Prediction of Quality of life by Self-Efficacy, Pain Intensity and Pain Duration in Patient with Pain Disorders

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ABSTRACT

The quality of life (QOL) has been defined as "a person's sense of well-being that stems from satisfaction or dissatisfaction with the areas of life that are important to him/her". It is generally accepted that pain intensity and duration have a negative impact on the QOL. One specific type of control is "self-efficacy", or the belief that one has the ability to successfully engage in specific actions. The ability to adapt to pain may play an important role in maintaining the QOL. In this study, we investigated the role of self-efficacy, pain intensity, and pain duration in various domains of quality of life such as physical, psychological, social and environmental domains. In this study, 290 adult patients (146 men, 144 women) completed coping self-efficacy and the WHOQOL-BREF Questionnaire. Moreover, we illustrated numerical rating scale for pain intensity. The results were analyzed using SPSS version of 19.0 and means, descriptive correlation, and regression were calculated. Our data revealed that self-efficacy but not the pain duration could significantly anticipate the QOL and its four related domains ($P<0.001$). In addition, it is noticeable that the effect of self-efficacy on the prediction of QOL is much more obvious in the psychological domain. However, the pain intensity could predict all of the QOL domains ($P< 0.001$) except social and environmental ones. In conclusion, to predict the quality of life (QOL) in person suffering from chronic pain, self-efficacy and pain intensity are more important factors than the pain duration and demographic variables.

1. Introduction

In the last decade, the importance of patients' quality of life (QOL) in relation to return to work and psychological well-being has been recognized. It is generally accepted that chronic pain has a negative impact on quality of life (Kempen, Ormel, Brilman, & Relyveld, 1997; Schlenk et al., 1998; Stewart et al., 1989).Chronic pain has negative consequences for general health (Becker et al., 1998) and for social and psychological well-being (Gureje, Von Korff, Simon, & Gater, 1998; Lame, Peters, Vlaeyen, Kleef, & Patijn, 2005). QOL is often viewed as a multidimensional construct that encompasses several domains (e.g., health, physical functioning, psychological status, spiritual well-being, social functioning). Although several studies have documented that pain can have negative effects on QOL, (Esnaola et al., 2002; Ferrell, Grant, Padilla, Vemuri, & Rhiner, 1991; Rustoen, Moum, Padilla, Paul, & Miaskowski, 2005), But at the present time it is necessary to more investigate about the probably negative effect of pain intensity and pain duration on QOL.

On the other hand, biopsychosocial models of chronic pain hypothesize that psychological and social factors play a key role in the adjustment to chronic pain. Pain self-efficacy that is, the belief or confidence in one's ability to engage in a specific behavior or other action to achieve desired goals despite pain (Arnstein, 2000; Bandura, 1977; Geisser, Robinson, Miller, & Bade, 2003; Nicholas, 2007). It has been one of the factors

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thought to mediate the impact of pain on disability. (Arnstein, 2000; Costa Lda, Maher, McAuley, Hancock, & Smeets, 2011; Denison, Asenlof, & Lindberg, 2004; Saunders, 2004; Ferreira-Valente, Pais-Ribeiro, & Jensen, 2011) To maintain a high quality of life, participants reported that they took control of their illness and advocated for themselves. Since the self-efficacy is the person's confidence in his ability to keep functioning despite pain and Individuals with higher self-efficacy can better cope with the pain. (Asghari-Moghadam, Karami & Rezaee, 2002).Also, pain coping strategies have been shown to be associated with severity of pain well as physical and psychological functioning among patients with chronic pain. Assessment of coping strategies has received increasing attention and several measures of cognitive and behavioral coping. (Asghari-Moghadam, Golak, 2005).

Taking control and self-advocacy are consistent with self-efficacy, which refers to the perception of one's ability and capability to successfully achieve valued behavioral outcomes (Bandura, 1977). Individuals with high self-efficacy gain an increased sense of confidence in their ability to control and manage the symptoms associated with their chronic disease (Daltroy, 1993). They also demonstrate long-term adherence in managing their disease, which significantly enhances quality of life (Han, Lee, Lee, & Park, 2003; Rosenstock, 1985).

Self-efficacy appears to be a modifiable variable that can affect health status, influence mood and motivation, and maintain participation in daily routines and roles (Bodenheimer, Lorig, Holman, & Grumbach, 2002; Buck, Poole, & Mendelson, 2010; Marks, Allegrante, & Lorig, 2005).The importance of positive pain self-efficacy for successful adaptation to chronic pain is well documented and chronic pain are more affected by self-efficacy (Arnstein, 2000) (Turk & Okifuji, 2002). One study demonstrates that social, psychological and part of the physical domain of QOL did not show significant correlation with pain duration (Tjakkes, Reinders, Tenvergert, & Stegenga, 2010). On the other hand, Gutierrez et al in 2007 showed that higher levels of shoulder pain were associated with lower subjective QOL scores (Gutierrez, Thompson, Kemp, & Mulroy, 2007). Also, Women on long-term sick-leave have more difficulties in focusing attention, making decisions, and carrying out tasks, as well as reduced quality of life in the dimensions of vitality, social functioning, emotional role, and mental health (Jansen, Linder, Ekholm, & Ekholm, 2011). The purpose of this study was the role of self-efficacy, pain intensity & pain duration on quality of life in patient with pain disorder.

2. Methods

2.1. Participants

A cross-sectional study was performed in a population of the patient's clinic for Pain and Pain management of the Tehran hospitals. This population (290 adult: 146 men and 144 women) is a heterogeneous group of chronic pain patients with different localizations of pain, such as low back pain, Arthritis, Rheumatoid, Foot pain, hand pain and migraine. The age of all patients was between 18 and 65 that who were selected through stratified random sampling. All participants were paid $2 for completing the study.

2.2. Measurement

WHOQOL-BREF: Before being asked the subjects to participate and fill out quality of life (QOL) questionnaire, a formal consent was obtained from all of the participants. With some modification, world health organization (WHOQOL-BREF) was used to measure QOL in the chronic pain patients. Each question had an equal value and the QOL was quantified as the sum of the scores for all domains. The higher scores on this scale represent a better QOL.

Coping Self-Efficacy: Participants were administered a truncated 13 item version of the coping self-efficacy scale (CSE) which is an accepted modification of the original 26 item scale (16). The goal of this measure is to assess how confident or certain someone is that they can do certain behaviors when faced with life challenges. Ratings are based on an 11 point scale ranging from 0 ('cannot do at all') to 10 ('certainly can do'). The 13 items are broken up into 3 different subscales which include one's perceived ability to a) use problem focused coping ("break an unpleasant problem down into smaller parts"), b) stop unpleasant thoughts and emotions ("keep from feeling sad"), and c) get emotional support from friends and family ("get friends to help with the things you need"). Each category contains 6, 4, and 3 items respectively. A self-efficacy score is created for each of the 3 domains by adding the items in each category together. For the purpose of this study, we solely focus on a caregiver's ability to use problem-focused coping (α= .87) which has been shown to be Predictive of decreased psychological distress and an augmented sense of psychological Well-being.

Numerical rating scale: Using this scale, the health care provider asks patients to rate their pain intensity on a numerical scale that usually ranges from 0 (indicating

"No pain") to 10 (indicating "The worst pain imaginable"). In addition, an author developed demographic information questionnaire was completed by patient with chronic pain, assessing information such as pain duration, age

3. Results

3.1. Descriptive Statistics

The results were analyzed by using SPSS software version of 19.0. Consequently, correlation and regression (Linear Method) for inferential statistics and Descriptive statistics were computed for frequency patient. Basic summary statistics (e.g. mean, standard deviation, minimum, and maximum,) were calculated for each variable in Table 1 & 2.

Table 1. Frequency table by sex, age and education

	Sex		Age		Education	
	M	F	≤40	>41	Bachelor and upper	Under of bachelor
Number	146	144	102	188	97	193
Total	290		290		290	

NEUROSCIENCE

Table 2. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Self	290	13	125	64.67	22.839	.149	.143	-.027	.285
Intensity	290	1	10	5.94	1.998	-.209	.143	-.633	.285
Duration	290	1	420	67.04	66.804	2.323	.143	7.161	.285
Quality of life	290	35	126	79.84	16.739	-.415	.143	.021	.285
Physical	290	7	34	21.28	5.678	-.359	.143	-.357	.285
Psychological	290	1	31	18.30	4.778	-.398	.143	.323	.285
Social	290	3	22	9.19	3.002	.149	.143	.843	.285
Environment	290	10	40	24.90	5.613	-.324	.143	.114	.285
Valid N (listwise)	290								

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3.1. Prediction of Quality of Life from Self-Efficacy, Pain Intensity and Pain Duration in Patients with Pain Disorders

Our data revealed that pain duration could not anticipate the QOL, but self-efficacy (P<0.001) and pain intensity (P<0.001) could significantly anticipate the QOL. Forty-two percent of the variance in QOL total score was predicted by self-efficacy and pain intensity (R: 0.65 R2: 0.42 F: 69.70). The analysis indicated that high self-efficacy score could positively anticipate the QOL, but the relationship between pain intensity and QOL was negative. Accordingly, a model was formulated as a regression equation:

Y: 0.418 (Self-Efficacy) – 1.312 (Pain Intensity) + 61.397 (Fig. 1).

3.2. Prediction of Physical Aspect of QOL by Self-Efficacy, Pain Intensity and Pain Duration in Patients with Pain Disorders

Our data showed that there was an important relationship between self-efficacy (P<0.001) and pain intensity (P<0.001) but duration unable to predict physical aspect of QOL. Patients with higher levels of self-efficacy have better QOL; however, pain intensity could negatively predict this domain. Self-efficacy and pain intensity predicted 31 percent of the variance in this domain (R: 0.55 R2:0.31 F: 42.96).

Accordingly, a model was formulated as a regression equation:

Y: 0.10 (Self-Efficacy) - 0.71 (Pain Intensity) + 18.99 (Fig. 2).

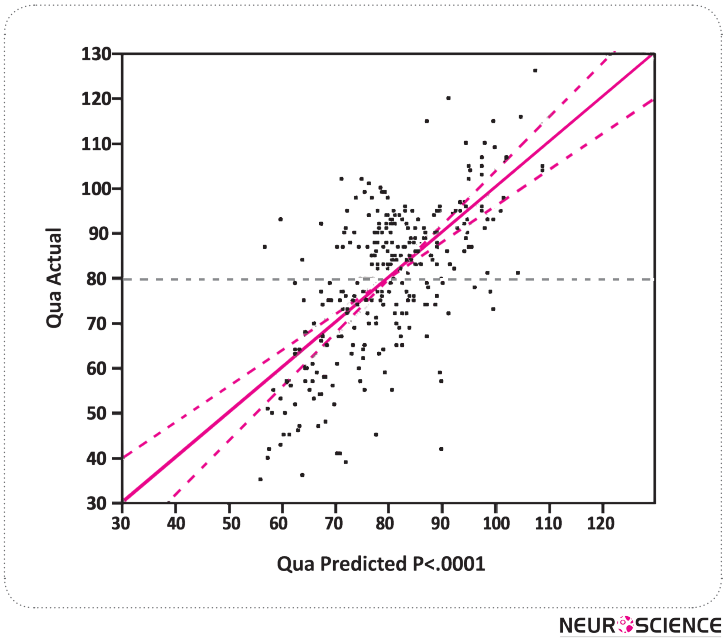

Figure 1. Prediction of quality of life from Self-Efficacy, pain intensity and pain duration in patients with pain disorders

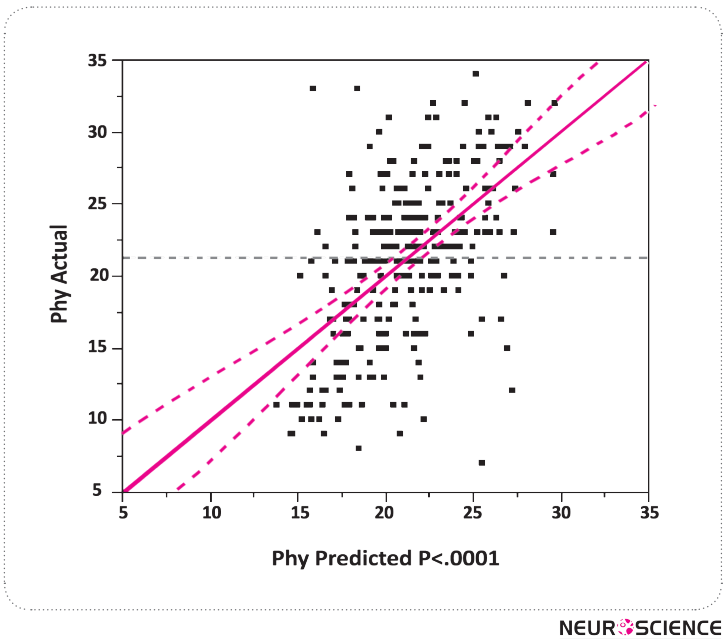

Figure 2. Prediction of physical aspect of QOL by Self-Efficacy, pain intensity and pain duration in patients with pain disorders

3.3. Prediction of Psychological Aspect of QOL by Self-Efficacy, Pain Intensity and Pain Duration in Patients with Pain Disorders

In this aim, the results showed that self-efficacy and pain intensity but not the pain duration could significantly anticipated the psychological aspect (P<0.001) (P<0.017). Self-efficacy and pain intensity predicted 38 percent of variance psychological domain (R: 0.62 R2:0.38 F: 59.84). Patients with high levels of self-efficacy have significantly higher scores on psychological aspect of quality of life subscales. In addition, it is noticeable that the effects of self-efficacy and pain intensity on the prediction of QOL are much more obvious in the psychological domain. Accordingly, a model was formulated as a regression equation:

Y: 0.16 (Self-Efficacy) - 0.28 (Pain Intensity) + 12.82 (Fig. 3).

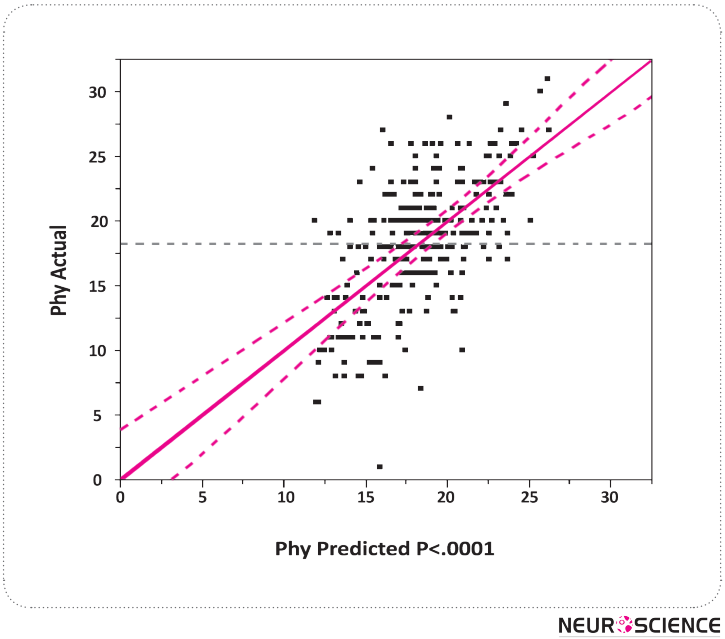

Figure 3. Prediction of psychological aspect of QOL by Self-Efficacy, pain intensity and pain duration in patients with pain disorders

3.4. Prediction of Social Aspect of QOL by Self-Efficacy, Pain Intensity and Pain Duration in Patients with Pain Disorders

Our result revealed that self-efficacy could anticipate the social aspect of quality of life (P<0.001) and pain duration and pain intensity could not significantly predicts the social domain. High levels of self-efficacy scale were predicted greater levels of social aspect of quality of life (R: 0.54 R2:0.29 F: 40.70). Accordingly, a model was formulated as a regression equation:

Y: 0.068 (Self-Efficacy) + 5.39 (Fig. 4).

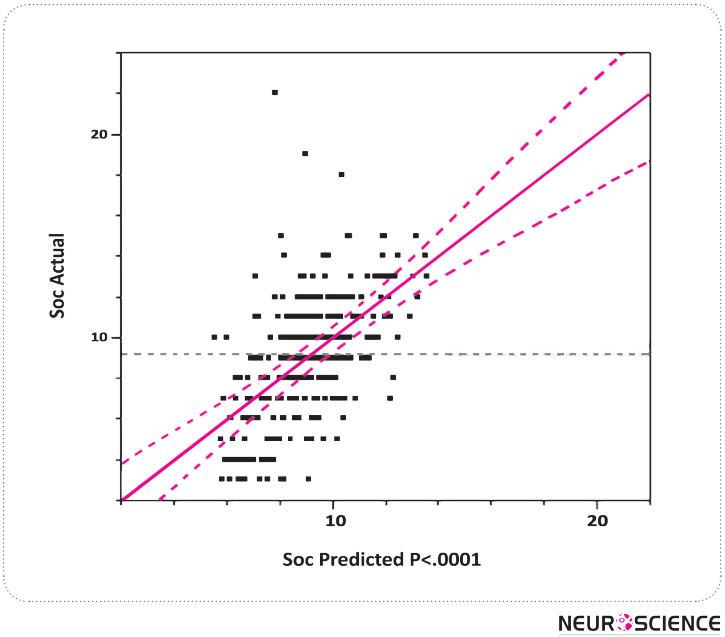

Figure 4. Prediction of social aspect of QOL by Self-Efficacy, pain intensity and pain duration in patients with pain disorders

3.5. Prediction of Environmental Aspect of QOL by Self-Efficacy, Pain Intensity and Pain Duration in Patients with Pain Disorders

Self-efficacy could significantly predict the environmental domain (P<0.001) and pain intensity and pain duration could not anticipate this domain. It is noticeable that the effect of Self-efficacy on the prediction of QOL is at a low level in the environmental domain(R: 0.43 R2:0.18 F: 21.98). Accordingly, a model was formulated as a regression equation:

Y: 0.10 (Self-efficacy) + 18.63 (Fig. 5).

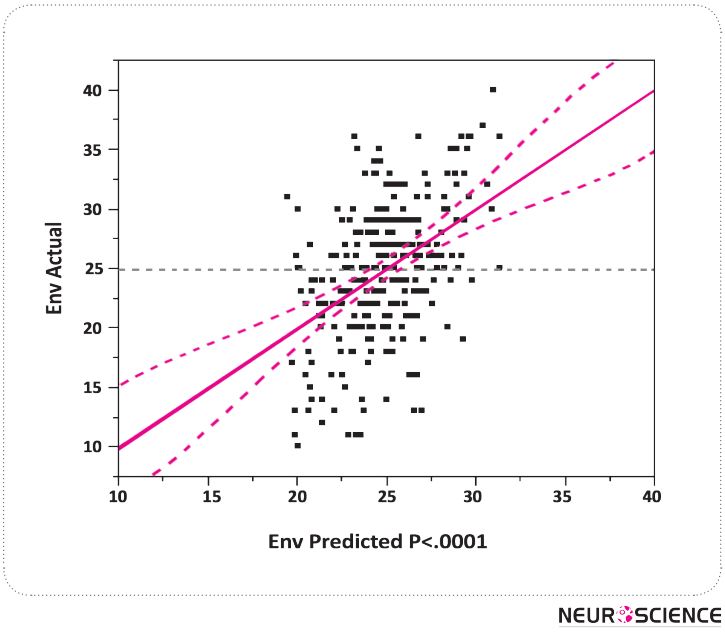

Figure 5. Prediction of environmental aspect of QOL Self-Efficacy, pain intensity and pain duration in patients with pain disorders

4. Discussion

The primary goal of this study was to examine the effects of self-efficacy, pain intensity & pain duration on quality of life in patient with pain disorder. Our results found that the significant association between self-efficacy and all of the domains of QOL. Also our data revealed that there was an important relationship between pain intensity and QOL and physical, psychological aspect of QOL, But pain duration could not anticipate the QOL and for all quality of life domains. Our findings confirmed the results of previous study, that chronic pain has negative impacts on many aspects of patient's life, including social and recreational activities as well as job and marital satisfaction (Asghari-Moghadam, 2004). While several studies show that increased self-efficacy promotes a higher sense of psychological well-being (DeWitz SJ, 2002; Yue, 1996), our current findings illustrate that increased self-efficacy can also have positive effect on prediction of high QOL. Alternatively, low self-efficacy has been shown to have a negative impact on disease management behaviors, resulting in poorer health outcomes, more pain, poorer psychological well-being, and decreased physical health status (Shifren, Park, Bennett, & Morrell, 1999). Specifically, Bandura (Bandura, 1997) conceptualizes that self-efficacy beliefs determine whether or not individuals think in self-aiding or self-debilitating ways, their emotional well-being, Therefore, self-efficacy in large part, determines whether problems appear manageable or overwhelming (Harmell et al., 2011), and it support that the Motivational Model of Pain Self-Management perceived the importance of self-efficacy for a particular pain management behavior. (Kratz, Molton, Jensen, Ehde, & Nielson, 2011).

Gutierrez et al., showed that the relationship between pain intensity and physical activity. The study indicates that persons were experiencing greater pain had lower levels of physical activity. Haghighat in 2011 provided empirical evidence supporting bio-psycho-social model and shows that psychological factors influence the per-

ception and experience of pain intensity (Haghighat, Zadhoosh, Tabatabaei, Etemadifar, 2011). Moreover evidences showed the chronic pain contributes to greater psychological distress (Ehde, Osborne, Hanley, Jensen, & Kraft, 2006; Hadjimichael, Kerns, Rizzo, Cutter, & Vollmer, 2007), health care utilization, physical disability, and reduced quality of life. (Khan & Pallant, 2007; O'Connor, Schwid, Herrmann, Markman, & Dworkin, 2008; O'Connor, et al., 2008; Thompson, 1998). Lame et al., in 2005, found that the pain intensity explains the relatively low scores on all quality of life domains (Lame, et al., 2005). In addition, the correlation between pain intensity, Health related quality of life (HRQL) and disease severity significantly reduced HRQOL(Afendy et al., 2009). In agreement with our result Lame et al., in 2005 showed that there are no significant relation between pain duration and quality of life (Lame, et al., 2005), despite in long-term disease, patients experience a considerable decrease in quality of life especially in physical and psychosocial domain, (Van Aken et al., 2005). Our findings propose the important role of self-efficacy in prediction of quality of life, and influence of pain intensity in health-related quality of life.

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References

Afendy, A., Kallman, J. B., Stepanova, M., Younoszai, Z., Aquino, R. D., Bianchi, G., Younossi, Z. M. (2009). Predictors of health-related quality of life in patients with chronic liver disease. Aliment Pharmacol Ther, 30(5), 469-476.

Arnstein, P. (2000). The mediation of disability by self efficacy in different samples of chronic pain patients. Disabil Rehabil, 22(17), 794-801.

Asghari-Moghaddam MA. (2004). The prevalence rate of chronic pain and some of its associations among the employees of a big industrial company in Tehran. Daneshvar, 1, 1-14.

Asghari-Moghadam MA, Karami A, Rezaee S. (2002). Prevalence of pain in life, chronic pain and continued with some of its characteristics. J Psychol, 1, 30-51.

Asghari-Moghadam MA, Glk N (2005). The role of pain coping strategies in coping with chronic pain. Daneshvar, 12(10), 1- 22.

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. Psychol Rev, 84(2), 191-215.

Bandura, A. (1997). Self-efficacy: The exercise of control. New York: W. H. Freeman.

Becker, N., Thomsen, A. B., Olsen, A. K., Sjogren, P., Bech, P., & Eriksen, J. (1998). Pain epidemiology and health-related quality of life in patients with chronic non-malignant pain. Ugeskr Laeger, 160(47), 6816-6819.

Bodenheimer, T., Lorig, K., Holman, H., & Grumbach, K. (2002). Patient self-management of chronic disease in primary care. JAMA, 288(19), 2469-2475.

Buck, U., Poole, J., & Mendelson, C. (2010). Factors related to self-efficacy in persons with scleroderma. Musculoskeletal Care, 8(4), 197-203.

Costa Lda, C., Maher, C. G., McAuley, J. H., Hancock, M. J., & Smeets, R. J. (2011). Self-efficacy is more important than fear of movement in mediating the relationship between pain and disability in chronic low back pain. Eur J Pain, 15(2), 213-219.

Daltroy, L. H. (1993). Doctor-patient communication in rheumatological disorders. Baillieres Clin Rheumatol, 7(2), 221-239.

Denison, E., Asenlof, P., & Lindberg, P. (2004). Self-efficacy, fear avoidance, and pain intensity as predictors of disability in subacute and chronic musculoskeletal pain patients in primary health care. Pain, 111(3), 245-252.

DeWitz SJ, W. W. (2002). Self-efficacy and college student satisfaction. Journal of Caree Assessment, 10 (15), 211-220.

Ehde, D. M., Osborne, T. L., Hanley, M. A., Jensen, M. P., & Kraft, G. H. (2006). The scope and nature of pain in persons with multiple sclerosis. Mult Scler, 12(5), 629-638.

Esnaola, N. F., Cantor, S. B., Johnson, M. L., Mirza, A. N., Miller, A. R., Curley, S. A., Skibber, J. M. (2002). Pain and quality of life after treatment in patients with locally recurrent rectal cancer. J Clin Oncol, 20(21), 4361-4367.

Ferreira-Valente, M. A., Pais-Ribeiro, J. L., & Jensen, M. P. (2011). Psychometric properties of the portuguese version of the Pain Self-Efficacy Questionnaire. Acta Reumatol Port, 36(3), 260-267.

Ferrell, B., Grant, M., Padilla, G., Vemuri, S., & Rhiner, M. (1991). The experience of pain and perceptions of quality of life: validation of a conceptual model. Hosp J, 7(3), 9-24.

Geisser, M. E., Robinson, M. E., Miller, Q. L., & Bade, S. M. (2003). Psychosocial factors and functional capacity evaluation among persons with chronic pain. J Occup Rehabil, 13(4), 259-276.

Gureje, O., Von Korff, M., Simon, G. E., & Gater, R. (1998). Persistent pain and well-being: a World Health Organization Study in Primary Care. JAMA, 280(2), 147-151.

Gutierrez, D. D., Thompson, L., Kemp, B., & Mulroy, S. J. (2007). The relationship of shoulder pain intensity to quality of life, physical activity, and community participation in persons with paraplegia. J Spinal Cord Med, 30(3), 251-255.

Hadjimichael, O., Kerns, R. D., Rizzo, M. A., Cutter, G., & Vollmer, T. (2007). Persistent pain and uncomfortable sensations in persons with multiple sclerosis. Pain, 127(1-2), 35-41.

Haghighat F., Zadhoosh S. Rasoolzade-Tabatabaei K. & Etemadifar M. (2011). The relationship between pain self-efficacy and pain intensity in multiple sclerosis patients. J Behav Sci, 5(1), 47-54.

Han, K., Lee, P., Lee, S., & Park, E. (2003). Factors influencing quality of life in people with chronic illness in Korea. J Nurs Scholarsh, 35(2), 139-144.

Harmell, A. L., Mausbach, B. T., Roepke, S. K., Moore, R. C., von Kanel, R., Patterson, T. L., Grant, I. (2011). The relationship between self-efficacy and resting blood pressure in spousal Alzheimer's caregivers. Br J Health Psychol, 16(Pt 2), 317-328.

Jansen, G. B., Linder, J., Ekholm, K. S., & Ekholm, J. (2011). Differences in symptoms, functioning, and quality of life between women on long-term sick-leave with musculoskeletal pain with and without concomitant depression. J Multidiscip Healthc, 4, 281-292.

Kempen, G. I., Ormel, J., Brilman, E. I., & Relyveld, J. (1997). Adaptive responses among Dutch elderly: the impact of eight chronic medical conditions on health-related quality of life. Am J Public Health, 87(1), 38-44.

Khan, F., & Pallant, J. (2007). Chronic pain in multiple sclerosis: prevalence, characteristics, and impact on quality of life in an Australian community cohort. J Pain, 8(8), 614-623.

Kratz, A. L., Molton, I. R., Jensen, M. P., Ehde, D. M., & Nielson, W. R. (2011). Further evaluation of the Motivational Model of Pain Self-Management: coping with chronic pain in multiple sclerosis. Ann Behav Med, 41(3), 391-400.

Lame, I. E., Peters, M. L., Vlaeyen, J. W., Kleef, M., & Patijn, J. (2005). Quality of life in chronic pain is more associated with beliefs about pain, than with pain intensity. Eur J Pain, 9(1), 15-24.

Marks, R., Allegrante, J. P., & Lorig, K. (2005). A review and synthesis of research evidence for self-efficacy-enhancing interventions for reducing chronic disability: implications for health education practice (part II). Health Promot Pract, 6(2), 148-156.

Nicholas, M. K. (2007). The pain self-efficacy questionnaire: Taking pain into account. Eur J Pain, 11(2), 153-163.

O'Connor, A. B., Schwid, S. R., Herrmann, D. N., Markman, J. D., & Dworkin, R. H. (2008). Pain associated with multiple sclerosis: systematic review and proposed classification. Pain, 137(1), 96-111.

Rosenstock, I. M. (1985). Understanding and enhancing patient compliance with diabetic regimens. Diabetes Care, 8(6), 610-616.

Rustoen, T., Moum, T., Padilla, G., Paul, S., & Miaskowski, C. (2005). Predictors of quality of life in oncology outpatients with pain from bone metastasis. J Pain Symptom Manage, 30(3), 234-242.

Saunders, D. (2004). Coping with chronic pain: what can we learn from pain self-efficacy beliefs? J Rheumatol, 31(6), 1032-1034.

Schlenk, E. A., Erlen, J. A., Dunbar-Jacob, J., McDowell, J., Engberg, S., Sereika, S. M., Bernier, M. J. (1998). Health-related quality of life in chronic disorders: a comparison across studies using the MOS SF-36. Qual Life Res, 7(1), 57-65.

Shifren, K., Park, D. C., Bennett, J. M., & Morrell, R. W. (1999). Do cognitive processes predict mental health in individuals with rheumatoid arthritis? J Behav Med, 22(6), 529-547.

Stewart, A. L., Greenfield, S., Hays, R. D., Wells, K., Rogers, W. H., Berry, S. D., . . . Ware, J. E., Jr. (1989). Functional status and well-being of patients with chronic conditions. Results from the Medical Outcomes Study. JAMA, 262(7), 907-913.

Thompson, A. J. (1998). Symptomatic treatment in multiple sclerosis. Curr Opin Neurol, 11(4), 305-309.

Tjakkes, G. H., Reinders, J. J., Tenvergert, E. M., & Stegenga, B. (2010). TMD pain: the effect on health related quality of life and the influence of pain duration. Health Qual Life Outcomes, 8, 46.

Turk, D. C., & Okifuji, A. (2002). Psychological factors in chronic pain: evolution and revolution. J Consult Clin Psychol, 70(3), 678-690.

van Aken, M. O., Pereira, A. M., Biermasz, N. R., van Thiel, S. W., Hoftijzer, H. C., Smit, J. W., Romijn, J. A. (2005). Quality of life in patients after long-term biochemical cure of Cushing's disease. J Clin Endocrinol Metab, 90(6), 3279-3286.

Yue, X. (1996). Test anxiety and self-efficacy: Levels and relationship among secondary school students in Hong Kong. J Psychol Orient, 39, 193–202.