Efficacy of a self-help parenting intervention for parents of children with Attention Deficit Hyperactivity Disorder in adjunct to usual treatment – Small Scale Randomised Controlled Trial

David Daley[1], Joanne Tarver[2], Kapil Sayal[1]

[1]Division of Psychiatry and Applied Psychology, School of Medicine, University of Nottingham; UK.

[2]School of Life and Health Sciences, Aston University, UK.

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Conflicts of Interest

DD is a co-author of the published self-help book which is tested in this study. JT and KS declare no conflicts of interest.

Availability of data and material: Full data not available for ethical reasons

Abstract

Background: Multimodal intervention incorporating psychosocial intervention and medication is recommended for school aged children with Attention-Deficit/Hyperactivity Disorder (ADHD). This randomised controlled trial (RCT) investigates the adjunctive benefit of the self-help version of the New Forest Parenting Programme (NFPP-SH) when offered in addition to treatment as usual (TAU) compared to TAU alone.

Method: Fifty-two children, receiving medication for ADHD as part of their usual care, were randomised to receive NFPP-SH+TAU or TAU alone.

Results: When used in adjunct to TAU, NFPP-SH may have beneficial effects for parenting efficacy ($F=6.28$, $p=0.02$), child social performance in school and negative comments made by parents during a recorded speech sample. However, the self-help intervention did not have any additional effect on child behaviour.

Conclusions: This study provides further support for self-help interventions as potentially low intensity, and cost-effective alternatives to therapist-led parenting interventions. The findings require replication in larger samples before any firm conclusions about adjunctive efficacy of NFPP-SH can be drawn but underline the potential for self-help within routine treatment. ClinicalTrials.gov Identifier: NCT02174952.

Introduction

Parenting interventions are recommended as part of a multimodal treatment approach for school-aged children with ADHD (NICE, 2018). Based on social learning principles, parenting interventions include strategies for parents aimed at increasing the frequency of adaptive child behaviours whilst reducing the occurrence of non-compliant or disruptive behaviour. However, their efficacy as treatments for ADHD has been questioned in a meta-analysis which found effect sizes for ADHD symptoms dropped to near zero when using outcome data from objective informants 'probably blind' to treatment allocation (Sonuga-Barke et al., 2013). Indeed behavioural interventions, such as parenting programmes may be better viewed as treatments with the ability to target some of the more distal functioning deficits associated with ADHD (Daley et al., 2014; Sonuga-Barke et al., 2013). This is especially true when behavioural programmes are offered as an adjunct to medication, which is associated with large effect sizes for ADHD symptoms. When analysing data from 'probably blind informants', there is more convincing evidence of the effectiveness of parenting interventions for child conduct problems, parenting behaviour and parenting efficacy (Daley et al., 2014).

There is mixed evidence regarding the additional benefits of parent interventions to medication. The Multimodal Treatment study for ADHD (MTA) reported no additional benefit of intensive multicomponent behavioural intervention incorporating parent training to medication compared to treatment with medication alone (The MTA Cooperative Group, 1999). However, a re-analysis of MTA data based on the number of children displaying an 'excellent response' to treatment highlighted that 68% of children receiving multimodal treatment showed an excellent response compared to 56% of those receiving medication alone (Swanson et al., 2001). There is also evidence of additional benefits for externalising and internalising child symptoms when a parenting intervention is added to treatment with medication alone (van den Hoofdakker et al., 2007). When offered as a standalone treatment, parenting interventions have beneficial effects for parental well-being including parenting efficacy and parental low mood (David Daley & O'Brien, 2013; Hoath & Sanders, 2002; Sonuga-Barke et al., 2001).

Self-help Parenting Programmes

Despite potential family-wide benefit, a number of practical and psychological barriers can limit the availability, uptake and adherence to therapist- led parenting programmes (Prinz & Sanders, 2007). First, parenting programmes are expensive and service provision may be limited (Foster et al., 2007). Second, psychological barriers such as perceived stigma or feelings of isolation can also impact on parental willingness to attend

sessions (Koerting et al., 2013; Prinz & Sanders, 2007). Third, parents may experience practical obstacles such as transport or childcare issues that prevent them from being able to attend sessions (Owens et al., 2002).

Consequently, there is growing interest in the development and efficacy of self-help (SH) parenting interventions which have the potential to overcome barriers to take-up or adherence. SH interventions provide parents with materials that enable them to teach intervention components to themselves with little or no therapist support. Similar to parent-led intervention, SH interventions have beneficial effects for parent-reported child behaviour and other family-wide outcomes including parental low-mood and stress, parenting behaviour and parenting efficacy (Tarver et al., 2014). There is also evidence of SH treatment effects being maintained at 1 year post intervention (Ise et al., 2015). SH parenting interventions therefore have potential to provide a potentially cost-effective, low-intensity alternative to therapist-led interventions that can be added to medication to provide a treatment package that adheres to guidelines recommending multi-modal intervention.

Few studies have investigated the adjunctive benefit of a SH parenting intervention to medication for the treatment of ADHD. Long et al. (1993) provided bibliotherapy to families with a child with a clinical diagnosis of ADHD and receiving medication as part of their usual care. At post-intervention, children in the intervention group scored lower on parent-reported and teacher-reported measures of oppositional behaviour. However, there was no difference between groups on parent-reported measures of hyperactivity or impulsivity (Long et al., 1993). More recently, Dose et al. (2017) have found evidence of telephone-assisted SH having additional benefit for teacher reported ODD symptoms and negative parenting behaviour. These studies provide preliminary support of the potential of SH interventions for aspects of parent and child well-being when children are receiving medication for ADHD symptoms; these findings now require replication with varying forms of SH intervention (Dose et al., 2017).

The New Forest Parenting Programme

The New Forest Parenting Programme (NFPP) is a parenting intervention developed specifically for the treatment of ADHD (Sonuga-Barke et al., 2006). In addition to behaviour management strategies, the intervention includes ideas for games and strategies that target some of the self-regulatory and cognitive deficits often present in ADHD. Therapist-led NFPP has been shown to be effective for the treatment of pre-school ADHD and behaviour problems in randomised controlled trials (Sonuga-Barke et al., 2001; Thompson et al., 2009).

A SH version of NFPP (NFPP-SH) has been developed and trialled in a small scale study with 43 children aged between 4-11 years and meeting diagnostic criteria for ADHD (David Daley & O'Brien, 2013). NFPP-SH was associated with reductions in parent-reported ADHD symptoms. However, independent observations of child behaviour failed to confirm this effect. NFPP-SH was also associated with large increases in parenting efficacy and satisfaction. NFPP-SH may not be sufficient to treat ADHD alone. Nonetheless, it could be a useful adjunct to medication with potential to combat some of the more distal problems commonly associated with ADHD, that medication may be less able to improve.

This study reports the findings of a trial exploring the efficacy of NFPP-SH when used in adjunct to treatment as usual including pharmacotherapy. The trial was designed as a pragmatic trial; few inclusion/exclusion criteria were applied in order to ensure the applicability of the findings to real-world clinical settings.

Method

Participants and recruitment

This study received ethical approval from the NHS Research Ethics Committee (REC ref: 12/EM/0200). Fifty two children aged between 6-10 years (mean 8.43 years, sd 1.31 years) were recruited from 11 participating community paediatric and child and adolescent mental health clinics throughout England. All participants provided informed written consent. The characteristics of the sample are presented in Table 1. As a pragmatic trial, few exclusion criteria were applied for study eligibility. Children aged 6-10 years were eligible for the trial if they had received a clinical diagnosis of ADHD (confirmed by referring clinician), were in receipt of medication for ADHD and their parent/caregiver was aged 18 years or over. There were no restrictions on the type of medication children were receiving (e.g. methylphenidate, lisdexamphetamine) or the length of time children had been receiving medication. Children were excluded if their parents were unable to read English (due to copyright restrictions, the SH manual was only available in English) or if the referring clinician felt that the parent/caregiver would be unable to complete the SH intervention (e.g. parent had severe mental illness). See Fig 1 for the flow of participants through the trial.

Trial Design

Families were randomised to receive NFPP-SH in adjunct to their usual treatment (NFPP-SH+TAU) or to usual treatment alone (TAU) by a member of the Clinical Trials Unit at the University of Nottingham.

Outcome measures were collected at pre-intervention (T1), post-intervention (T2;12 weeks) and longer term follow-up (T3;28 weeks). Data were collected via questionnaire batteries sent to parents. Questionnaire batteries also included child report questionnaires to be completed by the child, at home, where possible. Parents were asked to complete the questionnaires and return them to the research team in a prepaid envelope. Five Minute Speech Samples (FMSS; to provide a measure of parental expressed emotion) were recorded via the telephone at T1 and T2. Teacher report questionnaires were sent to teachers at T1 and T2 to be completed and returned to assess generalisation of treatment effects across settings. As parents were encouraged to share some aspects of the SH intervention with teachers, teachers were not considered blinded informants in this study.

Treatment arms

NFPP-SH+TAU

Participants allocated to TAU+SH received an intervention pack containing copies of the published NFPP-SH book (Laver-Bradbury et al., 2010) consisting of two parts. Part 1 includes brief psychoeducation and part 2 contains a six-step programme detailing empirically supported behavioural strategies. It was recommended that parents spend two weeks reading each step and implementing the strategies. Parents received a fortnightly phone call from a member of university staff external to the research team. The phone call served two purposes: to remind parents to move on the next step of the manual and to collect a measure of SH treatment fidelity for that fortnight. In the event of an unsuccessful attempt to contact parents by telephone, letters were sent to remind them to move on the next stage of the intervention.

The intervention pack also contained a DVD to accompany the SH manual. The Living with ADHD DVD contained psychoeducation about why children with ADHD behave in the way that they do, and also contained a brief summary of the core NFPP strategies that were explained in more detail in the self-help book (Laver-Bradbury et al., 2010). Parents received instructions on how to use the DVD in accordance with the SH manual and were advised to share the DVD with others involved in the caregiving of their child (e.g. partners, grandparents, teachers).

TAU alone

Families allocated to TAU were not contacted by the research team during the 12 week intervention period and received the SH intervention at the end of their involvement in the trial.

Outcome Measures

Primary Outcome Measure: Parenting efficacy

The Parenting Sense of Competency Scale (PSOC) (Johnston & Mash, 1989) is a frequently used measure of parenting efficacy and satisfaction . The scale has good internal reliability (α =0.79, 0.75 and 0.70 for the total scale, satisfaction subscale and efficacy subscale respectively). The PSOC has been used in previous parenting intervention studies showing sensitivity to treatment effects (e.g. Sonuga-Barke et al. 2001). In this sample α = 0.58 and 0.68 for the efficacy and satisfaction subscales respectively.

Secondary Outcome Measures

Parental Mental Health

The 12 item General Health Questionnaire (GHQ-12) (Goldberg, 1982) is a measure of common mental health problems in adults. Respondents rate the presence of each symptom on a four point scale (not at all, same as usual, no more than usual, rather more than usual). The scale has good internal reliability (alpha = 0.91) and test-retest reliability (ICC=0.79) (Schrnitz et al., 1999). In this sample, the GHQ-12 had an alpha value of 0.89.

Disruptive Behaviour

The Eyberg Child Behaviour Inventory (ECBI) (Eyberg et al., 1980) lists 36 problem behaviours. Parents rate the frequency of each behaviour on a 7 point scale (1= 'Never' and 7= 'Always'; intensity score). Parents rate whether each behaviour is a problem using a 'yes-no' scale (problem score). The reliability of the intensity and problem scales have been demonstrated with mean split-half correlations of r=0.95 and r=0.94 respectively (Robinson et al., 1980). In this sample, the Cronbach's alpha values were 0.90 and for the intensity scale and 0.89 for the problem scale.

ADHD and ODD Symptoms

The MTA version of the SNAP-IV (Swanson et al., 2001) contains 26 items measuring hyperactivity/impulsivity (9 items), inattention (9 items) and ODD (8 items). Both the parent and teacher versions were employed in this study. Items are rated on a 4-point scale (0= not at all; 1= just a little; 2= pretty much; 3=very much). Bussing et al. 2008 report satisfactory internal reliability for the parent report form (α= 0.90 for the inattention subscale, 0.79 for the hyperactivity subscale and 0.89 for the ODD subscale) and teacher report form (0.92 for the inattention subscale, 0.96 for the hyperactivity/impulsivity subscale and 0.92 for the ODD subscale have been reported) (Bussing et al., 2008). Acceptable internal reliabilities were replicated in this

sample for the parent (α= 0.80, 0.76 and 0.86 for the inattention, hyperactivity and ODD subscales respectively) and teacher version (α=0.86, 0.86 and 0.83 for the inattention, hyperactivity and ODD subscales respectively).

Family Functioning

The Family Strain Index (FSI) (Riley et al., 2006) is a six item measure assessing the impact of ADHD on family experience. Parents are asked to rate the frequency of each item on a 5-point scale (0= never, 1= almost never, 2= sometimes, 3= almost always, and 4= always). The scale has demonstrated sensitivity to treatment effects in a previous ADHD treatment study (Svanborg et al., 2009). In this sample, the FSI had a Cronbach's alpha value of 0.85.

Expressed Emotion

In the Five Minute Speech Sample (FMSS) (Daley et al., 2003), parents are asked to talk freely about their thoughts and feelings towards their child. Speech samples are rated on global scales of warmth, relationship and initial statement and frequency counts of positive and negative comments to provide a measure of parental Expressed Emotion (EE). High parental EE is indicated by the presence of a negative rating on one of the global scales or a higher number of negative comments than positive comments (Daley et al., 2003). The measure discriminates between mothers of children with ADHD and mothers of typically developing children (Daley et al., 2003).

Attitudes to drug treatment

The Southampton ADHD Medication Behaviour and Attitudes Scale (SAMBA) (Harpur et al., 2008) has parent and child versions, both of which were used in this study. The parent report has 32 items covering seven factors: perceived costs of taking medication, flexibility, resistance, perceived benefits of taking medication, child stigma, parent stigma and parental inconsistency, with Cronbach's alpha vales of 0.83, 0.82, 0.82, 0.81, 0.79, 0.75 and 0.67 respectively (Harpur et al., 2008). The child report version has 16 items containing four factors: stigma, perceived benefits, perceived costs and child's resistance with reported Cronbach's alpha values of 0.82, 0.82, 0.76 and 0.79 respectively. In this study, α= 0.88, 0.81, 0.70, 0.72, 0.78, 0.54, and 0.57 for the benefits, costs, child stigma, parent stigma, flexibility, resistance and parental inconstancy subscales respectively. Cronbach's alpha values for the child-report questionnaire were 0.73, 0.68, 0.57 and 0.61 for the benefits, stigma scale, perceived costs and resistance subscales respectively.

Academic and Social Functioning

The performance scale of the Vanderbilt ADHD Diagnostic Parent Rating Scale (Wolraich et al., 2003) is an 8-item scale and was used to provide a brief measure of academic and social functioning. Parents/teachers rate the child's performance on a 5 point scale where 1=problematic and 5=above average. In this sample, the questions relating to academic performance on the parent-report version had a Cronbach's alpha value of 0.84, whilst the questions relating to child social performance had a Cronbach's alpha value of 0.70.

Health Related Quality of Life (HRQOL)

The child report form of the Child Health and Illness Profile (CHIP-CE/CRF) is 45-item measure of HRQOL for children (Riley, Forrest, Rebok, et al., 2004). It has five scales measuring satisfaction (with health), comfort, resilience, risk avoidance and achievement. Each scale has good internal reliability with Cronbach's alpha values of 0.81, 0.82, 0.70, 0.82 and 0.74 for the satisfaction, comfort, resilience, risk avoidance and achievement scores respectively (Riley, Forrest, Rebok, et al., 2004). In this sample, Cronbach's alpha values were acceptable (α= 0.77, 0.74, 0.76, 0.61 and 0.87 for the comfort, achievement, risk avoidance, resilience and satisfaction domain respectively).

The 45-item version of the parent-report form of the CHIP-CE (CHIP-CE/PRF-45) was also utilised in this study (Riley, Forrest, Starfield, et al., 2004). The 45-item CHIP-CE/PRF is a shortened version of the original 76-item questionnaire which has good test-retest reliability (ICC= 0.79, 0.71, 0.80, 0.84 and 0.85 for the satisfaction, comfort, resilience, risk avoidance and achievement scales respectively) and internal reliability (α= 0.84, 0.88, 0.79, 0.82, and 0.83 for the satisfaction, comfort, resilience, risk avoidance and achievement scales (Riley, Forrest, Starfield, et al., 2004). The acceptable internal reliability of the scales was replicated in this sample (α= 0.87, 0.84, 0.77, 0.70, 0.66) for the satisfaction, comfort, resilience, risk avoidance and achievement domains respectively.

SH Treatment Fidelity

During fortnightly phone calls, parents in the NFPP+SH were asked to rate their engagement with the SH materials over the past fortnight. Parents were asked to rate (on a 5 point scale) the amount of reading they have completed that fortnight (1= I have not read any; 2= I have read a little; 3= I have read about half; 4= I have read the majority; 5=I have read all of the step). Parents were also asked to rate on a similar scale how frequently they engaged in the strategies included in the step for that fortnight. This provided a measure of self-reported treatment fidelity similar to that used by Abramowitz et al., (2009).

Current Treatment

At each time point, parents completed a treatment report form detailing the medication that their child is currently receiving (including dosage), how many contacts they have had with their clinician over the last 3 months (phone and face to face) and whether they are currently participating in any other form of behavioural or parenting intervention programme.

Analysis Strategy

All data analyses were conducted using IBM SPSS version 21.0. Data were analysed using an intention to treat approach with missing data replaced using the multiple imputation command within SPSS. Multiple imputation is seen as the most reliable way of dealing with missing values compared to more traditional forms of dealing with missing data such as last observation carried forward (Acock, 2005). In line with recommendations, 40 imputations were run for the analysis and the findings reported represent the pooled data for the 40 imputation patterns (Graham et al., 2007). The Markov Chain Monte Carlo method (MCMC) was used to impute missing data values (Graham, 2012).

Descriptive statistics were used to explore the means and standard deviations for the primary outcome and secondary outcomes; subscale data were also explored where appropriate. Logistic regression was used to explore possible associations with missing data and treatment drop-out. Baseline equivalence between treatment groups was analysed using a series of t-tests and chi-square tests -Mann-Whitney U tests were used to explore baseline equivalence on measures that were non-normally distributed.

To assess for differences between groups at T2 and T3, a series of Analysis of Co-variance (ANCOVAS) were conducted with T2 or T3 scores entered as the dependent variable and T1 scores and other potential confounding variables entered as covariates. ANCOVA is robust to the violation of the nonparametric assumption with more than 15 cases per cell. Effect sizes were calculated by dividing change in scores (T1 to T2 and T1 to T3) by the pooled pre-test standard deviation (Morris, 2008). The analyses did not apply adjustments for multiple outcomes (e.g. Bonferonni adjustments). As this was the first trial assessing the adjunctive benefit of NFPP-SH, the authors did not want to increase the risk of Type II error.

Results

Preliminary Analyses

Twenty eight families were allocated to NFPP-SH and 24 families were allocated to TAU. Of the 32 children that completed child report questionnaires at baseline (T1), 21 were allocated to NFPP-SH and 11 allocated to TAU. There were significantly more children who completed questionnaires in the NFPP-SH group ($\chi 2$ [1] = 4.65, $p<0.05$). At baseline, teacher reported data were available for 15 children in the NFPP-SH arm and 13 children in the TAU arm. There was no difference between the groups on any demographic variables or baseline characteristics.

Attrition

T2 data were missing for 9 families giving an overall attrition rate of approximately 17%, a similar rate to the previous trial of the NFPP-SH [8]. Of the 9 participants that dropped out, 6 were in the NFPP-SH treatment arm and 3 were in the TAU treatment arm, a non-significant difference ($\chi 2$ [1] =0.72, $p>0.05$). No differences were identified between those who dropped out of the study and those who did not. Of these who had responded at T1, T2 teacher questionnaires were returned by 25 teachers (89%) and T2 child report questionnaires were returned by 26 children (81%).

T3 data were missing for 20 families (38% attrition; 10 in the NFPP-SH treatment arm and 10 in the TAU treatment arm). Rates of dropout at T3 did not differ significantly between treatment groups ($\chi 2$ [1] =0.93, $p>0.05$). No significant differences were identified between those who did and did not drop out at T3. Child questionnaires were available for 18 children (11 NFPP-SH and 7 TAU) at T3 (50%).

Intervention effects on parental well-being

There was no significant effect of treatment on parenting efficacy at T2. Similarly there was no effect of intervention on parenting satisfaction or parental mental health at T2. At T3, there was a significant effect of treatment group on parenting efficacy (Table 2; $F[1,49]=4.06$,$p=0.02$). The treatment effect favoured the intervention group, but was small in magnitude ($d=0.11$). There was no effect of intervention on parental mental health or parenting satisfaction at T3.

Intervention effects on parent-reported child outcomes

There were no effects of treatment group on parent-reported child outcomes at T2 or T3 (see Table 2).

Intervention effects on family functioning

There was no significant effect of intervention on family strain according to parent report on the FSI at T2. However, when looking at data for study completers only, the effect of intervention on family strain was significant at T3 ($F[1,29]=5.41$, $p<0.05$). Parents who received the SH intervention and returned T3 assessments reported lower levels of family strain at T3 compared to families in the TAU who returned T3 assessments (mean 12.50 vs. 14.29).

Treatment effects on parental expressed emotion

There was a significant effect of treatment group on the number of negative comments that parents made about their child during the FMSS ($F[1,31]=9.39$, $p<0.01$). At T2, parents in the NFPP-SH group made fewer negative comments about their child than parents in the TAU control arm, after controlling for pre-treatment scores. This difference had a moderate effect size (d=0.49). There was no significant effect of treatment on any of the global measures collected in the FMSS or the number of positive comments.

Intervention effects on child reported outcomes

There was no significant difference between the treatment groups at T2 or T3 on any of the child-reported CHIP-CE or SAMBA subscales (see supplementary data tables).

Intervention effects on teacher reported outcomes

There was a significant effect of treatment on teacher reports of the child's relationships with their peers at T2 ($F[1,26]=6.28$, $p<0.05$). Whilst performance in peer relationships deteriorated in the TAU arm over the 12 week intervention period (mean change=-0.29), teachers reported improvements in peer relationships in children in the NFPP-SH treatment arm (mean change=0.30); this difference had a large effect size (d=0.75). There were no other significant differences on teacher reported outcomes at T2 (see supplementary data tables).

Change in Medication Status

Changes in medication status during the intervention period were explored for study completers. There was no difference in medication status change between the two groups at T2 ($\chi 2$ [3] = 2.73, $p>0.05$) or T3 ($\chi 2$ [4] = 7.20, $p>0.05$). The number of parent-reported contacts with clinician did not differ between the groups at T2 ($t[41]=-0.67$, $p>0.05$) or T3 ($t[30]=-0.91$, $p>0.05$).

Discussion

This study presents findings from the first randomised controlled trial of the NFPP-SH when used in adjunct to TAU including pharmacotherapy. The analyses provided some evidence of the adjunctive benefit of the NFPP-SH. Consequently, this low-intensity intervention may have additional beneficial effects for some of the more distal problems commonly associated with ADHD. At T2, parents in the NFPP-SH treatment arm made fewer negative comments about their child and teachers reported improvements in peer relationships. At T3, parenting efficacy was higher in the NFPP-SH treatment arm compared to the control arm, albeit with a small effect size. A larger effect size was anticipated given the effect size for parenting efficacy reported in the previous study of the NFPP-SH (David Daley & O'Brien, 2013). It is of note that levels of parenting efficacy were higher than expected at study entry (29.50 and 27.30 for the NFPP-SA+TAU and TAU groups respectively) which may explain the small effect size.

There were no other differences between groups on measures of parental well-being. The findings presented herein are in keeping with a recent meta-analysis that did not find any effect of behavioural interventions on parental well-being (Daley et al., 2014). Again, levels of well-being were high in this sample at baseline, perhaps reflecting those parents who are willing to participate in an RCT of SH behavioural interventions.

The NFPP-SH treatment arm fared better on teacher reports of child performance in peer relationships in school at T2. This finding is particularly striking since previous research has failed to find any adjunctive benefit of a parenting intervention for child social performance (Abikoff et al., 2004). The NFPP-SH includes games and activities aimed at improving turn taking and listening and organisational skills. Through engaging with their children in such activities, it is possible that these skills may have transferred to school and led to improved teacher rated performance in peer relationships. However, peer relationships were measured in this study via a single item on the Vanderbilt performance scale; this finding should be replicated using a more stringent, multi-item measure of social performance. Furthermore, this finding may reflect the effects of multiple testing.

Finally, parents in the NFPP-SH treatment arm made fewer negative comments about their child during the FMSS at T2. This replicates the reductions in negative comments observed by Thompson et al., 2009 after receipt of therapist-led NFPP.

There were no differences between groups on measures of ADHD symptoms at T2 or T3. This is in keeping with other multimodal treatment studies (The MTA Cooperative Group, 1999; van den Hoofdakker et al., 2007) and the previous trial assessing the adjunctive benefit of SH for the treatment of ADHD (Long et al., 1993). In

addition, there were no differences between treatment groups on parent or teacher reported measures of disruptive behaviour. In contrast, van den Hoofdakker et al., (2007) reported reductions in child externalising behaviour following receipt of a parenting intervention in addition to routine care compared to routine care alone. It is possible that a larger sample size would have led to the identification of significant effect sizes for disruptive behaviour in this study; effect sizes for parent ECBI scores and teacher SNAP ODD scores favoured the NFPP-SH treatment arm. Although the effect sizes were small in magnitude (approximately d=0.2), this effect could be meaningful considering both of the arms in the main trial were actively receiving treatment (Kraemer, 1992). However, this should be considered in light of some effect sizes that also favoured the control group which may also become significant should the trial be replicated in a larger sample.

Few parenting intervention trials to date have explored the effects of parenting interventions on child HRQOL. A trial of psychoeducation for parents of children with ADHD compared to a parent support and counselling intervention found no differences between the groups on measures of HRQOL (Ferrin et al., 2014). In the current study, non-significant effect sizes favoured the intervention group for the majority of HRQOL subdomains suggesting possible beneficial effects of NFPP-SH for some aspects of HRQOL if the trial were to be replicated in a larger sample.

Methodological Considerations

However, the findings of this trial should be interpreted in the light of some methodological considerations First, the sample size was small, albeit comparable to other parenting intervention trials in the ADHD literature (David Daley & O'Brien, 2013; Thompson et al., 2009). Although a formal power calculation for the study was not conducted, 52 families may be too few to provide a reliable estimation of treatment effects. Second, the analyses of outcomes in this study did not apply adjustments for multiple outcomes (e.g. Bonferonni adjustments); while the significant effects could be the result of multiple testing, the use of Bonferonni adjustments is controversial and while its use reduces the risk of type I errors, it does not reduce the risk of type II errors (Sedgwick, 2012). Third, data collection was reliant on parents completing and returning consent forms and study questionnaires independently. This approach could have led to sample bias since motivated and organised parents may be more likely to return the study questionnaires and consent forms. Indeed, baseline levels of parental well-being were higher in this sample than may be anticipated. Fourth, there was very little information available regarding parents use of the SH manual. Full sets of treatment fidelity scores were only available for 6 parents. There were insufficient resources in this current study to continue calling parents if they

were unable to take the call from the member of the research team collecting the fidelity measures. Due to the levels of missing data, we were unable to explore the relationship between treatment fidelity scores and treatment outcomes. Finally the overall sample was biased towards a more educated and higher income sample, suggested that while self-help may be helpful, it may not work for all families.

Methodological strengths of this study should also be noted. First, the main trial included outcome measures incorporating measurements of parent and child well-being and family functioning. Assessments of psychosocial intervention should include outcomes where the effects of medication are more uncertain (Antshel & Barkley, 2008). Second, the study used a multi-informant approach to data collection. Multi-informant approaches including self-report are seen as the gold standard in the assessment of mental well-being. However, it is appreciated that data were missing for teacher and child report questionnaires. Finally, this was a pragmatic trial that aimed to provide an indication of how well the NFPP-SH would work if delivered in real-world clinical settings. Clinical trials lack relevance for clinicians if they exclude patients with comorbid conditions and test interventions delivered by highly trained, motivated therapists (Glasgow et al., 2005). In order to improve the external validity of the findings, few exclusion criteria were applied to the trial.

Implications

Given the relatively small sample size, it is important for the main trial findings to be replicated in a larger sample that will provide a more reliable analysis of treatment effects. Future research should also include an analysis of cost-effectiveness and include analyses exploring mediators or moderators of treatment outcome. Finally, it would be interesting for future research to have a sample with a broader age range including younger children. Interventions may have superior effects if they are implemented before children are exposed to other potential risk factors including school failure and peer rejection.

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Conflicts of Interest

DD is a co-author of the published self-help book which is tested in this study. JT and KS declare no conflicts of interest.

Key messages

- Parent interventions are recommended as a first-line treatment for Attention Deficit Hyperactivity Disorder (ADHD) yet a number of practical and psychological barriers can impact their accessibility.
- Self-help parent interventions may provide an accessible alternative to therapist-led parent interventions.
- In this small-scale randomise controlled trial (RCT), receipt of the self-belp version of the New Forest Parenting Programme (NFPP), in adjunct to usual treatment, had beneficial effects for parenting efficacy, child social performance in school and negative comments made by parents during a recorded speech sample compared to TAU alone. However, the self-help intervention did not have any additional effect on child behaviour.
- Future research is needed to replicate these findings in a larger sample of children with ADHD.

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Table 1: Baseline characteristics of study sample (n=52)	
Child age (years), mean (SD)	8.43 (1.31)
Child gender (male), n (%)	44 (85%)
White British, n(%)	49(94%)
Comorbid disorders (clinical diagnosis), n (%)a	
Autism Spectrum Disorder	6 (12%)
Learning Difficulty	2 (4%)
Dyslexia	2 (4%)
Anxiety Disorder	1 (2%)
Attachment Disorder	1 (2%)
Disruptive Behaviour Disorder	2 (4%)
Tourette's Syndrome	1 (2%)
Parent/main caregiver age (years), mean (SD)	36.77 (6.41)
Parent/main caregiver gender (female), n (%)	50 (96%)
Parent highest level of education, n (%)	
No qualifications	8 (15%)
Completed school/GCSE's	17 (33%)
Completed college/ Further education/ A levels	15 (30%)
Undergraduate Degree/Higher education	2 (4%)
Postgraduate Degree	10 (19%)
Family Income per year, n (%)b	
Less than £10,000	14 (27%)
Between £10,000-£40,000	27 (52%)
Over £50,000	7 (14%)
Parent living alone, n (%)	16 (31%)
Medication Status	
Methylphenidate	39 (75%)
Atomoxetine	3 (6%)
Lisdexamfetamine	2 (4%)

Combination short & long acting Methylphenidate	7 (14%)
Combination short acting Methylphenidate & Atomoxetine	1 (2%)
Length of time child receiving medication	
Less than 1 month	16 (31%)
1-6 months	16 (31%)
7-12 months	9 (17%)
Longer than 13 months	11 (21%)
[a] parent report, comorbid diagnoses were not confirmed with referring clinicians.[b] n=4 declined to provide.	

Table 2: Means and Standard Deviations for parent-reported outcomes at T1 (Baseline), T2 (Post-intervention; 12 weeks) and T3 (28 weeks)

	NFPP-SH+TAU (N=28)			*TAU (N=24)*						
Measure	*T1*	*T2*	*T3*	*T1*	*T2*	*T3*	*T2 F (p value)*	*T3 F (p value)*	*Cohen's d (T1 to T2)*	*Cohen's d (T1 to T3)*
PSOC Efficacy	29.50(5.59)	29.85(4.52)	30.74(4.22)	27.33(4.27)	28.85(4.28)	28.00(3.72)	0.32 (p>0.05)	4.06(p<0.05)	-0.24	0.11
PSOC Satisfact	34.43(7.40)	34.49(6.18)	35.42(7.09)	36.04(5.81)	37.05(6.34)	34.19(5.19)	0.79(p>0.05)	2.40(p>0.05)	-0.14	0.43
SNAP Hyp/Imp	2.36(0.44)	2.19(0.61)	2.17(0.71)	2.44(0.44)	2.20(0.69)	2.20(0.78)	0.43(p>0.05)	0.07(p>0.05)	-0.16	-0.11
SNAP-Inatt	2.29(0.41)	2.14(0.51)	2.17(0.60)	2.22(0.53)	2.18(0.66)	2.22(0.71)	0.26(p>0.05)	0.87(p>0.05)	0.23	0.25
SNAP ODD	2.07(0.63)	1.93(0.72)	1.89(0.87)	1.80(0.62)	1.66(0.69)	1.81(0.87)	0.55(p>0.05)	0.56(p>0.05)	0	0.30
ECBI Intensity	180.71(30.81)	174.41(29.93)	170.02(25.92)	172.10(28.0)	171.84(33.06)	165.96(20.28)	1.09 (p>0.05)	0.03(p>0.05)	0.19	0.15
ECBI Problem	24.43(8.05)	22.64(8.77)	23.27(8.16)	21.89(6.46)	22.35(6.41)	23.74(5.58)	0.99 (p>0.05)	1.93(p>0.05)	0.31	0.41

GHQ-12	2.50(3.11)	2.01(2.57)	2.05(2.47)	3.42(3.78)	2.25(2.97)	2.49(2.24)	0.55 (p>0.05)	0.14(p>0.05)	-0.20	-0.14
FSI	13.75(5.65)	13.46(5.56)	12.75(4.66)	12.58(5.43)	13.41(5.63)	13.86(5.16)	1.49 (p>0.05)	1.81(p>0.05)	0.20	0.41
Vanderbilt										
School	2.50(0.95)	2.72(0.75)	2.89(0.95)	2.43(0.93)	2.67(0.69)	2.79(1.18)	0.85(p>0.05)	0.64(p>0.05)	-0.02	0.03
Maths	2.46(0.92)	2.49(0.66)	2.69(0.87)	2.54(1.06)	2.79(1.05)	3.06(1.15)	2.14(p>.05)	2.17(p>0.05)	-0.22	-0.29
Reading	3.18(1.16)	3.26(0.87)	3.19(1.06)	2.67(1.20)	2.92(1.06)	3.07(1.18)	0.48(p>0.05)	0.71(p>0.05)	-0.14	-0.44
Writing	2.18(0.72)	2.32(0.69)	2.63(0.81)	2.08(0.88)	2.42(0.80)	2.58(0.98)	1.10(p>0.05)	0.03(p>0.05)	-0.25	-0.06
Relationship with parents	3.21(1.03)	3.10(0.79)	3.12(1.05)	3.25(0.94)	3.04(0.90)	3.08(1.13)	0.38(p>0.05)	0.29(p>0.05)	-0.10	0.08
Sibling relationships	2.44(1.04)	2.48(0.90)	2.77(1.25)	2.68(1.04)	2.47(1.01)	2.77(1.06)	2.16(p>0.05)	0.34(p>0.05)	-0.24	0.23
Relationships with peers	2.82(0.94)	2.83(0.63)	2.80(0.90)	2.61(0.82)	2.80(0.85)	2.64(1.11)	0.30(p>0.05)	0.17(p>0.05)	-0.20	-0.06
Performance in games[a]	2.68(1.12)	2.74(0.80)	2.92(0.98)	2.58(0.97)	2.85(0.97)	3.01(1.27)	0.50(p>0.05)	0.24(p>0.05)	-0.20	-0.18

CHIP-CE										
Satisfaction	31.37(19.47)	34.73(17.10)	36.48(14.23)	35.93(12.99)	37.43(13.28)	35.69(9.54)	0.03(p>0.05)	1.41(p>0.05)	0.11	0.32
Comfort	37.59(14.75)	41.43(14.64)	45.13(10.48)	44.47(10.82)	41.65(10.09)	44.67(8.13)	1.14(p>0.05)	2.73(p>0.05)	0.51	0.57
Resilience	41.59(14.11)	38.80(14.33)	40.64(11.80)	46.25(14.01)	44.54(12.53)	40.06(13.86)	1.30(p>0.05)	1.55(p>0.05)	0.07	0.37
Risk Avoid	25.89(14.06)	26.12(11.48)	24.54(10.95)	26.40(10.16)	27.77(12.29)	23.05(8.48)	0.44(p>0.05)	0.54(p>0.05)	-0.04	0.16
Achievement	32.64(8.46)	33.61(5.89)	33.47(6.14)	31.17(9.94)	33.95(13.52)	34.80(9.36)	0.61(p>0.05)	1.37(p>0.05)	-0.20	-0.30
SAMBA										
Benefits	14.14(3.85)	13.69(3.36)	14.77(3.23)	14.28(4.63)	15.40(3.05)	14.86(3.28)	3.65(p>0.05)	0.42(p>0.05)	-0.37	0.01
Child Stigma	7.46(2.78)	7.27(2.72)	6.93(2.91)	7.30(3.25)	6.59(2.81)	6.53(2.42)	0.97(p>0.05)	0.29(p>0.05)	-0.17	-0.08
Costs	6.98(3.28)	7.24(2.88)	6.67(2.64)	7.13(2.80)	6.30(2.49)	6.46(2.33)	2.37(p>0.05)	0.17(p>0.05)	-0.27	-0.11
Flexibility	9.07(4.31)	9.86(3.86)	9.87(3.88)	10.13(4.60)	9.56(4.37)	11.00(4.04)	0.23(p>0.05)	0.43(p>0.05)	-0.31	-0.02
Resistance	7.96 (2.73)	8.39 (3.91)	8.81(3.25)	8.96 (3.05)	9.32(4.03)	8.73(2.69)	0.31(p>0.05)	0.42(p>0.05)	-0.02	-0.2

Inconsistent	4.46(2.33)	4.76(2.36)	4.84(1.85)	5.22(2.52)	4.62(1.93)	4.80(2.81)	0.85(p>0.05)	0.10(p>0.05)	-0.37	-0.3
ParentStigma	9.91(3.63)	9.22(3.26)	8.61(2.94)	9.89(4.02)	9.14(3.89)	8.99(2.96)	0.03(p>0.05)	0.24(p>0.05)	-0.02	0.10
FMSS IS	1.75(0.55)	1.66(0.61)		1.93(0.62)	1.84(0.47)		0.04(p>0.05)		0	
FMSS Warmth	1.65(0.67)	1.56(0.68)		1.86(0.77)	1.86(0.78)		2.61(p>0.05)		0.14	
FMSS Rel	1.85(0.49)	1.72(0.72)		1.93(0.27)	1.88(0.51)		0.97(p>0.05)		0.20	
FMSS Global	5.25(1.25)	4.95(1.40)		5.71(1.20)	5.58(1.18)		0.18(p>0.05)		0.14	
FMSS PC	4.15(2.13)	4.31(2.20)		3.14(2.35)	3.39(2.28)		0.42(p>0.05)		-0.04	
FMSS NC	2.75(2.63)	2.61(2.60)		2.57(1.56)	3.49(2.10)		9.39(p<0.01)		0.49	

TAU= Treatment as usual, PSOC= Parental sense of Competence Scale, PSOC Satisfac= satisfaction subscale, SNAP Hyp/Imp= Hyperactivity and Impulsivity subscale of the Swanson, Nolan and Pelham questionnaire, SNAP Inatt= inattention subscale of the Swanson, Nolan and Pelham questionnaire, ECBI=Eyberg Child Behaviour Inventory, GHQ=General Health Questionnaire, FSI=Family Strain Index, CHIP-CE= Child Health and Illness Profile, SAMBA= Southampton ADHD Medication Behaviour and Attitudes scale, FMSS=Five Minute Speech Sample, IS= Initial Statement, Rel=Relationship, PC=Positive Comments, NC=Negative Comments.