

Parenting intervention in Sure Start services for children at risk of developing conduct disorder: pragmatic randomised controlled trial

Judy Hutchings,¹ Frances Gardner,² Tracey Bywater,¹ Dave Daley,¹ Chris Whitaker,¹ Karen Jones,¹ Catrin Eames,¹ Rhiannon T Edwards³

EDITORIAL by Scott

¹School of Psychology, University of Wales Bangor, Bangor, Gwynedd, LL57 2DG

²Department of Social Policy and Social Work, University of Oxford

³Centre for the Economics of Health, Institute of Medical and Social Care Research (IMSCaR), University of Wales Bangor

Correspondence to: J Hutchings
j.hutchings@bangor.ac.uk

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ABSTRACT

Objective To evaluate the effectiveness of a parenting programme as a preventive intervention with parents of preschool children considered to be at risk of developing conduct disorder.

Design Pragmatic randomised controlled trial using a block design with allocation by area.

Setting Eleven Sure Start areas in north and mid-Wales.

Participants 153 parents from socially disadvantaged areas, with children aged 36-59 months at risk of conduct disorder defined by scoring over the clinical cut off on the Eyberg child behaviour inventory. Participants were randomised on a 2:1 basis, 104 to intervention and 49 to remaining on the wait listing (control). Twenty (13%) were lost to follow-up six months later, 18 from the intervention group.

Intervention The Webster-Stratton Incredible Years basic parenting programme, a 12 week group based intervention.

Main outcome measures Problem behaviour in children and parenting skills assessed by self reports from parents and by direct observation in the home. Parents' self reported parenting competence, stress, and depression. Standardised and well validated instruments were used throughout.

Results At follow-up, most of the measures of parenting and problem behaviour in children showed significant improvement in the intervention group. The intention to treat analysis for the primary outcome measure, the Eyberg child behaviour inventory, showed a mean difference between groups of 4.4 points (95% confidence interval 2.0 to 6.9, $P<0.001$) on the problem scale with an effect size of 0.63, and a mean difference of 25.1 (14.9 to 35.2, $P<0.001$) on the intensity scale with an effect size of 0.89.

Conclusion This community based study showed the effectiveness of an evidence based parenting intervention delivered with fidelity by regular Sure Start staff. It has influenced policy within Wales and provides lessons for England where, to date, Sure Start programmes have not been effective.

Trial registration ISRCTN46984318.

INTRODUCTION

Antisocial behaviour in young people is a growing problem. In the United Kingdom and the United States about 5-10% of children aged 5-15 present with clinically important conduct disorders.^{1,2} Higher rates occur in single parent families and families with frequent changes of parental figures and parental substance misuse, psychopathology, marital problems, and poor parenting skills. Up to 20% of children in disadvantaged areas have conduct disorders.³

Early onset behavioural problems such as aggression and non-compliance are the best predictors of antisocial and criminal behaviour in adolescence and adulthood.⁴ Untreated, up to 40% of children with early difficulties develop subsequent conduct disorder, including drug misuse and criminal and violent behaviour.⁵

Parenting behaviour contributes to the establishment of conduct disorder and many children learn, develop, or establish problem behaviours because parents lack, or inconsistently use, key parenting skills.⁶ When ineffective parenting is the problem, cognitive behaviourally based parenting programmes can provide an effective solution⁶ but are more effective with younger children. When problems are less well established parents can more easily influence their children's behaviour.⁷ One UK government strategy is the Sure Start early preventive parenting support for families of preschool children living in identified high risk, disadvantaged areas. The initial £20m (€30m, \$39m) non-randomised, area based evaluation of the first three years in England found no significant effect in preventing or reducing conduct disorder.^{8,9}

There is considerable evidence that conduct problems can be prevented and treated with cognitive behavioural parenting interventions.^{10,11} Few trials, however, tested them in real world community settings delivered by existing staff as part of their everyday work. The Webster-Stratton Incredible Years basic parenting programme¹² is one of the few "model" programmes for treatment and prevention of conduct disorder that incorporates all factors identified as improving parent training outcomes^{13,14} and can be used with disadvantaged, high risk families who either do not engage in or drop out of other programmes.¹⁵ Since 2001, 11 Sure Start services in north and mid-Wales began using the Incredible Years programme.¹⁶ This provided an opportunity for a pragmatic, service setting based trial of the programme as a preventive community intervention with parents of preschool children identified as high risk.

METHODS

Study population

The trial took place in 11 Sure Start areas in north and mid-Wales. Health visitors administered the Eyberg child behaviour inventory to socially disadvantaged families, with a child aged 3 or 4 years. Families were eligible if the child lived with the primary carer, scored above the clinical cut off on either the Eyberg problem or intensity scale (11 or 127), and the primary carer

was able to attend group times. In total 153 families were eligible and consented to take part; 104 were allocated to the intervention group and 49 to the control group. At follow-up 86 in the intervention group and 47 in the control group remained in the study (figure on bmj.com).

Intervention programme

A maximum of 12 parents attended each weekly session, which lasted for 2 to 2.5 hours, over a period of 12 weeks. Two trained leaders introduced a structured sequence of topics using a collaborative approach.

Measures and procedures

Measures included questionnaires completed by parents and independent blind observation of parent-child interactions collected by the research during two home visits, on entry to the trial and six months later. Parents in the intervention group attended sessions in the interim. The control families on the waiting list were offered the programme after follow-up.

Child problem behaviour reported by parents—The primary outcome measure was the Eyberg child behaviour inventory, which we used to assess the number and intensity of conduct problems. This was also administered to the sibling closest in age to the index child. Secondary outcome measures were the strengths and difficulties questionnaire to assess conduct and hyperactivity problems, the Conners abbreviated parent/teacher rating scale as a hyperactivity measure, and the Kendall self control rating scale.

Parenting competencies, mood, and demographics reported by parents—We used the parenting stress index (short form) to assess stress levels, the parenting scale to measure parental competencies, the Beck depression inventory, and the personal data and health questionnaire to assess demographics and risk factors (see table 1).

Observational measure—We used the Dyadic parent-child interaction coding system in a 30 minute home observation within three days of the administration of the questionnaires and have reported the summary variables of positive and critical parenting and deviant child behaviours. Inter-rater reliability was maintained through weekly training and reliability visits (20% of total visits). Observers were blind to allocation.

Randomisation

After we allowed for expected drop out of about 18%, based on similar studies,^{10,15} we calculated that we would need 126 families to achieve an effect size of 0.8 for the primary outcome measure at the 5% significance level with a ratio of 2:1 intervention to control. After the start of the study it was clear that more areas were needed to achieve the required number of families as some areas failed to recruit 12 intervention and six control families. Ultimately we evaluated 12 groups in 11 areas with an initial total of 153 families.

We used a pragmatic randomised controlled trial design. Participants were block randomised by area. The unit of randomisation was the parent-index child

pair. TB blindly and randomly allocated participants on a 2:1 basis, after stratification by sex and age, using a random number generator. This design allows evaluation of a larger intervention sample than a 1:1 ratio with only a small loss of statistical power and is a design favoured in this type of research.^{10,15}

Masking and analysis

Allocation took place after baseline assessment. Researchers blind to allocation carried out the interviews and observations. All families were included in the analysis irrespective of uptake of intervention. We carried out a strict intention to treat analysis and

Outline of the intervention

The programme promotes positive parenting through:

- Increasing positive child behaviour through praise and incentives

- Improving parent-child interaction: relationship building

- Setting clear expectations: limit setting and non-aversive management strategies for non-compliance

- Applying consistent gentle consequences for problem behaviour

The programme uses a collaborative approach with methods such as:

- Role play: acting out certain situations as parent or child

- Helping parents to identify social learning principles

- Modelling: learning positive behaviours by example

- Discussion: with reference to parents' experiences and difficulties while acknowledging their feelings

- Skills practise: practising new approaches during the session and through homework

- Analysis of video material: viewing tapes of family behaviour for discussion

The programme addresses barriers to attendance by:

- Offering transport

- Providing lunch

- Providing a crèche

The programme addresses fidelity of implementation by:

- Providing all course materials, CDs, handouts, books, raffle prizes, etc

- Ensuring leaders attended the accredited three day basic leader training and had previously run a group

- Completion of peer and self evaluation

- questionnaires by group leaders to evaluate treatment exposure, adherence, and treatment delivery

- Satisfaction questionnaires completed by parents

- Completion of session specific checklists to monitor treatment integrity, participant responsiveness, treatment delivery, and treatment differentiation

- Supervision to evaluate progress and delivery method—for example, reviewing videotapes during the three hour weekly supervision session with an incredible years trainer

- Certification—evaluation of treatment fidelity based on observation of random videotapes by an independent incredible years trainer

assumed no change from baseline assessment for those lost to follow-up.

RESULTS

Baseline characteristics

Most families were socially and economically disadvantaged compared with the mean values for the UK (tables on bmj.com).

Programme attendance

Of the 104 parents allocated to the intervention condition, 86 completed assessments after the intervention, and, of these, 71 (83%) attended seven or more (58%) of the 12 sessions. The overall mean attendance was 9.2 sessions (SD 3.2).

Main findings

Children in the intervention group had significantly reduced antisocial and hyperactive behaviour and increased self control compared with the control group children (table 1). The intention to treat analysis for the primary child outcome measure, the Eyberg child behaviour inventory, showed a mean difference of 4.4 points on the problem scale between groups at follow-up (95% confidence interval 2.0 to 6.9, $P<0.001$, effect size 0.63) and a mean difference of 25.1 on the intensity scale (14.9 to 35.2, $P<0.001$, effect size 0.89). This measure was also completed for sibling closest in age to the index child (range 2-15 years, intervention $n=60$, control $n=29$). Compared with parents in the control group, intervention group parents perceived intensity of problems in siblings as less severe at follow-up. For most of the remaining secondary outcome questionnaire measures the intervention families were above the level of clinical concern at baseline but below the level of clinical concern at follow-up. Observational results corroborated the questionnaire findings. There was a mean difference of 9.6 (3.7 to 15.5, $P<0.002$) between groups at follow-up for positive

parenting behaviours with an effect size of 0.57 (table 2). Levels of parental criticism were reduced at follow-up for the intervention parents, although the difference between the groups was not significant in the intention to treat analyses. The intervention condition showed twice the reduction in observed child deviance than the control condition, although this was not significant. Kappa coefficients for the observational measure showed high reliability between raters ($\kappa=0.91$ averaged over the two time points) for the reliability visits (20% of total visits).

DISCUSSION

In this randomised controlled trial we have shown that the Incredible Years basic parenting programme can reduce key risk factors for the development of conduct disorder. Although the mean measures and demographic scores were similar at baseline for the two groups, medium to large effect sizes and significant differences at follow-up indicated that the programme had a positive effect on parent and child behaviour in the intervention group. These findings suggest that child behaviour may be mediated through parent behaviour and the learning of key parenting skills.

Strengths and weaknesses of the study

Our study is original in testing effectiveness of an evidence based intervention, delivered with fidelity across multiple community sites, with regular staff from multiple agencies.

We applied strict measures to reduce any possible bias and to ensure that parents were unaware of the group allocation until after the first assessment. Interviewers and observers were kept blind to allocation, and 20% of all observation visits were assessed for inter-rater reliability. Compared with the control group we found increased positive parenting and reduced problem behaviour in the children in the intervention group at follow-up, not only through

Table 1 Summary of measures in children at baseline and follow-up

Measure (cut off)	Mean (SD) raw scores				Estimated mean difference* (95% CI), P value	Effect size* (95% CI)
	Control (n=49)		Intervention (n=104)			
	Before	After	Before	After		
ECBI-I (127)	141.3 (26.8)	144.0 (33.0)	146.8 (27.0)	122.3 (35.1)	25.05 (14.92 to 35.18), <0.001	0.89 (0.54 to 1.24)
ECBI-P (11)	15.3 (8.0)	14.3 (8.6)	16.4 (6.6)	10.6 (7.9)	4.42 (2.0 to 6.85), <0.001	0.63 (0.28 to 0.98)
Conners (15)	17.1 (6.7)	16.0 (6.9)	16.5 (7.0)	12.3 (7.5)	3.39 (1.47 to 5.31), <0.001	0.61 (0.27 to 0.96)
Kendall SCRS (160)	130.2 (27.4)	124.8 (24.4)	124.9 (31.5)	114.0 (29.9)	8.16 (0.68 to 15.61), 0.033	0.38 (0.03 to 0.73)
SDQ conduct problems (4)	5.6 (1.9)	4.7 (2.1)	5.6 (2.4)	4.1 (2.3)	0.65 (-0.03 to 1.32), 0.059	0.33 (-0.02 to 0.68)
SDQ total deviance (17)	18.4 (5.4)	16.4 (6.6)	17.2 (6.0)	14.1 (6.4)	1.52 (-0.24 to 3.28), 0.091	0.3 (-0.05 to 0.65)
SDQ hyperactive (7)	6.9 (2.2)	6.7 (2.5)	6.2 (2.5)	5.2 (2.8)	0.88 (0.13 to 1.64), 0.022	0.41 (0.06 to 0.76)
Sibling ECBI-I †(127)	120.0 (36.3)	124.8 (38.5)	129.4 (37.6)	113.7 (39.8)	18.98 (6.06 to 31.89), 0.005	0.69 (0.22 to 1.15)
Sibling ECBI-P †(11)	10.8 (7.6)	10.7 (9.2)	12.0 (8.2)	8.9 (9.1)	2.87 (-0.57 to 6.31), 0.1	0.39 (-0.08 to 0.85)
Child deviance – observation ‡	23.1 (31.0)	19.0 (21.7)	25.8 (34.4)	15.6 (23.6)	3.16 (-1.87 to 8.41), 0.226	0.21 (-0.13 to 0.55)

ECBI-I=Eyberg child behaviour inventory-intensity, ECBI-P=Eyberg child behaviour inventory-problem scale, SDQ=strengths and difficulties questionnaire, Conners=parent rating scale for hyperactivity, SCRS=Kendall self control rating scale.

*Difference in mean follow-up scores between intervention and waiting list control conditions measured by analysis of covariance, adjusted for baseline score and area.

†Intervention intention to treat analysis in siblings: 60 intervention, 29 control (53 and 27, respectively, in per protocol analysis).

‡No cut off, frequency count in 30 mins. Analysis performed on square root transformed values to ensure assumptions of normality and equal variability of residuals held. Differences and CIs calculated by back transformation.

Table 2 | Summary of measure in parents at baseline and follow-up

	Mean (SD) raw scores				Estimated mean difference* (95% CI), P value	Effect size* (95% CI)
	Control (n=49)		Intervention (n=104)			
	Before	After	Before	After		
PSI (cut off 90)	99.7 (22.9)	96.6 (24)	100.7 (23.8)	84.0 (22.6)	12.92 (6.09 to 19.75), <0.001	0.66 (0.31 to 1.0)
BDI (cut off 19)	15.2 (9.7)	13.9 (10.4)	17.1 (10.7)	11.0 (10.1)	4.19 (1.13 to 7.21), 0.008	0.48 (0.13 to 0.83)
Arnold (no cut off)	3.6 (0.7)	3.5 (0.7)	3.5 (0.8)	2.8 (0.8)	0.66 (0.42 to 0.91), <0.001	0.95 (0.6 to 1.31)
Positive parenting-observation†	21.7 (15.2)	21.5 (16.6)	22.6 (18.7)	30.4 (19.1)	9.59 (3.69 to 15.49), 0.002	0.57 (0.22 to 0.91)
Critical parenting-observation†	22.5 (16.7)	15.8 (13.8)	19.1 (14.6)	11.5 (11.3)	3.42 (-0.36 to 7.19), 0.076	0.32 (-0.03 to 0.67)

PSI=parenting stress index, BDI=Beck depression inventory, Arnold=parenting scale (higher score equals poorer parenting).

*Difference in mean follow-up scores between intervention and waiting list control conditions measured by analysis of covariance, adjusted for baseline score and area.

†Frequency count in 30 minutes.

subjective parental report but also by more objective direct observation. This method reduces bias that could occur if we relied solely on questionnaire data. Furthermore, observations were coded “live” to enable a precise account of parent-child interaction as it happened and, because recording was in “real time,” observations were minimally interpretative.¹⁷ Although our study had a short follow-up (six months after baseline), this is typical in this type of research.

Comparison with other studies

Although our study was in a Welsh, predominantly rural sample, with about 30% bilingual participants, the results reflect findings in similar studies in Canada, the US, the UK, and Norway.^{10 15 18 19}

Furthermore, we included problem behaviour outcomes reported by parents for the sibling closest in age to the index child. The positive effects of attending the parent programme also applied to this sibling, thereby suggesting additional benefits to the family and further possible reduced cost to society and services.

Meaning and implications of the study

These results are timely, particularly in the light of the recent appraisal from the National Institute for Health and Clinical Excellence that recommended the use of group parenting programmes for the treatment of conduct disorder in children²⁰ and given the impact of conduct disorder on our communities. This study holds important lessons for the UK government because, unlike the disappointing results from the national evaluation of Sure Start, it shows that choosing an evidence based programme and delivering it with

fidelity can achieve good outcomes in high risk children whose parents generally fail to engage with services. These results have already had impact within Wales, where the Welsh Assembly government have funded training in the programme across Wales as part of its parenting action plan.²¹ In England in the new Pathfinder trial has funded the programme in six authorities as one of three evidence based programmes.²² The government must commission effective services for children at high risk of conduct disorders. They deserve evidence based programmes, as do the public, who pay a high price for services and for the other costs of antisocial behaviour.

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Competing interests: JH is paid by Incredible Years for running occasional training courses in the delivery of the parent programme and has served as an expert witness for the NICE appraisal on parenting and conduct disorder.

Ethical approval: North West Wales research ethics committee (ref No 02/12).

- Office for National Statistics. *The mental health of children and adolescents in Great Britain. Summary report.* London: Office for National Statistics, 1999.
- Offord DR, Boyle MH, Racine Y. Ontario child health study: correlates of disorder. *J Am Acad Child Adolesc Psychiatry* 1989;28:850-60.
- Attride-Stirling J, Davis H, Day C, Sclare I. Someone to talk to who'll listen: addressing the psychosocial needs of children and families. *J Community Appl Soc Psychol* 2000;11:179-91.
- Broidy LM, Nagin DS, Tremblay RE, Bates JE, Brame B, Dodge KA, et al. Developmental trajectories of childhood disruptive behaviours and adolescent delinquency: a six site, cross-national study. *Dev Psychol* 2003;39:222-45.
- Coid J. Formulating strategies for the primary prevention of adult antisocial behaviour: “high risk” or “population” strategies? In: Farrington DP, Coid J, eds. *Early prevention of adult antisocial behaviour.* Cambridge: Cambridge University Press, 2003.
- Hutchings J, Gardner F, Lane E. Making evidence-based interventions work 2004 In: Sutton C, Utting D, Farrington D, eds. *Support from the start: working with young children and their families to reduce the risks of crime and anti-social behaviour.* Norwich: Department for Education and Skills, 2004:69-79 (research report 524).
- Kazdin AE. Treatment of conduct disorder: progress and directions in psychotherapy research. *Dev Psychopathol* 1993;5:277-310.

WHAT IS ALREADY KNOWN ON THIS TOPIC

Children who show early persistent signs of antisocial behaviour are at greater risk of later juvenile delinquency and social exclusion, with high societal costs

WHAT THIS STUDY ADDS

The Incredible Years basic parenting programme effectively increases positive parenting practices and reduces antisocial behaviour in children at risk of developing conduct disorder

The programme works as a preventive intervention in highly disadvantaged community based settings when it is delivered by regular Sure Start staff with high levels of supervision and support to enable the programme to be delivered with fidelity

- 8 Meadows P. *Cost effectiveness of implementing SSLPs: an interim report, research report*. London: Department for Education and Skills, 2006 (NESS/2006/FR/015).
- 9 Belsky J, Melhuish E, Barnes J, Leyland AH, Romaniuk H. Effects of Sure Start local programmes on children and families: early findings from a quasi-experimental, cross sectional study. *BMJ* 2006;332:1476-8.
- 10 Scott S, Spender Q, Doolan M, Jacobs B, Aspland H. Multicentre controlled trial of parenting groups for childhood antisocial behaviour in clinical practice. *BMJ* 2001;323:194-203.
- 11 Barlow J, Stewart-Brown S. Review article: behavior problems and parent-training programmes. *J Dev Behav Pediatr* 2000;21:356-70.
- 12 Webster-Stratton C, Hancock L. Parent training for young children with conduct problems. Content, methods and therapeutic process. In: Schaefer CE, ed. *Handbook of parent training*. New York: Wiley, 1998.
- 13 Mihalic S, Fagan M, Irwin K, Ballard D, Elliot D. *Blueprints for violence prevention replications: factors for implementation success*. University of Colorado, Boulder: Centre for the Study and Prevention of Violence, 2002.
- 14 Taylor TK, Biglan A. Behavioural family interventions for improving child-rearing: a review for clinicians and policy makers. *Clin Child Fam Psychol Rev* 1998;1:41-60.
- 15 Webster-Stratton C. Preventing conduct problems in Head Start children: strengthening parenting competencies. *J Consult Clin Psychol* 1998;66:715-30.
- 16 Hutchings J, Webster-Stratton C. Parenting in the community. In: Houghugh M, Long N, eds. *Handbook of parenting*. London: Sage, 2004.
- 17 Aspland H, Gardner F. Observational measures of parent-child interaction: an introductory review. *Child Adolesc Mental Health* 2003;8:136-43.
- 18 Gardner F, Burton J, Klimes I. Randomised controlled trial of a parenting intervention in the voluntary sector for reducing child conduct problems: outcomes and mechanisms of change. *J Child Psychol Psychiatr* 2006;47:1123-32.
- 19 Morch WT, Clifford G, Larsson B, Rypdal P, Tjeflaat, Lurie J, et al. *The incredible years: the Norwegian Webster-Stratton programme; 1998-2004*. www.incredibleyears.com.
- 20 National Institute of Clinical Excellence. Parent-training/education programmes in the management of children with conduct disorders. www.nice.org.uk/page.aspx?o=346134 27.09.06.
- 21 Department for Training and Education. Parenting Action Plan: supporting mothers, fathers and carers with raising children in Wales. Cardiff: Welsh Assembly Government, 2005 (Information Document No: 054-05). www.learning.wales.gov.uk/pdfs/parenting-action-plan-e.pdf.
- 22 Children's trust pathfinder. www.everychildmatters.gov.uk/strategy/childrenstrustpathfinders.

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Parenting programme for parents of children at risk of developing conduct disorder: cost effectiveness analysis

Rhiannon T Edwards,¹ Alan Céilleachair,¹ Tracey Bywater,² Dyfrig A Hughes,¹ Judy Hutchings²

EDITORIAL by Scott

¹Centre for the Economics and Policy in Health, Institute of Medical and Social Care Research (IMSCaR), University of Wales Bangor, Bangor LL57 1UT

²School of Psychology, University of Wales Bangor

Correspondence to: R T Edwards
r.t.edwards@bangor.ac.uk

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Objective To investigate the cost effectiveness of a parenting programme.

Design An incremental cost effectiveness analysis alongside a pragmatic randomised controlled trial of the effectiveness of a group parenting programme delivered through Sure Start in the community.

Setting Sure Start areas in north and mid Wales.

Participants Parents of 116 children aged 36-59 months (87% of the clinical sample) at risk of developing conduct disorders defined by scoring over the clinical cut off on the Eyberg child behaviour inventory). Children were identified by health visitors and recruited by the research team.

Intervention The Webster-Stratton Incredible Years basic parenting programme or a six month waiting list control.

Main outcome measure Incremental cost per unit of improvement on the intensity score of the Eyberg child behaviour inventory.

Results The bootstrapped incremental cost effectiveness ratio point estimate was £73 (€109, \$142) per one point improvement on the intensity score (95% confidence interval £42 to £140). It would cost £5486 (€8190, \$10 666) to bring the child with the highest intensity score to below the clinical cut-off point and £1344 (€2006, \$2618) to bring the average child in the intervention group within the non-clinical limits on the intensity score (below 127). For a ceiling ratio of £100 (€149, \$194) per point increase in intensity score, there is an 83.9% chance of the intervention being cost effective. The mean cost per child attending the parenting group was £1934 (€2887, \$3760) for eight children and £1289 (€1924, \$2506) for 12 children, including initial costs and

materials for training group leaders. When we categorised the sample into relatively mild, moderate, and severe behaviour groups based on intensity scores at baseline the intervention seemed more cost effective in those with the highest risk of developing conduct disorder.

Conclusion This parenting programme improves child behaviour as measured by the intensity scores of the Eyberg child behaviour inventory at a relatively low cost and was cost effective compared with the waiting list control. This parenting programme involves modest costs and demonstrates strong clinical effect, suggesting it would represent good value for money for public spending.

INTRODUCTION

Conduct disorder is estimated to affect 5-10% of children aged 5-15 years in the United Kingdom and the United States.^{1,2} For those children with early onset in preschool years, conduct disorder often persists into adulthood³ and predicts poor employment prospects, marriage breakdown, and self harming or antisocial criminal behaviour.⁴⁻⁶ The costs of publicly resourced services for those aged 28 with conduct disorder in childhood were estimated to be 10 times higher (£70 019; €104 416, \$137 450) than for those with no behavioural problems (£7423; €11 069, \$14 571).⁷

Parenting is a key determinant in child behaviour. Parents who encourage prosocial behaviour have children with fewer behaviour problems.⁸ Parenting training programmes are effective in helping families with children at risk of developing conduct disorders.⁹ The Incredible Years basic parenting programme is