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On the affective nature of chronic pain

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The aim of the present study was to test if the *Spanish Version of the McGill Pain Questionnaire* (MPQ-SV) can account for differences between chronic and acute pain patients and to test the equality of Factor Structures in both samples. The sample was made up of 175 chronic pain patients and 176 acute pain sufferers. The mean scores of the Sensory, Affective and Total Subscales of the MPQ-SV, intercorrelations between subscales and reliability indexes were compared in both samples and a multisample confirmatory factor analysis was carried out. The chronic pain sample showed higher scores than the acute pain sample in all the MPQ-SV scales: affective, sensory and total. On the other side, the intercorrelations between the MPQ-SV scales and its reliability indexes were more intense in chronic than in acute patients. Finally, the factorial structure of MPQ-SV according to a tridimensional model, could not be generalized to acute and chronic pain samples. In conclusion, MPQ accounted the differences between chronic and acute pain, the emotional distress of chronic pain was translated into high scores to all the MPQ scales.

La naturaleza afectiva del dolor crónico. El objetivo de este estudio fue contrastar si la versión española del Cuestionario de Dolor McGill (MPQ-SV) se muestra sensible a las diferencias entre pacientes con dolor agudo y pacientes con dolor crónico así como comprobar si la estructura factorial del cuestionario es generalizable a ambas muestras. La muestra estaba compuesta de 175 pacientes con dolor crónico y 176 pacientes con dolor agudo. Se llevó a cabo una comparación entre las puntuaciones medias de las subescalas (sensorial, afectiva y total), las correlaciones y los índices de fiabilidad de las mismas. También se realizó una análisis factorial confirmatorio multimuestra. Los pacientes de dolor crónico obtuvieron puntuaciones más altas que los pacientes con dolor agudo en todas las subescalas (sensorial y afectiva) y en la escala total. Por otro lado, las intercorrelaciones entre las subescalas y sus índices de fiabilidad fueron más altos cuando la muestra era de dolor crónico. Finalmente, de acuerdo con el modelo tridimensional que subyace a la creación del cuestionario, la estructura factorial del MPQ-SV no es generalizable de una muestra a otra. En conclusión, el MPQ es sensible a las diferencias entre dolor crónico y agudo. Se discute si la carga emocional del dolor crónico se traduce en altas puntuaciones en todas las subescalas del MPQ.

The verbal description of the quality of pain frequently provides the key to diagnosis and may even help to predict the course of therapy. The widespread use of distinctive pain descriptors for many pain syndromes suggests that each syndrome can be characterised by a unique constellation of words.

Melzack and Torgerson (1971) made a start toward specifying the quality of pain with the *McGill Pain Questionnaire*. In the first part of their study, they asked physicians and university graduates to classify 102 words, obtained from the clinical literature and the descriptions given by pain patients, into small groups that would describe distinctly different aspects of the experience of pain. The words were categorised into three main classes and 16 subclasses. The classes were: 1) words describing *sensory* qualities of the experience in terms of temporal, spatial, pressure, thermal and other properties; 2) words describing *affective* qualities in terms of tension, fear and autonomic properties that are part of the pain experience; and 3) *evaluative* words describing the subjective overall intensity of the total pain experience.

Since the *McGill Pain Questionnaire* (MPQ) was developed (Melzack, 1975), the language of pain has been analysed to determine whether the use of specific descriptors could reliably serve to differentiate between diagnostic categories. Many studies have demonstrated the capacity of the MPQ to discriminate between functional and organic pain (Leavitt, et al., 1979; Oostdam and Duivenvoorden, 1984), specific pain syndromes (Dubuisson and Melzack, 1976; Reading and Newton, 1977; Reading, et al., 1983; Hand and Reading, 1986), experimental phasic and tonic pain (Chen and Treede, 1985), and patients with and without mental illness (Kremer and Atkinson, 1983).

According to its temporal quality, pain has historically been classified into two broad categories: acute pain and chronic pain. Actually, the chronic pain constitutes an important field of research (Vallejo and Comeche, 1992; Llop Gimenez, 1993; Rodríguez, Esteve and López, 2000). Unlike subjects with acute pain, psychological and emotional complaints are frequent in chronic

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pain patients (Price, et al., 1987; Smith, et al., 1998; Kremer and Atkinson, 1984) and their daily life is often seriously impaired. Several studies found that acute and chronic pain patients could be reliably differentiated by their scores on the MPQ. Specifically, chronic pain patients typically showed higher scores in the affective dimension of the MPQ (Melzack, et al., 1982; Reading, et al., 1982). Several authors consider that the affective dimension of the MPQ is a good index of the psychological distress experienced by patients and that sensory descriptors add little to the prediction of distress (Kremer and Atkinson, 1984). Specifically, Atkinson and his colleagues (1982) research found that emotional distress was translated into high scores in all the MPQ scales.

In contrast to the previous studies, several works have questioned the capacity of the MPQ to differentiate between diagnostic categories of chronic pain patients by using their emotional distress as expressed by their scores in the affective scale. Atkinson and colleagues (1982) failed to identify distinctive word patterns for a wide sample of different chronic pain conditions. The authors suggested that the chronic status of pain may account for these results. They concluded that when affective distress is high (as is frequently the case in chronic pain), it is difficult to distinguish between the three dimensions of pain postulated by the *Multidimensional Pain Theory* (Melzack and Casey, 1968) because patients tend to choose a high number of descriptors from all the subscales of the McGill questionnaire, not just from the affective scale. In the same vein, Agnew and Mersky (1976) could not find any word pattern to reliably discriminate between various groups of medical and psychiatric patients. Atkinson and his colleagues (1982) and Kremer and Atkinson (1984) showed that as affective distress increased language became fuzzy, not only in the affective dimension but also in the sensory dimension. They concluded that this could occur because sensory phenomena, primarily due to affective experience, become confused with or are labelled as sensory phenomena associated with pain. It is plausible to assume that in acute, non-life-threatening diagnostic categories the level of affective distress would be substantially reduced. Besides this, different factor structures of the MPQ were found in acute and chronic pain patients. Specifically, for the chronic sample it was more difficult to distinguish between the sensory, affective and evaluative dimensions (Reading, 1982). It can be said that it is more difficult to discriminate dimensions of pain in chronic pain patients than in acute pain patients. The aforementioned results have important technical and theoretical implications: is it technically correct to use the three scores of the MPQ to evaluate pain in chronic pain patients? Should the total score only be used instead? Furthermore, when emotional distress is high, is chronic pain a global holistic experience in which the three dimensions postulated by the *Multidimensional Pain Theory* (Melzack and Casey, 1968) are indistinguishable?

Although it seems meaningful to try to answer the previous questions, no research has been carried out in this direction with any of the four Spanish versions of the *McGill Pain Questionnaire* (Lahuerta, et al., 1982; Molina, et al., 1984; Ruiz, et al., 1994; Lázaro, et al., 1994).

Therefore, the aim of this study was to shed light upon the capacity of one of the Spanish versions of the *McGill Pain Questionnaire* (Lázaro, et al., 1994) to account for differences between chronic and acute pain patients and to test the equality of factor structures in both samples. First, the acute and chronic pain patients' mean scores in the sensory and the affective dimensions were compared. As no research is available with the Spanish Version of the MPQ, hypotheses will be formulated taking as a framework the original position of the creators of the MPQ (Melzack, et al., 1982). According to their postulates no significant differences should be found in the sensory scale between acute and chronic pain patients; but in the affective scale chronic patients should show a significantly higher mean score. Furthermore, the three dimensions postulated by Melzack and Casey's (1968) *Multidimensional Pain Theory* should be equally distinguishable in both samples. That is, the internal consistency indexes and the intercorrelations between scales should be similar in chronic and acute patients. Besides this, the postulated tridimensional factor structure of the MPQ should be generalizable to both samples.

Method

Participants

Two separate populations experiencing pain (acute and chronic clinical pain) were selected at random for this investigation. The first sample consisted of 176 acute pain patients (50% female, 50% male) who received treatment at the Emergency ward in Carlos Haya Hospital (Malaga, Spain). They had a mean age of 54 years (range 16-87). The mean duration of pain was 48.73 hours. Following the IASP classification (1986), the categories of pain were as follows: Chest Pain (39.6%), Back Pain of Musculoskeletal Origin (25.7%), Abdominal Pain of Visceral Origin (12.9%), Back Pain of Visceral Origin (10.4%), Primary Headache Syndromes (2.5%), Disease of the Uterus, Ovaries and Adnexa (1.5%), Lesions of the Ear, Nose and Oral Cavity (1.5%) and miscellaneous (6%). The second sample was made up of 175 chronic patient (50% males, 50% females) from the Pain Clinic of the Carlos Haya Hospital (Malaga, Spain). The age of this sample averaged 57 years. The mean duration of pain was 96.3 months. Classification of pain was: Relatively Generalized Syndromes (48.3%), Back Pain of Musculoskeletal Origin (9.7%), Pain of Neurological Origin in Neck, Shoulder and Upper Extremities (9.6), Abdominal Pain of Visceral Origin (7.7%), Neuralgias of the Head and Face (5.3%), Visceral Pain in the Neck (5.3%), Lesions of the Brachial Plexus (3.9%), Vascular Disease of the Limbs (2.4%), Pain in Shoulders, Arms and Hands (1.9%), Primary Headache Syndromes (1.9%) and miscellaneous (6.3%).

Assessment

Spanish Version of the McGill Pain Questionnaire (Lázaro, et al., 1994). The Pain Rating Index (PRI) of the MPQ consists of 64 pain descriptors organised in 19 subclasses. Within each subclass, descriptors are ranked in order of intensity. Subclass scores are added to form three subscale scores: sensory (1-15), affective (16-18) and evaluative (19).

As Lázaro et al. (1994) showed, all rank values exhibited a high degree of correlation with the original scale values and with the VAS. In addition, Lázaro et al. (1994) checked the sensitivity of this version to detect changes after treatment. Factorial evidence is not provided, nor are internal consistency indexes.

Procedure

Data were collected by interview with a mean duration of 10 minutes for the acute sample. No other person was present. In both

samples, signed and informed consent was obtained prior to data collection. All patients were selected at random. After the interview, the doctors communicated to the researches the patients' diagnoses. For the acute sample responses to the MPQ-SV were obtained from subjects while they were waiting for medical treatment in the Emergency ward and the chronic patients were interviewed as they came asking for medical treatment. The pain descriptors of MPQ-SV were written in big cards that the interviewer showed to the patients.

Analysis

To compare the mean scores in the affective, sensorial and total scales, the Mann Whitney U-test was applied. To compare the internal consistency of each scale in both samples Crombach's Alpha reliability indexes were calculated. The intercorrelations between the scales were estimated by polychoric correlations.

To test the equality of factor structures of the MPQ-SV in both samples, a *multisample confirmatory factor analysis* was carried out. According to the *Multidimensional Pain Theory (*Melzack and Casey, 1968), the items of the MPQ-SV could be grouped in three scales matching each dimension postulated by the theory: Sensory, Affective and Evaluative. The *multisample confirmatory analysis*, proposed by Jöreskog and Sörbom (1979), evaluates the degree to which a theoretical model holds in two separate samples. The LISREL 8.20 (Jöreskog and Sörbom, 1996) computer program was used via Generalized Least Squares (GLS) as a method of estimation. In the first step it is assumed that all the model's parameters are invariant in both groups. That is, factor loadings and error variances are assumed to be the same in the chronic and the acute sample. In the following step, it is assumed that both samples differ in factor loadings and error variances are assumed to be equal between groups. Finally, the third step consists in assuming that factor loadings and error variances are different in both samples.

Multiple-group CFA provides a chi-square value and its accompanying degrees of freedom. To test each hypothesis about the similarity or invariance of the factor structures in various groups the chi-square difference is considered. If the chi-square difference test is non-significant, the plausibility of the null hypothesis of equality of factor structures is supported.

Results

The mean scores of the Sensory, Affective and Total scales of the MPQ-SV for the chronic and the acute pain samples were compared. The score of the evaluative scale could not be compared because it is made of just one item. The chronic pain patients had a significantly higher mean rank in the Affective Subscale (*mean rank chronic sample= 251.84, mean rank acute sample= 99.73); (Z= -14.057 P<0.001).* Besides, the chronic pain patients had significantly higher mean rank in the Sensory Subscale *(mean rank chronic sample= 225.11, mean rank acute sample= 127.16);* (*Z= -9.045, P<0.001)* and the Total Scale *(mean rank chronic sample= 230.13, mean rank acute sample= 121.52);* (*Z= -9.366, P<0.001)* than the acute pain sample.

The internal consistency reliability indexes for the Affective and Sensory Subscales and for the Total Scale are shown in Table 1. The Evaluative Subscale reliability could not be computed because it is made of just one item. We can see that the reliability indexes are higher for the chronic pain sample than for the acute sample. Nevertheless, these indexes are low, especially in the acute pain sample. Intercorrelations between scales yielded the same pattern. The intercorrelations are higher in chronic pain patients as well.

As previously mentioned, to test the equality of factor structures in chronic and acute pain patients, the 3-factor model based on the *Multidimensional Pain Theory* (Melzack and Casey, 1968) was assumed. In Table 2, the results of the *multisample confirmatory factor analyses* are presented. It can be observed that chi-square and the degrees of freedom have decreased significantly from step 1 to 2 (275.74 *(16), p<.001*) when factor loadings are assumed to be different in both groups. However, from step 2 to step 3, there is not a drop. Therefore, if we take the 3-factor model as our framework, the MPQ-SV differs in factor loadings but not in error variances in chronic and acute pain patients. Assuming with our results, the 3-factor model could not be generalizable to both samples.

Table 1
Intercorrelations and reliability indexes of the MPQ-SV subscales

	Acute	**Chronic**
Intercorrelations between scales		
Sensory - Affective	0.27	0.48
Affective - Evaluative	0.39	0.54
Sensory - Evaluative	0.25	0.53
Reliability indexes		
Sensory scale	0.43	0.66
Affective scale	0.46	0.55
Total	0.57	0.75

Table 2
Multisample confirmatory analysis for a classic 3 factor model in chronic and acute pain patients

Classic 3-Factor Model	χ^2	**d.f.**	$\Delta\chi^2$	**Δg.l.**
Step 1 Total invariance	928.05	238	_	_
Step 2 Different pattern loadings	652.31	222	275.74	16**
Step 3 Different pattern loadings and error variance	652.31	222	_	_

Note: χ^2= chi square; d.f.= degrees of freedom; $\Delta\chi^2$= chi square difference; Δg.l.= degrees of freedom difference.
***p<.001*

Discussion

According with our results, the *Spanish Version of the McGill Pain Questionnaire* accounts the differences between chronic and acute pain.

Our results agree with those studies which concluded that chronic and acute pain patients differ in their scores in the affective dimension of the MPQ (Melzack, et al., 1982; Reading, et al., 1982). Besides, the chronic pain sample showed higher scores than the acute pain sample in all the MPQ-SV scales: affective, sensory

and total. The same results are found by Atkinson, et al. (1982) and Kremer and Atkinson (1984). These authors considered that the emotional distress of chronic pain was translated into high scores to all the MPQ scales. Several other authors have explained this phenomenon by virtue of the emotional distress frequent in chronic patients (Price, et al., 1987; Smith, et al., 1996). Further, they stated that the assessment of pain by the MPQ could be confounded by the affective disturbance characteristic of chronic patients (Atkinson, et al., 1982).

At the same time, the intercorrelations between the MPQ-SV scales and the reliability indexes indicated that the relationship between the sensory and affective dimensions of pain is more intense in chronic than in acute patients. Therefore, according to our results, the relationship between the dimensions of pain changes depending on its chronicity. It could be said that chronic pain is a more holistic experience than acute pain as it is more difficult to differentiate between the different dimensions postulated by the *Multidimensional Pain Theory* (Melzack and Casey, 1968). So, our results could show that, assuming little affective distress in the acute sample, diffusion across sensory-affective boundaries does not occur and distinct separation of the pain experience could be obtained. The present study did not take into account the evaluative dimension. Nevertheless, previous studies on the MPQ-SV supported the sensory and affective dimensions but not the evaluative dimension (Masedo and Esteve, 1999). The evaluative scale of the MPQ-SV is made of quit a single item asking for a judgement about pain intensity. Following the *Gate Control Theory* (Melzack and Wall, 1965) the evaluative dimension refers to the cognitive components of pain and cannot be reduced to a mere judgement of intensity of pain.

Furthermore, as in Reading (1982), our results indicated that the factorial structure of MPQ-SV, according to a tridimensional classical model (Melzack and Casey, 1968), could not be generalized between acute and chronic pain samples. Future research is needed to establish the factorial structure of the MPQ-SV that better fits each type of pain. Alternatives models could be proposed taking into acount the affective predominance of chronic pain patients. Possibly, an unidimensional model could be more plausible for chronic pain and then only one global score would be used for the evaluation of chronic pain.

Finally, a technical question leads us to a theoretical issue about the nature of pain itself. Is acute and chronic pain so different that the MPQ is assessing different constructs? Are the three dimensions of pain postulated by the *Multidimensional Pain Theory* (Melzack and Casey, 1968) equally applicable to chronic and acute pain? Or on the contrary, are different dimensions of pain involved in different types of pain? We think that in chronic pain, the sensory and the affective dimensions are better comprissed in a global dimension and perhaps is not appropiate to differentiate those dimensions in chronic pain. Besides, chronic pain is not simply acute pain that has lasted a long time. Opposite to an analytic perspective, our results also lend support to a central integrating point of view (Vallejo and Comeche, 1992). According to our results, chronic pain is a global experience with an important emotional load that seriously affects the patients' day life. Future research on the assessment and nature of pain will provide the answer

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