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Fibromyalgia Impact and Depression: Can Perceiving a Silver Lining Make a Difference?

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Abstract

Individuals with fibromyalgia are at greater risk for depression than the general population, and this may be partially attributable to physical symptoms that impair day-to-day functioning. However, individual-level protective characteristics may buffer risk for psychopathology. For instance, the ability to perceive a "silver lining" in one's illness may be related to better mental and physical health. We examined perceived silver lining as a potential moderator of the relation between fibromyalgia impact and depressive symptoms. Our sample of persons with fibromyalgia (N = 401) completed self-report measures including the Fibromyalgia Impact Questionnaire-Revised, Depression Anxiety Stress Scales, and the Silver Lining Questionnaire. Moderation analyses covaried age, sex, and ethnicity. Supporting hypotheses, increasing impact of disease was related to greater depression, and perceptions of a silver lining attenuated that association. Despite the impairment-depression linkage, identifying positive aspects or outcomes of illness may reduce risk for psychopathology. Therapeutically promoting perception of a silver lining, perhaps via signature strengths exercises or a blessings journal, and encouraging cognitive reframing of the illness experience, perhaps via Motivational Interviewing or Cognitive Behavioral Therapy, may reduce depression risk in persons with fibromyalgia.

Keywords: fibromyalgia, depression, adversarial growth, silver lining, coping

Fibromyalgia Impact and Depression: Can Perceiving a Silver Lining Make a Difference?

Chronic health conditions, including fibromyalgia, are often associated with poor mental health outcomes, as disease impact on daily living may contribute to the development and maintenance of disruptions to affect and mood (Chapman, Perry, & Strine, 2005). Fibromyalgia is a chronic pain condition, affecting an estimated 2.7% of the population worldwide (Queiroz, 2013). There are sex differences in prevalence rates; fibromyalgia is seven times more common in women (Hawkins, 2013), affecting 3.4% of women versus 0.5% of men in the general population (Haviland, Banta, & Przekop, 2011). Fibromyalgia is characterized by widespread pain and fatigue, feelings of stiffness, tingling, or numbness, and headaches, as well as sleep disturbances and neurocognitive impairments (Clauw, 2009; Giacomelli et al., 2013). The etiology of fibromyalgia is unknown, with genetic, hormonal, immune, and central nervous system disturbances proposed as possible pathophysiological mechanisms underlying disease development (Bellato et al., 2012).

Of concern in persons with fibromyalgia is their increased risk for disturbances of mood, specifically symptoms of depression. Individuals with fibromyalgia are three times more likely to experience depressive symptoms than the general population (Patten et al., 2005), with 90% of patients displaying depressive symptoms and 62% receiving a diagnosis of major depression over the course of their illness (Gracely, Ceko, & Bushnell, 2012). Risk for depression may be due, in part, to the deleterious impact of physical symptoms on activities of daily living (Arnold et al., 2008), as chronically-ill individuals who perceive a higher impact of disease (i.e., greater perceived negative effect on daily activities and overall quality of life) are more likely to exhibit depressive symptoms (Goldenberg, 2008).

However, not all persons with a chronic illness develop depression, perhaps due to the presence of individual-level protective characteristics that buffer risk. Research in the field of positive psychology indicates that positive reframing and positive emotions, including positive outlook related to chronic illness, are related to fewer depressive symptoms (Hu & Gruber, 2008; Lambert, Fincham, & Stillman, 2011; Sirois & Wood, 2017). For instance, the ability to perceive a "silver lining" in one's illness is related to better mental and physical health outcomes (McBride, Dunwoody, Lowe-Strong, & Kennedy, 2008). "Silver lining" refers to the ability to perceive benefit after experiencing a stressful life event, in this case chronic illness, and a silver lining instrument specifically assesses "the extent to which people believe their illness has had a positive benefit despite the negative consequences of being ill" (Sodergren & Hyland, 1997, p. 7). The presence of a silver lining can be conceptualized as a positive transformational process, such as that sometimes observed in posttraumatic growth, resulting in psychological benefits such as greater appreciation for life, increased spirituality and religiousness, improved interpersonal relationships, and positive self-changes (McBride et al., 2008).

The ability to perceive a silver lining is a protective factor in chronic illnesses such as multiple sclerosis, cancer, and cardiac and renal diseases (Ackroyd et al., 2011; McBride et al., 2008; McBride, Schroevers, & Ranchor, 2009), but has not been examined in persons with fibromyalgia. At the bivariate level, we hypothesized that fibromyalgia impact would be positively related to depressive symptoms, and that silver living would be negatively related to all variables. At the multivariate level, we hypothesized that individuals reporting a greater level of disease impact from fibromyalgia would report more depressive symptoms, and that silver lining would moderate this association, such that the relation between fibromyalgia impact and

depressive symptoms would be weaker for those who acknowledged a silver lining to their illness.

Methods

Participants

In our university Institutional Review Board approved study, all participants provided informed consent, completed survey materials online via a secure server, and were not compensated for their participation. Our sample of persons with fibromyalgia (*N*=508) were recruited via invitations to state, regional, and national organizations and support groups. Our sample was predominantly female (95.7%; *n*= 401), with a mean age of 47.72 (*SD* = 13.14). The majority of participants identified as White (91.8%; *n* = 383), 3.1% identified as Black (*n* = 13), 2.6% as Multiracial (*n* = 11), 1.4% as Asian (*n* = 6), .2% as Native Hawaiian/Pacific Islander (*n* = 1), and .7% reported they did not know their race/ethnicity (*n* = 3). A majority of participants were married (57.7%; *n* = 239), 20% were single and never married (*n* = 83), 17.4% were divorced (*n* = 72), 2.9% were widowed (*n* = 12), and 1.9% were separated (*n* = 8). In terms of education level, the majority of our sample earned a GED/H.S. diploma (36.6%; *n* = 140). 25.3% a bachelor's degree (*n* = 97), 22.7% an associate's degree (*n* = 87), 13.8% a master's degree (*n* = 53), and 1.6% a doctorate or post doctorate degree (*n* = 6). Not all participants responded to each demographic question.

Materials

Fibromyalgia Impact. Participants completed the Fibromyalgia Impact Questionnaire-Revised (FIQR; Bennett et al., 2009), a 21-item questionnaire which assesses the current health status of individuals with fibromyalgia across a variety of domains related to disease impact including physical function, work impact, mood symptoms, pain, fatigue, and well-being.

Participants respond to items focused on disease impact over the past seven days, with each item scored on a variable Likert scale which ranges from 5 to 11, depending on the item. Sample items include "Fibromyalgia prevented me from accomplishing goals for the week," on an 11-point scale from "never" to "always," and "Please rate your level of pain," on an 11-point scale from "no pain" to "unbearable pain." The FIQR yields an overall score, ranging from 0 to 100, with a higher score representing greater disease impact. Among clinical samples, the internal consistency of the scale is excellent (α = .95; Bennett et al., 2009), as in the current study (α = .92).

Depressive Symptoms. Participants completed the Depression, Anxiety, and Stress Scale (DASS-21; Lovibond & Lovibond, 1995), and we utilized the depression subscale. The DASS is a 21-item questionnaire which assesses the severity of symptoms across three subscales related to negative mood (i.e., depression, anxiety, and stress). Using a 4-point Likert scale ranging from 0 ("did not apply to me at all") to 3 ("applied to me most of the time"), participants indicate the presence of symptoms over the past week. Samples of the seven items on the depression subscale include "I couldn't seem to experience any positive feeling at all" and "I felt that I had nothing to look forward to." Total scores on this subscale range from 0 to 42 (with scores multiplied by 2 for comparison with the DASS-42; Parkitny & McAuley, 2010). Among samples of individuals with fibromyalgia and chronic pain, the internal consistency of the depression subscale is excellent (α = .90) (Alok, Das, Agarwal, Salwahan, & Srivastava, 2011; Wood, Nicholas, Blyth, Asghari, & Gibson 2010), as it was in our study (α =.92).

Adversarial Growth in Illness. Participants completed the Silver Lining Questionnaire (SLQ-38; McBride et al., 2008), a 38-item questionnaire which measures an individual's perception of the positive side of their illness across five subscales: improved relationships,

increased life appreciation, positive impact on others, increased inner strength, and changes in life philosophy. Items are measured on a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree") and include statements such as "My illness made me think about the true purpose of life" and "My illness made me a better person." In clinical samples, the internal consistency of the measure is excellent (α = .93) (Sodergren, Hyland, Singh, & Sewell, 2002), as it was in our study (α = .96).

Analyses

All analyses were conducted using SPSS Version 25. Pearson's product-moment correlation coefficient analysis was used to determine the bivariate association between study variables. In addition, perception of silver lining was examined as a potential moderator of the relation between fibromyalgia impact and depressive symptoms. Covariates, and the independent variable (fibromyalgia impact) and moderator (silver lining), were entered on the first step of our model, and their interaction on the second step.

Results

At the bivariate level, supporting hypotheses, fibromyalgia impact was positively related to depressive symptoms ($r = .51$, $p < .01$), and perception of silver lining was negatively associated with fibromyalgia impact ($r = -.14$, $p < .05$) and depression ($r = -.37$, $p < .01$; see Table 1).

At the multivariate level, hypotheses were also supported. In Step One of our model containing fibromyalgia impact and silver lining, with depressive symptoms as an outcome, there was a significant main effect for fibromyalgia impact ($b = .17$, $SE = .02$, $p < .001$, *95% CI* = .14 to .20) as well as silver lining ($b = -.06$, $SE = .01$, $p < .001$, *95% CI* = -.08 to -.04), explaining approximately 39% of the variance in depressive symptoms ($R^2 = .39$, $p < .001$). When the

interaction term between fibromyalgia impact and silver lining was added to the model, on Step Two, there was a significant effect (b = -.002, SE = .001, p = .001, *95% CI* = -.003 to -.001), and a significant increase in the variance of depressive symptoms explained, ΔR^2 = .02, $F(1, 288)$ = 10.32, $p < .001$, indicating moderation.

Discussion

We examined the association between disease impact and depressive symptoms in a sample of persons with fibromyalgia. Consistent with bivariate hypotheses, fibromyalgia impact and depressive symptoms were positively related, and both variables were significantly negatively related to perceived silver lining. Supporting multivariate hypotheses, perceived silver lining significantly moderated the relation between fibromyalgia impact and depressive symptoms; that is, ability to perceive a silver lining weakened the association between fibromyalgia-related functional impairment and depressive symptoms.

Our findings support the extant literature regarding the association of fibromyalgia-related symptoms and functional impairment, with depressive symptoms (Gracely et al., 2012; Patten et al., 2005). We expand upon previous findings, by showing that perceptions of a silver lining act as a protective buffer against psychopathology in the context of chronic illness. The ability to engage in positive reframing, and to identify positive aspects of illness, may result in adversarial growth that beneficially affects the perception of illness and impairment and reduces consequent disturbances to mood (Ackroyd et al., 2011; McBride et al., 2008; McBride et al., 2009).

A “silver lining” can manifest in many ways in the context of chronic illness. Individuals may demonstrate appreciation for an act of kindness or life in general, with a desire to show beneficence in return (Polak & McCullough, 2006). For example, in a sample of individuals with

neuromuscular disorders, higher gratitude was associated with greater positive affect and optimism, improved exercise and sleep quality, and fewer physical complaints (Emmons & McCullough, 2003). Relatedly, greater appreciation for tangible social support (e.g., transportation to appointments) may lead to a deepening of existing relationships (Bower et al., 2008; Burg & Revenson, 2005). In a sample of persons living with orthopedic and rheumatic disorders, 71.3% reported interpersonal benefits resulting from their illness, including improved relations with distal others and a sense of meaning derived from educating others about their condition (Danoff-Burg & Revenson, 2005) which, in turn, contributed to enhanced physical well-being and less distress. Further evidence for the beneficial impact of appreciation and gratefulness can be found in a longitudinal study of persons with inflammatory bowel disease and arthritis. Specifically, gratitude emerged as a unique predictor of lower depressive symptoms at a six-month follow-up, after controlling for other positive psychological (e.g., thriving) and disease variables (e.g., time since diagnosis; Sirois & Wood, 2017).

A change in life philosophy, from maladaptive to adaptive, has also been associated with better adjustment among individuals with a chronic illness. When individuals experience an undesirable life event that is inconsistent with expectations or assumptions about the world (e.g., world as benevolent) or the self (e.g., personal control), cognitive processing aimed at reducing these inconsistencies may be initiated, necessitating reinterpretation of the event or accommodation of one's worldview following the event (Davis & Morgan, 2008). Appraisal of illness or other stressors, including its meaning and significance, may lead to specific negative emotions (e.g., depressive symptoms) (Troy, Wilhelm, Shallcross, & Mauss, 2010), therefore positive reinterpretations provide an opportunity for personal growth (Büssing, Ostermann, Neugebauer, & Heusser, 2010).

If individuals seek out benefits associated with their illness, they may experience increased value and enjoyment in daily activities, increasingly engage in positive health-related behaviors (e.g., diet, exercise), view stressors from a realistic perspective, and endorse fewer worries about minor hassles (Bower, Low, Moskowitz, Sepah, & Epel, 2008). Positive outcomes associated with an adaptive, yet illness-based change in life perspective / world-view have been demonstrated in many clinical samples (Büssing et al., 2010; Stanton, Revenson, & Tennen, 2007). Among individuals living with spine-associated pain syndromes (e.g., fibromyalgia, arthritis), a positive reinterpretation of illness was associated with a renewed desire to fulfill past dreams and wishes, greater consciousness about health, and improved life satisfaction. Similarly, in patients with rheumatoid arthritis, those able to find benefit from their illness experienced less pain and fatigue (Danoff-Burg & Revenson, 2006).

Finally, perception of a silver lining may involve the development of inner strength, comprised of a sense of connectedness, life purpose, self-transcendence, and hardiness (Boman, Gustafson, Häggblom, Fischer, & Nygren, 2015). Inner strength has been linked to fewer depressive symptoms (Boman et al., 2015); among older adults, connectedness has been shown to buffer against the development of negative feelings related to one's inability to fulfill expected social roles as a consequence of aging or poor health problems (Ashida & Heaney, 2008; Person, Bartholomew, Addiss, & van den Borne, 2007). Also, the ability to find a new life purpose may promote better adjustment. In the context of chronic illness, the adoption of new life goals, in congruence with one's physical abilities, may reduce risk for depressive symptoms and promote a more adaptive view of the self and one's illness (Roussi & Evrinomy, 2008; Stanton et al., 2007). Self-transcendence, which refers to a developmental process through which individuals experience spiritual growth and maturity, has also been linked to higher quality of life. For

example, among liver transplant recipients, an identification of the meaning in life and death as well as a perceived connectedness with God, nature, and others, was associated with improved physical health and less illness-related distress (Bean & Wagner, 2006). Hardiness, the final component of inner strength, involves the belief that one can *control* events, the ability to feel deeply *committed* to activities of life, and the anticipation of change as a *challenge* rather than a threat (Brooks, 2008). Hardiness has been linked to physical and psychological adjustment across multiple clinical samples (Pollock, 1999). In sum, the development of an inner strength may be yet another way in which individuals who perceive a silver lining do better in the management of their chronic illness.

To date, there is limited research on the construct of "silver lining," particularly regarding mental and physical health and well-being, or in a fibromyalgia sample. We found that silver lining, or identifying a positive aspect of illness, is related to fewer depressive symptoms in the context of perceived functional impairment resulting from chronic illness. Perception of a silver lining, which may involve a greater appreciation for life, changes in life philosophy, improved relationships, and development of an inner strength, may buffer against psychopathology in persons with fibromyalgia. To the extent that individuals can perceive a silver lining, the link between physical impairment and depressive symptoms may be weakened and, in turn, better health outcomes may be possible.

Limitations

Our findings must be considered within the context of our limitations. Although our sample is representative of the fibromyalgia population in terms of sex and age (Bartels et al., 2009), it lacked ethnic diversity, thereby limiting generalizability to other sociocultural groups.

As well, our use of cross-sectional data precludes examination of causality. Future prospective, longitudinal research, with diverse samples, is needed to substantiate our findings.

Implications

Despite limitations, our findings may have clinical implications. Therapeutic interventions aimed at increasing one's ability to perceive a "silver lining," such as identifying one's signature strengths or keeping a blessings journal may help to alleviate perceptions of functional impairment and reduce risk for the development of depressive symptoms (Seligman & Steen, 2005). Expressive writing, keeping a diary of positive and negative thoughts about one's illness, and identifying "three doors" that have been opened and closed due to one's illness, may help promote benefit-finding and a more adaptive view of the illness experience (Danoff-Burg, Agee, Romanoff, Kremer, & Strosberg, 2006; Farrugia & Fetter, 2009; Groarke, Curtis, & Kerin, 2012). Additionally, Acceptance and Commitment Therapy (ACT) may help individuals adjust their behaviors in a way that is consistent with newly developed life goals and values (Sturgeon, 2014).

Therapeutically addressing perceptions of impairment, as well as beliefs and values related to one's illness, may also reduce risk for depressive symptoms. Among persons with fibromyalgia, Motivational Interviewing (MI) (Anderson, 2007) has been used to increase participation in regular physical activity, and participants report decreases in physical (e.g., pain) and mental symptoms (e.g., anxiety, depression) (Jones, Burckhardt, & Bennett, 2004). Strategies from Cognitive Behavioral Therapy (CBT), including identification of maladaptive illness-related beliefs and behavioral activation (e.g., activity scheduling) (Butler, Chapman, Forman, & Beck, 2006; Farrugia & Fetter, 2009), have also been shown to increase physical (Williams et al., 2002) and mental (Groarke et al., 2012) health in the fibromyalgia population.

Taken together, such health promotion strategies may help to lessen perceived impact of disease and illness-related depressive symptoms (Nash, Ponto, Townsend, Nelson, & Bretz, 2013).

Conclusion

Individuals living with fibromyalgia experience numerous physical and mental health difficulties, including disruption of daily activities, contributing to low mood. In our sample of persons with fibromyalgia, the ability to perceive a silver lining buffered the association between fibromyalgia impact and depressive symptoms. Future research is needed to establish generalizability of our findings to diverse samples, and to confirm, prospectively, the beneficial impact of "silver lining" on health-related quality of life over the illness trajectory. Therapeutic techniques such as MI, CBT, or activities to promote sense of a silver lining, may contribute to beneficial outcomes in persons with fibromyalgia.

Geolocation Information

This research study was conducted in Johnson City, Tennessee, situated in the Appalachian region of the southeastern United States. Participants in the study were recruited from across the United States.

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Conflict of Interest

The authors report no affiliations or involvement, financial or otherwise, with any organization or entity in the subject matter of this research study.

References

American Psychiatric Association (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Washington, DC: Author.

Ackroyd, K., Fortune, D. G., Price, S., Howell, S., Sharrack, B., & Isaac, C. L. (2011). Adversarial growth in patients with multiple sclerosis and their partners: Relationships with illness perceptions, disability and distress. *Journal of Clinical Psychology in Medical Settings, 18*(4), 372-379. doi: 10.1007/s10880-011-9265-0

Alok, R., Das, S. K., Agarwal, G. G., Salwahan, L., & Srivastava, R. (2011). Relationship of severity of depression, anxiety and stress with severity of fibromyalgia. *Clinical and Experimental Rheumatology, 29*(6), 70-72.

Anderson, B. (2007). Collaborative care and motivational interviewing: Improving depression outcomes through patient empowerment interventions. *American Journal of Managed Care, 13*(4), 103-106.

Arnold, L. M., Crofford, L. J., Mease, P. J., Burgess, S. M., Palmer, S. C., Abetz, L. & Martin, S. A. (2008). Patient perspectives on the impact of fibromyalgia. *Patient Education and Counseling, 73*(1), 114-120. doi: 10.1016/j.pec.2008.06.005

Ashida, S., & Heaney, C.A. (2008). Differential associations of social support and social connectedness with structural features of social networks and the health status of older adults. *Journal of Aging and Health, 20*(7), 872-893. doi: 10.1177/0898264308324626

Bean, K.B., & Wagner, K. (2006). Self-transcendence, illness distress, and quality of life among liver transplant recipients. *The Journal of Theory Construction & Testing, 10*(2), 47-53.

Bellato, E., Marini, E., Castoldi, F., Barbasetti, N., Mattei, L., Bonasia, D. E., & Blonna, D.

(2012). Fibromyalgia syndrome: Etiology, pathogenesis, diagnosis, and treatment. *Pain Research and Treatment*, 1-17. doi: 10.1155/2012/426130

Bennett, R. M., Friend, R., Jones, K. D., Ward, R., Han, B. K., & Ross, R. L. (2009). The Revised Fibromyalgia Impact Questionnaire (FIQR): Validation and psychometric properties. *Arthritis Research and Therapy, 11*(5), 415. doi: 10.1186/ar2830

Boman, E., Gustafson, Y., Häggblom, A., Fischer, R.S., Nygren, B. (2015). Inner strength – associated with reduced prevalence of depression among older women. *Aging and Mental Health, 19*(12), 1078-1083. doi:10.1080/13607863.2014.977775

Bower, J.E., Low, C.A., Moskowitz, J.T., Sepah, S., & Epel, E. (2008). Benefit finding and physical health: Positive psychological changes and enhanced allostasis. *Social and Personality Psychology Compass, 2*(1), 223-244. doi: 10.1111/j.17519004.2007.00038.x.

Brooks, M.V. (2008). Health-related hardiness in individuals with chronic illnesses. *Clinical Nursing Research, 17*(2), 98-117. doi: 10.1177/1054773808316736

Büssing, A., Ostermann, T., Neugebauer, E.A.M., & Heusser, P. (2010). Adaptive coping strategies in patients with chronic pain conditions and their interpretation of disease. *BMC Public Health, 10*(507). doi: 10.1186/1471-2458-10-507.

Butler, A. C., Chapman, J. E., Forman, E. M., & Beck, A. T. (2006). The empirical status of cognitive-behavioral therapy: A review of meta-analyses. *Clinical Psychology Review, 26*(1), 17-31. doi: 10.1016/j.cpr.2005.07.003

Chapman, D. P., Perry, G. S., & Strine, T. W. (2005). The vital link between chronic disease and depressive disorders. *Preventing Chronic Disease, 2*(1), 1-10.

Clauw, D. J. (2009). Fibromyalgia: An overview. *The American Journal of Medicine, 122*(12), 3-13. doi: 10.1016/j.amjmed.2009.09.006

Danoff-Burg, S., Agee, J.D., Romanoff, N.R., Kremer, J.M., & Strosberg, J.M. (2006). Benefit finding and expressive writing in adults with lupus or rheumatoid arthritis. *Psychology and Health, 21*(5), 651-665. doi: 10.1080/14768320500456996

Danoff-Burg, S., & Revenson, T.A. (2005). Benefit-finding among patients with rheumatoid arthritis: Positive effects on interpersonal relationships. *Journal of Behavioral Medicine, 28*(1), 91-103. doi: 10.1007/s10865-005-2720-3

Davis, C.G., & Morgan, M.S. (2008). Finding meaning, perceiving growth, and acceptance of tinnitus. *Rehabilitation Psychology, 53*(2), 128-138. doi: 10.1037/0090-5550.53.2.128

Emmons, R.A., & McCullough, M.E. (2003). Counting blessings versus burdens: An experimental investigation of gratitude and subjective well-being in daily life. *Journal of Personality and Social Psychology, 84*(2), 377-389. doi: 10.1037/0022-3514.84.2.37

Giacomelli, C., Sernissi, F., Sarzi-Puttini, P., Di Franco, M., Atzeni, F., & Bazzichi, L. (2013). Fibromyalgia: A critical digest of the recent literature. *Clinical and Experimental Rheumatology, 31*(6), 153-157.

Goldenberg, D.L. (2008). Understanding fibromyalgia and its related disorders. *Primary Care Companion to the Journal of Clinical Psychiatry, 10*(2), 133-144.

Gracely, R. H., Ceko, M., & Bushnell, M. C. (2012). Fibromyalgia and depression. *Pain Research and Treatment*, doi: 10.1155/2012/486590

Groarke, A., Curtis, R., & Kerin, M. (2012). Cognitive-behavioural stress management enhances adjustment in women with breast cancer. *British Journal of Health Psychology, 18*(3), 623-641. doi: 0.1111/bjhp.12009

Haviland, M.G., Banta, J.E., & Przekop, P. (2011). Fibromyalgia: Prevalence, course, and co-morbidities in hospitalised patients in the United States, 1999-2007. *Clinical and Experimental Rheumatology, 29*(6, Suppl. 69), S79-87.

Hawkins, R.A. (2013). Fibromyalgia: A clinical update. *The Journal of the American Osteopathic Association, 113*(9), 680-689. doi:10.7556/jaoa.2013.034

Hayes, A.F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach.* New York, NY: Guilford Press.

Hu, J., & Gruber, K.J. (2008). Positive and negative affect and health functioning indicators among older adults with chronic illnesses. *Issues in Mental Health Nursing, 29*(8), 895-911. doi: 10.1080/01612840802182938

Lambert, N. M., Fincham, F. D., & Stillman, T. F. (2011). Gratitude and depressive symptoms: The role of positive reframing and positive emotion. *Cognition and Emotion, 26*(4), 615-633. doi: 10.1080/02699931.2011.595393

Layous, K., Chancellor, J., & Lyubomirsky, S. (2014). Positive activities as protective factorsagainst mental health conditions. *Journal of Abnormal Psychology*, *123,* 3-12. doi:10.1037/a0034709

Lovibond, S.H. & Lovibond, P.F. (1995). *Manual for the Depression Anxiety Stress Scales. (*2nd. Ed*.)* Sydney: Psychology Foundation.

McBride, O. M., Dunwoody, L., Lowe-Strong, A., & Kennedy, S. M. (2008). Examining adversarial growth in illness: The factor structure of the Silver Lining Questionnaire (SLQ-38). *Psychology and Health, 23*(6), 661-678. doi: 10.1080/14768320701356540

McBride, O., Schroevers, M. J., & Ranchor, A. V. (2009). The structure of adversarial growth ina sample of cancer patients 8 years post-diagnosis: A revision of the SLQ-38. *Psychologyand Health, 24*(10), 1197-1213. doi: 10.1080/08870440802108900

Nash, V.R., Ponto, J., Townsend, C., Nelson, P., & Bretz, M.N. (2013). Cognitive behavioral therapy, self-efficacy, and depression in persons with chronic pain. *Pain Management Nursing, 14*(4), 236 – 243. doi: 10.1016/j.pmn.2012.02.006

Neumann, L., & Buskila, D. (2003). Epidemiology of fibromyalgia. *Current Pain and Headache Reports, 7*(5), 362-368. doi: 10.1007/s11916-003-0035-z

Parkitny, L., & McAuley, J. (2010). The Depression Anxiety Stress Scale (DASS). *Journal of Physiotherapy, 56*(3), 204. doi: 10.1016/S1836-9553(10)70030-8

Patten, S. B., Beck, C. A., Kassam, A, Williams, J. V., Barbui, C., & Metz, L. M. (2005). Long-term medical conditions and major depression: Strength of association for specific conditions in the general population. *Canadian Journal of Psychiatry, 50*(4), 195–202.

Person, B., Bartholomew, L.K., Addiss, D., & van den Borne, B. (2007). Disrupted social connectedness among Dominican women with chronic filarial lymphedema. *Patient Education and Counseling, 68*(3)*,* 279-286. doi: 10.1016/j.pec.2007.06.015

Polak, E. L., & McCullough, M. E. (2006). Is gratitude an alternative to materialism? *Journal of Happiness Studies, 7*, 343-360. doi: 10.1007/s10902-005-3649-5

Pollock, S.E. (1999). Health-related hardiness with different ethnic populations. *Holistic Nursing Practice, 13*(3), 1-10. doi: 10.1097/00004650-199904000-00003.

Queiroz, L. P. (2013). Worldwide epidemiology of fibromyalgia. *Current Pain and Headache Reports, 17*(356). doi: 10.1007/s11916-013-0356-5

Roussi, P., & Evrinomy, A. (2008). Meaning-making and chronic illness: Cognitive and narrative approaches. *Hellenic Journal of Psychology, 5*(2)*,* 147-178.

Seligman, M.E.P., & Steen, T.A. (2005). Positive psychology progress: Empirical validation of interventions. *American Psychologist, 60*(5)*,* 410-421. doi: 10.1037/0003-066X.60.5.410

Sirois, F. M. & Wood, A. M. (2017). Gratitude uniquely predicts lower depression in chronic illness populations: A longitudinal study of inflammatory bowel disease and arthritis. *Health Psychology, 36,* 122-132.

Sodergren, S. C. & Hyland, M. E. (1997). Qualitative phase in the development of the Silver Lining Questionnaire. *Quality of Life Research, 6*(7-8), 365.

Sodergren, S.C., Hyland, M.E., Singh, S.J., & Sewell, L. (2002). The effect of rehabilitation on positive consequences of illness. *Psychology and Health, 17*(6)*,* 753-760. http://dx.doi.org/10.1080/0887044021000009674

Stanton, A.L., Revenson, T.A., & Tennen, H. (2007). Health psychology: Psychological adjustment to chronic disease. *Annual Review of Psychology, 58,* 565-592. doi: 10.1146/annurev.psych.58.110405.085615

Sturgeon, J.A. (2014). Psychological therapies for the management of chronic pain. *Psychology Research and Behavior Management, 7,* 115-124. doi: 10.2147/PRBM.S44762

Troy, A.S., Wilhelm, F.H., Shallcross, A.J., & Mauss, I.B. (2010). Seeing the silver lining: Cognitive reappraisal ability moderates the relationship between stress and depressive symptoms. *Emotion, 10*(6), 783-795. doi: 10.1037/a0020262.

Williams, D.A., Cary, M.A., Groner, K.H., Chaplin, W., Glazer, L.J., Rodriguez, A.M., & Clauw, D.J. (2002). Improved physical functioning status in patients with fibromyalgia:

A brief cognitive behavioral intervention. *The Journal of Rheumatology, 29*(6), 1280-1286.

Wolfe, F., Ross, K., Anderson, J., Russell, I.J., & Hebert, L. (1995). The prevalence and characteristics of fibromyalgia in the general population. *Arthritis & Rheumatism, 38*(1), 19-28.

Wood, B. M., Nicholas, M. K., Blyth, F., Asghari, A., & Gibson, S. (2010). The utility of the short version of the Depression Anxiety Stress Scales (DASS-21) in elderly patients with persistent pain: Does age make a difference? *Pain Medicine*, *11*(12), 1780-1790.

Table 1

Means, Standard Deviations, and Correlation Matrix of Study Variables

	M (SD)	Fibromyalgia Impact	Depressive Symptoms
Fibromyalgia Impact	66.42 (15.48)	---	---
Depressive Symptoms	15.16 (5.46)	.51**	---
Silver Lining	100.10 (26.90)	.15*	.37**

Note: Fibromyalgia Impact = Fibromyalgia Impact Questionnaire – Revised (FIQR); Depressive Symptoms = *Depression* Anxiety Stress Scale (DASS); Silver Lining = Silver Lining Questionnaire.
* $p < .05$, ** $p < .01$

Table 2

Multivariate Linear Regression – Fibromyalgia Impact, Silver Lining, and Depressive Symptoms

						95% CI	
	Variable	*b*	SE	*t-value*	*p*-value	Lower	Upper
Step 1							
	Age	-.08	.03	-3.12	.002	-.13	-.03
	Sex	-1.38	1.74	-.79	.43	-4.82	2.05
	Race	.47	.29	1.60	.11	-.11	1.04
	R^2	.04	5.37				
	F for ΔR^2	4.30**					
Step 2							
	Age	-.04	.02	-1.97	.05	-.08	.000
	Sex	-2.47	1.40	-1.77	.08	-5.23	.28
	Race	.25	.24	1.04	.30	-.22	.71
	FIQR	.17	.02	10.11	< .001	.14	.20
	SL	-.06	.01	-6.25	< .001	-.08	-.04
	R^2	.39	4.30				
	F for ΔR^2	82.33***					
Step 3							
	Age	-.04	.02	-2.08	.04	-.08	-.002
	Sex	-2.41	1.38	-1.75	.08	-5.12	.30
	Race	.24	.23	1.03	.30	-.22	.69
	FIQR	.36	.06	5.80	< .001	.24	.49
	SL	.06	.04	1.53	.13	-.02	.13
	FIQR x SL	-.002	.001	-3.21	.001	-.003	-.001
	R^2	.41	4.24				
	F for ΔR^2	10.32**					

Note: b = unstandardized regression coefficient; SE = standard error; CI = confidence interval; SL = Silver Lining Questionnaire total score; FIQR = Fibromyalgia Impact Questionnaire – Revised total score; Depressive Symptoms = *Depression* Anxiety Stress Scale total score.
** $p < .01$, *** $p < .001$

Figure 1. Interaction Plot of Fibromyalgia Impact, Depressive Symptoms, and Silver Lining

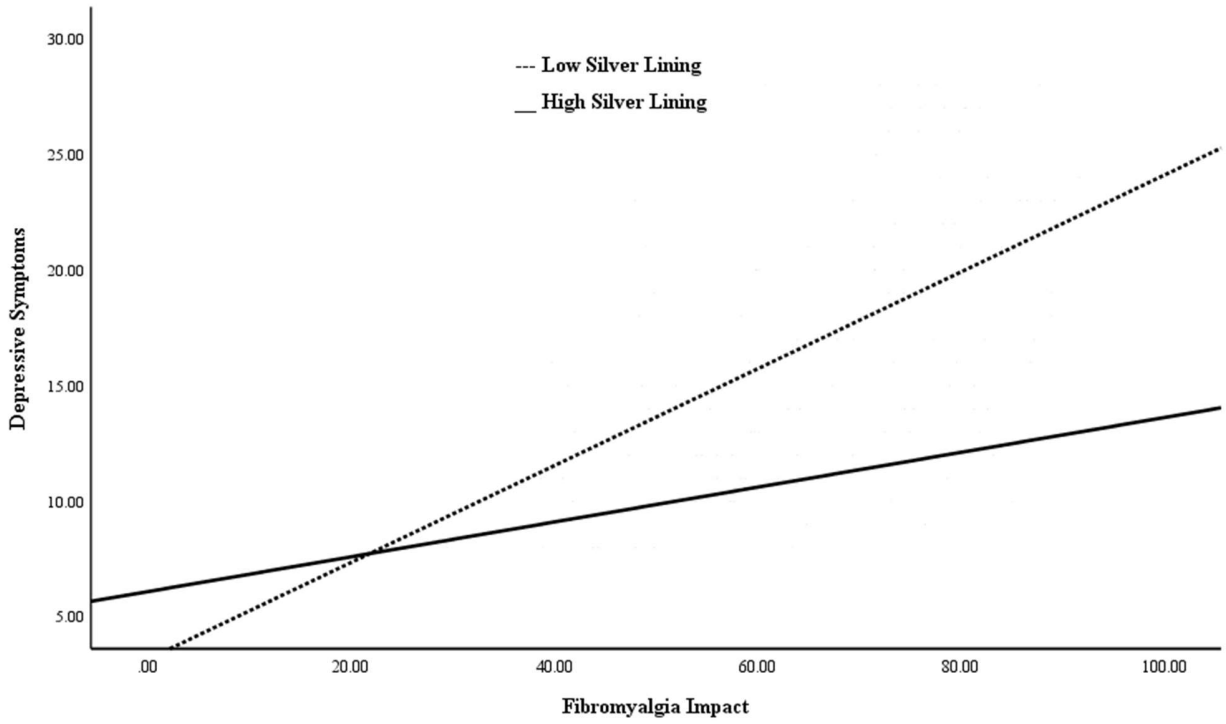

Figure 1. Interaction plot of fibromyalgia impact, depressive symptoms, and perception of a silver lining. At similar levels of disease impact, a high silver lining is associated with fewer depressive symptoms relative to persons who endorse low perceptions of a silver lining in the context of illness. Fibromyalgia Impact = Fibromyalgia Impact Questionnaire-Revised (FIQR); Depressive Symptoms = *Depression* Anxiety Stress Scale (DASS); Silver Lining = Silver Lining Questionnaire.