Brit. J. Psychiat. (1976), 129, 125–37

The Influence of Family and Social Factors on the Course of Psychiatric Illness

A Comparison of Schizophrenic and Depressed Neurotic Patients

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Summary. This study is a replication and extension of past work carried out by Brown, Birley and Wing (1972) concerning the influence of family life on the course of schizophrenia. In the original research the index of emotion expressed by a key relative about the patient at the time of key admission proved to be the best single predictor of symptomatic relapse in the nine months after discharge from hospital. In the present study this main finding of Brown *et al* has been replicated for two clinically different groups of psychiatric patients. The expressed emotion of the relative again seems to be associated with relapse independently of all other social and clinical factors investigated. In addition, important additive effects between various social influences and pharmacological treatments have been revealed which make it possible to predict relapse patterns in schizophrenia with considerable precision. The patterns of these relationships with relapse are different for the two clinical groups studied, patients with schizophrenic psychosis and with depressive neurosis.

Introduction

Although the aetiology of schizophrenia continues to puzzle clinicians and researchers alike, enough is now known about the precipitants of relapse in a patient with an established schizophrenic illness to suggest that he is highly responsive to his social environment. Of particular interest is a series of studies carried out by George Brown and his colleagues concerning the influence of family life on the course of a schizophrenic illness. In the most recent study (Brown, Birley and Wing, 1972) a standardized method was used to assess the *quality* of the emotional relationship between a schizophrenic patient and the relative with whom he lives. The authors found that they could predict relapse of schizophrenia during a nine months period following discharge by using an index of the expressed emotion (EE) shown by the relative during an interview shortly after the patient was admitted to hospital. This index of expressed emotion had three components, the most important of which was the number of critical comments made by the relative when talking about the patient and his illness. Additional measures of EE were hostility, which rarely occurred in the absence of high criticism, and marked emotional over-involvement.*

The index was used to categorize patients as coming from high EE or low EE homes. During the nine months after discharge from hospital, 58 per cent of the patients from high EE homes relapsed, compared with only 16 per cent of the low EE group, a highly significant finding ($P < 0{\cdot}001$). This association was independent of the patient's previous behaviour disturbance and work impairment.

* Criticism and hostility were based on either negative emotion (judged by tone of voice) or a 'clear statement of resentment, disapproval, dislike or rejection'. Marked emotional over-involvement tended to be found in parents rather than in other relatives and is best characterized by excessive anxiety, overconcern, or overprotectiveness toward the patient. It is rated on the basis either of feelings expressed in the interview or of behaviour reported outside it.

Results did suggest that patients living with relatives who expressed high emotion at the time of key admission were less likely to relapse if they either received regular phenothiazine medication (this trend did not reach significance) or managed to avoid close contact with the family. But the index of the relative's expressed emotion remained the best single predictor of symptomatic relapse.

The unequivocal nature of these results, and their practical and theoretical implications, made a replication of the study highly desirable. The present authors, although sharing the same research tradition as Brown and his colleagues, were determined to approach this work in a critical frame of mind. We were interested in whether the results concerning the factors influencing the outcome could be replicated with another sample of schizophrenic patients, and whether the factors were in any way specific for schizophrenia. It was decided to select a sample of depressed neurotic in-patients for comparison purposes. The sample of depressives was confined to those without delusions or hallucinations in order to ensure that there was no diagnostic overlap with the sample of patients diagnosed as suffering from schizophrenia.

In this paper, the main emphasis is on the data for schizophrenics, although a selection of results for the depressed patients are presented in order to demonstrate the relative importance of certain variables for patterns of relapse in the two clinical groups. A more comprehensive analysis of relapse patterns in the depressed patients will be presented elsewhere.

In most respects the present study is identical to the earlier study in its design and execution. A similar prospective nine months follow-up design is used, featuring independent assessments of past behaviour, present emotional response of relatives and any subsequent relapse. As before, the hypothesis to be tested is 'that a high degree of expressed emotion is an index of the characteristics in the relatives which are likely to cause a florid relapse of symptoms, independently of other factors such as length of history, type of symptoms or severity of previous behaviour disturbance'. And again, two basic assumptions are made: first, that the index of the relative's expressed emotion is a reasonable indicator of family relationships, which can be relied upon even though his everyday behaviour toward the patient is not being observed directly; second, that the attitude shown by the relative toward the patient during the interview is representative of an enduring relationship over time. Findings in the 1972 study by Brown *et al* appeared to justify these assumptions.

Design

Patients included in the study were collected sequentially at point of relapse, on admission to one of three hospitals in South East London (Bethlem, Maudsley, St. Francis). The case records were screened of all patients aged 17–64 whose native language was English and who were living with relatives at the time of admission. Any persons with suspected organic illnesses were excluded. The psychiatrist (J.L.) interviewed all patients whose records suggested a diagnosis of either schizophrenia or neurotic depression, using the 9th edition of the Present State Examination to make clinical ratings (Wing, Cooper and Sartorius, 1974). If the diagnosis was confirmed the patient was included in the study and his relatives were approached by the psychologist (C.V.)

Using these criteria, 43 schizophrenic patients and 32 depressed patients were initially selected. Of this original number, five schizophrenic patients and one depressed patient had to be excluded because their relatives refused to participate.* Two more patients were eliminated from the study during the nine months follow-up period. One of the depressed group died during this time, and a schizophrenic patient left home shortly after discharge from hospital. The remaining 37 schizophrenic and 30 depressed patients comprised the final follow-up groups, and represent 86 per cent and 94 per cent respectively of the original sample. The patients were distributed by sex and living group as shown in Table I.

The mean ages of the schizophrenic and depressed patients were 33·1 years and 38·6 years respectively; this is a non-significant difference. However, when the male patients were considered separately the schizophrenic males were significantly younger

* These were all cases in which the patient had a long psychiatric history and the relatives, generally very critical of the patient, were unwilling to retell the whole story yet another time. A typical response was 'It's an agony to me and a waste of your time'. All the excluded schizophrenic patients were living with parents.

https://doi.org/10.1192/bjp.129.2.125 Published online by Cambridge University Press

TABLE I

Distribution of patients by diagnosis, sex and living group

Type of household	Schizophrenic			Depressed		
	Male	Female	Total	Male	Female	Total
Parental	11	6	17	0	1	1
Marital	4	9	13	9	19	28
Other (patient living with adult child or other relative) ..	0	7	7	1	0	1
Total N	15	22	37	10	20	30

(age at key admission, schizophrenic males, $\bar{x} = 28 \cdot 1$ years; depressed males, $\bar{x} = 44 \cdot 8$ years; $t = 3 \cdot 48$, 23 df, $P < 0 \cdot 01$).

A disproportionate number of depressed patients were living with spouses, and so it was not possible to make cross-group comparisons between parents on the various measures. Attempts to explain this finding must be tentative, but it may be that an adult who becomes depressed is unlikely to be living with parents after a certain age. If unmarried, he is likely to be living on his own or with friends, which would of course exclude him from this study. On the other hand, it is well known that there is a low marriage rate among persons diagnosed as schizophrenic and that there is a tendency for the unmarried in this group to remain in the parental household.

The first patient was seen in October 1971, and the last follow-up interview took place in January 1975.

The current mental state (PSE) interviews were carried out by the psychiatrist shortly after the patient's admission to hospital, and again at readmission or nine months follow-up. An abbreviated version of the main family interview (Brown and Rutter, 1966; Rutter and Brown, 1966) was adminstered on a home visit by the psychologist within days of the psychiatrist's assessment. As in the original study, the husband or wife of a married patient was always seen. In cases where an unmarried patient lived with both parents, mother and father were interviewed on separate occasions. Of the 13 pairs of relatives, both were seen in 10 cases; in the remaining 3 pairs only one relative was seen.

In the study to be replicated the interview with the relative alone at the time of the key admission produced the significant finding. This therefore was considered to be the definitive interview. Family interviews were not repeated at the time of follow-up or readmission, nor given to the patient alone. For similar reasons the 'joint' interview was dropped. Certain measures, however, were reapplied by the psychiatrist at the time of follow-up, if changes were thought to have occurred during this period. For example, the patient was questioned about the family time budget if there had been changes in the amount of face to face contact between him and his relatives.

All but two of the 67 patients who qualified for the follow-up study were personally revisited by the psychiatrist. The two exceptions, both of whom had left the South East London area, were reassessed through hospital case notes and personal correspondence. In addition to repeating the Present State Examination, the psychiatrist took a careful history of drug treatment during the months since discharge, checking with out-patient records wherever possible. Criteria for judging whether a discharged patient had taken phenothiazines or antidepressants regularly were strictly adhered to. If drugs were discontinued or taken irregularly for more than one month of the nine months follow-up period, a person was considered to be off regular medication.

TECHNIQUES OF MEASUREMENT

The techniques of behavioural, psychiatric and family measurement were identical to those used in the earlier study, with one important difference: the abbreviated length of the main family interview schedule. The rationale for the abbreviated interview is given by Vaughn and Leff (1976). The psychologist spent several months learning to use the interview schedule. High inter-rater reliability with the original interviewers was established by rating tapes from the 1972 study. The psychiatrist also learned the technique for the rating of criticism; inter-rater reliability between psychologist and psychiatrist over 15 interviews was ·86 (product moment correlation).

1. *Ratings of emotional response*

Ratings were made on all the scales employed in the 1972 study, including the three which form the components of the overall index of relatives' expressed

emotion (EE): number of critical comments made about the patient, hostility, and emotional over-involvement. Detailed descriptions, with examples, of these and other measures (e.g. demonstrated warmth, dissatisfaction on four-point scales describing areas of family life) may be found in references already cited.

2. *Relapse*

The criteria used to assess relapse of schizophrenia were the same as those employed in the 1972 study. Brown *et al* distinguished between two types of relapse: Type I involved a change from 'normal' or 'non-schizophrenic' state to a state of 'schizophrenia' as defined by the CATEGO clinical classification procedure, classes S or P; (Wing, Cooper and Sartorius, 1974). Type II involved a 'marked exacerbation' of persistent schizophrenic symptoms. At the time of reassessment the psychiatrist was unaware of the original level of relatives' expressed emotion.

It was more difficult to assess relapse in the depressed group. In every case there had been a period of freedom from depressive symptoms between discharge and follow-up. Of the 16 patients who relapsed 14 had significant symptoms of depression rateable on the PSE at the time of follow-up. The other two patients were well at the follow-up interview, but reported an episode of depression, persisting for two weeks or more, during the months between discharge and the final month covered by the PSE.

Results

Schizophrenic group

The mean numbers of critical comments made by relatives of schizophrenics in the two series do not differ significantly ($z = \cdot 173$) despite the much abbreviated length of the family interview in our study. The mean number of critical remarks made by the 46 relatives in the present study was 8·22 (SD = 11·11). The mean number of comments for all 126 relatives interviewed in the 1972 study was calculated and found to be 7·86 (SD = 14·40). When one considers that these two series of patients and relatives were assessed by different research teams a decade apart in time, this seems an impressive result.

In the present sample, the mean number of critical remarks does not differ significantly for the two main living groups (Parental $\bar{x} = 7 \cdot 04$, SD = 7·63; Marital $\bar{x} = 11 \cdot 92$, SD = 17·14; $t = 1 \cdot 07$, 36 df, NS).

1. *Overall index of relatives' expressed emotion (EE)*

As before, the individual scales were first related to relapse. In the 1972 study a threshold of 7 critical comments was used to divide the families into two expressed emotion subgroups roughly equal in size. Using this same cut-off point, and including relatives who showed marked emotional over-involvement (i.e. scores of 4 or 5 on a five-point scale) in the high EE subgroup, we obtained the relapse figures shown in Table II(a). This threshold gives a split close to the median. However, a closer inspection of results revealed that a cut-off point of 6 critical remarks gave a better separation in terms of relapse rates (Table II(b)). In view of the arbitrary nature of the original cut-off point, we felt justified in making an adjustment in the level of criticism required for allocation to the high EE subgroup. All results presented below are based on this new criticism threshold.*

Table II

Relationship of relatives' expressed emotion to relapse in the 9 months after discharge—schizophrenic group

(a) *Using a criticism threshold of 7 critical comments*

EE of relatives	No relapse	Re-lapse	% relapse
High			
7+ critical comments and/or marked EOI	9	9	50%
Low			
1–6 critical comments; no marked EOI	17	2	12%
	Chi square, $p < 0 \cdot 02$		

(b) *Using a criticism threshold of 6 critical comments*

EE of relatives	No relapse	Re-lapse	% relapse
High			
6+ critical comments and/or marked EOI	11	10	48%
Low			
1–5 critical comments; no marked EOI	15	1	6%
	Fisher's exact test $p = 0 \cdot 007$		

* In no case was hostility found in the absence of high criticism, so it was not used in the compilation of the high EE group.

https://doi.org/10.1192/bjp.129.2.125 Published online by Cambridge University Press

2. *Relationship between index of expressed emotion and relapse*

The relapse figures for 37 schizophrenic patients from high EE and low EE homes are shown in Table II(b). A total of 11 schizophrenic patients (28 per cent) relapsed during the follow-up period. Of these all but one had a Type I relapse. They had been well for some time after their key discharge, but had definite schizophrenic symptoms at readmission or nine months follow-up. Six patients (16 per cent of the total sample) were readmitted to hospital. As in the 1972 study, there is a significant association between high EE and relapse (Fisher's exact $p = 0{\cdot}007$).

It is evident, however, that relatives' EE is not the sole determinant of relapse, for more than half of the patients from high EE homes managed to remain well during the follow-up period. Other factors—social, clinical, environmental—must be operating to influence outcome. A series of analyses was carried out to see whether the relationship between EE and relapse was linked with any other factors. Only the most important of these will be mentioned here.

3. *Other factors related to relapse*

(a) *Clinical and demographic factors*

A comparison was made between those schizophrenic patients who relapsed and those who remained well in terms of the clinical PSE syndromes present at key admission. Only one item was related to outcome at the 5 per cent level of significance: Grandiose Delusions were more common in those patients who relapsed.

Within the high EE subgroup a comparison was also made between those who relapsed and those who remained well. In this analysis two items, Grandiose Delusions and Residual Schizophrenia, were found more commonly in those who relapsed. As 38 comparisons were being made, these could well be chance findings.

No other clinical variable measured, nor any feature of psychiatric history assessed, added anything to the value of the EE index for predicting relapse. This is in accord with findings in the 1972 study.

Of the many demographic factors considered, only two were related to outcome: sex and marital status. The relapse rate for schizophrenic men is double that for women, and the rate for the unmarried is significantly greater than for the married (exact $p = 0{\cdot}033$):

Married: men, 25 per cent; women, 0 per cent; total 8 per cent.

Unmarried: men, 54 per cent; women, 31 per cent; total 42 per cent.

Very similar marital status and sex differences were revealed in the 1972 study. These differences do not affect the main association between expressed emotion and relapse.

(b) *Previous work impairment and behaviour disturbance*

Using the criteria of Brown *et al* for work impairment, 43 per cent of the present sample of schizophrenic patients were rated as impaired, two thirds of these being found in high EE homes. The relapse rate in the impaired group was 37 per cent, and in the non-impaired group 24 per cent (NS). As in the 1972 study, it was found that work impairment was only associated with relapse because of its association with level of EE. No work-impaired patients in a low EE home relapsed; 55 per cent of those in a high EE home did so.

Many measures of the patient's behaviour before admission were made from the relative's account. Their relationship both to the relative's EE and to relapse was examined in a variety of ways. When we employed the same criteria used by Brown *et al* to rate severe behaviour disturbance as either present or absent, we obtained almost identical results. We too found that a majority of the schizophrenic patients (present study, 62 per cent; cf 1972 study, 75 per cent) fall into one of two categories: either they are rated 'disturbed' in behaviour during the three months preceding admission and live with relatives showing a high degree of expressed emotion, or they are rated as 'not disturbed' and living with relatives with a low degree of expressed emotion. But in cases where patients are incongruent for the two factors the degree of EE is related to relapse (exact $p = 0{\cdot}027$) and the degree of disturbance in the months before admission is not important.

The analysis of Brown *et al* did not take into account the duration and persistence of symptoms or the possibility that certain behaviours might be differentially important both for the relative's response and for outcome. However, when the data were examined in a variety of ways, similar results were produced, indicating that the relationship between EE and relapse was independent of the patient's behaviour disturbance during the three months before admission.

(c) *Factors after discharge*

Two other factors found to be important in the 1972 study were examined: maintenance therapy with phenothiazines and amount of face to face contact. As in the 1972 study, neither of these factors had significance for the low EE group, but each did relate to outcome for those in high EE homes (Tables III and IV). In fact the result for maintenance therapy is statistically significant ($P < 0.05$). A similar trend failed to reach statistical significance in the 1972 study.*

4. *Relative contribution of various factors to relapse*

Having identified a number of factors individually related to relapse, we determined their relative contribution by a correlation matrix. This matrix (Table V) shows that relatives' EE is more closely related to relapse than any other factor considered, including lack of preventive drug treatment. When behaviour disturbance (based on total symptoms score) is partialled out, the significance levels are unchanged. In fact, the correlation between EE and relapse is actually raised ($r = .52$; $p < 0.01$). This is conclusive evidence that for schizophrenic patients the relationship between EE and relapse holds independently of behaviour disturbance.

5. *Additive effects of factors related to relapse*

These separate analyses aroused interest in the ways in which the effects of the different variables on relapse—maintenance therapy, face to face contact, relatives' EE—might be additive. This particular analysis had not been done by Brown and his colleagues, but because the two studies were so similar in design and methodology it was possible to return to the original data, reanalyse them, and pool the resulting figures with our own, as shown in Fig 1.

It is evident from the relapse rates that patients in high EE homes who spend much time with their relatives and are not protected by maintenance therapy (subgroup 6) have a very poor outcome. The relapse rates drop considerably if one of the two protective factors is operating (subgroups 4, 5). The prognosis is best of all, however, for patients living in high EE homes but protected both by reduced contact and by maintenance therapy. For this group of patients (subgroup 3), the relapse rate drops to 15 per cent, a rate significantly lower than that of patients for whom neither protective mechanism is operating ($p < 0.001$), and as low as that of patients from low EE homes (subgroups 1, 2).

* Fifty-seven per cent of the 37 schizophrenic patients satisfied our criteria for regular maintenance therapy. Equal proportions of low EE and high EE patients failed to take one of the phenothiazines regularly.

TABLE III

Relationship of relatives' EE, drug-taking after discharge and relapse—schizophrenic group

Relatives' EE	No drugs			Drugs			Significance (χ^2)
	No relapse	Relapse	% relapse	No relapse	Relapse	% relapse	
High ..	2	7	78%	9	3	25%	Fisher's exact test $p = 0.024$
Low ..	6	1	14%	9	0	0%	NS
Total ..	8	8	50%	18	3	14%	$p = 0.023$

https://doi.org/10.1192/bjp.129.2.125 Published online by Cambridge University Press

TABLE IV

Relationship of relatives' EE, time spent in face to face contact per week after discharge and relapse—schizophrenic group

Relatives' EE	Time in face to face contact with relatives: Less than 35 hours		
	No relapse	Relapse	% relapse
High	5	2	29%
Low	6	1	14%

χ^2 NS

Relatives' EE	Time in face to face contact with relatives: More than 35 hours		
	No relapse	Relapse	% relapse
High	6	8	57%
Low	9	0	0%

Fisher's exact test p = 0·006

The relapse rates in the six subgroups in Fig 1 provide valuable information about the preventive role of maintenance therapy. It is clear from the relapse rates in subgroups 1 and 2 that drugs make no difference for patients living in low EE homes. They are effective, however, in reducing the relapse rate in patients from high EE homes, especially in patients who spend less than 35 hours per week with their relatives.

Depressed group

1. *Overall index of relatives' expressed emotion (EE)*

If the mean number of critical comments is calculated, the relatives of the depressed patients are no more and no less critical than their counterparts in the two schizophrenic series ($\bar{x}$ = 7·19, SD = 9·86).

In attempting to relate the individual expressed emotion scales to relapse, we first used the cut-off point of 7 critical comments employed in the 1972 schizophrenia study and obtained the relapse results shown in Table VI(a).

It was immediately apparent that this particular threshold did not discriminate adequately between those who relapsed and those who remained well. Further analyses revealed that a much lower cut-off point of 2 critical remarks gave the best separation in terms of relapse rates (Table VI(b)). It was decided that any depressed patient whose key relative made two or more critical remarks would be allocated to the high criticism subgroup; all results presented below are based on this criticism threshold.

The other two indices of high expressed emotion, hostility and marked emotional overinvolvement, do not add anything to the significant association between critical comments and relapse in the depressed group. It was decided to call the index for this group of patients a 'criticism' index, so as to distinguish it from the differently constituted expressed emotion (EE) index used for the two series of schizophrenic patients.

TABLE V

Correlation matrix of factors—schizophrenic group

	1. Relapse	2. Behaviour disturbance	3. Critical comments	4. Drug treatment	5. Face to face contact	6. Expressed emotion
1.	1·00	−·20	·11	−·39*	·14	·45**
2.			·34*	·32	−·01	·24
3.				·24	·13	·58***
4.					−·01	·01
5.						·11

* $p < 0·05$. ** $p < 0·01$. *** $p < 0·001$.

https://doi.org/10.1192/bjp.129.2.125 Published online by Cambridge University Press

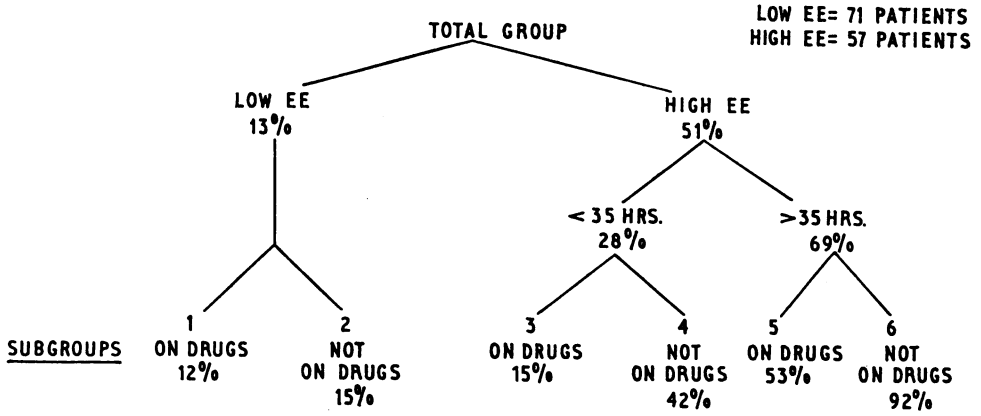

FIG 1.—Nine month relapse rates of total group of 128 schizophrenic patients.

TABLE VI

Relationship of relative's criticism to relapse in the 9 months after discharge—depressed group

(a) *Using a criticism threshold of 7 critical comments*

	No relapse	Re-lapse	% relapse
7+ critical comments	4	6	60%
0–6 critical comments	10	10	50%
		χ^2 NS	

(b) *Using a criticism threshold of 2 critical comments*

	No relapse	Re-lapse	% relapse
2+ critical comments	7	14	67%
<2 critical comments	7	2	22%
	Fisher's exact test $p = 0{\cdot}032$		

2. Relationship between index of expressed emotion and relapse

The depressed patients in our sample are even more vulnerable to the effects of relatives' criticism than are the schizophrenics and have a tendency to relapse at a lower level of criticism. The relapse figures for 30 depressed patients from high criticism and low criticism homes are shown in Table VI(b). Sixteen of the 30 (53 per cent of the total group) relapsed during the follow-up period; 7 of the 16 relapsed patients (23 per cent of the total group) were re-admitted to hospital. Patients whose relatives made two or more critical comments (at key interview) relapsed at a significantly higher rate than those with less critical relatives (Fisher's exact test, $p = 0{\cdot}032$).

3. Other factors related to release

(a) *Clinical and demographic factors*

Chi square analyses were carried out for each of the 38 PSE syndromes, to determine whether the absence or presence of a specified syndrome was related to any of the following: (a) depressed patient's nine months outcome (relapse/no relapse) within the total group ($N = 30$); (b) nine months outcome, within the high criticism group only ($N = 21$); (c) whether the patient's key relative expressed high criticism at interview. Only one of the syndromes, Irritability, related to relapse: patients admitting to feelings of anger in the month preceding admission were more likely to relapse than those who did not ($p < 0{\cdot}05$). But this relationship is almost certainly due to the link between a positive rating on Irritability and relatives' criticism ($p < 0{\cdot}02$), the mediating variable which is itself predictive of relapse.

Considering the high criticism group separately, there were no differences in presence/absence of PSE syndromes between those who relapsed and those who remained well during the follow-up period.

https://doi.org/10.1192/bjp.129.2.125 Published online by Cambridge University Press

Background variables, including features of the patient's psychiatric history, were in general unrelated to outcome in the depressed group. For example, a patient's sex, admission status, and the length of time since first onset were of no significance. Marital status could not be examined, as only two of the 30 depressed patients were *not* married and living with their spouses at key admission. There were, however, two factors which did interact with relatives' criticism and outcome: age at key admission and age at first onset. The five patients aged 45 years and older at key admission who returned to high criticism homes were extremely vulnerable; all of them relapsed. This is significantly higher than the 20 per cent rate of relapse for patients in the same age group but living with low criticism relatives (exact $p = 0{\cdot}01$).

Relatives' criticism was less important for outcome for those less than 45 years old at admission; the result does not reach statistical significance, although the findings are in the same direction.

Age at first onset also plays a significant role in determining which depressed patients remain well. Patients whose first depressive episodes occurred when they were either very young (<21 years) *or* middle-aged (>45 years) were significantly more likely to relapse than those who first became ill between the ages of 21 and 45 years (exact $p = 0{\cdot}001$). Within the high criticism subgroup this relationship still holds ($p < 0{\cdot}004$). But again, the presence of a low criticism relative is a protective influence, and when age at first onset is controlled for, the main relationship between criticism and outcome remains (exact $p = 0{\cdot}018$).

(b) *Previous work impairment and behaviour disturbance*

Little work impairment, as defined by Brown *et al* (1972), was found among the depressed patients; only two could be described as severely handicapped for as long as three months in a two-year period preceding key admission. There are significant differences between the depressed and schizophrenic patients in total proportions of: patients rated as work-impaired (6 per cent vs. 43 per cent, $p < 0{\cdot}01$); male patients unemployed at key admission (0 per cent vs. 40 per cent, exact $p = 0{\cdot}022$); female patients showing marked impairment in the home (5 per cent vs. 45 per cent, exact $p = 0{\cdot}003$). In every instance there is more impairment within the schizophrenic group.

In the range and severity of symptoms reported, the amount of behaviour disturbance in the months preceding admission was similar for the two clinical groups, but with the depressed patients there was a much closer link between reported disturbance (total symptoms score) and the number of critical remarks made by the relatives about the patients (schizophrenic group, $r = {\cdot}33$, $p < 0{\cdot}05$; depressed group, $r = {\cdot}48$, $p < 0{\cdot}01$). The amount of criticism was linked in turn to the length of interview (Vaughn and Leff, 1976), so that a fairly typical pattern of response for the relatives of depressed patients emerges: the longer the relative talks, the more criticism there is likely to be, and the higher the ratings of the patient's disturbance. Yet the construction of a correlation matrix reveals behaviour disturbance to be unrelated to 9 months outcome (Table VII).

Factors after discharge

Only a small proportion of depressed patients (20 per cent, $N = 6$) were on preventive medication at follow-up, too few to draw any conclusions about the effects of regular drug-taking on outcome. The amount of face to face contact between patients and relatives did not relate to relapse patterns. But depressed patients whose relatives made two or more critical remarks had significantly less contact with family members than did patients from low criticism homes (exact $p = 0{\cdot}024$).

Relative contribution of various factors to relapse

A correlation matrix (Table VII) shows that relatives' criticism is the only one of the factors considered which contributes a significant amount to relapse ($p < 0{\cdot}05$). When behaviour disturbance is partialled out in a stepwise regression analysis, there is still a significant correlation between criticism and relapse. In fact, when criticism is controlled for, the contribution to relapse of all other factors in the matrix is negligible.

TABLE VII

Correlation matrix of factors—depressed group

	1. Relapse	2. Behaviour disturbance	3. Number of critical comments	4. Drug treatment	5. Face to face contact	6. Relative's criticism level
1.	1·00	·15	0	·13	·04	·41*
2.			·49**	−·11	−·20	·38*
3.				−·31	−·45*	·49**
4.					·30	−·22
5.						−·40*

* $p < 0.05$. ** $p < 0.01$.

DISCUSSION

The main results of Brown *et al* (1972) concerning the family and social factors influencing the course of schizophrenia have been almost exactly replicated. It has been possible to predict relapse patterns even more precisely than in the earlier study, by considering the additive effects of various biological and social factors shown to be individually important for outcome. A high degree of emotion expressed by the relative at the time of key admission remains the best single predictor of symptomatic relapse during the nine months following discharge. But results suggest that the combination of maintenance therapy and reduction of face to face contact with a highly involved or critical relative will prevent relapse in nearly every instance.

Sex and living group differences

Brown *et al* believed the differences in relapse rates between the unmarried and married schizophrenics to be a consequence of the fact that if either or both parents live with the patient alone more emotion is expressed. But this was not the case in our study; parents were just as likely to show high EE if there were other persons in the household. Nor can the results be explained by differences in the amount of emotion expressed by parents and spouses; these were not significant.

Both the 1972 figures and our own show unmarried men to be at greatest risk of relapse, and married women to be least vulnerable. Evidence from both studies indicates that unmarried men from high EE homes are significantly less likely than their female counterparts to be protected by both drugs *and* reduced face to face contact (exact $p = 0.006$); only 5 per cent of these men had both protective mechanisms operating, compared with 50 per cent of the unmarried women.

One can only speculate about the reasons for the low relapse rate among married schizophrenic women; they may include such factors as premorbid personality and differing role expectations. This is not the place to expand on this finding at length. The importance of these results lies in the identification of a group which would be at high risk of relapse in any prevention programme.

Factors after discharge

Compared with our series of schizophrenic patients, a higher proportion of patients in the 1972 study relapsed while on drugs. These differing relapse rates may be due to the more stringent criteria for 'regular' drug-taking in the present study. Then too, ten years have passed since the original study was carried out. It may be that more discrimination is shown now in the way drugs are prescribed and given, the recipients now more often being those in greatest need.

Low face to face contact can result from the patient being away from the home, e.g. working or at a Day Centre, or can be produced by his staying in the home but withdrawing socially. A distinction must be made between two terms. 'Social withdrawal' refers to a decrease in *verbal* communication: a refusal to initiate conversation, failure to answer when directly addressed, seeming to be in another world. Face to face contact is a measure of actual physical proximity. Thus it is possible for a

person to have high face to face contact with his relatives and still rate highly on social withdrawal.

Brown and others have suggested that social withdrawal can be a means of coping with a stressful situation, a protective mechanism which lessens chances of relapse of schizophrenia. Investigation of this possibility revealed a significant association between low face to face contact and social withdrawal in patients from high EE homes (exact $p = 0{\cdot}023$). Within the high EE group, two thirds of those who were socially withdrawn or avoided family members in the months preceding key admission were well at follow-up, while 58 per cent of those who did *not* show signs of withdrawal later relapsed. This suggests a general coping style, and provides further support for the notion that the person suffering from schizophrenia does exercise some control over the course of his illness.

Comparison of the schizophrenic and depressed patterns of relapse

One of the aims of the present study was to determine whether the factors influencing outcome were in any way specific for schizophrenia, by including a sample of depressed neurotic patients. Our results suggest that patterns of relapse in the two clinical groups are different. There *is* a significant link between relatives' criticism and relapse in the depressed sample studied, suggesting that psychiatric patients other than schizophrenics are also affected by the quality of their emotional relationships with key relatives. However, depressed patients appear to be more sensitive to criticism than schizophrenic patients. Also the protective mechanisms which are so important for outcome for schizophrenic patients living in high EE homes (maintenance drug therapy and reduced contact with relatives) do not relate to relapse patterns in the depressed group.

Furthermore, there appears to be something specific about the ways in which schizophrenics respond to their social environment. For example, a patient confronted by a high EE relative may react by withdrawal or avoidance, with lowered face to face contact a consequence of this protective manoeuvre. This is a common pattern among the schizophrenic patients. When, however, one attempts to explain the link between low face to face contact and high criticism in the depressed group the evidence goes against this interpretation. There is more likely to be a generally poor relationship between the patient and the relative which predates the illness and is characterized by low face to face contact and poor communication. When the patient becomes ill, the relative responds with criticism and reports of highly disturbed behaviour (which may or may not be accurate). In any event, the response of the relative, rather than the severity of the illness, is the best predictor of whether the patient will break down again within a specified time period.

Practical applications

Throughout this paper, the importance of relatives' EE for outcome, first recognized by Brown and his colleagues, has been re-emphasized. Yet it is clear that the negative effects of relatives' high EE can be modified by the two protective mechanisms, drugs and lowered face to face contact (Fig 1). One of the many difficulties in attempts to treat persons for schizophrenia has been a lack of knowledge of what the goals of intervention should be. Our data suggest that if one could actually intervene so as to ensure that patients from high EE homes, identified as being at high risk, were maintained on drugs and saw their relatives as little as possible, the likelihood is that the relapse rate could be lowered toward that of patients from low EE homes.

The summary of factors relating to relapse makes it immediately apparent who would be the highest risk subjects in any prevention programme. In order to be minimally protected against relapse, an unmarried male living in a high EE home should both be taking drugs regularly *and* seeing his family as little as possible. For unmarried women and married men, the presence of just one extra protective factor might be sufficient, while married women might conceivably remain well even if off drugs and in high contact with relatives.

The first step in any intervention programme would be the identification of families in which schizophrenic patients are at a high risk of

relapse. Although the Brown-Rutter family interview has until now only been used as a research tool, it is possible that a streamlined version, such as the one developed by Vaughn and Leff (1976), could be adapted for use as a practical clinical instrument; but the importance of a standardized instrument, administered by a properly trained interviewer, cannot be too strongly emphasized.

Clearly it would also be an advantage to be able to identify patients at high risk in terms of some psycho-physiological measures of stress. 'Arousal' levels have been shown to be surprisingly high in chronic schizophrenics (Venables, 1960). It might be possible to pick up abnormalities of psycho-physiological response in patients and in this way identify those most sensitive to their social environment.

Once high risk patients have been identified, there are a number of possibilities for active intervention. Maintenance therapy is perhaps the single most important protective factor for patients in high EE homes. But with the patients at greatest risk, e.g. unmarried males, relapse will not be prevented with drugs alone. It is necessary to find ways of reducing face to face contact between the patient and his high EE relative. The obvious solution for persons in parental households, removal to a hostel or other sheltered accommodation, is not always practicable. An alternative strategy would be to get the patient out to work or to a Day Centre, which would give the patient a measure of independence and cut down on the hours patient and family spend together.

Ultimately, however, these 'administrative' solutions are unlikely to be effective without the co-operation of the patient and his relatives. The subgroups in Fig 1 are not randomly allocated, but self-selected. There may be features of a relationship which bind family members together despite considerable tension and strain. In such cases, family members are likely to resist outsiders' attempts to prise them apart, however tactful the efforts may be; this is especially true of families in which the relative is emotionally over-involved. Unless these potential difficulties are recognized and dealt with early on in an intervention programme it may be doomed to failure.

This brings us to yet another kind of intervention; efforts to change the attitudes of over-involved or highly critical relatives. At the moment we know very little about the formation of such attitudes and their susceptibility to change, which makes this suggestion very speculative. But an analysis of the determinants of relatives' expressed emotion would provide clues as to how one might best intervene.

For example, in considering how to deal with a highly critical relative, it would be useful to examine systematically the relative's complaints —to carry out, in effect, a content analysis of his responses. Are his remarks directed at long-standing personality traits of the patient, or are they primarily about illness-related behaviours? This work is now under way.

Fifteen years have passed since Brown and his colleagues first began to explore the complex relationships between the schizophrenic and his social environment. Present knowledge about the factors influencing outcome is such that we can at least begin to plan effective programmes for the prevention of relapse of schizophrenia. Possibly the new techniques in behaviour therapy may provide tools for intervening in a rational way. However daunting the prospect, there may never be a better time.

Acknowledgements

We are very grateful for the co-operation extended to us by the patients and relatives who agreed to be interviewed, and to the consultants concerned. We also wish to express our debt to Professor George W. Brown for his encouragement and support throughout this study. In addition to permitting access to unpublished data from his own research, he provided helpful comments on earlier drafts of this paper, as did Professor J. K. Wing and Dr J. L. T. Birley.

The work was undertaken while the authors were members of the scientific staff of the MRC Social Psychiatry Unit, Institute of Psychiatry, London.

References

Brown, G. W., Birley, J. L. T. & Wing, J. K. (1972) Influence of family life on the course of schizophrenic disorders: a replication. *British Journal of Psychiatry*, **121**, 241–58.

—— & Rutter, M. (1966) The measurement of family activities and relationships: a methodological study. *Human Relations*, **19**, 241–63.

RUTTER, M. & BROWN, G. W. (1966) The reliability and validity of measures of family life and relationships in families containing a psychiatric patient. *Social Psychiatry*, **1**, 38–53.

VAUGHN, C. E. & LEFF, J. P. (1976) The measurement of expressed emotion in the families of psychiatric patients. Accepted for publication, *British Journal of Social and Clinical Psychology*.

VENABLES, P. H. (1960) The effect of auditory and visual stimulation on the potential response of schizophrenics. *Brain*, **83**, 77–92.

WING, J. K., COOPER, J. E. & SARTORIUS, N. (1974) *The Description and Classification of Psychiatric Symptoms: An Introduction Manual for the PSE and Catego System*. London: Cambridge University Press.

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(*Received 13 October; revised 18 November 1975*)