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Pain-Related Attitudes and Functioning in Elderly Primary Care Patients

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Abstract. This study examined the associations between specific pain-related beliefs and both mental health and pain interference in elderly patients with chronic pain. A total of 139 patients completed validated questionnaires assessing pain domains (i.e., intensity, duration and location), psychological functioning, pain interference and demographic variables. Pain-related beliefs were related with poorer mental health (Disability = –.27; Harm = –.23; Solicitude = –.24; Control = .18; Emotion = –.29) and greater interference in daily activities (Disability =.41; Harm =.13; Solicitude =.29; Control = –.31). Our findings are consistent with a biopsychosocial model of chronic pain which goes beyond physical variables in an attempt to understand and promote patients' adjustment to chronic pain problems.

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Chronic pain has a considerable physical and mental impact on older adults, particularly those who are frail (Helme & Gibson, 2001), and can lead to a great deterioration in their quality of life (Fayers et al., 2011). Although chronic pain in these populations might be the consequence of underlying physiological activity due to ongoing aging processes, relatively consistent evidence suggests that psychological and social factors may play an important role in the experience and impact of pain (Rafteri et al., 2011).

The biopsychosocial model conceptualizes pain as the result of a complex interaction of physical, cognitive, emotional, behavioral/societal factors that, altogether, influence the experience of pain. What people think and believe about themselves and their ability to control pain has been found to influence the experience of pain. There are examples of this relationship in both adults (Jensen, Turner, & Romano, 2001) and children (Miró, Huguet, & Jensen, 2014). Research has shown that attitudes are important factors in understanding and adjusting to the experience of pain, even in people for whom pain is secondary to a physical disability (e.g., Miró, Gertz, Carter, & Jensen, 2012). Health beliefs and pain-specific attitudes have been shown to influence acceptance of treatment (Kimball, Marshall, Micich, & Cosby, 2010), and are related to a diminution in pain after, for example, exercise-based rehabilitation programs (Hurley, Walsh, Bhavnani, Britten, & Steevnson, 2010). Beliefs are culturally shared cognitive forms which model people's attitudes about present and future events. The elderly may share similar beliefs about pain that can have a positive influence if, for example, they perceive that they can do something to control the problem. But beliefs may also influence negatively if, for example, people perceive that there is nothing they can do to control the problem. Under these circumstances, patients might tend to become less motivated about treatment and comply less with therapeutic suggestions.

Recently, Uthaikhup, Sterkling, and Jull (2009) found specific relationships between certain attitudes and quality of life in a sample of elderly patients with headaches. Specifically, they reported significant negative correlations between patients' physical well-being and the belief that one cannot function because of the pain, the belief that pain is a sign of damage and that certain activities should be avoided, and the belief that others should be solicitous in response to one's pain behaviors.

Thus, there are some data to suggest that the pain-related beliefs and attitudes of the elderly might be at least partly responsible for the way they experience pain and how they adjust to chronic pain problems. Attitudes towards health and illness may vary during the life span (Jensen, Counte, & Glandon, 1992), therefore additional research is needed to clarify this hypothesis in this specific and particularly important population.

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The objective of our work was to study the extent to which pain-related beliefs contributed to the psychological functioning of the elderly, and to the interference of pain in their daily functioning. Most studies on elderly populations have been carried out with nursing home residents or community-residents, and about specific medical conditions. The objective of this study was to analyze the relationship between attitudes and functioning among primary care patients.

Method

The study is based on a personal interview of an older adult population living in Catalonia, a Mediterranean region in the north-east of Spain. The data are part of an ongoing longitudinal study of pain among elderly Catalan citizens.

Participants

Following University and Governmental Health authorities ethical approval, a representative sample of elderly people was randomly chosen (the selection process has been reported elsewhere, Miró et al., 2007). Participants had to be able to understand Spanish and provide informed consent on their own behalf. They also had to experience some form of a chronic pain problem (i.e., pain that had lasted for at least 3 months). Severe cognitive deterioration was a criterion for exclusion. In accordance with Spanish normative studies (Casabella & Espinàs, 1999) individuals with a score below 21 on the Mini-Mental State Examination were excluded. Data from 48 participants with a MMSE below 21 were finally excluded from the study.

The sample for this study consists of the 139 people with chronic pain (pain lasting more than three months), 65 years or older, who gave complete valid data during interviews.

Procedure

Letters were sent, and a week later potential participants were phoned. Almost all the people approached agreed to collaborate in the study. The acceptance rate was 94.9%. Data was collected during a 40-minute personal interview with participants at their primary care center. First of all, participants were asked about their current health situation, and then the interviewer concentrated on the participants' pain condition, how their pain interfered with daily activities, and their quality of life. The participants' mental health status was also assessed so that the presence of dementia could be identified. Those participants with no cognitive problems also reported on their pain-related attitudes.

Socio-demographic information

The participants' date of birth, gender, employment status, educational attainment and living arrangements were collected. Their socio-economic (SES) status was classified in accordance with the work by Domingo-Salvany et al. (2001).

Mini Mental State Examination

The Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975) is a widely used clinical scale designed to evaluate an individual's cognitive mental status. The Spanish version of the MMSE by Lobo, Saz, Marcos, and Grupo ZARADEMP (2002) was used in this study.

Psychological Functioning

Psychological functioning was measured by the SF-12 (Ware, Kosinski, & Keller, 1996), a short-form generic measure of health-related quality of life derived from the 36-item form (Ware, et al., 1994). Items are summarized into two scales (Physical Component Summary Scale, PCS; and Mental Component Summary Scale, MCS), which are designed to assess impairment in everyday functioning associated with physical and psychological problems, respectively. Lower scores indicate higher levels of impairment.

Pain-related information

Our measure of the occurrence of pain was based on the question: "In the past 3 months have you had pain that has lasted for one day or longer in any part of your body?'' (this question has been used in several epidemiological pain studies and has been found to be valid and reliable; see von Korff, Dworkin, & Le Resche, 1990). Those responding positively were asked to provide additional information about the pain and the other variables in the study.

Pain intensity

Participants were asked to provide an estimation of the average overall pain intensity in the previous week. They had to give a number between 0 and 10 where a "0" meant "no pain" and a "10" indicated "pain as bad as it could be".

Interference of pain with everyday life

The information about the interference of pain in participants' everyday life was based on a single question taken from the SF-12 (Gandek et al., 1998): "During the past week, how much did pain interfere with your normal work (including both work outside the home and housework)''. The question used has five response

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options: "not at all", "a little bit", "moderately", "quite a bit" and "extremely".

Pain cognitions

The 57-item Survey of Pain Attitudes was used to assess pain-related cognitions (SOPA; Jensen et al., 1994). The SOPA includes 7 scales that assess specific types of pain cognitions: Control (the belief that one is in control of the pain), Disability (the belief that one cannot function because of the pain), Harm (the belief that pain is a sign of damage and that activity should be avoided), Emotion (the belief that emotions influence the pain), Medication (the belief that chronic pain may be treatable with medications), Solicitude (the belief that others should be solicitous in response to one's pain behaviors), and Medical Cure (the belief that a medical cure may be available for one's pain). The range of possible answers is 0 ("This is very untrue for me") to 4 ("This is very true for me"). The SOPA has shown robust psychometric properties (Jensen et al., 1994). The Spanish version of the instrument was used (Miró, 2005).

Data analyses

Zero-order correlations, independent samples *t*-tests, and regression analyses were conducted to study the extent to which demographic characteristics (i.e., age, sex and SES), and pain ratings (i.e., overall pain intensity during the previous week) were related to the outcome variables: pain interference and psychological functioning.

We conducted two hierarchical multiple regression analyses, one for each of our primary criterion variables: that is, pain-related interference and psychological functioning. For all analyses we followed the same logic: we first entered a set of demographic variables (age, sex, and SES), then average pain intensity and, finally, in the third block, pain-related beliefs. This procedure was followed because the hypothesis was that pain-related beliefs would account for a significant proportion of the variance of the outcome measures even after controlling for demographic and pain intensity variables.

The scale scores of the SOPA were subjected to principal components analyses (PCA) to reduce the number of predictor variables in regression equations. Univariate analyses were also conducted to help explain the specific findings. PCA was chosen over other possible analyses because it maximizes variance (Tabachnik & Fidell, 1989). Varimax rotation was implemented to maximize the variance of the loadings within the components and across variables and simplify the interpretability of the underlying components (Tabachnik & Fidell, 1989). The scree test and the Kaiser criterion were used to determine the number of components (Kaiser, 1960).

RESULTS

Sample characteristics

The sample (N = 139) was predominantly female (57%) with a mean age of 75.4 (SD = 8.2). Most participants were retired (77%). In terms of occupation, most participants were in the "unqualified workers" category (25%) (see Table 1 for additional details of participants in the study).

Principal component analysis of the Survey of Pain Attitudes (SOPA)

The PCA of the SOPA scales resulted in a three-component solution which accounted for 66% of the

Table 1. *Descriptive statistics*

	Scale range	Mean (*SD*) or %
Age	65–99	81.16 (6.47)
Education		
No schooling		13.4%
Less than high School		58.2%
More than high school		28.4%
Pain location		
Head		35%
Neck		53%
Upper limbs		32%
Thoracic region		12%
Abdominal region		21%
Lower back		60%
Hips		30%
Foot		50%
Joints		62%
Lower limbs		60%
Duration in days for most bothersome pain		152.9 (160.9)
Pain Intensity (vNRS-10)	0–10	4.20 (1.10)
Psychological functioning (SF-12 MCS)	0–100	66.92 (19.02)
Pain interference scale	0–4	2.96 (2.42)
SOPA scales	0–4	
Control		2.01 (0.72)
Disability		2.03 (0.79)
Harm		2.15 (0.79)
Emotion		1.69 (0.74)
Medication		2.66 (0.81)
Solicitude		1.61 (0.79)
Medical cure		1.60 (0.61)

Note: N = 139. *vNRS-10* = verbally administered Numerical Rating Scale for pain intensity; *SF-12 MCS* = Mental Component Summary Scale; *SOPA* = Survey of Pain Attitudes.

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variance in pain beliefs scores. Eigenvalues were as follows: 2.14, 1.43, 1.08, .79, .66, .57, and .49. The scales that loaded on the first component were: Control (–.82), Disability (.74), and Harm (.77). The second component included the Medication (.81), and Medical Cure (.77) scales. Finally, the third component was formed by the Emotion (.80) and Solicitude (.74) scales. The three components were labeled as: (1) Disability and Harm Beliefs, (2) Pain as Illness Beliefs, and (3) Emotion and Solicitude Beliefs.

Associations between pain-related attitudes and psychological functioning

A regression analyses was performed to predict psychological functioning in our participants' sample. Gender, SES and age explained only 6% of the variance in the criterion (R^2 = .06, F = 2.21, p = .20). After controlling for these variables, average pain intensity accounted for an additional 8% (F = 4.36, *ns*). When the pain-related beliefs were entered in the last step of the analysis, they accounted for an additional (and statistically significant, p < .001) 16% of the variance in psychological functioning. Poorer psychological functioning was significantly associated with higher scores on the Disability and Harm Beliefs factor of the SOPA (β = .25, p < .001) (see Table 2).

Association between pain-related attitudes and pain interference

In the regression analysis predicting pain interference, gender, SES, and age explained 12% of the variance in the criterion (R^2 = .12, F = 5.12, *ns*). After controlling for these variables, average pain intensity accounted for an additional 39% (F = 69.19%, p < .001). Finally, when the pain-related beliefs were entered in the last step of the analysis, they accounted for an additional (and statistically significant, p < .001) 15% of the variance in pain interference. Greater pain interference was significantly associated with higher scores on the Disability and Harm Beliefs factor of the SOPA (β = .21, p < .001) (see Table 3).

Since we used PCA to help us in the analysis process, in order to identify unique relationships between specific pain beliefs and the outcome variables, we conducted zero-order correlations which are presented in Table 4.

Different SOPA scales were significantly related to psychological functioning: specifically, participants who held greater beliefs that one is unable to function because of pain (Disability scale), that pain is a sign of damage and that activity should be avoided (Harm scale), that others should provide assistance in response to one's pain behaviors (Solicitude scale) and that emotions influence pain (Emotion scale) were related to poorer psychological functioning. Meanwhile, those with greater beliefs that one is in control of the pain (Control scale) reported better psychological functioning. Similarly, significant relationships were observed between a number of SOPA scales and pain interference scores. In this case, participants reporting greater beliefs that one cannot function due to the pain (Disability scale), that pain is a sign of damage and that activity should be avoided (Harm scale), and that others should be solicitous in response to one's pain behaviors (Solicitude scale) showed greater pain interference, whereas those believing that one is in control of the pain (Control scale) showed lower levels of pain interference.

Conclusions

The results of this study support the postulate of the biopsychosocial model of pain which considers that

Table 2. *Multiple regression analyses predicting psychological functioning*

Step and variables	Total R^2	R^2 change	F change	Beta
1. Demographic variables	.06	.06	2.21	
Gender				.02
SES				.14
Age				.20*
2. Pain intensity	.14	.08	4.36	–.14
3. Pain-related beliefs	.30	.16	10.42**	
SOPA Factor 1				.25**
SOPA Factor 2				–.10
SOPA Factor 3				.20**

Note: *$p \leq .05$; *$p < .001$; SES = Socio-economic status; SOPA = Survey of Pain Attitudes.

Table 3. *Multiple regression analyses predicting pain interference*

Step and variables	Total R^2	R^2 change	F change	Beta
1. Demographic variables	.12	.12	5.21	
Gender				–.10
SES				.07
Age				–.06
2. Pain intensity	.51	.39	69.19**	.54**
3. Pain-related beliefs	.66	.15	10.04**	
SOPA Factor 1				.21**
SOPA Factor 2				.04
SOPA Factor 3				–.09

Note: **$p < .001$; SES = Socio-economic status; SOPA = Survey of Pain Attitudes.

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Table 4. *Zero-order correlation coefficients between scale scores of the beliefs measure (SOPA) with psychological functioning (SF-12 MCS) and pain interference scores*

Belief scores (SOPA scales)	Psychological functioning (SF-12 MCS)	Pain interference
Disability	–.27*	.41*
Harm	–.23*	.13*
Medication	–.03	.13
Medical cure	–.07	.10
Solicitude	–.24	.29*
Control	.18*	–.31*
Emotion	–.29*	.03

Note: *$p < .001$.

cognitions are important factors to explain how people experience and adjust to pain problems, long and beyond the presence or absence of underlying physiological aging processes. To the best of our knowledge, this is the first time that pain-related attitudes have been specifically studied in a sample of elder patients suffering from a wide range of chronic pain problems.

Certain beliefs seem to be more strongly related than others, which may have important implications not only for understanding how the elderly cope and adjust to their pain problems, but also for tailoring multidisciplinary treatment programs to this population. These findings are consistent with other studies that show that certain pain beliefs are related to poorer functioning and adjustment to chronic pain: for example, disability, harm, or solicitude (e.g., Hirsh et al., 2010; Jensen et al., 2007; Molton et al., 2009; Tsai, 2007).

Due to the correlational characteristics of our study, the nature of this relationship cannot be elucidated. That is, we cannot ascertain whether pain-related beliefs can influence and lead to more or less malfunction; whether this malfunction does in fact lead towards specific, less adaptive ways of thinking; or whether the observed malfunction and beliefs influence each other or reflect or are caused by other variables (e.g., a negative catastrophic attitude). However, some recent evidence suggests that changes in health beliefs and pain attitudes are associated with decreases in pain after participation in a rehabilitation program (Hurley et al., 2010). Nevertheless, additional work is needed to identify the generalizability of these findings, and how changes in pain beliefs contribute to improved functioning in elderly populations suffering from chronic pain.

Several methodological limitations of this study should be acknowledged. First, a cross-sectional research design was implemented. Longitudinal studies are needed if the nature and magnitude of these relationships are to be better understood. Also, experimental studies are fundamental to determine if changes in certain pain beliefs result in changes in the functioning of the elderly. Second, only self-report measures were implemented, so the relationships might be due to shared method variance. The use of other alternative measurement procedures in future studies would help to elucidate this issue.

Nevertheless, despite these limitations, this study helps to advance our knowledge by providing specific information on pain-related beliefs and how these beliefs are related to elderly people adjusting to chronic pain. The data presented here suggests that better psychological functioning is associated with greater belief that one is in control of the pain. Poorer psychological functioning, on the other hand, is associated with greater belief that one is unable to function because of pain, that pain is a sign of damage and that activity should be avoided, that others should provide assistance in response to one's pain behaviors, and that emotions influence pain. Lower levels of pain interference were experienced by elders who believed that one is in control of the pain; and greater pain interference was associated with greater belief that one cannot function due to the pain, that pain is a sign of damage and that activity should be avoided, and that others should be solicitous in response to one's pain behaviors.

Although further research is needed to replicate these findings, our data suggest that beliefs are important factors to understand chronic pain problems in elderly patients; pain-related beliefs have been postulated to be important contributors in the transition from acute to persistent pain problems (DeGood & Tait, 2001).

The elderly population around the world is increasing fast. Current estimations show that people over 85 are the fastest growing segment in countries like Spain, the USA and France, and the percentage of this population with chronic pain is very high. Understanding the relationship between pain-related beliefs and attitudes, and functioning and adjustment is of great interest. Thus, future studies might profitably examine and test causal relationships between pain attitudes and changes in outcomes in the elderly with chronic pain problems.

References

Casabella B., & Espinàs J. (1999). *Demencias*. [Dementias] Barcelona, Spain: Sociedad Española de Medicina de Familia y Comunitaria.

DeGood D. E., & Tait R. (2001). Assessment of pain beliefs and pain coping. In D. C. Turk, & R. Melzack (Ed.), *Handbook of pain assessment*. New York, NY: Guilford Press.

https://doi.org/10.1017/sjp.2014.103 Published online by Cambridge University Press

Domingo-Salvany A., Regidor E., Alonso J., Álvarez-Dardet C., Borrell C., Doz F., … & Rodríguez J. (2001). Una propuesta de medida de clase social. [A proposal for social class measure] *Atención Primaria*, *25*, 132–51.

Fayers P. M., Hjermstad M. J., Klepstad P., Loge J. H., Caraceni A., Hanks G. W., … & Kaasa S. (2011). The dimensionality of pain: Palliative care and chronic pain patients differ in their reports of pain intensity and pain interference. *Pain*, *152*, 1608–1620. http://dx.doi.org/10.1016/j.pain.2011.02.052

Folstein M. F., Folstein S. E., & McHugh P. R. (1975). "Mini-Mental State". A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*, *12*, 189–198.

Gandek B., Ware J. E., Aaronson N. K., Apolone G., Bjorner J. B., & Brazier J. E. (1998). Cross-validation of item selection and scoring for the SF-12 health survey in nine countries: Results from the IQOLA Project. *Journal of Clinical Epidemiology*, *51*, 1171–1178.

Helme R. D., & Gibson S. J. (2001). The epidemiology of pain in elderly people. *Clinics in Geriatric Medicine*, *17*, 417–431. http://dx.doi.org/10.1016/S0749-0690(05)70078-1

Hirsh A. T., Kupper A. E., Carter G. T., & Jensen M. P. (2010). Psychosocial factors and adjustment to pain in individuals with postpolio syndrome. *American Journal of Physical Medicine Rehabilitation*, *89*, 213–224. http://dx.doi.org/10.1097/PHM.0b013e3181c9f9a1

Hurley M. V., Walsh N., Bhavnani V., Britten N., & Stevenson F. (2010). Health beliefs before and after participation on an exercise-based rehabilitation program for chronic knee pain: Doing is believing. *BMC Musculoskeletal Disorders*, *11*, 31. http://dx.doi.org/10.1186/1471-2474-11-31

Jensen J., Counte M. A., & Glandon G. L. (1992). Elderly health beliefs, attitudes and maintenance. *Preventive Medicine*, *21*, 483–497. http://dx.doi.org/10.1016/0091-7435(92)90055-M

Jensen M. P., Kuehn C. M., Amtmann D., & Cardenas D. D. (2007). Symptom burden in persons with spinal cord injury. *Archives of Physical Medicine and Rehabilitation*, *88*, 638–645. http://dx.doi.org/10.1016/j.apmr.2007.02.002

Jensen M. P., Turner J. A., & Romano J. M. (2001). Changes in beliefs, catastrophizing and coping are associated with improvement in multidisciplinary pain treatment. *Journal of Consulting and Clinical Psychology*, *69*, 655–662. http://dx.doi.org/10.1037//0022-006X.69.4.655

Jensen M. P., Turner J. A., & Romano J. M. (2007). Changes after multidisiciplinary pain treatment in patient pain beliefs and coping are associated with concurrent changes in patient functioning. *Pain*, *131*, 38–47. http://dx.doi.org/10.1016/j.pain.2006.12.007

Jensen M. P., Turner J. A., Romano J. M., & Lawler B. K. (1994). Relationship of pain-specific beliefs to chronic pain adjustment. *Pain*, *57*, 301–309. http://dx.doi.org/10.1016/0304-3959(94)90005-1

Kaiser H. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement*, *20*, 141–151. http://dx.doi.org/10.1177/001316446002000116

Kimball P., Marshall L. A., Micich A., & Cosby G. (2010). Health beliefs related to willingness to accept treatment of pain with potentially addictive drugs. *International Journal of Pharmaceutical and Healthcare Marketing*, *4*, 9–20.

Lobo A., Saz P., Marcos G., & **Grupo ZARADEMP: MMSE**. (2002). *Examen cognoscitivo Mini-Mental* — Adaptación española. [Mini-mental Cognoscitive Exam – Spanish adaptation] Madrid, Spain: Tea Ediciones SA.

Miró J. (2005). *Catalan and Spanish versions of the Survey Pain Attitudes: Psychometric properties and characteristics*. Unitat per a l'Estudi i Tractament del Dolor – ALGOS. Tarragona, Spain: Universitat Rovira i Virgili.

Miró J., Gertz K. J. Carter G. T., & Jensen M. P. (2012). Chronic pain in neuromuscular disease: Pain site and intensity differentially impacts function. *Physical Medicine Rehabilitation Clinics of North America*, *23*, 895–902.

Miró J., Huguet A., & Jensen M. P. (2014). Pain-specific beliefs predict pain intensity and pain status in children: Usefulness of the pediatric version of the Survey of Pain Attitudes. *Pain Medicine*, *15*, 887–897.

Miró J., Huguet A., Nieto R., Paredes S., & Baos J. (2005). Evaluation of reliability, validity, and preference for a pain intensity scale for use with the elderly. *Journal of Pain*, *6*, 727–35.

Miró J., Paredes S., Rull M., Queral R., Miralles R., Nieto R., … Baos J. (2007). Pain in older adults: A prevalence study in the Mediterranean region of Catalonia. *European Journal of Pain*, *11*, 83–92.

Molton I. R., Stoelb B. L., Jensen M. P., Ehde D. M., Raichle K. A., & Cardenas D. D. (2009). Psychosocial factors and adjustment to chronic pain in spinal injury: Replication and cross-validation. *Journal of Rehabilitation Research & Development*, *46*, 31–42.

Raftery M. N., Sarma K., Murphy A. W., De la Harpe D., Normand C., & McGuire B. E. (2011). Chronic pain in the Republic of Ireland-community prevalence, psychosocial profile and predictors of pain-related disability: Results from the Prevalence, Impact and Cost of Chronic Pain (PRIME) Study. Part 1. *Pain*, *152*, 1096–1103. http://dx.doi.org/10.1016/j.pain.2011.01.019

Strong J., Ashton R., & Chant D. (1992). The measurement of attitudes towards and beliefs about pain. *Pain*, *48*, 227–236. http://dx.doi.org/10.1016/0304-3959(92)90062-G

Tabachnick B. G., & Fidell L. S. (1989): *Using multivariate statistics* (2nd Ed.). Cambridge, UK: Harper & Row.

Tsai Y. F. (2007). Gender differences in pain and depressive tendency among Chinese elders with knee osteoarthritis. *Pain*, *130*, 188–194. http://dx.doi.org/10.1016/j.pain.2007.03.014

Uthaikhup S., Sterling M., & Jull G. (2009). Psychological, cognitive and quality of life features in the elderly with chronic headache. *Gerontology*, *55*, 683–693. http://dx.doi.org/10.1159/000235655

Von Korff M., Dworkin S. F., & Le Resche L. (1990). Graded chronic pain status: And epidemiologic evaluation. *Pain*, *40*, 279–291. http://dx.doi.org/10.1016/0304-3959(90)91125-3

Ware J. E., Kosinski M., & Keller S. D. (1994). *SF-36 Physical and Mental Health Summary Scales: A user's manual*. Boston, MA: New England Medical Center (Health Institute).

Ware J. E., Kosinski M., & Keller S. D. (1996). A 12-item short-form health survey: Construction of scales and preliminary tests of reliability and validity. *Medical Care*, *34*, 220–233.

https://doi.org/10.1017/sjp.2014.103 Published online by Cambridge University Press