

Relatives' illness attributions mediate the association of expressed emotion with early psychosis symptoms and functioning

By: Tecelli Domínguez-Martínez, Cristina Medina-Pradas, [Thomas R. Kwapil](#), Neus Barrantes-Vidal

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Abstract:

The mechanisms underlying the association between expressed emotion (EE) and the prognosis in early psychosis are still not well understood. Based on the attributional model, this study investigated the association of criticism and Emotional Over-Involvement (EOI) with symptoms and functioning in At-Risk Mental State (ARMS) and First-Episode Psychosis (FEP) patients, and whether these associations were mediated by relatives' attributions of control and blame. Forty-four patients (20 ARMS and 24 FEP) and their relatives were included. Findings indicated that relatives' criticism was associated with positive, negative, and general symptoms. EOI was related to negative and general symptoms. Both indices were related with impaired functioning. Most of the relations between EE indices and illness severity were mediated by relatives' attributions of blame toward the patient. Relatives' self-blaming attributions and attributions of control over the disorder by either relatives or patients were not associated with patients' variables or EE. Findings highlight the importance of family emotional environment in the early stages of psychosis, as well as the mediating role that relatives' beliefs can exert in those relationships. Family interventions aimed to assist relatives to change attributions that blame patient should be included in clinical protocols in order to prevent the entrenchment of high-EE.

Keywords: Illness perceptions | Criticism; Emotional Over-Involvement | Family | At-Risk Mental States | First-Episode Psychosis | Early psychosis

Article:

Introduction

An increasing body of evidence indicates that expressed emotion (EE; Vaughn and Leff, 1985), particularly criticism and Emotional Over-Involvement (EOI), is a strong predictor of poor prognosis in schizophrenia (Butzlaff and Hooley, 1998 and Hooley, 2007). Nevertheless, the mechanisms underlying this association remain unclear.

The attributional model (Barrowclough et al., 1994 and Barrowclough and Hooley, 2003) could be useful for elucidating the developmental pathways through which family stress and psychotic processes are related. It postulates that relatives' beliefs about patients' problematic behaviours are related to relatives' emotional attitudes towards patients. It seems that critical relatives are more likely to blame patients for their behaviours and view symptoms as controllable by the patients, rather than as a result of the illness. Consequently, family members attempt to change those behaviours by employing critical comments. In contrast, relatives who feel excessively blameworthy regarding the patient's illness may resort to over-involvement or self-sacrificing attitudes (Bentsen et al., 1998). It has been suggested that those behaviours that more clearly reflect signs of mental disorder, such as positive symptoms, are more likely to elicit attributions by relatives that symptoms are uncontrollable, and therefore, engender EOI attitudes (i.e., exaggerated emotional responses or overprotectiveness) (Brewin et al., 1991). Conversely, disturbances such as negative symptoms or poor functioning are more likely to be considered under the patient's control, eliciting more critical attitudes from relatives (Weisman et al., 1998).

The study of EE in the early stages of the psychosis continuum is highly relevant given that the specific circumstances of early psychosis differ from those of chronic schizophrenia, in which the disorder is clearly established and understood by relatives. Although EE was originally conceptualised in the case of chronic schizophrenia, recent studies have shown that relatives' EE levels are independent of illness chronicity (Bachmann et al., 2002; Meneghelli et al., 2011), suggesting the suitability of examining EE in early psychosis. Indeed, the early stages of psychosis are critical to explore associations between EE, symptoms and mediating mechanisms given that both patients' symptoms and relatives' appraisals and attitudes are emerging and their associations being established. Furthermore, the study of these phenomena without the bias created by the chronic course of psychosis and long term burden is essential to better understand the ontogenesis of the relationship between patients' symptoms and relatives' attitudes, as well as to design early interventions focused on the prevention of entrenchment of high-EE and encouragement of attributional changes.

To date, findings about the differential relationships between EE indices and specific symptoms and functioning in early psychosis are scarce and contradictory. On the one hand, some studies on At-Risk Mental States (ARMS) and First-Episodes Psychosis (FEP) found no association between EE and symptoms/functioning (e.g., McFarlane and Cook, 2007, Álvarez-Jiménez et al., 2010 and Meneghelli et al., 2011). On the other hand, other studies on FEP have shown associations of general and negative symptoms with both criticism and EOI (King, 2000 and Mo et al., 2007). Furthermore, preliminary research on ARMS patients points out the important role that EE seems to play in the outcome of early psychosis. Particularly, attitudes related to positive affect predicted improvement in negative symptoms and functioning (O'Brien et al., 2006 and O'Brien et al., 2008), whereas negative affect in the form of criticism predicted worsening of attenuated psychotic symptoms (Schlosser et al., 2010).

Regarding the association between relatives' illness attributions and EE in early psychosis, some studies have found support for the attributional model at the recent-onset psychosis stage; relatives who were highly critical were more likely to attribute that psychotic disorder was controllable by the patient (McNab et al., 2007 and Vansconcelos et al., 2013). Nevertheless, no studies have directly considered the possible mediating role of attributions in the association

between EE and illness severity, although it has been demonstrated that caregivers' cognitive representations of psychosis may play an important role in their emotional appraisals (e.g., Gómez-de-Regil et al., 2014), even at an early stage of the disorder (Onwumere et al., 2008).

The goals of the present study were to (1) examine the association of relatives' EE with patients' symptoms and functioning and determine whether this potential association differed for ARMS and FEP patients; and (2) test whether the association between EE and symptoms/functioning is mediated by relatives' attributions of control and blame. Despite the lack of previous studies, we established hypotheses following the attributional model: (a) EOI would be associated with positive symptoms, whereas criticism would be associated with negative symptoms and functioning; (b) considering that, theoretically, signs of illness are more evident in FEP than in ARMS patients, the association between EOI and positive symptoms would be stronger in the FEP group, whereas the associations between criticism and negative symptoms/functioning would be stronger in the ARMS group; (c) relatives' attributions of self-control (i.e., beliefs that they can greatly influence patients' problems) and self-blame (i.e., feeling blameworthy of patients' illness) would mediate the association between EOI and positive symptoms, as relatives would consider that they need to largely intervene (i.e., EOI) to decrease positive symptoms; whereas, relatives' attributions of control and blame toward the patient would mediate the association between criticism and negative symptoms and functioning, as relatives do not so readily perceive that avolition, inhibition, isolation and lack of functioning are out of the patients' control.

Methods

Participants

Forty-four patients (20 ARMS and 24 FEP) and their respective relatives were included in the study. Relatives were those who had most contact and/or the most significant relationship with the patient. ARMS criteria were established based on the Comprehensive Assessment of At-Risk Mental States (CAARMS; Yung et al., 2005). FEP patients met DSM-IV (APA, 2002) criteria for any psychotic disorder or affective disorder with psychotic symptoms. Exclusion criteria for patients were (a) evidence of organically based psychosis, (b) any previous psychotic episode that involved pharmacotherapy, and (c) mental retardation.

Measures

Relatives completed the Family Questionnaire (FQ; Wiedemann et al., 2002) and the Illness Perception Questionnaire for Schizophrenia (IPQS; Lobban et al., 2005). Both are well-established instruments to measure EE and attributions, respectively. The FQ consists of 20 items equally distributed into two subscales (EOI and criticism) and scored on a 4-point scale ranging from 'never/very rarely' to 'very often'. The internal consistency (Cronbach's alpha) of the scores for the two subscales in our sample was of 0.80 for EOI and 0.87 for criticism. Four subscales of the IPQS were used for the present study: Control-patient; Control-relative; Blame-patient; and Blame-relative. Attributions of control are based on beliefs that patient/relative can do things to control the symptoms or to determine whether the problems improve or worsen. Attributions of blame refer to beliefs that patient/relative are responsible for the symptoms, that

they could do more or try harder to get better. All the IPQS items are rated from 1 'strongly disagree' to 5 'strongly agree'. Alpha for these subscales was good (from 0.62 to 0.88).

Patients were assessed with the Positive and Negative Syndromes Scale (PANSS; Kay et al., 1987) and the Calgary Depression Scale (CDS; Addington et al., 1990). Two complementary measures of social functioning were used, one that assessed the global level of functioning based on the clinicians' perspective, the Social and Role Global Functioning Scales (GF-S and GF-R; Cornblatt et al., 2007), and another that assessed specific indicators of social functioning as appraised by the patient, the short version of the Social Functioning Scale (SFS; Birchwood et al., 1990). To confirm the fulfilment of the diagnostic inclusion criteria, the CAARMS (Yung et al., 2005) was administered to ARMS patients and the Structured Clinical Interview for DSM-IV Axis-I Disorders (SCID-I; First et al., 1996) was administered to FEP patients.

Procedure

The present study is embedded in a larger longitudinal study carried out in three Mental Health Centres of Barcelona (Spain) belonging to the Sant Pere Claver Early Psychosis Program (Domínguez-Martínez et al., 2011). The study is being developed in accordance with the Code of Ethics of the World Medical Association (Declaration of Helsinki). It has been approved by the local ethic committee. Written informed consent was obtained from all the participants.

All the assessments were conducted by experienced clinical psychologists. The time gap between patients and relatives assessments ranged from 3 to 15 days.

Data analysis

First, the association of relatives' EE (criticism and EOI) with patients' symptoms and functioning, group (ARMS=0 vs. FEP=1) and their interaction (EE×group) was analysed by means of separate multiple linear regression models. The effect size (Cohen's f^2) is also presented and was interpreted following Cohen's (1988) guidelines (medium effect: magnitude >0.15, large effect: magnitude >0.35). Second, in order to investigate whether relatives' illness attributions of control and blame mediated the association between EE (criticism and EOI) and symptoms/functioning, regression analyses were first used to test the association between relatives' beliefs with EE and patients' variables and, secondly, Sobel's test was used to test for partial mediation.

Results

Sample characteristics

Relatives were predominantly female (65.9%), specifically patients' mothers (59.1%), with the remaining caregivers being fathers (27.3%), partners (9.1%) or siblings (4.5%). Mean age of the relatives was 51.2 years old (S.D.=11.9). Most patients were male (65.9%) and lived with their relatives (86.4%). Mean age of the patients was 23.7 years old (S.D.=5.6). 59.2% of patients were studying, working or performing any daily activity, 34.1% were unemployed/unoccupied, and 6.8% had a sick leave.

For the sake of completeness, descriptive data for all relatives' and patients' measures are presented in Table 1. Significant differences between groups were found in general psychopathology and social functioning scores as assessed by SFS. ARMS patients showed greater severity of general psychopathology than FEP patients ($t=2.06$; $p=0.05$; $d=0.62$), whereas FEP group showed worse social functioning than those of ARMS ($t=-3.0$; $p=0.004$; $d=-0.90$). No significant differences emerged between ARMS and FEP relatives in terms of EE or attributions.

	ARMS $n=20$	FEP $n=24$
	Mean (S.D.)	Mean (S.D.)
<i>Relatives</i>		
Expressed Emotion (FQ)		
Criticism	21.94 (6.50)	18.20 (6.10)
EOI	24.42 (6.50)	22.52 (4.73)
Attributions (IPQS)		
Control patient	11.50 (1.82)	11.14 (2.70)
Control relative	13.00 (2.61)	14.10 (2.94)
Blame patient	10.80 (2.70)	9.13 (3.33)
Blame relative	7.84 (2.54)	6.40 (3.02)
<i>Patients</i>		
Symptoms		
Positive symptoms (PANSS)	13.30 (3.71)	13.63 (4.60)
Negative symptoms (PANSS)	19.80 (6.26)	18.50 (6.50)
General symptoms (PANSS)	38.60 (8.20)	33.25 (8.90)
Depression (CDS)	6.70 (4.91)	5.60 (5.20)
Functioning		
Social Functioning (SFS)	19.50 (6.10)	24.50 (4.92)
Social Functioning (GF-S)	6.00 (1.38)	6.17 (1.43)
Role Functioning (GF-R)	5.60 (1.19)	5.46 (1.31)

Table 1. Descriptive data of At Risk Mental States (ARMS) and First Episode Psychosis (FEP) relatives and patients ($n=44$).

Abbreviations: FQ=Family Questionnaire; EOI=Emotional Over-Involvement; IPQS=Illness Perceptions Questionnaire for Schizophrenia; PANSS=Positive and Negative Syndrome Scale; CDS=Calgary Depression Scale; SFS=Social Functioning Scale; GF-S=Global Functioning – Social Scale; and GF-R-Global Functioning – Role Scale.

Association of relatives' EE with patients' symptoms and functioning and differences between groups (ARMS vs. FEP)

Results of the association of relatives' levels of criticism and EOI with patients' measures, group (ARMS vs. FEP) and their interaction are provided in Table 2 and Table 3. On the one hand, criticism was significantly associated with all patients' clinical and functioning variables, except for social functioning as measured with the GF-S (see Table 2). Thus, relatives' criticism was associated with patients' higher symptom severity and worse functioning. No interaction between criticism and group was found. On the other hand, EOI was significantly associated with negative and general symptoms, as well as social and role functioning (see Table 3). Thus, the fact that relatives behaved in a more overinvolved way with patients was also related to worse functioning and greater symptom severity, except for positive symptoms and depression. Again, the interactions between EOI and group were not significant.

Criterion	Step 1 (d.f.=1, 39)		Step 2 (d.f.=1, 38)		Step 3 (d.f.=1, 37)	
	Criticism		ARMS vs. FEP		Criticism×group interaction	
	β	f^2	β	f^2	β	f^2
Clinical measures						
Positive symptoms (PANSS)	0.42**	0.21	0.12	0.02	0.13	0.02
Negative symptoms (PANSS)	0.35*	0.14	-0.08	0.01	-0.07	0.01
General symptoms (PANSS)	0.43**	0.23	-0.25	0.08	-0.05	0.00
Depression (CDS)	0.36*	0.14	-0.02	0.00	0.05	0.00
Functioning						
Social Functioning (SFS)	-0.43**	0.22	0.39**	0.20	0.02	0.00
Social Functioning (GF-S)	-0.29	0.09	0.07	0.00	0.21	0.05
Role Functioning (GF-R)	-0.43**	0.22	-0.19	0.04	-0.01	0.00

Abbreviations: ARMS=At-Risk Mental State; FEP=First Episode of Psychosis; d.f.=degrees of freedom; β =Beta; f^2 =effect size coefficient; PANSS=Positive and Negative Syndrome Scale; CDS=Calgary Depression Scale; SFS=Social Functioning Scale; GF-S=Global Functioning – Social Scale; and GF-R=Global Functioning – Role Scale.

* $p < 0.05$.

** $p < 0.01$; Medium effect sizes in bold.

Table 2. Linear regressions of the effect of relatives' criticism, group (ARMS vs. FEP) and their interaction on patients' clinical and functional measures ($n=44$).

Criterion	Step 1 (d.f.=1, 40)		Step 2 (d.f.=1, 39)		Step 3 (d.f.=1, 38)	
	EOI		ARMS vs. FEP		EOI×group interaction	
	β	f^2	β	f^2	β	f^2
Clinical measures						
Positive symptoms (PANSS)	0.25	0.06	0.11	0.01	-0.05	0.00
Negative symptoms (PANSS)	0.37*	0.16	-0.06	0.00	-0.14	0.02
General symptoms (PANSS)	0.40**	0.19	-0.26	0.08	-0.18	0.04
Depression (CDS)	0.30	0.09	-0.02	0.00	-0.07	0.00
Functioning						
Social Functioning (SFS)	-0.14	0.02	0.45**	0.25	0.06	0.00
Social Functioning (GF-S)	-0.49**	0.31	0.02	0.00	0.06	0.00
Role Functioning (GF-R)	-0.43**	0.22	-0.15	0.03	-0.06	0.00

Abbreviations: EOI=Emotional Over-Involvement; ARMS=At-Risk Mental State; FEP=First Episode of Psychosis; d.f.=degrees of freedom; β =Beta; f^2 =effect size coefficient; PANSS=Positive and Negative Syndrome Scale; CDS=Calgary Depression Scale; SFS=Social Functioning Scale; GF-S=Global Functioning – Social Scale; and GF-R=Global Functioning – Role Scale.

* $p < 0.05$.

** $p < 0.01$; Medium effect sizes in bold.

Table 3. Linear regressions of the effect of relatives' EOI, group (ARMS vs. FEP) and their interaction on patients' clinical and functional measures ($n=44$).

Relatives' illness attributions as mediators of the association between relatives' EE and patients' symptoms/functioning

As can be seen in Table 4, relatives' attributions of blaming the patient about their disorder were significantly associated with levels of EE, patients' negative, general and depressive symptoms, and impaired functioning. No significant interaction of relatives' beliefs blaming the patient×group was found. Relatives' attributions of control by the patient, control by relatives themselves and self-blaming attributions, were not associated with levels of EE or any of the patients' measures.

Criterion	Step 1 ^a		Step 2 ^a		Step 3 ^a	
	Blame patient		ARMS vs. FEP		Blame patient×group interaction	
	β	f^2	β	f^2	β	f^2
Expressed Emotion(FQ)						
Criticism	0.52**	0.37	-0.18	0.04	-0.12	0.02
EOI	0.31*	0.11	-0.11	0.01	-0.26	0.08
Clinical measures						
Positive symptoms (PANSS)	0.29	0.09	0.10	0.01	0.02	0.00
Negative symptoms (PANSS)	0.49***	0.32	-0.00	0.00	0.00	0.00
General symptoms (PANSS)	0.47**	0.29	-0.25	0.08	-0.07	0.00
Depression (CDS)	0.31*	0.11	-0.10	0.00	-0.23	0.06
Functioning						
Social Functioning (SFS)	-0.45**	0.26	0.31*	0.13	-0.05	0.00
Social Functioning (GF-S)	-0.30*	0.10	0.02	0.00	0.10	0.01
Role Functioning (GF-R)	0.54***	0.41	-0.19	0.05	-0.16	0.04

Abbreviations: ARMS=At-Risk Mental State; FEP=First Episode of Psychosis; β =Beta; f^2 =effect size coefficient; FQ=Family Questionnaire; EOI: Emotional Over-Involvement; PANSS=Positive and Negative Syndrome Scale; CDS=Calgary Depression Scale; SFS=Social Functioning Scale; GF-S=Global Functioning – Social Scale; and GF-R=Global Functioning – Role Scale.

Medium effect sizes in bold; large effect sizes in bold and italics.

a For the regressions on criticism, degrees of freedom (d.f.) were (1, 38), (1, 37), and (1, 36) for each step respectively; and for regressions on EOI, d.f. were (1, 39), (1, 38), and (1, 37). For the rest, d.f. were (1, 41), (1, 40), and (1, 39).

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

Table 4. Linear regressions of the effect of relatives' attributions of blame toward the PATIENT, group (ARMS vs. FEP) and their interaction on relatives' EE and patients' clinical and functional measures ($n=44$).

Finally, the examination of relatives' attributions of blaming the patient as mediators of the relationship between EE levels and patients' scores is presented in Table 5. Relatives' attributions of blame toward the patient were a full mediator of the association of criticism with negative symptoms, general psychopathology, depression, social functioning (SFS) and role functioning. Likewise, attributions of blaming the patient also fully mediated the relationship of EOI with

negative and general symptoms, but not with social and role functioning. Thus, relatives' blame towards patients mediated the association of negative and general symptoms with both criticism and EOI, and the association of functioning with criticism (but not EOI).

DV	IV	Mediator	Zero-order correlation	Partial correlation	Sobel	Mediation?
Negative symptoms (PANSS)	Criticism	Blame patient	0.35*	0.11	–	Full
General symptoms (PANSS)	Criticism	Blame patient	0.43**	0.23	–	Full
Depression (CDS)	Criticism	Blame patient	0.36*	0.27	–	Full
Social Functioning (SFS)	Criticism	Blame patient	–0.44**	–0.24	–	Full
Role Functioning (GF-R)	Criticism	Blame patient	–0.42**	–0.19	–	Full
Negative symptoms (PANSS)	EOI	Blame patient	0.37*	0.25	–	Full
General symptoms (PANSS)	EOI	Blame patient	0.40**	0.30	–	Full
Social Functioning (GF-S)	EOI	Blame patient	–0.49**	–0.43**	–1.27 n.s.	None
Role Functioning (GF-R)	EOI	Blame patient	–0.43**	–0.32*	–1.79 n.s.	None

Abbreviations: EE=Expressed Emotion, DV=Dependent variable; IV=Independent variable; PANSS=Positive and Negative Syndrome Scale; CDS=Calgary Depression Scale; SFS=Social Functioning Scale; GF-S=Global Functioning – Social Scale; GF-R=Global Functioning – Role Scale; and EOI=Emotional Over-Involvement.

n.s.=Non significant.

* $p < 0.05$.

*** $p < 0.01$.

Table 5. Mediation analyses testing the mediating role of relatives' attributions of blame toward the patient in the association between relatives' EE with patients' symptoms and functioning (n=44).

Discussion

This study investigated the relationship of relatives' cognitive and emotional appraisals with patients' symptoms and functioning in early psychosis. To the best of our knowledge, this is the first study investigating mediation by relatives' attributions on the association between EE and patients' symptoms and functioning in early psychosis. Relatives' EE was associated with a wide

variety of patients' symptoms and functioning at both the subclinical and onset stages of psychosis. Relatives' attributions of blaming patients for their impairment mediated the relationship between EE and patients' features. Altogether, this highlights the importance of the family emotional environment in the early stages of psychosis, as well as the mediating role that relatives' beliefs can play in those associations.

Both criticism and EOI are relevant factors associated with symptoms and functioning in early psychosis, although a differential pattern of relationships with positive and negative symptoms emerged. Higher levels of criticism, but not of EOI, were related to the severity of positive symptoms, whereas both EE indices were related to negative symptoms (and general psychopathology). Our first hypothesis was partially confirmed, since we expected that EOI would be more strongly related to positive symptoms and criticism to negative symptoms and functioning. These findings seem to suggest that relatives of early psychosis patients, unlike relatives of patients with longstanding psychosis, express similar levels of EOI and criticism towards negative symptoms and react to incipient positive symptoms with a critical attitude instead of overinvolvement, as is typical in schizophrenia (Brewin et al., 1991 and Weisman et al., 1998). One plausible explanation to account for these differences is that the attributional model is based on the process of patient relapse in chronic disorders. Whereas relatives of chronic patients tend to decrease their critical reactions towards positive symptoms as they become more aware of their pathological nature and worried about repeated relapses, relatives of early psychosis patients, who may lack understanding of the situation, proactively overreact in order to normalise their relatives' behaviour. On the other hand, relatives of early psychosis patients expressed concern about negative symptoms, which may be related to their lower level of burden compared to relatives of chronic schizophrenia. Moreover, recent studies suggest that during these early phases of psychosis relatives are more likely to attribute problematic behaviours to factors such as adolescence, patients' personality and/or substance use, rather than to an illness process (Clarke and Couchman, 2012).

Another interesting and differential aspect of early psychosis is that EOI seems to act more as a protective factor and could have some positive effects in patients' outcome (O'Brien et al., 2006). It might be that at these stages relatives still have not developed overprotective or self-sacrificing attitudes, which appear to be the EOI attitudes that have the most negative effect on patients (Vaughn and Leff, 1985). In contrast, high EOI levels could indicate over-concern, distress and/or anxiety towards negative symptoms and poor functioning, but not dysfunctional overprotection and/or self-sacrifice related to positive symptoms, as reported in schizophrenia relatives. Furthermore, our findings are consistent with several previous studies showing that EOI is not related to positive symptoms in incipient psychosis (King, 2000 and Mo et al., 2007) and support Schlosser et al.'s (2010) suggestion that criticism plays a more stressful influence on outcome at these stages than EOI.

Overall, our second hypothesis regarding group differences (ARMS vs. FEP) in the association between EE and type of symptoms/functioning was not confirmed. The associations between EE and patients' symptoms/functioning did not differ between groups. This finding suggests that ARMS and FEP patients are similarly influenced by the family emotional environment and emphasises the importance of consider family variables even at the at-risk stage.

Concerning the mediating role of relatives' illness attributions in the association that EE had with patients' problems, our findings showed that attributions of blame toward the patient (i.e., patient is responsible for his/her symptoms/behaviour) mediated most of the relationships between EE and patients' symptoms and functioning, with the exception of the relationship between EOI and functioning. These data lend partial support to the attributional model in the sense that relatives who blame patients for their behaviours were more likely to use criticism as a mechanism to coerce the patient to change their behaviour (Barrowclough and Hooley, 2003) or EOI as a way to influence their behaviour by doing things for the patient (over-protection) as a consequence of the over-concern about their well-being and commitment to deal with the disorder (Schlosser et al., 2010).

Contrary to what was expected, and in contrast with some previous studies on schizophrenia and FEP (e.g., McNab et al., 2007; Vansconcelos et al., 2013; Wasserman et al., 2012), relatives' self-blame and self-control attributions were not related with EE components. It is possible that relatives' lack of knowledge about the illness at these early stages (especially in the case of ARMS relatives) enhances beliefs that symptoms and altered behaviour are the patient's fault, rather than self-blame or control attributions. In addition, it might be that feelings of blame toward the patient constitute a primary cognitive-affective representation that, as the disorder progresses and relatives gain more knowledge, becomes differentiated from attributions of controllability. In any case, the construct of blame towards the patient within the theory of EE warrants further investigation, especially in early psychosis in which it has been scarcely explored.

According to Brewin (1994), the success of interventions reducing EE in relatives might lie in part in their ability to promote an attributional change. Indeed, our findings support the importance of setting attributional changes as an early therapeutic target to help relatives better understand and progressively emotionally accept the new family situation and resolve issues of shame and loss in the very early stages of the disorder (Patterson et al., 2005 and Wasserman et al., 2012). Nevertheless, further research should be conducted to better understand how relatives interpret symptoms prior to the establishment of a diagnosis of a mental disorder and how these attributions change over the course of the disorder longitudinally.

The implications of high EE in early stages of psychosis remain unclear, but it is well known that these influences are problematic later in the course of the disorder. Therefore, EE should be considered in early family interventions, as it could precipitate transition to psychosis in at risk patients and contribute to relapse in FEP patients. This work should help to prevent the entrenchment of dysfunctional attitudes within family members and thus minimise high EE levels in future stages of the disorder.

This study has some limitations. First, the cross-sectional design precludes causal conclusions, which can only be disentangled with prospective studies. Second, some level of EOI is likely to be present in most parents of young people, and especially so when confronting stressful situations such as the emergence of a disorder. The FQ assessment of EOI does not allow us to differentiate if relatives' attitudes of emotional involvement are appropriate to the children age and circumstances or could be considered as exaggerated (i.e., EOI) and ultimately as problematic. In this sense, as evidence accumulates, it might be relevant to adapt available

measures to the specificities of early psychosis. In addition, the FQ does not consider positive affect (e.g., warmth) of relatives towards patients, which would be an interesting protective factor as it has been demonstrated to be related to less severity of psychotic symptoms (Medina-Pradas et al., 2013). Future studies should consider more complete EE measures such as The Brief Dyadic Scale of EE (Medina-Pradas et al., 2011). Third, it is important to note that the relationship between EE components and patients' outcome is thought to be bidirectional and interactional (Kavanagh, 1992 and Miklowitz., 2004); however, in this particular study we focused on the association between EE and patients' outcome and the mediating role of relatives' attributions in early psychosis. Future studies should consider the dynamics of this association.

In conclusion, this study shows that family negative affect, in the form of criticism and EOI, is strongly associated with symptoms and functioning in early stages of psychosis and that relatives' attributions of blame toward the patient are a strong mediator of the association between EE with clinical and functional features of early psychosis patients. Furthermore, these findings underline important clinical applications. Considering the vulnerable psychological status of early psychosis patients and, given that this is a critical period where patients' symptoms and relatives' appraisals are forming, family interventions should be included in early psychosis programs, in order to assist relatives to change attributions of blame toward the patient and to prevent the entrenchment of high-EE attitudes.

Conflict of interest

All authors declare that they have no conflicts of interest.

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