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Internal validity of the French version of the Family Coping Questionnaire (FCQ): A confirmatory factor analysis

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ABSTRACT

Family members of patients with schizophrenia, especially when they assume caregivers' positions, experience difficulties to adapt to the situation. To gain insight into these caregivers' coping style is a challenge to decrease the stress of family members, and in this way, improve patient related outcome. The FCQ (Family Coping Questionnaire) is an adapted clinical assessment tool that focuses on specific ways to cope with dysfunction that characterize the psychotic pathology. The goal of this study was to provide validity evidence about the French version of the FCQ. Swiss and French family members of individuals suffering from schizophrenia ($n = 204$) responded to the FCQ. A confirmatory factor analysis (CFA) was applied estimating two models. The seven-factor model showed adequate fit to the data while the three-factor model fit was poor. This FCQ internal validation showed an adequate model fit with a French population including various family members (parents, siblings, etc.) of persons with enduring mental illness.

1. Introduction

Currently, families play a key role in the support network for individuals who develop psychosis, support that was originally performed by hospitals or psychiatric institutions (Del Vecchio et al., 2015). Family caregivers refers to family members, such as parents, siblings, husbands, and children, who provide support to persons with chronic illness. Living with someone enduring schizophrenia is an intense source of stress for family caregivers (Birchwood and Cochrane, 1990; Schene et al., 1998). This stress leads to greater levels of both objective and subjective burden (Schene, 1990). According to the stress-appraisal coping model, family caregivers will evaluate a situation and implement coping strategies (Lazarus and Folkman, 1984).

According to this model, coping is understood as the cognitive process of managing situations (external or internal demands) that are appraised as taxing or exceeding the resources of a person (Lazarus and Folkman, 1984). Obviously, a wide range of coping strategies can be used to address a stressful situation, and some authors have categorized them as problem-focused coping strategies and emotion-focused coping strategies (Lazarus and Folkman, 1984; Scherer, 2001). Whereas problem-focused coping consists of reducing or altering the situation itself, such as by seeking information, taking control, and evaluating pros and cons, emotion-focused coping aims to regulate emotional reactions that accompany the perception of stress so that the distress associated with the situation can be minimized. Positive reappraisal, distancing, escape-avoidance, and exercising self-control can thus be categorized as emotion-focused. Another category, called social-focused coping, consists of seeking social support (Greenglass, 1993). However, depending on the coping strategies adopted by family caregivers of persons with schizophrenia, the burden associated with the process of caregiving could be experienced as more or less important or unchanged (Grover et al., 2015; Magliano et al., 2000; Rexhaj et al., 2013).

An examination of the adaptation styles adopted by family caregivers of people with schizophrenia offers a possible understanding of the complex relationships between these family caregivers and their ill relatives (Birchwood and Cochrane, 1990). For instance, expressed emotion (EE) is one of these adaptation styles, consisting of criticism, hostility, and emotional overinvolvement, emanating from the family caregiver towards the ill relative, and it is strongly involved in relapses (Butzlaff and Hooley, 1998).

Currently, several scales allow coping strategies to be assessed. Among them are the Ways of Coping [WOC (Lam et al., 2015; Tennakoon et al., 2000)], Coping Checklist (Rammohan et al., 2002), the BRIEF-Cope (Baumstarck et al., 2017; Hc et al., 2016; Serres et al., 2017), Mechanisms of Coping Scale [MOC (Creado et al., 2006)], and COPE-Inventory [COPE (Onwumere et al., 2017)]. However, none of

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these scales is specific to family caregivers of people with mental illness. Accordingly, a specific and individual assessment of family caregivers' coping strategies is a challenge for health care professionals who strive to decrease their stress and thereby improve patient-related outcomes.

A study conducted by Magliano and colleagues explored precisely the family behaviors towards a relative suffering from a mental illness to develop a specific instrument for family caregivers of schizophrenic patients: The Family Coping Questionnaire [FCQ (Magliano et al., 1996)]. This questionnaire measures the following coping strategies: information gathering, positive communication, social involvement, coercion, avoidance, resignation and the patient's social involvement. Using a factor analysis, the authors identified three coping styles: (1) problem-focused coping, (2) emotion-focused coping and (3) social support-focused coping (Magliano et al., 1996). This instrument is repeatedly used in the scientific literature among family members of schizophrenic patients [parents, siblings or, more rarely, more distant family members (Caqueo-Urízar et al., 2012; Chandrasekaran et al., 2002; Gonçalves-Pereira et al., 2013; Hanzawa et al., 2008, 2010; Magliano et al., 1998, 2005; Rexhaj et al.,2013, 2016)]. This confirms the special interest of the questionnaire in assessing the coping strategies used by family caregivers to deal with their relatives' symptoms (e.g., delusions, hallucinations, behavior problems, anhedonia, cognitive disorders and isolation). This distinctiveness has recently led searchers to use the existing schizophrenia version of the FCQ as a model to develop and validate a new questionnaire specifically designed to assess the coping strategies of relatives of people enduring eating disorders [the FCQ-ED (Fiorillo et al., 2015, 2017)].

First designed in the Italian language (Magliano et al., 1996), the FCQ is now available in many European languages, such as German, English, Greek and Portuguese (Magliano et al., 1998), confirming the wide usage and relevance of this instrument. Despite all these versions, a similar instrument specifically developed to measure the family coping strategies in the French language is still missing. Such a French instrument would provide to clinical and social practitioners a useful tool to design and assess interventions to reduce the stress induced by taking care of patients enduring schizophrenia. This French validation would also be helpful for clarifying the different coping styles of relatives according to their country of origin. More generally, offering a useful clinical tool (adapted in French) would contribute to insights into the coping styles of these key relatives of patients enduring psychotic disorders. It would advance the assessment of their behavior and subjective state by specifying the cognitive process of managing situations that they preferentially use to deal with the stressful situation of caregiving (problem-focused coping, emotion-focused coping and social-focused coping).

The first goal of this study was to validate the seven-factor structure of the French version of the FCQ scale (information gathering, positive communication, social involvement, coercion, avoidance, resignation and the patient's social involvement). The second objective was to verify if these seven subscales could be combined into three factors representing different coping styles.

2. Method

2.1. Design and data collection

The total sample came from French-speaking Switzerland and from France. Participants were recruited through family support associations between 2012 and 2015. In French-speaking Switzerland, four family associations participated in the study: l'Ilot ("Association de proches des troubles psychiques"), Synapsespoir ("Association des proches de personnes souffrant d'une schizophrénie en Valais"), Relais ("Association genevoise de soutien aux proches de personnes souffrant de troubles psychiques") and A3 ("Association de familles et amis de malades souffrant de schizophrénie"). In France, one family association participated in the study: l'Unafam ("Union nationale de familles ou amis de personnes malades et/ou handicapées psychiques"), an association for families and relatives of persons enduring chronic mental illness. The purpose of these associations is to tackle stigma associating with mental illness, to offer support groups for peers and for family members.

The recruitment used a convenience sampling strategy and met the following criteria: (1) being 18 years old or older, (2) living in Switzerland or in France, (3) speaking French fluently, (4) being a family member of a person enduring schizophrenia and (5) having had at least a one-hour face-to-face contact with this person over the course of the year. Each participant could either choose the paper version or the electronic version of the questionnaire. Three conferences were organized by the associations to present the research project. Participants could either take the paper version of the questionnaire during the conferences or respond to it at home. They could also respond to the online questionnaire from the electronic link sent by the associations' presidents. Two different target populations were selected to diversify the types of relationships between patients and family members. The first targeted extended family members, whereas the second targeted siblings specifically.

2.2. Instruments

2.2.1. The socio-demographic questionnaire

To identify the specificity of the family caregiver sample, a socio-demographic questionnaire was created. Questions about the participants concerned (1) age, (2) gender, (3) the kinship with their ill relative, (4) the frequency of close contact and (5) if they were living with their ill relative. Questions about their ill relative concerned (1) the patient's age, (2) the patient's gender and (3) the duration of the patient's illness.

2.2.2. The Family Coping Questionnaire

A first version consisted of a self-administered questionnaire including 27 items divided in 7 subscales (information gathering, positive communication, social involvement, coercion, avoidance, resignation, the patient's social involvement), whose validity was demonstrated in Magliano et al. (1996). A new version was developed that included 34 items whose validity was demonstrated in the BIOMED 1 study, conducted in five European countries (Magliano et al., 2000). However, in that study, the authors only used the subscales of the strategy model measured by the 34 items, not the coping style factor solution. This coping style factor solution analysis by the author of the scale (Magliano et al., 1996) suggested three coping styles: problem-focused coping, emotion-focused coping and social-focused coping. This solution included 27 items. Family caregivers responded to each item using a 5-level Likert scale: 1: never; 2: rarely; 3: sometimes; 4: very often; 5: not applicable. For each of the seven subscales, which presented seven respective coping strategies (patient's social involvement, positive communication, avoidance, information gathering, resignation, coercion and, social interest), the average score was obtained by adding the scores of all the items in the subscale divided by the number of items (cf. scoring procedure presented in Table 5).

The first factor, problem-focused coping, included five subscales (patient's social involvement, positive communication, avoidance, information gathering and resignation): (1) The patient's social involvement subscale referred to the inclusion of the patient in social or familial activities. It included items number 7, 8 and 12 (e.g., Item 12, "In the past two months, when I noticed that S tended to stay alone, I tried to encourage him/her to meet his/her friends"). (2) The positive communication subscale refers to the ability of the caregiver to communicate calmly and peacefully with the patient. It included items number 2, 3, 4, 6, 9 and 11 (e.g., Item 11, "In the past two months, when S did something wrong, I told him/her – without raising my voice – how I would like him/her to behave next time."). (3) The avoidance subscale included items number 20 and 21. (4) The information gathering subscale referred to the caregiver's ability to seek information about how to conduct with the patient's illness. It included items number 1 and 15 (e.g., Item 15, "In the past two months, I tried to collect as much information as I could about S's illness"). (5) The resignation subscale referred to the caregiver's submission to the situation with any willingness to change. It included items number 14, 16 and 18 (e.g., Item 18 "In the past two months, I have felt that S's situation would definitely get worse."). The avoidance and resignation subscales were negatively correlated with this first factor.

The second factor, emotion-focused coping, included three subscales (coercion, avoidance and resignation): (1) The coercion subscale referred to the caregiver's tendency to act with anger and aggressiveness toward the patient. It included items number 5, 22, 23 (reversed item), 24 and 32 (e.g., Item 32, "In the past two months, when S spoke in a strange or nonsensical way, I tended to quarrel with him/her"). (2) and (3) Items of the avoidance and resignation subscales have been described previously.

The third factor, social support-focused coping, included two subscales (avoidance and social interest): (1) Items of the avoidance subscale have been described previously. (2) The social interest subscale refers, for family members, to the ability to keep interest in their own social environment. It included items number 17, 19, 13 (reversed item), 10, 31, 33 (e.g., Item 33 "In the past two months, I had enjoyable interests on my own"). The FCQ questions referred to the previous two months.

The present study is based on the FCQ, originally validated in Italian (Magliano et al., 1996) and completed by the authors in a European study (Magliano et al., 2000). The 34-item version was translated into French by a transcultural translation/back-translation method, with the consent of the original author of the FCQ. First, a professional translator translated the Italian version into French. Then, six members of the committee of a family association reviewed the questionnaire and suggested improvements to the translation. Finally, the questionnaire was back-translated into Italian by an independent native Italian speaker. All the item translations were considered accurate and similar in meaning. For that matter, this French version of the FCQ had already been used in previous studies (Rexhaj et al., 2013, 2016) and is available in the appendix. The original Italian instrument can also be obtained directly from the author, who authorized us to publish her email address:lorenza.magliano@unicampania.it.

2.3. French data analysis

For the confirmatory factor analysis (CFA), each data item was treated as categorical ordinal, and the models were estimated using a robust weighted least squares estimator with adjustments for the mean and variance (WLSMV). Subscale scores were treated as continuous, and the last model was estimated through maximum likelihood estimation. Three models were estimated. A seven-factor model representing *Information, Positive communication, Social interest, Coercion, Avoidance, Resignation* and *Patient's social involvement* as defined by (Magliano et al., 1996) was first tested on the 27 FCQ items. A simpler, three-factor model distinguishing *problem-focused coping, Emotion-focused coping* and *Social-focused coping* was also tested. These two alternatives were compared using a robust chi-square test using the DIFFTEST procedure. Finally, a three-factor model was estimated on the basis of the seven subscales scores. Loadings for these seven subscales were expected. Based on previous (Magliano et al., 1996) exploratory factor analysis, the problem-focused coping factor was defined by the *Patient's social involvement, Positive communication, information, Avoidance* and *Resignation* subscale scores. Negative loadings for the Avoidance and Resignation scores were also expected. The Emotion-focused coping factor was defined by the *Coercion, Avoidance* and *Resignation* subscale scores. Finally, the Social-focused coping factor was defined on the basis of the *Social Interest* and *Avoidance* subscale scores. With only two loadings, this last factor could be considered locally under-identified, so both loadings were fixed to one for identification purpose. Several indicators of model fit, such as the root mean square error of approximation (RMSEA), the comparison fit index (CFI) and the standardized root mean square residual (SRMR), were used when available. Values of RMSEA ≤ 0.06, CFI ≥ 0.95 and SRMR ≤ 0.08 were interpreted as a good fit, while values of RMSEA ≤ 0.08 and CFI ≥ 0.90 were considered to indicate acceptable fit (Hu and Bentler, 1999). All statistical analyses were performed with the M plus statistical package version 7.4.

2.4. Ethical considerations

The research protocol received full authorization by the Ethics Committee for human-based research in the canton of Vaud, Switzerland, and it conformed to the ethical standards defined by the local institutional review board and the principles of the Declaration of Helsinki (World Medical Association, 2013). The participants were informed orally or by emails with a written information description for both. Participants who used the written form signed a written informed consent; the participants who used the electronic form had to validate their consent to have access to the questionnaires.

3. Results

3.1. Sample and descriptive statistics

Members of the research team presented the project in four conferences organized by the various associations. In each conference, there were approximately 20 family caregivers, mostly parents but also siblings or others. Seventy paper questionnaires were given out during these conferences. Initially, approximately 80% of them expressed the wish to participate. The participant gave only an oral commitment to participate and then took the time to become actively involved in this study. This solution was chosen to avoid group pressure or the researcher's desire bias. Forty-seven paper questionnaires were completed and returned to the research team by mail (two were not completed, and 45 were included in this study), so that an average of 67% of the family members who showed an interest participated in the research. The electronic survey was sent through the associations' networks, and 159 responses were collected. A total of 204 participants, both from French-speaking Switzerland (92 participants) and from France (112 participants) completed the FCQ. Its self-administration took approximately 20 to 25 minutes, depending on the participant.

Women were more represented than men ($n_{\text{women}} = 156$; $n_{\text{men}} = 48$). The average age of participant was 46.32 years (min 18 – max 77). Siblings were the most represented among participants (120 participants), followed by parents (61 participants) and others (daughter, son, spouses, etc., $n = 23$ participants).

The main characteristics of the participants are presented in Table 1. Table 2 shows the average score obtained in each of the seven-coping strategy subscales and the three coping styles of the FCQ. In our sample, the average scores obtained in the social interest and in the positive communication subscales were the highest. By comparison, avoidance and coercion scores seemed to be lower.

The first coping strategy employed by our sample was problem-focused coping. Second, our sample preferentially used social support-focused coping. Finally, the last strategy used by our research sample was emotion-focused coping.

As shown in Table 3, the seven-factor model showed adequate fit to the data, while the three-factor model fit was poor. The results of the robust chi-square difference tests confirmed that the seven-factor model did significantly improve model fit over the three-factor model and should therefore be preferred (7 factors against 3 factors: $\Delta\chi^2 = 106.225$, $\Delta df = 16$, $p < .001$). All factor loadings were statistically significant with the exception of one item of the coercion subscale

(Item 23, "In the past two months, I was able to keep my cool even at times when S did something that irritated or bothered me significantly") (cf. Table 4). A third model was estimated to verify whether the seven subscales could be combined into three coping style factors as suggested by (Magliano et al., 1996). The model fit could be considered adequate (Table 3 and 5) with good SRMR and CFI values but with rather poor RMSEA.

This model is represented in Fig. 1. It is worth noting that all expected loadings were significant with the notable exception of the Avoidance and Resignation subscales on the Problem-focused coping factor. The three-factor correlations were weak and not statistically significant. Regarding the sampling adequacy, both KMOs (item level and subscale level) were over 0.50, and both Bartlett's tests were significant.

4. Discussion

The aim of the present study was to provide, for French-speaking countries, a useful contribution to an internal validation of a self-report instrument able to assess the coping strategies of family caregivers of persons enduring schizophrenia. The present study shows that the French version of the FCQ items can be well clustered into three factors.

We conducted a confirmatory factor analysis (CFA) to test the factor structure obtained by the authors of the FCQ (Magliano et al., 1996) with seven factors. Our results show that the FCQ was better represented in seven dimensions than only three styles. However, these seven subscales could adequately be clustered into three coping style factors, as suggested by Magliano et al. (1996). Examination of the factor correlations suggested that the three styles were independent.

Overall and according to current methodological recommendations, our results show a stable factor structure. We found that problem-focused coping was strongly represented by patients' social involvement, positive communication and information. Considering the present family caregiver sample, this coping style obtained the highest average score. In contrast, emotion-focused coping, represented by avoidance, resignation and coercion, obtained the lowest average score in our family caregiver sample. Social-focused coping was represented by social interest and avoidance. It obtained the second highest average score in our family caregiver sample. Overall, these findings appear consistent with the findings obtained in previous research among family caregivers of patients enduring schizophrenia. Such research reveals the preferential use of problem-focused coping, followed by social-focused coping and, finally, emotion-focused coping (Grover et al., 2015; Rexhaj et al., 2013; Scazufca and Kuipers, 1999).

Table 1
Socio-demographic characteristics (N = 204).

	Variables	N (%) or m (SD)
Family member (FM)'s age		46.32 (16.03)
Patient's age		35.67 (12.05)
Duration of patient's illness (years)		16.67 (11.85)
FM's sex, N (%)	Female	156 (76.5)
	Male	48 (23.5)
Patient's sex, N (%)	Female	35 (17.2)
	Male	169 (82.8)
Relationship type	Mother/father	61 (29.9)
	Sister/brother	120 (58.8)
	Other (Wife/husband, daughter/son, …)	23 (11.3)
Living under the same roof as patient	Yes	44 (21.6)
	No	159 (77.9)
Frequency of close contact	Daily	65 (31.9)
	Several times per month	70 (34.3)
	Monthly at least	31 (15.2)
	Once or twice a year	37 (18.1)

Note. FM = family member; N = number of participants; % = percentage; m = mean; SD = standard deviation.

Table 2
Mean and standard deviation (SD) scores of the coping strategies and coping styles of family members (N = 204).

	Mean (SD)	Median score (min to max)
Strategies		
Information	2.36 (0.92)	2.50 (1.00–4.00)
Positive communication	3.03 (0.75)	3.16 (1.00–4.00)
Social interest	3.40 (0.53)	3.50 (1.33–4.00)
Coercion	1.72 (0.69)	1.60 (1.00–3.80)
Avoidance	1.55 (0.77)	1.00 (1.00–4.00)
Resignation	2.08 (0.86)	2.00 (1.00–4.00)
Patient's implication	2.38 (0.86)	3.00 (1.00–4.00)
Coping styles (number of items)		
Problem-focused coping (11)	2.92 (0.49)	3.00 (1.23–3.83)
Emotion-focused coping (10)	1.77 (0.52)	1.72 (1.00–3.27)
Social support-focused coping (8)	2.48 (0.50)	2.41 (1.17–4.00)

Note. N = number of participants; SD = standard deviation.

Table 3
Comparisons of the model fit for the FCQ scale.

Model	χ^2	df	p-value	RMSEA	90% CI for RMSEA	CFI	SRMR
Item-based models							
Seven-factor model	503.623	303	< 0.001	0.057	0.048–0.066	0.900	N/A
Three-factor model	664.225	319	< 0.001	0.073	0.065–0.081	0.827	N/A
Subscale-based model							
Three-factor model	26.139	9	.002	0.097	0.055–0.141	0.909	0.052

Note. χ^2 = chi-square; df = degrees of freedom; RMSEA = root mean square error of approximation; CI = confidence interval; CFI = comparative fit index; SRMR = standardized root mean square residual; N/A = not available.

Whereas the avoidance and resignation subscales contributed negatively to the problem-focused coping factor in the previous study of Magliano et al. (1996), these two subscales did not contribute significantly to the problem-focused coping factor in the present study. This difference from the original version suggested that these two subscales should not be included into the computation of a problem-focused coping style score. This is in line with the Lazarus and Folkman theoretical framework, in which problem-focused coping consists of reducing or altering the situation itself using strategies such as information seeking, taking control, and evaluating pros and cons (Lazarus and Folkman, 1984; Scherer, 2001). However, some caution is advised with the theoretical framework and clinical interest. For example, acceptance of the illness, like any human response, could be interesting to assess to better guide family members (Knudson and Coyle, 2002).

Our study has provided a tool to French-speaking clinical and social practitioners that will allow them to specifically measure coping strategies adopted by family members of persons enduring mental illnesses, such as schizophrenia. All of the items are linked with some symptoms of schizophrenia and explore the various reactions that caregivers can experience. This internal validation in French is useful, as it would contribute to a better assessment of coping strategies, thus providing valuable insights for designing interventions to reduce the stress induced by caregiving.

Indeed, when a person in the family suffers from psychological disorders, it becomes an issue for the whole family. Indeed, primary caregivers and other family members present equal risks of enduring psychic disorders (Magliano et al., 1999). Therefore, if the coping

Table 4
Subscales and items of the French version of the Family Coping Questionnaire (FCQ) – standardized loadings for the items included in the seven-factor solution.

Subscales	Items (item's number and * if reversed item)	Standardized loadings (if included in a 7-factor solution)
Information	In the past two months, I tried to ask for guidance on how to behave towards S. (1)	.804*
	In the past two months, I tried to collect as much information as I could about S's illness. (15)	.776*
Positive communication	In the past two months, whenever S appeared nervous or anxious, I tried to have him/her sit down and tell me what was wrong, and I tried to be reassuring. (2)	.658*
	In the past two months, when we discussed work- or family-related issues at home, I tried to get S involved in the discussion. (3)	.686*
	In the past two months, when S did something wrong, I was usually able to tell him/her quietly what I did not like. (4)	.820*
	In the past two months, when S did something I liked, I told him/her I was pleased and/or said thank you. (6)	.689*
	In the past two months, I praised S when I saw that he/she looked after his/her dress or appearance. (9)	.821*
	In the past two months, when S did something wrong, I told him/her - without raising my voice - how I would like him/her to behave next time. (11)	.788*
Social interests	In the past two months, there were other important things in my life besides S's situation. (10)	.622*
	In the past two months, I was able to get out and meet people. (13*).	.409*
	In the past two months, I had time to think of my own needs or interests. (17)	.758*
	In the past two months, I managed to keep away from S and take time and space to myself. (19)	.900*
	In the past two months, I did not devote all my spare time to S, but pursued interests I liked as well. (31)	.650*
	In the past two months, I had enjoyable interests on my own. (33)	.803*
Coercion	In the past two months, when S spoke nonsensically, I shouted to him/her to cut the nonsense. (5)	.755*
	In the past two months, when S did something wrong, I lost my temper, without thinking about the consequences. (22)	.762*
	In the past two months, I was able to keep my cool even at times when S did something that irritated or bothered me significantly. (23*)	.138
	In the past two months, I reacted to S in an impulsive way that later I regretted. (24)	.828*
	In the past two months, when S spoke in a strange or nonsensical way, I tended to quarrel with him/her. (32)	.761*
Avoidance	In the past two months, I avoided staying alone in S's company. (20)	.872*
	In the past two months, I thought of moving house, because of S's problems. (21)	.461*
Resignation	In the past two months, I felt that the only way in which S's situation can improve is by a miracle happening. (14)	.562*
	In the past two months, I felt that I had no energy left to respond and that I was just waiting for events to happen. (16)	.618*
	In the past two months, I have felt that S's situation will definitely get worse. (18)	.788*
Patient's social involvement	In the past two months, when I noticed that S tended to stay alone, I tried to get him/her to take part in the things I did with my friends or with other family members. (7)	.721*
	In the past two months, I tried to get S interested in something that might prove pleasant for him/her. (8)	.855*
	In the past two months, when I noticed that S tended to stay alone, I tried to encourage him/her to meet his/her friends. (12)	.710*
Collusion	During the past two months, when S said something strange, I said I agreed with him/her. (26)	
	In the past two months, when S refused medication, I did not say anything about it. (27)	
	In the past two months, when S refused to meet the professionals of the mental health service, I found it appropriate not to push him/her. (29)	
	In the past two months, when S did little or nothing, I found it easier to leave him/her alone. (34)	
Use of alcohol	In the past two months, I had to drink or take drugs to forget about S's situation. (25)	
Talking with friends	In the past two months, I tried to discuss problems related to S's situation with my friends. (28)	
Spiritual help	in the past two months, I have prayed or asked for spiritual help because of S's situation. (30)	

Note. *$p < .05$.

strategies employed do not allow caregivers to cope efficiently with the stress associated with the situation, some members of the family may experience a huge burden on themselves, which can in turn reverberate to the whole family as well as on the individual afflicted by the disorder (Kate et al., 2014). This instrument could also be helpful for the assessment of psycho-educational interventions with caregivers of patients with schizophrenia, allowing for research on the evolution of coping strategies. Finally, and as suggested by Magliano et al. (1998), coping strategies can be different between countries, and it could be important to clarify what those differences are and why they occur. For instance, some countries might favor some form of support to enable families to adapt as best as they can to the situation.

4.1. Limitations of the study

The present study contains certain limitations that should be taken into consideration to correctly grasp its results. For instance, each family member category (fathers, mothers, siblings, uncles, aunts and other family members) was not equitably represented in the sample. Nevertheless, some findings suggest that all these family member categories, whether primary caregivers or not, can use coping strategies in an undifferentiated way (Magliano et al., 1999). Similarly, the gender ratio was not well-balanced. The female over-representation is, however, not surprising, as it matches well with the overall gender ratio of family caregivers of persons enduring mental illness (Magliano et al., 1996, 1998, 2000; Onwumere et al., 2017). In addition, the convenience sampling may have led to under-representation bias in the family caregivers of people enduring schizophrenia who do not belong to family support associations.

Another major particularity of this study was the over-representation of siblings (59% of the sample). It differs from the usual sample configuration reported in the scientific literature, in which parents are the main focus of interest (Magliano et al., 2000; Stålberg et al., 2004). For instance, the original paper of Magliano et al. (1996) included 63%

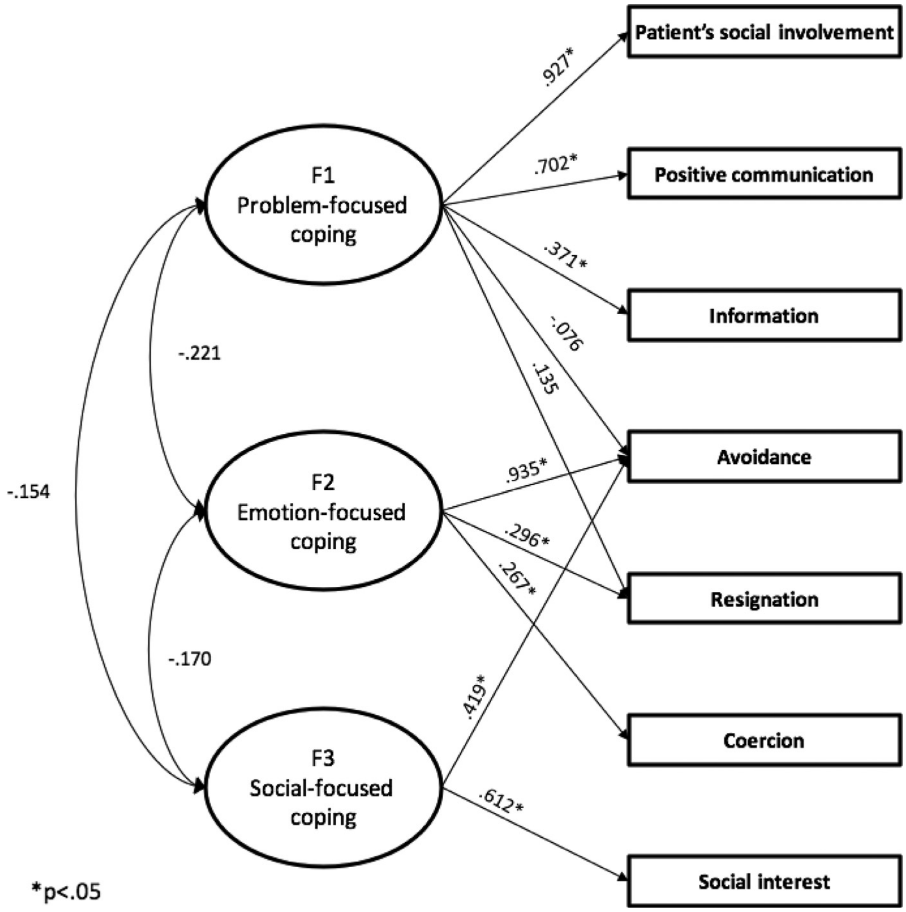

Fig. 1. Three-factor model for the FCQ subscales.

parents, 11% spouses and only 18% siblings. Moreover, 63% of the participants in that study were key relatives, caring continuously for the patient during the previous 3 months, whereas in the present study 78% of the participants did not live under the same roof as the patient, with only 32% having daily contact with the patient. This distinctiveness of the present study thus requires taking caution in comparisons with, especially, the original Italian validation. Indeed, the coping styles most used by participants in the present study may have been affected by the fact that the representation of family members differed from the usual samples' configuration. For these reasons, the findings of the present study show the first internal validation of this French version of the FCQ on a sample of family members. Other studies will need to generalize its validity to schizophrenia caregivers in general.

Nevertheless, because all family members can be covered by the FCQ, which concerns not only key relatives but any members of the family, it was important to collect data from other family members than

Table 5

FCQ coping strategies, their seven-factor solution, and the scoring procedure.

Coping strategies	Seven-factor solution	Item examples
Problem-focused coping	Positive communication (Items 2, 3, 4, 6, 9 and 11)	In the past two months, when we discussed work- or family-related issues at home, I tried to get S involved in the discussion.
	Patient's social involvement (Items 7, 8 and 12)	In the past two months, I tried to get S interested in something that might prove pleasant for him/her.
	Information (Items 1 and 15)	In the past two months, I tried to ask for guidance on how to behave towards S.
Emotion-focused coping	Coercion (Items 5, 22, 23*, 24 and 32)	In the past two months, when S did something wrong, I lost my temper without thinking about the consequences.
	Avoidance (Items 20 and 21)	In the past two months, I avoided staying alone in S's company.
	Resignation (Items, 14, 16 and 18)	In the past two months, I felt that the only way in which S's situation can improve is by a miracle happening.
Social support-focused coping	Avoidance (Items 20 and 21)	In the past two months, I thought of moving house, because of S's problems.
	Social interests (Items 10, 13*, 17,19, 31 and 33)	In the past two months, I did not devote all my spare time to S but pursued interests I liked as well.

FCQ scoring procedure:

To compute the total score for each of the seven subscales: (score item n_i + score item n_{ii} + score item n_{iii} + …)/n items of the subscale.

To compute the total score for each coping strategies: (score subscale n_i + score subscale n_{ii} + …) /n subscale(s) of the coping strategy.

* Reverse the score for these items (e.g., answer 1 = 4, 2 = 3, 3 = 2, 4 = 1).

parents. Interestingly, our findings demonstrated that siblings are closely involved in the participation in research (Bowman et al., 2014; Davtian, 2010; Sin et al., 2013). This over-representation probably highlights the siblings' feelings, as their experiences might not be considered enough. This result reaffirms the genuine need to focus on these specific family members. The results of the present study show that the FCQ (since it is a family questionnaire) is as well suited for parents as for siblings. Since siblings are younger than parents, they were probably more at ease in responding to an electronic survey.

The cultural and ethnic background of the participants was not documented in the present study. Thus, it may have influenced the results. However, these criteria were not central to the internal validation of the present instrument. Since all participants spoke French fluently, this cultural bias may have been reduced. Further studies should nevertheless take into consideration these factors, as well as the likely presence of a social desirability risk linked with the fact that the FCQ is a self-report questionnaire.

Because schizophrenia is a chronic illness, another limitation of our study is the lack of knowledge about the likely relapse period for the suffering relative at the moment the family member completed the FCQ. The FCQ questions are addressed to family caregivers regarding the two previous months. Given the chronicity of schizophrenia, another limitation of our study is the lack of knowledge about the likely relapse period for the suffering relative. For future research, it may be interesting to collect more socio-demographic information about family members and persons enduring a mental illness (relapse period or not; patients' number of hospitalizations; relatives' working conditions; being a key relative or not) to evaluate and interpret different coping strategies.

Additionally, even if findings collected from 45 participants by Magliano et al. (1999) suggest that coping strategies are used in an undifferentiated way between primary caregivers and other family members, future studies using a larger sample of French-speaking participants would be required. Such studies will improve our knowledge of the coping strategies used by the different family members, depending on their kinship with the suffering relative (siblings, children, spouse, grandparents) and their engagement supporting patients as a primary informal caregiver. It is very likely that each person will adopt a different coping strategy depending on his or her familial relationship to the schizophrenic relative.

5. Conclusion

To conclude, and despite some limitations, the findings of this study provide the first evidence of the internal validity of the French version of FCQ. Therefore, this study makes available a useful French tool specially adapted to the assessment of the specific coping strategies adopted by family members. It will thus provide valuable insights for designing clinical interventions to minimize the burden of specific family caregivers.

Supplementary material 1: The French version of the Family Coping Questionnaire (FCQ).

Conflict of interest

None.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2018.08.021.

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