Evaluation of the Parenting Plus Programme

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ABSTRACT

In a comparative group outcome study involving 40 parents of children with disruptive behaviour disorders, it was found that compared with controls, those who participated in the Parenting Plus Programme reported greater gains in the attainment of personal parenting goals. Also, there were trends for participants in the Parenting Plus Programme to report fewer child behaviour problems on the externalizing scale of the Child Behaviour Checklist (CBCL) and the total problems, conduct problems and hyperactivity scales of the Strengths and DIfficulties Questionnaire (SDQ). In addition, compared with controls, parents who participated in the Programme reported significant improvements in parent-child interaction on the Parenting Stress Index. Gains on the Parent Goals Scales, the total problem scale of the SDQ and the externalizing scale of the CBCL were maintained at 5.5 months follow-up. With respect to clinical significance, compared with controls, twice as many parents who participated in the Parenting Plus Programme reported that their children had moved from the clinical to the non-clinical range on the total problem scale of the SDQ and the externalizing scale of the CBCL by the end of the programme. Compared with non-improvers, improvers had less severe behavioural and psychosomatic difficulties and more severe emotional problems at intake and their parents were more distressed and had less familial social support.

INTRODUCTION

Evidence for the efficacy and cost effectiveness of video-modelling assisted behavioural parent training is particularly compelling (Behan & Carr, 2000). The Parents Plus Programme (Sharry & Fitzpatrick, 1997), which was specifically developed for use in an Irish context, is a practical and positive video-based course which helps parents to manage and solve discipline problems in 4-11year old children. It is a group programme involving eight weekly sessions of two hours each. The programme materials include two videos and a facilitator's manual. The manual contains direction on running the programme, session plans and handouts for parents. The videos show scenes played by actors of parents interacting positively with their children, both avoiding misbehaviour and dealing with it when it occurs along with positive comments by clients who have used these parenting practices with their children. The video scripts were written in an Irish idiom and the actors all speak in Irish accents. However, the overall curriculum of the programme closely parallels North American Programmes that have been found to be effective in empirical studies (e.g., Webster-Stratton, 1981, 1987). Topics covered include using parental attention to change behaviour; play and special time; encouragement and praise; using reward systems effectively; setting rules and helping children keep them; using active ignoring; using time-out and other sanctions; and solution building with children. A typical session involves a welcome from the facilitator, a review from the participants of how they have put into practice the new ideas from the previous week's session, introduction of the current week's topic, video input and discussion of the topic, role play and skills rehearsal, planning for the next week and summing up. The programme uses a broadly cognitive behavioural model but is unique in being solution focused, drawing on parents' strengths and expertise and being highly collaborative in its approach. In the study described in this paper the programme facilitators were all experienced child mental health professionals who had participated in a one-day training workshop for facilitators. The aim of this study was to evaluate the impact of the Parenting Plus Programme using a waiting list control design.

METHOD

Design

This was a comparative treatment outcome study in which parents were randomly assigned to treatment or control groups and assessed before (Time 1) and after (Time 2) the treatment group's participation in the Parenting Plus Programme. In addition, the treatment group were assessed at 22 weeks (5.5 months) follow-up (Time 3).

Participants

Participants were 50 parents whose children, aged 3-12 years, had been referred to outpatient child psychiatry clinics at two major teaching hospitals in central Dublin. The referred children of all participants in treatment and control groups received routine multidisciplinary child mental health services throughout the study. In all cases the primary referral problem was child misconduct which included noncompliance, oppositional behaviours, aggression or destructiveness. Participants were randomly assigned to treatment and control groups. Prior to the fourth treatment session, 10 participants dropped out of the study. Twenty-six parents in the treatment group and 14 in the control

group completed the study. The demographic characteristics of parents in the treatment and control group and dropouts are presented in Table 1. The significance of differences across these three groups was evaluated with a series of one-way ANOVAs and post hoc comparisons for continuous variables and chi square tests for categorical variables.

From Table 1 it is clear that dropouts differed significantly from parents in the treatment and control groups in four main respects: They were younger, were predominantly from lower socio-economic groups, and reported less social support and higher levels of life stress.

Treatment and control groups did not differ significantly on demographic variables or indices of stress and social support. From Table 1 it may be seen that the two groups were demographically similar. The parents were in their mid-thirties. Just over half were mothers. Under a third were single parents and under a quarter were from lower socio-economic groups. With respect to the children identified as being of central concern, they were on average seven and a half years of age and there were more than twice as many boys as girls. Over two thirds of the children of central concern to participating parents had a DSM IV diagnosis. These included attention deficit hyperactivity disorder; oppositional defiant disorder; conduct disorder; anxiety disorder; specific learning disability.

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Insert Table 1 about here

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Instruments
The Parent Goal Scales (PGS), the Strengths and Difficulties Questionnaire (SDQ, Goodman, 1997); the Child Behaviour Checklist (CBCL, Achenbach, 1991); the Parenting Stress Index (PSI, Abidin, 1983); and the Multidimensional Scale of Perceived Social Support (MSPSS, Dahlem, Zimet & Walker, 1991) were the principal instruments used in this study. The PGS was designed for this study and used to evaluate parents' attainment of specific goals. The CBCL and SDQ were used to evaluate parents' perceptions of child behaviour problems before and after the programme. The parent-child dyad subscale of the PSI was used before and after the programme to evaluate parents' perceptions of the quality of their relationships with their children. The stressful life event scale of the PSI was used to measure parents' overall level of life stress prior to the programme and the MSPSS was used to evaluate their pre-programme levels of social support.

Parent Goal Scales (PGS).
Parents were asked to select and define two goals in each of three domains: negative behaviour, positive behaviour and personal parenting goals. With respect to the first domain, participants were asked to select two specific negative behaviours that they wished to help their child decrease, for example fighting or having temper tantrums. With respect to the second domain, participants were asked to select two specific positive behaviours that they wished to help their child increase, for example playing co-operatively with other children or eating meals in a mannerly way. With respect to the third domain, participants were asked to identify two personal goals in the broad area of parenting

which they wished to attain. These personal parenting goals included such things as developing a better parent-child relationship, increasing understanding of how to manage problematic behaviour, developing skills for managing non-compliance, or learning how to improve children's confidence. Participants were helped in an interview situation during the pre-treatment assessment to select specific goals in all three domains of particular relevance to their own situation and to define these in unambiguous and concrete terms. For each goal, they were then invited to indicate on a 10 point Likert scale, the frequency with which the target behaviour defined by the goal was achieved in the preceding month. Response categories ranged from 1=never to 10=always. In scoring PGS, a mean score was calculated for each of the three domains: less negative behaviour; more positive behaviour; and personal parenting goals. Each of these two item subscales had acceptable levels of internal consistency reliability with Cronbach alpha's above 0.7. However, the 6 goals collectively did not constitute a scale with an acceptable level of internal consistency reliability (alpha = .53). Because of this only the 3 PGS subscale sores were included in statistical analyses described in the results section.

The Strengths and Difficulties Questionnaire (SDQ).
This 25 item scale, for completion by parents to describe their children's positive and negative behaviours, yields scores on 5 five-item subscales: hyperactivity, emotional symptoms, conduct problems, peer problems, and prosocial behaviour (Goodman, 1997). In addition scores from the four problem subscales may be combined to yield a total problem scale score. For each item there are three response categories: 0=not true, 1=somewhat true, and 2=certainly true. Subscales scores range from 0-10 and are obtained by summing scores for each of 5 items. The total problem scale ranges from 0-40 and a cut-off score of 17 is indicative of clinical significant difficulties. The SDQ has high internal consistency and test-retest reliability (Smedje, Broman, Hetta, & von Knorring, In Press) and good discriminative validity (Goodman & Scott, 1999).

The Child Behaviour Checklist (CBCL).
 This 113 item inventory is completed by parents to describe their children's behaviour problems (Achenbach, 1991). The CBCL yields scores on 3 broad band scales and 8 narrowband subscales. The broad band scales are the total problem scale, the externalizing behaviour problem scale and the internalizing behaviour problem scale. The narrowband subscales are: withdrawn, somatic complaints, anxious/depressed, social problems, thought problems, attention problems, delinquent behaviour and aggressive behaviour. Items describe problem behaviours that children in the 4-16 year age bracket may exhibit. A three point response format is used for each item: 0=not a problem, 1 sometimes a problem, 2=often a problem. Scales and subscales differ in the number of items they contain, and for convenience in clinical practice raw scores are converted to T-scores with a mean of 50 and a standard deviation of 10. T-scores above a clinical cut-off of 67 on the broad band scales are indicative of clinically significant problems. The author of the scale argues that in statistical analysis of group data, raw scores may be used (Achenbach, 1991). The CBCL scales and subscales have high internal consistency and test-retest reliability (Achenbach, 1991) and good discriminative validity (Kasius, Ferdinand, van den Berg & Verhulst, 1997)

Parenting Stress Index (PSI).

This self-report inventory for completion by parents gives information on parent and child characteristics, the quality of the parent child relationship, and stress in the parents' social environment (Abidin, 1983). It yields scores on the following 4 subscales: parental distress, difficult child, parent-child dysfunctional interaction and total stress. It also includes a validity subscale: defensive responding. The short form of the PSI, contains 36 items. For all items a 5 point Likert type response format is used with categories ranging from 1=strongly agree to 5=strongly disagree. Subscales of the PSI have high internal consistency reliability and a range of studies have supported its content, concurrent, and construct validity (Abidin, 1983). The long form of the PSI contains 120 items. Items 102-120 inquire about a list of common stressful life events and participants indicate whether or not each of these events have occurred in their lives by answering 1=yes or 0=no. In the present study this stressful-life event scale was used to evaluate the amount of life stress to which participants had been exposed in the period before the study.

Multidimensional Scale of Perceived Social Support (MSPSS).

This 12 item scale yields an overall score and scores on three subscales that assess social support from family , friends, and significant others. Responses to items are given on 7 point Likert scales with high scores reflecting greater support. Alpha internal consistency reliability coefficients for the overall scale and three subscales above .8 have been obtained in both the present study and in other studies along with evidence for criterion validity (Cecil, Stanley, & Swann, 1995; Dahlem, Zimet & Walker, 1991).

Procedure

All participants signed consent forms when recruited into the study. Their stress and social support levels at entry to the study were evaluated with the stressful life events PSI subscale and the MPSS. At Times 1 and 2 all participants completed the PGS, the SDQ, the CBCL and the PSI parent-child dyad subscale and this same protocol was completed by the treatment group at Time 3. The majority of Time 1 and Time 2 assessments were conducted in the treatment centers. Time 3 data were collected for the treatment group during the last half-hour of the final session and by mail the same week for waiting-list subjects. Follow-up data were not collected from the control group because they had been taken off the waiting list and had competed the Parenting Plus Programme during the follow-up period.

RESULTS

Complete data on all cases were obtained at Time 1. At Time 2 one case was lost from the treatment group and one from the control group. At Time 3, we were unable to trace 6 cases in the treatment group. These 6 cases did not differ from the remaining 20 on demographic or clinical variables.

In presenting the results, changes in group mean scores will first be addressed. Analyses of frequencies of cases showing clinically significant change will then be outlined. Finally, profiles of improvers and non-improvers will be compared.

Analysis of changes in group means

For the 3 PGS subscales, the 5 SDQ scales, the 11 CBCL scales and the 4 PSI scales a series of analyses was conducted to examine statistically significant changes in group means. To examine statistically significant change from Time 1 to Time 2 for both groups, each dependent variable was analyzed using a 2X2, one-between one-within mixed model ANOVA. To examine statistically significant change from Time 1, to Time 2, to Time 3 within the treatment group, each dependent variable was analyzed using a one-way repeated measures ANOVA.

It was expected that in all mixed model ANOVAs a statistically significant Group X Time interaction would occur and that comparison of pairs of means would show a significant reduction in symptoms from Time 1 to Time 2 for the treatment group only. It was also expected that in all one-way repeated measures ANOVAs a significant Time effect would occur and that comparison of pairs of means would show a significant reduction in symptoms from Time 1 to Time 2 but not significant change from Time 2 to Time 3. In presenting the results, the main focus in the text will be on these sets of effects although all effects are presented in the Tables 2-5.

Because control group means differed from those of the treatment group for a number of variables at Time 1, a set of alternative analyses were conducted in which the significance of differences between the two groups at Time 2 was tested with ANCOVAs using Time 1 scores as covariates. Results of these ANCOVAs were similar to the results of the ANOVAs and are not reported in this paper.

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Insert Table 2 about here

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Parent Goals Scales.

Means, standard deviations and results of the ANOVAs for the Parent Goals Scales are presented in Table 2. For the mixed model ANOVAs significant Group X Time effects were observed as expected for the goals of increasing children's positive behaviours, and achieving personal parenting goals. In each instance, the treatment group showed a greater increase in goal attainment from Time 1 to Time 2 compared with the control group.

For the repeated measures ANOVAs, a significant Time effect was observed as expected for the goals of increasing children's positive behaviours, and achieving personal parenting goals. This indicates that a sustained significant improvement in reaching goals in both domains from Time 2 to Time 3.

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Insert Table 3 about here

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Strengths and Difficulties Questionnaire.

Means, standard deviations and results of the ANOVAs for the 6 SDQ scales are presented in Table 3. For the mixed model ANOVAs near-significant (p<.09) Group X Time effects were observed as expected for the total problems, conduct problems and hyperactivity subscales of the SDQ. In each instance, the treatment group showed a greater decrease in behaviour problems from Time 1 to Time 2 compared with the control group.

For the repeated measures ANOVAs, a significant (p<.05) Time effect was observed as expected for the total problems scale of the SDQ but not the conduct problems or hyperactivity subscales. This indicates that a sustained significant reduction in behaviour problems occurred on the total problems scale of the SDQ only.

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Insert Table 4 about here

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Child Behaviour Checklist.

Means, standard deviations and results of the ANOVAs for the 11 CBCL scales are presented in Table 4. For the mixed model ANOVAs a near significant (p<.09) Group X Time effect was observed as expected for the CBCL externalizing scale only. The treatment group showed a greater decrease in behaviour problems from Time 1 to Time 2 compared with the control group on this scale.

For the repeated measures ANOVAs, a near significant (p<.09) Time effect was observed as expected for the CBCL externalizing scale. This indicates that a sustained reduction in behaviour problems occurred on the CBCL externalizing scale.

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Insert Table 5 about here

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Parent Child Dyad subscale of the Parenting Stress Index.

Means, standard deviations and results of the ANOVAs for the PSI subscales are presented in Table 5. For the mixed model ANOVAs a near significant (p<.09) Group X Time effect was observed as expected on the PSI Parent-Child Dyad subscale. The treatment group showed a greater decrease in parent-child relationship problems from Time 1 to Time 2 compared with the control group on this scale.

For the repeated measures ANOVAs, no significant Time effect was observed as expected for the PSI Parent-Child Dyad subscale. This indicates that whatever improvement in the parent-child relationship occurred on the scale from Time 1 to Time 2 was lost at Time 3.

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Insert Figure 1 about here

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Conclusion concerning changes in group means.

Graphs of mean scores for children on the PGS, total problem scale of the SDQ, the externalizing scale of the CBCL and the Parent Child Dyad subscale of the PSI are presented in Figure 1. These graphs illustrate the principal conclusion that may be drawn from the statistical analyses reported in this section. That is, compared with waiting list control, parents in the treatment group reported significant goal attainment and near significant (p<.09) improvements in their children's behaviour problems and the perceived quality of parent-child interaction from the pre-treatment to the post-treatment assessment and most of these gains were maintained at 5.5 months follow-up.

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Insert Table 6 about here

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Analysis of clinically significant change

To examine differences in the distribution of improvers and non-improvers across treatment and control groups, analyses were conducted based on both the SDQ and the CBCL. In one set of analyses, cases were classified as improvers or non-improvers with reference to clinical cut-off scores on the total problem scale of the SDQ and in the other the clinical cut-off score on the CBCL externalizing scale was employed. For the SDQ total problem scale a cut-off score of 17 was used. For the CBCL externalizing scale raw scores of 26 for boys and 23 for girls were used since these correspond to T scores of 67, which is a conservative cut-off point (Achenbach, 1991). Cases classified as improved, were those whose scores changed from above to below the clinical cut-off score used for that analysis from Time 1 to Time 2. The remaining cases were classified as non-improvers. Fisher's Exact Probability test was used to evaluate the statistical significance of inter-group differences in the distribution of improvers and non-improvers across treatment and control groups. Results are given in Table 6.

When cases were classified using the SDQ, 31% of cases in the treatment group were improved after treatment compared with 14% from the control group. When cases were classified using the CBCL, 23% of cases in the treatment group were improved after treatment compared with 7% from the control group. For analyses based on both the SDQ and the CBCL, these differences in distributions of improvers and non-improvers across treatment and control groups were not statistically significant.

At Time 3, 15% of cases were classified as improvers on both the SDQ and the CBCL compared with improvement rates of 31% and 23% at Time 2 on these scales respectively. These reductions in improvement rates from Time 2 to Time 3 were not statistically significant.

From Table 6 it may be seen that a similar pattern of improvement rates occurred when only those cases who scored above the clinical cut-off points of the SDQ total problem scale and the CBCL externalizing scale at Time 1 were considered. The improvement rates at Time 2, for cases that scored above the SDQ clinical cutoff at Time 1 were 36% for the treatment group and 20% for the

control group. The improvement rates at Time 2, for cases that scored above the CBCL clinical cut-off at Time 1were 31% for the treatment group and 16% for the control group. For analyses based on both the SDQ and the CBCL cut-off scores, the difference in improvement rates across treatment and control groups were not statistically significant.

In the treatment group, at Time 3 the improvement rate based on the SDQ was 18% compared with 36% at Time 2. On the CBCL, in the treatment group, at Time 3 the improvement rate was 25% compared with 31% at Time 2. These reductions in improvement rates were not statistically significant.

Conclusions concerning clinically significant change.
From Time 1 to Time 2, the improvement rate in the treatment group was approximately double that of the control group. However, these differences in improvement rates were not statistically significant. At Time 3, when cases were classified using the SDQ, about half of the cases that were improved following treatment had relapsed. In contrast when cases were classified using the CBCL, the relapse rate was less marked. Reductions in improvement rates from Time 2 to Time 3 were not statistically significant.

Profiling improvers and non-improvers
To find out if cases that improved from T1 to T3 differed from those that did not, the significance of differences between these two groups of cases on all variables assessed at T1 were evaluated using t-tests for independent samples. When improvement was defined as moving from the clinical to the non-clinical range on the Externalizing scale of the CBCL, improvers differed from non-improvers in being significantly younger (t=4.72, p<.01); having fewer CBCL somatic problems (t=2.52, p<.05); fewer CBCL attention difficulties (t=2.4, p<.05); fewer SDQ hyperactivity problems (t=6.26, p<.01); and more PSI child difficulties (t=3.5, p<.01) at intake. When improvement was defined as moving from the clinical to the non-clinical range on the total problem scale of the SDQ, improvers differed from non-improvers in being significantly more anxious and depressed on the CBCL (r=2.29, p<.05); having more PSI parenting distress (t=2.18, p<.05); and less MSPSS familial social support (t=2.09, p<.05).

Conclusions concerning improvers and non-improvers.
Compared with non-improvers, in cases that showed clinically significant improvement the children had less severe behavioural and psychosomatic difficulties and more severe emotional problems at intake. The parents in these cases were more distressed and had less familial social support at intake compared with non-improvers.

DISCUSSION

The following conclusions may be drawn from this study. First, compared with waiting list controls, following treatment participants in Parenting Plus Programme reported greater gains in the attainment of personal parenting goals. Second, there were trends for participants in the Parenting Plus Programme to report fewer child behaviour problems on the externalizing scale of the CBCL and the

total problems, conduct problems and hyperactivity scales of the SDQ. Third, parents who participated in the programme reported significant improvements in parent-child interaction on the parent-child dyad subscale of the PSI. Fourth, gains on the parent goals scales, the total problem scale of the SDQ and the externalizing scale of the CBCL were maintained at 5.5 months follow-up. Fifth, with respect to clinical significance, compared with controls, twice as many parents who participated in the Parenting Plus Programme reported that their children had moved from the clinical to the non-clinical range on the total problem scale of the SDQ and the externalizing scale of the CBCL by the end of the programme. Sixth, improvement rates at 5.5 months follow-up were lower than those immediately following treatment, but this drop in improvement rate was not statistically significant. Seventh, compared with non-improvers, improvers had less severe behavioural and psychosomatic difficulties and more severe emotional problems at intake and their parents were more distressed and had less familial social support.

Two specific difficulties with the study deserve mention. First, dropouts differed from those who engaged in the study in four key respects. They were younger parents from lower SES groups with higher levels of life stress and less social support. Thus, our results may not be generalizable to this less well psychologically and economically resourced group. Second, the number of participants in our study was relatively small and this compromised the power of statistical tests. Had a larger number of participants been included, near significant trends (p<.09) would probably have become statistically significant (p<.05) findings.

With these shortcomings in mind, a number of features of the study suggest that considerable confidence may be place in the results obtained. First, cases were representative of typical referrals to the tertiary referral centers involved in the study. These were 'difficult cases' that had not responded to routine primary or secondary care. Second, cases were randomly assigned to treatment and control groups. Third, well validated, reliable instruments were included in the assessment protocol. Fourth, the programme was delivered by trained therapists using detailed programme manuals and videos to insure a high level of programme integrity. A fifth reason for having confidence in the results is the duration of the follow-up period. The final round of data collection occurred 5.5 months following the baseline assessment period. Thus the pattern of changes probably reflected enduring changes rather than short term fluctuations. Finally, it is important to highlight that our study examined the impact of the programme on families whose children were receiving routine child mental health services in addition to the parenting training programme. This factor contributes to the clinical validity of the results, insofar as it indicates the incremental benefit of participating in parent training for cases already involved in routine treatment.

The results of the study reported in this paper are consistent with the results of other similar studies conducted outside Ireland (Behan & Carr, 2000; Kazdin, 1998, Serketich and Dumas, 1996). Clearly, group based, video-modelling assisted behavioural parent training with 'difficult cases' is as effective within an Irish context as elsewhere.

Future research in this area should examine ways of engaging less well-resourced parents into the parenting Plus Programme and evaluating its effectiveness with this group. The evaluation of the effectiveness of the programme with 'routine cases' in primary care settings should also be a research priority.

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Table 1. Pretreatment demographic characteristics, diagnoses, stress and social support

Variable			Treatment Group (N=26)	Control Group (N=14)	Drop Outs (N=10)	F or χ
Parent's Age		M	37.69a	38.86a	31.30b	4.71**
		SD	05.76	07.15	06.78	
Child's Age		M	7.58	7.64	5.70	2.20
		SD	2.77	2.34	2.21	
Parent's Gender	**Male**	f	11	6	5	.184
		%	42%	43%	50%	
	Female	f	15	8	5	
		%	58%	57%	50%	
Child's Gender	**Male**	f	18	12	9	2.49
		%	69%	85%	90%	
	Female	f	8	2	1	
		%	31%	15%	10%	
Marital Status	**Married**	f	21	10	8	.048
		%	80%	71%	80%	
	Single	f	5	4	2	
		%	20%	29%	20%	
Socio-economic group	**1**	f	4	4	1	
		%	15%	29%	10%	
	2	f	6	6	2	
		%	23%	43%	20%	
	3	f	10	2	0	
		%	39%	14%	0%	
	4	f	6	1	1	
		%	23%	7%	10%	
	5	f	0	0	6	
		%	0%	0%	60%	
	6	f	0	1	0	
		%	0%	7%	0%	
	Total in SEG 4-6	f	6a	2a	7b	9.81**
		%	23%	14%	70%	
Diagnosis	**ADHD**		2	0	0	
	ODD		4	1	0	
	CD		2	2	0	
	ADHD/ODD		3	2	1	
	ADHD/CD		0	0	1	
	ODD/LD		3	2	1	
	ADHD/LD		0	0	1	
	ODD/ANX		2	3	0	
	LD/ANX		1	0	0	
	ODD/ADHD/LD		0	0	1	
	Total with Diagnosis	f	17	11	5	5.01
		%	65%	71%	50%	
Social Support (MSPSS)		M	66.69a	60.15	56.80b	3.27*
		SD	12.15	11.67	8.23	
Life-Stress (PSI)		M	1.42a	1.67a	3.10b	4.029*
		SD	1.47	1.23	2.23	

Note: ADHD=Attention deficit hyperactivity disorder. ODD=Oppositonal defiant disorder. CD= conduct disorder. LD=Specific learning difficulty. Anx= Anxiety Disorder. MSPSS=Multidimensional scale of perceived social support. PSI=Parenting stress index. * $p<.05$, ** $p<.01$. M=Mean. SD= standard deviation. f=frequency. a,b=means with different subscripts differ at $p<.05$. . Cases were assigned to socio-economic groups on the basis of occupation with O'Hare, Whelan & Cummins (1991) scale.

Table 2. Parent's Goals Scales

Variable		Treatment Group			Control Group		Group† Effect	Time† Effect	Group by Time† Interaction	Time Effect†† for Treatment Group
		Time 1	Time 2	Time 3	Time 1	Time 2	F	F	F	F
Less NB	M	7.50	6.15	6.29	7.65	6.35	0.07	9.44**	0.00	3.10+
	SD	2.30	2.30	1.70	1.94	2.73				
More PB	M	3.80	5.85	6.13	5.15	5.62	0.90	13.87***	5.54*	8.78***
	SD	1.99	1.78	2.17	1.92	2.21				
Parent Goals	M	3.49	6.33	6.10	4.59	4.64	0.33	19.43***	18.25***	21.08***
	SD	1.48	1.60	2.00	1.51	1.57				

Notes: M=Mean, SD=Standard Deviation.
Less NB = Goals set by parents for decreasing children's negative behaviour.
More PB = Goals set by parents for promoting children's positive behaviour.
Parent Goals = Individual goals set by parents prior to group participation.
† Results of a 2x2 One-Between One-Within variable Groups by Time ANOVA
†† Results of a Repeated Measures ANOVA for Time 1, Time 2 and Time 3 on Treatment Group
* p<.05, ** p<.01, *** p<.001, +p<.10

Table 3. Strengths and Difficulties Questionnaire

Variable		Group					ANOVA Effects			
		Treatment Group			Control Group		Group☐ Effect	Time☐ Effect	Group by Time☐ Interaction	Time Effect☐☐ for Treatment Group
		Time 1	Time 2	Time 3	Time 1	Time 2	F	F	F	F
Total	M	22.60	18.32	19.24	19.86	18.50	0.51	11.93***	3.20+	3.49*
	SD	4.98	6.52	6.43	6.61	5.46				
Emotion	M	4.76	3.08	3.67	3.86	3.00	0.45	13.26***	1.40	2.80+
	SD	2.54	2.63	2.44	2.44	1.71				
Peer Problems	M	4.64	4.36	4.00	4.50	3.93	0.10	1.51	0.18	0.31
	SD	3.04	2.66	2.41	3.46	2.67				
Conduct Problems	M	5.44	4.16	4.71	4.50	4.57	0.15	3.03+	3.79+	2.16
	SD	2.62	1.72	2.10	1.95	2.77				
Hyper-Activity	M	7.76	6.72	6.86	7.00	7.00	0.09	3.30+	3.30+	1.13
	SD	2.70	2.64	2.54	2.29	2.11				
Prosocial	M	6.24	6.56	6.52	4.71	5.29	4.68*	1.72	0.14	0.19
	SD	1.98	1.71	2.32	2.58	2.81				

Notes: M=Mean, SD=Standard Deviation.
☐ Results of a 2x2 One-Between One-Within variable Groups by Time ANOVA
☐☐ Results of a Repeated Measures ANOVA for Time 1, Time 2 and Time 3 on Treatment Group
* p<.05, + p<..10, +p<.10

Table 4. Child Behaviour Checklist

Variable		Group					ANOVA Effects			
		Treatment Group			Control Group		Group Effect	Time Effect	Group by Time Interaction	Time Effect for Treatment Group
		Time 1	Time 2	Time 3	Time 1	Time 2	F	F	F	F
Total	M	61.61	48.76	47.33	54.25	49.31	0.50	18.34***	0.22	2.95+
	SD	24.48	24.53	17.94	30.29	26.90				
Internalizing	M	13.62	9.54	10.57	13.25	9.08	0.02	13.52***	0.00	1.80
	SD	8.38	7.97	7.55	9.89	6.73				
Externalizing	M	23.31	18.19	17.71	19.07	17.50	0.57	12.61***	3.54+	2.65+
	SD	10.86	9.39	7.50	9.75	10.90				
Withdrawn	M	4.42	3.27	3.00	3.00	3.57	0.21	8.64**	0.10	1.84
	SD	2.86	2.79	2.57	4.80	3.34				
Somatic Complaints	M	2.31	1.81	2.29	2.28	1.00	0.43	3.06+	0.42	0.25
	SD	2.41	3.11	2.94	2.47	1.71				
Anxious Depressed	M	7.54	4.73	5.57	7.29	5.50	0.03	13.40***	0.66	2.18
	SD	6.39	3.84	4.03	5.14	3.88				
Social Problems	M	6.19	4.77	4.25	4.93	4.29	0.82	10.28**	1.47	2.66+
	SD	3.05	3.12	2.81	2.79	3.31				
Thought Problems	M	2.19	1.73	1.57	3.07	2.50	1.53	3.30+	0.04	0.62
	SD	2.08	2.18	1.69	2.43	2.14				
Attention Problems	M	9.96	8.15	7.43	9.43	7.07	0.30	15.98***	0.28	1.67
	SD	4.90	5.33	4.52	4.24	3.99				
Delinquent Behaviour	M	4.42	3.85	3.33	3.29	3.71	0.32	0.05	2.24	0.59
	SD	4.17	3.41	2.24	2.13	3.50				
Aggressive Behaviour	M	18.85	14.35	14.38	15.79	13.79	0.58	19.11***	2.83	3.61*
	SD	7.66	6.62	5.90	8.10	8.19				

Notes: M=Mean, SD=Standard Deviation.
☐ Results of a 2x2 One-Between One-Within variable Groups by Time ANOVA
☐☐ Results of a Repeated Measures ANOVA for Time 1, Time 2 and Time 3 on Treatment Group
* +p<.07, p<.05, ** p<.01, *** p<.001, +p<.10

Table 5. Parenting Stress Index

Variable		Treatment Group			Control Group		Group Effect	Time Effect	Group by Time Interaction	Time Effect for Treatment Group
		Time 1	Time 2	Time 3	Time 1	Time 2	F	F	F	F
Parent Child	M	31.96	28.46	30.10	32.21	31.00	0.30	15.34***	3.61+	1.11
	SD	8.43	7.88	9.13	8.07	7.51				
Parent Distress	M	33.46	30.65	31.10	34.29	33.00	0.34	2.64	0.37	0.67
	SD	10.52	9.29	7.49	5.86	8.25				
Difficult Child	M	41.12	37.77	39.95	44.77	40.23	1.12	14.67***	0.34	1.14
	SD	7.41	9.53	6.93	9.49	8.89				
Total Score	M	106.54	96.88	101.14	111.31	105.38	0.91	14.05***	0.38	1.31
	SD	21.07	23.47	19.56	19.21	19.39				

Notes: M=Mean, SD=Standard Deviation.
▯ Results of a 2x2 One-Between One-Within variable Groups by Time ANOVA
▯▯ Results of a Repeated Measures ANOVA for Time 1, Time 2 and Time 3 on Treatment Group

* $p<.05$, ** $p<.01$, *** $p<.001$, +$p<.10$

Table 6. Clinically significant change

Improvement index	Treatment group (N=26)	Control Group (N=14)	P
Improved on SDQ total from T1 to T2 for all cases	31% (8/26)	14% (2/14)	.34
Improved on SDQ total from T1 to T2 for cases above cut-off at T1	36% (8/22)	20% (2/10)	.22
Improved on CBCL Ext from T1 to T2 for all cases	23% (6/26)	7% (1/14)	.17
Improved on CBCL Ext from T1 to T2 for cases above cut-off at T1	31% (5/16)	16% (1/6)	.35
Improved on SDQ total from T1 to T3 for all cases	15% (4/26)	----	
Improved on SDQ total from T1 to T3 for cases above cut-off at T1	18% (4/22)	----	
Improved on CBCL Ext from T1 to T3 for all cases	15% (4/26)	----	
Improved on CBCL Ext from T1 to T3 for cases above cut-off at T1	25% (4/16)	----	

Note: SDQ total=Strenghts and Difficulties Questionnaire Total Problem scale on which the clinical cutoff is 17. CBCL Ext=Child behaviour Checklist Externalizing behaviour problem scale on which the clinical cutoff is a T score of 67. T1=Time 1 before treatment. T2=Time 2 after treatment. T3= Time 3, 3 months follow-up. P values are from Fishers exact probability test.

Figure 1. Changes on PGS, SDQ, CBCL and PSI before and after the Parenting Plus programme

PGS More Positive Behaviour

PGS Parent Goals

SDQ Total Problem Score

CBCL Externalizing Behaviour Problem Scale

PSI Parent-Child Relationship Scale