Symptom changes of oppositional defiant disorder after treatment with the Incredible Years Program

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Objective: To examine changes in symptoms of oppositional defiant disorder (ODD) after treatment with the Incredible Years Program. The frequency of symptoms was also calculated.

Method: The participants were 84 children (aged 4.1–8.9 years) diagnosed with ODD before treatment. The data were collected with KIDDIE-SADS interviews before treatment and at a 1-year follow-up.

Results: At the 1-year follow-up, descriptive analyses showed that 68% of the children no longer had an ODD diagnosis. Even though all the ODD symptoms had been significantly reduced after treatment, most symptoms still occurred “sometimes”.

Conclusions: The Incredible Years Program has a positive effect on children with ODD. However, many children still have symptoms of ODD at the 1-year follow-up, although the frequency of symptoms is significantly reduced. Future studies should explore further these changes in ODD symptoms and evaluate whether some parents and children need support in addition to the Incredible Years Program. It would also be valuable to determine whether patterns of childhood ODD symptoms are related to later development of depression and conduct disorder.


Behavioral disorders are among the most common psychiatric problems in children (1), and oppositional defiant disorder (ODD) is grouped with the disruptive behavioral disorders (2). In Norway, 1–3% of children may receive an ODD diagnosis (3). While ODD is not limited to a particular age group, it is most commonly diagnosed in late preschool or early school age and manifest by 8 years of age (4, 5).

Children with an early onset of ODD have an increased risk of peer rejection, school drop-out, substance abuse, juvenile delinquency and higher rates of serious criminal activity (6, 7). ODD also plays an important part in the development of psychopathologies such as anxiety, depression, conduct disorder (CD) and antisocial personality disorder (8).

ODD reflects “a pattern of negativistic, hostile, and defiant behavior lasting at least 6 months” (2). The DSM-IV criteria for ODD include the presence of at least four of the following eight symptoms occurring more frequently than is typically observed in individuals of comparable age and developmental level (2):

1) often loses temper;
2) often argues with adults;
3) often actively defies or refuses to comply with adult’s requests or rules;
4) often deliberately annoys people;
5) often blames others for his or her mistakes or misbehavior;
6) is often touchy or easily annoyed by others;
7) is often angry or resentful;
8) is often spiteful or vindictive.

The extent to which ODD symptoms occur during normal development depends upon the child’s age. Egger & Angold (9) have suggested that the cutoff score for frequency of different ODD symptoms may correspond to the 90th percentile for the child’s age group based on normative reference data. For instance, the cutoff score for frequency of loss of temper in day-care children is two to three times a day, contrasting to the rate for school-aged children which is twice a week (9). These findings indicate that ODD symptoms are developmentally

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sensitive, and that normal aggression and non-compliance for some aspects vary extensively by age and therefore may be inappropriately labeled as psychopathological. However, ODD symptoms and diagnostic criteria have been found to identify groups of impaired young children with clinically significant behavioral problems (9, 10).

Although behavioral problems are more common in boys than in girls (5), when girls are diagnosed with ODD, their problems are just as stable as in boys. For both genders, these problems tend to remain relatively stable throughout childhood for a high proportion of the children with an early onset (7). The risk of developing serious problems later in life is increased in children who develop ODD at a young age (4). Therefore, it is important to identify children with behavioral problems in preschool and early school age and intervene appropriately.

Recent analyses of ODD symptoms suggest that it is useful to distinguish between negative emotions (being touchy, angry and vindictive) and oppositional behavior (defying, arguing and losing temper) in the child (8). These symptom sets seem to have different consequences and lead to different psychological disorders. According to Loeb et al. (8), the presence of negative emotions is associated with later development of depression, whereas oppositional behavior is associated with later development of CD. Thus, ODD can lead to the development of both internalizing (depression) and externalizing (CD) disorders (8). When considering the different consequences of various ODD symptoms, it is important to examine whether some ODD symptoms are more common and if treatment improves certain symptoms more than others.

The Incredible Years Program was developed by Dr. Carolyn Webster-Stratton in the USA, and has been widely used in Europe and the USA. It consists of parent training and child therapy programs, and the positive effects of behavioral problems are well documented internationally (11–15). Few controlled studies have been conducted in Scandinavia on the effects of treatments for ODD in children. Larsson et al. (16) reported positive effects of the Incredible Years Program in Norwegian children for externalizing problems and a reduction of ODD diagnoses. Although all the children in that study had received a formal or subthreshold ODD diagnosis before treatment, 64% were no longer diagnosed with ODD 1 year after treatment (16). While these findings were encouraging, there are other aspects of outcome that are not explored, for instance changes in specific ODD symptoms in the child after treatment. The present study is part of the Larsson et al. (16) research project, which was conducted from 2001 to 2004.

The aims of the present study were to examine changes in ODD diagnosis and ODD symptoms among Norwegian children after treatment with the Incredible Years Program. The following issues were addressed:

1) To what extent did the treatment reduce the number of ODD diagnoses?
2) What was the frequency of the different ODD symptoms before and after treatment?
3) To what extent was each ODD symptom reduced after treatment?

**Method**

**Participants**

Children considered for inclusion in the present study were referred for treatment of oppositional or conduct problems to child psychiatric outpatient clinics in two university cities in Norway, Trondheim and Tromsø. The sample consisted of 84 children who ranged in age from 4.1 to 8.9 years (mean age was 6 years and 7 months, standard deviation = 1.3) at time one (before treatment). At the 1-year follow-up, the children ranged in age from 5.2 to 10.0 years. Our participants were recruited from the Larsson et al. (16) sample and consisted of those children who had a complete KIDDIE-SADS interview (17) (see description below) both before treatment and at the 1-year follow-up. See demographic information in Table 1.

**Table 1. Child and family characteristics of the total sample before treatment (N = 84).**

<table>
<thead>
<tr>
<th>Demographic factors</th>
<th>% (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Child gender</strong></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>80 (67)</td>
</tr>
<tr>
<td>Girls</td>
<td>20 (17)</td>
</tr>
<tr>
<td><strong>Age group</strong></td>
<td></td>
</tr>
<tr>
<td>4–5 years</td>
<td>29 (24)</td>
</tr>
<tr>
<td>6–8 years</td>
<td>71 (60)</td>
</tr>
<tr>
<td>Age*</td>
<td>6.7 (1.3)</td>
</tr>
<tr>
<td><strong>Child diagnoses</strong></td>
<td></td>
</tr>
<tr>
<td>ODD</td>
<td>100 (84)</td>
</tr>
<tr>
<td>CD</td>
<td>16 (13)</td>
</tr>
<tr>
<td>Anxiety/depression</td>
<td>10 (8)</td>
</tr>
<tr>
<td>ADHD</td>
<td>36 (30)</td>
</tr>
<tr>
<td><strong>Living situation</strong></td>
<td></td>
</tr>
<tr>
<td>Both parents†</td>
<td>50 (42)</td>
</tr>
<tr>
<td>Mother and stepfather</td>
<td>19 (16)</td>
</tr>
<tr>
<td>Single mothers</td>
<td>31 (26)</td>
</tr>
<tr>
<td><strong>Mother education</strong></td>
<td></td>
</tr>
<tr>
<td>College or university</td>
<td>17 (13)</td>
</tr>
<tr>
<td>High school or partial college</td>
<td>77 (60)</td>
</tr>
<tr>
<td>Partial high school or less</td>
<td>6 (5)</td>
</tr>
<tr>
<td><strong>Father education</strong></td>
<td></td>
</tr>
<tr>
<td>College or university</td>
<td>17 (11)</td>
</tr>
<tr>
<td>High school or partial college</td>
<td>71 (47)</td>
</tr>
<tr>
<td>Partial high school or less</td>
<td>12 (8)</td>
</tr>
</tbody>
</table>

ODD, oppositional defiant disorder; CD, conduct disorder; ADHD, attention deficit hyperactivity disorder.

*Mean and standard deviation.
†Including adoptive and foster parents and parents with shared custody.
The original Larsson et al. (16) sample included 127 children, of which 99 were randomly assigned to treatment and 28 to a control group. For ethical reasons, children in the control group were offered treatment after 6 months; they did not participate in the 1-year follow-up, and thus they were not part of the present study. Similarly, 15 of the 99 children who received treatment but did not attend the diagnostic interview at the 1-year follow-up were excluded. Analyses showed that these 15 children did not differ significantly from the remaining 84 children with respect to gender, age or severity of behavior problems.

All but one of the families in the study were native Norwegians. Children were excluded if their referring unit reported that they had gross physical impairments, sensory deprivation, intellectual deficits or autism or if they were receiving other psychotherapeutic interventions. Those who received medication for ADHD were only included if this treatment was initiated more than 6 months prior to study entry (16). Five children were on medication for ADHD when they entered the study and 10 children started with such medication between post-treatment and the 1-year follow-up assessment.

**Procedures**

Information about the study was given to referral agencies and professionals such as teachers, doctors, healthcare nurses and child welfare workers throughout the project period. In Norway, parents, doctors and child welfare workers can refer children with mental health problems to child psychiatric outpatient clinics.

All referred children were first screened by using the Eyberg Child Behavior Inventory (ECBI) (18). Parents of children who received a score above the 90th percentile on the ECBI were subsequently interviewed with KIDDIE-SADS (17) by trained interviewers at the University of Trondheim or the University of Tromsø. The parents of children who received a definite or sub-threshold diagnosis of ODD and/or CD were invited to participate in the study.

The only data used in the present study were collected with KIDDIE-SADS, which was administered before initiation of treatment and at a follow-up 1 year after termination of treatment, which lasted about one semester (see description of treatment below).

**Assessment measures**

**Eyberg Child Behavior Inventory (ECBI)**

The ECBI is filled out by parents to assess behavioral problems in children. The ECBI consists of 36 problem behaviors, which are rated for frequency on a 1–7 scale. It has been shown to be a sound measure of behavioral problems in children aged 4–12 years (18). Norwegian norms have previously been calculated in a sample of children aged 4–12 years (19), and in the present study, the 90th percentile of the intensity scale was used as a cutoff score. In our sample, the ECBI had an internal consistency of 0.81. The ECBI was used only during the screening procedure of this study.

**KIDDIE-SADS**

This is a semi-structured diagnostic interview designed to assess psychopathology in children and adolescents aged 6–18 years according to DSM-IV criteria (17). Because some children in the present study were younger than 6 years, a shortened version of the KIDDIE-SADS was used. Only diagnostics appropriate for young children were included. The KIDDIE-SADS has been shown to have good inter-rater and test–retest reliability. However, there are limited validating data for the KIDDIE-SADS (20).

Three trained raters conducted the diagnostic interviews. They were blind in regards to the participants’ treatment group at the pretreatment assessment, but at the 1-year follow-up, they were aware that all children had received treatment. The interviews were recorded, and random checks showed high inter-rater reliability, with all Kappa scores being above 0.90 (16). The severity of each symptom was divided into three categories: 1) not present, 2) the symptom is sometimes present but below threshold level and is therefore not counted as a symptom when setting a diagnosis of ODD, and 3) the symptom is often present and above the threshold level for a formal ODD diagnosis. These categories were used to calculate medians for the analyses in this study.

**Treatment with the Incredible Years Program**

Detailed information about the treatment conditions used in this study is provided in Larsson et al. (16) and Webster-Stratton and Hammond (21).

**Parent training, basic**

Ten to twelve parents met every week in groups with two therapists at the child psychiatric clinic for two-hour sessions. This program teaches parents the use of positive discipline strategies, effective parenting skills, strategies for coping with stress and ways to strengthen children’s social skills. The program started in September or January each semester and lasted for 12–14 weeks. On average, parents attended 93% of the scheduled meetings, with a variation ranging from 0.33 (n = 1) to 1.00. 58% of the parents attended every meeting.

**DINA Dinosaur Child Training Program**

Groups of six children and two therapists met weekly for two-hour sessions at the child psychiatric clinic. The treatment program addresses interpersonal difficulties in young children with ODD, tries to increase their social skills and conflict resolution skills, and improve their
play and co-operation with peers. The program started in September or January each semester and lasted for 18 weeks. On average, children attended 92% of the scheduled meetings. The variation in attendance rates for the children was 0.65 (n = 1) to 1.00. 40% of the children attended every meeting.

**Therapists**

Fifteen therapists administered the parent training groups and nine administered the child therapy at the two sites. Each had a Bachelor’s or Master’s degree in a field related to mental health, and all were experienced clinicians. The therapists were trained according to certification procedures established by the Incredible Years Program (16). To ensure treatment integrity, the therapists followed a treatment manual and completed standard checklists during every therapy session. They also received continuous supervision from a certificated trainer during the study period (16).

**Design**

A randomized between-groups design with pre- and post-treatment measurements was used in the main study, including a 1-year follow-up of the children who received treatment. Children and families were randomized to parent training alone, a combination of parent training and child therapy or to a waiting-list control group (16). No significant difference in treatment effects between the two active treatment groups was found, and they were therefore combined in the present study (16). The children in the waiting-list control group received treatment before the 1-year follow-up for ethical reasons. They did not participate in the 1-year follow-up and were therefore not part of the present study. The trial was registered with the international RCT number: ISRCTN10430476.

**Statistical procedures**

Descriptive statistics were used to explore the frequency of the different ODD symptoms before treatment (T1) and at the 1-year follow-up (T2). Changes in symptoms from baseline to the 1-year follow-up were analyzed using the Wilcoxon signed-rank test for related samples. This non-parametric test was used because the data from the KIDDIE-SADS interviews were ordinal, with three categories (22). The P-value for significance was set at < 0.05. Effect sizes were calculated by use of the following formula (23): z-value/square root of total number of observations. Effect sizes were thereby evaluated using Cohen’s criteria (24) for small effect (< 0.3), medium effect (0.3–0.5) and large effect (> 0.5).

**Results**

In this study, we explored the change in ODD diagnosis, the frequency of different ODD symptoms before and after treatment, and the extent to which each symptom was reduced after treatment. Score on the KIDDIE-SADS was the only dependent variable in the present study.

**Frequency of the ODD diagnosis and of specific ODD symptoms before treatment and at the 1-year follow-up**

Before treatment, 90.5% (n = 76) of the children received a definite ODD diagnosis, whereas 9.5% (n = 8) received a subthreshold diagnosis. At the 1-year follow-up, 21.4% (n = 18) received a definite ODD diagnosis, 10.7% (n = 9) received a subthreshold diagnosis and 67.9% (n = 57) no longer received an ODD diagnosis.

As Table 2 shows, the four most common ODD symptoms before treatment were “argues with adults”, “actively defies or refuses to comply with adult’s requests or rules”, “touchy or easily annoyed by others” and “angry or resentful”. Two of these symptoms belong to the “negative emotions” symptom set and two to the “oppositional behavior” set (8). The four most common symptoms before treatment were still among the most common symptoms at the 1-year follow-up, albeit at a

**Table 2. Frequency of oppositional defiant disorder symptoms before treatment and at the 1-year follow-up as measured by KIDDIE-SADS (N = 84).**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Before treatment % (n)</th>
<th>1-year follow-up % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not present/ sometimes present</td>
<td>Often present</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Loses temper</td>
<td>39.3 (33)</td>
<td>60.7 (51)</td>
</tr>
<tr>
<td>2. Argues with adults</td>
<td>26.2 (22)</td>
<td>73.8 (62)</td>
</tr>
<tr>
<td>3. Actively defies or refuses to comply with adult’s requests or rules</td>
<td>11.9 (10)</td>
<td>88.1 (74)</td>
</tr>
<tr>
<td>4. Deliberately annoys people</td>
<td>33.3 (28)</td>
<td>66.7 (56)</td>
</tr>
<tr>
<td>5. Blames others for his or her mistakes or misbehavior</td>
<td>39.3 (33)</td>
<td>60.7 (51)</td>
</tr>
<tr>
<td>6. Touchy or easily annoyed by others</td>
<td>25.0 (21)</td>
<td>75.0 (63)</td>
</tr>
<tr>
<td>7. Angry or resentful</td>
<td>17.9 (15)</td>
<td>82.1 (69)</td>
</tr>
<tr>
<td>8. Spiteful or vindictive</td>
<td>56.0 (47)</td>
<td>44.0 (37)</td>
</tr>
</tbody>
</table>
much lower rate. However, the most frequent symptom at the 1-year follow-up was “blames others for his or her mistakes or misbehavior”; despite it being one of the rarest symptoms before treatment. This symptom showed the smallest change in frequency during treatment.

**Symptom reduction**

All symptoms showed a significant reduction from before treatment to the 1-year follow-up (Table 3). Even though ODD symptoms were not present often enough in every child to warrant an ODD diagnosis, they were not completely absent in many children (i.e. they still occurred sometimes; Table 3). Two symptoms changed from a median of 3 (often present) to a median of 1 (not present), indicating a large reduction. These symptoms were “actively defies or refuses to comply with adult’s request or rules” and “deliberately annoys people”. The symptom “actively defies or refuses to comply with adult’s request or rules” showed a large effect size (Table 3), while the symptom “blames others for his or her mistakes or misbehavior” had a small effect size. The remaining six symptoms showed a medium effect size.

The reductions in symptoms categorized as “negative emotions” and “oppositional behavior” (8) were quite similar. After treatment, two symptoms in both groups showed a median of 2 and one symptom showed a median of 1.

**Discussion**

The present study examined 84 children with ODD who were treated with the Incredible Years Program. The main findings were that: 1) after treatment, about 68% of the children no longer had an ODD diagnosis; 2) the four most common symptoms before treatment were still among the most common after treatment, but the most commonly reported symptom changed; and 3) even though all of the ODD symptoms were significantly reduced after treatment, most symptoms still occurred sometimes. Reductions in ODD diagnoses following treatment with the Incredible Years Program have been well documented in previous studies (13, 25, 26). In this study, however, the focus was on improvement of specific ODD symptoms. As far as we are aware, previous studies have not explored these effects before.

The present study shows that, before treatment, half of the ODD symptoms occurred often in the children’s daily lives and they were above the threshold for a diagnosis. These symptoms were “actively defies or refuses to comply with adult’s requests or rules”, “angry or resentful”, “touchy or easily annoyed by others” and “argues with adults”. Two of these symptoms belong to the ODD symptoms classified as negative emotions (being angry and touchy) and two belong to the oppositional behavior category (defying and arguing) (8). Even though all the ODD symptoms showed a significant reduction after treatment, most symptoms still occurred sometimes. Seven of the eight ODD symptoms showed a medium or large effect size, which indicates a great improvement. The symptom “blaming others for his or her mistakes or misbehavior” decreased the least in frequency and effect size. It was the most frequently reported symptom after treatment, indicating that it is hard to treat. The Incredible Years Program may not focus enough on how to help children deal with their conscience and their responsibility for what they are doing. Such processes and changes may need individual support that is tailored to each child. However, it may also be that children need to be older before they are cognitively able to deal with this symptom. Children in the present study were quite young, even at the 1-year follow-up.

The other symptoms that occurred most frequently after treatment also occurred most frequently before treatment. However, far fewer children showed these ODD symptoms often enough to receive an ODD diagnosis 1 year after treatment. Most children showed these behaviors at a normal level for their age groups following treatment. With respect to the distinction between negative emotions (being touchy, angry and vindictive) and oppositional behavior (defying, arguing and losing

### Table 3. Presence of symptoms measured with medians on the KIDDIE-SADS before treatment (T1) and at the 1-year follow-up (T2), and statistically significant changes from T1 to T2 (N = 84).

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Median T1</th>
<th>Median T2</th>
<th>z-value</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Loses temper</td>
<td>3</td>
<td>2</td>
<td>-5.56***</td>
<td>-0.42</td>
</tr>
<tr>
<td>2. Argues with adults</td>
<td>3</td>
<td>2</td>
<td>-5.18***</td>
<td>-0.40</td>
</tr>
<tr>
<td>3. Actively defies or refuses to comply with adult’s requests or rules</td>
<td>3</td>
<td>1</td>
<td>-6.98***</td>
<td>-0.54</td>
</tr>
<tr>
<td>4. Deliberately annoys people</td>
<td>3</td>
<td>1</td>
<td>-5.71***</td>
<td>-0.44</td>
</tr>
<tr>
<td>5. Blames others for his or her mistakes or misbehavior</td>
<td>3</td>
<td>2</td>
<td>-2.75**</td>
<td>-0.21</td>
</tr>
<tr>
<td>6. Touchy or easily annoyed by others</td>
<td>3</td>
<td>2</td>
<td>-5.03***</td>
<td>-0.39</td>
</tr>
<tr>
<td>7. Angry or resentful</td>
<td>3</td>
<td>2</td>
<td>-6.32***</td>
<td>-0.49</td>
</tr>
<tr>
<td>8. Spiteful or vindictive</td>
<td>2</td>
<td>1</td>
<td>-4.32***</td>
<td>-0.33</td>
</tr>
</tbody>
</table>

*Meaning of values: 1) the symptom is not present; 2) the symptom is sometimes present, but below threshold; 3) the symptom is often present.

*P < 0.05; **P < 0.01; ***P < 0.001.
temper) (8), the present study did not find differences in the symptom changes between the two categories. However, it would be valuable to investigate this further in studies that follow the children over a longer period. In particular, it would be interesting to see whether symptom patterns in childhood predict the development of depression and CD later in life.

Three ODD symptoms were no longer present after treatment, indicating that the Incredible Years Program could have a particularly positive effect on these types of behaviors. The symptoms were “actively defies or refuses to comply with adult’s request or rules”, “deliberately annoys people” and “spiteful and vindictive”. During the Parent Training, parents are shown how to develop a better relationship with their children and trained to give them more positive feedback. It is likely that this change in parental behavior helps the children become more cooperative and show more positive behavior, particularly in terms of the three ODD symptoms described here.

On the KIDDIE-SADS, each ODD symptom is assessed according to three levels of frequency. Instead of simply determining the presence or absence of symptoms (as it is done when making a diagnosis), there is a level in between, level 2. At this level, the symptom is present sometimes but not often enough to contribute to the diagnosis of ODD. Levels 1 and 2 of the KIDDIE-SADS assessment indicate that ODD symptoms are in the normal range. However, in clinical assessment, children are usually regarded as at risk if they have many scores at level 2 combined with diminished psychosocial functioning (27). For the age group studied here, even if only a few ODD symptoms are occurring frequently, it is still reason for concern (10). Children with several symptoms at level 2 may still be in need of increased support from their parents. If a child has many symptoms in this middle category, he or she may have serious behavior problems but still not warrant a formal ODD diagnosis. It is important to be aware of these children, as the child and the family might require some help or treatment. The findings reported here indicate that it might not be sufficient to determine only whether a child is diagnosed with ODD; we should also examine the frequency of each symptom reported. Likewise, following treatment it is important to assess whether the child’s functioning is diminished and whether his or her quality of life has changed for the better. To evaluate fully the effects of treatment, it is not sufficient to consider simply the child’s symptom levels and diagnosis. Lurie and Clifford (28) found that most parents were very satisfied with the Incredible Years Program following treatment, even if their child still showed high levels of ODD symptoms after treatment. Parents reported that they now dealt with their child’s behavior in a much better way and that problems in their daily family life were greatly reduced.

Limitations and strengths of the study
A limitation of this study is the lack of a control group of untreated children. For ethical reasons, children in the control group of the main study received treatment before the 1-year follow-up. They were therefore excluded from the present study. Another limitation of the present study was the use of a single outcome measure, the KIDDIE-SADS. Use of additional measurements would probably have given more nuanced findings.

A strength of this study is that no other studies have reported changes in specific ODD symptoms among children aged between 4 and 8 years. The findings therefore provide valuable information about the treatment effects of the Incredible Years Program for Norwegian children with ODD.

Conclusion
The findings reported here indicate that the Incredible Years Program has a positive effect on children with ODD. Many of the children no longer received an ODD diagnosis after treatment, and all symptoms were significantly reduced. About one-third of the children were still diagnosed with ODD after treatment, and they showed several ODD symptoms frequently. Future studies should investigate further how ODD symptoms can be reduced for these children. An important aspect to be aware of is the degree of symptom reduction. Most symptoms do not disappear but merely become less frequent. Perhaps the Incredible Years Program is not enough in itself, or maybe the parents participating in the program could benefit from more support to implement adequately the strategies they learn. It is also possible that the treatment strategies in the program, which was developed in the USA, are not properly suited to the Norwegian way of child rearing. It would be valuable to investigate these aspects further in order to develop an optimal treatment regimen for Norwegian children with ODD.

Future studies should also examine changes in specific ODD symptoms in more detail to evaluate whether there is a pattern as to which symptoms are most amenable to reduction.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

References

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