

## How does family intervention improve the outcome of people with schizophrenia?

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### Abstract

**Background** There is strong evidence of the efficacy of family psychosocial interventions for schizophrenia, but evidence of the role played by the attitudes of relatives in the therapeutic process is lacking.

**Method** To study the effect of a family intervention on family attitudes and to analyse their mediating role in the therapeutic process 50 patients with schizophrenia and their key relatives undergoing a trial on the efficacy of a family psychosocial intervention were studied by means of the Affective Style Coding System, the Scale of Empathy, and the Relational Control Coding System. Specific statistical methods were used to determine the nature of the relationship of the relatives' attitudes to the outcome of family intervention.

**Results** Family psychosocial intervention was associated with a reduction in relatives' guilt induction and dominance and an improvement in empathy. Empathy and lack of dominance were identified as independent mediators of the effect of family psychosocial intervention. The change in empathy and dominance during the first 9 months of the intervention predicted the outcome in the following 15 months.

**Conclusion** Relatives' empathy and lack of dominance are mediators of the beneficial effect of family psychosocial intervention on patient's outcome.

**Keywords** Schizophrenia · Family attitudes · Psychosocial family intervention · Relational control · Empathy

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## Introduction

Schizophrenia is one of the most severe mental disorders. The onset of psychotic symptoms in early adulthood is preceded by several years of cognitive and social deterioration, and three-quarters of those affected experience recurrent relapses and continuous disability [1]. There is general consensus that the onset of the disorder results from the interaction between biopsychosocial vulnerability factors and environmental stressors, such as adverse rearing patterns [2], early life adversity, growing up in an urban environment, minority group position and cannabis use [3]. However, regarding factors influencing the course of the disorder the immediate family environment has been more often the main focus of attention. Relatives' attitudes towards the patient, such as high levels of expressed emotion (EE) involving criticism, over involvement and intrusiveness [4, 5], and the attribution of symptoms to the patient's will [6] have been shown to be related to an unfavourable course of the disorder. It has also been reported that the relatives of persons with schizophrenia with high EE display a controlling and dominant style of communication [7], but the association between relatives' dominant attitudes and the outcome of therapy has not yet been sufficiently researched [8]. The majority of previous studies focus on family negative attitudes thus creating a blaming viewpoint which may not be fair to the role the family may play in the outcome of therapy. Positive attitudes such as empathy [9, 10] and affective support [11] may foster resilience in the patient and help to buffer environmental stress.

There is strong evidence showing that family psychosocial interventions are effective in improving the course of schizophrenia [12] and it is frequently assumed that their beneficial effect is mainly mediated by a positive change in the relatives' attitudes. However, there is no definitive evidence on the existence of a causal link between the change in relatives' attitudes during the intervention and the improvement in patient's outcome. Even more, it has been suggested that a patient's unusual behaviour may be the cause of relatives' negative attitudes and not the other way around [13]. Moreover, there is no agreement regarding which attitudes may be involved in the process.

Having demonstrated the efficacy of family psychosocial intervention in improving the clinical and social course of severe schizophrenia in a randomized clinical trial already published [14], we now turn to investigate the role played by family attitudes in the therapeutic process. Based on previous studies we have chosen to focus on the role potentially played by relatives' criticism, guilt induction, intrusiveness, dominance, support and empathy.

## Method

### The clinical trial

For details regarding sampling, design, procedure and results of the clinical trial, the reader is referred to a previous publication [14]. Only a brief account will be given here. A 2-year randomized controlled trial with blind assessments was carried out to study the efficacy of family psychosocial intervention on clinical and social functioning and family burden. Fifty patients with DSM-IV schizophrenia and their key relatives (those with the most face-to-face contact) were randomized to two groups: family intervention + placebo individual counselling + standard treatment, or placebo individual counselling + standard treatment. Two interventions were made, one family intervention and the other was individual counselling applied to patients in both groups so as to balance the expectations of the control group. Individual counselling was based on information and support. Kuipers, Leff and Lam's manualized evidence-based family psychosocial intervention [15] was used. The key elements of this technique include information about schizophrenia, support for caregivers, illness management, communication techniques and problem-solving strategies. A specific module to train the patient and his or her relative in empathy was added at the end of the ninth month. The results showed that family psychosocial intervention was significantly associated with improved clinical (positive symptoms, negative symptoms and frequency of relapse) and social (employment and interpersonal relationships) outcomes. A patient's Global Outcome Score was calculated by adding the standardized scores of the following variables: clinical relapse, change in positive symptoms, change in negative symptoms, change (in %) in social relations, and change in employment [14, 16]. In the present study, patients' Global Outcome Scores will be used as the outcome measure. Two evaluators were involved: one assessed clinical and social variables, and the other relatives' attitudinal variables. Both were independent of each other and blind to the patients' group assignment. Patients were asked to participate voluntarily in the study and gave their written consent after being informed of the nature and the possible consequences of participation. All potential participants who did not participate in the study were not disadvantaged in any way by not participating. The study protocol was approved by the bioethical board of Miguel Hernández University.

### The family interaction task

In this study, family attitudes were measured during a dyadic interaction encounter [17]. The patient and his or

her key relative were asked to discuss and resolve three problems or conflicts related to their daily life together. They were instructed to spend approximately 10 min on each problem. To elicit the problems, a research assistant previously interviewed the couple using the Problem Questionnaire based on Wing et al. [18]. One problem was chosen by the patient, one by the relative and the third one by consensus. The task was carried out before treatment started and after 9 and 24 months, and was videotaped, transcribed and blindly coded by a trained and independent observer.

#### Instruments used to assess family attitudes

To measure criticism, guilt induction, intrusiveness and support in a relative's verbal expressions, the Affective Style Coding System [19] was adapted and employed. A detailed manual with operational definitions, levels of measurement and examples of these attitudes was developed and used for training the research assistant. Criticism was defined as any negative evaluation of the patient's personality and/or behaviour. Guilt induction was characterized by comments that made the patient feel responsible for his or her symptoms or maladaptive behaviour, or for the negative consequences of the behaviour on family members. Intrusiveness was defined as the relative's unjustified knowledge of the thoughts, feelings and/or motivations of the patient. Support included expressions of backing and endorsement of the patient's opinions, feelings and/or behaviour. The quotient of the number of sentences that expressed each one of these attitudes and the number of the relative's verbal expressions was used as the score.

Empathy was defined as the relative's capacity for knowledge of the emotional state of the patient regardless of his/her own emotional state [20]. To measure empathy in each relative's verbal expression, Ivey's Scale of Empathy [20] was adapted and used. The scale has seven levels, and Level 4 identifies the basic level of empathic attitude. The percentage of the relative's verbal expressions that reached an empathy level of 4 or more was used as the score.

The relative's dominance was defined as any attempt by the relative to take control over the patient during the verbal interaction, a negative escalating verbal communication pattern. To measure dominance, the Relational Control Coding System [21] was used. Within one speaking turn any attempt to assert control was coded as a "one-up" message. The dominance score of the relative was the rate of dyadic sequences of consecutive one-up messages, where one-up of the patient was followed by one-up of the relative, with respect to the total number of the relative's verbal expressions.

A rater was specifically trained in the use of the three instruments obtaining an inter-rater single measure Intra-class Correlation Coefficient (two evaluators, 21 patients) of 0.96 for the global score of Affective Style (0.93 for Criticism, 0.86 for Intrusiveness and 0.92 for Guilt Induction), 0.96 for empathy and 0.97 for dominance.

#### Statistical analysis

First, to study the effect of family intervention on the relative's negative attitudes, the differences between the groups in mean change scores between the beginning and the end of the trial were compared. To avoid autocorrelation and to control the within-group and between-group variability when assessing the differences between groups, percentages of relative change  $((\text{baseline score} - \text{final score})/\text{baseline score}) \times 100$ , or absolute change when baseline scores included 0, were used.

Second, to study the relationship between attitudes and the Global Outcome Score, correlation and multiple linear regression analysis were conducted following Girón et al. [14]. To determine the relationship between family attitudes and the patient's Global Outcome Score, several regression models in blocks were constructed. The first block included family intervention (which was maintained in all estimations). Family attitudes were introduced one by one, ordered according to their Pearson correlation coefficient, if the level of significance was  $p < 0.1$ . Family attitudes with correlation coefficients with a  $p \geq 0.1$  were included together in the last block.

Third, all the family attitude variables were considered potential mediators of the therapeutic effect [22]. To assess mediation, the total effect of the family intervention on the patient's Global Outcome Score was divided in a direct effect and in an indirect effect through the proposed mediators [22]. This indirect effect is the product of the effect (the unstandardized regression coefficient) of the family intervention on the mediator by the effect (the unstandardized regression coefficient) of the mediator on the patient's Global Outcome Score. We used the Preacher and Hayes' SPSS macro to estimate the indirect effects of multiple mediators (single-step multiple mediator analysis) [23]. Total indirect effect is the sum of all individual indirect effects. Given the sample size, a bootstrapping method (with 1,000 bootstrap resamples) was used to assess indirect effects. We consider point estimates of indirect effects significant if zero is not contained in the confidence intervals. The relationship between mediators and Global Outcome Score was analysed including the effect of two therapeutic potential mediators: the average dosage of antipsychotic medication taken in mg/day of chlorpromazine and the number of hours of exposure to rehabilitation during the 24 months, and controlling for the

**Table 1** Relatives' attitudes at baseline, 9 and 24 months in the control and the family intervention groups

	Control			Family intervention			Control Mean change 0–24	Family intervention Mean change 0–24	<i>p</i>
	0	9	24	0	9	24			
Mean in critical attitude	0.026 (0.040)	0.045 (0.106)	0.025 (0.071)	0.067 (0.069)	0.032 (0.050)	0.042 (0.075)	0.000 (0.059)	0.024 (0.077)	$t = -1.2, p = 0.222$
Mean in guilt induction	0.009 (0.015)	0.009 (0.017)	0.011 (0.021)	0.017 (0.023)	0.007 (0.022)	0.006 (0.014)	-0.003 (0.019)	0.012 (0.023)	$t = -2.4, p = 0.019$
Mean in intrusiveness	0.005 (0.012)	0.006 (0.012)	0.005 (0.006)	0.014 (0.024)	0.005 (0.014)	0.006 (0.018)	0.000 (0.015)	0.008 (0.031)	$t = -1.1, p = 0.280$
Mean in support	0.0 (0.0)	0.0 (0.0)	0.001 (0.004)	0.0 (0.0)	0.001 (0.046)	0.004 (0.012)	-0.001 (0.004)	-0.004 (0.012)	$t = 1.2, p = 0.229$
Mean in dominance	0.141 (0.081)	0.153 (0.081)	0.157 (0.105)	0.166 (0.088)	0.134 (0.068)	0.117 (0.090)	-0.016 (0.091)	0.048 (0.090)	$t = -2.5, p = 0.016$
Mean in empathy (in %)	0.001 (0.003)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.001 (0.004)	0.005 (0.012)	0.001 (0.003)	-0.005 (0.012)	$t = 2.4, p = 0.025$

Standard deviation (SD) given in parentheses

**Table 2** Pearson's correlation matrix of change in family attitudes and patient's Global Outcome Score during the months 0–24 ( $n = 50$ )

	Patient's Global Outcome Score	1	2	3	4	5
1. Change in critical attitude during the months 0–24	0.296 (0.037)					
2. Change in guilt induction during the months 0–24	0.381 (0.006)	0.380 (0.006)				
3. Change in intrusiveness during the months 0–24	0.223 (0.120)	0.404 (0.004)	0.583 (0.000)			
4. Change in support during the months 0–24	-0.270 (0.058)	-0.373 (0.008)	-0.234 (0.102)	-0.300 (0.034)		
5. Change in empathy (in %) during the months 0–24	-0.387 (0.005)	-0.093 (0.521)	-0.106 (0.465)	-0.316 (0.025)	-0.074 (0.608)	
6. Change in dominance during the months 0–24	0.471 (0.001)	0.334 (0.018)	0.317 (0.025)	0.274 (0.055)	-0.096 (0.507)	-0.139 (0.336)

effect of those covariates (being single, presence of persisting positive symptoms during the year before the trial) associated in an independent and statistically significant form with the patient's Global Outcome Score in previous research [14]. All estimations were based on an intention-to-treat analysis.

Lastly, to study the direction of the effects of family attitudes on the patient's outcome, the change in family attitudes and each patient's Global Outcome Score was calculated for 0–9 and 10–24 months. Multiple regression analysis was conducted.

## Results

Measurements of two patients from the control group in the evaluations at 9 and 24 months, and another

four at 24 months (two from the control group and two from the experimental group), could not be obtained.

### Effect of family intervention on family attitudes

Family intervention was associated with a decrease in relatives' guilt induction, and dominance and an increase in empathy (Table 1). Table 2 shows that changes in criticism, guilt induction, dominance and empathy were related to patients' Global Outcome Score ( $p < 0.05$ ). In Table 3 the final multiple linear regression model predicting the patients' Global Outcome Score is shown, including the presence of persistent positive symptoms and being single at the beginning of the trial. The tolerance coefficients were satisfactory in both the initial model ( $\geq 0.6$ ) and the final model ( $\geq 0.7$ ).

**Table 3** Results of the estimation of multiple linear regression's models predicting patient's Global Outcome Score during the months 0–24 ( $n = 50$ )

	$\beta$ (SE)	Standardized $\beta$	$p$
Intervention			
Family intervention <sup>a</sup>	2.095 (0.834)	0.265	0.016
Mediators			
Change in relatives' dominance during the months 0–24	13.114 (4.066)	0.312	0.002
Change in relatives' empathy (in %) during the months 0–24	−109.288 (42.669)	−0.249	0.014
Covariates			
Single <sup>a</sup>	−4.223 (1.137)	−0.347	0.001
Presence of persistent positive symptoms <sup>a</sup>	2.616 (0.783)	0.317	0.002
$F$ ratio ( $df$ ) $p$	15.490 (5, 44) <0.001		
$R^2$ total	0.638		

 $\beta$  unstandardized coefficient<sup>a</sup> 0 = no, 1 = yes**Table 4** Total, direct, and indirect effects of family intervention on patient's Global Outcome Score during the months 0–24 adjusted by covariates in multivariate mediating analysis ( $n = 50$ )

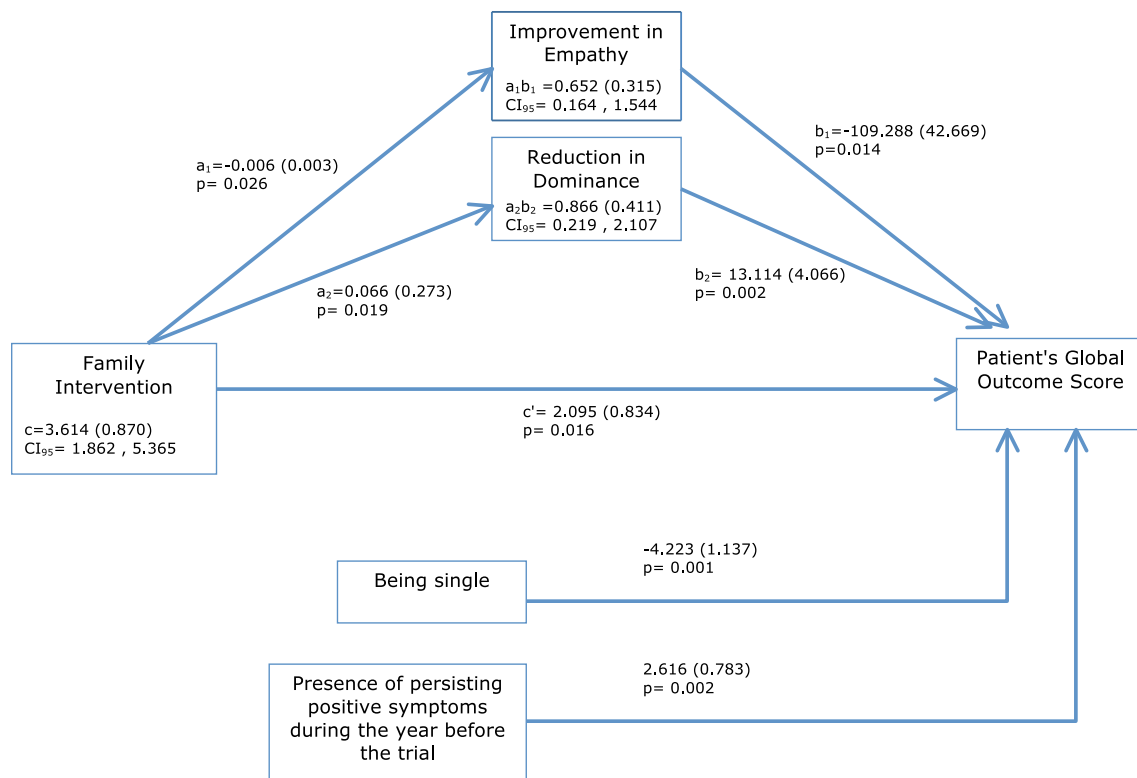
	$\beta$	95 % CI or $p$	% on total effect
Total effect of family intervention	3.614 (SE = 0.870)	$p = 0.000$	100
Direct effect of family intervention <sup>a</sup>	1.955 (SE = 0.922)	$p = 0.041$	54.1
Total of indirect effects of family intervention	1.659	0.381, 3.430	45.9
Indirect effect of family intervention through change in relatives' dominance during the months 0–24	0.899	0.174, 2.248	24.9
Indirect effect of family intervention through change in relatives' empathy (in %) during the months 0–24	0.719	0.161, 1.870	19.9
Indirect effect of family intervention through change in relatives' support (in %) during the months 0–24	0.106	−0.078, 1.048	
Indirect effect of family intervention through change in relatives' guilt induction (in %) during the months 0–24	0.024	−0.553, 1.003	
Indirect effect of family intervention through change in relatives' critical attitude (in %) during the months 0–24	0.016	−0.312, 0.706	
Indirect effect of family intervention through change in relatives' intrusiveness (in %) during the months 0–24	−0.079	−0.817, 0.166	
Indirect effect of family intervention through average dosage of antipsychotic medication taken during the 24 months	−0.021	−0.952, 0.147	
Indirect effect of family intervention through the number of hours of exposure to rehabilitation during the 24 months	−0.006	−0.235, 0.800	
Covariates			
Single <sup>a</sup>	−3.997 (SE = 0.921)	$p = 0.003$	
Presence of persistent positive symptoms <sup>a</sup>	2.551 (SE = 1.234)	$p = 0.009$	

 $\beta$  unstandardized coefficient,  $SE$  standard error<sup>a</sup> 0 = no, 1 = yes

Controlling the effect of prognostic factors does not reduce the significant correlation of empathy and dominance with the Global Outcome Score, but it does cancel the correlation of support.

Identification of mediators of the therapeutic process

To give the possibility that any attitudinal factor would be identified as a mediator in a multiple mediator model [22],



**Fig. 1** Graphical display of the path model with the total ( $c$ ), direct ( $c'$ ) and indirects ( $a_1b_1$ ,  $a_2b_2$ ) effects of the family intervention on patient's Global Outcome Score during the months 0–24, adjusted by covariates in multivariate mediating analysis, through the statistically

significant mediators and covariates. Unstandardized coefficients (standard errors) and 95% confidence intervals or  $p$  levels. Family intervention: 0 = no, 1 = yes ( $n=50$ )

the six family attitudes, and the two therapeutic factors as mediators, and the two prognostic factors as covariates were incorporated into a multiple mediating analysis model to assess the effect of the family intervention on the patient's Global Outcome Score. Both direct and indirect effects of family intervention were statistically significant. The results indicated that 44.8 % of the total effect of the intervention was accounted for by the improvement in empathy and reduction in dominance (Table 4). The estimation of a more parsimonious model including these two relatives' attitudes and the two prognostic factors indicated that the effect of the intervention was accounted, in a statistically significant form, for by the improvement in empathy (18 %) and reduction in dominance (24 %). The graphical display of this path model with the two significant mediators and covariates is shown in the Fig. 1.

#### Analysis of the direction of effects

The patients' Global Outcome Scores of the control group deteriorated during the first 9 months (mean of GOS =  $-0.89$ , SD = 2.77) and between months 9th and 24th (mean of GOS =  $-1.59$ , SD = 2.86), whereas it improved in the

therapy group during both periods (months 0 to 9th, mean of GOS = 0.89, SD = 3.14; months 9th to 24th, mean of GOS = 1.59, SD = 1.96). The change scores were significantly different between the groups in both periods ( $t_{0-9} = -2.12$ ,  $p = 0.039$ ;  $t_{9-24} = -4.58$ ,  $p = 0.000$ ). To assess the independent effect of change in empathy and dominance during months 0–9 on patients' Global Outcome Scores during months 9–24, a multivariate regression model was built. This model included the family intervention (0 = no, 1 = yes), the patients' Global Outcome Scores during months 0–9 and the change in empathy and dominance during months 9–24. The regression analysis selected family intervention, change in empathy and dominance during months 0–9 and the change in dominance between months 9–24, as predicting variables with statistically significant coefficients (Table 5). Empathy mean change during months 9–24 showed a tendency towards statistical significance. The regression analysis by blocks, including persistent positive symptoms at the start of the trial, being single, average dosage of antipsychotic medication taken and the number of hours of exposure to rehabilitation during the 24 months, selected the presence of persistent positive symptoms and did not modify the

**Table 5** Results of the estimation of linear regression's models predicting patient's Global Outcome Score during the months 9–24 ( $n = 50$ )

	$\beta$ (SE)	Standardized $\beta$	$p$
Family intervention <sup>a</sup>	1.813 (0.733)	0.315	0.017
Patient's Global Outcome Score during the months 0–9	0.000 (0.113)	0.000	0.997
Change in relatives' dominance during the months 0–9	11.103 (4.112)	0.352	0.010
Change in relatives' empathy (in %) during the months 0–9	–259.269 (97.791)	–0.318	0.011
Change in relatives' dominance during the months 9–24	9.251 (4.570)	0.254	0.049
Change in relatives' empathy (in %) during the months 9–24	–62.756 (37.569)	–0.199	0.102
$F$ ratio ( $df$ ) $p$	6.73 (6, 43) 0.000		
$R^2$ total	0.484		

$\beta$  unstandardized coefficient

<sup>a</sup> 0 = no, 1 = yes

result obtained with the first model. On the other hand, the results of two multivariate regression analyses neither showed a significant relationship between the change in dominance or empathy during the last 15 months and patients' Global Outcome Scores during the first 9 months, nor with patients' Global Outcome during the last 15 months. The tolerance coefficients were satisfactory ( $>0.70$ ).

## Discussion

In this study, a reduction in criticism, dominance and guilt induction and an increase in empathy were all significantly associated with good outcome, but when incorporated into the multivariate analysis, only dominance and empathy maintained this association. Almost 50 % of the family intervention effect was mediated by the reduction of relatives' dominance and improvement in empathy, and the mediation role of these attitudes was independent of other therapeutic potential mediators as the dosage of antipsychotics taken and the exposure to rehabilitation activities. Due to lack of reliable information in the data previous to the start of the study, the dosage of antipsychotics taken expressed as the number of hours of exposure to rehabilitation activities was used in the analysis rather than the change values. According to our results, the directionality of the effects goes from these two family attitudes to patients' outcome and not the other way around.

Out of all the seven published clinical trials dealing with the effect of family interventions on outcome while considering the role of relatives' attitudes [11, 24–29], only one shows a significant positive effect of family intervention on outcome but no relationship was found between the intervention and the change in family attitudes [24]. It may be that the EE was not a valid measure of relatives' state of

attitude. On the other hand, none have analysed the mediating process using specific statistical procedures.

Consistent with our results, criticism and lack of empathy have been previously associated with poor outcome in cohort studies [9, 10]. Intrusiveness, support, guilt induction, and dominance have not been previously sufficiently studied [8, 10, 30]. In our study, induction and criticism were associated with outcome in the bivariate analysis, but not in the multivariate. However, this may be due to the insufficient size of the sample.

The findings of this study could be interpreted in the light of the stress-vulnerability model of schizophrenia [31, 32]. The results of the interaction between the patient's vulnerability and the level of environmental stress may be buffered by the relative's positive attitudes such as empathy, whereas dominance may reinforce the negative effect of environmental stress as well as being itself a source of stress for the patient.

The relative's narrative may be incorporated by the patient as part of his/her own self-definition [33]; negative attitudes that may induce feelings of insecurity and misinterpret the patient's true motivations and feelings can erode his sense of identity and self-agency, which in turn can lead to failure in functioning [34]. This hypothesis is consistent with our previous finding that negative family attitudes are associated with poor social functioning [10]. Self-agency has been proposed to play an important role in the recovery process of schizophrenia [35]. On the other hand, relative's effort to understand and respect the patient's behaviour as done by highly empathic relatives may have an empowering effect, thus diminishing his/her vulnerability.

From a different perspective, the results regarding empathy are consistent with the beneficial role attributed to empathy in all types of psychological interventions [36]. Increasing the relative's empathy may foster his or her capacity to tolerate and integrate intense and contradictory

emotions and help to bring about a cooperative spirit in problem solving with the patient [37]. Based on these ideas, we created and incorporated in the family intervention pack a specific module for improving the relative's empathic skills [14]. To train in empathy we used a microcounselling approach based on role-playing and video feedback [38] extending over six sessions. The first two sessions focused on listening skills (eye contact, posture, verbal and nonverbal interruptions and facilitations) [39], followed by one more sessions to improve attentional skills (patient and relatives were asked to summarize the content of 1 min of the other's speech). Next, two sessions were devoted to specific training in empathy (role change focusing in the other's feelings) and the last session concentrated in problem solving. We think the relative's capacity to capture and respond in a positive way to the patient's attitude, needs and feelings should not be expected to improve unless specifically trained.

The results regarding dominance as a mediator in the process are new, but not unexpected. The results of our study show a significant effect of a negative escalating verbal communication pattern on poor outcome. In the family communication-based model, communication serves the function of transmitting information and, in its formal aspects, provides the ways in which family members define, control and reinforce the relationships with each other to maintain the constancy of the family's internal environment [40]. It is this second formal aspect of communication that has been identified as related to outcome in this study. As suggested by Gottman and Levenson [41], the key to preventing a damaging relationship may not lie in solving conflict issues but rather in focusing on the formal process of dealing with these issues.

In summary, from the clinical point of view our results show that in family therapy of schizophrenia relatives should be specifically trained in improving their empathic capacity towards the patient by the use of appropriate role-playing techniques. Secondly, more attention should be paid to the formal aspect of interpersonal communication [42] rather than to the content of conflictive issues; teaching conflict de-escalation and acceptance of an equal power relationship are a prerequisite for training in empathy.

Regarding research, conceptualizing criticism as dominance has important heuristic consequences. Moving the focus of interest from the purely empirical context where the EE approach has been developed to the theoretical framework of the "relational communication system" [10, 42] will prove a more fertile research approach.

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