *Pediatrics, 131,* 1584–1604.

Connell, C. M., & Prinz, R. J. (2002). The impact of childcare and parent–child interactions on school readiness and social skills development for low-income African American children. *Journal of School Psychology*, *40*(2), 177-193.

Conners, C. K., Sitarenios, G., Parker, J. D., & Epstein, J. N. (1998). Revision and restandardization of the Conners Teacher Rating Scale (CTRS-R): factor structure, reliability, and criterion validity. *Journal of abnormal child psychology*, *26*(4), 279-291.

Daley, D., & O'Brien, M. (2013). A small-scale randomized controlled trial of the self-help version of the New Forest Parent Training Programme for children with ADHD symptoms. *European child & adolescent psychiatry*, *22*(9), 543-552.

DuPaul, G., Anastopoulos, A., Power, T., Redi, R., Ikeda, M., & McGoey, K., (1998). Parent ratings of attention-deficit hyperactivity disorder symptoms: factor structure and normative data. *Journal of Psychopathological and Behavioural Assessments, 20*, 83-102

DuPaul, G. J., & Eckert, T. L. (1997). The effects of school-based interventions for attention deficit hyperactivity disorder: A meta-analysis. *School Psychology Review*, 26, 5−27.

Fabiano, G.A., (2009).. A meta-analysis of behavioral treatments for attention-deficit/hyperactivity disorder. *Clinical Psychology Review*,*29*(2),129-140.

Gough, D., (2007). Weight of evidence: a framework for the appraisal of the quality and relevance of evidence. *Research papers in education*, *22*(2), 213-228.

Greenhill, L., Kollins, S., Abikoff, H., McCracken, J., Riddle, M., Swanson, J., McGough, J., Wigal, S., Vitiello, B., Skrobala, A., Posner, K., Ghuman, J., Cunningham, C., Davies, M., Chuang, S., & Cooper, T., (2006). Efficacy and safety of immediate-release methylphenidate treatment for pre-schoolers with ADHD. *Journal of the American Academy of Child and Adolescent Psychiatry, 45*, 1284-1239.

Kratochwill, T. R. (2003). Evidence-Based Practice: Promoting Evidence-Based Interventions in School Psychology. *School Psychology Quarterly, 18*(4), 389-408.

McCann, D. C., Thompson, M., Daley, D., Barton, J., Laver-Bradbury, C., Hutchings, J., & Sonuga-Barke, E., (2014). Study protocol for a randomized controlled trial comparing the efficacy of a specialist and a generic parenting programme for the treatment of preschool ADHD. *Trials*, *15*(1), 142.

McEwan, F., Thompson, M., Laver-Bradbury, C., Jefferson, H., Koerting, J., Smith, E., & Sonuga-Barke, E., (2014). Adapting a specialized ADHD parenting programme for use with

‘hard to reach’ and ‘difficult to treat’ preschool children. *Child and Adolescent Mental Health*.

McMahon, R. J., & Forehand, R. L. (2005). *Helping the noncompliant child: Family-based treatment for oppositional behavior*. Guilford Press.

Pelham, W. E., & Gnagy, E. M., (1999) Psychosocial and combined treatments. *Mental Retardation and Developmental Disabilities Research Reviews, 5*, 225–236.

Routh, D., (1978). Hyperactivity. In: Magrab P (Ed.), *Psychological management of paediatric problems*, University Park Press, Baltimore.

Sanders, M,R., New directions in behavioural family intervention with children: From clinical management to prevention. *New Zealand Journal of Psychology*, *21*,25-25.

Scahill, L., & Schwab-Stone, M. (2000). Epidemiology of ADHD in school-age children. *Child and adolescent psychiatric clinics of North America*.

Sonuga-Barke, E. J., Brandeis, D., Cortese, S., Daley, D., Ferrin, M., Holtmann, M., & Sergeant, J. (2013). Nonpharmacological interventions for ADHD: systematic review and meta-analyses of randomized controlled trials of dietary and psychological treatments. *American Journal of Psychiatry*, *170*(3), 275-289.

Sonuga-Barke, E.J.S., Daley, D., Thompson, M., Laver-Bradbury, C., & Weeks, A., (2001)

Parent-based therapies for preschool attention deficit/hyperactivity disorder: a randomized, controlled trial with a community sample. *Journal of the American Academy of Child and Adolescent Psychiatry, 40,* 402–408

Sonuga-Barke, E.J.S., Thompson, M., Daley, D., & Laver-Bradbury, C., (2004) Parent training for attention deficit/hyperactivity disorder: is it as effective when delivered as routine rather than as specialist care? *British Journal of Clinical Psychology, 43*, 449–45.

Spencer, T. J., Biederman, J., & Harding, M., (1996) Growth deficits in ADHD children revisited: evidence for disorder-associated growth delays? *Journal of the American Academy of Child and Adolescent Psychiatry, 35*, 1460–1469.

Swanson, J.M., McBurnett, K., & Wigal, T.,(1993), Effect of stimulant medication on children with attention-deficit disorder: a review of reviews. *Exceptional Children Journal, 60,* 154–162.

Taylor, E., Sandberg, S., Thorley, G. & Giles, S., (1991). The epidemiology of childhood hyperactivity. Oxford: Oxford University Press.

Thompson, M. J., Laver-Bradbury, C., Ayres, M., Le Poidevin, E., Mead, S., Dodds, C., & Sonuga-Barke, E. J., (2009). A small-scale randomized controlled trial of the revised new forest parenting programme for preschoolers with attention deficit hyperactivity disorder. *European child & adolescent psychiatry*, *18*(10), 605-616.

Volkow, N.D., & Insel, T.R. (2003). What are the long-term effects of methylphenidate treatment? *Biological Psychiatry*, 54, 1307–1309.

Webster-Stratton, C. The Incredible Years: Parent, Teacher, and Child Training Series (IYS). *Preventing Violence and Related Health-Risking Social Behaviors in Adolescents: An NIH State-of-the-Science Conference.*

Weeks, A., Thompson, M., & Laver-Bradbury, C. (1999). Information manual for professionals working with families with hyperactive children aged 2–9 years. Ashurst, UK: Ashurst Child & Family Evidence Centre.

Whalen, C. K. & Henker, B., (1991). Therapies for hyperactive children: comparisons, combinations, and compromises. *Journal of Consulting and Clinical Psychology, 59*, 126–137.

Zhang, S., Faries, D., Vowles, M. & Michelson, D., (2005). ADHD Rating Scale IV: Psychometric properties from a multinational study as a clinician administered instrument. *Internal Journal of Methods in Psychiatric Research, 14,* 186-201.

Appendices

Appendix A

Table highlighting excluded studies with rationale linking to inclusion criteria.

Excluded Study	Rationale
McEwan, F., Thompson, M., Laver-Bradbury, C., Jefferson, H., Koerting, J., Smith, E., & Sonuga-Barke, E. (2014). Adapting a specialized ADHD parenting programme for use with 'hard to reach'and 'difficult to treat'preschool children. *Child and Adolescent Mental Health*.	Excluded on non-compliance to criteria 6: "must be a Randomised Controlled Trial". Study provided an outline for an adapted programme.
Daley, D., Jones, K., Hutchings, J., & Thompson, M. (2009). Attention deficit hyperactivity disorder in pre-school children: current findings, recommended interventions and future directions. *Child: care, health and development*, *35*(6), 754-766.	Excluded on non-compliance to criteria 6: "must be a Randomised Controlled Trial". Study was a review of current ADHD research.
Sonuga-Barke, E. J., Thompson, M., Abikoff, H., Klein, R., & Brotman, L. M. (2006). Nonpharmacological interventions for preschoolers with ADHD: the case for specialized parent training. *Infants & Young Children*, *19*(2), 142-153.	Excluded on non-compliance to criteria 6: "must be a Randomised Controlled Trial". Study was a review of current ADHD research.
McCann, D. C., Thompson, M., Daley, D., Barton, J., Laver-Bradbury, C., Hutchings, J., & Sonuga-Barke, E. (2014). Study protocol for a randomized controlled trial comparing the efficacy of a specialist and a generic parenting programme for the treatment of preschool ADHD. *Trials*, *15*(1), 142.	Excluded on non-compliance to criteria 6: "must be a Randomised Controlled Trial" and criteria 8: "must be published in a peer reviewed journal". Study was a protocol which had not yet been completed and published.
Jensen PS, Arnold LE, Richters JE, Severe JB, Vereen D, Vitiello, B., Schiller E, Hinshaw SP, Elliott RG, Conners CK, Wells KC, March J, Swanson J, Wigal T, Cantwell DP, Abikoff HB, Hechtman L, Greenhill LL, Newcorn JH, Pelham WE, Hoza B, Kraemer HC (1999) A 14-month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. *Arch Gen Psychiatry*, 56:1073–1086.	Excluded on non-compliance to criteria 5: "must be using the NFPP or a modified version of the program". Study was using an alternative intervention.
van den Hoofdakker BJ, Van der Veen-Mulders L, Sytema S, Emmelkamp PMG, Minderaa RB, Nauta MH (2007) Effectiveness of behavioral parent training for children with ADHD in routine clinical practice: a randomized controlled study. *J Am Acad Child Adolesc Psychiatry* 46:1263–1271	Excluded on non-compliance to criteria 5: "must be using the NFPP or a modified version of the program". Study was using an alternative intervention.

O'Brien M, Daley D (2011) Self-help parenting interventions for childhood behaviour disorders: a review of the evidence. *Child Care Health Dev* 37(5):623–637	Excluded on non-compliance to criteria 6: "must be a Randomised Controlled Trial". Study was a review of current ADHD research.
Laver-Bradbury C, Thompson M, Weeks A, Daley D, Sonuga-Barke EJS (2010) *Step by step help for children with ADHD: a self-help manual for parents*. Jessica Kingsley, London	Excluded on non-compliance to criteria 6: "must be a Randomised Controlled Trial". This was a self-help manual and not a study.
Morawska A, Sanders MR (2006) Self-administered behavioural family intervention for parents of toddlers: part I. efficacy. *J Consult Clin Psychol* 74:10–19	Excluded on non-compliance to criteria 6: "must be a Randomised Controlled Trial". Study was a review of current ADHD research.
O'Brien M (2011) Self-help Parent Training for Childhood ADHD Symptoms. Unpublished doctoral dissertation. Bangor University, UK	Excluded on non-compliance to criteria 8: "must be published in a peer reviewed journal". Study was a doctoral dissertation that had not been published in a peer reviewed journal.
Brotman, L.M., Calzada, E., Huang, K.Y., Kingston, S., Dawson-McClure, S., Kamboukos, D., & Petkova, E. (2011). Promoting effective parenting practices and preventing child behavior problems in school among ethnically diverse families from underserved, urban communities. *Child Development,* 82, 258–276.	Excluded on non-compliance to criteria 5: "must be using the NFPP or a modified version of the program". Study was using an alternative intervention.
Brotman, L.M., Gouley, K.K., Huang, K.Y., Rosenfelt, A., O'Neal, C., Klein, R.G., & Shrout, P. (2008). Preventive intervention for preschoolers at high risk for antisocial behavior: Long-term effects on child physical aggression and parenting practices. *Journal of Clinical Child and Adolescent Psychology,* 37, 386–396.	Excluded on non-compliance to criteria 5: "must be using the NFPP or a modified version of the program". Study was using an alternative intervention.
Charach, A., Carson, P., Fox, S., Ali, M.U., Beckett, J., & Lim, C.G. (2013). Interventions for preschool children at high risk for ADHD: A comparative effectiveness review. *Pediatrics,* 131, 1584–1604.	Excluded on non-compliance to criteria 6: "must be a Randomised Controlled Trial". Study was a review of current ADHD research.
Hinshaw, S.P., Klein, R.G., & Abikoff, H.B. (2007). *Childhood attention-deficit/hyperactivity disorder: Nonpharmacological treatments and their combination with medication.* In P.E. Nathan, & J.M. Gorman (Eds.), A guide to treatments that work (3rd edn, pp. 3–27). New York: Oxford University Press.	Excluded on non-compliance to criteria 6: "must be a Randomised Controlled Trial". This was a guide published within a book and not a study.

Peed, S., Roberts, M., & Forehand, R. (1977). Evaluation of the effectiveness of a standardized parent training program in altering the interaction of mothers and their noncompliant children. *Behavior Modification,* 1, 323–350.	Excluded on non-compliance to criteria 5: "must be using the NFPP or a modified version of the program". Study was using an alternative intervention.
Rajwan, E., Chacko, A., & Moeller, M. (2012). Nonpharmacological interventions for preschool ADHD: State of the evidence and implications for practice. *Professional Psychology: Research and Practice,* 43, 520	Excluded on non-compliance to criteria 6: "must be a Randomised Controlled Trial". Study was a review of current ADHD research.
Sonuga-Barke, E.J., Brandeis, D., Cortese, S., Daley, D., Ferrin, M., Holtmann, M, & Sergeant, J. (2013). Nonpharmacological interventions for ADHD: Systematic review and meta-analyses of randomized controlled trials of dietary and psychological treatments. *American Journal of Psychiatry,* 170, 275–289.	Excluded on non-compliance to criteria 6: "must be a Randomised Controlled Trial". Study was a meta-analysis of current ADHD research
Webster-Stratton, C. (1998). Preventing conduct problems in Head Start children: Strengthening parent competencies. *Journal of Consulting and Clinical Psychology,* 66, 715–730.	Excluded on non-compliance to criteria 5: "must be using the NFPP or a modified version of the program". Study was using an alternative intervention.
Webster-Stratton, C.H., Reid, M.J., & Beauchraine, T. (2011). Combining parent and child training for young children with ADHD. *Journal of Clinical Child and Adolescent Psychology,* 40, 191–203.	Excluded on non-compliance to criteria 5: "must be using the NFPP or a modified version of the program". Study was using an alternative intervention.

Appendix B

Amendments made to the original Kratchowill (2003) protocol and rationale.

Section Heading	Section Removed/Modified	Rationale
I. General Characteristics	B7. Coding B.8 Interactive process followed	Studies do not use qualitative research methods
II. Key Features for Coding Studies and Rating Level of Evidence/ Support	Rating for secondary outcomes	Focusing only on outcomes relevant to research question.
II. Key Features for Coding Studies and Rating Level of Evidence/ Support	C3. Evidence of appropriate statistical analysis for **secondary outcomes** (answer C3.1 through C3.3) C4. Percentage of **secondary outcomes** that are significant (select one of the following)	Secondary outcomes not relevant to research question
II. Key Features for Coding Studies and Rating Level of Evidence/ Support	C. Table of Primary/Secondary Outcomes Statistically Significant and	Information available in findings/outcomes section of review
II. Key Features for Coding Studies and Rating Level of Evidence/ Support	E. Identifiable Components	Not all papers contain this information so deemed not relevant (as according to Kratchowill, 2003)
II. Key Features for Coding Studies and Rating Level of Evidence/ Support	H1. School site	All interventions are conducted in an off-school site
II. Key Features for Coding Studies and Rating Level of Evidence/ Support	G. Replication	All papers in assignment are replications of the NFPP

III. Other Descriptive or Supplemental Criteria to Consider	D. Dosage Response	Medication not involved in NFPP
III. Other Descriptive or Supplemental Criteria to Consider	I. Training and Support Resources	Modified to reflect the training given to those who delivered the program to the program implementers (parents)

Appendix C

Coding Protocol: Group-Based Design

Domain:

- ☐ School- and community-based intervention programs for social and behavioral problems
- ☐ Academic intervention programs
- ☐ Family and parent intervention programs
- ☐ School-wide and classroom-based programs
- ☐ Comprehensive and coordinated school health services

Name of Coder(s): **Date**: 06/02/15

Full Study Reference in APA format: Sonuga-Barke, E., Daley, D., Thompson, M., Laver-Bradbury, C., Weeks, A. (2001). Parent-Based Therapies for Preschool Attention Deficit/Hyperactivity Disorder: A Randomised Controlled Trial with a Community Sample. *Journal of the American Academy of Child and Adolescent Psychiatry, Vol 40 (4), pages 402-408.*

Intervention Name (description from study): New Forest Parenting Program

Study ID Number (Unique Identifier): 1

Type of Publication: (Check one)

- ☐ Book/Monograph
- ☐ Journal article
- ☐ Book chapter
- ☐ Other (specify):

I. General Characteristics

A. General Design Characteristics

A1. Random assignment designs (if random assignment design, select one of the following)

- A1.1 ☐ Completely randomized design
- A1.2 ☐ Randomized block design (between-subjects variation)
- A1.3 ☐ Randomized block design (within-subjects variation)
- A1.4 ☐ Randomized hierarchical design

A2. Nonrandomized designs (if nonrandom assignment design, select one of the following)

- A2.1 ☐ Nonrandomized design
- A2.2 ☐ Nonrandomized block design (between-participants variation)
- A2.3 ☐ Nonrandomized block design (within-participants variation)
- A2.4 ☐ Nonrandomized hierarchical design
- A2.5 ☐ Optional coding of Quasi-experimental designs (see Appendix C)

A3. Overall confidence of judgment on how participants were assigned (select one of the following)

- A3.1 ☐ Very low (little basis)
- A3.2 ☐ Low (guess)
- A3.3 ☐ Moderate (weak inference)
- A3.4 ☐ High (strong inference)
- A3.5 ☐ Very high (explicitly stated)
- A3.6 ☐ N/A
- A3.7 ☐ Unknown/unable to code

B. Statistical Treatment/Data Analysis (answer B1 through B6)

B1. Appropriate unit of analysis	yes	no	
B2. Familywise error rate controlled	yes	no	N
B3. Sufficiently large *N*	yes	no	

Explicitly stated in paper under 'subjects'

Statistical Test: ANCOVA
_level: .05
ES: large
N required: 21

B4. Total size of sample (start of the study): 78
N

B5. Intervention group sample size: 30
N

B6. Control group sample size: 28 (PC&S), 20 (WLC)
N

C. Type of Program (select one)

C1. ☐ Universal prevention program
C2. ☐ Selective prevention program
C3. ☐ Targeted prevention program
C4. ☐ Intervention/Treatment
C5. ☐ Unknown

D. Stage of the Program (select one)

D1. ☐ Model/demonstration programs
D2. ☐ Early stage programs
D3. ☐ Established/institutionalized programs
D4. ☐ Unknown

E. Concurrent or Historical Intervention Exposure (select one)

E1. ☐ Current exposure
E2. ☐ Prior exposure
E3. ☐ Unknown

II. Key Features for Coding Studies and Rating Level of Evidence/ Support

(3=Strong Evidence 2=Promising Evidence 1=Weak Evidence 0=No Evidence)

A. Measurement (answer A1 through A4)

A1. Use of outcome measures that produce reliable scores for the majority of primary outcomes. The table for Primary/Secondary Outcomes Statistically Significant allows for listing separate outcomes and will facilitate decision making regarding measurement (select one of the following)

A1.1☐ Yes
A1.2☐ No
A1.3☐ Unknown/unable to code

A2. Multi-method (select one of the following)

A2.1☐ Yes
A2.2☐ No
A2.3☐ N/A
A2.4☐ Unknown/unable to code

A3. Multi-source (select one of the following)

A3.1☐ Yes
A3.2☐ No
A3.3☐ N/A
A3.4☐ Unknown/unable to code

A4. Validity of measures reported (select one of the following)

A5.1☐ Yes validated with specific target group
A5.2☐ In part, validated for general population only
A5.3☐ No
A5.4☐ Unknown/unable to code

Rating for Measurement (select 0, 1, 2, or 3)**:** ☐**3** ☐**2** ☐**1** ☐**0**

B. Comparison Group

B1. Type of Comparison Group (select one of the following)

B1.1☐ Typical contact
B1.2☐ Typical contact (other) specify:
B1.3☐ Attention placebo
B1.4☐ Intervention elements placebo
B1.5☐ Alternative intervention
B1.6☐ Pharmacotherapy
B1.7☐ No intervention
B1.8☐ Wait list/delayed intervention
B1.9☐ Minimal contact
B1.10☐ Unable to identify comparison group

Rating for Comparison Group (select 0, 1, 2, or 3)**:** ☐**3** ☐**2** ☐**1** ☐**0**

B2. Overall confidence rating in judgment of type of comparison group (select one of the following)

B2.1 Very low (little basis)
B2.2 Low (guess)
B2.3 Moderate (weak inference)
B2.4 High (strong inference)
B2.5 Very high (explicitly stated)
B2.6 Unknown/Unable to code

B3. Counterbalancing of Change Agents (answer B3.1 to B3.3)
B3.1 By change agent
B3.2 Statistical
B3.3. Other

B4. Group Equivalence Established (select one of the following)
B4.1 Random assignment
B4.2 Posthoc matched set
B4.3 Statistical matching
B4.4 Post hoc test for group equivalence

B5. Equivalent Mortality (answer B5.1 through B5.3)
B5.1 Low Attrition (less than 20% for Post)
B5.2 Low Attrition (less than 30% for follow-up)
B5.3 Intent to intervene analysis carried out

Findings: 7 drop-outs from the trial. The dropouts were for personal/domestic reasons (not dissatisfaction with treatment), dropouts were no different from any of the other children on baseline measures. Dropouts were handled in the most statistically conservative manner (replacing scores at T_2 and T_3 with values representing the poorest outcome for participants in their particular condition).

D. Educational/Clinical Significance

Outcome Variables:	Pretest	Posttest	Follow Up
D1. Categorical Diagnosis Data	Diagnostic information regarding inclusion into the study presented: ☐ Yes ☐ No ☐ Unknown	Positive change in diagnostic criteria from pre to posttest: ☐ Yes ☐ No ☐ Unknown	Positive change in diagnostic criteria from posttest to follow up: ☐ Yes ☐ No ☐ Unknown
D2. Outcome Assessed via continuous Variables		Positive change in percentage of participants showing clinical improvement from pre to posttest: ☐ Yes ☐ No ☐ Unknown	Positive change in percentage of participants showing clinical improvement from posttest to follow up: ☐ Yes ☐ No Unknown
D3. Subjective Evaluation: The importance of behavior change is evaluated by individuals in direct contact with the participant.	Importance of behavior change is evaluated: ☐ Yes ☐ No Unknown	Importance of behavior change from pre to posttest is evaluated positively by individuals in direct contact with the participant: ☐ Yes ☐ No Unknown	Importance of behavior change from posttest to follow up is evaluated positively by individuals in direct contact with the participant: Yes No Unknown
D4. Social Comparison: Behavior of participant at pre, post, and follow up is compared to normative data (e.g., a typical peer).	Participant's behavior is compared to normative data Yes No Unknown	Participant's behavior has improved from pre to posttest when compared to normative data: Yes No Unknown	Participant's behavior has improved from posttest to follow up when compared to normative data: Yes No Unknown

Rating for Educational/Clinical Significance (select 0, 1, 2, or 3)**:** ☐ **3** ☐ **2** ☐ **1** ☐ **0**

F. Implementation Fidelity

F1. Evidence of Acceptable Adherence (answer F1.1 through F1.3)

F1.1 ☐ Ongoing supervision/consultation
F1.2 ☐ Coding intervention sessions/lessons or procedures
F1.3 ☐ Audio/video tape implementation (select F1.3.1 or F1.3.2):

F1.3.1 ☐ Entire intervention
F1.3.2 ☐ Part of intervention

F2. Manualization (select all that apply)

F2.1 Written material involving a detailed account of the exact procedures and the sequence in which they are to be used

F2.2 Formal training session that includes a detailed account of the exact procedures and the sequence in which they are to be used

F2.3 Written material involving an overview of broad principles and a description of the intervention phases

F2.4 Formal or informal training session involving an overview of broad principles and a description of the intervention phases

F3. Adaptation procedures are specified (select one) ☐ yes ☐ no ☐ unknown

Rating for Implementation Fidelity (select 0, 1, 2, or 3)**:** ☐ **3** ☐ **2** ☐ **1** ☐ **0**

H. Site of Implementation

H2. Non School Site (if it is a non school site, select one of the following options) H2.1

☐ Home
H2.2 ☐ University Clinic
H2.3 ☐ Summer Program
H2.4 ☐ Outpatient Hospital
H2.5 ☐ Partial inpatient/day Intervention Program
H2.6 ☐ Inpatient Hospital
H2.7 ☐ Private Practice
H2.8 ☐ Mental Health Center
H2.9 ☐ Residential Treatment Facility
H2.10 ☐ Other (specify):_____
H2.11 ☐ Unknown/insufficient information provided

Rating for Site of Implementation (select 0, 1, 2, or 3)**:** ☐ **3** ☐ **2** ☐ **1** ☐ **0**

I. Follow Up Assessment

☐ Timing of follow up assessment: after 15 weeks

☐ Number of participants included in the follow up assessment: All participants (minus 7 drop-outs)

☐ Consistency of assessment method used: All measures were re-assessed at follow up

Rating for Follow Up Assessment (select 0, 1, 2, or 3)**:** ☐ **3** ☐ **2** ☐ **1** ☐ **0**

III. Other Descriptive or Supplemental Criteria to Consider

A. External Validity Indicators

A1. Sampling procedures described in detai ☐ yes ☐ no

Specify rationale for selection: Participants identified at their 3 year developmental check. A screening stage was conducted using the Werry-Weiss-Peters Activity Scale and all children who scored more than 20 were included in sample. Following this Parental Account of Childhood Symptoms (PACS).

Specify rationale for sample size: Sample size selected to ensure there was sufficient power to detect effects of moderate size and clinical significance.

A1.1Inclusion/exclusion criteria specified ☐ yes ☐ no

A1.2 Inclusion/exclusion criteria similar to school practice ☐ yes ☐ no

A1.3 Specified criteria related to concern ☐ yes ☐ no

A2. Participant Characteristics Specified for Treatment and Control Group

Participants	Age	Gender	Ethnicity	Primary Language	SES	Family Structure	Locale	Disability
Child/Student Parent/Caregiver Teacher School Other	3 years 0 months - 3 years 11 months	Boys: 48 Girls: 30	NOT KNOWN	NOT KNOWN	Social class 1&2 (Professional): 42% Social Class 3&4 (Skilled): 40% Social class 5&6 (Unskilled): 18%	NOT KNOWN	A community sample was taken from the Hampshire Area (participants sourced from a population of 3051 children identified at a 3 year developmental check))	100% of children in the study met the criteria for ADHD symptoms raised as a concern by parents. 29% of the children in the study met the criteria for PACS conduct problems.

A3. Details are provided regarding variables that:

A3.1 Have differential relevance for intended outcomes yes ☐ no ☐

Specify: _____

A3.2 Have relevance to inclusion criteria ☐ yes ☐ no

Specify:

A4. Receptivity/acceptance by target participant population (treatment group)

Participants from Treatment Group	Results (What person reported to have gained from participation in program)	General Rating
☐ Child/Student ☐ Parent/caregiver ☐ Teacher ☐ School ☐ Other	Mothers reported increased maternal wellbeing (but this was reduced by follow-up)	☐ Participants reported benefiting overall from the intervention ☐ Participants reported not benefiting overall from the intervention

A5. Generalization of Effects:

A5.1 Generalization over time

A5.1.1 Evidence is provided regarding the sustainability of outcomes after intervention is terminated ☐ yes ☐ no

Specify:Effects of PT are reportedly maintained for 15 weeks after treatment.

A5.1.2 Procedures for maintaining outcomes are specified ☐ yes ☐ no

Specify: _____

A5.2 Generalization across settings

A5.2.1 Evidence is provided regarding the extent to which outcomes are manifested in contexts that are different from the intervention context ☐ yes ☐ no

Specify: _____

A5.2.2 Documentation of efforts to ensure application of intervention to other settings ☐ yes ☐ no

Specify: _____

A5.2.3 Impact on implementers or context is sustained ☐ yes ☐ no

Specify: The effects of PT on maternal wellbeing was initially strong but was reduced somewhat by follow up. Additionally, this does not allow us to identify what role, if any, parental wellbeing plays in mediating behavioural change.

A5.3 Generalization across persons

Evidence is provided regarding the degree to which outcomes are manifested with participants who are different than the original group of participants for with the intervention was evaluated ☐ yes ☐ no

Specify: _____

B. Length of Intervention (select B1 or B2)

B1 ☐ Unknown/insufficient information provided

B2 ☐ Information provided (if information is provided, specify one of the following:) B2.1 weeks 8

B2.2 months _____ N

B2.3 years _____ N

B2.4 other _____ N

C. Intensity/dosage of Intervention (select C1 or C2)

C1. ☐ Unknown/insufficient information provided

C2. ☐ Information provided (if information is provided, specify both of the following:)

C2.1 length of intervention session 1 hour N

C2.2 frequency of intervention session weekly N

E. Program Implementer (select all that apply)

E1. ☐ Research Staff
E2. ☐ School Specialty Staff
E3. ☐ Teachers
E4. ☐ Educational Assistants
E5. ☐ Parents (Implemented the program)
E6. ☐ College Students
E7. ☐ Peers
E8. ☐ Other E9. Unknown/insufficient information provided
☐

F. Characteristics of the Intervener

F1. ☐ Highly similar to target participants on key variables (e.g., race, gender, SES)
F2. ☐ Somewhat similar to target participants on key variables
F3. ☐ Different from target participants on key variables

G. Intervention Style or Orientation (select all that apply)

G1. ☐ Behavioral
G2. ☐ Cognitive-behavioral
G3. ☐ Experiential
G4. ☐ Humanistic/interpersonal
G5. ☐ Psychodynamic/insight oriented
G6. ☐ other (specify):_____
G7. ☐ Unknown/insufficient information provided

H. Cost Analysis Data (select G1 or G2)

H1. ☐ Unknown/insufficient information provided
H2. ☐ Information provided (if information is provided, answer H2.1)

H2.1 Estimated Cost of Implementation:_____

I. Training given to staff delivering program

I1. ☐ Who delivered the intervention to change agents
☐ ☐ I1.1 Project Director
☐ I1.2 Graduate/project assistants

☐ I1.3 Other (please specify):
☐ Specially Trained Health Visitors
I1.3 Unknown

I2. Training workshops conducted

# of Workshops provided 1

Average length of training N/A

I3. ☐ Ongoing technical support
I4. ☐ Program materials used
I5. ☐ Special Facilities
I6. ☐ Other (specify):

J. Feasibility

J1. Level of difficulty in training intervention agents (select one of the following)

J1.1☐ High
J1.2☐ Moderate
J1.3☐ Low
J1.4☐ Unknown

J2. Cost to train intervention agents (specify if known): _____

J3. Rating of cost to train intervention agents (select one of the following)

J3.1☐ High
J3.2☐ Moderate
J3.3☐ Low
J3.4☐ Unkno

Summary of Evidence for Group-Based Design Studies

Indicator	Overall Evidence Rating NNR = No numerical rating or 0 - 3	Description of Evidence Strong Promising Weak No/limited evidence
General Characteristics		
General Design Characteristics	NNR	Strong
Statistical Treatment	NNR	Promising
Type of Program	NNR	Strong
Stage of Program	NNR	Promising
Concurrent/Historical Intervention Exposure	NNR	No/Limited evidence
Key Features		
Measurement	3	Strong
Comparison Group	3	Strong
Educational/clinical significance	0	No/Limited evidence
Implementation Fidelity	2	Promising
Site of Implementation	3	Strong
Follow Up Assessment Conducted	2	Promising
Descriptive or Supplemental Criteria		
External validity indicators	NNR	Weak
Length of Intervention	NNR	Strong
Intensity/dosage	NNR	Strong
Program Implementer	NNR	Strong
Characteristics of the Intervener	NNR	Promising
Intervention Style/Orientation	NNR	Promising
Cost Analysis Data Provided	NNR	No/Limited Evidence
Training given to staff delivering program	NNR	Promising
Feasibility	NNR	No/Limited Evidence

Appendix D

A number of different methodological weightings have been considered for Weight of Evidence A (WoE A). The weightings in tables 1-3 (measurement, comparison group and follow up) were drawn from the 'Key Features' section of the Kratchowill Coding Protocol. Tables 4 and 5 demonstrate two additional relevant methodological weightings (analysis and participants) that have been constructed using information from the 'General Characteristics' section of the Kratchowill Coding Protocol. All relevant sub-sections that informed the weightings in tables 1-5 have been explicitly stated above each table.

The following sections from the 'Key Features' section of Kratchowill were not included:

- Educational/Clinical Significance – all studies received the same score of 0 in the for this section because there was not sufficient evidence provided in any paper to conclusively give a rating. This measure was therefore not deemed relevant for inclusion.
- Implementation Fidelity – this was explored as part of WoE C
- Site of Implementation – all studies were conducted in a home environment and thus this measure was not deemed relevant for inclusion.

Table 6 demonstrates the individual weightings given to each study and overall weighting for WoE A.

Table 1

Key Feature: Measurement *- Drawn from sub-sections A.1-A.4 of Kratchowill (Section II).*

Weighting	Description
High (3)	1. Provides comprehensive measures for 3 primary outcomes (ADHD symptoms): ADHD rating, observation and parent child interaction. 2. Provides at least 3 measures for secondary outcomes (parent self-efficacy) 3. Sources information from parents, teachers, child and external observer 4. Measures have good reliability of .85 or above (reported in text) or are well referenced
Medium (2)	1. Measures for at least two of primary outcomes (ADHD symptoms): ADHD rating, observation and parent child interaction. 2. Provides at least 3 measures for secondary outcomes (parent self-efficacy) 3. Data collected from at least two or more sources 4. Measures have reliability of 0.7

Low (1)	1. Measures for at least one primary outcome (ADHD symptoms): ADHD rating, observation and parent child interaction 2. Provides at least 2 measures for secondary outcomes (parent self-efficacy) 3. Data collected from parent and child 4. Measures have reliability of less than 0.7

Table 2

Key Feature: Comparison Group *- Drawn from sub-section B.1 of Kratchowill Coding Protocol (Section II)*

Weighting	Description
High (3)	Wait List control AND active comparison group
Medium (2)	Wait List control
Low (1)	Treatment as Usual

Table 3

Key feature: Follow up Assessment Conducted *- Drawn from sub-section I of Kratchowill Coding Protocol (Section II).*

Weighting	Description
High (3)	15 weeks or more follow up Less than 30% attrition for follow up
Medium (2)	15 weeks or more follow up More than 30% attrition for follow up
Low (1)	No follow up

Table 4

Analysis *- Drawn from sub-section B1-B6 of Kratchowill Coding Protocol (Section I).*

Weighting	Description
High (3)	All of: 1. Uses appropriate unit of analysis 2. Sufficiently large sample size 3. Enough information for effect size to be calculated

Medium (2)	2 or more of: 1. Uses appropriate unit of analysis 2. Sufficiently large sample size 3. Enough information for effect size to be calculated
Low (1)	1 of: 1. Uses appropriate unit of analysis 2. Sufficiently large sample size 3. Enough information for effect size to be calculated

Table 5

Participants *- Drawn from sub-sections B.3 (section I) and A.2 (Section III)*

Weighting	**Description**
High (3)	4 or more of the following: 1. Sufficiently large sample size 2. Participants sourced from a community setting 3. Participants from the UK 4. Participants are pre-school aged 5. Wide range of SES (reported in text) 6. Recruitment of participants based on a large population (more than convenience sampling)
Medium (2)	4 or more of the following: 1. Sufficiently large sample size 2. Participants sourced from a community setting 3. Participants from the UK 4. Participants are pre-school aged 5. Wide range of SES (reported in text) 6. Recruitment of participants based on a large population (more than convenience sampling)
Low (1)	Less than 4 of the following: 1. Sufficiently large sample size 2. Participants sourced from a community setting 3. Participants from the UK 4. Participants are pre-school aged 5. Wide range of SES (reported in text) 6. Recruitment of participants based on a large population (more than convenience sampling)

Table 6

Summary table for Weight of Evidence A

Study	Measurement	Comparison Group	Follow up	Analysis	Participants	Overall WoE A
Sonuga-Barke et al (2001)	High (3)	High (3)	Medium (2)	High (3)	High (3)	High (2.8)
Sonuga-Barke et al (2004)	High (3)	Low (1)	Medium (2)	Medium (2)	High (3)	Medium (2.2)
Thompson et al (2009)	High (3)	Low (1)	Medium (2)	Medium (2)	Low (1)	Medium (1.8)
Daley and O'Brien (2013)	High (3)	Low (1)	Low (1)	Medium (2)	Medium (2)	Medium (1.8)
Abikoff et al (2014)	High (3)	High (3)	High (3)	High (3)	Low (1)	High (2.6)

Appendix E

Tables 1-3 highlight the criteria and rationale for Weight of Evidence B: Measures, Participants, Appropriate Measures and Sampling. Table 4 demonstrates the individual weightings given to each study and overall weighting for WoE B.

Table 1

Participants *– NFPP was originally devised and assessed with preschool children so ages 3 years – 4 years 11 months will provide the most accurate group for the research question.*

Weighting	Description
High (3)	Participants aged 3 years – 4 years 11 months
Medium (2)	Participants aged 3 years – 6 years 11 months
Low (1)	Participants aged 3 years – 11 years

Table 2

Appropriate measures *– a wider range of measures and from different sources gives a more suitable over view of improvement in symptoms.*

Weighting	Description
High (3)	1. Measures come from 3 or more of: child, parent, teacher and clinician 2. Measures include ADHD rating, observation AND parent-child interaction
Medium (2)	1. Measures come from at least 3 of: child, parent, teacher and clinician 2. Measures include at least 2 of: ADHD rating, observation and parent-child interaction
Low (1)	1. Measures come from at least 2 of the following: child, parent, teacher and clinician 2. Measures include at least 1 of: ADHD rating, observation and parent-child interaction

Table 3

Sampling Procedure *– A greater number of forms of clinical screening will identify participants who are most representative of the group who suffer from ADHD.*

Weighting	Description
High (3)	3 or more forms of clinical screening (e.g. PACS, WWP, CPRS-R, CTRS-R, DISC-IV-YR)
Medium (2)	2 or more forms of clinical screening (e.g. PACS, WWP, CPRS-R, CTRS-R, DISC-IV-YR)
Low (1)	1 or more forms of clinical screening (e.g. PACS, WWP, CPRS-R, CTRS-R, DISC-IV-YR)

Table 4

Summary table for Weight of Evidence B

Study	Participants	Appropriate Measures	Sampling Procedure	Overall WoE B
Sonuga-Barke et al (2001)	High (3)	Medium (2)	Medium (2)	Medium (2.3)
Sonuga-Barke et al (2004)	High (3)	Low (1)	Medium (2)	Medium (2)
Thompson et al (2009)	Medium (2)	Medium (2)	Medium (2)	Medium (2)
Daley and O'Brien (2013)	Low (1)	Medium (2)	Low (1)	Low (1.3)
Abikoff et al (2014)	High (3)	High (3)	High (3)	High (3)

Appendix F

Table 1 highlights the criteria and rationale for Weight of Evidence C. The rationale for this criteria was such that in order to assess whether the intervention has been effective the most suitable papers will be those that use the intervention in the original and intended format. Any changes to the delivery or design of the program may have an impact on the outcomes.

Table 1

Delivery of the NFPP program

Weighting	Description
High (3)	NFPP delivered in 'pure form': Weekly direct support from a specialist trained professional
Medium (2)	NFPP delivered in 'modified form': Weekly direct support from a non-specialist trained professional.
Low (1)	NFPP delivered in 'limited form': Limited direct support from trained professionals (weekly scripted telephone call for progress update). Parents receive brief initial training and use handbook.

Appendix G

Table 1 demonstrates the Weight of Evidence Averaging criteria which was used for WoE D. This criteria was also applied to WoE A and B. This criteria ensured that in order to obtain a high overall WoE, the 'high' weighting must have appeared at least twice in any of the previous categories.

Category	Numerical Rating
Low	1.4 or less
Medium	1.5-2.4
High	2.5 or above