

Outcomes of an early intervention program for children with disruptive behaviour

Louise Hayes, Rebecca Giallo and Kate Richardson

Objective: Outcomes are presented from a public mental health early intervention program for children aged 5–9 years with disruptive behaviours.

Method: This was a school-based intervention initiative, delivered within a psychiatric child and adolescent mental health service and includes child, parent and teacher components. Participants were 235 children selected via school-based population assessments.

Results: A baseline period was used as a form of control that would demonstrate the stability of problem behaviours. Results showed that during a 26-week baseline period, teachers reported increasing levels of problem behaviour, and that the behaviour was creating increased difficulty in the classroom. The shorter 7-week baseline also showed the difficult behaviours were ongoing. Following the intervention, significant improvements in children's behaviour were seen on the Strengths and Difficulties Questionnaire reported by parents ($\eta^2 = 0.30$) and teachers ($\eta^2 = 0.23$), and on the parent Eyberg Child Behaviour Inventory ($\eta^2 = 0.35$), and teacher Sutter-Eyberg Student Behaviour Inventory ($\eta^2 = 0.22$).

Conclusion: The outcomes show promising results from an early intervention program delivered in schools by a public mental health service and are discussed within the context of dissemination of evidence-based programs through mental health services.

Key words: disruptive behaviour, early intervention, externalizing behaviour, mental health service delivery.

Disruptive behaviours are frequent in the toddler and preschool years and decrease into pre-adolescence.¹ However for some children, disruptive behaviours that began in childhood continue into adolescence and adulthood.² Australian estimates suggest that 12.9% of 4–12-year-old children have externalizing problems in the clinical range.³ Longitudinal research has shown that without intervention, clinical levels of disruptive behaviour can evolve into disrupted schooling, deviant peer relationships, and problems into adulthood with relationships, employment and deviance.^{2,4–7} Furthermore, research has also shown that childhood conduct disorder is an accurate predictor of adult criminality up to 30 years later.^{8–10} It is clear that if this life trajectory can be changed through early intervention it is socially valuable.

EFFECTIVE PROGRAMS FOR DISRUPTIVE BEHAVIOURS

Two major reviews^{11,12} have examined the outcome literature for child psychosocial treatments spanning 40 years from 1966 to 2007. The most

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recent of these reviews¹² identified 16 treatments that could be considered evidence-based treatments (EBTs). The most effective programs intervene early in the life cycle and across multiple domains.¹³⁻¹⁷ Fewer treatments are listed as efficacious in schools, most notable are the Incredible Years Child Training¹⁸ and Problem Solving Skills Training.^{19,20} In Australia school-based programs are a long way behind parent programs such as Triple P.¹⁷

Disseminating and transporting effective programs

Dissemination of evidence-based treatments into community services for children should demand high priority. Economic modelling in the US has shown that early intervention is financially efficient in the long term.²¹ Despite this, there is limited uptake of early intervention EBTs through child and adolescent mental health services.^{22,23} However, treatments can only be regarded as evidence based when they can be transported from university clinics into a standard service²⁴ and when they reliably reach those in need.²⁵ The challenges faced by community mental health services in adopting early intervention models are threefold: (i) transportability of programs, (ii) individuality of mental health services, and (iii) individuality of schools. In this present work, one mental health service was required to work with 30 idiosyncratic schools, while delivering programs with fidelity and flexibility!

The present study reports on the outcomes of the CAMHS and Schools Together Program (CAST), a program funded

by the mental health sector of the Victorian Government. All of the above dissemination challenges were faced during the delivery of the present program and provide the necessary context for the results. Nevertheless, this program has become a model for early intervention and it is important to demonstrate outcomes. It was proposed that parents and teachers would report reductions in disruptive behaviour in children aged 5-9 years and to demonstrate that mental health services can measure their effectiveness as part of routine service.

METHOD

Participants

Participants were 235 primary school students (aged 5-9 years) displaying disruptive behaviour. A three-step gated approach was used to select participants. Figure 1 maps participant selection using an adaptation of the CONSORT recommendations for participant tracking.²⁶ First, identification of disruptive behaviour occurred through a population wide survey (n = 2459) across 30 schools.²⁷ Then children were selected if they scored one standard deviation above the mean on the Strengths and Difficulties Questionnaire (SDQ).²⁸ Teachers were consulted to confirm the presence of disruptive behaviours, and finally an assessment interview was conducted with parents. The final sample consisted of 235 children and their parents. Demographic characteristics are presented in Table 1. The average age of children was 6.98 years (SD = 0.91), and the majority were male (71.9%). There were approximately even numbers of

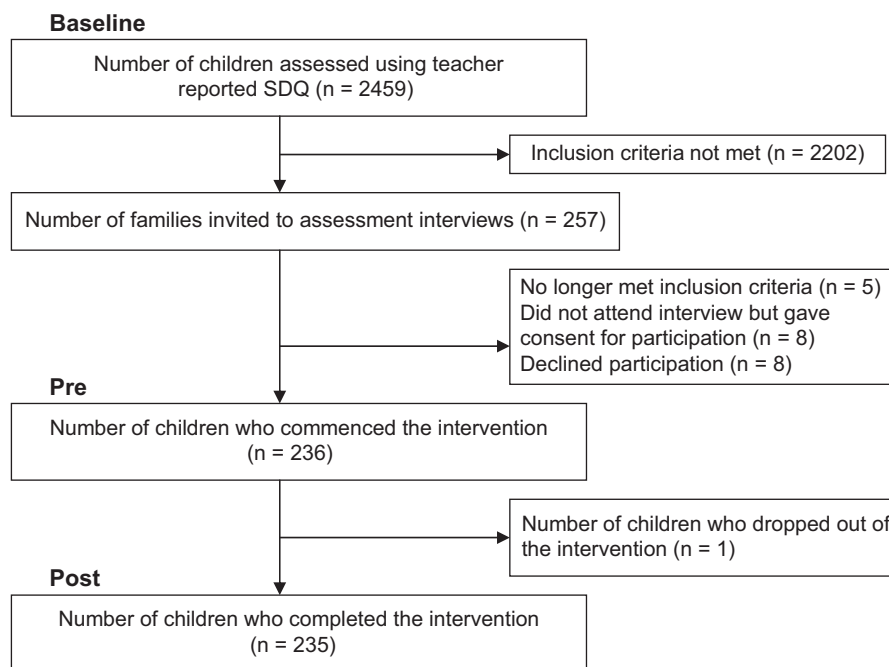


Figure 1: Participant tracking during selection and engagement in intervention.

Table 1: Demographic characteristics of children and respondents

Variable	(n = 235)
Child's age in years (M, SD)	6.98 (0.91)
Child age range	5.1–9.1 years
Child's sex, n (%)	
Male	169 (71.9%)
Female	66 (28.1%)
Grade level, n (%)	
Prep	51 (21.7%)
One	90 (38.3%)
Two	77 (32.8%)
Not reported	17 (7.2%)
Parent respondents, n (%)	
Mother	233 (99.2%)
Father	1 (0.4%)
Both parents	1 (0.4%)

children across the first three school years (in Australia, Grade Prep, 1 and 2). The majority of respondents were mothers.

It is noted that although 235 children completed the intervention, a total of 173 parent- and 167 teacher-reported measures were completed at pre-intervention. This represents a return rate of 73.6% and 71.1% for parents and teachers, respectively. At postintervention, 100 parent- and 163 teacher-reported measures were completed, representing a 57.8% and 97.6% return rate for parents and teachers, respectively. Reasons for the incomplete data include parents and teachers failing to complete and return questionnaires, and clinicians not following up and collecting questionnaires.

Procedure

School participation was voluntary. Teachers from participating schools obtained written consent from parents of all P-2 students to complete an SDQ on each child in their class. There was a time lag between teacher baseline measures and children being accepted into the program of approximately 26 weeks. Parents completed the baseline measures 7 weeks prior to the intervention. Pre-intervention measures were completed by parents and teachers in the week prior to the intervention. Post-intervention measures were collected 10 weeks later, after the final session of the child program.

Program content

The CAST program is delivered in the school setting to children, parents and teachers. Although the program has universal, targeted and indicated levels of intervention, this present study reports on outcomes of the targeted intervention only. The parent group program used was the Signposts for Building Better

Behaviour – Early School Version.²⁹ This program has been shown to be effective in reducing children's difficult behaviour.³⁰ Signposts was delivered in a six-session closed group format, conducted by one CAST facilitator and a school welfare officer. The program materials are available from the Parenting Research Centre (www.parentingrc.org.au). The key elements include: contingency management to shape, teach and reinforce wanted behaviours or reduce unwanted behaviours, and a simplified functional assessment. The teacher program included 2 hours of teacher professional development in classroom contingency management, a written manual on classroom management, and individualized behaviour planning.³¹ The teacher manual is available from the first author. The child program was a targeted pull-out group program for up to eight children; it comprised 10 sessions, 1 hour each week, plus in-class generalization activities. The program was facilitated by CAST staff and a welfare officer. The child program taught social and problem-solving skills in vivo, imagined, and role-played with repeated practice and feedback. Generalization was encouraged through classroom activities. The manualized program was the Cool At School Together (CAST) program and is available from the first author. It was modified from the Confident Kids program³² to suit this population group.

Measures

Parents and teachers completed parallel measures of the child's behaviour at pre- and post-intervention as follows.

The Strengths and Difficulties Questionnaire – Parent Version (SDQ-P²⁸) is a brief questionnaire that assesses the global functioning of children. Psychometric properties of the SDQ-P are established, with Cronbach's α of 0.82 on the total scale, and subscales ranging from 0.57 to 0.85.³³ Cronbach's α coefficients for the current sample ranged from 0.58 to 0.77 for the subscales, and 0.82 for the Total Difficulties score.

Eyberg Child Behaviour Inventory (ECBI³⁴) is a measure of parental perceptions of disruptive behaviour in children aged 2–16 years. There are 36 items on a 7-point scale. The Intensity Scale represents the total frequency of occurrence for all behaviours, while the Problem Scale refers to the total number of behaviours that are indicated to be a problem. The ECBI has established internal reliability of 0.95 and test-retest reliability over 12-weeks of 0.80.³⁴ Cronbach's α coefficient for the Intensity Scale for the current sample was 0.94.

The Strengths and Difficulties Questionnaire – Teacher Version³³ parallels the parent version as a measure of global functioning, with Cronbach's alpha of 0.87 on the Total Difficulties score, and 0.70 to 0.88 on the subscales.³³ Reliability for the current sample was 0.58 to 0.80 for the subscales, and 0.78 for the Total Difficulties Score.

Sutter-Eyberg Student Behaviour Inventory-Revised (SESBI-R³⁴) measures teacher perceptions of disruptive behaviour in children aged 2–16 years. The Intensity

Scale (IS) and Problem Scale mirror the parent ECBI. Psychometric properties of the SESBI-R are 0.98 for internal consistency and 0.87 for test-retest.³⁴ Cronbach's α coefficient for the Intensity Scale for the current sample was 0.97.

Data screening and data analyses strategy

All data met assumptions of normality and were suitable for inferential analyses. Following this, data analyses were conducted in three stages. First, repeated measures ANOVA on baseline and pre-intervention established the ongoing nature of the problem behaviour for parents and teachers, and represents a form of control in the study. Second, repeated measures ANOVAs examine the effect of the intervention from parent and teacher reports (pre-intervention to post-intervention). Finally, intention-to-treat analysis was conducted using the last observation carried forward method³⁵ for the missing post-intervention data from parents and teachers.

RESULTS

Baseline data on problem behaviours

Teachers completed baseline measures of each child's global functioning on the SDQ-T were compared with pre-intervention measures. A significant multivariate effect was found, indicating that teachers reported increases in difficulties during the 26-week baseline

period (Wilks' $\lambda = 0.124$, $F(5,135) = 3.83$, $p = 0.003$, multivariate $\eta^2 = 0.124$). Follow-up univariate analyses revealed a significant increase in scores during the baseline period for each of the subscales of the SDQ-T, as shown in Table 2. This increasing classroom severity is indicative of the problems that teachers were reporting in managing these children within their classes. Parent baseline data were also compared to preintervention, although the data available was limited to a sample of 30 parents on the SDQ-P and 61 parents on the ECBI (parent data were missing due to adherence issues which are addressed in the discussion). On both the SDQ-P and ECBI, there were no significant changes in child functioning, indicating that overall child disruptive behaviour was stable during the 7-week baseline period. This suggests that parents saw the problems as ongoing. Descriptive statistics for parent SDQ and ECBI are presented in Table 2.

Intervention outcomes on problem behaviours

Pre- to post-intervention changes for parent and teacher reports are presented in Table 3. A significant multivariate effect was found for the teacher reported global functioning on the SDQ-T (Wilks' $\lambda = 0.772$, $F(5,143) = 8.47$, $p < 0.001$, multivariate $\eta^2 = 0.23$). Follow-up univariate analyses for each of the SDQ-T subscales revealed a significant decrease in scores on the Emotional, Conduct, Hyperactivity and Peer subscales, and a significant improvement in Prosocial Behaviour following the intervention. Parents also reported significant changes on the

Table 2: Means and standard deviations for baseline and pre-intervention on child outcome variables

Dependent variable	Baseline			Pre-intervention			F	Sig
	n	M	SD	M	SD			
Teacher report								
SDQ								
Emotional symptoms	140	2.29	(2.34)	2.76	(2.38)	4.93	*	
Conduct problems	140	4.10	(2.59)	4.55	(2.27)	4.91	*	
Hyperactivity	140	6.69	(3.14)	7.31	(2.56)	5.65	*	
Peer problems	140	2.63	(2.19)	3.42	(2.40)	17.16	***	
Prosocial behaviour	140	5.54	(2.65)	4.94	(2.38)	6.17	**	
Parent report								
SDQ								
Emotional symptoms	30	2.53	(2.29)	2.53	(2.37)	0.01		
Conduct problems	30	3.20	(1.67)	3.10	(1.56)	0.13		
Hyperactivity	30	6.43	(2.18)	5.90	(2.44)	4.27		
Peer problems	30	2.37	(1.61)	2.40	(1.69)	0.03		
Prosocial behaviour	30	7.40	(1.68)	7.43	(1.72)	0.02		
ECBI								
Intensity	61	124.07	(23.92)	125.34	(30.85)	0.19		
Problem	61	13.97	(6.81)	13.38	(8.20)	0.48		

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 3: Means and standard deviations for pre- and post-intervention on child outcome variables by completers and intention-to-treat analysis

Dependent variable	Preintervention			Post-intervention			Intention-to-treat Analysis F
	n	M	SD	M	SD	F	
Teacher report							
SDQ							
Emotional symptoms	148	2.61	(2.42)	2.13	(2.06)	9.15**	9.59**
Conduct problems	148	4.55	(2.28)	3.85	(2.53)	15.28**	14.07***
Hyperactivity	148	7.26	(2.56)	6.31	(2.95)	19.21***	19.06***
Peer problems	148	3.34	(2.33)	2.84	(2.24)	10.32**	11.00**
Prosocial behaviour	148	4.99	(2.33)	5.80	(2.51)	18.50***	18.36***
SEBSI-R							
Intensity	132	149.07	(43.05)	134.48	(48.15)	23.37**	21.69***
Problem	132	15.94	(10.71)	10.63	(10.06)	35.52**	34.09***
Parent report							
SDQ							
Emotional symptoms	79	2.89	(2.42)	2.46	(2.36)	3.60	3.59
Conduct problems	79	3.89	(2.21)	3.03	(1.90)	18.91***	18.70***
Hyperactivity	79	5.85	(2.60)	5.08	(2.37)	13.92***	13.81***
Peer problems	79	2.94	(1.97)	2.71	(2.03)	1.63	1.63
Prosocial behaviour	79	7.06	(1.85)	7.75	(1.70)	12.79***	12.70**
ECBI							
Intensity	84	162.82	(34.40)	111.15	(33.10)	36.15***	27.61***
Problem	84	13.24	(8.35)	9.13	(8.41)	27.88***	24.73***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

SDQ-P, with a significant multivariate effect found (Wilks' $\lambda = 0.70$, $F(5,74) = 6.35$, $p < 0.001$, multivariate $\eta^2 = 0.30$). Follow-up univariate analyses for each of the subscales are shown in Table 3.

Changes in disruptive behaviour on the ECBI and SESBI-R for parent and teacher are shown in Table 3. A significant multivariate effect was found for the teacher reported SESBI-R (Wilks' $\lambda = 0.78$, $F(2,130) = 18.32$, $p < 0.001$, multivariate $\eta^2 = 0.22$), indicating that teachers reported significantly lower levels of disruptive behaviour following the intervention. A significant multivariate effect was found for the parent ECBI (Wilks' $\lambda = 0.65$, $F(2,82) = 21.61$, $p < 0.001$, multivariate $\eta^2 = 0.35$), indicating that parents reported significantly lower levels of disruptive behaviour following the intervention.

DISCUSSION

Reductions in disruptive behaviours and improvements in global functioning were reported by parents and teachers. Following the intervention, there were significant improvements in the children's global functioning on the SDQ. Furthermore, parents and teachers indicated that disruptive behaviours had reduced and that the child's behaviours were perceived

as less problematic to parents and teachers. The results of this study demonstrate that child and adolescent mental health services can deliver promising results at early intervention levels, and that this can be achieved at outreach sites. Although findings from this study are limited because there was no control group, the baseline period represents a form of control. Furthermore, the results are in keeping with more rigorous studies, which have shown that early interventions for children with disruptive behaviours can have positive effects.^{11,12,18,36} The literature on highly regarded EBT also suggests that programs need to include children, parents and teachers.

Although standard in clinical trials, a strength of this study was using the CONSORT method²⁶ to track participants through the service. This has provided transparency in the program evaluation by accounting for participants from a population level down to program delivery level.

This study also demonstrates that services can and should measure their effectiveness as part of everyday practice. The data were collected by the CAST mental health clinicians, as financial constraints prevented the use of research staff for data collection. Hence, there were difficulties with adherence, for example the parent

data at baseline were not collected from all parents, and this was the result of clinician confidence and training. The research on dissemination has shown that the uptake of evidence base is rarely demonstrated²⁵ and experiences in this project suggests that the pressure just to deliver the service is so great that it can overshadow allocation of the resources needed to gather data and demonstrate outcomes. Indeed, for dissemination to be demonstrated as effective, it is necessary for research to be moved higher up the agenda and incorporated into everyday service delivery.

Several limitations reflect the complexity of measuring outcomes within a service. First, there is a lack of follow-up data to determine if the outcomes were maintained over time. Specific questions around the intensity of the intervention need to be addressed in future. Second, the study is limited in that process measures of program adherence have not been taken. Questions around adherence by teachers and school staff as well as teacher efforts to facilitate maintenance and generalization of the skills learned by the children have not been recorded.

In summary, this study demonstrated positive outcomes from a program for children with difficult and challenging behaviours delivered by a mental health service in outreach mode in schools. Findings from this study are in keeping with research showing the benefits of early intervention for children with disruptive behaviours delivered to parents and teachers.^{12,18,37,38} The limitations discussed in this study reflect the complexities of delivering such services in schools, and provides direction for future work. It is argued that addressing dissemination challenges can be done and that ongoing evaluation of client outcomes is a necessary part of service delivery.

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DISCLOSURE

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

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