

Relatives' Expressed Emotion and the Course of Schizophrenia in Chandigarh A Two-Year Follow-up of a First-Contact Sample

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A two-year follow-up was conducted of a subsample of the Chandigarh cohort of first-contact schizophrenic patients from the WHO Determinants of Outcome project. The patients were those living with family members who had been interviewed initially to determine their levels of expressed emotion (EE). The interview was repeated for 74% of the relatives at one-year follow-up. A dramatic reduction had occurred in each of the EE components and in the global index. No rural relative was rated as high EE at follow-up. Of the patients included in the one-year follow-up, 86% were followed for two years. In contrast to the one-year findings, the global EE index at initial interview did not predict relapse of schizophrenia over the subsequent two years. However, there was a significant association between initial hostility and subsequent relapse. The better outcome of this cohort of schizophrenic patients compared with samples from the West is partly attributable to tolerance and acceptance by family members.

In an earlier series of papers we reported on a study of relatives' expressed emotion (EE) in a Hindi-speaking population in Chandigarh, north India (Wig *et al*, 1987a,b; Leff *et al*, 1987). This was a sub-study of the Determinants of Outcome project of the World Health Organization (WHO), and was aimed at elucidating causes for the better outcome for schizophrenic patients in north India, revealed by the two-year follow-up of the International Pilot Study of Schizophrenia (World Health Organization, 1979). The project on Determinants of Outcome of Severe Mental Disorder is a prospective epidemiological, clinical, and social study of schizophrenia and related conditions in different cultures, coordinated by the WHO in Geneva. The study is financed jointly by the WHO, the US National Institutes of Mental Health, and 12 field research centres (FRCs) in Aarhus (Denmark), Agra and Chandigarh (India), Cali (Columbia), Dublin (Ireland), Honolulu and Rochester (USA), Ibadan (Nigeria), Moscow (USSR), Nagasaki (Japan), Nottingham (UK), and Prague (Czechoslovakia). All the FRCs participated in a 'core' epidemiological and clinical study, a preliminary report on which has been published (Sartorius *et al*, 1986).

The FRCs in Aarhus and Chandigarh undertook a sub-study of the association between relatives' EE and the course of schizophrenia. Unfortunately, too few patients in Aarhus remained with their families to make an analysis of follow-up data worthwhile. However, a one-year follow-up of the Chandigarh patients showed that when the same criteria as used

in previous Anglo-American studies were employed to categorise households as high EE, a significant relationship with relapse emerged ($P=0.035$). A significant result was found only when the broadest diagnostic grouping was utilised, namely a centre diagnosis of schizophrenia ($n=70$). If the narrower diagnostic group of CATEGO classes S, O and P (Wing *et al*, 1974) was used ($n=49$), the association between EE and relapse was no longer significant (Leff *et al*, 1987).

Compared with the families of first-admitted schizophrenic patients in London, the families of Chandigarh patients showed a significantly lower proportion with high-EE ratings ($P<0.005$). Thus, these findings suggested that the better outcome for schizophrenia in north India might be partly attributable to the greater tolerance of relatives for the illness and its associated disabilities.

A two-year follow-up was incorporated in the design of the Determinants of Outcome project and was successfully carried out in the Chandigarh FRC. Furthermore most relatives in the EE sub-study were administered the Camberwell Family Interview (CFI; Vaughn & Leff, 1976) at the one-year follow-up, allowing a second rating of EE to be made. In this paper we present data from the one-year follow-up of relatives' EE and the two-year clinical follow-up of schizophrenia in the Chandigarh FRC.

Method

This was described in detail by Leff *et al* (1987), and is only briefly summarised here. Patients from the 'core' study

were included in the EE sub-study if they were living with at least one key relative with whom they maintained daily face-to-face contact. Of the 207 patients included in the 'core' study, 78 with a centre diagnosis of schizophrenia entered the EE sub-study. The CFI was administered to relatives by two Hindi-speaking field workers, a psychologist (DKM), and a social anthropologist (HB). Regular checks were made on the inter-rater reliability of their EE ratings, which remained at a satisfactorily high level.

Following an initial course of treatment, which was on an out-patient basis for 88% of the sample, almost every patient was seen monthly over the two years of follow-up. At each visit a condensed form of the Present State Examination (PSE; Wing *et al*, 1974) was administered, the clinician focusing on symptoms rated as present during the index episode. These records were scrutinised by an independent researcher (JL) who was blind to the EE ratings of relatives and who decided whether a relapse had occurred during the two-year follow-up. Relapse was defined as a reappearance of schizophrenic symptoms in a patient who had been free of them following the initial episode (type I), or the exacerbation of persistent schizophrenic symptoms (type II). Once a relapse was noted, the records were not examined for subsequent relapses. A few patients (9%) failed to show any improvement in the schizophrenic symptoms they exhibited in the index episode. They were excluded from consideration in the follow-up analysis because of the difficulty of making a judgement about relapse. However, their relatives were reinterviewed with the CFI after one year, and these data are of some interest.

The various assessments conducted at different times were:

- (a) at initial contact, clinical assessment and CFI
- (b) at one-year follow-up, clinical assessment and CFI
- (c) at two-year follow-up, clinical assessment.

For a small number of patients followed up clinically at two years the CFI was not conducted on their relatives at one year, while other patients had moved residence since the second CFI. Consequently the numbers of subjects in the EE and clinical data do not always coincide.

Results

Attrition of sample

By the end of the first year of follow-up, eight of the original 78 patients with a centre diagnosis of schizophrenia had been excluded: six had persistent florid symptoms, one died, and one moved to another household. During the second year of follow-up, patients were also excluded if they went to live alone or with other kin whose EE level had not been determined. An exception was made for a patient who married in month 23 and moved out in month 24.

Six patients were excluded on the above grounds, and a further four patients were lost to follow-up. There remained 60 patients with a centre diagnosis of schizophrenia for whom two-year follow-up data were obtained. These represent 77% of the original 78 patients, and 86% of those included in the one-year follow-up.

TABLE I
Changes in EE ratings from initial CFI to one-year follow-up

	Initially	Follow-up
Critical comments (mean)	2.10	0.97*
Hostility (% of relatives)	18%	5%*
Overinvolvement (mean)	0.38	0.17*
Warmth (mean)	2.14	0.51*
Positive remarks (mean)	0.77	0.24*
High EE (% of relatives)	25%	9%*

* $P < 0.01$.

One-year follow-up of EE ratings

The CFI was repeated for the majority (77 of 104) of the original relatives at one year. The changes in EE ratings are shown in Table I. It is noteworthy that no rural relative was rated as high EE at follow-up compared with seven out of 56 (12.5%) urban relatives (Fisher's exact test, $P = 0.048$).

A highly significant reduction occurred in each of the components and in the EE index. This diminution affected both negative and positive aspects of EE, and its extent can be appreciated by considering the number of relatives who were rated zero on all five component EE scales. Such a pattern has rarely, if ever, been encountered in the research on Anglo-American families, either at initial assessment or at follow-up. In the Chandigarh sample, five zeros were scored by two out of the 77 relatives at the initial assessment and by 31 at one year. This remarkable change in ratings demands an explanation.

Brown *et al* (1972) conducted a follow-up assessment of EE after nine months and found that about one-third of the relatives had changed from high to low on critical comments. There was relatively little alteration in scores of overinvolvement. This has been confirmed by the studies of therapeutic intervention in families of schizophrenic patients (e.g. Leff *et al*, 1982) which have shown that critical comments decline spontaneously in some control families, while overinvolvement is relatively stable.

In the Chandigarh sample, 15 (79%) out of 19 relatives had dropped from high to low EE by the one-year follow-up, a much higher proportion than in any of the Anglo-American studies. The possibility was entertained that this marked drop in criticism might be because critical comments were focused on the acute symptoms of schizophrenia, unlike those of British relatives. To check this a content analysis of the first 100 critical comments rated in the study was performed.

Critical comments were classified on the basis of their content as either 0 (focused on acute symptoms or illness-related behaviour) or 1 (directed at long-standing behaviour or personality attributes). It was found that 75% of comments were concerned with long-standing behaviour not obviously a consequence of illness. This is comparable with the British finding of 70% of comments critical of long-standing behaviour (Leff & Vaughn, 1985). Hence the focus of criticism fails to explain the drastic reduction in critical attitudes in this study.

Relatives who became less critical or hostile

It was considered that a better understanding of these changes in EE might be gained by studying the comments made by relatives who became less critical, or lost their hostility over the one-year follow-up. Some verbatim statements made by relatives during the repeat CFI follow.

Patient no. 113. Relative: mother. Critical comments reduced from 11 to 0. "She spends most of her day at home. She gets up late in the morning. Occasionally she gets irritable with her brothers but I make her understand that she should not do that. It's only when she gets irritable over something that she becomes quarrelsome. I don't get angry with her. I am satisfied that she has become alright after treatment."

Patient no. 120. Relative: mother. Critical comments reduced from 7 to 1. Asked about household tasks: "We don't expect him to do anything. We want that he should become alright, then he will do them by himself. We get along well with each other. Sometimes we get irritable but then cool down."

Patient no. 164. Relative: father. Critical comments reduced from 3 to 2, hostility from 1 to 0. Patient continuously psychotic for the year. "We cannot say that he is perfectly alright. Previously he used to indulge in arguments very frequently but now he does not do that. Previously we also used to lose temper with him but now we talk to him with love and affection and that this thing is good for you. There is nothing wrong with him now. Only when he loses his temper he talks like that."

Patient no. 224. Relative: wife. Critical comments reduced from 5 to 1, hostility from 1 to 0. Patient showed a slow recovery of psychotic symptoms and persistent negative symptoms. "He used to be irritable earlier but now it is much less. Nowadays he is quite alright. There is about 80% improvement. Now I have adjusted myself to him since I have come to know about his illness. There is no difficulty in living with him. His behaviour has completely changed now. He talks very little."

These extracts illustrate considerable acceptance of both negative and positive symptoms. The relatives concerned seem to have come to terms with the fact that the patients suffer from an illness and consequently no longer blame them for difficult behaviour. They also seem to have learned not to be provoked by the patient's irritability into becoming angry.

The change in attitude to the patient's responsibility for disturbed behaviour is particularly salient with respect to hostility. One of the questions asked of relatives concerns their attribution of responsibility or control. Responses to this question were available for 40 of the relatives in the EE sub-study. Only four of these ascribed partial or total responsibility for the illness to the patient. Three were among the eight relatives expressing hostility, while only one was among the 32 non-hostile relatives, a significant difference (Fisher's exact test, $P=0.02$). Hence hostile attitudes are closely linked to the relative's belief that the

patient bears responsibility for the disturbed behaviour accompanying a schizophrenic episode.

Relapse

Twelve patients relapsed during the second year of follow-up, a rate of 20%. When these are added to the ten patients who relapsed over the first year, the rate over two years becomes 22 out of 60 (37%).

Relationships between EE components and relapse

A basic assumption in this body of research is that a CFI conducted with a relative at a time of crisis elicits emotional attitudes that reflect the relative's behaviour towards the patient over long periods of time. This assumption is supported by the robust association established between EE and the course of schizophrenia. Once the crisis of admission to hospital has passed, a substantial proportion of relatives in Western studies show a reduction in critical comments (e.g. Brown *et al*, 1972). Hence, EE ratings made when the patient is in remission are much less likely to predict subsequent relapse (McCreadie & Phillips, 1988). In view of the dramatic reduction in the EE ratings of Chandigarh relatives in the first year of follow-up, we would not expect the ratings at one year to be associated with relapse over the second year of follow-up. Indeed, there is no such significant association. However, Leff & Vaughn (1981) found that EE measured shortly after a patient's admission predicted relapse of schizophrenia over two years after discharge. Therefore this association was examined for the Chandigarh patients.

As in the one-year follow-up, we examine the relationship between the individual components of EE and relapse over two years before proceeding to the composite EE index.

TABLE II
Relationship between EE components and relapse of schizophrenia over two years

	No. of patients well	No. of patients relapsed	% relapse
No. of critical comments			
6+	3	4	57
<6	37	16	30
Hostility			
present	3	6	67*
absent	35	16	31
Overinvolvement score			
3+	3	1	25
<3	35	21	38
Warmth			
4+	11	3	21
<4	27	19	41
EE index			
high	7	7	50
low	31	15	33

* $P=0.043$, other differences relapsed v. well not significant.

We adopted the convention used in the Anglo-American studies that where two relatives in one household have been assessed for EE, the higher rating on each component is used to analyse the relationship with relapse.

Regrettably, the four patients lost to follow-up included two who lived with relatives who were initially rated as high on critical comments, and who also exhibited hostility. Thus the small proportion of households initially categorised as high EE was further reduced for the two-year follow-up. The relevant data are displayed in Table II, in which significance has been appraised with Fisher's exact test.

Although the difference in relapse rates is in the expected direction for critical comments and warmth, and for the EE index, in no case is it statistically significant. Only for hostility does a significant difference in relapse rates appear. At this point it is worth noting that for the one-year follow-up data, hostility was the only EE component significantly associated with relapse, although by contrast with the present findings the overall EE index was also significantly related to relapse.

Influence of other factors on relapse

In the one-year follow-up, sex, marital status, and urban domicile were not significantly related to relapse. However, CATEGO class exerted a significant effect; patients assigned to an S+ class (at least one Schneiderian first-rank symptom present) had a worse outcome than other patients. This association was re-examined for the two-year follow-up data and was found to be no longer significant, 46% of S+ patients relapsing compared with 27% of the others ($\chi^2 = 2.63$, NS).

CATEGO 0? class, which was on the borderline of a significant relationship with relapse for the one-year follow-up, remains so for the two-year follow-up data ($\chi^2 = 3.78$, NS).

The role of maintenance neuroleptic drugs in prevention of relapse was examined for patients who were free of relapse at one year. Patients were considered to be on regular maintenance neuroleptics if the records indicated that they had taken them continuously in the second year, without an interruption of more than two months at a stretch. Only six out of 55 patients fulfilled this criterion, indicating that neuroleptic drugs played an insignificant role in the after-care of this sample of patients.

Discussion

The global EE index was significantly related to the one-year relapse rate of this first contact, geographically based sample of schizophrenic patients, but for the two-year data this relationship had attenuated and lost its significance. However, the presence of hostility, which was the major contributor to the high-EE group of relatives, remained significantly associated with relapse for both the one-year and the two-year follow-up. Hostility is rated as present if the relative shows a generalisation of criticism and/or a rejecting attitude

towards the patient. All but one of the hostile relatives in this study confined themselves to a generalisation of criticism. The single exception also exhibited a rejecting attitude.

We noted in an earlier paper (Wig *et al*, 1987b) that hostility in the Chandigarh sample of relatives was the only negative component of EE that was as common as in British and Danish relatives. In fact, it was present in 16% of Chandigarh relatives and 15% of relatives in the Northwick Park study of first-onset schizophrenia (MacMillan *et al*, 1986). In one respect it was unlike hostility rated in the European and American EE studies, in that it was not invariably associated with high levels of criticism. Indeed, the modal number of critical comments coexisting with hostility among Chandigarh relatives was 3 (range 1–1). Six relatives expressed hostility while scoring below the threshold on critical comments. It is likely that hostility is subject to different social constraints in Indian as opposed to American and European cultures, and this topic merits study. The fact that among Chandigarh relatives hostility was significantly associated with the belief that patients had control over or responsibility for their disturbed behaviour, suggests that it would be fruitful to inquire into their attributional style.

There are two other published naturalistic studies of relatives' EE and the course of schizophrenia over two years, those by Leff & Vaughn (1981) and MacMillan *et al* (1986). In both studies relatives' EE was found to be significantly related to the relapse rate at two years, although controversy surrounds the role of mediating factors in the latter study (Leff & Vaughn, 1986). The failure of the global EE index to predict relapse over two years in the Chandigarh sample might be ascribed to the dramatic reduction in all EE components by one year after the episode of inclusion, an exceptional finding in this area of research. However, this explanation cannot be correct since hostility at initial assessment predicts relapse over two years, even though it is virtually undetectable at one year.

There are two possible explanations for this. It could be, as argued above, that it is only at a time of crisis that EE ratings accurately reflect relatives' ongoing behaviour. The initial rating of hostility would then indicate continuing behaviour inimical to the patient's psychological state, even though this was not detected by the CFI at one year. An alternative explanation is that the relatives' hostility is elicited by some characteristic of the patients which also renders them more vulnerable to subsequent relapse. It was to test these opposing hypotheses that

we initiated trials of intervention in high EE families. These trials (Leff *et al*, 1982, 1985, 1989) provided evidence in support of a direct influence of relatives' EE on the course of schizophrenia, and hence favour the former explanation.

We cannot explain why hostility should have emerged as the key EE component in these Indian families. An explanation should be sought in the nature of emotional relationships within this culture. However, we would emphasise the remarkable tolerance for and acceptance of both the positive and negative symptoms of schizophrenia that our findings imply. It is noteworthy that two relatives lost their hostility over the course of a year even though the patients suffered from unremitting florid symptoms. Acceptance of a similar nature was shown by Mexican-American relatives in the study by Jenkins *et al* (1986). Relatives' comments quoted in their work are very similar to the verbatim statements by Chandigarh relatives reported above. Jenkins *et al* drew attention to a number of factors that determine a low-EE response among Mexican-American relatives. Three of these seem to be particularly pertinent to Chandigarh relatives, namely: (a) a view of the problem as a serious, legitimate illness outside of the patient's locus of control, (b) styles of coping with troublesome behaviour in a manner which avoids arguments or confrontations, and (c) large kin-based households and networks in which the importance of family bonds induces relatives to assume responsibility for the patient's care and recovery.

In fact the proportion of Mexican-American relatives rated as high EE was 31%, almost identical to the figure of 30% for urban relatives in Chandigarh, although rural relatives were rated much lower at 8% (Wig *et al*, 1987*b*). No rural relative was categorised as high EE at the one-year follow-up.

Given the acceptance by Chandigarh relatives of the symptoms of schizophrenia, is the two-year outcome of this sample of patients better than that of a comparable sample from the West? Unfortunately, it is difficult to find a directly comparable sample. The study of Leff & Vaughn (1981) included first admissions and readmissions, which introduces a bias towards a poorer outcome, and furthermore was not epidemiologically based. The other centres in the WHO Determinants of Outcome project did not separate patients into those living with families and those living alone in the presentation of outcome data (Sartorius *et al*, 1986). The closest is the Northwick Park study, which included first-admitted patients living with relatives, although it was not strictly based on a defined catchment-area population (MacMillan *et al*, 1986).

The two-year relapse rate for patients living with relatives in the Northwick Park study was 40 out of 77 (52%). The comparable rate for the Chandigarh sample was 22 out of 60 (37%), which is substantially lower. The lower relapse rate of Chandigarh patients cannot be fully explained by the effect of hostility because only two of the 12 patients who relapsed over the second year of follow-up lived with initially hostile relatives. The other ten patients who relapsed were in households which were initially low EE. A substantial proportion of these relapses may well have been precipitated by life events, since Leff *et al* (1987) found that 57% of unmedicated patients in low-EE households who relapsed during the first year had experienced an independent event in the three weeks before onset.

Another explanation that needs to be explored concerns the high proportion (22%) of patients in the Chandigarh sample assigned to CATEGO class 0?. As already noted, the relapse rate of these patients was close to being significantly lower than that of others given a centre diagnosis of schizophrenia. Since CATEGO 0? patients were not included in the Northwick Park study, it seemed worthwhile examining the effect of eliminating them from the Chandigarh data. The consequence is to increase the relapse rate slightly to 19 out of 48 (40%). This suggests that the inclusion of CATEGO 0? patients in the Chandigarh sample cannot account for the relatively benign outcome of this cohort over two years. A similar conclusion was reached from a preliminary analysis of the two-year follow-up data from the Determinants of Outcome project (Sartorius *et al*, 1986). Furthermore, maintenance neuroleptics cannot be cited as a contributory factor since very few patients received them regularly over the second year.

We conclude that we have not identified a single comprehensive explanation for the relatively good two-year outcome of this first-contact sample of schizophrenic patients in Chandigarh. Our findings suggest that some contribution to the good prognosis arises from the tolerance and accepting attitudes of family members. These are more characteristic of traditional rural societies than of industrial urban ones. The relative size of the contributions of these factors and others to the good outcome are likely to emerge from more detailed analysis of the two-year follow-up data from the Determinants of Outcome project.

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