

Effects on Parental Mental Health of an Education and Skills Training Program for Parents of Young Children With Autism: A Randomized Controlled Trial



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Articles

Effects on Parental Mental Health of an Education and Skills Training Program for Parents of Young Children With Autism: A Randomized Controlled Trial

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ABSTRACT

Objective: To determine the impact of a parent education and behavior management intervention (PEBM) on the mental health and adjustment of parents with preschool children with autism. **Method:** A randomized, group-comparison design involving a parent education and counseling intervention to control for nonspecific therapist

effects and a control sample was used. Two metropolitan and two rural regions were randomly allocated to intervention groups ($n = 70$) or control ($n = 35$). The parents of consecutive children with autism (2½–5 years old) from the autism assessment services for the intervention regions were then randomly allocated to either a 20-week manual-based parent education and behavior management intervention ($n = 35$) or a manual-based parent education and counseling intervention ($n = 35$). The main outcome measure of parental mental health was the General Health Questionnaire used pre- and postintervention and at 6-month follow-up. Results: Both treatments resulted in significant and progressive improvement in overall mental health at follow-up ($F = 2, 97, p = .007$) and mental health significantly improved over time in the 54% of principal caregivers who had the highest levels of mental health problems. The parent education and behavior management intervention was effective in alleviating a greater percentage of anxiety, insomnia, and somatic symptoms and family dysfunction than parent education and counseling at 6-month follow-up. Conclusions: A 20-week parent education and skills training program for parents of young children newly diagnosed with autism provides significant improvements in parental mental health and adjustment, justifying its addition to early intervention programs at least for parents with mental health problems. *J. Am. Acad. Child Adolesc. Psychiatry*, 2006;45(5):561–569.

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autism

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early intervention.

Autism is associated with burden and stress for parents ([Howlin et al., 2004](#)). The demands placed on parents caring for a child with autism contribute to a higher overall incidence of parental stress, depression, and anxiety and adversely affects family functioning and marital relationships compared with parents of children with other intellectual, developmental, or physical disabilities ([Dunn et al., 2001](#) ; [Yim et al., 1996](#)).

Mothers of children with autism are more likely to suffer from depression than mothers of children with intellectual disability (ID) without autism and mothers with typically developing children ([Bristol et al., 1993](#) ; [Olsson and Hwang, 2001](#) ; [Yirmiya and Shaked, 2005](#)); however, they may also have a heritable vulnerability for depression ([Bolton et al., 1998](#)). Therefore, autism treatment studies should include measures of parental mental health and family functioning ([Fisman et al., 2000](#) ; [Koegel et al., 1996](#) ; [Tunali and Power, 2002](#)).

Parent training has long been regarded as an important component of early intervention programs for children with autism ([Harris, 1994](#)). There is empirical evidence that parent training contributes to the effectiveness of behavioral treatments ([Schreibman, 2000](#) ;

Schreibman and Anderson, 2001) and, for example, enhances functional communication in young children with autism (Moes and Frea, 2002) and may result in improved parent—child interactions after pivotal response training (Koegel et al, 1996). Although most research has focused on child outcomes, there are several equivocal studies of the effect on parental adjustment of parent training programs for parents of children with autism. The EarlyBird Programme (Shields, 2001), offers a 3-month program of parent support groups, behavior management training, and individual early intervention for the child with autism. In a pilot study of this program, parents reported decreased stress after 3- and 6-month follow-up. A small, nonrandomized controlled study (treatment $n = 12$; control $n = 5$) of The Scottish Centre for Autism program (therapist-supervised parent—child sessions, behavior management parent training groups) found a nonsignificant reduction of parental stress (Salt et al., 2002). A randomized controlled trial of a parent intervention that focused on the development of joint attention skills and joint action routines in 12 children with autism compared with 12 children receiving local services only found no treatment effect at 12-month follow-up (Drew et al., 2002).

Therefore, the aim of this article is to report on a large, randomized controlled study of the impact of a manual-based parent education and behavior management (PEBM) training intervention on the mental health and adjustment of parents with preschool children recently diagnosed with autistic disorder. Improvement in the child's adjustment may follow as a consequence but is the subject of a secondary study.

METHOD

Research Design

A parallel-group comparison design compared a PEBM intervention, a parent education and counseling (PEC) intervention to control for nonspecific therapeutic effects, and a control sample. To avoid the likelihood of exchange of information between the parents attending the same regional early intervention services, initial allocation between one of two geographically separate metropolitan regions and one of two rural regions was made by computer-generated random numbers to either a treatment intervention region or a control region. Intervention subjects were then randomly allocated by computer to either the PEBM intervention ($n = 35$), or the PEC intervention ($n = 35$). The randomly selected metropolitan and rural control regions contributed 35 families.

Subjects

Children 2½–5 years old were obtained during the month after diagnosis from consecutive referrals to two metropolitan and two rural regional assessment services for young children suspected of having autism ($N = 107$). All but two families agreed to participate. The catchment areas comprise a broad cross-section of social class and ethnic backgrounds. All of the children lived with their parents and attended a play group or preschool. Children in the treatment and control groups also received a similar early intervention program after the diagnosis of autism was made (mean 7.3 hours/week and 7.9 hours/week of intervention, respectively). The children had a strict *DSM-IV* diagnosis of autistic disorder (American

Psychiatric Association, 1994) based on a standardized clinical interview (Einfeld, 1992) for children with developmental disability and the Autism Diagnostic Interview-Revised (Lord et al., 1994). Each diagnosis was confirmed using a screen observation or video record of the interview by an independent clinician. All of the parents had adequate English language skills to complete the questionnaires and participate in the intervention programs.

Measures

Parent Measures.

Measures of parent and family functioning were taken pre- and posttreatment assessment and at 6-month follow-up. The primary measure of parental mental health was the General Health Questionnaire (GHQ-28; Goldberg and Williams, 1988) a widely used, reliable, and valid self-administered adult screening test designed to detect psychiatric disorder in community settings (Cronbach α range, .82–.93; sensitivity, 0.79; and specificity, 0.87). The 28-item version has four subscales: somatic symptoms, social dysfunction, anxiety and insomnia, and severe depression. Secondary outcome measures were the Parenting Stress Thermometer, a visual analogue rating of general level of stress from 0 (none) to 4 (very, very much) and the McMaster Family Assessment Device (FAD; Epstein et al., 1983), a self-administered 12-item general functioning scale measuring general family function. Reliability of the global functioning scale is high (intercorrelation coefficient [ICC] = 0.86, split-half = 0.83), with good construct validity obtained by assessing its relationship with 12 family variables from the Ontario Child Health Study (Byles et al., 1988).

Child Measures.

Measures of each child's development and severity of autistic symptoms were taken at the pretreatment assessment and 6-month follow-up and are reported in a companion paper. The main measure of child psychopathology was the Developmental Behaviour Checklist (DBC), a reliable and valid 96-item, parent-completed questionnaire with a total problem behavior score \pm ICC = 0.80) and an autism screening algorithm, the DBC-Autism Screening Algorithm, which is sensitive and specific for the symptoms of autism (area under the curve = 0.80; sensitivity, 0.86 [95% confidence interval 0.80–0.91]; and specificity, 0.69 [95% confidence interval: 0.62–0.76]; Brereton et al., 2002 ; Einfeld and Tonge, 2002). The Psychoeducational Profile-Revised (Sehopler et al., 1990) is a developmental measure designed specifically for use with children who have autism. A total developmental score and developmental quotient are calculated, along with a profile of the child's performance in seven domains assessed relative to standardized age equivalents. Items have been empirically tested and have clinical validity. At the end of the treatment program, the parents completed a brief treatment acceptability and consumer satisfaction questionnaire (Harrold et al., 1992).

Procedure

The study was approved by the Monash Medical Centre Human Research Ethics Committee and parents provided written consent.

Screening and Pretreatment Assessment.

After a *DSM-IV* diagnosis of autism was confirmed, the child was enrolled in the project and all other measures were taken. Families from the randomly allocated intervention regions were then randomly allocated to either the PEBM or the PEC group.

PEBM Skills Training.

Parents in this treatment condition received a manual-based education and behavior management skills training package ([Brereton and Tonge, 2005](#)). The program was broadly based on multiple early intervention and cognitive behavioral techniques previously tested for acceptability with three families. Treatment sessions included education about autism; features of communication, social, play, and behavioral impairments; principles of managing behavior and change; teaching new skills; improving social interaction and communication; services available; managing parental stress, grief and mental health problems; and sibling, family, and community responses to autism. Sessions were skills based and action oriented through the provision of workbooks, modeling, videos, rehearsal (with child when present), homework tasks, and feedback.

PEC.

The aim of this treatment was to control for the nonspecific aspects of the PEBM intervention, in particular, therapist attention, understanding, and support. The educational material in the manual for PEC group discussion sessions was the same as for the PEBM group; however, for the individual sessions, no skills training or homework tasks were set and the emphasis was on nondirective interactive discussion and counseling.

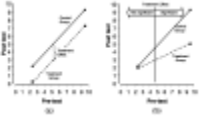
Both treatments were delivered by special educators or psychologists who had experience working with children with autism and their parents. Ten 90-minute small group (four to five families) sessions alternated with ten 60-minute individual family sessions over a 20-week period. To sustain treatment integrity: (1) therapists received training in the procedures for each condition; (2) therapists were required to follow a manual that delineates each treatment on a session-by-session basis ([Brereton and Tonge, 2005](#)); (3) a random 10% sample of therapy sessions for both conditions was videotaped for content review and intervention adherence; and (4) therapists received ongoing clinical supervision and training throughout the study. To safeguard against possible confounding because of individual therapist effects, therapists were rotated across treatment conditions.

Nonintervention Control Group.

This group consisted of children with autism and their families from the randomly allocated control regions who received local early childhood services but no PEBM and PEC intervention. Parents were informed they were to be part of a follow-up study of autism and receive three 6-month assessments.

Posttreatment and Follow-up Assessments.

Subjects in all groups underwent reassessment at the completion of the treatment program (at 20 weeks after the initial assessment for the control group) and at 6 months after the completion of treatment using all of the pretreatment measures of child and parent/family



functioning. These measures were completed by a clinician blind to the results of the pretreatment assessments and to treatment group membership.

Data Analysis

Principal Caregiver Measures.

To assess the impact of the intervention posttreatment and at follow-up, primary (GHQ total and its four subscales [somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression]) and secondary (stress thermometer ratings and FAD total) outcome measures were analyzed using analysis of covariance. Group (PEBM, PEC, control) was the between-subjects factor with the corresponding pretreatment scores serving as a covariate. This method of accounting for pretreatment status is generally the most powerful of the available alternatives (see [Prison and Pocock, 1992](#)). This approach and its alternatives assume that the benefit of the intervention is constant—in other words, unrelated to parents' initial levels of distress ([Fig. 1 a](#)). However, because participants were recruited for the trial based on their child's status rather than their own distress, wide variation was observed on these measures pretest. This included parents with “floor value” or low scores who have little scope for reduction of their scores than more distressed parents. This effect can be assessed by testing for the presence of an interaction between the pretest covariate and treatment condition. When a significant interaction is found, the Johnson-Neyman (J-N) technique ([Huitema, 1980](#)) may be used to establish the value of the pretest score beyond which the treatment was significantly superior to the control condition ([Fig. 1 b](#)).

Figure 1. Hypothetical relationship between pre- and posttest scores, a, No interaction between pretest and treatment group leading to a constant effect of treatment independent of pretest score, b, Significant interaction between the pretest and treatment groups. The Johnson-Neyman ([Huitema, 1980](#)) procedure determines the range of pretest scores associated with a statistically significant effect of treatment.

RESULTS

Intervention Effects: Principal Caregiver Measures

Results are presented for the principal caregivers in the PEBM treatment ($n = 35$), PEC treatment ($n = 33$), and control group ($n = 35$). Two PEC group principal caregivers did not complete the parent training. One family moved interstate for work and the other attended 10 sessions before a change in employment prevented attendance. The parents attended virtually all of the group sessions. On the rare occasion that one parent was unable to attend, the other was present. Individual sessions were rescheduled if necessary so that none was missed. All of the parents in treatment and control groups participated in follow-up; hence, there was no attrition. Status as principal caregiver was defined as the parent who spent the most time caring for the child; in all but four families, this was the mother. The other caregiver (usually the father) was encouraged to attend sessions and approximately 50% in both groups attended. Meetings were held at times convenient for the families. Child

care was available. There were no significant differences between control and treatment groups for socioeconomic status as determined by the Australian Standard Classification of Occupations ([Australian Bureau of Statistics, 1997](#) ; $t_{103} = -0.19, p = .85$) or parental age ($t_{103} = 1.16, p = .25$). There were no significant differences between the intervention groups and the control group for child developmental quotient ($t_{103} = -1.10, p = .27$) or gender ($\chi^2 = 0.64, p = .42$) or for DEC overall symptoms of disturbed behavior (total behavior problem score; $t_{121} = -1.52, p = .13$) or specific autism symptoms (DEC— Autism Screening Algorithm; $t_{101} = -1.73, p = .08$; [Tables 1 and 2](#)).

TABLE 1 -- Frequencies, Means, and SDs of Principal Caregiver's Age and Socioeconomic Status

	PEC, n = 33	PEBM, n = 35	Control, n = 35
Principal caregiver age, yr			
Range	25–42	28–43	26–42
Mean	33.3	35.2	33.3
SD	4.7	3.8	4.2
Principal caregiver SES			
Range	2–8	2–8	2–8
Mean	5.1	4.1	4.7
SD	2.1	1.8	2.1
<i>Note:</i> PEC = parent education and counseling; PEBM = parent education and behavioral management; SES = socioeconomic status.			

TABLE 2 -- Frequencies, Means, and SDs of Children's Pretreatment Age, Sex, PEP-R Developmental Quotient, DBC TBPS, and DBC-ASA

	PEC, n = 33	PEBM, n = 35	Control, n = 35
Child age, mo			
Range	30–65	23–65	33–70

TABLE 2 -- Frequencies, Means, and SDs of Children’s Pretreatment Age, Sex, PEP-R Developmental Quotient, DBC TBPS, and DBC-ASA

	PEC, n = 33	PEBM, n = 35	Control, n = 35
Mean	45.3	45.3	49.4
SD	8.9	8.5	10.0
Sex, %			
Male	87.9	77.1	88.6
Developmental quotient			
Range	12–97	13–113	12–127
Mean	48.9	64.7	63.3
SD	22.0	27.4	28.5
DBC ASA			
Range	10–48	2–45	0–40
Mean	28.7	26.1	23.8
SD	9.2	9.1	10.4
DBC TBPS			
Range	25–118	14–137	27–114
Mean	65.4	64.9	73.8
SD	(24.6)	(25.0)	(17.0)
PEP-R = Psychoeducational Profile-Revised; DBC-ASA = Developmental Behaviour Checklist-Autism Screening Algorithm; DBC TBPS = Developmental Behaviour Checklist Total Behavior Problem Score.			

Table 3 presents a summary of the principal caregivers’ dependent measure means and SDs for the PEBM, PEC, and control groups pre- and posttreatment and at follow-up.

TABLE 3 -- GHQ Total and Subscale Scores, Stress Thermometer, and FAD Score Means and SDs by Group and Time (*N* = 13)

Measure	PEC, <i>n</i> = 33			PEBM, <i>n</i> = 35			Control, <i>n</i> = 35		
	Pre	Post	F-U	Pre	Post	F-U	Pre	Post	F-U
GHQ total	22.06 (10.02)	19.12 (11.90)	16.70 (10.51)	28.54 (13.43)	18.03 (13.56)	17.06 (7.59)	19.17 (7.61)	21.69 (10.20)	21.46 (11.94)
GHQ subscale									
Somatic symptoms	6.18 (2.95)	5.75 (4.54)	4.81 (3.62)	7.86 (3.99)	6.11 (4.61)	5.06 (2.96)	5.29 (3.10)	6.77 (4.10)	5.69 (3.45)
Anxiety and insomnia	7.00 (3.83)	6.06 (4.24)	4.75 (3.79)	9.26 (4.54)	5.20 (4.36)	4.71 (2.82)	6.43 (3.54)	6.26 (3.31)	6.91 (5.15)
Social dysfunction	6.94 (2.44)	5.34 (2.72)	5.75 (2.85)	8.20 (2.62)	5.49 (3.80)	5.97 (2.22)	6.49 (2.17)	7.40 (2.34)	6.86 (2.85)
Severe depression	1.91 (3.85)	1.81 (3.14)	1.47 (2.94)	3.20 (4.56)	1.31 (2.76)	.88 (2.52)	0.97 (1.98)	1.31 (2.53)	1.57 (3.07)
Stress thermometer	2.27 (0.91)	1.82 (0.91)	1.70 (1.05)	2.51 (0.82)	1.86 (0.94)	1.86 (0.88)	2.06 (0.87)	2.26 (1.09)	2.09 (0.89)
FAD score	1.84 (0.66)	1.81 (0.52)	1.64 (0.58)	1.76 (0.46)	1.78 (0.32)	1.67 (0.46)	1.70 (0.64)	1.94 (0.52)	1.74 (0.73)

Note: SDs in parentheses. GHQ = General Health Questionnaire; PEC = parent education and counseling; PEBM = parent education and behavioral management; Pre = pretreatment; Post = posttreatment; F-U = follow-up; FAD = McMaster Family Assessment Device score.

GHQ Total Score.

Pretreatment, 29.1% of the total sample received a GHQ total score equal to or above the clinical cutoff score of 25, indicative of a clinical level of mental health problems (Goldberg and Williams, 1988). Posttreatment, covarying for pretest value, the main effect of treatment group was not statistically significant, nor was any interaction between pretest value and group observed. No significant differences were found in comparing PEBM to PEC. However, at follow-up, the overall (three-group) interaction between pretest score used as a covariate and group was highly significant for GHQ total score ($F = 2, 97, p = .007$). Subsequent pairwise analyses found that although the main effect was not significant for the PEBM/control group comparison, the interaction between pretest score and group was statistically significant ($F = 1, 66, p = .001$). The same pattern was found for the comparison of PEC to the control group ($F = 1, 64, p = .051$). No statistically significant differences were found in comparing PEC to PEBM (Table 4). The heterogeneity of slopes relating follow-up score to pretest score implies that the effect of treatment is dependent on

the level of symptomatology at pretest. The J-N technique showed that the PEBM was significantly better than no treatment above a pretest GHQ total score of 18.49. The J-N technique also established that the advantage of PEC over the control group was significant for pretest values on this measure above 18.29. In the total sample, these values corresponded to the 47th and 46th percentiles, respectively. There was no evidence that the mental health of the parents who were in the healthier half of the sample deteriorated from pre- to posttreatment ($t_{47} = -1.34, p = .19$) or from posttreatment to follow-up ($t_{47} = -.08, p = .94$). Inspection of GHQ subscale scores suggested that the interventions may have differential effects on different facets of psychopathology.

TABLE 4 -- Main Effects and Covariate Interactions for Principal Caregiver Measures

	Occasion	Effect	Overall F(dfr,dfd)	Control vs. PEBM F(dfn,dfd)	Control vs. PEC F(dfn,dfd)
GHQ total score	Post	Group	ns	ns	ns
		Cov Int	ns	ns	ns
	F-U	Group	ns	ns	ns
		Cov Int	5.17 [*]	11.39 [*]	0.72, $p = .051$
GHQ somatic symptoms	Post	Group	ns	ns	ns
		Cov Int	4.26 [*]	8.39 [*]	ns
	F-U	Group	ns	ns	ns
		Cov Int	4.63 [*]	10.26 [*]	ns
GHQ anxiety and insomnia	Post	Group	ns	ns	ns
		Cov Int	ns	ns	ns
	F-U	Group	ns	ns	ns
		Cov Int	7.32 [*]	12.93 [*]	9.00 [*]
GHQ severe depression	Post	Group	ns	ns	ns
		Cov Int	5.72 [*]	12.34 [*]	6.26 [*]
	F-U	Group	ns	ns	ns
		Cov Int	4.67 [*]	9.95 [*]	5.40 [*]
Stress thermometer	Post	Group	ns	ns	ns
		Cov Int	ns	ns	ns
	F-U	Group	6.91 [*]	7.40 [*]	ns

TABLE 4 -- Main Effects and Covariate Interactions for Principal Caregiver Measures

	Occasion	Effect	Overall <i>F</i> (<i>dfr,dfd</i>)	Control vs. PEBM <i>F</i> (<i>dfn,dfd</i>)	Control vs. PEC <i>F</i> (<i>dfn,dfd</i>)
		Cov Int	5.24 [*]	7.49 [*]	ns
FAD score	Post	Group	ns	ns	ns
		Cov Int	ns	ns	ns
	F-U	Group	ns	5.40 [*]	ns
		Cov Int	4.77 [*]	7.85 [*]	5.85 [*]

Note: None of the comparisons between the PEBM and PEC groups were significant. *dfn,dfd* = degrees of freedom numerator, degrees of freedom denominator; PEBM = parent education and behavioral management; PEC = parent education and counseling; GHQ = General Health Questionnaire; Pre = pre-treatment; Post = post-treatment; F-U = 6-month follow-up; ns = not significant; Cov Int = covariate interaction.

^{**}*p* < .01;

^{***}*p* < .005.

^{*}*p* < .05

GHQ Somatic Symptoms. Posttest, the overall (three-group) comparison was significant for the somatic symptoms subscale, with significant heterogeneity in the relationship with pretest scores ($F = 2, 96, p = .016$). Subsequent analyses revealed a significant interaction between pretest score and group for the comparison of PEBM to the control groups ($F = 1, 66, p = .005$; Table 4). The heterogeneity of slopes relating the posttest score to the pretest score implies that the effect of treatment is dependent on the level of somatic symptomatology pretest. Using the J-N technique and an α level of .05, it was established that PEBM was statistically better than no treatment posttest above a pretest GHQ somatic symptom score of 7.04. This value corresponds to the 79th percentile and indicates that approximately 21 % of participants with the more severe somatic symptoms would be expected to benefit immediately from PEBM treatment rather than no treatment.

At follow-up, the overall pattern of results, with significant interactions between pretest score and group, was maintained for the PEBM versus control group analysis. The J-N procedure showed that participants with pretest somatic symptom scores above 6.58 stood to benefit significantly compared with the comparison group (69th percentile). This indicates that in the long-term, a greater portion of the sample (31%) with somatic symptoms was likely to have significant improvement in their somatic symptoms resulting from PEBM treatment compared to no treatment.

GHQ Anxiety and Insomnia.

Posttreatment, neither the main effect nor the interaction between pretest score and group was statistically significant for PEBM or PEC compared to the control group. Similarly, no significant differences were found in comparing PEBM to PEC posttreatment. At follow-up, the overall (three-group) interaction between pretest score and group was highly significant for GHQ anxiety and insomnia scores ($F = 2, 95, p = .001$). Subsequent analyses found significant interactions between pretest score and group for PEBM versus control ($F = 1, 65, p = .001$) and for PEC versus control ($F = 1, 63, p = .004$; [Table 4](#)). For PEBM, the J-N technique showed that participants with pretest anxiety and insomnia scores above 5.35 (39th percentile) stood to benefit significantly compared to no treatment. For PEC, benefit occurred above 6.00 (50th percentile). Thus, approximately 61% of the sample that presented with the highest levels of anxiety and insomnia would be predicted to benefit from PEBM compared with those with no treatment. PEC is likely to be effective in significantly reducing symptoms of anxiety and insomnia in 50% of parents.

GHQ Social Dysfunction.

This analyses produced one nearly significant main effect between the PEBM and control groups, indicating an almost significant effect of treatment posttest, regardless of pretest status ($F = 1, 66, p = .064$; [Table 4](#)). However, neither the main effect nor the interaction between pretest score and group was statistically significant for the PEC to control comparison and for the PEC to PEBM comparison posttest. The overall pattern of results, with nearly statistically significant main effects for the PEBM versus control group comparison was maintained at follow-up ($F = 1, 65, p = .081$).

GHQ Depression.

The main effect was not significant for the overall (three-group) comparison, but the interaction between the pretest score used as a covariate and group was significant for GHQ Depression posttreatment scores ($F = 2, 96, p = .007$). Subsequent pairwise analyses revealed that the main effect was not significant for the PEBM versus control group comparison, although the interaction between pretest score by group was statistically significant ($F = 1, 66, p = .001$). The same pattern was found for the comparison of PEC to the control group ($F = 1, 63, p = .015$; [Table 4](#)). No statistically significant differences were found comparing PEC to PEBM.

The heterogeneity of slopes relating the posttest score to the pretest score implies that the effect of treatment is dependent on level of depressive symptomatology at pretest. J-N procedures, using an $\alpha = .05$ level, established that PEBM was significantly superior to no treatment posttest above a pretest GHQ depression score of 1.53. PEC was superior only for pretest GHQ depression scores above 4.10. In the total sample, these scores corresponded to the 73rd and 84th percentiles, respectively. Approximately one fourth of the sample who were the most depressed benefited from PEBM compared with 16% who benefited from PEC.

The overall pattern of results, with significant interactions between the pretest score and group was maintained at follow-up for PEBM versus control and for PEC versus control analyses ([Table 4](#)). For PEBM, the J-N technique showed that participants with pretest

depression scores above 1.26 (72nd percentile) stood to benefit significantly compared with no treatment. PEC benefit occurred above 3.01 (80th percentile). Care must be exercised in interpreting these values because the groups had differing levels of depression at pretest. In particular, few participants in the comparison group had scores in the range in which PEC was estimated to be superior to no treatment.

Stress Thermometer and FAD.

Posttreatment, the main effect and interaction between the pretest score used as a covariate and group were not statistically significant for PEBM or PEC compared with the control for both measures. Similarly, no significant differences were found in comparing PEBM to PEC posttreatment. At follow-up, the overall (three-group) comparison and interaction between pretest score and group were both significant for stress thermometer ratings ($F = 1,97, p = .01$ and $F = 2,97, p = .007$) and ($F = 2,97 = 4.77, p = .01$ and $F_{1,66} = 5.40, p = .23$), respectively. Subsequent analyses revealed a significant main effect for the PEBM/control group comparison for the stress thermometer ($F_{1,66} = 7.4, p = .008$) and for the FAD ($F_{1,66} = 7.85, p = .007$). The interaction between pretest score and group was similarly statistically significant for the comparison of PEBM to the control group ($p = .008$) for the stress thermometer ($F_{1,66} = 7.4, p = .008$) and the FAD ($F_{1,64} = 5.85, p = .018$; [Table 4](#)). The heterogeneity of slopes relating the follow-up test score to the pretest score implies that the effect of treatment is dependent on the levels of stress and family functioning pretest. Using $\alpha = .05$, it was established that any effects are caused by PEBM, which is superior to control as a function of increasing pretest status for both variables. The J-N procedure showed that the advantage of PEBM over no-treatment control was significant for pretest values on stress scores above 2.45 (96th percentile) and FAD scores above 1.89 (67th percentile) and an even lower score of 1.75 for PEC (57th percentile).

DISCUSSION

This study provides evidence that both a parent education and skills training program and a parent education and counseling program for parents of young children with autism was of benefit to their mental health and well-being. Not surprisingly, this applied particularly if parents had preexisting mental health problems.

Given that parents were not recruited into the study based on psychiatric symptomatology or psychological distress, there was a wide range of scores on outcome measures pretest and the effect of the interventions was contingent on pretest status. Those parents already showing low levels of distress at the beginning of the study could not be expected to show improvements on these measures. This was reflected in significant interactions between pretest scores and intervention group in the analyses of covariance. Nevertheless, more than half of the sample had serious problems with their mental health. These participants were shown to benefit from either the PEBM or PEC intervention compared to the no treatment condition. The benefit of these interventions commenced for the parents well below the GHQ cutoff score for a caseness of 25. The interventions are also clearly of benefit in the relief of anxiety and insomnia and for more severe somatic symptoms and depression. The benefit of either intervention in reducing both overall psychiatric

symptomatology and somatic and anxiety and depression symptoms in the parent emerges over the long, rather than short, term following intervention. This may suggest that the benefits are cumulative and promote future mental health. This concept of resilience building is also described as a longer-term outcome of cognitive-behavioral therapy for depression ([Wallis, 2002](#)). Family functioning also significantly improved over time in the 33%–43% of treatment families who had the highest level of dysfunction.

There was no statistical evidence to support the overall superiority of PEBM over PEC. The PEBM intervention was effective in alleviating the symptoms of somatic complaints, anxiety, insomnia, stress, and family dysfunction in a greater percentage of parents in the longer term. The less structured PEC intervention led to a relief of depressive symptoms in a slightly larger percentage of parents. The costs of PEBM and PEC are equivalent in terms of therapist time, educational materials, and number of sessions, although PEBM does require the parents to do homework tasks. The evidence of greater treatment effects 6 months after the interventions may point to a cumulative benefit as parents apply skills learned. This “*sleeper effect*” has been described following cognitive-behavioral therapy for the treatment of anxiety and depression ([Rossellò and Bernal, 1999](#)). All of the parents participating in the treatment groups indicated that they would attend another such program should it be offered in the future and rated the program highly.

Limitations

It is possible that potential differences in regional services and populations may have confounded differences in outcome. However, there were no significant differences between control and intervention regions for parental socioeconomic status and age and child developmental level, gender, and amount of early intervention received. Pretreatment scores were used as covariates in the data analysis to further account for any pretreatment differences between subjects. Education and treatment services for children with autism and their families vary widely between countries and within countries such as the United States ([Volkmar, 2005](#)). The quality and quantity of available services may contribute to the mental health and adjustment of parents, thus influencing the extent to which parent education and skills training is of benefit to parental mental health.

The same therapists administered both treatments but were rotated between therapies, and review of videotapes of randomly selected sessions ensured treatment condition compliance. It should be noted that results have been reported with no adjustment for multiple testing. Given the substantial degree of relationship between many of the outcome measures, it is difficult to determine a suitable adjustment factor that does not inappropriately reduce power. However, care should be exercised in interpreting the outcomes of isolated measures with marginally significant *p* values. Effects for the primary outcome measure (GHQ) can withstand substantial adjustment for multiple testing and remain statistically significant.

All outcome measures of parental adjustment were self-reports. The GHQ is a well-established and reliable measure. Criterion validity of the GHQ as a measure of psychiatric disturbance has been established with reference to standardized psychiatric assessments, the Present State Examination, or the Clinical Interview Schedule in 12 studies providing a

variance-weighted mean validity sensitivity coefficient of 84% and specificity coefficient of 82% (Goldberg and Williams, 1988). However, the GHQ scales are only indicative measures of complex psychiatric constructs, and in this study, an independent, standardized clinical assessment was not conducted to validate the GHQ findings. It is possible that the interventions may have been beneficial to the secondary caregiving parent. About half of the fathers attended, but this number was insufficient to provide empirical evidence of the benefit of these interventions for fathers.

Clinical Implications

This randomized, controlled trial produced evidence that either a manual-based PEBM or PEC intervention for parents of young children with autism is likely to improve parental mental health and adjustment in parents, particularly those with preexisting mental health problems. At least half of the parents had mental health problems; therefore, in situations of scarce resources, perhaps they should be selected to receive a PEC program. However, parents who did not have mental health problems may have gained some unmeasured benefit, and they all gave positive feedback about the experience. Their presence may also be an element that contributed to recovery in the parents who did have problems. A further aim of the study was to investigate the benefit of the interventions on parenting skills reflected in their child's behavior and development. This outcome will be the subject of a companion paper.

Disclosure: Drs. Tonge and Brereton are the sole authors of the parent training manual used in this study. The manuals were published recently by Jessica Kingsley Publishers, and the authors receive royalties (5%) from sales. The other authors have no financial relationships to disclose.

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