

COGNITIVE-BEHAVIOURAL GROUP TREATMENT WITH HYPNOSIS: A RANDOMIZED PILOT TRIAL IN FIBROMYALGIA

Antoni Castel^{1,2}, Marta Salvat¹, José Sala¹, Maria Rull^{1,3}

¹*Pain Clinic, Hospital Universitari de Tarragona Joan XXIII, Tarragona, Spain;* ²*Gestió i Prestació de Serveis de Salut, Tarragona, Spain;* ³*Departament de Medicina i Cirurgia, Universitat Rovira i Virgili, Tarragona, Spain*

Abstract

This study examined the contributing effects of hypnosis on a standard cognitive-behaviour therapy (CBT) intervention for treating pain in patients with fibromyalgia. Forty-seven patients with fibromyalgia were randomly assigned to one of three conditions: (1) Pharmacological treatment (standard care control group); (2) CBT group therapy; or (3) CBT group therapy with hypnosis. Outcome measures assessing pain intensity, sensorial and affective quality of pain and total FIQ score were administered before and after treatment. The analyses indicated that patients who received either CBT or CBT plus hypnosis improved more than patients who received only conventional pharmacological treatment; patients who received CBT plus hypnosis showed greater improvement than those who received CBT without hypnosis. The findings are consistent with previous research demonstrating the additive benefits of hypnosis when combined with other effective treatments. Copyright © 2008 British Society of Experimental & Clinical Hypnosis. Published by John Wiley & Sons, Ltd.

Key words: chronic pain, fibromyalgia, hypnosis, group treatment, psychological treatment

Introduction

Fibromyalgia (FM) is a condition of unclear origin associated with significant pain and disability. The diagnostic criteria for fibromyalgia include widespread pain and presence of excessive tenderness in response to pressure on 11 of 18 specific muscle-tendons sites. Some FM patients experience only pain, while others experience a number of other additional symptoms (Giesecke, Williams, Harris, Cupps, Tian, Tian, Gracely and Clauw, 2003). Nevertheless, for all of them, pain is often severe and is frequently accompanied by stiffness, especially in the morning or after periods of rest. Other symptoms often reported are fatigue (especially after physical or mental exercise), sleep dysfunction, anxiety, depression, complaints of cognitive dysfunction, nocturnal paresthesia, irritable bowel syndrome and functional and vegetative alterations (Busquets, Vilaplana and Arxer, 2005).

Several studies from the United States and Western Europe countries report a prevalence of fibromyalgia of about in 2% of general population (3.4% in women, 0.5% in men; see Neumann and Buskila, 2003). Demographic and social characteristics associated with the presence of fibromyalgia include: being female, being divorced, lack of higher education (failure to complete high school) and low income.

Research suggests that multidisciplinary treatment can result in decreases in pain intensity and fibromyalgia impact, as well as increases in self-efficacy and physical functioning (Fishbain, Rosomoff, Goldberg, Cutler, Abdel-Moty, Khalil and Rosomoff, 1993; Goldenberg, Burckhardt and Crofford, 2004; Lemstra and Olszynski, 2005; Burckhardt, 2006). Multidisciplinary treatments including medication management, education, physical exercise and cognitive-behaviour therapy (CBT) are now viewed as the best approach. The CBT component of multidisciplinary treatment for fibromyalgia, in particular, has received strong empirical support. CBT includes a number of components, such as education about illness and theory of pain perception, relaxation training, cognitive restructuring therapy, behavioural goal setting, problem solving, communication and assertiveness training, as well as generalization and maintenance of skills learned (Bradley, 1996). Individual CBT has been shown to improve pain, fatigue, mood and function in a number of studies of patients with fibromyalgia (Rossy, Buckelew, Dorr, Hagglund, Thayer, McIntosh, Hewett and Johnson, 1999; Williams, Cary, Groner, Chaplin, Glazer, Rodriguez and Clauw, 2002; Goldenberg et al., 2004; Bennett and Nelson, 2006; Burckhardt, 2006). There is also evidence that group CBT is effective in FM patients (Keel, Bodoky, Urs and Müller, 1998; Williams et al., 2002).

Also hypnotic analgesia has been shown to reduce both acute and chronic pain (see reviews by Hildgard and Hildgard, 1975; Barber, 1996; Syrjala and Abrams, 1996; Montgomery, DuHamel and Redd, 2000; Barber, 2001; Patterson and Jensen, 2003; Jensen and Patterson, 2006). However, there are only a few studies on the effects of hypnosis on fibromyalgia-related pain. In one of them, Hannen, Hoenderdos, van Romunde, Hop, Mallee, Terweil and Hekster (1991) showed that the muscular pain, fatigue, sleep disorders and overall assessment of patients treated with hypnotherapy improved to a greater extent than in patients treated with physical therapy. These benefits were maintained after a follow-up of 24 weeks. In an experimental study, Wik, Fischer, Brag e, Finer and Fredrikson (1999) found that patients with fibromyalgia reported less pain during hypnosis than when they were at rest and congruent changes in blood flow. More recently, Castel, P erez, Sala, Padrol and Rull (2007) found that suggestions for hypnotic analgesia had a greater effect than hypnotic relaxation alone. In addition, Ericksonian hypnosis (Alvarez-Nemegyei, Negreros-Castillo, Nu o-Guti rrez,  lvarez-Berzunza and Alcocer-Martinez, 2007) decreased the number of tender points, although patients did not show any improvements in functional capacity, as measured by the Fibromyalgia Impact Questionnaire (FIQ).

Hypnosis can also enhance the efficacy of other treatments. In particular, a meta-analytic review (Kirsch, Montgomery and Sapirsten, 1995) showed that hypnosis enhances the efficacy of CBT. However, despite the fact that pain reduction is one of the most common clinical applications of hypnosis, only two of the studies included in Kirsch et al.'s meta-analysis studied pain, and neither of these studies found that adding hypnosis produced better results than CBT alone (Milling, Kirsch, Meunier and Levine, 2002; Milling, Meunier and Levine, 2003). To address this gap, we compared the efficacy of two psychological treatments for fibromyalgia (CBT alone and CBT plus hypnosis) between each other and to standard care (medication management).

Method

Participants

Inclusion criteria for study participation were: having a fibromyalgia diagnosis using the ACR diagnostic criteria (Wolfe, Smythe, Yunus, Bennett, Bombardier, Goldenberg,

Tugwell, Campbell, Abeles and Clark, 1990); being between 18 years old and less than 60 years old; having a minimum of 6 months history of chronic pain; and having at least 6 years of education. The latter criterion was included because participation in the CBT intervention used requires minimal reading and writing abilities. Exclusion criteria were: one or more additional severe chronic medical pain conditions; significant suicidal ideation; severe psychopathology (e.g. psychosis); moderate to severe cognitive impairment; or the presence of pending litigation.

Forty-seven individuals attending at the Pain Unit at the Joan XXIII Hospital University in Tarragona, Spain, were enrolled in the study. Demographic data are shown in Table 1. Among the 47 patients initially recruited into the study, 39 (83%) completed it. Five control group participants (11%) did not come to a second visit. An additional two (4%) of the CBT participants, and one (2%) of the CBT plus hypnosis participants did not complete treatment. The demographic data from the subjects who completed the study are shown in Table 1.

Procedure

Recruitment, random assignment, and outcome assessment

The study was described to all eligible participants, and those who elected to participate were asked to sign the study consent form. Pretreatment outcome measures were administered in the week prior to the beginning of the treatment, after which all participants were randomly assigned to one of the three treatment conditions: standard care (medication management) control group, CBT alone, or CBT plus hypnosis. Following treatment all of the outcome measures were again administered to the study participants

Treatment conditions

Participants in the standard care control conditions received conventional pharmacological treatments including analgesics, antidepressants, sedatives and myorelaxants, as appropriate. Participants assigned to the CBT alone treatment conditions were provided with standard medication management, as well as twelve 90-minute sessions of CBT treatment. The CBT sessions included: didactic presentation of information about fibromyalgia and theory of pain perception, relaxation training, cognitive restructuring, assertiveness training, behavioural goal setting, problems solving, and training in outcome generalization and maintenance of gains. In the last 20 minutes of the group CBT sessions, participants received a group session of relaxation training, which consisted of 5 minutes of relaxing different parts of the body (beginning with the feet and finishing with the head) by means of sensation awareness. Then, for 10 minutes, participants focused on diaphragmatic breathing and finally, feelings of well-being and general relaxation were suggested for the last 5 minutes. Following the first relaxation training session, the participant was given an audio CD of a relaxation exercise to listen to at home.

Participants who were assigned to the CBT plus hypnosis condition were provided with standard medication management, as well as the same 12 sessions of group CBT given to the CBT alone participants. However, instead of relaxation training, these participants were given twelve 20-minute group sessions of self-hypnosis training, which consisted of a hypnotic induction of staring at an external stimulus and at a particular moment to close their eyes. A chain of suggestions were made using palpebral catalepsy, catalepsy of the vocal cords and the raising of an arm. Afterwards, participants were asked to visualize a leaf swaying on the branch of a tree and then floating slowly to the ground. This

Table 1. Demographic and pain-related data

GROUP	Age (years)	Sex		Pain duration (years)	Formal education			Marital status			
		Male	Female		Low	Mid	High	Single	Married	Separated	Widow
<i>All participants (n = 39)</i>	44.2 SD 10.2	2 (5%)	37 (95%)	11.0 SD 10.2	26 (67%)	12 (31%)	1 (2%)	3 (8%)	31 (79%)	2 (5%)	3 (8%)
<i>Control (n = 7)</i>	49.6 SD 7.5	1 (14%)	6 (86%)	7.1 SD 5.6	2 (29%)	4 (57%)	1 (14%)	1 (14%)	4 (58%)	1 (14%)	1 (14%)
<i>CBT (n = 16)</i>	43.0 SD 9.8	1 (6%)	15 (94%)	10.2 SD 10.7	12 (75%)	4 (25%)	0 (0%)	0 (0%)	14 (88%)	1 (6%)	1 (6%)
<i>Hypnosis – CBT (n = 16)</i>	43.0 SD 11.3	0 (0%)	16 (100%)	13.8 SD 11.6	12 (75%)	4 (25%)	0 (0%)	2 (13%)	13 (81%)	0 (0%)	1 (6%)

Note: low education = completed their primary education; mid education = completed secondary education; high education = completed higher education.

image was associated with the descent of the arm and deeper hypnosis. This procedure lasted for about 10 minutes followed by analgesia suggestions. The analgesia suggestions included imagining a liquid or blue 'analgesic' stream that filtered through the skin and reached different parts of the body (including muscles, joints, bones, internal organs). The liquid was said to soothe any discomfort in the most affected areas, eliminate tension and create feelings of well-being. Participants in the CBT plus hypnosis condition were also given an audio CD to listen to, allowing them to practise the technique at home. In each subsequent hypnosis group sessions, the suggestion of analgesia was reinforced and associated with an anchor consisting of a simple mechanical gesture with the dominant hand. Additional suggestions made during the group hypnosis sessions included asking the participants to visualize alternative situations (and associated thoughts and behaviour) associated with relief and feelings of safety and well-being. The CBT and CBT plus hypnosis groups had no fewer than four participants in each session.

Variables

Average pain intensity

Participants rated their average, least and worst pain intensity over the previous week using a 0–10 Numeric Pain Rating Scale, with 0 = 'No pain' and 10 = 'Maximum possible pain'. The three pain scores were combined into a composite measure of usual pain. Such composite scores have demonstrated high reliability and validity as indicants of characteristic pain intensity (Dworkin and Siegfried, 1994; Jensen, Turner, Romano and Fisher, 1999).

Impact of fibromyalgia

The impact of fibromyalgia on the patients' lives was assessed using the Fibromyalgia Impact Questionnaire (FIQ; Burckhardt, Clark and Bennett, 1991. Spanish version from Rivera and González, 2004). The FIQ is a 10-item instrument that assesses the impact of fibromyalgia on physical functioning, work status, depression, anxiety, sleep, pain, stiffness, fatigue and well-being. The higher the FIQ score is, the greater is the impact of fibromyalgia on a patient's life. The FIQ is a widely used instrument for an outcome measure of patients with fibromyalgia with demonstrated reliability and validity (Rossy et al., 1999; Goldenberg et al. 2004; Burckhardt, 2006).

Pain quality

Pain quality was assessed using the McGill Pain Questionnaire (MPQ; Melzack, 1975. Spanish version from Lázaro, Bosch, Torrubia and Baños, 1994). The MPQ assesses 20 domains of pain quality that are categorized (and scored) into three global domains: sensory, affective and evaluative pain domains. A great deal of evidence supports the reliability and validity of the MPQ (Lázaro, Caseras, Whizar-Lugo, Wenk, Baldioceda, Bernal, Ovalle, Torrubia and Baños, 2001; Melzack and Katz, 2001). Although the whole of the test was administered, the study only used the Pain Rating Index Sensory (PRIS) and the Pain Rating Index Affective (PRIA) scales because of the strong evidence supporting the psychometric properties of these two scales, in particular, in the Spanish version of the MPQ (Masedo and Esteve, 2000).

Global hypnotizability

In the subjects included in the CBT plus hypnosis treatment group, hypnotizability was assessed using the Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS-A;

Shor and Orne, 1962; Spanish version from Lamas, Valle-Inclán, Blanco and Albo Díaz, 1989). The HGSHS-A reports internal consistency coefficients between 0.62 and 0.84, and high correlation with the Stanford Hypnotic Susceptibility Scale, form C (SHSS:C; Weitzenhoffer and Hilgard, 1962).

Data analysis

First, we compared the participants in the three treatment conditions on demographic and pre-treatment outcome variables using t-tests for continuous variables and chi-square analyses for categorical variables. Next, we evaluated the changes induced by each condition treatment (control group, CBT group, CBT plus hypnosis group) with respect to pre-treatment conditions using paired- t-tests. Between treatments comparisons were performed by univariate analyses, when appropriate. The percentage of patients that experienced a significant change in pain intensity was also evaluated and a cut-off of 30% was accepted as indicator of a clinically important improvement (Farrar, Young, LaMoreaux, Werth and Poole, 2001). In the CBT plus hypnosis group, Pearson correlations between hypnotizability and pre- post-treatment differences were evaluated.

Results

No statistically significant differences were found between the three experimental groups on age, sex distribution, pain duration, marital status or educational level (see Table 1) as well as on pre-treatment measures of usual pain, FIQ total score, and MPQ scale scores.

As shown in Table 2, there was little change in any outcome measure in patients in the standard care control condition and no significant effects were observed. At variance, there was significant improvement in FIQ Total Score [$t = 2.28$; $p < 0.05$] for patients in the CBT condition. The participants in the CBT plus hypnosis condition exhibited significant improvement in Usual Pain Intensity [$t = 2.39$, $p < 0.05$], FIQ Total Score [$t = 3.84$, $p < 0.01$], and MPQ Affective Index [$t = 2.96$, $p < 0.01$]. No significant differences were found between groups after treatments, although according to the standard criteria for clinically meaningful changes showed that none of the patients in the control group (0%) obtained a decrease in Usual Pain Intensity, while 19% ($n = 3$) of the CBT group patients and 25% ($n = 4$) of the CBT plus hypnosis group patients reported post-treatment decreases in pain intensity.

In the patients receiving CBT plus hypnosis, the hypnotizability was positively correlated with improvement in the FIQ Total Score ($r = 0.63$, $p < 0.01$), and with improvement in the MPQ Affective Index ($r = 0.60$, $p < 0.01$). The HGSHS-A mean ratings for the patients of the CBT plus hypnosis group was 7.8 [S.D. 1.95; range = 4–10].

Discussion

In spite of the few significant results, the results indicate: 1) the patients with fibromyalgia who received CBT alone or CBT plus hypnosis tended to show more benefit than patients who received standard care; 2) the patients who received CBT plus hypnosis tended to show more benefit than patients who received CBT alone; 3) in patients who participated in the CBT plus hypnosis treatment, hypnotizability scores were positively associated with improvement.

The efficacy of the CBT treatment demonstrated in this study is consistent with other controlled trials of CBT treatment for fibromyalgia (Vlaeyen, Teeken-Gruben, Goossens,

Table 2. Pre- and post-treatment outcome measures of participants in each treatment conditions

Outcome domain	Control group (Pre-post)	CBT alone (Pre-post)	CBT plus hypnosis (Pre-post)
<i>Usual pain intensity (NRS)</i>	6.60–7.00 (S.D. 1.18–S.D. 1.01)	6.16–6.10 (S.D. 1.69–S.D. 2.52)	6.68–5.79* (S.D. 1.25–S.D. 2.05)
<i>FIQT 1 – FIQT 2</i>	72.14–66.14 (S.D. 8.95–S.D. 18.81)	67.44–60.96* (S.D. 16.08–S.D. 22.69)	67.19–48.00** (S.D. 17.43–S.D. 19.49)
<i>PRIS 1 – PRIS 2</i>	28.14–25.29 (S.D. 7.69–S.D. 10.25)	26.13–23.88 (S.D. 6.02–S.D. 8.79)	26.25–26.25 (S.D. 3.49–S.D. 7.19)
<i>PRIA 1 – PRIA 2</i>	5.29–5.86 (S.D. 1.11–S.D. 0.90)	5.06–4.25 (S.D. 1.98–S.D. 2.04)	4.50–3.31** (S.D. 1.54–S.D. 2.35)

* p < 0.05; ** p < 0.01

Note: pre- post-treatment differences for each of the treatment groups were performed with t-test paired samples. FIQT = Fibromyalgia Impact Questionnaire – Total score; PRIS = McGill Pain Questionnaire, Sensory Score; PRIA = McGill Pain Questionnaire, Affective Score.

Rutten-van Mólken, Pelt, van Eek and Heuts, 1996; Nicassio, Radojevic, Weisman, Schuman, Kim, Schoenfeld-Smith and Krall, 1997); Williams et al., 2002; Redondo, Justo, Moraleda, Velayos, Puche, Zubero, Hernández, Ortells and Pareja, 2004) although follow-up studies on this point are not consistent (see Keel et al., 1998; Redondo et al., 2004) and suggest that the beneficial effects of CBT on pain may take months or even years to emerge.

When CBT has been combined with other treatments, it appears to demonstrate more immediate effects in decreasing pain intensity, as occurs when CBT was combined with movement therapy (Singh, Berman, Hadhazy and Creamer, 1998; Creamer, Sinh, Hochberg and Berman, 2000) or physical exercise (Bennett, Burkhardt, Clark, O'Reilly, Wiens and Campbell, 1996; Lemstra and Olszynski, 2005). In juvenile fibromyalgia, contradictory results were found, since some authors reported results equivalent to those induced by the CBT alone (Kashikar-Zuck, Swain, Jones and Graham, 2005), while others described better treatment outcome consisting of significant improvement in pain intensity, as well as function and other symptoms (Degotardi, Klass, Rosenberg, Fox, Gallelli and Gottlieb, 2006) with respect to CBT alone.

Although CBT alone demonstrated higher effectiveness than pharmacological treatment alone, the differences in improvement found between treatment conditions in this study were not statistically significant. This finding is consistent with previous studies, cited above (e.g. Nicassio et al., 1997; Redondo et al., 2004; Bennett and Nelson, 2006). Participants in the CBT plus hypnosis condition reported significant decreases in pain, and those in the CBT alone condition (as well as those in the standard care condition) did not, although differences between treatment conditions were not statistically significant. The beneficial effects of hypnosis which have been observed are consistent with other findings on chronic pain (Melzack and Perry, 1975; Kirsch et al., 1995; Jensen and Patterson, 2006) and are also in line with the results of psychological therapies including hypnosis in cancer pain patients (Spiegel and Bloom, 1983). In fact, cancer pain patients reported less increase in pain over time (as illness progressed) compared with patients who did not receive hypnosis. Finally, Edelson and Fitzpatrick (1989) compared the effects of CBT and CBT plus hypnosis treatment in a sample of patients with a variety of chronic pain conditions and observed that the patients that were given CBT following an hypnotic induction treatment reported a significantly higher decrease in pain intensity and pain behaviours than the patients who received CBT alone. A possible explanation of the lack of significant between group differences may be related to our specific experimental procedures.

Our findings concerning the correlation between the CBT plus hypnosis treatment outcome and hypnotizability are not highly reliable because they concern a very small sample and the patients' range of hypnotizability was limited to 4 to 10. However, it is known that in patients this correlation is not so strong as it is in healthy individuals (Jensen, Hanley, Engel, Romano, Barber, Cardenas, Kraft, Hoffman and Patterson, 2005a). Hypnosis appeared more effective on the affective dimension of pain than over the sensory dimension, which is in line with other authors' findings (e.g. Price, Hakins and Baker, 1987; Meier, Klucken, Soyka and Bromm, 1993; Price, 1999).

There are a number of limitations of the study that should be considered when interpreting the results. First, there was a higher rate of drop-out in the standard care control condition than in the treatment conditions. Thus, it is possible that the differences in outcome between treatment conditions could be due to differences in the make-up of the samples (due to drop-out) rather than differences in the efficacy of the treatments. However, to the extent that people drop out of treatment because they find the treatment

ineffective, in fact, a greater dropout rate in the control condition (i.e. those patients who are not benefiting leaving the analyses) could potentially result in an underestimation of the efficacy of treatment. The fact that significant effects were found for the CBT conditions relative to the control condition despite the higher dropout rate in the control condition provides even more support for the efficacy of the former.

A second limitation of the study is the relatively small sample size, which can limit our ability to detect real effects. This problem is especially a concern for the control condition, as it can limit the ability to detect possible benefits in that condition. However, an examination of the means indicate that there was not even a trend for improvement in the control condition participants.

Third, we did not evaluate treatment outcome expectancy in the study participants. It is possible that some, or even all, of the differences found between treatment conditions might have been due to differences in outcome expectancy engendered by the interventions (as opposed to anything specific about the CBT or hypnosis interventions). Including measures of outcome expectancy would have allowed us to test and control for these effects (Kirsch, 1999; Jensen and Patterson, 2005b, 2006).

Fourth, we did not perform any long-term (or even intermediate-term) follow-up assessments, so we are unable to draw any conclusions about the maintenance of gains made. However, other researchers have included follow-up analyses (see Jensen, Barber, Hanley, Engel, Romano, Cardenas, Kraft, Hoffman and Patterson, 2008) demonstrating that, at least among some patients who received hypnosis treatment for pain management, treatment benefits can maintain for as long as 12 months after treatment.

However, despite the limitations of the study, the findings provide additional support for the efficacy of CBT for helping patients with fibromyalgia manage their pain, and for the additive effects of hypnosis for enhancing the effects of CBT treatment. This study adds to the growing body of research indicating that persons with chronic pain should at least be offered treatments in addition to medication management, and that those treatments should include both CBT and hypnosis.

Acknowledgements

We would like to thank professor Juan R. Lamas for his collaboration in facilitating the Spanish version of the Harvard Group Scale of Hypnosis Susceptibility, Form A. We would also like to thank Tiago Serodio for his efficiency in the translation of the manuscript, as also Filipa Lobato, scholarship holder in our unit, for her collaboration in the statistical analysis of the data. Lastly, we would like to thank all the patients for their collaboration and patience, without whom we would not have been able to accomplish this study.

References

- Alvarez-Nemegyei J, Negreros-Castillo A, Nuño-Gutiérrez J, Álvarez-Berzunza J, Alcocer-Martínez LM (2006) Eficacia de la hipnosis ericksoniana en el síndrome de fibromialgia en mujeres. *Revista Médica del Instituto Mexicano de Seguro Social* 45(4): 395–401.
- Barber J (1996) *Hypnosis and Suggestion in the Treatment of Pain. A Clinical Guide*. New York: Norton Company Inc.
- Barber J (2001) Hypnosis. In: JD Loeser (ed.) *Bonica's Management of Pain*. Philadelphia, EEUU: Lippincott Williams and Wilkins, 1768–78.
- Bennett R, Nelson D (2006) Cognitive behavioral therapy for fibromyalgia. *Nature Clinical Practice Rheumatology* 2(8): 416–24.

- Bennett RM, Burkhardt CS, Clark SR, O'Reilly CA, Wiens AN, Campbell SM (1996) Group treatment of fibromyalgia: a 6 month outpatients program. *Journal of Rheumatology* 23: 521–8.
- Bradley LA (1996) Cognitive-behavioral therapy for chronic pain. In: RJ Gatchel, DC Turk (eds) *Psychological Approaches to Pain Management: A Practitioner's Handbook*. New York, EEUU: The Guilford Press, 131–47.
- Burckhardt CS (2006) Multidisciplinary approaches for management of fibromyalgia. *Current Pharmaceutical Design* 12: 59–66.
- Burckhardt CS, Clark SR, Bennett RM (1991) The Fibromyalgia Impact Questionnaire: development and validation. *Journal of Rheumatology* 18: 728–33.
- Busquets C, Vilaplana J, Arxer A (2005) Dolor musculoesquelético de origen mecánico e inflamatorio. In: M Rull (ed.) *Dolor Musculoesquelético*. La Coruña, Spain: SED, 63–103.
- Castel A, Pérez M, Sala J, Padrol A, Rull M (2007) Effect of hypnotic suggestion on fibromyalgic pain: comparison between hypnosis and relaxation. *European Journal of Pain* 11: 463–8.
- Creamer P, Sinh BB, Hochberg MC, Berman BM (2000) Sustained improvement produced by nonpharmacologic intervention in fibromyalgia: results of a pilot study. *Arthritis Care and Research* 13(4): 198–204.
- Degotardi PJ, Klass ES, Rosenberg BS, Fox DG, Gallelli KA, Gottlieb BS (2006) Development and evaluation of a cognitive-behavioral intervention for juvenile fibromyalgia. *Journal of Pediatric Psychology* 31(7): 714–23.
- Dworkin RH, Siegfried RN (1994) Are all those pain ratings necessary? [letter to the editor]. *Pain* 58: 279.
- Edelson J, Fitzpatrick JL (1989) A comparison of cognitive-behavioral and hypnotic treatments of chronic pain. *Journal of Clinical Psychology* 45: 316–23.
- Farrar JT, Young JP, LaMoreaux L, Werth JL, Poole RM (2001) Clinical importance of changes in chronic pain intensity measured on an 11-point numerical pain rating scale. *Pain* 94: 149–58.
- Fishbain DA, Rosomoff HL, Goldberg M, Cutler R, Abdel-Moty E, Khalil TM, Rosomoff RS (1993) The prediction of return to the workplace after multidisciplinary pain center treatment. *The Clinical Journal of Pain* 9(1): 3–15.
- Giesecke T, Williams DA, Harris RE, Cupps TR, Tian X, Tian TX, Gracely RH, Clauw DJ (2003) Subgrouping of fibromyalgia patients on the basis of pressure-pain thresholds and psychological factors. *Arthritis and Rheumatism* 48(10): 2916–22.
- Goldenberg DL, Burckhardt C, Crofford L (2004) Management of fibromyalgia syndrome. *JAMA* 17(19): 2388–95.
- Haanen HCM, Hoenderdos HTW, van Romunde LKJ, Hop WCJ, Mallee C, Terweil JP and Hekster GB (1991) Controlled trial of hypnotherapy in the treatment of refractory fibromyalgia. *Journal of Rheumatology* 18: 72–5.
- Hilgard ER, Hilgard JR (1975) *Hypnosis in the Relief of Pain*. Los Altos, CA: Williams Kaufmann, Inc.
- Jensen MP, Barber J, Hanley MA, Engel JM, Romano JM, Cardenas DD, Kraft GH, Hoffman AJ, Patterson DR (2008) Long-term outcome of hypnotic-analgesia treatment for chronic pain in persons with disabilities. *International Journal of Clinical and Experimental Hypnosis* 56: 156–69.
- Jensen MP, Hanley MA, Engel JM, Romano JM, Barber J, Cardenas DD, Kraft GH, Hoffman AJ, Patterson DR (2005a) Hypnotic analgesia for chronic pain in persons with disabilities: a case series. *International Journal of Clinical and Experimental Hypnosis* 53: 198–228.
- Jensen MP, Patterson DR (2005b) Control conditions in hypnotic-analgesia clinical trials: challenges and recommendations. *International Journal of Clinical and Experimental Hypnosis* 53(2): 170–97.
- Jensen MP, Patterson DR (2006) Hypnotic treatment of chronic pain. *Journal of Behavioral Medicine* 29(1): 95–123.

- Jensen MP, Turner JA, Romano JM, Fisher LD (1999) Comparative reliability and validity of chronic pain intensity measures. *Pain* 83: 157–62.
- Kashikar-Zuck S, Swain NF, Jones BA, Graham TB (2005) Efficacy of cognitive-behavioral intervention for juvenile fibromyalgia syndrome. *Journal of Rheumatology* 32: 1594–602.
- Keel PJ, Bodoky C, Urs G, Müller W (1998) Comparison of integrated group therapy and group relaxation training for fibromyalgia. *The Clinical Journal of Pain* 14(3): 232–8.
- Kirsch I (1999) Hypnosis and placebos: response expectancy as a mediator of suggestion effects. *Anales de Psicología* 15(1): 99–110.
- Kirsch I, Montgomery G, Sapirsten G (1995) Hypnosis as an adjunct to cognitive-behavioral psychotherapy: a meta-analysis. *Journal of Consultant Clinical Psychology* 63(2): 214–20.
- Lamas JR, Valle-Inclán F, Blanco MJ, Albo Díaz A (1989) Spanish norms for the Harvard Group Scale of Hypnosis Susceptibility, Form A. *International Journal of Clinical and Experimental Hypnosis* 37: 264–73.
- Lázaro C, Bosch F, Torrubia R, Baños JE (1994) The development of a Spanish Questionnaire for assessing pain: preliminary data concerning reliability and validity. *European Journal of Psychological Assessment* 10(2): 145–51.
- Lázaro C, Caseras X, Whizar-Lugo VM, Wenk R, Baldioceda F, Bernal R, Ovalle A, Torrubia R, Baños JE (2001) Psychometric properties of a Spanish version of the McGill Pain Questionnaire in several Spanish-speaking countries. *Clinical Journal of Pain* 17(4): 365–74.
- Lemstra M, Olszynski WP (2005) The effectiveness of multidisciplinary rehabilitation in the treatment of fibromyalgia. *Clinical Journal of Pain* 21(2): 166–74.
- Masedo AI, Esteve R (2000) Some empirical evidence regarding the validity of the Spanish version of the McGill Pain Questionnaire (MPQ-SV). *Pain* 85: 451–6.
- Meier W, Klucken M, Soyka D, Bromm B (1993) Hypnotic hypo and hyperalgesia: divergent effects on pain ratings and pain-related cerebral potentials. *Pain* 53: 175–81.
- Melzack R (1975) The McGill pain questionnaire: major properties and scoring methods. *Pain* 1: 277–99.
- Melzack R, Katz J (2001) The McGill Pain Questionnaire: Appraisal and current status. In: DC Turk and R Melzack (eds) *Handbook of Pain Assessment* (2nd edn). London: The Guilford Press, 35–52.
- Melzack R, Perry C (1975) Self-regulation of pain: the use of alpha-feedback and hypnotic training for the control of chronic pain. *Experimental Neurology* 46: 452–69.
- Milling LS, Kirsch I, Meunier SA, Levine MR (2002) Hypnotic analgesia and stress inoculation training: individual and combined effects in analog treatment of experimental pain. *Cognitive Therapy and Research* 26: 355–71.
- Milling LS, Meunier SA, Levine MR (2003) Hypnotic enhancement of cognitive-behavioral interventions for pain: an analogue treatment study. *Health Psychology* 22 (4): 406–13.
- Montgomery GH, DuHamel KN, Redd WH (2000) A meta-analysis of hypnotically induced analgesia: how effective is hypnosis? *International Journal of Clinical and Experimental Hypnosis* 48(2): 138–53.
- Neumann L, Buskila D (2003) Epidemiology of fibromyalgia. *Current Pain and Headache Reports* 7: 362–8.
- Nicassio PM, Radojevic V, Weisman MH, Schuman C, Kim J, Schoenfeld-Smith K, Krall T (1997) A comparison of behavioral and educational interventions for fibromyalgia. *Journal of Rheumatology* 24(10): 2000–7.
- Patterson DR, Jensen MP (2003) Hypnosis and clinical pain. *Psychological Bulletin* 129(4): 138–3.
- Price DD (1999) *Psychological Mechanism of Pain and Analgesia*. Seattle, WA: IASP Press.
- Price DD, Haskins SW, Baker C (1987) Sensory-affective relationships among different types of clinical and experimental pain. *Pain* 28: 297–307.
- Redondo JR, Justo CM, Moraleda FV, Velayos YG, Puche JJ, Zubero JR, Hernández TG, Ortells LC, Pareja MA (2004) *Arthritis and Rheumatism* 51(2): 184–92.

- Rivera J, González T (2004) The Fibromyalgia Impact Questionnaire: a validated Spanish version to assess the health status in women with fibromyalgia. *Clinical and Experimental Rheumatology* 22: 554–60.
- Rossy LA, Buckelew SP, Dorr N, Hagglund KJ, Thayer JF, McIntosh MJ, Hewett JE, Johnson JE (1999) A meta-analysis of fibromyalgia treatment interventions. *Annals of Behavioral Medicine* 21(2): 180–91.
- Shor RE, Orne EC (1962) Harvard Group Scale for Hypnotic Suggestibility, form A. Palo Alto, CA: Consulting Psychologists Press.
- Singh BB, Berman BM, Hadhazy VA, Creamer P (1998) A pilot study of cognitive behavioral therapy in fibromyalgia. *Alternative Therapies in Health and Medicine* 4(2): 67–70.
- Spiegel D, Bloom JR (1983) Group therapy and hypnosis reduce metastatic breast carcinoma pain. *Psychosomatic Medicine* 45: 333–9.
- Syrjala KL, Abrams JR (1996) Hypnosis and imagery in the treatment of pain. In: RJ Gatchel, DC Turk (editors) *Psychological Approaches to Pain Management: A Practitioner's Handbook*. New York, EEUU: The Guilford Press, 231–58.
- Vlaeyen JW, Teeken-Gruben NJ, Goossens ME, Rutten-van Mólken MP, Pelt RA, van Eek H, Heuts PH (1996) Cognitive-educational treatment of fibromyalgia: a randomized clinical trial. I. Clinical effects. *Journal of Rheumatology* 23(7): 1237–45.
- Weitzenhoffer AM, Hildgard ER (1962) Stanford Hypnotic Susceptibility Scale, Form C. Palo Alto, CA: Consulting Psychologists Press.
- Wik G, Fischer H, Bragée B, Finer B, Fredrikson M (1999) Functional anatomy of hypnotic analgesia: a PET study of patients with fibromyalgia. *European Journal of Pain* 3: 7–12.
- Williams DA, Cary MA, KH Groner, Chaplin W, Glazer LJ, Rodriguez AM, Clauw DJ (2002) Improving physical functional status in patients with fibromyalgia: a brief cognitive behavioral intervention. *The Journal of Rheumatology* 29: 1280–6.
- Wolfe F, Smythe HA, Yunus MB, Bennett RM, Bombardier C, Goldenberg DL, Tugwell P, Campbell SM, Abeles SM, Clark P, et al. (1990) The American College of Rheumatology 1990 Criteria for the Classification of Fibromyalgia: Report of the Multicenter Criteria Committee. *Arthritis and Rheumatism* 33: 160–72.

Address for correspondence:

Dr Antoni Castel

Unitat de Dolor

Hospital Universitari de Tarragona Joan XXIII

C/ Doctor Mallafré Guasch

4. 43007 Tarragona

Spain

Tel: (+34) 977295800 (ext. 1324)

Fax: (+34) 977295805

Email: antonicastel.riu@gmail.com