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Social comparison processes and catastrophising in fibromyalgia: A path analysis

V. Cabrera-Perona^{a*} , A.P. Buunk^{b§} , M.C. Terol-Cantero^a , Y. Quiles-Marcos^a 
and M. Martín-Aragón^a 

^aDpto. de Psicología de la Salud, Campus de San Juan, Universidad Miguel Hernández de Elche, Alicante, Spain; ^bRoyal Netherlands Academy of Sciences, University of Groningen, Groningen, The Netherlands

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Introduction: In addition to coping strategies, social comparison may play a role in illness adjustment. However, little is known about the role of contrast and identification in social comparison in adaptation to fibromyalgia.

Aim: To evaluate through a path analysis in a sample of fibromyalgia patients, the association between identification and contrast in social comparison, catastrophising and specific health outcomes (fibromyalgia illness impact and psychological distress).

Material and Method: 131 Spanish fibromyalgia outpatients (mean age: 50.15, SD = 11.1) filled out a questionnaire.

Results: We present a model that explained 33% of the variance in catastrophising by direct effects of more use of upward contrast and downward identification. In addition, 35% of fibromyalgia illness impact variance was explained by less upward identification, more upward contrast and more catastrophising and 42% of the variance in psychological distress by a direct effect of more use of upward contrast together with higher fibromyalgia illness impact.

Discussion: We suggest that intervention programmes with chronic pain and fibromyalgia patients should focus on enhancing the use of upward identification in social comparison, and on minimising the use of upward contrast and downward identification in social comparison.

Keywords: social comparison; fibromyalgia; health outcomes; catastrophising; path analysis

Introduction

Social comparison theory postulates that in absence of objective reality, individuals are motivated to search in others for relevant social information in order to assess their own situation or performance (Festinger, 1954). This impulse or drive occurs more frequently when uncertainty and stress are present (Buunk & Gibbons, 1997; Van der Zee, Buunk, Sanderman, Botke, & van den Bergh, 1999). Other people in a similar situation (e.g. with the same diagnosis) are the most relevant comparison targets (Kulik & Mahler, 1997; Tennen, Mckee, & Affleck, 2000). In research on social comparison it is

*Corresponding author. Email: vcabrera@umh.es

§Present address: University of Curacao, Willemstad, Curacao.

assumed that an individual may face two possible comparison directions: (1) *upward* (the comparison target is someone who performs better or is better off than the individual) and (2) *downward* (the target performs worse or is worse off than the individual) (Buunk & Gibbons, 1997). However, according to Buunk and Ybema (1997) and their Identification-Contrast Model, evaluation by the individual during the social comparison process may imply two possible interpretations: (1) *identification* and (2) *contrast*. In the case of identification, individuals assume that the situation of the target is similar to their actual fate, or may be their own future (Buunk & Ybema, 1997, p. 369), whereas in the case of contrast, individuals will consider the target as a standard to evaluate their current state. Therefore, the combination of direction and interpretation results in four strategies of social comparison: upward identification, upward contrast, downward identification and downward contrast, which may lead to different outcomes. Various studies have shown that social comparison strategies tend to be related to emotional responses, i.e. upward identification with hope, inspiration or optimism (among others) and downward contrast with relief or pride. Meanwhile, upward contrast tends to be related to envy, inadequacy, frustration or shame and downward identification to fear, worry or anguish (Arigo, Suls, & Smyth, 2014; Smith, 2000). Thus, while upward identification and downward contrast may lead to positive affect, upward contrast and downward identification may lead to negative affect (Buunk & Ybema, 1997; Smith, 2000; Terol, Lledó, Quiles, & Martín-Aragón, 2014; Van der Zee et al., 1999).

Research on social comparison and chronic illness has suggested that in addition to coping strategies, social comparison may function as a modulator or mediator of illness adjustment (Arigo et al., 2014; Buunk, Gibbons, & Reis-Bergan, 1997; Jensen, Turner, Romano, & Karoly, 1991; Lledó-Boyer et al., 2010; Tennen et al., 2000; Van der Zee, Buunk, & Sanderman, 1995). Diener and Fujita (1997) proposed that individuals may use social comparisons to cope with their own situation, to understand their illness and to improve their subjective well-being. From this perspective, it has been proposed that social comparison may serve simultaneously both emotion-focused and problem-focused coping strategies (Gibbons & Gerrard, 1991; Taylor & Lobel, 1989; Van der Zee et al., 1999). In line with the Identification-Contrast Model (Buunk & Ybema, 1997), studies linking social comparison and coping have found that the two strategies that elicit positive affect (upward identification and downward contrast) have been mainly associated with active coping strategies (Curtis, 2008; Terol et al., 2007; Van der Zee et al., 1999; Wills, 1997). Vice versa, the two strategies that elicit negative affect (upward contrast and downward identification) have tended to be related to passive and avoidant strategies (Buunk, Zurriaga, & González, 2006; Curtis, 2008; Dibb & Yardley, 2006; Gibbons & Gerrard, 1991; Van der Zee et al., 1999). In chronic pain, active coping (e.g. seeking information or engage in physical activities) is characterised by patients' attempts to control pain using their internal resources whereas passive coping is described by helplessness and strategies that relinquish pain control, relying on external resources. The use of active coping strategies has been related to lower pain, lower depressive symptoms and less functional impact (Ramírez-Maestre, Esteve, & López, 2008). Passive coping strategies (e.g. wishful thinking, avoidance or distraction) have been widely related to higher perceived pain and more emotional and functional impact (Jensen et al., 1991; Mellegård, Grossi, Joaquim, & Soares, 2001; Nicassio et al., 1997).

Social comparison and fibromyalgia

The analysis of social comparison in relation to illness adjustment, must heed the particularities of the disease under study (Gibbons & Gerrard, 1991; Terol et al., 2007). Fibromyalgia is characterised by chronic widespread musculoskeletal pain of unknown etiology, accompanied by a variety of symptoms, including fatigue, stiffness, sleep disturbances and high levels of anxiety and depression (Miró, 2003; Wolfe et al., 1997). Fibromyalgia has a high prevalence, estimated at about 2.4% for the Spanish population where the present study was conducted (EPISER Study-Valverde, 2007). These patients refer to constant pain, functional restrictions and a social and familiar misunderstanding of the disease. In addition, its course and prognosis may vary considerably (Peñacoba, 2009). All these factors tend to generate a high degree of stress and uncertainty that encourages continuous self-assessment and social comparison about pain intensity, duration, functionality, disability, coping and adaptation to chronic pain (Tennen & Affleck, 1997).

To date, only a few studies have examined social comparison in fibromyalgia (Affleck, Tennen, Urrows, Higgins, & Abeles, 2000; Groothof & Scholtes, 2007; Terol et al., 2014), showing that fibromyalgia patients tended to use social comparison more frequently than other coping strategies such as relaxation or distraction from pain (Affleck et al., 2000). This was especially true for patients with a high Social Comparison Orientation (SCO), that is, a predisposition of individuals to compare their features and situation with others (Gibbons & Buunk, 1999; Groothof & Scholtes, 2007). In addition, other studies suggested that downward contrast was associated with a lower pain perception and a better mood (Affleck et al., 2000), whereas upward contrast and downward identification were associated with higher psychological distress (anxiety and depression) (Terol et al., 2014). Moreover, fibromyalgia patients with a higher SCO showed more negative affect as a result of their use of downward identification (Groothof & Scholtes, 2007).

One important characteristic of fibromyalgia patients is catastrophising, that is, a negative mental set carried out during the present or anticipated pain experience based on negative thoughts about, and negative expectations of, pain (Sullivan, 2009; Sullivan, Bishop, & Pivik, 1995). Catastrophising as a coping strategy is considered a significant mediator of illness aggravation and chronicity (Rodero, García-Campayo, Casanueva, & Buriel, 2009) and may be acting as a cognitive appraisal process before starting other coping strategies (Jensen et al., 1991; Quartana, Campbell, & Edwards, 2009). Indeed, in patients with chronic pain and fibromyalgia, catastrophising has appeared to be a good predictor of physical disability and illness impact (García-Campayo et al., 2008; Rodero et al., 2010) and in some studies predicted the overall functioning of patients better than pain intensity did (García-Campayo & Rodero, 2009). Positive health outcomes, such as quality of life, subjective well-being or adjustment, often appeared to be inversely related to levels of catastrophising, suggesting that catastrophising had an important relation with the functionality and severity of symptoms (Toth, Brady, & Hatfield, 2014; van Wilgen, van Ittersum, Kaptein & van Wijhe, 2008). In addition, more catastrophising was related to higher psychological distress (anxiety and depression) (García-Campayo et al., 2008; Martin et al., 1996). In fibromyalgia, psychological distress levels were usually higher than in other chronic physical illnesses like cancer, low-back pain or rheumatoid arthritis (Arnold, 2006;

Bennet, 2002; Epstein et al., 1999) and were related to more functional disability (Walker et al., 1997), and a higher severity of illness (Arnold, Keck, & Welge, 2000; Petzke, Gracely, Park, Ambrose, & Clauw, 2003).

While various studies have illuminated the importance of physical and psychosocial factors for coping and adaptation among fibromyalgia patients, little is known about the role of social comparison in the adaptation and especially about its relation with catastrophising. In this sense, research has not provided information about social comparison considered ‘as a means’ related to cognitive coping or appraisal mechanisms. Therefore, the aim of this study is to evaluate in a path analysis model the role of social comparison for fibromyalgia, by assessing the relationships among social comparison, catastrophising and specific health outcomes. We expect on the basis of the identification-contrast model that social comparison strategies will show relationships with psychosocial variables in the following way: upward identification and downward contrast comparisons will be related directly to less catastrophising, less fibromyalgia illness impact, and less psychological distress levels, i.e. anxiety and depression. Meanwhile, upward contrast and downward identification comparisons will be related directly to more catastrophising, more fibromyalgia illness impact and more psychological distress, i.e. anxiety and depression. Catastrophising will be directly related to fibromyalgia illness impact and indirectly to psychological distress, i.e. anxiety and depression, through illness impact (see Figure 1).

Method

Sample

One hundred and thirty-one Spanish women outpatients were interviewed at the San Vicente del Raspeig Hospital (fibromyalgia service). Inclusion criteria were: (1) fibromyalgia diagnosis re-confirmed by the American College of Rheumatology (ACR) criteria (Wolfe et al., 1990) upon their arrival to the Fibromyalgia Service, (2) age over 18 years, (3) ability to understand questionnaires and (4) informed consent

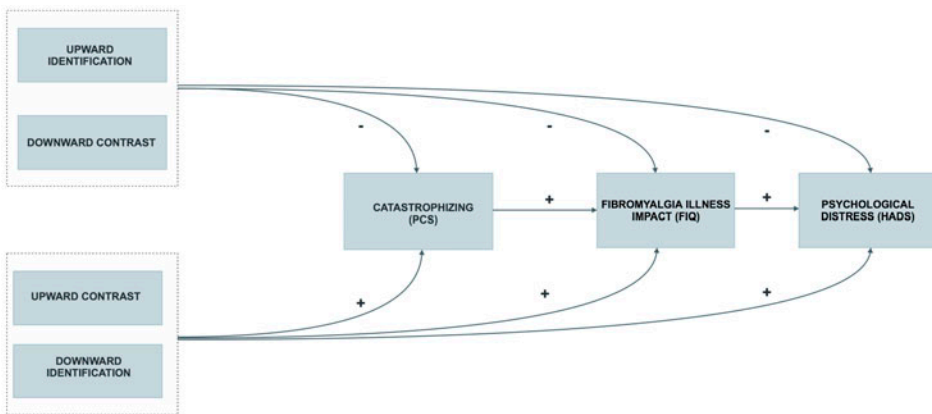


Figure 1. Hypothetical model of the role of social comparison in fibromyalgia.

to participate in the study. The mean age was 50.15 years (SD = 11.14). The data on sociodemographic and clinical variables are shown in Table 1. 68.70% of participants were married, 41.98% had primary education and 51.10% did not have a job (i.e. housewife or unemployed). Besides, 13.74% were on time-off work situation and 7.63% in labour lawsuit pending. As further shown in Table 1, patients had a 36.20 (SD = 11.68) average period since onset of pain, 13.95 (SD = 10.88) average years since onset of symptoms and 4.32 (SD = 4.99) average years since diagnosis until their arrival at the fibromyalgia service. None of the patients in the study had been diagnosed psychiatrically previously.

Procedure

After the Hospital Ethics Committee's approval of the study, we selected during 12 months, 152 newly admitted outpatients derived from other healthcare services (primary health care and rheumatology and traumatology services) and re-confirmed in their diagnosis upon their arrival to this specialised Fibromyalgia Service. They were informed of the purpose, procedure and methodology of the study by signing the informed consent. Thirteen patients refused to participate and 8 were excluded by the inclusion criteria. Subsequently, 131 outpatients were assessed, under supervision of a psychologist with sessions ranging from 20 to 30 min.

Table 1. Sample features description. Sociodemographic and clinical variables.

<i>N</i> = 131, mean age = 50.15 (DT = 11.14) sociodemographic variables			
	<i>N</i>	%	
<i>Marital status</i>			
Married	90	68.70	
Single	20	15.27	
Separate-divorced	17	12.98	
Widow	4	3.05	
<i>Educational level</i>			
Not read/not write	5	3.82	
Read/write	7	5.34	
Primary education	55	41.98	
Secondary education	48	36.64	
Higher education	14	10.69	
<i>Occupational status</i>			
Active	52	39.69	
Housewife	43	32.82	
Unemployed	24	18.32	
Temporary disability	1	.76	
Permanent disability/Retired	8	6.11	
Time-off work	18	13.74	
Labour lawsuit pending	10	7.63	
<i>Clinical Variables</i>			
	<i>M</i>	<i>SD</i>	Range
Pain onset age	36.20	11.68	0–65
Time since diagnosis (years)	4.32	4.99	0–50
Time since onset of symptoms (years)	13.95	10.88	0–50

M: Mean score; *N*: Subjects; *SD*: Standard Deviation

Instruments

Sociodemographic variables

The questionnaire collected information about age, marital status, educational level and occupational status.

Clinical variables

We included measures about clinical aspects of fibromyalgia: pain onset age, time since diagnosis and time since onset of symptoms. Current pain, average last week pain and maximum last week pain were measured with a visual analogue scale (VAS) (Aliaga Font, 2009) consisting in a 10 centimetres line with tips representing the minimum and maximum values: 0 (*no pain*) to 10 (*worst imaginable pain*), where patients should mark their perception of pain.

Social comparison processes in illness

This variable was assessed using the 12 item Social Comparison Illness Scale (Van der Zee et al., 1999; Spanish adaptation Terol et al., 2007, 2014), with a Likert type of response (1 = *never*; 5 = *very often*). The scale includes subscales for the four social comparison strategies (range: 3–15): upward identification, upward contrast, downward identification and downward contrast. Higher scores indicate a greater frequency of each

Table 2. Mean scores and internal consistencies of the psychosocial variables.

	α	M	SD	Range
<i>Social comparison illness scale</i>				
Upward identification	89	9.31	2.97	3–15
Upward contrast	84	11.30	3.11	3–15
Downward identification	93	9.98	3.63	3–15
Downward contrast	75	9.10	3.01	3–15
<i>PCS scale</i>				
Catastrophising	93	29.73	10.91	0–52
Helplessness	88	13.71	5.36	0–24
Magnification	82	5.79	3.10	0–12
Rumination	81	10.23	3.42	0–16
<i>FIQ scale</i>				
Fibromyalgia illness impact	81	72.01	13.74	0–100
Fibromyalgia functional impact	90	3.16	1.98	0–10
<i>HADS Scale</i>				
Anxiety (HADS-A)	80	13.71	4	0–21
Depression (HADS-D)	85	10.73	4.64	0–21
Psychological distress (HADS-T)	89	24.44	7.88	0–42

Notes: α : Cronbach Alpha; Fibromyalgia Impact Questionnaire, FIQ; Burckhardt et al., 1991; Esteve-Vives et al., 2007; Hospital Anxiety and Depression Scale, HADS, Zigmond & Snaith, 1983; Terol et al., 2007, 2014); HADS-A: Anxiety Subscale HADS Scale; HADS-D: Depression Subscale HADS Scale; HADS-T: Psychological Distress Total Scale HADS; M: Mean; PCS: (Pain Catastrophizing Scale, PCS; Sullivan et al., 1995; García-Campayo et al., 2008). SD: Standard Deviation; Social comparison Illness Scale (Terol et al., 2014; Van der Zee et al., 1999).

comparison strategy. In this study, Cronbach's alphas ranged between $\alpha = .75$ and $\alpha = .93$ for the four strategies (see Table 2).

Catastrophising

This variable was assessed using the self-report Pain Catastrophising Scale (PCS; Sullivan et al., 1995; Spanish adaptation Garcia-Campayo et al., 2008). This scale is a 13-item with a Likert type of response (0 = *not at all*; 4 = *all the time*; range: 0–52) representing three dimensions (rumination, magnification and helplessness). Higher total score indicate higher presence of catastrophising thoughts. Cronbach's alpha in this study was $\alpha = .93$ (see Table 2).

Fibromyalgia illness impact

We evaluated last week patient's perceived health and illness impact by Fibromyalgia Impact Questionnaire (FIQ; Burckhardt, Clark, & Bennett, 1991; Spanish adaptation Esteve-Vives, Rivera, Salvat, de Gracia-Blanco, & Alegre de Miquel, 2007). FIQ is a 10-item fibromyalgia-specific self-report questionnaire. The first item (*functional impact*), consists of nine Likert-scale questions, and measures physical functionality. The remaining items (items 2 to 10) combine Likert scale questions and visual analogue scales (range: 0–10) and assess well-being, missed work days and job difficulty, pain, fatigue, morning stiffness, tiredness and emotional status. Fibromyalgia illness impact (includes functional impact) represents the total score and ranges between 0 (*minimum impact*) and 100 (*maximum impact*). Higher scores indicate higher impact and more severe symptoms. Internal consistency in this study was $\alpha = .81$ (see Table 2).

Psychological distress (Anxiety and depression)

Psychological distress was measured by Hospital Anxiety and Depression Scale (HADS, Zigmond & Snaith, 1983; Spanish adaptation Terol et al., 2007, 2014). The HADS is a 14-item self-administered scale containing two subscales 7-items each: Anxiety (HADS-A, odd items) and Depression (HADS-D, even items). Response type scale is Likert 0–3 with a score range 0–21 for each subscale. The scores of *psychological distress* as a global scale ranges 0–42. Higher scores denote higher levels of anxiety (HADS-A), depression (HADS-D) and psychological distress (HADS-T). Internal consistency for this study are HADS-A $\alpha = .80$, HADS-D $\alpha = .85$, HADS-T $\alpha = .89$ (see Table 2).

Statistical analysis

Statistical package IBM SPSS v.22 was used. Bivariate correlations and descriptive analysis were performed. The estimation of the models was carried out by AMOS v.22.0, applying the full information maximum likelihood estimation procedure. Each variable in the path models was measured using the corresponding scale's sum score. The measurement model's fit was assessed by the χ^2 statistic of goodness of fit. Because χ^2 tends to be significant in large samples, the χ^2/df ratio was calculated. If this ratio is inferior to 6, it is assumed that the model fit is adequate. This index is called

the relative χ^2 , as it is calculated to look for its independence of the sample size. Carmines and McIver (1981) and Kline (1998) establish a value of 3 for an acceptable model. Furthermore, and following the recommendation that advises contrasting various indices to assure the fit of the proposed model, the following goodness of fit indices were considered: (a) the Goodness of Fit Index (GFI), which represents the percentage of observed covariances that are explained by the implicit covariances of the model; it must reach a value equal or superior to .90 (Schumacher & Lomax, 1996); (b) The Comparative Fit Index (CFI), which compares the fit of the model with a null model assuming that the latent variables are not related, and requires values equal or superior to .90 (Schumacker & Lomax, 1996); and, (c) the indices based on the non centrality parameter, the Root Mean Square Error of Approximation (RMSEA), which supplies a measurement of the discrepancy by degrees of freedom. Values equal to or less than .05 indicate good representativeness of the sample, and when values are inferior to .08, the fit is considered acceptable (Browne & Cudeck, 1992; Jöreskog & Sörbom, 1993).

Results

Internal consistency and descriptive analyses

A summary of mean, standard deviations, ranges and internal consistency of Social comparison, catastrophising (PCS), fibromyalgia illness impact (FIQ) and psychological distress (HADS) scales are provided in Table 2.

Regarding the clinical variables, mean scores were for current pain, $M = 5.48$, $SD = 1.56$; for last week average pain, $M = 6.58$, $SD = 1.56$; and for maximum last week pain, $M = 7.18$, $SD = 1.44$ (range for all three variables from 0 to 10).

Mean differences and correlations

Sociodemographic variables

First, it was examined whether sociodemographic variables showed any relationship with the other variables. Only active employment status was associated with higher use of the downward contrast strategy ($F(2, 128) = 4.71, p < .05$). Higher educational levels were associated with a lower fibromyalgia illness impact ($F(2, 128) = 3.31, p < .05$). For catastrophising and psychological distress (anxiety and depression), no significant correlations were found with the sociodemographic variables. Because of this, the sociodemographic variables were omitted from further analyses.

Clinical variables

Table 3 shows that time since diagnosis was negatively correlated with upward identification ($p < .05$) and time since onset of symptoms was also correlated in a negative way with upward contrast ($p < .01$), downward identification ($p < .05$) and downward contrast ($p < .05$).

Regarding perceived pain variables (current pain, average last week pain and maximum last week pain), they all correlated in a positive way with the two negative-interpretation social comparison strategies: upward contrast ($p < .001$) and downward identification (current pain: $p < .05$; average last week pain: $p < .001$; maximum last

Table 3. Correlations between the clinical and psychosocial variables.

	Social comparison illness scale				PCS scale				FIQ scale			HADS scale	
	Upward identification	Upward contrast	Downward identification	Downward contrast	Catastrophising	Helplessness	Magnification	Rumination	Fibromyalgia illness impact	Fibromyalgia functional impact	Anxiety	Depression	Psychological distress
	Time since diagnosis	-.19*	-	-	-	-	-	-	-	-	-	-	-
Time since onset of symptoms	-	-.24**	-.20*	-.20*	-	-	-	-	-	-	-	-	-
Current pain	-.22*	.31***	.20*	-	.27**	.29**	.21*	.21*	.42***	-	.21*	.23*	.24**
Average last week pain	-.25**	.39***	.33***	-.20*	.40***	.42***	.31***	.33***	.58***	.22*	.24**	.20*	.24**
Maximum last week pain	-	.40***	.28**	-	.33***	.37***	.23**	.28**	.47***	-	.28**	.21*	.27**

Notes: Fibromyalgia Impact Questionnaire, FIQ; Burckhardt et al., 1991; Esteve-Vives et al., 2007; Hospital Anxiety and Depression Scale, HADS; Zigmond & Snaith, 1983; Terol et al., 2007, 2014; HADS-A: Anxiety Subscale HADS Scale; HADS-D: Depression Subscale HADS Scale; HADS-T: Psychological Distress Total Scale HADS; M: Mean; PCS: (Pain Catastrophizing Scale, PCS; Sullivan et al., 1995; Garcia-Campayo et al., 2008). SD: Standard Deviation; Social comparison Illness Scale (Terol et al., 2014; Van der Zee et al., 1999).

* $p < .05$; ** $p < .01$; *** $p < .001$

week pain: $p < .01$). Pain variables also correlated with catastrophising ($p < .001$; current pain: $p < .01$), fibromyalgia illness impact ($p < .001$; current pain: $p < .01$), anxiety ($p < .01$, current pain : $p < .05$), depression ($p < .05$) and psychological distress ($p < .01$). Only average last week pain correlated positively with fibromyalgia functional impact ($p < .05$) and negatively with the positive-interpretation social comparison strategies: upward identification ($p < .01$) and downward contrast ($p < .05$) (see details and correlation coefficients at Table 3).

Psychosocial variables

Table 4 shows the relationships between the psychosocial variables. The negative-interpretation social comparison strategies (upward contrast, downward identification) were related in a positive way with catastrophising ($p < .001$) and its subscales ($p < .001$), fibromyalgia illness impact ($p < .001$), fibromyalgia functional impact ($p < .05$), anxiety ($p < .001$) and depression (upward contrast: $p < .001$; downward identification: $p < .01$) and psychological distress total scale ($p < .001$). At the same time, the positive interpretation upward identification and downward contrast correlated inversely with fibromyalgia illness impact (upward identification: $p < .001$; downward contrast: $p < .01$), anxiety ($p < .05$), depression (upward identification: $p < .001$; downward contrast: $p < .01$) and psychological distress total scale (upward identification: $p < .001$; downward contrast: $p < .01$). Positive correlations were found between the remaining psychosocial variables (catastrophising and its dimensions, fibromyalgia illness impact, fibromyalgia functional impact and psychological distress (anxiety and depression) (see details and correlation coefficients at Table 4).

Path analysis model

The global fit shown by the model proposed (see Figure 1) was not adequate. The chi-square test was significant ($\chi^2_{(5)} = 46.09$, $p = .000$) and the (χ^2/df ratio of 9.22 was sufficiently superior to the expected. The GFI and CFI adopted values of .92 and .85, respectively, while the RMSEA estimation was .25 (see Table 5).

We explored various respecification possibilities that were settled in two modifications sequentially performed: (a) the non-significant relationships in the AMOS model were eliminated (downward contrast \rightarrow catastrophising; upward identification \rightarrow catastrophising; downward identification \rightarrow fibromyalgia illness impact; downward contrast \rightarrow fibromyalgia illness impact); (b) the modification indices also indicated a possible direct relation between upward contrast \rightarrow psychological distress-HADS-T.

A new Comparative Fit Analysis (CFA) was performed using the respecified model, resulting in a better fit of the data ($\chi^2 = 7.62$ $p = .178$, ($\chi^2/\text{df} = 1.52$; GFI = .98, CFI = .98, RMSEA = .064) that was considered acceptable (Browne & Cudeck, 1992; Jöreskog & Sörbom, 1993) (see Table 5). The graphic representation of this model is shown in Figure 2.

Upward contrast showed a positive relation with fibromyalgia illness impact, catastrophising and psychological distress (HADS-T). Upward identification strategy showed a negative relation with fibromyalgia illness impact. On the other hand, downward identification strategy showed a significant positive relation with catastrophising. Downward contrast did not show any significant relationship. Of the variance in catastrophising

Table 4. Mean scores, internal consistencies of and correlations between the psychosocial variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13
Upward identification(SC Illness Scale) (1)	–	-.23**	-.37***	.45***	-.31***	-.34***	-.27**	-.21*	-.39***	–	-.21*	-.34***	-.31***
Upward contrast(SC Illness Scale) (2)	–	–	.55***	–	.44***	.43***	.37***	.38***	.44***	.20*	.58***	.52***	.60***
Downward identification(SC Illness Scale) (3)	–	–	–	–	.55***	.53***	.59***	.39***	.35***	.17*	.45***	.28**	.40***
Downward contrast(SC Illness Scale) (4)	–	–	–	–	–	–	–	–	-.25**	–	-.19*	-.26**	-.25**
Catastrophising (PCS) (5)	–	–	–	–	–	.95***	.88***	.90***	.50***	.30**	.27**	.25**	.29**
Helplessness (PCS) (6)	–	–	–	–	–	–	.76***	.79***	.52***	.29**	.26**	.27**	.29**
Magnification (PCS) (7)	–	–	–	–	–	–	–	.70***	.42***	.28**	.25**	.18*	.24**
Rumination (PCS) (8)	–	–	–	–	–	–	–	–	.41***	.25**	.21*	.23**	.24**
Fibromyalgia illness impact (FIQ) (9)	–	–	–	–	–	–	–	–	–	.44***	.42***	.46***	.48***
Fibromyalgia functional impact (FIQ) (10)	–	–	–	–	–	–	–	–	–	–	.22*	.34***	.31***
Anxiety (HADS-A) (11)	–	–	–	–	–	–	–	–	–	–	–	.65***	.89***
Depression (HADS-D) (12)	–	–	–	–	–	–	–	–	–	–	–	–	.92***
Psychological Distress (HADS-T) (13)	–	–	–	–	–	–	–	–	–	–	–	–	–

Notes: Fibromyalgia Impact Questionnaire, FIQ; Burekhardt et al., 1991; Esteve-Vives et al., 2007; Hospital Anxiety and Depression Scale, HADS, Zigmond & Snaith, 1983; Terol et al., 2007, 2014; HADS-A: Anxiety Subscale HADS Scale; HADS-D: Depression Subscale HADS Scale; HADS-T: Psychological Distress Total Scale HADS; M: Mean; PCS: (Pain Catastrophizing Scale, PCS; Sullivan et al., 1995; García-Campayo et al., 2008). SD: Standard Deviation.; SC Illness Scale: Social comparison Scale (Terol et al., 2014; Van der Zee et al., 1999).

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 5. Fit indices of the hypothetical-proposed model and final model.

	$\chi^2_{(s)}$	χ^2/df	GFI	CFI	RMSEA
Hypothetical-proposed model	46.09***	9.22	.92	.85	.25
Final model	7.62	1.52	.98	.98	.064

Notes: df = degrees of freedom; CFI = Comparative fit index; GFI: Goodnes of fit index; RMSEA = root mean square error of aproximation.

*** $p < .001$.

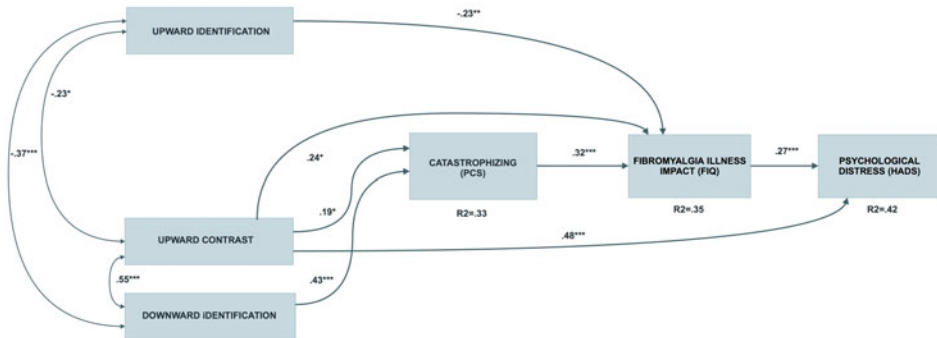


Figure 2. Path analysis of the role of social comparison in fibromyalgia.

33% was explained by the direct effect of upward contrast ($\beta = .19$, $p < .05$) and downward identification ($\beta = .43$, $p < .001$). In addition, the model explained 35% of the variance in fibromyalgia illness impact by less upward identification ($\beta = -.23$, $p < .01$), more upward contrast ($\beta = .24$, $p < .05$) and more catastrophising ($\beta = .32$, $p < .001$), whereas 42% of variance in psychological distress (HADS-T) variance was explained by the direct effect of more use of upward contrast ($\beta = .48$, $p < .001$) and higher fibromyalgia illness impact ($\beta = .27$, $p < .001$).

Discussion

The major aim of this study was to evaluate the role of social comparison in a model for fibromyalgia, based on the proposed theoretical relationships with other psychosocial variables (Arnold et al., 2000; Buunk & Gibbons, 1997; García-Campayo et al., 2008; Martin et al., 1996; Terol et al., 2014; Van der Zee et al., 1995; Walker et al., 1997) and based on the identification-contrast model (Buunk & Ybema, 1997). As expected, patients with fibromyalgia used quite often most social comparison strategies, although it is remarkable that negative-interpretation or less favourable comparisons (upward contrast and downward identification) showed slightly higher scores. This finding tallies with the results of a recent study on fibromyalgia (Terol et al., 2014), but differ from those reported in other chronic patients, as rheumatoid arthritis or cancer patients, who use predominantly more positive-interpretation strategies (upward identification or downward contrast) (Blalock, De Vellis, & De Vellis, 1989; DeVellis, Holt, Renner, & Blalock, 1990; Dibb & Yardley, 2006; Taylor, Buunk, & Aspinwall, 1990; Terol et al., 2007;

Van der Zee et al., 1999). Regarding catastrophising, our results show high levels similar to the findings of other fibromyalgia studies (García-Campayo et al., 2008; Rodero et al., 2010). Furthermore, we can add to this descriptive analysis that patients with fibromyalgia presented a perceived high illness impact, although reporting a moderate functional impact. These results reveal that, apart from pain and functional impact, deterioration due to illness chronicity undermines basic aspects of patient quality of life (occupational, social, emotional, among others) (Gormsen, Rosenberg, Bach, & Jensen, 2010; Peñacoba, 2009; Wolfe et al., 1997).

The clinical profile of the patients in this sample as well as the relationships found between clinical and psychosocial variables are representative and consistent with previous studies on this population. Our results show that the more pain patients perceive, the more they use negative-interpretation comparison strategies (upward contrast, downward identification), have more catastrophising thoughts, and perceive greater overall illness impact and psychological distress (Affleck, Urrows, Tennen, & Higgins, 1992; Affleck et al., 2000; DeVellis et al., 1990; García-Campayo et al., 2008; Heidrich, 1996; Martin et al., 1996; Terol et al., 2007, 2014; *inter alia*).

Focusing on the proposed model and ours hypothesis, the findings suggest that negative-interpretation comparison strategies together with catastrophising somehow determine fibromyalgia emotional and impact results. In our model, a higher catastrophising is explained by more use of downward identification and upward contrast; a higher fibromyalgia illness impact is explained by both upward comparison strategies (more use of upward contrast and less use of upward identification) together with more catastrophising. Finally, a higher psychological distress is explained by the more use of upward contrast strategy together with higher illness impact. Thus, negative-interpretation strategies show stronger relationships and greater incidence in the explained variance of psychosocial variables. In line with these results, although there are no explanatory models of social comparison in fibromyalgia, previous studies in this population have shown that higher use of upward contrast and downward identification were related to higher perception of stress and psychological distress and worse quality of life and overall adjustment (Groothof & Scholtes, 2007; Terol et al., 2014). Contrary to expectations in our hypotheses, positive-interpretation strategies have no relationship on catastrophising and psychological distress and only more upward identification reveal a direct effect on lower illness impact, whereas downward contrast has no relationship with the model. This is an especially remarkable result. Many studies in chronic pain samples have shown the frequent use of downward contrast related to better psychological and psychosocial adjustment and lower depression levels (Affleck et al., 2000; Blalock et al., 1989; Heidrich, 1996; Terol et al., 2007, *inter alia*), suggesting again a different and less adaptive social comparison pattern in patients with fibromyalgia regarding other chronic pain patients.

These findings confirm that in our sample, the use of less favourable strategies could be explained as a part of a 'maladaptive pattern' characterised by increased prevalence of anxiety and depression in these patients (Bennet, 2002; Epstein et al., 1999). Regarding this 'maladaptive pattern', some authors have paid attention to bias and cognitive distortions (Mathews, Ridgeway, Cook, & Yiend, 2007; Standage, Harris, & Fox, 2014). Fibromyalgia patients would show negative-interpretation or negative focus on disease – more than other chronic patients – exacerbating even more their symptoms and pain. According to this bias or distortion, they would verify their 'bad' condition

by comparing themselves to people and situations confirming them, while they would elude the people disconfirming them. In fact, these cognitive biases or distortions are related to disability and pain in chronic patients, and catastrophising is considered a catalyst for the attention to symptoms (Eccleston & Crombez, 1999; Gracely et al., 2004; Sullivan, 2009). Consequently, combining negative-interpretation comparison with catastrophising results in more perceived illness impact and psychological distress. On the contrary, in line with the identification-contrast model (Buunk & Ybema, 1997), positive-interpretation comparisons – upward identification in this study – would buffer the fibromyalgia illness impact since they are negatively related to it.

Practical implications

According to the model, our patients using upward contrast strategies could perceive themselves unable to cope or manage their disease like the ‘referent’ or target to whom they compare (Buunk & Ybema, 1997; Van der Zee et al., 1999). This could generate even greater illness impact. Besides, the use of downward identification comparisons would lead to helplessness (Van der Zee et al., 1999; Wills, 1997), since they could perceive as their own prognostic, the worst situation their ‘referents’ or targets suffer, thus generating catastrophising thoughts about their situation. At the same time, use of the upward identification would allow them to re-appraisal their illness status with the useful information that other referents may provide and would motivate and develop coping strategies leading to lower impact with more adequate adaptive processes (Arigo et al., 2014; Buunk & Ybema, 1997; Corcoran, Crusius, & Mussweiler, 2011; Groothof & Scholtes, 2007; Smith, 2000). In line with our results, a recent study linking social comparison and acceptance of chronic pain, has shown that more upward identification together with less upward contrast and downward identification were related significantly to a higher affective acceptance of chronic pain (Orfgen & Dijkstra, 2015). Given that more acceptance is a strong and consistent mediator of lower catastrophising (Alda et al., 2011; de Boer, Steinhagen, Versteegen, Struys, & Sanderman, 2014; Rodero et al., 2010), social comparison would appear to be related to the two great psychological constructs that best explain the results of applied-treatment in chronic pain. Thus, our results suggest practical implications since the model supports interventions oriented to increase the use of upward identification social comparisons, and to minimise the use of upward contrast and downward identification strategies, due to the direct effect of these orientations on lower impact and higher catastrophising levels, respectively.

In this sense, it is reasonable to recommend the inclusion of evaluation processes in programmes with fibromyalgia patients, in order to identify the social comparison strategies related to catastrophising profiles and those strategies and ‘models’ or referents being useful for these patients. Besides, this would recuperate one classic function of social comparison: self-improvement, which leads the subject to use social information to improve self-performance (Taylor & Lobel, 1989). In this context, this kind of initiatives is already being implemented with catastrophising dimensions, which are crucial to cope with illness impact and emotional responses (Spinhoven et al., 2004; Sullivan, Feuerstein, Gatchel, Linton, & Pransky, 2005).

Limitations of the study and future lines of research

Several limitations must be taken into account and advise to take our results with caution. The main limitation of this study is that it is a cross-sectional study. It would be interesting to check model-fit with longitudinal data. Longitudinal designs are more suited to test mediation relationships. Additionally, this study focuses on a specialised Fibromyalgia service. It would be interesting to know possible differences in primary care level or even patients associations, including context in which comparisons occur.

On the basis of the findings presented in this paper, future work on social comparison in fibromyalgia must be done, mainly focusing on the content of the comparison (symptoms, mood, coping strategies, among others) allowing the identification of the strategies or comparison styles that these patients prefer. Furthermore, it would be of great interest to include information on the comparison 'referents' and their perceived or assessed features. Finding out if the 'referents' are other patients, healthy individuals or even themselves in other moment of the illness course, may lead the scope of study to lateral and temporal comparisons scarcely investigated to date (Arigo et al., 2014; Bennenbroek, Buunk, van der Zee, & Grol, 2002; Bogart & Helgeson, 2000; Buunk & Gibbons, 1997). Moreover, knowing and comparing the influence and relationships within other psychosocial general and specific variables (control, perceived self-efficacy coping with illness status, different coping strategies, among others) would help to better determine the social comparison process and how 'referents' are chosen and the strategies used.

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ORCID

V. Cabrera-Perona  <http://orcid.org/0000-0003-3891-939X>

A.P. Buunk  <http://orcid.org/0000-0002-2176-614X>

M.C. Terol-Cantero  <http://orcid.org/0000-0002-3445-8883>

Y. Quiles-Marcos  <http://orcid.org/0000-0003-0966-7058>

M. Martín-Aragón  <http://orcid.org/0000-0001-6562-6184>

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