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Treatment of oppositional defiant and conduct problems in young Norwegian children

Results of a randomized controlled trial

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Abstract The efficacy of the Incredible Years parent training and child therapy programs was examined in a randomized controlled study including 127 Norwegian children aged 4–8 years. Children diagnosed with oppositional defiant disorder (ODD) or conduct disorder (CD) were randomized to parent training (PT), parent training combined with child therapy (PT + CT), or a waiting-list control condition (WLC). Assessments were carried out at baseline, posttreatment and at a one-year follow-up using standardized measures and a semi-structured interview. Both active treatment conditions reduced child conduct problems posttreatment as opposed to the WLC, while differences between the two treatment conditions were small and nonsignificant. About two thirds of the treated children functioned within normal variation after treatment, and the same proportion no longer received an ODD diagnosis at the one-year follow-up. Parental use of positive strategies increased after treatment, and the use of harsh and inconsistent discipline decreased as did mother experience of stress. The outcome of this study emphasizes the importance of offering parent training to young children with severe conduct problems exhibited at home. The findings and usefulness of the Incredible Years program in the present Norwegian replication study further support and extend positive outcomes of previous controlled trials conducted primarily in Anglo-Saxon countries.

Key words oppositional defiant disorder – conduct disorder – parent training – child therapy – randomized controlled trial

Abbreviations PT: Parent training; PT + CT: Parent training and child therapy; WLC: Waiting list control; ODD: Oppositional defiant disorder; CD: Conduct disorder

Introduction

Oppositional defiant and conduct problems are common problems in young children [15]. Children with early onset of severe conduct problems are at increased risk of peer rejection, parental abuse, and at later stages, poor school adaptation and dropout, substance abuse, and juvenile delinquency [11]. Overall, early onset tends to predict more severe,

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long-lasting problems and a poorer outcome [22]. Recently, Romeo et al. [28] reported a substantial annual cost of severe conduct problems in children aged 3–8 years and that the burden fell most heavily on the family.

Several parent training programs primarily developed in the USA have established efficacy in reducing behavioral problems in children [10, 22]. The Incredible Years program developed by Webster-Stratton and colleagues has also achieved the status as an exemplary "Blueprints" program by the US Office of Juvenile Justice Delinquency Prevention [33]. The efficacy of various forms of parent training and child therapy in the Incredible Years program for 3–8 year old children with oppositional and conduct problems has been systematically evaluated in a series of studies. To date, six independent replications have been conducted; one in the USA [31], Ireland [13], Canada [32], Sweden [6], and two in the UK [20, 30]. In these comparisons, parent training reduced conduct problems in children significantly more than eclectic outpatient treatment [32] or waiting-list control conditions [13, 20, 30, 31]. The improvements obtained in Webster-Stratton's own studies [34, 36] and the replication studies have been found to be well maintained 6, 12 months and 3 years later [29, 37] as well as 10–15 years later [35].

In cross-cultural comparisons, the prevalence rates of parent reported emotional as well as behavioral problems among Scandinavian children have consistently been found to be lower than in other countries/cultures [16, 25]. For example, substantially lower mean scores in parental ratings of conduct problems in children on the Eyberg child behavior inventory (ECBI) have been recently found in a Norwegian normative study as compared to US norms [24]. Whether differences in parental perception of child problems in Scandinavian countries also implicate differences in response to an established parenting program such as the Incredible Years treatment program, is unknown. To date, this program has been evaluated primarily in Anglo-Saxon countries. Weisz and colleagues have emphasized the need for cross-cultural comparisons and testing of evidence-based treatments when employing these in a different cultural and linguistic settings [39].

In a previous study of the present Norwegian sample, positive generalisation effects across settings defined as reduced levels of child aggression in day-care or school after treatment were found for children who had received combined PT + CT intervention, however, these improvements were not maintained one year later [17].

Similarly, in the same sample combined PT + CT intervention achieved most improvement in child social competence based on mother, father and child reports [18]. However, no generalisation effects to peer-relationships in day-care or school settings were found on teacher or child reports.

The aims of the present study were to compare the effects of the Incredible Years Basic parent training (PT) program, or PT combined with child therapy (PT + CT) to a waiting list control (WLC) condition in a randomized controlled trial including a one-year follow-up. The study set out to replicate the effects of previous controlled trials including PT vs. PT + CT vs. WLC conditions [34] in a Norwegian sample of young children with severe conduct problems and a psychiatric diagnosis of ODD or CD. We hypothesized that PT and PT + CT would be more powerful in improving child conduct problems than untreated children on the prime outcome measure, the ECBI and that small differences between the two active conditions would be obtained. We also expected improvements in parenting practices, reduction of parent stress and internalizing problems in the child after active treatment.

Method

Participants

All 4–8 year old children referred because of oppositional or conduct problems for treatment to two child psychiatric outpatient clinics in two university cities in Norway were considered for inclusion. In all, 127 children were included, 98 subjects in Trondheim and 29 in Tromsø. Children with gross physical impairment, sensory deprivation, intellectual deficit, or autism and children receiving other psycho-therapeutic interventions were excluded. Those who received medication for ADHD were included only if this treatment was initiated more than six months prior to study entry. All but one family in the study were native Norwegians. The allocation of the participants did not differ significantly in regard to demographic variables, diagnostic status or use of medication because of ADHD. Child and family characteristics are presented in Table 1.

Procedures

Information about the study was given to referral agencies and professionals such as teachers, physicians, health nurses, and child welfare workers throughout the project period. Children were first screened by means of the ECBI [26] using the 90th percentile as a cut-off score according to Norwegian norms [24]. The intensity and problem scales of the

Table 1 Demographic information by treatment condition

Demographic variable	Mean (SD)		
	PT (n = 47)	PT + CT (n = 52)	WLC (n = 28)
Child age	6.4 (1.5)	6.7 (1.3)	6.9 (1.1)
Age at onset (months)	25.4 (18.7)	21.2 (20.9)	36.4 (24.2)
Mother age	33.7 (6.3)	32.0 (4.8)	34.9 (6.8)
Father age[a]	35.2 (5.7)	36.0 (7.0)	37.0 (8.0)
Number of children	2.5 (1.3)	2.1 (1.2)	2.2 (1.0)
	No. (%)		
Boys	38 (80.9)	41 (78.8)	22 (78.6)
One-parent families	16 (37.2)	12 (30.0)	8 (32.0)
Mothers not completing high school	11 (23.9)	13 (28.3)	8 (33.3)
Fathers not completing high school	9 (25.0)	9 (22.0)	6 (31.6)

Chi-square or ANOVA indicated no significant difference for any variable
PT parent training, *PT + CT* parent training and child therapy, *WLC* waiting list control
[a]Fathers in PT n = 41, PT + CT n = 42, and in WLC n = 21

ECBI constituted the prime outcome measures due to the establishment of Norwegian norms for the present age group. Children who attained a score above the 90th percentile or higher were subsequently interviewed with the K-SADS-PL (see description below). Those who received a subthreshold or definitive diagnosis of ODD and/or CD were included. Following the recommendations by Angold and Costello [5] regarding "subthreshold diagnosis", children who scored one criterion less than the four criteria required for a formal DSM-IV ODD diagnosis [4] or the three required for a formal CD diagnosis, while also having a diminished function, were included.

Assessment

Eyberg child behavior inventory (ECBI)

This measure contains 36 items (1–7 scale) for parents to assess child conduct problem behaviors among children aged 2–16 years [9, 27]. Total intensity scores were used to indicate frequency of conduct problems, ranging from 36 to 264 with an internal consistency of 0.82. Intraclass correlation between mother and father reports (ICC) on the ECBI intensity scale was 0.40. On the problem scale, parents are asked to indicate whether they perceive each child behavior difficult to handle or not (score range from 0 to 36). Test–retest has been reported to be 0.86 [38].

Child behavior checklist (CBCL)

The problem part of the CBCL consists of 118 items (0–2 scale) rated by parents addressing various emotional and behavioral problems in the child [2]. Here, the Aggression and Attention subscales (20 and 11 items, respectively, and scores range from 0 to 40 and from 0 to 22, respectively), and the Internalizing syndrome scale (31 items; score range: 0–62) were included with alphas of 0.84, 0.74, and 0.84, respectively. Short-term test–retest reliability is high for these scores [26]. The ICC for between-parent reports on the CBCL subscales were 0.62 for aggression, 0.68 for attention, and 0.51 on the internalizing syndrome scale.

Parent practices interview (PPI)

The PPI was modified from the Oregon Social Learning Center's discipline questionnaire to apply to young children [36]. Three summary scores were computed for *harsh discipline* (14 items), *inconsistent discipline* (6 items), and *positive parenting* (15 items), all items being rated on a 1–7 scale with alphas of 0.80, 0.69 and 0.65, respectively. ICC for between-parent reports on the PPI subscales were 0.27 for harsh discipline, 0.31 for inconsistent disciplining, and 0.19 for positive parenting.

Parent stress index (PSI)

This measure consisting of 101 items rated on a 1–5 scale (total score range 101–505) was used to assess parents' perceived stress related to both child behaviors and parenting [1]. The internal consistency was 0.94 and ICC for between-parent reports on the PSI total stress was 0.48.

Consumer's satisfaction

At the one-year follow-up, parents in the PT and PT + CT treatment conditions were asked to rate their satisfaction with the treatment program on a 1–7

point likert scale ("Not satisfied" to "Very satisfied"), and whether they would recommend it to other parents ("Strongly recommend" to "Strongly not recommend").

K-SADS-PL

This semi-structured diagnostic interview was administered to assess psychopathology in children and adolescents according to DSM-IV criteria [21] before treatment and at the one-year follow-up. The *K-SADS-PL* was not used immediately after treatment because symptoms for both ODD and CD disorders require a presence of at least 6 months to a year. The following diagnoses based on parental reports of current child symptoms and impairment were assessed: ODD, CD, ADHD, generalized and specific anxieties, depression, enuresis, encopresis, tics and Tourette. Three trained raters conducted the diagnostic interviews at baseline and at the one-year follow-up. These interviewers were blinded to patient treatment status at baseline, but were no longer naïve to treatment status at follow-up. The interviews were recorded and random checks showed high inter-rater reliability with all Kappa scores above 0.90.

Design

An experimental randomized control between-group design was used with pre- and post measurements, and one-year follow-up of the treated children. (The trial is registered with the international RCT number: ISRCTN10430476). Children and families were randomized to Parent Training (PT; $n = 51$), Parent Training combined with Child Therapy (PT + CT; $n = 55$), or Waiting-List Control group (WLC; $n = 30$) (see flow chart in Fig. 1).

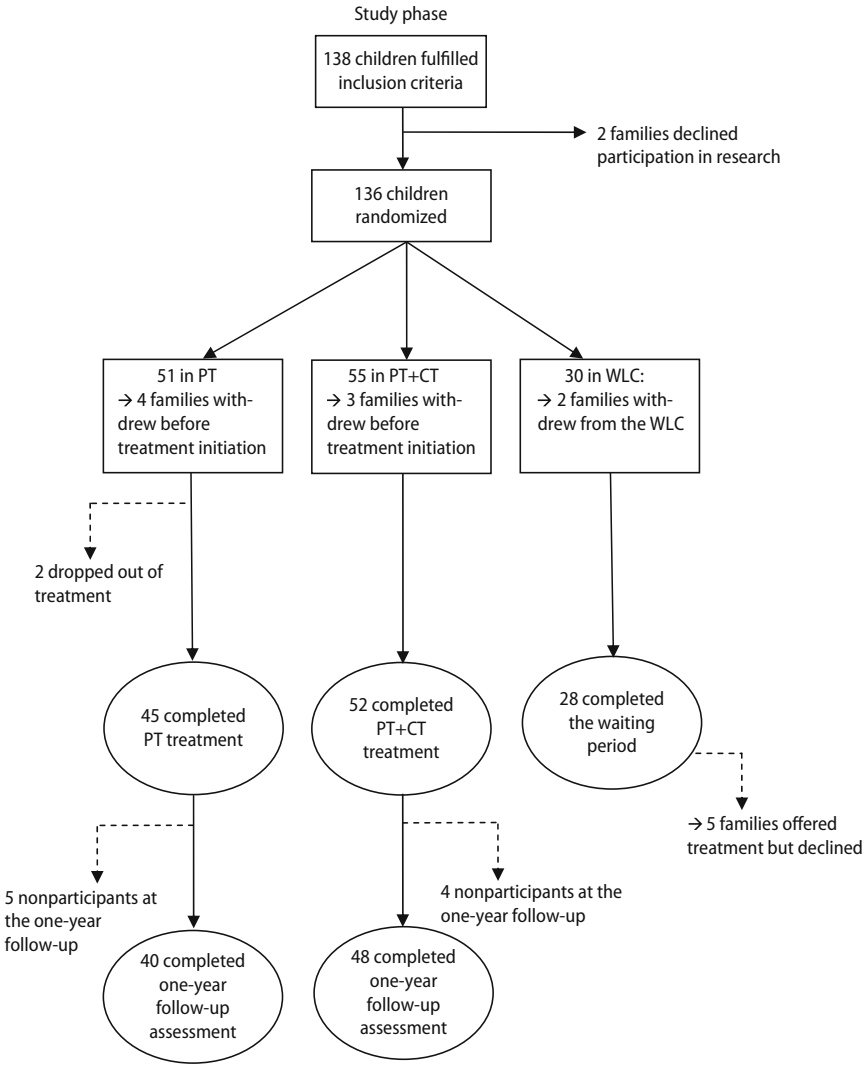

Fig. 1 Flow chart of participants across trial phase

Treatment

Parent training (PT)

Ten to twelve parents met in weekly groups with two therapists at the clinic during 12–14 weeks for 2-h sessions and participated in the Basic Incredible Years Parenting Program [34]. This program teaches parents the use of positive disciplinary strategies, effective parenting skills, strategies for coping with stress, and ways to strengthen children's social skills, using video vignettes for discussions in the parent group, role play, rehearsals and homework assignments. PT focuses on a collaborative process between parents and therapists and is based on social learning theory, an ecological view of child development and family processes [35]. On average parents attended 92% of the scheduled meetings.

Child therapy (CT)

Groups of six children met with two therapists in the clinic for 18 weekly 2-h sessions based on the Incredible Years Dinosaur School Program. The aims were to increase child social skills, conflict resolution skills, playing and cooperation with peers, using video vignettes for discussions, role play, rehearsals and home assignments [35]. CT ran parallel to PT and started at the beginning of each semester. Children attended 91% of the planned sessions. The content of the treatment curriculum of the PT and the CT programs was identical to the ones in the original manuals. For more detailed information regarding implementation of the The Incredible Years in Norwegian clinical settings, see Ferrer-Wreder et al. [19]. Hand-outs were translated and the original video vignettes dubbed into Norwegian.

Waiting-list control (WLC)

For ethical reasons, families assigned to this condition were offered treatment after 6 months; however, 5 of 28 families chose not to participate in treatment. The analysis for families in WLC was restricted to pre vs. posttreatment evaluations.

Therapists and treatment integrity

Altogether 15 therapists administered PT and 9 the CT program at the two sites. Each had a Bachelor or Master degree in mental health-related fields and experience in clinical work. The therapists were trained according to certification procedures established by The Incredible Years program and they were certified by the program developer. The therapists received continuous supervision through observations, role play, and video reviews from one of the authors (WTM), a certified trained in the Incredible Years program. The therapists employed a treatment manual, completed standard check-lists for each session, and tracked group activities (number of vignettes showed, role-plays, home-tasks etc.). All sessions were videotaped for evaluation by the mentor and weekly peer and self-evaluation meetings.

Ethics committee

Informed consent was obtained from all parents. The study was approved by The Regional Committee for Ethics in Medical Research, University of Tromsø, and by the Norwegian Data Inspectorate.

Statistics

Associations between categorical variables were analyzed with χ^2 test. Differences in group means between treatment conditions posttreatment and at the 1-year follow-up were analyzed by ANCOVAs using pretreatment scores as covariates. Overall significant effects were followed by Bonferroni post hoc test. Effect sizes were calculated using Cohen's d and η^2 [12]. For pairwise comparisons $d = 0.5$ denotes a medium effect, and 0.8 denotes a large effect, while a η^2 of 0.06 represents a medium effect, and a $\eta^2 = 0.14$ a large effect. For subjects having one missing value on any of the three assessment points, imputations for continuous variables were performed using Bingham's method [8]. In accordance with suggestions by Cook and Sackett [14], clinical significance was also assessed estimating number of subjects needed to treat (NNT) for one subject to achieve success (here defined as functioning within norms posttreatment on the prime outcome measure, the ECBI). NNT is calculated as the inverse of absolute risk reduction for binary outcome. Confidence intervals were calculated as suggested by Altman [3].

Results

Sample characteristics

Results of ANOVAs and χ^2 tests revealed no significant differences between the three conditions on any of the demographic variables (see Table 1). Before treatment, all children received a definite diagnosis of ODD ($n = 111$) or a subthreshold ODD ($n = 16$), and 18.9% received a subthreshold ($n = 14$) or a definite CD diagnosis ($n = 10$). In all, 35.4% ($n = 45$) met

diagnostic criteria for ADHD. The distribution of diagnostic categories did not differ significantly between the conditions, neither did the two sites differ on the prime outcome measure, the ECBI, at any of the assessment points.

Posttreatment effects on child behavior

From all families initiating treatment, only two dropped out. Because intent-to-treat analyses showed identical results to per protocol analyses for the primary measure, the ECBI, outcomes below are reported for completers only. Mean (SD) scores for the three treatment conditions and the three assessment points, and effect sizes (*d*) for pairwise between-group differences are presented in Table 2.

Parent report

On the ECBI intensity scale, mothers reported a significant between-group effect, ($F_{2,\ 121} = 4.68$, $P < 0.05$, $\eta^2 = 0.07$). Subsequent post-hoc tests showed that mothers in PT scored significantly ($P = 0.003$) lower than those in WLC. Father reports showed a significant between-group effect, ($F_{2,\ 74} = 4.32$, $P < 0.05$, $\eta^2 = 0.11$), and subsequent post-hoc analyses showed that fathers in PT reported significantly ($P = 0.009$) lower scores on the ECBI intensity than those in WLC. Although mother reports showed a nonsignificant between-group difference on the ECBI problem score, father scores showed a significant between-group difference, ($F_{2,\ 74} = 4.60$, $P < 0.05$, $\eta^2 = 0.11$). Subsequent post-hoc tests showed that fathers in the PT condition rated their children as having significantly ($P = 0.007$) lower scores than those in the PT + CT condition, and fathers in PT reported significantly ($P = 0.015$) lower scores on the ECBI problem score than those in WLC.

On the CBCL aggression subscale, a significant between-group difference was found for mother reports, ($F_{2,\ 118} = 5.04$, $P < 0.01$, $\eta^2 = 0.08$). Subsequent post hoc test showed that mothers in both PT and PT + CT experienced their children as significantly ($P = 0.007$ and $P = 0.004$, respectively) less aggressive than those in WLC. On the CBCL attention subscale, mothers reported a significant between-group effect, ($F_{2,\ 118} = 3.61$, $P < 0.05$, $\eta^2 = 0.06$), and those in PT considered the children significantly ($P = 0.012$) less inattentive as compared to mothers in WLC. On the CBCL internalizing scale, mothers reported a significant between-group effect, ($F_{2,\ 118} = 3.56$, $P < 0.05$, $\eta^2 = 0.06$). Subsequent post-hoc tests showed that mothers in PT rated their children as having significantly ($P = 0.012$) less problems than those in WLC. However, father reports showed no significant effects on any of the CBCL scales.

Using a two-way mixed effects model, agreement (ICC) between mothers and fathers on the ECBI intensity and the CBCL aggression scales at posttreatment were .77 ($CI_{95\%}$: 0.61–0.86) and 0.79 ($CI_{95\%}$: 0.66–0.87), respectively.

Table 2 Means and SDs by treatment condition and assessment point for parent reports of child behaviors

Measure	PT			PT + CT			WLC		Effect size (*d*)		
	Pre Mean (SD)	Post Mean (SD)	Follow-up Mean (SD)	Pre Mean (SD)	Post Mean (SD)	Follow-up Mean (SD)	Pre Mean (SD)	Post Mean (SD)	PT vs. WLC	PT + CT vs. WLC	PT vs. PT + CT
ECBI intensity											
Mother	157.1 (24.2)	116.5 (27.0)	121.3 (28.8)	156.5 (22.0)	121.8 (31.9)	119.1 (31.4)	159.7 (23.1)	137.3 (28.6)	0.65*	0.42	0.22
Father	140.3 (21.2)	108.0 (24.1)	108.9 (22.3)	143.8 (23.2)	123.2 (27.0)	116.1 (24.3)	142.9 (29.7)	125.7 (32.0)	0.80*	0.17	0.54
ECBI problems											
Mother	20.7 (6.2)	10.8 (8.9)	11.1 (8.4)	20.2 (6.3)	10.0 (8.0)	10.2 (8.1)	19.8 (4.8)	14.1 (8.4)	0.47	0.55	−0.03
Father	16.6 (6.4)	7.0 (6.4)	7.0 (5.5)	15.6 (6.3)	11.4 (7.3)	8.3 (7.5)	15.1 (8.4)	10.9 (7.5)	0.75*	0.02	0.67*
CBCL aggression											
Mother	18.8 (6.8)	11.9 (8.1)	11.0 (7.0)	21.7 (7.0)	13.7 (8.6)	12.7 (7.4)	20.0 (7.7)	17.2 (8.2)	0.58*	0.75*	−0.15
Father	14.8 (5.0)	9.2 (5.4)	8.6 (4.3)	19.8 (8.4)	13.4 (8.4)	12.1 (8.4)	17.4 (8.2)	14.2 (7.6)	0.40	0.52	−0.12
CBCL attention											
Mother	6.8 (3.6)	4.9 (3.7)	5.2 (3.5)	8.0 (3.6)	6.1 (3.9)	6.1 (4.3)	7.3 (3.6)	7.2 (3.9)	0.53*	0.59	−0.03
Father	5.3 (3.0)	3.8 (2.1)	4.3 (2.8)	8.3 (3.8)	6.1 (4.0)	5.1 (3.5)	7.5 (3.9)	6.9 (3.8)	0.34	0.50	−0.24
CBCL internalizing											
Mother	11.0 (6.2)	6.5 (5.1)	6.9 (6.3)	12.5 (8.6)	7.7 (6.7)	6.9 (6.3)	10.1 (6.5)	9.0 (6.1)	0.57*	0.60	−0.05
Father	7.5 (6.3)	5.7 (5.9)	6.2 (6.5)	11.3 (7.9)	7.5 (5.9)	6.6 (5.7)	9.0 (5.0)	6.9 (4.3)	-0.07	0.33	−0.36

Effect sizes (*d*) posttreatment

PT parent training ($n = 45$ mothers, 25 fathers); *PT + CT* parent training and child therapy ($n = 52$ mothers, 32 fathers); *WLC* waiting list control ($n = 28$ mothers, 21 fathers), *ECBI* Eyberg child behavior intensity, *CBCL* child behavior checklist, *PSI* parent stress index

*$P < 0.0167$ (Bonferroni corrected significance level)

Dose–response relationship

Eighty-three mothers attending more than 75% of the scheduled sessions reported a pre-posttreatment reduction of 38.8 points on the ECBI, while those 11 mothers attending 75% of the sessions or fewer, reported a reduction of 25.9 points, and the 27 mothers receiving no session in the WLC condition reported a reduction of 22.8 points. The results of ANCOVA on the ECBI post scores controlling for pretreatment values was significant, ($F_{2,\ 115} = 4.29$, $P < 0.05$). Subsequent post-hoc test showed that mothers attending more than 75% of the sessions reported significantly better improvement on child behavior than those receiving none ($P = 0.01$). Overall, there was only a tendency for mothers attending more treatment sessions to report larger reductions on the ECBI, $r = 0.18$. No significant difference was found for mother attendance in PT and PT + CT conditions. Of the children assigned to the CT condition, four children attended less than 75% of the sessions (two attended 52.9 and 64.7% of the sessions, and two others attended 70.5%).

Parenting practices and stress

When considering parental use of harsh child disciplinary practices, the results showed a significant between-group difference in maternal reports, ($F_{2,\ 117} = 14.50$, $P < 0.001$, $\eta^2 = 0.20$). Subsequent tests for contrasts showed that mothers in both PT and the PT + CT employed significantly less harsh child disciplining practices compared to those in WLC ($P < 0.001$ for both treatment conditions). Father reports of harsh parenting showed a significant between-group difference, ($F_{2,\ 79} = 3.12$, $P < 0.05$, $\eta^2 = 0.07$), however, subsequent contrast tests were nonsignificant. Significant between-group differences were also obtained in mother reports of inconsistent disciplining of the child, ($F_{2,\ 118} = 16.18$, $P < 0.001$, $\eta^2 = 0.22$). Subsequent post-hoc tests showed that mothers were significantly ($P < 0.001$) less inconsistent in their disciplining of the child in both active treatment conditions compared to those in WLC. Similarly, on father reports, a significant difference between treatment conditions was found, ($F_{2,\ 79} = 4.91$, $P < 0.01$, $\eta^2 = 0.11$). Subsequent post-hoc tests showed that fathers in PT + CT used inconsistent practices significantly ($P = 0.002$) less than those in the WLC condition. Both mother and father use of positive parenting showed significant between-group differences, ($F_{2,\ 116} = 37.12$, $P < 0.001$, $\eta^2 = 0.39$ and $F_{2,\ 78} = 20.55$, $P < 0.001$, $\eta^2 = 0.35$, respectively). Subsequent post-hoc tests indicated that both mothers and fathers in the active treatment conditions used significantly ($P < 0.001$) more positive parenting after treatment compared to those in WLC.

Analysis of *parental stress* on the PSI showed a significant between-group difference on both mother and fathers reports, ($F_{2,\ 91} = 7.31$, $P = 0.01$, $\eta^2 = 0.14$ and $F_{2,\ 59} = 4.15$, $P = 0.01$, $\eta^2 = 0.12$, respectively). Subsequent post-hoc tests showed that maternal stress was significantly lower in both PT ($P = 0.005$) and PT + CT ($P < 0.001$) as compared to those in WLC. Post-hoc tests showed that stress was significantly ($P = 0.008$) lower among fathers in PT as compared to those in WLC.

The magnitude of changes in both mother and father reports of parenting practices and parental stress showed moderate to large effect sizes (0.52–2.24) when comparing changes in the two active treatment conditions to the WLC condition. Mean (SD) scores for the three treatment conditions and the three assessment points, and the obtained *d*'s, are presented in Table 3.

One-year follow-up outcome

Additional help

Of the 88 (88.9% of those randomized) treated children available for diagnostic assessment at the follow-up, 21 (23.9%) had been referred for additional assessment or treatment during the follow-up period, six (15%) in PT and 15 (31.3%) in PT + CT. Eight children (9.1%) were waiting for additional outpatient treatment because of disruptive or oppositional behavior problems. A total of ten children (11.4%) had initiated drug treatment because of ADHD, and one child had received antidepressant medication.

Fathers in PT + CT reported a significant, ($F_{1,\ 61} = 4.15$, $P = 0.015$) reduction in harsh disciplining of the child as opposed to those in PT. However, no significant difference between PT versus PT + CT on any of mother or father measures of child behavior problems was found at follow-up (see Table 2). Neither were changes in mother or father reports of parenting practices and parental stress significantly different between the two active treatment conditions.

Child psychiatric diagnostic status

Out of the 88 treated children, 70 children (79.6%) no longer received a formal ODD diagnosis at the one-year follow-up, but 11 (15.7%) met criteria for subthreshold ODD (four in PT and seven in PT + CT). Of the eight children (9.1%) who met criteria for CD at pretreatment, two children (2.3%) continued to have

Table 3 Means and SDs by treatment condition and assessment point for parent reports of parenting practices and stress

	PT			PT + CT			WLC		Effect size (*d*)		
	Pre Mean (SD)	Post Mean (SD)	Follow-up Mean (SD)	Pre Mean (SD)	Post Mean (SD)	Follow-up Mean (SD)	Pre Mean (SD)	Post Mean (SD)	PT vs. WLC	PT + CT vs. WLC	PT vs. PT + CT
PPI-harsh discipline											
Mother	2.2 (.5)	1.8 (.5)	1.8 (.4)	2.2 (.5)	1.7 (.3)	1.8 (.4)	2.5 (.7)	2.3 (.7)	0.61*	0.86*	−0.25
Father	2.3 (.4)	1.9 (.3)	2.1 (.4)	2.4 (.6)	2.0 (.6)	1.9 (.6)	2.1 (.5)	2.1 (.4)	0.82	0.70	0.04
PPI inconsistent discipline											
Mother	3.1 (.6)	2.6 (.5)	2.7 (.5)	3.1 (.7)	2.6 (.6)	2.6 (.6)	3.4 (.7)	3.4 (.7)	1.05*	0.74*	0.16
Father	3.2 (.7)	2.7 (.5)	2.8 (.5)	3.0 (.7)	2.4 (.6)	2.6 (.5)	3.1 (.5)	3.0 (.6)	0.67	0.52*	−0.06
PPI positive parenting											
Mother	4.4 (.6)	5.1 (.6)	5.0 (.5)	4.3 (.6)	5.2 (.6)	5.0 (.7)	4.0 (.5)	4.0 (.5)	1.44*	1.41*	−0.29
Father	3.8 (.5)	4.6 (.6)	4.5 (0.6)	3.9 (0.7)	4.6 (0.6)	4.5 (0.7)	4.1 (0.6)	4.1 (0.6)	2.24*	1.50*	0.41
PSI-total stress											
Mother	262.4 (43.8)	233.3 (47.5)	235.7 (41.4)	264.7 (34.6)	228.6 (36.8)	225.4 (35.0)	273.0 (38.2)	265.9 (40.7)	0.67*	1.07*	−0.22
Father	246.1 (45.1)	219.4 (48.7)	217.9 (47.8)	258.1 (28.4)	232.0 (31.0)	223.1 (32.4)	244.6 (53.7)	242.9 (38.0)	0.86*	0.82	0.02

Effect sizes posttreatment (*d*)
PT Parent training ($n = 43$ mothers, 29 fathers), *PT + CT* parent training and child therapy ($n = 51$ mothers, 35 fathers), *WLC* waiting list control ($n = 28$ mothers, 19 fathers), *PPI* parenting practices interview, *PSI* parent stress index
*$P < 0.0167$ (Bonferroni corrected significance level)

Table 4 Number of children with a psychiatric diagnosis (subthreshold or definitive) at pretreatment and the one-year follow-up in PT, PT + CT, and WLC conditions

Diagnosis	PT ($n = 40$)				PT + CT ($n = 48$)				WLC ($n = 28$)	
	Pretreatment		Follow-up		Pretreatment		Follow-up		Pretreatment	
	Subthr	Def	Subthr	Def	Subthr	Def	Subthr	Def	Subthr	Def
ODD	5 (12.5)	35 (87.5)	4 (10)	7 (17.5)	4 (8.3)	44 (91.7)	7 (14.6)	11 (22.9)	7 (25)	21 (75)
CD	3 (7.5)	3 (7.5)	0 (–)	1 (2.5)	2 (4.4)	5 (10.4)	1 (2.1)	1 (2.1)	4 (14.3)	1 (3.6)
ADHD	12 (30)	8 (20)	7 (17.5)	9 (22.5)	7 (14.6)	22 (45.8)	5 (10.4)	14 (29.2)	3 (10.7)	10 (35.7)

Percentages within parenthesis
PT parent training, *PT + CT* parent training and child therapy, *WLC* waiting list control, *ODD* oppositional defiant disorder, *CD* conduct disorder, *ADHD* attention deficit hyperactivity disorder, *Subthr* subthreshold, *Def* definitive

CD. While 14 children in PT + CT had ADHD at the follow-up compared to 22 before treatment, the corresponding figures in PT were nine and eight subjects, respectively (see Table 4).

Clinical significance at posttreatment and one-year follow-up

At posttreatment, mothers reported that 57.1% of the children in PT, 54.9% in PT + CT, and 29.6% in WLC scored within normal variation on the ECBI intensity score (father reports were incomplete but very similar to mothers), a significant difference, χ^2 (2) = 5.83, $P = 0.05$. At the one-year follow-up, a somewhat higher proportion of improvement was found in that mothers scored 63.2% of the children in PT and 65.6% in PT + CT within normal range, a nonsignificant difference.

Estimates of number-needed-to-treat (NNT) ratios comparing PT to WLC was 3.6 ($CI_{95\%}$: 2.0–21.4) for the ECBI intensity score, while the corresponding value for PT + CT was 4.0 ($CI_{95\%}$: 2.1–30.2).

Consumer satisfaction

At the one-year follow-up, 93.8% of the mothers and 83.7% of the fathers considered the treatment program as "Good" or "Very good", and 93.8% of the mothers and 95.4% of the fathers would "Recommend" or " "Strongly recommend" it. No significant difference between the two treatment conditions in parental ratings was found.

Discussion

In the present study, the effectiveness of the Incredible Years parent training and child therapy programs was examined in a randomized controlled trial

including 127 Norwegian children aged 4–8 years referred to child psychiatric outpatient clinics because of severe oppositional or conduct problems. Overall, treatment outcomes in this replication study showed powerful reductions of child aggressive behaviours at home, improvement of parental practices and reduction of parental stress, both according to mother and father reports. The parents generally harmonized their views on children's aggressive behaviours after treatment. Although both PT and PT + CT approaches reduced child behavior problems at home compared to nontreated children in WLC, small differences were found between the two active treatments. Mothers also reported moderate improvements in children's internalizing problems, while father reports were nonsignificant. Improvements in child behavior problems were further substantiated after one-year in that about two thirds of treated children now functioned within normal variation on standardized measures, and the same proportion no longer received either a subthreshold or definitive diagnosis of ODD. Similar trends were also found for CD. Further estimate of clinical and statistical significance of improvement in child conduct problems showed that absolute risk reduction after PT and PT + CT combined showed that about four children needed to be treated for one child to function within normal range. Overall, the findings of this study showed somewhat smaller treatment effects in reductions of child disruptive behaviours as compared to those in the original studies by Webster-Stratton' and her colleagues [34, 36], but are well in line with outcomes of earlier replication studies [20, 30–32]. Maintenance of achieved improvement in child conduct problems one year after treatment in the present study also concurs well with similar outcomes reported by Webster-Stratton [37] and Scott [29].

Of particular interest is that the BASIC Incredible Years program also reduced parental use of harsh and inconsistent disciplinary strategies towards the child as well as increasing the use of positive strategies, all changes showing large effect sizes. Such improvements are also in line with previous findings by the originator of the intervention program [35]. In a recent replication study, Gardener and collaborators [20] noted that changes in parenting skills seem to be the critical mechanism in parent training. Similarly, critical, harsh, and ineffective parenting has been found both to predict and mediate treatment outcomes when pooling data together from six RCTs [7].

Reduced levels of child conduct problems at home are also likely to contribute to parental reports of decreased stress experience related to such problems.

Although combined PT + CT showed a more powerful reduction of child conduct problems immediately after intervention and generalization effects across daycare or school settings in a previous report on the present sample, these improvements were not sustained one year later [17]. Further, the majority of children (83%) exhibited the same clinical levels of behavior problems, i.e. behavior problems at home and in day-care or school setting at the one-year follow-up as before treatment [18], a higher figure than the one (50–60%) reported by Webster-Stratton and Hammond [34]. Whether the somewhat lower response rate obtained in this study of Norwegian children compared to previous controlled RCTs on Anglo-Saxon participants are due to cultural differences, or the fact that the present sample consisted of children with more pervasive disruptive behaviors, is unclear. One possible explanation might be the lower number of sessions provided to parents in the present study (12–14 sessions) as compared to the 22–24 sessions used in the original studies by Webster-Stratton [36]. However, overall our findings agree well with outcomes from other replication studies using the basic Incredible Years program and almost identical number of sessions [20, 30].

A strikingly high compliance with treatment in the present study was found in that only two families dropped out from the study, both from parent training and at an early stage of treatment. This finding was further supported by a high attendance rate for both parents and the children in the scheduled sessions. Given that mothers attending more than 75% of the scheduled sessions also reported a significantly better improvement in child behavior at home, this is an important predictor of outcome. Parents also reported high levels of satisfaction with the intervention and would recommend it to other parents having similar child behavior problems. Similar and high satisfaction levels with the Incredible Years program have also been reported by the originator [36] and other replication studies [6, 20].

A few limitations of the present study need to be considered. First, parents were the sole informants in the study and higher effect sizes have been reported for observational measures on child versus parent, peer and teacher interactions. The pronounced improvement in a few families in WLC (all received a total of about 5 h of assessment) also heavily influenced between-group contrasts after treatment. Due to ethical reasons, treatment was offered to all families at the end of the 6 months waiting period, thus no untreated control group was included at the one-year follow-up. Because 21 children were referred for assessment or treatment during the one-year follow-up period and eleven children had initiated drug treatment, this additional help may have contributed to the lasting treatment effects obtained. Due to limited sample size, we also had limited power to detect

significant differences between the two active treatment conditions.

Conclusion

The very encouraging positive results of the present study further emphasize the utility of highly structured parent training and child therapy in the management of severe oppositional defiant and conduct problems here exhibited in young Norwegian children as reported by their parents. The clinical significance of treatment improvement was well documented although it is unclear what benefits the child therapy added to parent training. As a consequence of the positive findings of the original studies by Webster-Stratton, subsequent replications, and the outcomes of the present study, the Incredible Years parent training and child therapy programs are now being implemented nationally in Norway.

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