Effects of behavioural family management on family communication and patient outcomes in schizophrenia

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Background Family interventions for schizophrenia have proved to be highly effective in preventing relapse, but it is not clear how they work or how they should be structured.

Aims To examine the effects of a behavioural family intervention and a family support programme on communication, problem solving and outcome in order to determine the impact of structured communication training.

Method Patients and family members participating in the Treatment Strategies in Schizophrenia study were videotaped engaging in 10-minute problem-solving conversations at baseline and after the conclusion of the family intervention. Tapes were subsequently evaluated for changes in communication patterns.

Results The intensive behavioural intervention did not produce differential improvement in communication, and change in communication was unrelated to patient outcomes.

Conclusions The data suggest that intensive behavioural family interventions may not be cost efficient, and that change in family communication patterns may only be important for a subset of families.

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The Treatment Strategies in Schizophrenia (TSS) study (Schooler *et al*, 1997) found no difference in outcome between behavioural family therapy and a less intensive family intervention, although both approaches appeared to have a positive effect on outcome. We examined the effects of the two interventions on communication and problem-solving behaviour in order to analyse further these findings. Patients and family members participated in problem-solving conversations at baseline and again after the conclusion of the behavioural intervention. The conversations were videotaped and rated on a variety of different communication behaviour. The behavioural intervention did not produce greater changes in communication or problem solving than the less intensive intervention, and change in communication was not associated with better outcomes. The data suggest that the benefits of psychoeducational family interventions for schizophrenia do not derive from changes in family communication patterns. Implications for the role of family communication and the content of family intervention are discussed.

Background

Several family intervention approaches for schizophrenia have been developed based on the general assumption that maladaptive interaction patterns within the family produce high levels of stress for the patient and lead to relapse (see reviews: Bellack & Mueser, 1993; Dixon & Lehman, 1995). These interventions have attempted to reduce the risk of relapse either by altering communication and problem solving in the home or by modifying family attitudes about the patient through education about the illness. Although the effect of these interventions on relapse has been quite positive, it is not clear that changes in parental attitudes and/or communication patterns within the home are central to

improved outcome. This issue has important implications for the validity of the conceptual model underlying the new family interventions, for the implementation of the treatment and for our understanding of the role of the family in relapse.

The TSS study provided a unique opportunity to examine this issue. The protocol included an introductory psychoeducational workshop followed by random assignment to one of two family interventions (a behavioural family therapy conducted in the home and supplemented by monthly multi-family group meetings versus monthly multi-family group meetings only) and one of three maintenance pharmacological treatment strategies. Contrary to expectations, there was no overall difference in outcomes associated with either of the two family management conditions, and no family management by medication interaction effects on outcome (Schooler *et al*, 1997). However, the overall relapse rate for subjects in the active medication conditions was only 25% at the 2-year point, suggesting that exposure to family interventions made an appreciable contribution to the effects of the medication on clinical outcome.

The TSS study design did not include a family control condition, which might have shed more light on the specific effects of family intervention. Consequently, we conducted ancillary assessments in order to tease apart the contribution of the two family management approaches and to evaluate the effects of the extensive training in communication and problem-solving skills included in the behavioural condition. Patients and family members participated in a structured interaction, the Family Problem Solving Task (FPST), at each major assessment point. Developed by Bellack *et al* (1990, 1996), the FPST provides a standardised, reliable sample of patient and family behaviour during two 10-minute problem-solving discussions. The sample is subsequently coded to examine the occurrence of specific behaviour taught during home visits and/or thought to have an important effect on patient outcome. The following questions were addressed.

(a) Did patients and family members in the behavioural family management condition learn the interpersonal skills targeted in treatment?

(b) Did patients and family members in the family control condition change their

communication and problem-solving styles during the course of treatment?

(c) Did improved communication and problem solving lead to a better outcome for the patient?

METHOD

TSS study design

Subject inclusion criteria were: DSM–III–R (American Psychiatric Association, 1987) schizophrenia, schizoaffective disorder or schizophreniform disorder; age between 18 and 55 years; having at least 4 h per week of face-to-face contact with the family of origin or a family member serving *in loco parentis*; and informed consent provided by both the patient and at least one family member. Exclusion criteria included pregnancy, epilepsy and drug or alcohol dependence. Patients were recruited during an acute episode of illness, after which their family members were invited to attend a multiple family psychoeducation workshop modelled after the Survival Skills Workshop developed by Anderson *et al* (1986). Patients then were assigned randomly to one of the two family management conditions, Applied Family Management (AFM) or Supportive Family Management (SFM). They then entered a 6-month (maximum) 'stabilisation' period, followed by randomisation to one of three maintenance pharmacological treatment strategies: standard dose (12.5–50 mg) fluphenazine decanoate, low-dose (2.5–10 mg) fluphenazine decanoate or targeted dose (placebo injections). The reader is referred to Schooler *et al* (1997) for a more complete description of the procedure and for the results of the trial.

The AFM intervention was modelled after Falloon's Behavioural Family Therapy (BFT; Falloon *et al*, 1982, 1984). This is a manual-driven approach that provides structured training in communication and problem-solving skills that are intended to reduce family conflict, increase the ability of family members to communicate in a non-hostile manner and to assist all family members in achieving life goals. It was conducted in the home for 13 weekly sessions, followed by 13 bi-weekly sessions and then monthly sessions until 1 year after the patient had completed stabilisation. In addition, patients and family members were invited to attend monthly, multiple family support group meetings throughout the 2-year trial, and they received case

management as needed. The SFM condition included monthly multiple family group meetings and case management as needed throughout the 2-year study period. Separate group meetings were held for participants in the two family management conditions.

Subjects

A total of 528 patients entered the TSS study. The current project was initiated some time after the TSS study began, and 265 families had already been enrolled. In addition, some FPSTs could not be coded due to technical problems or procedural errors, and some families were not assessed at all time points. This paper focuses on 77 cases who provided codable data at the baseline and 1-year assessments (i.e. the conclusion of the home visit portion of the AFM intervention). These 77 cases are highly representative of the entire TSS sample. There were no significant differences between patients in this sample and the remaining cohort on gender, age, race, severity of illness, number of hospitalisations in the previous 12 months or age of first psychiatric treatment (see Table 1). The FPST was conducted with the patient and the parent or family member who

served *in loco parentis*. In 68% of the cases that person was the mother and in 11% it was the father. Family members in the cohort of 77 were comparable to those in the full sample on most demographic characteristics, but they had higher education and occupational achievement, differences that should favour the highly verbal approach taught in the AFM condition.

Family Problem Solving Task

The primary measure of family communication was the FPST: a structured conversational interaction that is videotaped for subsequent coding on a variety of specific behavioural categories. Following a warm-up activity designed to acclimatise the dyad to problem-oriented discussion on videotape, a family problem identified by either the patient or family member in a prior interview was presented for discussion by a research assistant, who directed the dyad to discuss the issue and attempt to reach some resolution. After 10 minutes of discussion, a second problem was presented and the procedure was repeated. The FPST procedure draws on similar behavioural observation assessment strategies used by Bellack (Bellack *et al*, 1990), Goldstein and colleagues (Miklowitz *et al*, 1984;

Table 1 Demographic and clinical characteristics of subjects by intervention group

	Applied Family Management (n=43)	Supportive Family Management (n=34)	All other TSS subjects (n=236)
Age, years (mean (s.d.))	31.3 (8.3)	27.1 (6.4)	29.6 (7.3)
Gender (n male (%))	29 (67)	27 (79)	151 (64)
Race (n, %)			
Caucasian	21 (48.8)	15 (44.1)	88 (37.3)
African–American	19 (44.2)	15 (44.1)	123 (52.1)
Other	3 (7)	4 (11.8)	25 (10.6)
Marital status (n, %)			
Never married	34 (79.1)	30 (88.2)	192 (75.4)
Educational achievement			
College graduate	22 (52)	14 (41)	86 (36.4)
High school graduate	14 (33)	14 (41)	79 (33.5)
< High school graduate	7 (16)	6 (18)	71 (30.1)
Previous hospitalisations (n, %)			
None	13 (30.2)	12 (35.3)	59 (25.0)
One or more	30 (69.8)	22 (64.7)	177 (75.0)
BPRS total score (mean (s.d.))	38.8 (11.6)	37.7 (10.5)	38.1 (10.5)
BPRS psychotic scale (mean (s.d.))	2.3 (1.4)	2.5 (1.0)	2.4 (1.2)
SANS total score (mean (s.d.))	11.9 (3.1)	11.9 (4.0)	11.8 (3.8)

TSS, Treatment Strategies in Schizophrenia; BPRS, Brief Psychiatric Rating Scale; SANS, Scale for the Assessment of Negative Symptoms.

Doane *et al*, 1985) and others. Miklowitz *et al* (1984) and Strachan *et al* (1986) found that there were significant differences in the way parents with high and low expressed emotion (EE) responded to their offspring with schizophrenia on this type of task, and the general procedure has been shown to differentiate distressed from non-distressed families and to be sensitive to treatment effects.

Staff training

Staff who administered the FPST at the five TSS sites all received extensive training from the first author (A.S.B.) via a two-day workshop, pilot cases and conference calls. Each research assistant was 'certified' as meeting the criterion on the task before conducting assessments on protocol cases. Videotapes from each research assistant were reviewed by A.S.B. on a regular basis throughout the project to ensure continued procedural standardisation.

Behavioural coding

The FPST coding system was designed to address the three major dimensions that were a primary focus of treatment: communication skills; problem-solving behaviour taught in the AFM treatment; and critical and overinvolved behaviour (as per the concept of high EE) associated with relapse in schizophrenia. The system included 12 behaviours coded using a 30-second time-sampling system and 7 global ratings based on five-point Likert-type scales for each 10-minute discussion.

Separate principal component analyses were conducted on data from all patients and family members who participated in the FPST assessments at any one of the time points: baseline, 1 year or 2 years. Three equivalent factors were identified for each group of speakers (patients and family members) across each assessment point: criticality/intrusiveness; communication effectiveness; and problem-solving skills. In order to limit the number of statistical tests, all subsequent analyses were conducted on these six factor scores (three for patients and three for family members). The reader is referred to Bellack *et al* (1996) for behavioural definitions of the component codes, data on the individual behaviours and factor loadings.

Reliability and validity of the FPST

A complete report on the reliability and validity of the FPST in the complete TSS sample is presented in Bellack *et al* (1996). There was high interrater agreement for the behavioural coding: intracluster correlation coefficients and κ values on 25% of the sample were in the ranges 0.62–0.82 and 0.61–0.89, respectively. The data provided considerable support for the internal consistency and construct validity of the coding system, and there was evidence of good concurrent validity for behaviour exhibited during the FPST discussions. Notably, critical and intrusive behaviours expressed by relatives during the FPST were significantly correlated with criticism and hostility about the patient expressed during Camberwell Family Interviews (CFIs; Mueser *et al*, 1993) and subjective ratings of burden and feelings of rejection toward the patient expressed in an interview about the patient's social behaviour.

RESULTS

Treatment group comparisons at baseline

Demographic characteristics of the sample for this trial are presented in Table 1. There were no differences between the two family management groups in terms of gender, race/ethnicity, marital status, educational attainment or occupational status of subjects. Patients in the SFM condition were younger (mean age 27.2 years) than patients in the AFM condition (mean age 31.3 years) (F (1,59)=4.11, P=0.05). The two groups were, in general, equivalent in terms of the socio-economic status of the patient's family of origin, although mothers of subjects assigned to the AFM condition had a lower mean level of occupational achievement than did the mothers of subjects assigned to the SFM condition (F (1,56)=6.94, P=0.01).

Subjects in the two groups were equivalent in terms of ratings of global severity of illness (Clinical Global Impression, CGI; Guy, 1976), severity of negative symptoms (total of global items on the Scale for the Assessment of Negative Symptoms (SANS; Andreason, 1981)) and severity of psychotic symptoms (psychotic symptom scale from the Brief Psychiatric Rating Scale, BPRS; Overall & Gorham, 1962), age at onset and number of hospitalisations during the prior 12 months. There were no significant differences between the groups in the amount of face-to-face or telephone contact

between patient and family in the year prior to entry into the study. There were no significant differences between the two treatment groups on any of the composite measures of communication at baseline (for either the patient or family member).

Change in communication patterns over time

We had a number of a priori hypotheses about the effects of family management on communication and the relationship of changes in communication patterns to outcome, but we did not have specific predictions about the impact of medication condition or the family by medication interaction. Consequently, we used a protected α level of 0.01 to interpret any result involving the medication factor.

Treatment effects on communication

A series of $2 \times 3 \times 2$ (family management × medication condition × time) repeated measures analyses of variance were conducted separately for patients and family members in order to examine the effects of the treatments on communication from baseline to 1 year. As summarised in Table 2, there were no significant main effects of family management, medication strategy or time for either the patient or family member on any of the three communication variables, and only one interaction effect approached the $P < 0.01$ criterion for statistical significance: the three-way interaction of family management, medication treatment and time on non-constructive criticism/intrusiveness (F (71,2)=4.48, $P < 0.02$). Evaluation of the interaction via *post hoc* analyses did not identify any predicted or consistent direction of effects among the three variables.

Attendance at AFM sessions and change in communication

One possible explanation for the lack of an AFM treatment effect could be poor attendance at home visits. Overall, attendance was very good, with a mean of 24 sessions attended out of a possible maximum of 32. A series of Pearson correlations were conducted between attendance of patients and family members and change in each communication composite. The correlations ranged from 0.01 to -0.28, with none reaching significance at the $P < 0.05$ level.

Table 2 Multivariate effects for repeated measures analysis of variance for family × medication × time on communication composites for patient and family member subjects

Effect	Non-constructive criticism/intrusiveness	Problem solving	Communication effectiveness
Patient			
Time effect	$F(1,71)=3.25; P<0.08$	$F(1,71)=0.278; P>0.6$	$F(1,71)=4.93; P<0.03$
Family × time	$F(1,71)=0.22; P>0.6$	$F(1,71)=0.841; P>0.3$	$F(1,71)=0.50; P>0.8$
Medication × time	$F(1,71)=0.60; P>0.5$	$F(1,71)=1.86; P>0.1$	$F(1,71)=0.44; P>0.6$
Family × medication × time	$F(2,71)=4.48; P<0.02$	$F(2,71)=0.369; P>0.6$	$F(2,71)=0.39; P>0.6$
Family member			
Time effect	$F(1,71)=0.21; P>0.6$	$F(1,71)=0.096; P>0.7$	$F(1,71)=3.64; P<0.06$
Family × time	$F(1,71)=0.76; P>0.3$	$F(1,71)=0.431; P>0.8$	$F(1,71)=0.46; P>0.8$
Medication × time	$F(1,71)=0.86; P>0.4$	$F(1,71)=2.45; P<0.1$	$F(1,71)=0.85; P>0.4$
Family × medication × time	$F(2,71)=0.22; P>0.8$	$F(2,71)=0.361; P>0.6$	$F(2,71)=0.23; P>0.7$

Moderator effects of symptomatology on communication

To ascertain whether symptom severity influenced outcome on the communication measures, we conducted a series of six analyses of variance and covariance, with each of the communication composite change indices (computed as deviation scores by regressing the baseline value for the composite on the 1-year value for the same measure) serving as the dependent variables. For each of these analyses, medication condition and family management served as the independent variables and baseline symptom measures were the covariates. There were no direct or moderator effects of overall psychopathology (total BPRS), positive symptoms (BPRS psychotic symptom scale) or negative symptoms (total SANS) on any of the patient or family communication composites ($F(1,68)=0.11–3.11, P>0.05$).

Clinical outcome

Time to rehospitalisation and time to first use of supplemental medication

There were two primary clinical outcome variables evaluated in the TSS study: time from initiation of double-blind medication to rehospitalisation; and time to first use of supplemental (rescue) medication. We examined the contribution of treatment and each of the communication indices to variance on each of these outcome variables using Cox regression analyses. Two dummy drug variables (indexing the contrast of the low dose versus the other two drug conditions and the standard dose versus the other two drug conditions) were entered in the first step, along with the family management assignment variable. Standard dose predicted longer time to rehospitalisation (Wald=5.35, d.f.=1, $P<0.02$). All six communication variables were then forced into the equation on the second step. None of the communication variables predicted time to rehospitalisation, and standard medication dose continued to predict time to rehospitalisation (Wald=4.02, d.f.=1, $P<0.04$). A similar pattern was found in logistic analyses conducted on time to first use of supplemental (rescue) medication. Each of the two active drug treatment strategies predicted time to first use of supplemental medication (Wald=12.02, d.f.=1, $P<0.001$, and Wald=8.35, d.f.=1, $P<0.004$ for each variable). Neither family management nor communication composites predicted outcome on this index.

Symptomatology

A series of hierarchical multiple regression analyses were also conducted to evaluate the contribution of treatment and each of the communication measures to clinical outcome on key clinical symptomatology measures, including overall psychopathology (total BPRS) and psychoticism (BPRS psychotic symptom scale). Both drug and family treatment accounted for significant amounts of variance in symptom outcomes, but neither patient nor family communication variables predicted outcome at 1 year on any of the three symptomatology measures.

Family constellation and face-to-face patient contact

To ascertain whether patients in families led by a single parent (mother only) experienced worse outcomes, a dichotomous (single mother v. family member) variable was entered along with the three treatment variables and the family communication variables in a second set of regression analyses. Family constellation did not contribute significantly to outcome. The mean number of hours of face-to-face contact per week between family and patients in the year prior to study entry were 37.3 (s.d.=30.7) and 40.9 (s.d.=26.5) for the AFM and SFM groups, respectively. This difference was not significant and amount of contact was not associated significantly with outcome.

DISCUSSION

We had expected the AFM condition to be more effective than SFM, given its greater intensity, the inclusion of home visits and the focused communication training, which had been shown to be effective in other studies. We had also hypothesised that its effects would be mediated by improved communication and problem solving. Neither of these hypotheses was supported. The AFM condition did not result in better outcomes than SFM on any of the primary outcome measures that were evaluated (Schooler et al, 1997). The data reported here indicate that AFM also did not have a greater effect than SFM on its primary targets: there were no group differences in acquisition of communication skills for either patients or family. In addition, the results indicate that the behaviours targeted were not associated with relapse or clinical status outcomes.

Potential limitations

These unexpected findings raise two questions about the internal validity of our investigation. Was the FPST a valid technique for examining communication patterns? Did TSS provide a fair test of AFM? Although there are legitimate questions about the extent to which any analogue assessment procedure accurately represents *in vivo* behaviour, measures of this type generally reflect the *most skillful performance* that subjects can manifest (Bellack, 1979; Bellack *et al*, 1990). It would be expected that interactions at home would be characterised by greater stress and conflict and less inhibition than the structured, videotaped interactions in the clinic. Consequently, both parents and patients would be less likely to use the controlled, highly verbal AFM strategies outside of the clinic than they would be to use them during the FPST assessment. Moreover, the FPST was based on widely used procedures that have demonstrated construct and concurrent validity in other studies (e.g. Doane *et al*, 1985; Miklowitz *et al*, 1989; Mueser *et al*, 1993).

The second question about internal validity concerns how effectively AFM was administered. As discussed above, several steps were taken to ensure the competence of clinicians and their adherence to the protocol (Falloon *et al*, 1996). The intervention was guided by a detailed manual developed by Falloon and McGill. They conducted an initial training workshop with all clinicians and their on-site supervisors, and periodic follow-up workshops thereafter. Falloon or McGill certified the competence of each clinician before he or she was authorised to begin treating the protocol families. Clinicians received ongoing supervision from an on-site supervisor and participated in monthly conference calls with Falloon or McGill, who reviewed videotapes of sessions throughout the project. Liberman & Mintz (1998) argued that the trial was limited by the fact that most clinicians were not experienced behaviour therapists. However, it should be noted that the AFM intervention at the Philadelphia site was directed and supervised by A.S.B. and Kim Mueser, two highly experienced behaviour therapists who had expected AFM to produce better outcomes than SFM. Yet, there was no site effect or other indication that AFM had a greater impact on outcome or communication in Philadelphia. New interventions often are more effective in the hands of the originators than in other settings. The TSS project may not represent the *best possible* outcomes for the behavioural approach, but it can be viewed as a *best case* evaluation of effectiveness that can be achieved with careful dissemination.

Implications

Given that this study did have adequate internal validity, the findings have important implications for both the content of family interventions and for understanding the role of family communication patterns in outcome. First, AFM and, by implication, Falloon's BFT did have a demonstrable clinical benefit. However, the benefits were associated with aspects of the procedure that were in common with the less intensive SFM, not to the home visits or communication training. Given the cost of these components of AFM, the overall equivalence of the two family interventions argues against their use. Moreover, the interaction data reported in this paper lead us to question the value of the focused communication and problem-solving training, even if it could be implemented in a more cost-efficient manner. Most families either did not learn the skills or did not apply them, and improved communication did not result in better outcomes.

Consistent with our findings, several recent reviews and clinical trials have raised questions about the mechanism of action of family interventions and the importance of behavioural skills training (Halford, 1991; Penn & Mueser, 1996; Dixon *et al*, 2000). Tarrier *et al* (1988) did find superior patient outcomes with two variations of a behavioural approach compared to family education and routine treatment. However, the educational intervention consisted of only two sessions, and the advantage of the behavioural approach was limited to patients coming from families with high EE. In line with our findings, Zastowny *et al* (1992) did not find a behavioural approach to be superior to another active family intervention.

Expressed emotion has been shown to be a reliable indicator of risk of relapse, and reductions in EE are often associated with good treatment outcome, especially in families with high levels of face-to-face contact with the patient. However, the construct is also viewed as a form of stigma by many families, and its utility is limited by its dependence on the CFI. Consequently, TSS was not designed as an EE study. We did not assess EE or limit the sample to families with high levels of ongoing face-to-face contact between patients and relatives with high EE. As pointed out by one of the reviewers of this paper, the results may have been different if we had restricted the sample to such families and caution is advised in generalising from our study to that particular high-risk population. Conversely, Leff *et al* (1989) failed to find an advantage for the behavioural approach even with families with high EE and high contact, and recent findings have raised questions about whether EE is a correlate of the patient's symptomatology or a reflection of parental attributions about the patient, rather than a 'marker' for meaningful parent–parent exchanges that play a central role in influencing the long-term course of schizophrenia (Halford, 1991; Barrowclough *et al*, 1994; Weardon *et al*, 2000). With the exception of McFarlane's multiple family approach (McFarlane *et al*, 1995), there is no evidence that any particular family approach is superior to another (Baucom *et al*, 1998; Dixon *et al*, 2000). Further research is required to explicate how family interventions produce their beneficial effects and to understand better the role of EE in relation to clinical improvement in the patient. In the interim, there seems to be little justification for the expense of including extensive communication training within a supportive psychoeducational family intervention.

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CLINICAL IMPLICATIONS

- Behavioural family interventions may not be effective in altering communication within the family.

- Psychoeducational family interventions need not produce changes in communication patterns to be effective.

- Home visits are not a cost-efficient addition to family psychoeducation and support.

LIMITATIONS

- These findings may not apply to families with high expressed emotion and high levels of face-to-face contact between patients and family.

- The sample of patients and families in the Treatment Strategies in Schizophrenia study may not be fully representative of patients with schizophrenia in the community.

- The analogue task used to assess communication does not completely reflect family interactions in the home.

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