Original Article

Understanding the Relationship Between Spiritual Well-Being and Depression in Chronic Pain Patients: The Mediating Role of Pain Catastrophizing

Maryam Shaygan, PhD [*], Laila Shayegan, MSc [†]

[*] Community Based Psychiatric Care Research Centre, Faculty of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran
[†] Islamic Azad University, Shiraz Branch, Shiraz, Iran

ARTICLE INFO

ABSTRACT

Background: It is well established that there is an association between chronic pain and depression.
Aims: The present study aimed to identify whether pain catastrophizing and spiritual well-being may influence depression in chronic pain patients when other variables are controlled for (sociodemographic characteristics and pain intensity). Furthermore, it investigated possible mechanisms by which spiritual well-being can influence depression in these patients.
Design: The present study employed a cross-sectional design.
Settings and Participants: This study was performed with a convenience sample of 300 consecutive patients with different types of chronic pain (defined as recurrent or persistent pain over >3 months), referred to clinics affiliated with Shiraz university of Medical Sciences between March and October 2017.
Methods: Patients completed validated self-report questionnaires: Spiritual Well-being Questionnaire, Patient Health Questionnaire, Pain Catastrophizing Scale, and Numeric Rating Scale.
Results: Hierarchical multiple regression analysis indicated that a significant portion of the variance in depression scores can be explained by catastrophizing and spiritual well-being. In Multiple Mediation Procedure, pain catastrophizing could negatively mediate the relationship between spiritual well-being and depression when controlling for sociodemographic characteristics and pain intensity.
Conclusions: The findings add some evidence to further support the influence of spiritual well-being on depression levels through diminished pain catastrophizing. The present results could help clinicians to determine which variables should be emphasized for a successful treatment of depression in pain patients. Clinical interventions that increase meaningfulness and purpose in life may allow patients with chronic pain to overcome the maladaptive cognitions associated with pain, thereby reducing depressive symptoms.

© 2019 American Society for Pain Management Nursing. Published by Elsevier Inc. All rights reserved.

Chronic pain is a major health care problem in most societies. It is common all over the world and several studies have reported that approximately 3.9%-64% of the general population suffer from various types of chronic pain (Johannes, Le, Zhou, Johnston, & Dworkin, 2010; Sjøgren, Ekholm, Peuckmann, & Grønbæk, 2009; Steingrímsdóttir, Landmark, Macfarlane, & Nielsen, 2017; Zarei, Bigizadeh, Pourahmadi, & Ghobadifar, 2012). It is well established that there is a comorbidity between chronic pain and depression, with co-occurrence rates of 30%-50% (Kroenke et al., 2011; Lerman,

Rudich, Brill, Shalev, & Shahar, 2015; Li, 2015). It is widely accepted that the presence of pain is not sufficient condition for the development of depression. It has been suggested that negative appraisals and interpretations of pain may underlie problematic emotional responses (e.g., depression) (Burns, Day, & Thorn, 2011; Goesling, Clauw, & Hassett, 2013; Lazaridou et al., 2017; Turk, 2003).

Perhaps the best studied and potentially most relevant to the pain-depression relationship is catastrophizing. Catastrophizing is a cognitive style characterized by magnification, rumination, and helplessness (Sullivan et al., 2001). Catastrophizers experience more difficulty controlling pain-related thoughts than do non-catastrophizers (Quartana, Campbell, & Edwards, 2009). It has been suggested that the belief that pain will get worse and that one is

Address correspondence to Maryam Shaygan, PhD, Faculty of Nursing and Midwifery, Shiraz University of Medical Sciences, P.O. Box 713451359, Shiraz, Iran.
E-mail address: m2620.shaygan@gmail.com (M. Shaygan).

helpless to deal with it (catastrophization) intensifies the experience of pain and depression in pain patients (Shaygan, Boeger, Kroener-Herwig, 2018; Sullivan et al., 2001; Ziadni, Sturgeon, & Darnall, 2018). Research suggests that women with chronic pain are particularly vulnerable to cognitive dysfunction (Munce & Stewart, 2007).

Various factors may help patients to maintain their psychological health despite the pain. One such factor has attracted much interest in recent years—that is, spiritual well-being (Siddall, Lovell, & MacLeod, 2015). Spiritual well-being is defined as satisfaction with one's relationship with a higher power and one's sense of meaning and purpose in life (Ellison & Smith, 1991; Paloutzian & Ellison, 1982). According to the biopsychosocial-spiritual model of pain, spiritual beliefs play an important role in the appraisal process and the ability to tolerate the pain (Lysne & Wachholtz, 2010; Taylor, Stotts, Humphreys, Treadwell, & Miaskowski, 2013).

Spiritual well-being may help individuals experiencing chronic pain to cope with pain (Rippentrop, Altmaier, Chen, Found, & Keffala, 2005; Taylor et al., 2013; Wachholtz, Pearce, & Koenig, 2007). A growing body of research suggests that spirituality is associated with positive health outcomes, such as less depression in patients with chronic illness (Abu et al., 2018; Aukst-Margetić, Jakovljević, Margetić, Bišćan, & Šamija, 2005; Bekelman et al., 2007; Kandasamy, Chaturvedi, & Desai, 2011; Nsamenang, Hirsch, Topciu, Goodman, & Duberstein, 2016). Although limited, there are some studies that suggest spiritual well-being may be associated with better mental health status in chronic pain patients (Baetz & Bowen, 2008; Büssing et al., 2009, Rippentrop et al., 2005). Despite this, some conflicting results exist. For example, Mystakidou et al. (2007) have found no significant associations between spirituality and depression in patients with advanced cancer, and still others have found spiritual beliefs to be associated with more symptoms of anxiety and depression in patients with cancer (Johnson et al., 2011). However, patients with chronic pain may have different experiences with spirituality than those facing advanced illnesses such as cancer (Büssing, Ostermann & Koenig, 2007), and it is not known if this pattern holds for those with chronic pain. Moreover, the impact of spirituality on illness-related aspects is highly dependent on the cultural context (Mattis, Ahluwalia, Cowie, & Kirkland-Harris, 2006).

Given the discrepancy in study results, particularly in different cultures and religions, research is needed to better understand the relationship between spiritual well-being and depression in chronic pain patients. Furthermore, available data do not give us information about how spiritual well-being may protect chronic pain patients from depression. Greater efforts are needed to identify "process variables" that could be used to identify outcomes.

To further elaborate the relationship between spiritual well-being and depression, the present study investigated two main questions. First, it was examined whether pain catastrophizing and spiritual well-being would influence depression in chronic pain patients when other variables (i.e., sociodemographic characteristics and pain intensity) are controlled for. It was expected that the inclusion of these cognitive and spiritual variables in a multiple regression analysis would increase the total amount of variance in depression scores explained by other variables. Second, it was investigated whether spiritual well-being was associated to less depression through diminished pain catastrophizing after controlling for sociodemographic characteristics and pain intensity. According to the biopsychosocial-spiritual model of pain, it has been hypothesized that spiritual well-being may affect appraisal processes, which then influence pain catastrophizing, thereby reducing depression in pain patients.

Methods

Participant Selection

This cross-sectional study was conducted in 300 patients with chronic pain who had been referred to clinics affiliated with Shiraz University of Medical Sciences. Power analysis, conducted with G*Power analysis software, ensured that the size of the sample was adequate to perform the analysis (Faul, Erdfelder, Buchner, & Lang, 2009) with a statistical power (1-β error probability) of .95, medium effect size of 0.3, and significance level of .05 (type I error). A convenience sample method was used in this research. Criteria for inclusion were age older than 18 years and having chronic pain. Individuals with chronic pain were identified by affirmative answers to three screening questions: (a) "Are you currently troubled by pain or discomfort, either all the time or on and off?" (b) Have you had this pain or discomfort for more than 3 months?" (c) "Does it affect your life and activities?" These questions are based on the *International Classification of Diseases,* 11th Revision, criteria (Treede et al., 2015) and have been validated and used in various studies of chronic pain (Beitel et al., 2016; Hairi, Cumming, Blyth, & Naganathan, 2013; Rutherford, Nixon, Brown, Briggs & Horton, 2016; VanDenKerkhof et al., 2016). Participants were also asked if they had been diagnosed with any common causes of pain (e.g., back problems, arthritis, headache, diabetes, a surgical operation more than 3 months ago, damaged nerve, etc.). The chronic pain conditions represented in the sample included spinal column pain, musculoskeletal pain, neuropathic pain, headache, and postoperative pain. Patients were excluded if they had been diagnosed with a malignant disease or with chronic diseases not related to pain (e.g., Alzheimer).

Procedures

Ethical approval was obtained from the Ethics Committee of the Islamic Azad University, Institute for Psychology. The researcher screened patients for eligibility, explained the study to them, and obtained informed consent. After giving informed consent, patients meeting eligibility criteria completed the study questionnaires.

Measures

In addition to the standard sociodemographic assessment (age, gender, education, and marital status), the following variables were measured:

The average intensity of pain during the last 2 weeks was assessed on a Numeric Rating Scale (NRS). The NRS is an 11-point Likert scale ranging from 0 (no pain) to 10 (worst imaginable pain). It is an often-used reliable scale to assess intensity of pain (Dworkin et al., 2005).

Depressive symptoms were assessed by the Patient Health Questionnaire for depression (PHQ-9; Spitzer, Kroenke, Williams, & Patient Health Questionnaire Primary Care Study Group, 1999). Each item of the questionnaire evaluates the presence of one of the nine *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (American Psychiatric Association, 2013) criteria for major depression. The nine items are answered on a 4-point rating scale ranging from 0 = not at all to 3 = nearly every day. The PHQ-9 score can range from 0 to 27. The instrument has high internal consistency (Cronbach's α = .89; Rief, Nanke, Klaiberg, & Braehler, 2004). In a study by Martin, Rief, Kleiberg, and Braehler (2006), the construct validity of the PHQ-9 was assessed by correlating its total score with a shortened version of the Beck Depression Inventory (Schmitt & Maes, 1999) (r = 0.73) and the General Health Questionnaire (Goldberg & Williams, 1988) (r = 0.59). In a study by

Khamseh et al. (2011), the reliability (Cronbach's α = .87) and validity of the Persian version of the instrument were confirmed. The Persian version also had a high sensitivity (73.8%) and specificity (76.2%) regarding the diagnosis of a depressive disorder (Khamseh et al., 2011). This instrument has strong internal consistency (Cronbach's α = .89) in the present sample.

Catastrophizing cognitions concerning pain were measured with the Pain Catastrophizing Scale (PCS) (Sullivan, Bishop, & Pivik, 1995). The PCS is a self-administered questionnaire to assess the extent of the patient's catastrophizing thoughts and behaviors. It consists of 13 items answered on a 5-point scale ranging from 0 (not at all) to 4 (all the time) and comprises three subscales: *helplessness*, *magnification*, and *rumination*. The scores for the subscales are given by the sum of the corresponding items, and the total score is computed by summation of all items. The PCS score ranges from 0 to 52 points (Sullivan et al., 1995). The instrument has been found to have adequate to excellent internal consistency (Cronbach's α: rumination = .87, magnification = .66, helplessness = .78, and total PCS = .87; Sullivan et al., 1995). In a study by Mortazavi-Nasiri, Pakdaman, and Dehghani (2015), the construct validity of the Persian version of the PCS was assessed by correlating its total score with the Pain Anxiety Symptoms Scale (r = 0.60) and the Headache Disability Inventory (r = 0.64) in a sample of patients with headache. The Persian version of scale had good internal consistency (Cronbach's α = .87) (Mortazavi-Nasiri et al., 2015). This instrument was found to have excellent internal consistency in the present study (Cronbach's α = .93).

Spiritual well-being was assessed by the Spiritual Well-being Questionnaire (SWBQ; Gomez & Fisher, 2003). The SWBQ is a self-report questionnaire including 20 questions rated on a 5-point Likert scale, ranging from very low (rated 1) to very high (rated 5). The scale had good reliability (Cronbach's α, composite reliability and variance extracted) as well as (construct, concurrent, discriminant, predictive) validity (Gomez & Fisher, 2003). The Persian version of scale had good internal consistency (Cronbach's α = .82) and validity (Seyed, Rezaei, Givari, & Hosseini, 2006). This scale was found to have good internal consistency (Cronbach's α = .87) in the present study.

Statistical Analysis

Descriptive statistics on all demographic variables are shown in Table 1. To evaluate the predictors of depressive symptoms in chronic pain patients, hierarchical multiple regression analysis (method: Enter) was performed. First, sociodemographic factors were assessed regarding their association with depressive symptoms because some studies have indicated that these factors are correlated with depression (Akhtar-Danesh & Landeen, 2007; Lopes, Fernandes, Dantas, & Medeiros, 2015). In a second step in the regression analyses, pain intensity and pain catastrophizing were entered into the model because it has been found that patients with higher levels of pain and catastrophizing report more depressive symptoms (Shaygan, 2017; Shaygan et al., 2018). Finally, spiritual well-being was entered into the model because we wanted to investigate whether the inclusion of a spiritual variable increased the total amount of explained variance in the dependent variable (depressive symptoms) after controlling for the previously entered variables. This statistical strategy allows determination of the increase in explained variance by each block of variables entered. Variance inflation factors were calculated for the independent variables to test the assumption of collinearity (Myers & Myers, 1990).

We used the Hayes and Preacher (2014) Multiple Mediation Procedure (Indirect) to determine whether the relationship between spiritual well-being and depression was negatively

Table 1
Sample Characteristics (n = 300)

Characteristic	Value (M ± SD)/n (%)
Age (M ± SD)	52.3 ± 15.8
Age groups, n (%)	
18-30	31 (10%)
31-40	53 (18%)
41-50	74 (25%)
>50	142 (47%)
Sex, n (%)	
Female	228 (76%)
Marital status, n (%)	
Married	235 (78%)
Single	39 (13%)
Divorced/separated	10 (3%)
Widowed	16 (6%)
Educational level, n (%)	
Primary education	59 (20%)
Secondary education	39 (13%)
High school certificate	126 (42%)
College or university degree	76 (25%)
Pain intensity (NRS)	6.65 ± 2.33
Depression (PHQ-9)	9.92 ± 5.82
Pain catastrophizing (PCS)	24.72 ± 12.66
Spiritual well-being (SWBS)	73.78 ± 12.10

M = mean; SD = standard deviation; NRS = Numeric Rating Scale; PHQ-9 = Patient Health Questionnaire; PCS = Pain Catastrophizing Scale; SWBS = Spiritual Well-Being Scale.

mediated by catastrophizing after controlling for sociodemographic factors and pain intensity. The Multiple Mediation Procedure (Indirect) involves estimating relative indirect effects in mediation models using a mediator after controlling for covariates. Inferences about indirect effects were on the basis of percentile bootstrap confidence intervals (n = 5,000; confidence intervals to be set at 95%). Bootstrapping is a sampling method that increases the precision of the constructed confidence intervals. According to Hayes and Preacher (2014), if 0 is outside the confidence interval, then the relative indirect effect is deemed to be statistically different from 0. Including sociodemographic factors and pain intensity as the covariates allowed us to determine the magnitude of the specific indirect effect of catastrophizing, conditional on the inclusion of the covariates in the model. All the data were analyzed using the IBM SPSS Statistics for Windows, Version 22.0 (IBM Corp., Armonk, NY). The significance level was set at p < .05.

Results

Study Sample

Of the 312 patients who fulfilled the inclusion criteria, a total of 12 patients had to be excluded from the study because they experienced a malignant disease or some other chronic diseases not related to pain (e.g., Alzheimer, cardiovascular disease). The mean age of the patients was 52.3 years (standard deviation [SD] = 15.8), and the highest percentage of patients (47%) belonged to the age group >50 years old (Table 1). The majority of patients were female (76%) and married (78%), and about 42% had a high school certificate (Table 1). Average pain intensity over the previous 2 weeks was 6.65 (SD = 2.33) on an 11-point NRS (Table 1).

Predictors of Depressive Symptoms in Chronic Pain Patients

The present study examined whether pain catastrophizing and spiritual well-being influence depression in chronic pain patients when other variables are controlled for (sociodemographic characteristics and pain intensity). As shown in Table 2, in the first step

of the hierarchical regression analyses, age, sex, marital status, and educational level were assessed regarding their association with depressive symptoms. Sex (β = .17, p = .004, 95% confidence interval [CI] = 0.76, 3.87 and educational level (β = .13, p = .02, 95% CI = −1.26, −0.09) were significantly associated with depressive symptoms, but other variables were not. This model achieved a variance explanation of only 4%, F (4, 295) = 5.82, p = .001 (Table 2). In the second step, pain intensity and pain catastrophizing were included in the model. Catastrophizing turned out to be a significant predictor in this model (β = .43, p = .000, 95% CI = 0.14, 0.25) but pain intensity did not. Sex also remained as predictive factor in this model (β = .13, p = .01, 95% CI = 0.38, 3.20), but the variable "educational level" did not maintain its status as a predictive variable, p = .22. Age and marital status also did not contribute to the prediction of depressive symptoms, F (6, 293) = 18.39, p = .000. This model achieved a variance explanation of 18% more than the previous model, R^2 = 22%, ΔR^2 = .18, ΔF (2, 294) = 35.22, p = .000 (Table 2). Finally, spiritual well-being was entered into the model. Spiritual well-being contributed to the prediction of depressive symptoms in this model (β = −.34, p = .000, 95% CI = −0.21, −0.11). The inclusion of spiritual well-being led to an 11% increase in explained variance, for a total explanation of variance of 33%, ΔR^2 = .11, ΔF (1, 293) = 47.27, p = .000. Sex (β = .13, p = .005, 95% CI = 0.58, 3.20) and catastrophizing (β = .34, p = .000, 95% CI = 0.10, 0.20) also remained as predictive factors in this model, but the variables pain intensity, age, educational level, and marital status did not (F [7, 292] = 25.62, p = .000) (Table 2). The collinearity statistics indicated that tolerance levels were between 0.7 and 0.9 and variance inflation factors for all variables were between 1.06 and 1.37, indicating that multicollinearity was not present.

Mediating Role of Pain Catastrophizing in the Relationship between Spiritual Well-Being and Depression

It was investigated whether spiritual well-being was associated to less depression through diminished pain catastrophizing after

Table 2
Hierarchical Multiple Regression Analyses Predicting Depressive Symptoms from Pain-Related Variables and Spiritual Well-Being

Depressive symptoms					
Predictor	ΔR^2	B	SEB	β	p
Step 1	0.04[*]				
Age		0.06	0.62	.009	.54
Sex		20.32	0.79	.17	.004
Marital status		0.07	0.55	.008	.59
Educational level		0.67	0.29	.13	.02
Step 2	0.18[†]				
Age		0.06	0.62	.008	.55
Sex		10.79	0.71	.13	.01
Marital status		0.81	0.51	.08	.11
Educational level		0.33	0.27	.06	.22
Pain intensity		0.04	0.14	.01	.76
Catastrophizing		0.20	0.02	.43	.000
Step 3	0.11[†]				
Age		0.04	0.59	.006	.60
Sex		10.89	0.66	.13	.005
Marital status		0.24	0.48	.02	.62
Educational level		0.23	0.25	.04	.34
Pain intensity		0.01	0.13	.006	.90
Catastrophizing		0.15	0.02	.34	.000
Spiritual well-being		−0.16	0.02	−.34	.000
Total R^2	0.33[†]				
N	300				

[*] $p < .01$.
[†] $p < .001$.

controlling for sociodemographic characteristics and pain intensity. The findings revealed that pain catastrophizing (95% CI = −0.06, −0.01) negatively mediated the relationship between spiritual well-being and depression when controlling for sociodemographic characteristics and pain intensity (Table 3).

Discussion

The present study aimed to identify whether pain catastrophizing and spiritual well-being may influence depression in chronic pain patients when other variables are controlled for (sociodemographic characteristics and pain intensity). Furthermore, it was investigated possible mechanisms by which spiritual well-being may influence depression in these patients. The results indicate that a significant portion of the variance in depression scores of chronic pain patients can be explained by cognitive and spiritual variables catastrophizing and spiritual well-being. Our findings revealed that pain catastrophizing negatively mediated the relationship between spiritual well-being and depression after controlling for sociodemographic factors and pain intensity.

Consistent with our hypothesis, catastrophizing significantly contributed to the prediction of depressive symptoms, even when controlling for sociodemographic variables and pain intensity. This finding is consistent with previous research (Edwards, Cahalan, Mensing, Smith, & Haythornthwaite, 2011; Hülsebusch, Hasenbring, & Rusu, 2016; Shaygan, 2017). Pain catastrophizing is viewed as an appraisal process characterized by a lack of confidence and control (Sullivan et al., 2001). In their study, Hülsebusch et al. (2016) conceptualized catastrophizing as a mechanism in emotion regulation and suggested that the thoughts of having no control about the pain experience might influence the development of depression in patients with chronic pain. Fahland, Kohlmann, Hasenbring, Feng, and Schmidt (2012), in a study on 413 patients with back pain, reported that pain had no direct effect on depression when controlling for cognitive mediators, which included catastrophizing. In one other study with functional magnetic resonance imaging in patients with chronic pain, it was reported that characterizations of pain as awful, horrible, and unbearable were significantly associated with increased activity in brain areas related to emotional aspects of pain (Gracely et al., 2004). Thus these data suggest that how someone with chronic pain thinks could be an important factor in the development of depression.

As expected, the inclusion of spiritual well-being in a multiple regression analysis significantly increased the total amount of variance in depression scores of chronic pain patients when controlling for sociodemographic variables and pain intensity. Consistently, there is some evidence of an inverse association between spiritual well-being and depression in other chronic illnesses such as cancer (Ando et al., 2009; Kandasamy et al., 2011; Lo et al., 2010), heart failure (Bekelman et al., 2007), and multiple sclerosis (Nsamenang et al., 2016). Although we did not find any research investigating the relationship between spiritual well-being and depression in chronic pain patients, there is evidence from a number of studies to indicate that positive spiritual coping strategies are associated with a higher tolerance of pain as well as better mood and satisfaction with life in the presence of pain (Baetz & Bowen, 2008; Rippentrop et al., 2005, Wachholtz & Pargament, 2005, Wachholtz et al., 2007). For example, Wachholtz and Pargament (2005) tested college students with a cold pressor task to determine whether spiritually based meditation had more effects on anxiety and positive mood than non−spiritually based meditation. They found that the spiritually based meditation group had greater decreases in anxiety and more positive mood than the

Table 3
Multiple Mediation Analysis Mediating the Indirect Effects of Spiritual Well-Being on Depression

Independent Variable X	Dependent Variable Y	Mediating Variable M	Effect of X on M	Effect of M on Y	Partial Effect of Control Variables on Y	Indirect Effect	B Ca, 95% CI[*]	
							Lower	Upper
Spiritual well-being	Depression	Catastrophizing	$-4.42^{\dagger}$	$6.18^{\dagger}$		-0.03	-0.06	-0.01
Control Variables								
Age					0.11^{ns}			
Sex					0.96^{ns}			
Marital status					-0.49^{ns}			
Educational level					-0.94^{ns}			
Pain intensity					-0.11^{ns}			

B Ca = bias corrected and accelerated bootstrapping confidence intervals that include corrections for both median bias and skew; CI = confidence interval; ns = not significant.
[*] Confidence interval not containing 0 is interpreted as significant.
[†] $p < .001$.

other group. In another study, Rippentrop et al. (2005) found that daily spiritual experiences and self-rankings of spiritual intensity significantly predicted mental health status assessed by the Short Form 36 in a chronic pain population. Altogether, our results identified some evidence to support an inverse relationship between spiritual well-being and depression in a sample of chronic pain patients.

As hypothesized, the relationship between spiritual well-being and depression in chronic pain patients was mediated by pain catastrophizing. This result supports the biopsychosocial-spiritual model of pain, which posits that spiritual health plays an important role in the appraisal process and therefore coping with pain (Lysne & Wachholtz, 2010; Taylor et al., 2013). Our findings seem to suggest that spiritual well-being may help patients to ameliorate the negative cognitions, such as catastrophizing, which may contribute to depressive symptoms. According to literature, there are different ways in which spiritual well-being may influence catastrophizing of pain.

Wachholtz et al. (2007) have discussed that spirituality allow the individuals to focus on transcendent ideas or beliefs, thereby reducing their focus on their body, which may in turn reduce the magnification of pain. Also, it has been assumed that spiritual techniques such as reading spiritual texts may provide a time to set aside negative thoughts in order to integrate a more spiritual dimension into the individual's life, thereby reducing rumination on the daily stressors of life such as pain (Wachholtz et al., 2007). In Lysne and Wachholtz's (2010) review of the literature, it was discussed that when individuals are confronted with an out-of-control situation such as pain, they are likely to turn to an alternative source for help in coping. It seems that spirituality brings people into contact with one whom they perceive as having control, therefore giving them more of a sense of control. Having a sense of control in the context of chronic illness may help to counteract the negative cognitions, such as helplessness, which often contribute to depressive symptoms (Johnson et al., 2011; Nsamenang et al., 2016; Tan, Jensen, Thornby, & Sloan, 2008).

Finally, as Lysne and Wachholtz (2010) articulated, spirituality may help individuals to make specific appraisals and attributions about the meaning and purpose of pain. It has been suggested that individuals who make effective spiritual meanings of pain may experience lower levels of the negative psychological sequelae of chronic pain—specifically, catastrophizing (Harris et al., 2017). Nsamenang et al. (2016) suggested that having a sense of meaning and purposefulness (defined as spiritual well-being) in the context of chronic illness may help to counteract the negative states, such as hopelessness, helplessness, and depression in patients with multiple sclerosis. Therefore it seems that placing the experience of pain in a spiritual framework could provide the ability to counteract the negative appraisals of pain by giving

them a spiritual meaning. However, more research is needed to understand how individuals experiencing pain specifically employ their spiritual beliefs to create a positive meaning from a negative event such as pain.

In summary, based on our findings, spiritual well-being might influence depression in pain patients through decreased maladaptive cognitions such as magnification, rumination, and helplessness, which are the common features of catastrophizing of pain in these patients. However, certainly there are other factors that also affect the relationship between spiritual well-being and depression and further research in this area is needed.

Limitations

It is important to mention some of the limitations of our study. Depressive symptoms were assessed based on the self-report questionnaire and not on clinical examination. Compared with clinical assessment, the accuracy of self-report measures may be affected by response bias (Shaygan, Boeger, & Kroener-Herwig, 2014). Further, given the cross-sectional design, our findings do not shed light on causal relationships. Moreover, undoubtedly there are other factors, including pain interference, not assessed in this study that also affect the relationship between spiritual well-being and depression (Nsamenang et al., 2016). Prospective research with larger samples, and which assesses a wider array of potential mediating factors, is needed.

Implications for Nursing

It is a widely accepted belief that people are made up of mind, body, and spirit (Holt & McClure, 2006; Latorre, 2000). With this recognition, the management of chronic pain requires a multidimensional approach focused on biological, psychologic, sociologic, and spiritual needs of patients. However, nurses may lack the necessary time and skills to address spiritual needs of patients. As Taylor et al. (2013) mentioned, nurses put more emphasis on the biopsychosocial aspects of chronic pain in this population. Nevertheless, a growing body of research suggests that addressing issues of spirituality in pain patients is an important, if not crucial, aspect of chronic pain management (Lysne & Wachholtz, 2010, Rippentrop, 2005, Taylor et al., 2013, Wachholtz et al., 2007). Although our study was cross-sectional, and correlational findings do not shed light on causal relationships, the results indicated that spiritual well-being may help patients to ameliorate the negative cognitions, such as catastrophizing, which may contribute to depressive symptoms in pain patients. Thus to promote the holistic health of patients, assessment and management of spiritual factors affecting persistent pain should be included as routine core elements in the integrated care of the whole person.

Conclusions

In summary, based on our results, depression was associated with less spiritual well-being and more catastrophizing in chronic pain patients. Although correlational findings do not shed light on causal relationships, the results add some evidence to further support the influence of spiritual well-being on depression levels through diminished pain catastrophizing. Clinical interventions that increase meaningfulness and purpose in life may allow patients with chronic pain to overcome some of the negative cognitions associated with pain (e.g., catastrophizing), thereby reducing depressive symptoms.

Acknowledgments

References

Abu, H. O., Ulbricht, C., Ding, E., Allison, J. J., Salmoirago-Blotcher, E., Goldberg, R. J., & Kiefe, C. I. (2018). Association of religiosity and spirituality with quality of life in patients with cardiovascular disease: A systematic review. *Quality of Life Research, 27*, 2777–2797.

Akhtar-Danesh, N., & Landeen, J. (2007). Relation between depression and socio-demographic factors. *International Journal of Mental Health Systems, 1*(1), 4.

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders. *American Psychiatric Association* (5th ed.). Arlington: American Psychiatric Publishing.

Ando, M., Morita, T., Akechi, T., Ito, S., Tanaka, M., Ifuku, Y., & Nakayama, T. (2009). The efficacy of mindfulness-based meditation therapy on anxiety, depression, and spirituality in Japanese patients with cancer. *Journal of Palliative Medicine, 12*(12), 1091–1094.

Aukst-Margetić, B., Jakovljević, M., Margetić, B., Bišćan, M., & Šamija, M. (2005). Religiosity, depression and pain in patients with breast cancer. *General Hospital Psychiatry, 27*(4), 250–255.

Baetz, M., & Bowen, R. (2008). Chronic pain and fatigue: Associations with religion and spirituality. *Pain Research and Management, 13*(5), 383–388.

Beitel, M., Stults-Kolehmainen, M., Cutter, C. J., Schottenfeld, R. S., Eggert, K., Madden, L. M., Kerns, R. D., Liong, C., Ginn, J., & Barry, D. T. (2016). Physical activity, psychiatric distress, and interest in exercise group participation among individuals seeking methadone maintenance treatment with and without chronic pain. *The American Journal on addictions, 25*(2), 125–131.

Bekelman, D. B., Dy, S. M., Becker, D. M., Wittstein, I. S., Hendricks, D. E., Yamashita, T. E., & Gottlieb, S. H. (2007). Spiritual well-being and depression in patients with heart failure. *Journal of General Internal Medicine, 22*(4), 470–477.

Burns, J. W., Day, M. A., & Thorn, B. E. (2011). Is reduction in pain catastrophizing a therapeutic mechanism specific to cognitive-behavioral therapy for chronic pain? *Translational Behavioral Medicine, 2*(1), 22–29.

Büssing, A., Michalsen, A., Balzat, H. J., Grünther, R. A., Ostermann, T., Neugebauer, E. A., & Matthiessen, P. F. (2009). Are spirituality and religiosity resources for patients with chronic pain conditions? *Pain Medicine, 10*(2), 327–339.

Büssing, A., Ostermann, T., & Koenig, H. G. (2007). Relevance of religion and spirituality in German patients with chronic diseases. *The International Journal of Psychiatry in Medicine, 37*(1), 39–57.

Dworkin, R. H., Turk, D. C., Farrar, J. T., Haythornthwaite, J. A., Jensen, M. P., Katz, N. P., Kerns, R. D., Stucki, G., Allen, R. R., Bellamy, N., Carr, D. B., Chandler, J., Cowan, P., Dionne, R., Galer, B. S., Hertz, S., Jadad, A. R., Kramer, L. D., Manning, D. C., Martin, S., McCormick, C. G., McDermott, M. P., McGrath, P., Quessy, S., Rappaport, B. A., Robbins, W., Robinson, J. P., Rothman, M., Royal, M. A., Simon, L., Stauffer, J. W., Stein, W., Tollett, J., Wernicke, J., Witter, J., & IMMPACT. (2005). Core outcome measures for chronic pain clinical trials: IMMPACT recommendations. *Pain, 113*(1), 9–19.

Edwards, R. R., Cahalan, C., Mensing, G., Smith, M., & Haythornthwaite, J. A. (2011). Pain, catastrophizing, and depression in the rheumatic diseases. *Nature Reviews Rheumatology, 7*(4), 216.

Ellison, C. W., & Smith, J. (1991). Toward an integrative measure of health and well-being. *Journal of Psychology and Theology, 19*(1), 35–45.

Fahland, R. A., Kohlmann, T., Hasenbring, M., Feng, Y. S., & Schmidt, C. O. (2012). Which route leads from chronic back pain to depression? A path analysis on direct and indirect effects using the cognitive mediators catastrophizing and helplessness/hopelessness in a general population sample. *Schmerz (Berlin, Germany), 26*(6), 685–691.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*(4), 1149–1160.

Goesling, J., Clauw, D. J., & Hassett, A. L. (2013). Pain and depression: An integrative review of neurobiological and psychological factors. *Current Psychiatry Reports, 15*(12), 421.

Goldberg, D. P., & Williams, P. (1988). *A user's guide to the GHQ*. Windsor, UK: NFER-Nelson.

Gomez, R., & Fisher, J. W. (2003). Domains of spiritual well-being and development and validation of the Spiritual Well-Being Questionnaire. *Personality and Individual Differences, 35*(8), 1975–1991.

Gracely, R. H., Geisser, M. E., Giesecke, T., Grant, M. A. B., Petzke, F., Williams, D. A., & Clauw, D. J. (2004). Pain catastrophizing and neural responses to pain among persons with fibromyalgia. *Brain, 127*(4), 835–843.

Hairi, N. N., Cumming, R. G., Blyth, F. M., & Naganathan, V. (2013). Chronic pain, impact of pain and pain severity with physical disability in older people—is there a gender difference? *Maturitas, 74*(1), 68–73.

Harris, J. I., Usset, T., Krause, L., Schill, D., Reuer, B., Donahue, R., & Park, C. L. (2017). Spiritual/religious distress is associated with pain catastrophizing and interference in veterans with chronic pain. *Pain Medicine, 19*(4), 757–763.

Hayes, A. F., & Preacher, K. J. (2014). Statistical mediation analysis with a multi-categorical independent variable. *British Journal of Mathematical and Statistical Psychology, 67*(3), 451–470.

Holt, C. L., & McClure, S. M. (2006). Perceptions of the religion-health connection among African American church members. *Qualitative Health Research, 16*(2), 268–281.

Hülsebusch, J., Hasenbring, M. I., & Rusu, A. C. (2016). Understanding pain and depression in back pain: the role of catastrophizing, help-/hopelessness, and thought suppression as potential mediators. *International Journal of Behavioral Medicine, 23*(3), 251–259.

Johannes, C. B., Le, T. K., Zhou, X., Johnston, J. A., & Dworkin, R. H. (2010). The prevalence of chronic pain in United States adults: Results of an Internet-based survey. *The Journal of Pain, 11*(11), 1230–1239.

Johnson, K. S., Tulsky, J. A., Hays, J. C., Arnold, R. M., Olsen, M. K., Lindquist, J. H., & Steinhauser, K. E. (2011). Which domains of spirituality are associated with anxiety and depression in patients with advanced illness? *Journal of General Internal Medicine, 26*(7), 751–758.

Kandasamy, A., Chaturvedi, S. K., & Desai, G. (2011). Spirituality, distress, depression, anxiety, and quality of life in patients with advanced cancer. *Indian Journal of Cancer, 48*(1), 55.

Khamseh, M. E., Baradaran, H. R., Javanbakht, A., Mirghorbani, M., Yadollahi, Z., & Malek, M. (2011). Comparison of the CES-D and PHQ-9 depression scales in people with type 2 diabetes in Tehran, Iran. *BMC Psychiatry, 11*(1), 61.

Kroenke, K., Wu, J., Bair, M. J., Krebs, E. E., Damush, T. M., & Tu, W. (2011). Reciprocal relationship between pain and depression: A 12-month longitudinal analysis in primary care. *The Journal of Pain, 12*(9), 964–973.

Latorre, M. A. (2000). A holistic view of psychotherapy: Connecting mind, body, and spirit. *Perspectives in Psychiatric Care, 36*(2), 67–68.

Lazaridou, A., Kim, J., Cahalan, C. M., Loggia, M. L., Franceschelli, O., Berna, C., Schur, P., Napadow, V., & Edwards, R. R. (2017). Effects of cognitive-behavioral therapy (CBT) on brain connectivity supporting catastrophizing in fibromyalgia. *The Clinical Journal of Pain, 33*(3), 215.

Lerman, S. F., Rudich, Z., Brill, S., Shalev, H., & Shahar, G. (2015). Longitudinal associations between depression, anxiety, pain, and pain-related disability in chronic pain patients. *Psychosomatic Medicine, 77*(3), 333–341.

Li, J. X. (2015). Pain and depression comorbidity: A preclinical perspective. *Behavioural Brain Research, 276*, 92–98.

Lo, C., Lin, J., Gagliese, L., Zimmermann, C., Mikulincer, M., & Rodin, G. (2010). Age and depression in patients with metastatic cancer: the protective effects of attachment security and spiritual wellbeing. *Ageing & Society, 30*(2), 325–336.

Lopes, J. M., Fernandes, S. G. G., Dantas, F. G., & Medeiros, J. L. A. (2015). Association between depression and sociodemographic characteristics, quality of sleep and living habits among the elderly of the north-east of Brazil: A cross-sectional population based study. *Revista Brasileira de Geriatria e Gerontologia, 18*(3), 521–531.

Lysne, C. J., & Wachholtz, A. B. (2010). Pain, spirituality, and meaning making: What can we learn from the literature? *Religions, 2*(1), 1–16.

Martin, A., Rief, W., Klaiberg, A., & Braehler, E. (2006). Validity of the brief patient health questionnaire mood scale (PHQ-9) in the general population. *General Hospital Psychiatry, 28*(1), 71–77.

Mattis, J. S., Ahluwalia, M. K., Cowie, S. E., & Kirkland-Harris, A. M. (2006). Ethnicity, culture, and spiritual development. In E. C. Roehlkepartain, P. E. King, L. Wagener, & P. L. Benson (Eds.), *The Handbook of Spiritual Development in Childhood and Adolescence* (pp. 283–296). Thousand Oaks, CA: SAGE Publications.

Mortazavi-Nasiri, F. S., Pakdaman, S., & Dehghani, M. (2015). The association of catastrophizing and pain-related anxiety with headache-related disability in patients suffering from migraine. *Journal of Research in Behavioural Science, 13*(4), 609–616.

Munce, S. E., & Stewart, D. E. (2007). Gender differences in depression and chronic pain conditions in a national epidemiologic survey. *Psychosomatics, 48*(5), 394–399.

Myers, R. H., & Myers, R. H. (1990). *Classical and modern regression with applications, 2*. Belmont, CA: Duxbury Press.

Mystakidou, K., Tsilika, E., Parpa, E., Pathiaki, M., Patiraki, E., Galanos, A., & Vlahos, L. (2007). Exploring the relationships between depression, hopelessness, cognitive status, pain, and spirituality in patients with advanced cancer. *Archives of Psychiatric Nursing, 21*(3), 150–161.

Nsamenang, S. A., Hirsch, J. K., Topciu, R., Goodman, A. D., & Duberstein, P. R. (2016). The interrelations between spiritual well-being, pain interference and depressive symptoms in patients with multiple sclerosis. *Journal of Behavioral Medicine, 39*(2), 355–363.

Paloutzian, R. F., & Ellison, C. W. (1982). Loneliness, spiritual well-being and the quality of life. In L. A. Peplau, & D. Perlmen (Eds.), *Loneliness: A sourcebook of current theory, research and therapy* (pp. 224–237). Hoboken, NJ: Wiley.

Quartana, P. J., Campbell, C. M., & Edwards, R. R. (2009). Pain catastrophizing: A critical review. *Expert Review of Neurotherapeutics, 9*(5), 745–758.

Rief, W., Nanke, A., Klaiberg, A., & Braehler, E. (2004). Base rates for panic and depression according to the Brief Patient Health Questionnaire: A population-based study. *Journal of Affective Disorders, 82*(2), 271–276.

Rippentrop, A. E., Altmaier, E. M., Chen, J. J., Found, E. M., & Keffala, V. J. (2005). The relationship between religion/spirituality and physical health, mental health, and pain in a chronic pain population. *Pain, 116*(3), 311–321.

Rutherford, C., Nixon, J. E., Brown, J. M., Briggs, M., & Horton, M. (2016). The Leeds Assessment of Neuropathic Symptoms and Signs Scale (LANSS) is not an adequate outcome measure of pressure ulcer-related neuropathic pain. *European Journal of Pain, 20*(10), 1710–1720.

Schmitt, M., & Maes, J. (1999). *Vorschlag zur Vereinfachung des Beck-Depressions-Inventars (BDI)*. Berlin: Inst. für Psychologie.

Seyed, F. N., Rezaei, M., Givari, A., & Hosseini, F. (2006). Prayer and spiritual well-being in cancer patients. *PAYESH, 5*(4), 295–303.

Shaygan, M. (2017). Intensity of depression, its predictive and mediating factors in the patients with chronic headache. *Scientific Journal of Kurdistan University of Medical Sciences, 22*(2), 110–119.

Shaygan, M., Boeger, A., & Kroener-Herwig, B. (2014). Neuropathic sensory symptoms: association with pain and psychological factors. *Neuropsychiatric Disease and Treatment, 10*, 897.

Shaygan, M., Boeger, A., & Kroener-Herwig, B. (2018). Predicting factors of outcome in multidisciplinary treatment of chronic neuropathic pain. *Journal of Pain Research, 11*, 2433–2443.

Siddall, P. J., Lovell, M., & MacLeod, R. (2015). Spirituality: What is its role in pain medicine? *Pain Medicine, 16*(1), 51–60.

Sjøgren, P., Ekholm, O., Peuckmann, V., & Grønbæk, M. (2009). Epidemiology of chronic pain in Denmark: an update. *European Journal of Pain, 13*(3), 287–292.

Spitzer, R. L., Kroenke, K., Williams, J. B., & Patient Health Questionnaire Primary Care Study Group. (1999). Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. *Journal of the American Medical Association, 282*(18), 1737–1744.

Steingrímsdóttir, Ó. A., Landmark, T., Macfarlane, G. J., & Nielsen, C. S. (2017). Defining chronic pain in epidemiological studies: A systematic review and meta-analysis. *Pain, 158*(11), 2092–2107.

Sullivan, M. J., Bishop, S. R., & Pivik, J. (1995). The pain catastrophizing scale: Development and validation. *Psychological Assessment, 7*(4), 524.

Sullivan, M. J., Thorn, B., Haythornthwaite, J. A., Keefe, F., Martin, M., Bradley, L. A., & Lefebvre, J. C. (2001). Theoretical perspectives on the relation between catastrophizing and pain. *The Clinical Journal of Pain, 17*(1), 52–64.

Tan, G., Jensen, M. P., Thornby, J., & Sloan, P. A. (2008). Negative emotions, pain, and functioning. *Psychological Services, 5*(1), 26.

Taylor, L. E. V., Stotts, N. A., Humphreys, J., Treadwell, M. J., & Miaskowski, C. (2013). A biopsychosocial-spiritual model of chronic pain in adults with sickle cell disease. *Pain Management Nursing, 14*(4), 287–301.

Treede, R. D., Rief, W., Barke, A., Aziz, Q., Bennett, M. I., Benoliel, R., Cohen, M., Evers, S., Finnerup, N. B., First, M. B., Giamberardino, M. A., Kaasa, S., Kosek, E., Lavand'homme, P., Nicholas, M., Perrot, S., Scholz, J., Schug, S., Smith, B. H., Svensson, P., Vlaeyen, J. W., & Wang, S. J. (2015). A classification of chronic pain for ICD-11. *Pain, 156*(6), 1003.

Turk, D. C. (2003). Cognitive-behavioral approach to the treatment of chronic pain patients. *Regional Anesthesia and Pain Medicine, 28*(6), 573–579.

VanDenKerkhof, E. G., Mann, E. G., Torrance, N., Smith, B. H., Johnson, A., & Gilron, I. (2016). An epidemiological study of neuropathic pain symptoms in Canadian adults. *Pain Research and Management, 2016*, 9815750.

Wachholtz, A. B., & Pargament, K. I. (2005). Is spirituality a critical ingredient of meditation? Comparing the effects of spiritual meditation, secular meditation, and relaxation on spiritual, psychological, cardiac, and pain outcomes. *Journal of Behavioral Medicine, 28*(4), 369–384.

Wachholtz, A. B., Pearce, M. J., & Koenig, H. (2007). Exploring the relationship between spirituality, coping, and pain. *Journal of Behavioral Medicine, 30*(4), 311–318.

Zarei, S., Bigizadeh, S., Pourahmadi, M., & Ghobadifar, M. A. (2012). Chronic pain and its determinants: A population-based study in Southern Iran. *The Korean Journal of Pain, 25*(4), 245–253.

Ziadni, M. S., Sturgeon, J. A., & Darnall, B. D. (2018). The relationship between negative metacognitive thoughts, pain catastrophizing and adjustment to chronic pain. *European Journal of Pain, 22*(4), 756–762.