CRITICALLY APPRAISED PAPER (CAP)

FOCUSED QUESTION

What is the effectiveness of a 12-week family-centered evaluation and intervention program for children with attention deficit hyperactivity disorder (ADHD) and their families in improving behavior and providing a family-centered approach?


CLINICAL BOTTOM LINE:

This study presents encouraging results on the effectiveness of a 12-week family-centered evaluation and intervention program for children with attention deficit hyperactivity disorder (ADHD) in improving behavior and delivering a family-centered approach. The authors report the findings are in line with other efficacy studies.

The 12-week program incorporates a multidimensional evaluation and therapist interpretation of the data and treatment-planning time with parents and teacher, followed by a multifaceted intervention program.

Study findings highlighted the importance of family-centered care, as parents are able to provide depth of knowledge about their children, enabling more comprehensive and tailored treatment plans for the family and child’s needs. This also resulted in increased parent confidence in managing ADHD.

Although several limitations in research design were noted, such as small sample size, lack of randomization, and absence of a control group, this article provides the basis for future larger randomized controlled trials. These should be based on determining the effectiveness of therapeutic intervention as an alternative to or in conjunction with current pharmacological interventions for ADHD.

The results of this study indicate a multidimensional evaluation and multifaceted family-centered program for children with ADHD can improve behavior. Therapists should collaborate with parents to enhance effective child outcomes and take a dynamic multidimensional approach to evaluation and intervention of children with ADHD.

RESEARCH OBJECTIVE(S)

List study objectives.
Determine whether a family-centered occupational therapy evaluation and intervention package carried out over 3 months is effective in producing significant changes in the behavioral patterns of children with ADHD aged between 5 and 10 years.

Determine whether a family-centered care approach elicits positive parental perceptions of the care that they and their children have received.

**DESIGN TYPE AND LEVEL OF EVIDENCE:**

According to the researchers, this study used a Level III single-group nonrandomized, pretest–posttest design to evaluate change in behavioral patterns across multiple centers in the four countries (England, Northern Ireland, Scotland, and Wales) of the United Kingdom. However, on reviewing the study, this could be described as a multiple case study design because pretest–posttest measures were administered and analyzed for each case study with an absence of overall group pretest–posttest analysis.

Participant selection was through therapists who had participated in a former consensus development research study and met the researchers’ selection criteria. Twenty therapists were selected to be local researchers.

The local researchers attended 3-day training events and were provided with a comprehensive manual of the study’s assessment and treatment procedures. They each subsequently were asked to select two children who had been newly diagnosed with ADHD.

The ADHD Rating Scale IV Home and School Versions was administered prior to the multifaceted intervention, which was provided to all participants and readministered following intervention for the Reliable change index to be calculated. This was given to both parents and teachers for home and school each time.

Following treatment, parents completed the MPOC-20 to measure parental perceptions of the level to which services provided were felt to be family-centered.

**Limitations (appropriateness of study design):**

Was the study design type appropriate for the knowledge level about this topic? *Circle yes or no, and if no, explain.*

**YES/NO** The study design was appropriate given the background provided. The introduction delineated a model of occupational therapy practice for children with ADHD based on interactions among the child, environment, and task demands. From this model, the researchers developed a family-centered occupational therapy evaluation and intervention package. This study explores the effectiveness of the proposed evaluation and intervention package to provide some validation of the model. Therefore, as an exploratory study, this is considered an appropriate study design.

**SAMPLE SELECTION**

How were subjects selected to participate? *Please describe.*

Convenience sampling was used to recruit therapists as local researchers. All had previously responded to a prior consensus development research project and were invited to apply for participation in this study. Inclusion was subject to selection criteria by the primary researcher. This could be considered purposive sampling (a form of convenience sampling).
Study participants were then selected through purposive sampling by the local researchers using selection criteria by the primary researcher. Authors do not report whether the 20 recruited students were recruited by each of the 20 therapists acting as local researchers or whether some therapists had more than 1 participant included in the study.

Inclusion Criteria

In order to be selected as local researchers, the therapist inclusion criteria consisted of:
- The therapist working in an appropriate service setting with direct access to children with ADHD.
- Number of years therapist had clinical experience (aiming for a range of junior and senior therapists).
- Knowledge and skills working with children with ADHD and related developmental problems such as developmental coordination disorder (DCD) and their families.
- Knowledge and skills in using standardized tests.
- Experience of working in a multidisciplinary team.

The inclusion criteria for study participants (children and family) were:
- Children aged 5 to 10 years referred to the service because of concerns related to ADHD.
- Children with average intellectual capacity, that is, with no identifiable learning disability.
- Children without other known neurological disorders such as traumatic brain injury.
- Children without any other pervasive developmental disorder, including autism.
- Children without other assessed comorbid mental health problems such as schizophrenia or conduct disorder.
- Children with normal birth and delivery, that is, not children who were born preterm and with low birth weight.

Exclusion Criteria

Children who were involved in any other form of treatment were excluded from this study.

SAMPLE CHARACTERISTICS

<table>
<thead>
<tr>
<th>N=</th>
<th>% Dropouts</th>
<th>#/% Male</th>
<th>#/% Female</th>
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<tbody>
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<td>50%</td>
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<td>N=2</td>
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<tr>
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Disease/disability diagnosis

Check appropriate group:

<table>
<thead>
<tr>
<th>ADHD</th>
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<td>&lt;20/study group</td>
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INTERVENTION(S) AND CONTROL GROUPS

Add groups if necessary

Group 1
| Brief Description | The 12-week evaluation and treatment program was administered to 20 participants across the United Kingdom.

Multidimensional Evaluation (3–4 contacts) included
  - Rating scales and questionnaires, interviews and direct observational assessment, clinic-based assessment, and information gathering from other professionals.

Therapists interpreted and evaluated the collected data prior to conducting an intervention planning meeting with parents and teacher. This involved feeding back the results of the evaluation, setting common goals, and agreeing on intervention strategies to be integrated into home and school environments.

A multifaceted intervention was provided. This was comprised of 7–8 meetings that included
  - Parent and teacher education through previous feedback session, information packs and subsequent contacts.
  - An integrated behavioral management and sensory diet program for home and school.
  - Adaptations to classroom environment and routine.
  - Treatment strategies to address other developmental and functional difficulties (e.g., perceptual–motor, handwriting skills, self-care skills, social skills) |

| Setting | This study was conducted across multiple settings geographically spread across the four countries of the United Kingdom (England, Northern Ireland, Scotland, and Wales). Thirteen therapists were based in child health community settings and 7 therapists were within child psychiatry. |
| Who Delivered? | 20 therapists across who were recruited to the study conducted the intervention. |
| Frequency? | 12 weekly sessions within 3 months incorporating evaluation, treatment planning, and intervention. |
| Duration? | 3 months |

**Intervention Biases:** *Circle yes or no and explain, if needed.*

**Contamination**

| YES/NO | NR. Not applicable as there was no control group involved in this study. |

**Co-intervention**

| YES/NO | NR. The researcher controlled for this in the inclusion criteria, as participants were excluded if they were in receipt of any other intervention. |

**Timing**

| YES/NO | All interventions were conducted through 12 weekly sessions in 3 months. Although this was consistent, the particular time of day and time of year of |
intervention were not reported, which could lead to differences in outcome for study participants. Also not reported was whether the therapist saw children at the same time each week during their 12 weekly sessions. Fluctuation may lead to bias as children may perform differently at differing times of the day.

Site

| YES/NO | Multiple sites, including 13 community health settings across the United Kingdom and 7 child psychiatry settings (based in England and Scotland, but not in Wales or Northern Ireland). Although not stated, it may be assumed due to the settings listed these were clinic environments. As this was a multicenter study, and there were no environmental parameters or fidelity measures set, the equity between the sites cannot be assumed and was not controlled for in this study. |

Use of different therapists to provide intervention

| YES/NO | Due to this being a multicenter study, different therapists provided intervention to the participants. Therapists included 11 from England, 4 from Scotland, 2 from Wales, and 3 from Northern Ireland. All therapists participated in a 3-day training program and received a comprehensive manual; they also remained in regular communication with the primary researcher. However, no formal procedure was undertaken to ensure the fidelity to intervention, which could lead to bias. |

MEASURES AND OUTCOMES

Complete for each relevant measure when answering the evidence-based question:

Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article – yes/no/NR [not reported]), and how frequently the measure was used.

The ADHD Rating Scale IV Home and School versions were provided to parents and teachers for completion pre- and posttreatment as an outcome evaluation. Reliability and validity are not reported by the author. The use of the Reliable Change Index (RCI) is described. The RCI is reported to be able to measure change from pretreatment to posttreatment. This authors state this to be an effective way to indicate that functional improvement is due to treatment effect rather than due to lack of precision in measurement.

Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article – yes/no/NR [not reported]), and how frequently the measure was used.

The Measure of Processes of Care–20-item version (MPOC-20) was completed post-treatment by parents to measure their perceptions of the extent to which the health services that they and their children had received were family-centered. The researchers report the validity evidence shows the MPOC-20 can capture parents’ perceptions of caregiving, regardless of the child’s age or diagnosis. However, they do not provide more specific information. Reliability is not reported.

Measurement Biases

Were the evaluators blind to treatment status? Circle yes or no, and if no, explain.

| YES/NO | The local researchers were not blinded within the study as they were responsible for evaluation intervention and data collection, which can create bias. The |
primary researcher provided advice and consultation throughout to the local researchers and was sent all the assessment results and interpretation. Any anomalies were queried by the primary researcher, so it is felt the primary researcher also was not truly blinded.

Recall or memory bias. Circle yes or no, and if yes, explain.

YES/NO

Others (list and explain):

RESULTS

List results of outcomes relevant to answering the focused question

Include statistical significance where appropriate (p<0.05)
Include effect size if reported

Participants in the study showed significant differences through the RCI scores on the ADHD Rating Scale IV home and school versions. Overall, 17 children demonstrated improvement in scores before and after treatment.

Within the two subscales (Inattention and Hyperactivity-Impulsivity subscales), 13 children showed statistically significant ($p < 0.05$) changes in at least one of the subscales.

Eleven children were found to have statistically significant changes ($p < 0.05$) to their total score for home, school, or both home and school.

Following intervention, 3 children were found to have slight deterioration in their scores. Effect size is not reported in this study. This is likely to be due to the small sample size.

Mean scores for the MPOC–20 are interpreted as mean of 7, which indicates the needs are being met “to a great extent,” whereas a mean of 4 indicates “sometimes” their needs are met. Highest mean score of 6.48 was shown to be in the subscale of Coordinated and Comprehensive Care while the lowest mean score (5.67) was in the scale of Providing General Information. Overall, the results were of the parents experiencing good levels of family-centered care.

Was this study adequately powered (large enough to show a difference)? Circle yes or no, and if no, explain.

YES/NO

This study has small a sample size of 20 participants, which is a reasonable number for a multiple case study. However, as this was a study based on multiple case reports, power and effect size are not advised. This is also likely to be why effect size (Cohen’s $d$) was not reported.

Were appropriate analytic methods used? Circle yes or no, and if no, explain.

YES/NO

The data analysis methods were appropriate, but not in line with the author’s description of the study design, as this was reportedly a single group study design. Data analysis was on a case-by-case basis rather than as a group.

Given the small sample size, this study design could be considered
appropriate; however, reporting of study design (multiple case studies rather than single group design) should reflect this. The RCI was reported for the ADHD scale with statistical significance (p value) identified and descriptive statistics used in the MPOC, both of which are suitable.

Were statistics appropriately reported (in written or table format)? Circle yes or no, and if no, explain.

The data for outcomes of the ADHD Rating Scale–Home and School versions were presented in table format. Descriptive statistics for the MPOC–20 were also clearly presented in table format. Results for both measures also were narratively described providing clarity to the reader.

CONCLUSIONS
State the authors’ conclusions that are applicable to answering the evidence-based question.

This study illustrated that the 12-week family-centered evaluation and treatment package was effective in improving behavior for children with ADHD. It also was felt that the package encouraged the occupational therapists to consider the role of the parents and enhance effective collaboration.

Although this is a small study with some limitations, the principles of this assessment and treatment package were shown to be beneficial overall, on a case-by-case basis. This approach should be considered for clinic- and school-based practice settings as an alternative to or in conjunction with current pharmacological interventions for ADHD.

Therapists working with children with ADHD for the benefit of improving behavior should adopt a multidimensional evaluation process and multifaceted treatment approach. This study also highlights the importance of a family-centered approach. Parent–therapist collaboration should be a high priority for therapists in their clinical practice for the benefit of the child.

This work is based on the evidence-based literature review completed by Jill Massey, MOTS, and Margaret Morris, OTD, OTR/L, Faculty Advisor, Tufts University.


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