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Modification of family expressed emotion after a psychosocial intervention: stability in time

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Introduction. There is some controversy about whether expressed emotion (EE) tends to remain stable or fluctuates in time and there are very few studies on EE evolution and its subscales once a family intervention has been performed. Better knowledge about its behavior in time would have important theoretical and clinical implications.

Methods. We have studied changes in EE and its subscales that are produced in a cohort of 37 relatives of schizophrenic patients to whom a familiar intervention orientated to reducing environmental stress was performed. Changes were analyzed according to three cross-sectional moments of evaluation: one moment previous to intervention, another one when it was finished and finally, one at five years of finishing it.

Results. In this work, the EE levels tend to vary in time. These changes are mainly produced in the period when the family intervention is carried out, at the expense of decreasing the levels of emotional overinvolvement. Between the end of therapy and the analysis carried out five years later, levels remain stable. The few changes that take place in this period, if any, are associated to variables of clinical severity and social adjustment.

Conclusions. Family intervention appears as the determining factor for reducing EE levels, whereas productive clinical severity and the patient's social adjustment condition increases in their levels.

Key words:
Schizophrenia. Expressed emotion. Family therapy. Stability.

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Modificación de la expresividad emocional familiar tras una intervención psicosocial: estabilidad en el tiempo

Introducción. Existe controversia sobre si la expresividad emocional (EE) tiende a mantenerse estable o a fluctuar en el tiempo y apenas hay estudios sobre la evolución de la EE y sus subescalas una vez realizada una intervención familiar. Un mayor conocimiento de su comportamiento temporal tendría importantes implicaciones teóricas y clínicas.

Métodos. Se estudian los cambios en la EE y sus subescalas que se producen en una cohorte de 37 familiares de pacientes esquizofrénicos a la que se le realiza una intervención familiar orientada a reducir el estrés ambiental. Los cambios se analizan respecto a tres momentos de evaluación transversales: un momento previo a la intervención, otro al concluir ésta y por último a los 5 años de finalizarla.

Resultados. En este trabajo los niveles de la EE tienden a variar en el tiempo. Estos cambios se producen mayoritariamente en el período de realización de la intervención familiar a expensas de la reducción de los niveles de sobreimplicación emocional. Entre la finalización de la terapia y el análisis realizado 5 años después los niveles se mantienen estables. Los escasos cambios en este período, cuando se producen, se asocian con variables de gravedad clínica y ajuste social.

Conclusiones. La intervención familiar aparece como el factor determinante para la reducción de niveles de EE, mientras que la gravedad de la clínica productiva y el ajuste social del paciente condicionan los incrementos de sus niveles.

Palabras clave:
Esquizofrenia. Expresividad emocional. Terapia familiar. Estabilidad.

INTRODUCTION

In 1972, Brown et al. described the construct of expressed emotion (EE hereafter) as an index of family attitudes towards the schizophrenic patient[1]. Since then, many studies have verified its importance as predictor of course, not only for schizophrenia in different cultural or care settings, but also for other chronic diseases. Simultaneously to the extension of studies on EE, several intervention programs in families of schizophrenic patients arose, starting in the de-

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cade of the 80's, to reduce the number of recurrences by changing the family emotional climate, that is, by reducing EE.

In spite of this extensive literature, little has been studied on whether the EE levels remain stable over time, both spontaneously and after having performed a family intervention.

Most of the existing studies[1-9] note that between 50% and 68% of the family members tend to maintain the same EE level during the observation period. The initial low or high EE during follow-up, regardless of whether an intervention was performed or not varied in the remaining family members.

Spontaneous change is more frequent from high EE to low EE than to the contrary. Spontaneous reduction of the EE levels is associated to different variables, depending on the study reviewed[1,3-5,9,13-15], although all coincide in the non-existence of association with disease evolution time. This seems to indicate that decrease of EE is not a mere effect of the passing of time. There is greater controversy is about which of the EE subscales has the greatest tendency to fluctuate spontaneously: the critical[1,4,6], overinvolved[7,10,15] or both[16].

The studies that compare stability between intervened and non-intervened subjects[6,15,16] also find that the EE variations and their subscales occur independently of whether there has been an intervention, or if the reductions of the EE levels occur in greater number between those with intervention. The finding that intervention causes or favors decrease in EE levels implies the question of for how much time this effect is maintained once the therapy is finished. Unfortunately, most of the studies observe short evolution times (between 9 and 18 months), with the exception of the study by Lenior 2002[15] who finds that the levels increase again 34 months after the intervention has concluded.

It seems clear that there is a need for studies with longer evolution times that contribute to answer the theoretical question of whether EE reflects a pattern of attitudes inherent to the family, in the face of which it could be expected that it would remain stable in time or reflect an emotional response to the patient's symptoms, which entails its fluctuation based on clinical variables.

In addition, from the clinical point of view, if a profile of patients who tend to maintain high EE or are vulnerable to increase it could be identified, they would require more attention than those with the inclination to maintain it low or with the tendency to reduce its levels.

Finally, it would help resolve the debate on the optimum duration of the family interventions, since it would depend on the length of time of the changes produced by the intervention.

This study aims to determine the changes in EE that are produced after a family intervention and if these are maintained and to identify variables that could contribute to the stability or fluctuation of the EE levels and their components over time.

METHOD

The study design corresponds to a follow-up study of a cohort of relatives of schizophrenic patients who once participated in a 12 month long family intervention within a larger intervention study[17]. Three cross-sectional evaluations were performed: an initial evaluation prior to the performance of the intervention, another one immediately after finishing it and a final evaluation 5 years after concluding it (hereafter, t0, t1 and t5, respectively).

Sample

The sample is made up by the key family members (understood as the family member most directly in charge of the patient's care) of 87 patients diagnosed of schizophrenia who had suffered a last episode in the previous year, lived with their family and were seen in the area 4 psychiatry out-patient clinic of Valencia. Once the acute symptoms of the patients were established, they were referred by their psychiatrists to receive a 12 month long cognitive-behavior orientation family intervention[17].

Those families of patients in whom the clinical condition of the patient was justified by the existence or organic disease or significant consumption of toxic drugs were excluded from the initial sample.

Given that the study objective was to assess the changes that are produced after the family intervention and if these are maintained in time, those cases that were not seen in at least 75% of the sessions were excluded from the analysis, 35 cases being eliminated. In addition, those cases in which there had been changes in the figure of the main caretaker, or if he/she had died or did not have the physical or psychological conditions to be evaluated, which occurred in 15 cases.

In this way, the original sample of 87 relatives was reduced to 37 cases for the statistical analysis.

Evaluation and measurement Instruments

The patients and their families were evaluated in the three assessment times described (t0, t1 and t5) by two independent investigators who were previously trained in the management of the Spanish versions of a series of instruments.

The clinical and sociodemographic information was completed and compared with the clinical history and then with the interview of family assessment.

Measurement of the family EE level and its subscales was performed with the Camberwell Family Interview (CFI). It is a semistructured psychiatric interview that evaluates the emotional climate of the family of the chronic mental patients, both through the account and of the spontaneous expression of feelings of the key family member. The Spanish version of the Mental Health Center of Camarillo, modified by Montero and Ruiz, was used for this study[18].

The classical scoring criteria were followed[19], considering the family member as high EE if 6 or more critical comments were made, if there were 3 (moderate) or more on the emotional overinvolvement or if the hostility was present in any of its forms. In addition, the direct contact time between the patient and the other family members was calculated.

All the interviews were taped for later evaluation by an investigator (IM), previously trained in specialized centers with inter-rater reliability levels greater than r = 0.85.

In order to analyze if the changes in the EE levels were associated to the patient's clinical condition, the presence and intensity of the productive psychotic symptoms was evaluated with the Spanish version of the Psychiatric Assessment Scale (PAS)[20]. With the same objective, social adjustment of the patient was evaluated with the Spanish version of Disability Assessment Schedule II (DAS-II)[21] and morbidity of the key family member with the short version in Spanish of the General Health Questionnaire by Goldberg (GHQ)[22].

Statistical analysis

The analysis was performed with the SPSS 11.5 statistical program.

A descriptive analysis was made of the sample, calculating the frequencies for each variable. The proportions of the categoric variables were compared with the chi squared test and when necessary (non-fulfillment of statistical suppositions), the Fisher's exact test and the Monte Carlo simulation method. The ANOVA was used in continuous dependent variable and the Kruskal-Wallis ANOVA in the ordinal ones.

Statistical accuracy of the estimations was determined by the calculation of 95% confidence intervals. Alpha levels under 0.5 were considered significant.

To analyze change, the Paired McNemar tests were performed, applying Bonferroni's correction to decrease type I error possibility.

Lack of statistical significance in the multivariate analysis of the variables involved made it impossible to study the contribution of the different variables to the stability of EE in the follow-up period.

RESULTS

The sociodemographic profile of the key family members in our sample is similar to the usual one of main caretakers of other chronic diseases: mostly women (87.8%), usually mothers of the patients (82%), with a mean age of 56 years (SD = 11.7) and more than half without paid work (66.7%). A total of 64.9% of them scored positively on the GHQ. In 75.7%, contact time face to face between patient and caretaker was greater than 35 h week. In 70.3% of the cases, the families were made up by more than three members.

Thus, the patients' profile when being referred to intervention is superimposed to that of most of the studies in this field: their mean age is approximately 24.68 years (SD = 4.88) with predominance of men, single, almost all occupationally inactive, who live in the parent's home. Clinically, the mean evolution is 4.6 years (SD = 3.3), the patients mostly comply with the treatment and usually have active symptoms and deficient social functioning (table I).

The cases that abandon intervention only differ from those that complete it in that their patients' ages are greater both at the time of evaluation ($t = 2.83$; $p = 0.006$) and at the onset of the disease ($t = 2.35$; $p = 0.021$), they belong to smaller families ($\chi^2 = 10.81$; $p = 0.001$) and they have a history of more admissions ($t = 2.69$; $p = 0.009$).

The levels of expressed emotion in the initial evaluation were high in 73% of the cases, above all at the expense of overinvolvement, which was elevated in 81.5% of the families with high EE. No association was found between expressed emotion levels or their subscales and previous evolution time of the schizophrenia.

During the period in which the intervention was performed, 43.2% of the cases reduced their EE levels, there being no case in which it increased. Between the end of the intervention and final evaluation, 8.1% more reduced their EE levels, while there was an increase in 13.6% of the cases. Only 35% of the family members maintained their EE level unchanged among the three evaluations. 21.5% were stable with low EE and 13.5% with high EE (fig. 1).

The EE subscales also showed a tendency to improve during the intervention, without experiencing hardly any changes in the follow-up period.

Performance of paired McNemar tests among three evaluations times (that is, t0-t1, t1-t5 t0-t5) made it possible to examine when the changes occurred more closely. To do so a significance level was established at $p < 0.0166$ after applying Bonferroni's correction (fig. 2).

Thus, significant changes occurred in the expressed emotion levels between t0-t1 and t0-t5, and no variations were found between t1 and t5. That is, the differences between EE and the initial evaluation and that of 5 years of follow-

Table 1 Level of emotional expressiveness and sociodemographic and clinical characteristics

Key family gender (n, %)
- Male: 4 (12.2%)
- Female: 33 (87.8%)

Key family gender (mean, SD): 56 (11.7)

Key family work situation (n, %)
- Active: 12 (33.3%)
- Inactive: 25 (66.7%)

Initial GHC (n, %)
- No disease: 13 (35.1%)
- Disease: 24 (65.9%)

EE components
- Critical comments (n, %)
  - Less than 6: 27 (73%)
  - Six or more: 10 (27%)
- Overinvolvement (n, %)
  - Absent: 15 (40.5%)
  - Present: 22 (59.5%)
- Hostility (n, %)
  - Absent: 30 (81.1%)
  - Present: 7 (18.9%)
- Positive comments (mean, SD): 1.9 (1.72)
- Affection (mean, SD): 3.54 (1.37)

Face-face contact (n, %)
- < 35 hours: 9 (24.3%)
- > 35 hours: 28 (75.7%)

Gender patient (n, %)
- Male: 25 (67.6%)
- Female: 12 (32.4%)

Age patient (mean, SD): 24.68 (4.88%)

Work situation patient (n, %)
- Active: 1 (2.7%)
- Inactive: 36 (97.3%)

Evolution time (mean, SD): 4.6 (3.3)

Onset age (mean, SD): 20.11 (3.37)

Number of previous admissions (mean, SD): 1.8 (0.79)

Admission background (n, %)
- No: 15 (40.5%)
- Yes: 22 (59.5%)

Initial PAS sum (mean, SD): 6.2 (3.16)

Treatment compliance (n, %)
- Yes: 36 (97.3%)
- No: 1 (2.7%)

Initial DAS (n, %)
- Excellent: 0
- Good: 3 (8.1%)
- Moderate: 10 (27%)
- Poor: 17 (45.9%)
- Serious lack of adjustment: 7 (18.9%)

Family composition (n, %)
- One father and patient: 1 (2.7%)
- Both parent and patient: 7 (18.9%)
- Parents, sibings and patient: 26 (70.3%)
- Partner and patient: 1 (2.7%)
- Others: 2 (5.4%)

up occurred at the expense of those produced between the onset and end of the intervention, since the changes produced were maintained since it ended. On the contrary, in the group of cases that abandoned the intervention, no changes were observed when making the analysis between initial EE (t0) and the final one (t5) with McNemar's test.

The emotional overinvolvement subscale had an identical behavior to that of the EE. On the other extreme, hostility did not show significant changes at any time, it being shown to be the most resistant subscale to change. Criticism only showed a significant reduction after the intervention, which was not translated into a decrease of its levels in the total period of follow-up. The remaining subscales were favorably changed after the intervention, but without reaching statistical significance.

The finding of this instability of EE in our sample posed the question, on the one hand, of what was the relative contribution of each subscale to global EE variability and, on the other hand, if there were variables that could be associated to greater instability.

Regarding the relative contribution that each subscale could have in the variability between the different EE measurements and given the non-existence of a specific test for ordinal variables, an attempt was made to approach the question with an analysis of the univariate variable. In spite of the violation of the suppositions by the measurement scales (these are ordinals and not intervals as the ANOVA would require), we can get an idea that comes close enough to the contribution of each subscale, since statistical significance is reached with the Kruskal-Wallis test.

Within these limitations, emotional overinvolvement accounted for 17.5% of the variance found in EE stability/instability between the previous evaluation and posterior one to the intervention. On the contrary, when the sample is analyzed in the post-test (t2-t3), stability/instability of expressed emotion could be explained by the major contribu-

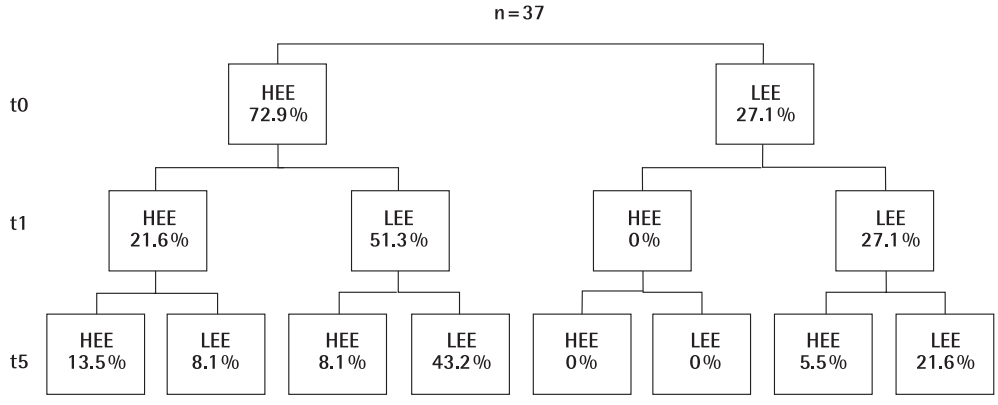

Figure 1 *Frequencies of the changes in the EE levels during observation period. t0: initial evaluation; t1: evaluation after intervention; t5: evaluation 5 years after intervention; HEE: high expressed emotion; LEE: low expressed emotion.*

tion of two of the subscales that make it up: overinvolvement and critical comments, with a size of effect, operating as corrected squared R of 0.083 and 0.153 respectively.

Regarding what variables were associated with stability and instability of the EE levels and their subscales, it was detected that they were only clinical, no relationship with sociodemographic factors being found.

Between the onset and end of the intervention (t0-t1), the decrease in EE levels was only associated to the absence of relapses (Fischer: 0.042) and to readmissions (Fischer: 0.046) during this period.

Between the conclusion of the intervention and final evaluation (t1-t5), the variability of the EE levels and its subscales were associated with the seriousness of productive symptoms and social adjustment (table II).

The minor clinical seriousness at the end of the intervention (t1) was associated with stably low EE levels $\chi^2=4.543$; p= 0.009) and overinvolvements (U=8.500; p=0.004). At the end of the follow-up (t5), a greater clinical seriousness was associated with maintainably high levels or increase of EE ($\chi^2=9.242$, p=0.018), with stability of the high levels of overinvolvement (U=13.00; p=0.013) and with the decrease of the affection (U=22.500; p=0.025).

Better social adjustment in the final evaluation (t5) was associated with stable levels of low EE ($\chi^2=9.299$; p=0.026), while worse social adjustment was related with the increase of overinvolvement (U=10.500; p=0.037), and with the decrease of affection (U=31.500, p=0.014) and with positive comments (U=3.000; p=0.003).

Cases with high stable criticism were distinguished from those with low stable ones in that, when the intervention was completed (t1), greater doses of neuroleptics were received (U=3.000; p=0.021) and that more admissions had been required at 5 years (U=5.000; p=0.029). No differential profiles were found regarding hostility.

No associations could be found with the use of multivariate techniques. The fact that no predictive variable appeared with sufficient statistically power is possibly due to the small sample size.

DISCUSSION

The main limitation of this study is its small sample size which, although equivalent to other similar studies[4,6,8,9,11], did not make it possible to make a deep analysis. In any event, the fact that the different findings point to a same sense seems to rule out that the associations found were due to chance.

The results obtained point to the fact that the global changes of all the observation period were produced at the expense of those produced during the intervention. Once concluded, this did not produce significant variations in the next 5 years.

The fact that the intervention appears as the main determining factor for the decrease of EE levels would agree with most of the intervention studies, although few of them study what occurs beyond the year after ending therapy. Thus, the main contribution of our study may possibly be that because it has a greater follow-up period than any other study of these characteristics, except for the Lenior study in 2002[15].

Unfortunately, we do not have a control group that allows us to attribute the changes observed to therapeutic intervention. With this limitation, if we compare our values in an orientative way with those described in the literature regarding western cultures, we see that, in our case, there are greater reductions than the spontaneous decreases de-

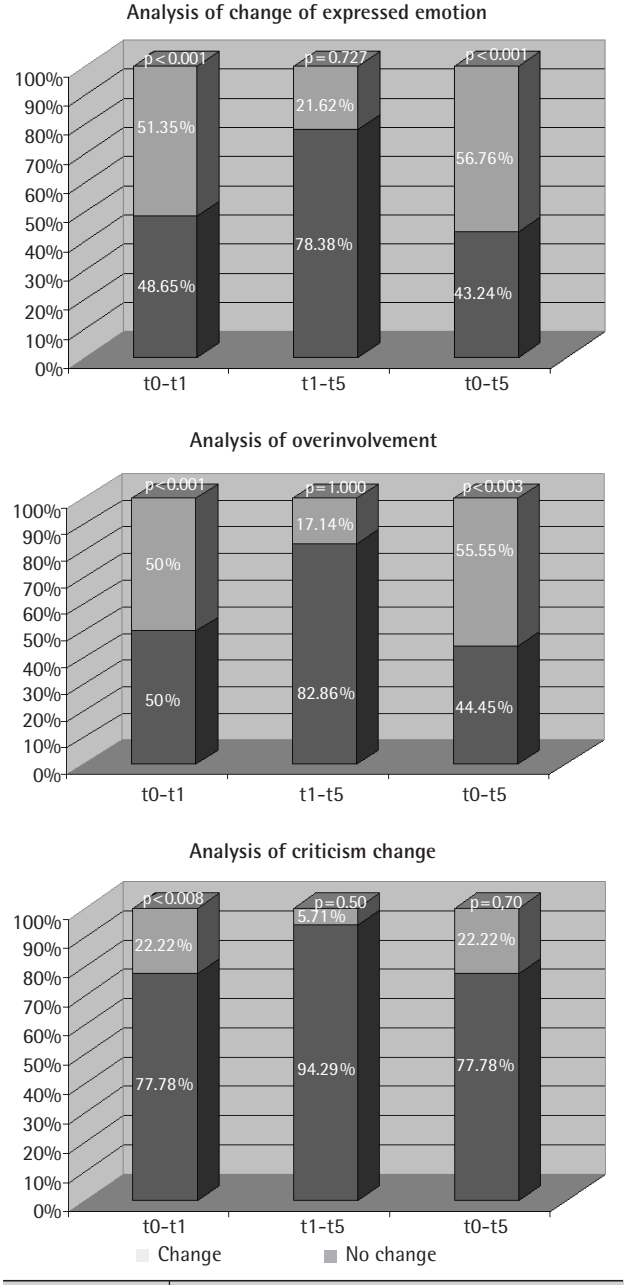

Figure 2 *Analysis of change among the three evaluation times. The statistically significant McNemar has been emphasized after applying Bonferroni's correction.*

Table 2 **Changes of EE levels and subscales after the end of the intervention: association with clinical variables**

	PASt1	PASt5	ADMISt5	DASt5	Dose t1
High EEt1 → high EEt5		↑**			
Low EEt1 → high EEt5		↑**			
Low EEt1 → low EEt5	↓*			↓**	
High EOIt1 → high EOIt5		↑**			
Low EOIt1 → high EOIt5				↑**	
Low EOIt1 → low EOIt5	↓*				
High CRt1 → high CRt5			↑**		↑**
High Wt1 → low Wt5		↑**			
Low Wt1 → high Wt5				↓**	
High CPt1 → low CPt5				↓*	

t1: evaluation after intervention; t5: evaluation at 5 years; *p < 0,01; **p < 0,05; EE: expressed emotion; EOI: overinvolvement; CR: criticism; H: hostility; W: affection; PC: positive comments; PAS: clinical seriousness (the greater, the higher); DAS: social adjustment (the higher, the lower); ADMIS: number of admissions; dose: drug doses.

scribed by other authors, that range from 25%[3,10] to 41%[4,8]. In any event, the changes only occur in the intervened family group, there being no changes in the EE levels of the drop-out group. This would orient us again to the fact that the variations are not spontaneous.

This hypothesis is supported by that fact that, coincidently with the literature, no associations have been detected between EE measured in the initial contact and the previous time of disease evolution, which reinforces the non-existence of a spontaneous tendency towards the reduction of EE levels with the passage of time.

Finally, analysis with paired McNemars also confirms the change around the performance of the intervention, and no significant changes are detected after it is concluded.

Another important piece of data in our study is that the EE variation is produced, above all, at the expense of emotional overinvolvement. This means a difference regarding the different anglo-saxon studies, in which overinvolvement is the most resistant subscale to change[6,11].

In our sample, it is intuitively observed that the high overinvolvement is that which mainly determines the classification of the family members as high EE and, thus, the variations in the EE levels are basically produced at the expense of overinvolvement. To be able to observe statistically the contribution of the global EE subscales, an approximation that violated the suppositions of the measure scales had to be used. This methodological limitation points to the greater contribution of overinvolvement in the intervention period while the major role was for criticism, overinvolvement passing to a second place, after the end of the intervention.

Perhaps the most obvious explanation to this finding is the high percentage of overinvolved families in our sample. This predominance of overinvolvement may have several possible explanations.

The most probable interpretation is that it is due to the cultural differences between the Mediterranean emotional

patterns and the Anglo-Saxon ones, whose samples show greater rates of criticism than overinvolvement[1,2,6,10,11,16].

Another variable that may be involved is type of living arrangement, that also differs from Anglo-Saxon studies, since all the patients in our sample continue to live with the origin families, with high face to fact contact time, which would lead to greater overinvolvement.

It is also possible that it reflects a difference in gender, as our sample is almost exclusively made up by mothers while there is greater equality in the distribution of caretakers by gender in other studies. If this is true, it could imply a greater tendency of the mothers to be emotionally involved in the patient's care.

Finally, another possibility is that the sample would be biased towards greater overinvolvement. Initially, as no intervention was offered systematically but only when it was considered adequate by the patient's psychiatrist, this could have been preferentially given to the most demanding family members who were more involved with the patient, that is, the most overinvolved. On the other hand, given that only that data of those coming to more than 75% of the sessions were analyzed, it is possible that the family members with greater tendency to become overinvolved had greater adherence than those who reacted with greater hostility or criticism, and, therefore, they were overrepresented.

In any event, whatever the reason for the predominance of the overinvolvement in our sample, this does not invalidate the finding that the overinvolvement is shown to be more susceptible to change than criticism.

Another outstanding result of this study is found in the fact that fluctuations of the EE levels are only associated with clinical variables.

Thus, between the onset and end of the intervention, the only variables that are significantly associated with the decrease of the initial EE levels were the absence of relapses and readmissions, which could indicate both that the EE is reduced as the patients relapse less and that the decrease of EE produces fewer relapses.

Between the end of the intervention and final evaluation, the fact that the EE levels vary or not depends on the seriousness of the productive symptoms and social adjustment grade. The fact that no association with the number of relapses occurs in this period could be because the family members «become more accostumed» over time to the crisis situations, the daily presence of a greater symptomatic seriousness or worse social functioning causing more emotional repercussion.

Overinvolvement and criticism also vary in relationship with clinical variables independently of the sociodemographic ones.

We do not have characteristic data that could orient us on the direction of the causal relationship between EE (and its subscales) and the patient's symptoms, although, according to the literature[3,4,14], it is likely that this association is due to the reciprocal influence between the patient's symptoms and the family reactions. In any case, these findings once again stress on the importance of EE as a predictor of course, not only in relationship with the relapses but also with other clinical variables.

The changes reached in our study after intervention were maintained for at least 5 years. In this period, increase in the EE levels was only detected in the subgroup of cases that have greater seriousness of the productive symptoms or worse social adjustment. Clinically, this would imply that there would be a risk of losing the benefits of therapy on EE in this subgroup with the passage of time. Thus, special attention should be given to them and the therapy duration in these families should be prolonged.

Given the theoretical and clinical importance of the study of EE behavior in time, we consider that studies with larger samples that make it possible to validate the results are necessary.

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