9-2014

Fibromyalgia and Rheumatoid Arthritis: The Relationship Between Pain, Depression, and Family Health

Macey Wolfe

LOMA LINDA UNIVERSITY
School of Behavioral Health
in conjunction with the
Faculty of Graduate Studies

_____

Fibromyalgia and Rheumatoid Arthritis: The Relationship between
Pain, Depression, and Family Health

by

Macey Wolfe

_____

A Thesis submitted in partial satisfaction of
the requirements for the degree
Doctor of Philosophy in Clinical Psychology

_____

September 2014

Each person whose signature appears below certifies that this thesis in his/her opinion is adequate, in scope and quality, as a thesis for the degree Doctor of Philosophy.

_____ , Chairperson
Kendal C. Boyd, Professor of Psychology

_____
Jana K. Boyd, Associate Director, Christian Counseling Services

_____
Holly E.R. Morrell, Assistant Professor of Psychology

ACKNOWLEDGEMENTS

I would like to express my sincerest appreciation to my advisor and chairperson, Dr. Kendal Boyd, who has been my guide and mentor throughout this process. Thank you for encouraging my research endeavors and for helping me to grow as a researcher. I would also like to acknowledge my committee members, Dr. Holly Morrell and Dr. Jana Boyd. Thank you for making my defense an enjoyable experience and for all your suggestions and advice. I truly appreciate you prioritizing my thesis in your busy lives.

Special thanks to my family; I am truly grateful for the support and sacrifices on my behalf made by my husband, parents, siblings, and in-laws. Your constant encouragement has been the fuel to spur me on throughout this long process. I could not end these acknowledges without expressing my deepest appreciation to my husband, Craig, for proofreading draft after draft of this thesis. Without you bestowing your comma knowledge on me, I surely would have failed.

CONTENT

FIGURES

ABSTRACT OF THE THESIS

Fibromyalgia and Rheumatoid Arthritis: The Relationship between
Pain, Depression, and Family Health
by

Macey Wolfe

Doctor of Philosophy, Graduate Program in Psychology
Loma Linda University, September 2014
Dr. Kendal Boyd, Chairperson

Past research suggests that there is a positive relationship between pain and depression in those with fibromyalgia and rheumatoid arthritis, and negative relationship between depression and family health. However, these relationships have not been examined together using hierarchical linear modeling. Participants were 90 patients with either a fibromyalgia or rheumatoid arthritis diagnosis. A series of questionnaires were used to measure depression, pain, and family health. Using a path analysis it was determined that pain was significantly associated with depression, such that as pain increased by one standard deviation depression increased by .48 standard deviations ($\beta = .48$, $p < .05$). Depression was also significantly associated with family health as depression increased by one standard deviation, family health decreased by .23 standard deviations ($\beta = -.23$, $p < .05$). The relationship between all three of these variables, pain, depression and family health, suggests social support should be considered a target of therapy and services as soon as clients experiencing pain are seen by mental health or health professionals as a proactive attempt to stave off more negative consequences of the pain experienced in this patient group.

INTRODUCTION

Fibromyalgia syndrome (FMS) and rheumatoid arthritis (Lezak,

Howieson, Bigler, & Tranel) are both chronic pain disorders. The etiology of FMS is

poorly understood, while RA is much better understood (Mc Innes & Schett, 2011; Turk,

Okifuji, Sinclair, & Starz, 1998; Wentz, Lindberg, & Hallberg, 2004). Little research has

been conducted in the area of family health of this group of chronic pain patients, even

though both types of patients experience many symptoms that may negatively impact this

aspect of their lives (Coty & Wallston, 2010; Karlsson, Berglin, & Wallberg-Jonsson,

2006; Orellana et al., 2008; Reich, Olmsted, & Van Puymbroeck, 2006). Both pain and

elevated risk of depression is present in both patient populations (Cosci, Pennato,

Bernini, & Berrocal, 2010; Lankveld, Ruiterkamp, Näring, & Rooij, 2004; Markkula et

al., 2011; Shaver, Wilbur, Robinson, Wang, & Buntin, 2006). It has also been found in

previous research that having adequate social support is associated with higher levels of

overall functionality (Cosci et al., 2010; Nicassio & Radojevic, 1993; Preece & Sandberg,

2005; Reese, Somers, Keefe, Mosley-Williams, & Lumley, 2010). Thus, as improving

overall functionality and well-being is a major goal of health professionals who work

with these groups of chronic pain patients, and because social support is an important

aspect of functionality, an examination of the relationship between pain and depression

on family functioning could help patients improve their overall well-being.

FMS and RA are marked by pain and decreased functionality. FMS is diagnosed

using the criteria of widespread musculoskeletal pain experienced for at least three

months and tenderness at several sites across the body (Björkegren, Wallander,

1

Johansson, & Svärdsudd, 2009; Waylonis & Heck, 1992; Wentz et al., 2004; Wolfe & Hauser, 2011). There are many somatic symptoms associated with FMS that include extreme fatigue, non-refreshed sleep, stiffness, constipation, diarrhea, and concentration problems (Markkula et al., 2011; Wentz et al., 2004; Wolfe & Hauser, 2011). The combination of pain, severe fatigue and other symptoms leads to difficulty performing activities of daily life and functional impairment to the point that FMS becomes disabling (Björkegren et al., 2009; Cosci et al., 2010; Markkula et al., 2011). RA is an autoimmune disease that generally causes progressive disability. It is characterized by synovial inflammation, cartilage and bone destruction that can lead to deformity. RA is also associated with cardiovascular disease, pulmonary difficulties, psychological disorders, stroke, skin disease and infection (Mc Innes & Schett, 2011; Scott, Wolfe, & Huizinga, 2010). The prevalence of RA rises with age and people with this diagnosis experience a functional decline over time (Scott et al., 2010). Bone erosion begins quickly after the onset of the disease and the inflammation leads to fatigue and reduces cognitive functioning (Mc Innes & Schett, 2011).

Pain is a major part of the lives of both patients with RA and FMS and it is highly related to depression. FMS patients have been found to experience more pain than osteoarthritis patients and controls (Cosci et al., 2010; Reich et al., 2006). The chronic inflammation and joint deterioration causes pain and tenderness for RA patients (Scott et al., 2010) In chronic pain patients, pain intensity and depression have consistently been shown to have a positive relationship (Baker, Buchanan, Small, Hines, & Whitfield, 2011; Erbaydar & Cilingiroglu, 2010; Velly et al., 2011; W. S. Wong et al., 2011). Antidepressants are also effective in improving pain scores in chronic pain patients (Ang

2

et al., 2010). In RA patients that had two or more episodes of depression in the past reported more pain than those with less than two episodes of depression in their history (Zautra et al., 2007). Also, in RA patients there is a significant positive relationship between pain and depression (Brown, 1990; Nas et al., 2011; Wolfe & Michaud, 2009). Gormsen and associates also found a significant correlation between average pain scores and depression scores of FMS patients (Gormsen, Rosenberg, Bach, & Jensen, 2010).

In addition to often debilitating pain, depression is also a reality for both patient groups. Both FMS and RA are associated with higher levels of depression than control samples and community samples (Cosci et al., 2010; Shaver et al., 2006; Walsh, Blanchard, Kremer, & Blanchard, 1999). It has also been found that RA patients report higher levels of depression than their spouses (Lankveld et al., 2004). Depression in chronic pain patients has been found to be negatively associated with marital satisfaction, and in RA patients it has been found to be negatively associated with family functioning and sexual satisfaction (Coty & Wallston, 2010; Karlsson et al., 2006; Lankveld et al., 2004; Ramano, Turner, & Jensen, 1997). It has been consistently demonstrated that depression also has a negative relationship with social support in RA patients (Doeglas et al., 2004; Goodenow, Reisine, & Grady, 1990; Nas et al., 2011; Neugebauer & Katz, 2004). In one study, it was also found that there was a direct relationship between the number of people RA patients felt they could turn to for support and higher mental quality of life (Kojima et al., 2009). FMS patients that reported significantly less social support were more depressed when compared to those who did not report too little social support and in the same study unmarried patients had a 41% higher chance of being depressed (Fuller-Thomson, Nimigon-Young, & Brennenstuhl, 2012). It has also been

3

found in FMS patients that social support and depression have a negative relationship (Philips & Stuifbergen, 2009).

Family health and other aspects related to it (marital satisfaction, sexual dysfunction, etc.) have been found to be affected in both patient groups by symptoms and disability caused by them. In one study, it was found that 84% and 97% of patients with either RA or FMS had some kind of sexual dysfunction, (Orellana et al., 2008). In another study involving patients with RA, nearly half of the woman and more than half of the men who participated reported sexual dysfunction (El Miedany, El Gaafary, El Aroussy, Youssef, & Ahmed, 2011). FMS patients and their spouses have been found to be less satisfied with their sexual lives than controls, and relationship satisfaction has also been found to be negatively related to sexual problems in FMS patients (Kool, Woertman, Prins, Van Middendorp, & Geenen, 2006; Lankveld et al., 2004). Husbands of FMS patients report less marital satisfaction than control groups; however, their spouses reporting sufficient levels of social support was associated with higher levels of satisfaction (Steiner, Bigatti, Hernandez, Lyndon-Lam, & Johnston, 2010). In a group of RA patients, those who perceived better family functioning also reported greater well being, but negative support was associated with poorer family functioning (Coty & Wallston, 2010). Higher marital adjustment, family social support and hardiness, less psychological distress, and positive relationships have all been found to be associated with higher overall functionality in both FMS and RA patients (Cosci et al., 2010; Preece & Sandberg, 2005; Reese et al., 2010). However, higher family stress and distress was related to poorer overall functionality in FMS, and in both FMS and RA patients lack of

promotion of family activity was associated with greater disability (Nicassio & Radojevic, 1993; Preece & Sandberg, 2005).

Taken together, these findings illustrate the effect pain and depression can have on marital relationships and family health. However, thus far research has focused on one relationship at a time, rather than multiple relationships using hierarchical linear modeling. In one study, it was found that a multidisciplinary approach to treatment that included psychological treatment (in a group setting) was effective in lowering pain, anxiety and depression in FMS patients (Turk et al., 1998). If patients' home lives and support systems are negatively affected by the consequences of their diagnosis (such as depression, pain, illness uncertainty, psychological distress, etc.), it may be important to target this area of their lives with proper services to counteract the negative affects this could have on their mental health and pain management. This is especially relevent because better disease outcomes are associated with better social support (Holtzman & DeLongis, 2007; Lam, 2009).

This current study's aim is to ascertain the relationships between depression, pain and family health in patients with FMS or RA. Specifically, the hypotheses are that (1) higher levels of pain will be associated with higher levels of depression; (2) higher levels of depression will be associated with lower family health (See Figure 1).
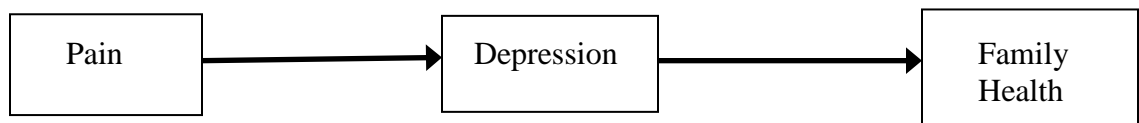

Figure 1. Path model for pain, depression and family health

5

CHAPTER TWO

METHOD

Participants

Participants are 90 adults; 52 had a FMS diagnosis (58%) and 38 had an RA diagnosis (42%). The only criteria for participation were that participants were adults who self-reported a diagnosis of FMS or RA given by a physician; no other chronic pain patients or arthritis patients were included. The participants were predominantly female (92%) and married (56%). Twenty-two percent were divorced and 11% were single or never married. Also, the majority of participants were not employed (54%), but 40% were employed at least part time. Most of the participants had attended at least some college (30%), 27% of the participants had a college degree, and 14% had high school degrees. The ages ranged from 18 to 76 (Mean = 49, SD = 12.86).

Procedure

The participants were recruited from the Loma Linda University Medical Center rheumatology clinic waiting room. The participants took part in a larger study involving coping style, religiosity and chronic pain. Patients received a questionnaire packet from the clinic receptionist, which included informed consent documents along with the various questionnaires. The participants were informed of the purpose of the study, advised that they had no obligation to participate and were given a $15 gift certificate upon return and completion of the survey. All questionnaires are kept in a locked cabinet in the Loma Linda University Psychology Department.

Family Health

Family health was measured using the *Self-report Family Inventory (SFI)* (W. R. Beavers & Hampson, 1990). This is a self-report measure of family functioning. The 36 items cover five domains: health, conflict, cohesion, emotional expressiveness and leadership. These are scored on a five-point Likert Scale. Higher scores on this inventory correspond to poorer family health and lower scores indicate better family health. This scale has been found to have good validity with a canonical correlation of .62 or higher with the Self-report Family Inventory competence score and the Beavers Interactional Competence Scale (R. Beavers & Hampson, 2000). Retest reliability is reported at .85 by Beavers and Hampson (2000). According to Beavers and Hampson (1990), the Cronbach's alphas range from .84 to .93, depending on the scale. Also, the *SFI* has a high test-retest reliability of .85 (W. R. Beavers & Hampson, 1990). In the current study, the Cronbach's alpha was calculated to be .71.

Pain

Pain intensity was measured by the *Short Form of the McGill Pain Questionnaire (SF-MPQ)* (McDonald & Weiskopf, 2001). This is a self-report scale that consists of 15 adjectives that describe pain, and participants rank these on a Likert scale with a range of 0 (none) to 3 (severe), with higher scores representing more pain. Concurrent validity of the SF-MPQ with the original MPQ has been reported as .70 in musculoskeletal pain populations (McDonald & Weiskopf, 2001). This scale has been found to have

Cronbach's alphas ranging from .72 to .85 (McDonald & Weiskopf, 2001). However, in the current study the alpha was .71.

Depression

Depression was measured using the *Center for Epidemiological Studies – Depression (CES-D)*, which is commonly used in pain research. This 20-item scale measures how often depressive symptoms have occurred in the past week. Patients choose from "Rarely to none of the time (less than 1 day)" to "Most of the time to all the time (5-7 days)." Higher scores on this scale indicate more depressive symptoms. In one sample of chronic pain patients this measure was found to have excellent predictive validity, with a sensitivity of 85% and specificity of 79% (W. S. Wong et al., 2011). The Cronbach's alpha in this sample was .75.

Statistical Analysis

A path analyses was performed using EQS version 6.1 and maximum likelihood estimation. To assess the overall fit of the model, several fit indices were examined, including the likelihood ratio chi-square with a *p*-value of greater than .05 denoting good fit. The root mean square error of approximation (RMSEA) with a value of .08 or below and a 90% CI that does not include .10 also indicates good fit. The comparative fit index (CFI) will also be examined for a value that is greater than .90, and the standardized root mean square residual (SRMR) with a value less than .10 also shows good fit.

Based on power calculations using a correlation of .40 (based on prior research) for both the path between of pain and depression and the path between depression and

8

family functioning, an alpha at .05 with 90 participants that likelihood significance to be found is 96%.

CHAPTER THREE

RESULTS

A reliability analysis was performed to improve the reliability of the SFI. Four items were removed to bring the Cronbach's alpha from .71 to .85. The items removed were: "we usually blame one person in the family when things aren't going right, family members go their own way most of the time, when things go wrong we blame each other, our family members would rather do things with other people than together." These items are all reverse coded and represent negative attributes of family life. These items do not appear to yield consistent responses from the participants and may be a poor representation of family health in this sample. Because the majority of the items are preserved, including other items addressing negative aspects, the validity of the measure is maintained.

The model was a good fit to the data, $X^2(3) = .48$, $p = .48$, CFI = 1.0, RMSEA = .00, 90% CI [.00, .245], SRMR = .03 (Figure 1). Though the RMSEA value is acceptable, the confidence interval goes beyond .10; however, the rest of the indices show good fit and thus the model is interpreted as a good fit of the data.

The first hypothesis was supported, pain was significantly associated with depression, such that as pain increased by one standard deviation depression increased by .48 standard deviations ($\beta = .48$, $p < .05$). Pain and depression accounted for 23% of the variance in family health.

The second hypothesis was also supported, that depression was significantly associated with family health as depression increased by one standard deviation, family

health decreased by .23 standard deviations ($\beta = -.23$, p < .05). The relationship between pain and family health accounted for 5% of the overall variance in family health.

The Legrange Multiplier suggested adding a direct path between pain and family functioning, creating a simple mediation model (Figure 2). This path adds complexity to the model but makes theoretical sense because a greater amount of disability is associated with lower levels of family activity (Nicassio & Radojevic, 1993). Thus, the revised model was also tested. Due to the model being just identified the path between pain and depression was constrained to the variance of this path found in the first model, .48. The second model was a good fit to the data, $X^2(3) = .10$, $p = .74$, CFI = 1.0, RMSEA = .00, 90% CI [.00, .19], SRMR = .02. However, this model did not improve the upper limit of the 90% confidence interval on the RMSEA. Additionally, the added path was not significant ($\beta = .08$, p >.05) and added very little to the explained variance. Therefore, the original model was retained.
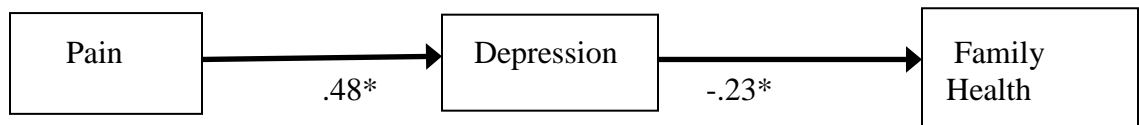

Figure 2. Path model for pain, depression and family health, * Denotes significance at .05 level, all standardized β coefficients reported.
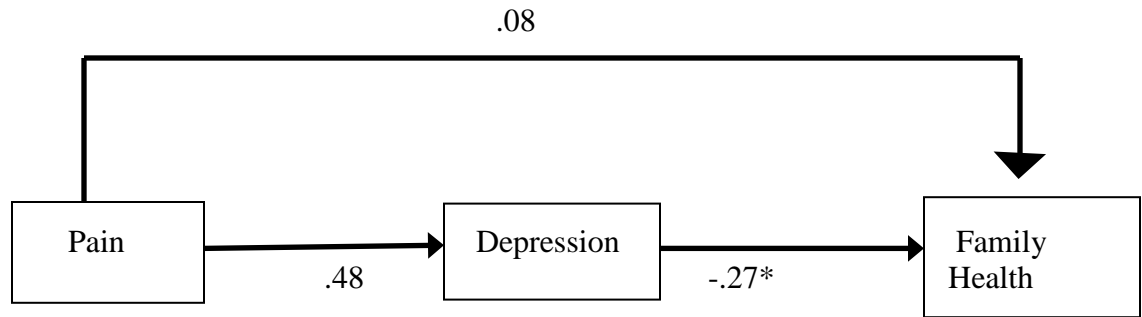
Figure 3. Path model for pain, depression and family health with added path between pain and family health, * Denotes significance at .05 level, all standardized β coefficients reported

CHAPTER FOUR

DISCUSSION

As predicted, when the level of pain in chronic pain patients increased, depressive symptoms also rose. This suggests that the more pain rheumatoid and fibromyalgia patients endure the more depressive symptoms they also experience. This has many implications for the treatment of this chronic pain group, which is known to experience higher levels of depression when compared to community and control samples (Cosci et al., 2010; Shaver et al., 2006; Walsh et al., 1999). Specifically, this may mean that mental health professionals who are working with this patient group may need to advocate for their patients to receive more pain management medications or treatment and teach them ways to cope with their pain in order to impact depression levels. On the other side of care, health care professionals seeing patients with FMS or RA should be aware that their patients experiencing higher pain are likely to experience more depressive symptoms, and thus should have resources and referral sources ready.

It was also predicted that as depressive symptoms rose family health would decrease, which was supported by the findings. These finding imply that as patients with RA and FMS experience more depressive symptoms their family functioning will likely deteriorate. Because higher family health and support are associated with many positive outcomes in this patient group such as higher well-being, higher marital adjustment, hardiness and less psychological distress, this association becomes very important (Cosci et al., 2010; Coty & Wallston, 2010; Preece & Sandberg, 2005; Reese et al., 2010). Again, this has implications for this patient group's care. Mental health professionals aware of this association have a better chance at positively affecting their client's social

13

support system as soon as signs of depression increase rather than later when the negative associations of poorer family health begin to materialize. When one considers the relationship between all three of these variables, pain, depression and family health, then social support should be considered a target of therapy and services as soon as clients experiencing pain are seen by mental health or health professionals as a proactive attempt to stave off more negative consequences of the pain experienced in this patient group.

There were several limitations of this study. First of all, the data set is archival and applying a theory to an already existing data set is not ideal, so it will be important for these findings to be replicated in a new sample. Also, as the data is cross sectional, causality cannot be inferred from the findings as it could more effectively from a longitudinal or experimental design. Additionally, this paper utilizes a very simple model, with significant variance unaccounted for, which indicates that there are likely more variables involved. From a family systems standpoint, these relationships could also be considered in the reverse, having family health as the first variable with a path to depression and pain. This is an option for further research and application.

The treatment of chronic health patients, specifically those with FMS and RA, is still developing. The relationships explored in this paper the findings should be replicated, and other possible variables explored, so that health professionals treating RA and FMS patients can be more informed, ultimately leading to better patient care.

REFERENCES

Ang, D. C., Bair, M. J., Damush, T. M., Wu, J., Tu, W., & Kroenke, K. (2010). Predictors of pain outcomes in patients with chronic musculoskeletal pain co-morbid with depression: Results from a randomized controlled trial *Pain Medicine, 11*, 482-491.

Baker, T. A., Buchanan, N. T., Small, B. J., Hines, R. D., & Whitfield, K. E. (2011). Identifying the relationship between chronic pain, depression, and life satisfaction in older African Americans *Research on Aging, 34*(4), 426-443. doi: DOI: 10.1177/0164027511403159

Beavers, R., & Hampson, R. B. (2000). The Beavers systems model of family functioning. *Journal of Family Therapy, 22*, 128-143.

Beavers, W. R., & Hampson, R. B. (1990). *Successful Families: Assessment and Intervention* New York: W. W. Norton.

Björkegren, K., Wallander, M., Johansson, S., & Svärdsudd, K. (2009). General symptom reporting in female fibromyalgia patients and referents: a population-based case-referent study. [Research Support, Non-U.S. Gov't]. *BioMedCentral Public Health 9*, 402. doi: 10.1186/1471-2458-9-402

Brown, G. K. (1990). A causal analysis of chronic pain and depression. *Journal of Abnormal Psychology, 99*(2), 127-137.

Cosci, F., Pennato, T., Bernini, O., & Berrocal, C. (2010). Psychological well-being, negative affectivity and functional impairment in fibromyaliga. *Psychotherpay and Psychosomatics, 80*, 256-259. doi: 10.1159/000322031

Coty, M., & Wallston, K. A. (2010). Problematic social support, family functioning, and subjective well-being in women with rheumatoid arthritis *Women & Health, 50*, 53-70. doi: 10.1080/03630241003601079

Doeglas, D. M., Suurmeijer, P. B., Van Der Heuvel, W. J., Krol, B., Van Rijswijk, M. H., Van Leeuwen, M. A., & Sanderman, R. (2004). Functional ability, social support, and depression in rheumatoid arthritis *Quality of Life Research, 13*, 1053-1065.

El Miedany, Y., El Gaafary, M., El Aroussy, N., Youssef, S., & Ahmed, L. (2011). Sexual dysfunction in rheumatoid arthrits patients: Arthritis and beyond. *Clinical Rheumatology*, 6. doi: 10.1007/s10067-011-1891-2

Erbaydar, N. P., & Cilingiroglu, N. (2010). Chronic pain and depression: A descriptive survey among adult primary health care centre patients. *Turkish Journal of Medical Science 40*(5), 707-714.

Fuller-Thomson, E., Nimigon-Young, J., & Brennenstuhl, S. (2012). Individuals with fibromyalgia and depression: findings from a nationally representative Canadian survey *Rheumatology International 32*, 853-862. doi: 10.1007/s00296-010-1713-x

Goodenow, C., Reisine, S. T., & Grady, K. E. (1990). Quality of social support and associated social and psychological functioning in women with rheumatoid arthritis *Health Psychology, 9*(3), 266-284.

Gormsen, L., Rosenberg, R., Bach, F. W., & Jensen, T. S. (2010). Depression, anxiety, health-related quality of life and pain in patients with chronic fibromyalgia and neuropathic pain. *European Journal of Pain, 14*, 127.e121 - 127.e128. doi: 10.1016/j.ejpain.2009.03.010

Holtzman, S., & DeLongis, A. (2007). One day at a time: The impact of daily satisfaction with spouse reponse on pain, negative affect, and catastrophizing among individuals with rheumatoid arthritis. *Pain, 131*, 202-113. doi: 10.1016/j.pain.2007.04.005

Karlsson, B., Berglin, E., & Wallberg-Jonsson, S. (2006). Life satisfaction in early rheumatoid arthritis: A prospective study *The Scandinavian Journal of Occupational Therapy, 13*, 193-199. doi: 10.1080/11038120500462337

Kojima, M., Kojima, T., Ishiguro, N., Oguchi, T., Oba, M., Hiroki, T., . . . Tokudome, S. (2009). Psychosocial factors, disease status, and quality of life in patients with rheumatoid arthritis. *Journal of Psychosomatic Research, 67*, 6. doi: 10.1016/j.jpsychores.2009.01.001

Kool, M. B., Woertman, L., Prins, M. A., Van Middendorp, H., & Geenen, R. (2006). Low relationship satisfaction and high partner involvement predict sexual problems of women with fibromyalgia. *Journal of Sex and Marital Therapy, 32*, 409-423. doi: 10.1080/00926230600835403

Lam, M. M. (2009). *Spouse depression and disease course among persons with rheumatoid arthritis (Unpublished master's thesis).* University of British Columbia, Vancouver.

Lankveld, W. V., Ruiterkamp, G., Näring, G., & Rooij, D. J. D. (2004). Marital and sexual satisfaction in patients with RA and their spouses. *Scandinavian Journal of Rheumatology, 33*(6), 405-408. doi: 10.1080/03009740410010317

Lezak, M. D., Howieson, D. B., Bigler, E. D., & Tranel, D. (2012). *Neuropsychological assessment* (5th ed.). New York: Oxford Press.

Markkula, R., Kalso, E., Huunan-Seppala, A., Koskenvuo, M., Koskenvuo, K., Leino-Arjas, P., & Kaprio, J. (2011). The burden of symptoms predicts early retirement: A twin cohort study on fibromyalgia-associated symptoms. *European Journal of Pain, 15*(741-448), 741-747. doi: 10.1016/j.ejpain.2011.01.004

Mc Innes, I. B., & Schett, G. (2011). The pathogenesis of rheumatoid arthritis. *New England Journal of Medicine 365*(23), 205-220.

McDonald, D. D., & Weiskopf, C. S. (2001). Adult patients' postoperative pain descriptions and responses to the Short-Form McGill Pain Questionnaire. *Clinical Nursing Research 10*(4), 442-454.

Nas, K., Sarac, A. J., Gur, A., Cevik, R., Altay, Z., Erdal, A., . . . Ozgocmen, S. (2011). Psychological status is associated with health related quality of life in patietns with rheumatoid arthritis. *Journal of Back and Musculoskeletal Rehabilitation, 24*, 95-100. doi: 10.3233/BMR-2011-0281

Neugebauer, A., & Katz, P. P. (2004). Impact of social support on valued activity disability and depressive symptoms in patients with rheumatoid arthritis. *Arthritis & Rheumatism, 51*(4), 586-592.

Nicassio, P. M., & Radojevic, V. (1993). Models of family functioning and their contribution to patient outcomes in chronic pain. *Motivation and Emotion, 17*(3), 295-306. doi: 10.1007/BF00992224

Orellana, C., Casado, E., Masip, M., Galisteo, C., Gratacos, J., & Larrosa, M. (2008). Sexual dysfuntion in fibromyalgia patients. *Clinical and Experimental Rheumatology, 26*, 663-666.

Philips, L. J., & Stuifbergen, A. K. (2009). Structural equation modeling of disability in women with fibromyalgia or multiple sclerosis *Western Journal of Nursing Research, 31*(1), 89-101. doi: 10.1177/0193945908328174

Preece, J. C., & Sandberg, J. G. (2005). Family resilience and the management of fibromyalgia: Implications for family therapists. *Contemporary Family Therapy, 27*(4), 559-576. doi: 10.1007/s10591-005-8242-x

Ramano, J. M., Turner, J. A., & Jensen, M. P. (1997). The family enviroment in chronic pain patients: Comparison to controls and relationship to patient functioning. *Journal of Clinical Psychology in Medical Settings, 4*(4), 383-395.

Reese, J. B., Somers, T. J., Keefe, F. J., Mosley-Williams, A., & Lumley, M. A. (2010). Pain and functioning of rheumatoid arthritis patients based on marital status: Is a distressed marriage preferable to no marriage? *The Journal of Pain, 11*(10), 258-265. doi: 10.1016/j.jpain.2010.01.003

Reich, J. W., Olmsted, M. E., & Van Puymbroeck, C. M. (2006). Illness uncertainty, partner caregiver burden and support, and relationship satisfaction in fibromyalgia and osteoarthritis patients. *Arthritis Care and Research, 55*(1), 86-93.

Scott, D. L., Wolfe, F., & Huizinga, T. W. (2010). Rheumatoid Arthritis *The Lancet, 376*, 1094-1109.

Shaver, J. L. F., Wilbur, J., Robinson, F. P., Wang, E., & Buntin, M. S. (2006). Women's health issues with fibromyalgia syndrome. *Journal of Women's Health, 15*(9), 1035-1046.

Steiner, J. L., Bigatti, S. M., Hernandez, A. M., Lyndon-Lam, J. R., & Johnston, E. L. (2010). Social support mediates the relations between role strains and marital satisfaction in husbands of patients with fibromyalgia syndrome. *Families, Systems, & Health 28*(3), 209-224. doi: 10.1037/a0020340

Turk, D. C., Okifuji, A., Sinclair, D. J., & Starz, T. W. (1998). Interdisciplinary treatment for fybromyalgia syndrome: Clinical and statistical significance *Arthritis Care and Research, 11*(3), 186-196.

Velly, A. M., Look, J. O., Carlsom, C., Lenton, P. A., Kang, W., Holcroft, C. A., & Friction, J. R. (2011). The effect of catastrophizing and depression on chronic pain - a prospective cohort study of temporomandibular muscle and joint pain disorders. *Pain, 152*, 2377-2383.

Walsh, J. D., Blanchard, E. B., Kremer, J. M., & Blanchard, C. G. (1999). The psychosocial effects of rheumatoid arthritis on the patient and the well partner *Behaviour Research and Therapy, 37*, 259-272.

Waylonis, G. W., & Heck, W. (1992). Fibromyalgia syndrome. New associations. *American Journal of Physical Medicine and Rehabilitation, 71*(6), 345-347.

Wentz, K. A., Lindberg, C., & Hallberg, L. R. (2004). Psychological functioning in women with fibromyalgia: A grounded theory study. *Health Care Women International, 25*(8), 702-729. doi: 10.1080/07399330490475575

Wolfe, F., & Hauser, W. (2011). Fibromyalgia diagnosis and diagnostic criteria. *Annals of Medicine 43*(7), 495-502. doi: 10.3109/07853890.2011.595734

Wolfe, F., & Michaud, K. (2009). Predicting depression in rheumatoid arthritis: The signal importance of pain extent and fatigue, and comorbidity *Arthritis & Rheumatism 61*(5), 667-673. doi: 10.1002/art.24428

Wong, W. S., Chen, P. P., Yap, J., Mak, K. H., Tam, B. H., & Fielding, R. (2011). Assessing depression in patients with chronic pain: A comparison of three rating scales. *Journal of Affective Disorders, 133*, 179-187. doi: 10.1016/j.jad.2011.04.012

Wong, W. S., Chen, P. P., Yap, J., Mak, K. H., Tam, B. H., & Fielding, R. (2011). Chronic pain and psychiatric morbidity: A comparison between patients attending a specialist orthopedics clinic and multidisciplinary pain clinic. *Pain Medicine, 12*, 246-259.

Zautra, A. J., Parrish, B. P., Van Puymbroeck, C. M., Tennen, H., Davis, M. C., Reich, J. W., & Irwin, M. (2007). Depression history, stress, and pain in rheumatoid arthritis patients. *Journal of Behavioral Medicine, 30*, 187-197. doi: 10.1007/s10865-007-9097-4