

Helplessness as a Mediator of Health Status in Fibromyalgia

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Based on learned helplessness theory, this research evaluated a model in which helplessness and perceived control (internality) were hypothesized to mediate the effects of pain and disability (quality-of-well-being) on depression and pain behavior in 122 participants with fibromyalgia. Path analytic procedures revealed that helplessness partially mediated the effects of pain and disability on depression, and fully mediated the effects of pain on self-reported pain behavior. Disability was an independent predictor of both self-reported and observed pain behavior. Beliefs in internality were unrelated to depression and pain behavior measures, and thus did not serve in a mediational capacity. The findings underscore the importance of the helplessness construct in fibromyalgia, a chronic pain syndrome of unknown etiology.

KEY WORDS: fibromyalgia; helplessness; mediator; health status.

Fibromyalgia (FM) is an enigmatic chronic pain disorder of undetermined etiology that has been shown to have a deleterious impact on mood, social and occupational functioning, and quality of life of afflicted patients (Cathey, Wolfe, Kleinheksel, Miller, & Patetti, 1988; Schoenfeld-Smith, Nicassio, Radojevic, & Paterson, 1995). Although pharmacological (e.g., Gabriel & Bombardier, 1989) and psychoeducational approaches adopting cognitive-behavioral principles have shown some benefit in alleviating the suffering and disability attendant to FM (Burckhardt, Mannerkorpi, Hedenberg, & Bjelle, 1994; Nicassio et al., 1997), the condition is generally regarded as highly refractory to clinical intervention and a source of frustration to both patients and their treating clinicians.

Lack of understanding regarding the nature of the condition and its pathogene-

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sis has contributed to uncertainty about its management, and whether, in fact, FM constitutes a diagnosable medical condition. The work of Wolfe et. al. (1990) found that widespread musculoskeletal pain (upper and lower body) of 3 months' duration or greater and the existence of 11 of 18 tender points in skeletal muscle tissue distinguish FM from arthritis and other chronic pain syndromes. Nevertheless, these criteria do not explain the existence of associated symptoms such as depression, fatigue, and sleep disturbance that are commonly found in FM.

Helplessness and FM

Due to the absence of scientific knowledge about the origin and treatment of the condition, idiosyncratic beliefs and schemas regarding the causes of FM and the perceived controllability of pain and related symptoms may develop. FM patients face an unpredictable future, not knowing when, or if, they will obtain relief from the illness and the disability it causes. This state of uncertainty may be associated with a sense of helplessness and ineffective coping effort. The helplessness construct (Seligman, 1975) may be especially important in explaining the high levels of depression and functional impairment that have been observed in FM patients (Ahles, Khan, Yunus, Spiegel, & Masi, 1991; Schoenfeld-Smith, Nicassio, Radojevic, & Patterson, 1995). Based on experimental studies of helplessness theory (Peterson, 1982), the state of helplessness in chronic illness may be characterized by: (1) motivational deficits (e.g., lack of effort to cope with symptoms), (2) cognitive deficits (e.g., the belief that a coping response will not reduce the pain), and (3) affective deficits (e.g., increased anxiety and/or depression). Passivity and behavioral impairment (e.g., disability) may be seen as consequences of this constellation of deficits in FM.

Helplessness and Arthritic Conditions

It has been shown repeatedly that helplessness, measured by the 15-item Arthritis Helplessness Index (AHI; Nicassio, Wallston, Callahan, Herbert, & Pincus, 1985) and by the five-item Helplessness Subscale (Stein, Wallston, & Nicassio, 1988), is directly related to depression and disability in patients with rheumatoid arthritis (RA), independently of disease severity. Over a 2-year period, high helplessness beliefs predicted functional declines in a group of more than 300 RA patients (Stein, Wallston, Nicassio, & Castner, 1988). The same pattern of relationships has been demonstrated between helplessness and clinical outcomes using a Swedish version of the AHI (Lindroth, Strombeck, Brossner, Gullberg, & Wollheim, 1994).

Findings from other studies suggest that the helplessness construct may be generalizable across rheumatic illnesses. Application of helplessness theory to systemic lupus erythematosus (SLE) using the general version of the AHI, the Rheumatology Attitudes Index (RAI; Callahan, Brooks, & Pincus, 1988), has yielded results consistent with data on RA patients. Engle, Callahan, Pincus, and Hochberg (1990) found helplessness to be related to higher pain, greater dissatisfaction with activities of daily living, and greater disability due to illness in a clinical cohort of SLE

patients. Using regression analysis, Tayer, Nicassio, Radojevic, and Krall (1996) reported that pain and helplessness independently predicted depression in a community sample of SLE patients.

Evaluation of the independent relationship between helplessness and clinical outcomes, however, does not directly confirm the theory of learned helplessness. Peterson (1982) notes that the term *learned helplessness* only applies to instances in which there has been exposure to uncontrollable events (e.g., symptoms, impact of illness) coupled with helplessness (aforementioned beliefs) as a mediator of the effects of these events. Not all instances of helplessness are examples of learned helplessness in that the state of helplessness may result from a variety of causes such as trauma or acute illness without the previously mentioned criteria being met.

A mediational paradigm is an appropriate framework for examining learned helplessness in chronic illness. In such a framework, troublesome aspects of the illness (e.g. symptoms, disability) are assessed along with beliefs about their controllability or lack thereof. Smith, Peck, and Ward (1990), for example, demonstrated that helplessness mediated the effects of RA disease severity on depression. Disease severity was related to depression only through helplessness. Whereas higher disease severity was related to greater helplessness, helplessness alone contributed to depression.

Internality and Health Outcomes

Factor analyses of the AHI and RAI (DeVellis & Callahan, 1993; Stein, Wallston & Nicassio, 1988) have revealed the existence of a seven-item factor assessing "arthritis internality," referring to the magnitude of control beliefs in the face of arthritis. Beliefs in the controllability of adverse life circumstances may be associated with reductions in psychological distress and/or the adoption of problem-oriented coping efforts that may be efficacious in mitigating the impact of adverse events (Folkman & Lazarus, 1989). With regard to chronic pain, beliefs in controllability and the presence of rational thinking in the face of pain have been related to less pain distress and impairment in persons with osteoarthritis and RA (Keefe, Brown, Wallston, & Caldwell, 1989; Keefe et al., 1987). In RA, higher internality scores have been associated with better adjustment, as reflected in negative correlations with several clinical criteria, including pain, disability, and depression (Stein, Wallston & Nicassio, 1988). However, internality has not been as strong a predictor of health outcomes as has helplessness, and relatively sparse attention has been given to the role of this construct in the long-term adjustment of patients with arthritis. Yet, control beliefs, assessing the degree to which persons feel capable and hopeful of diminishing negative outcomes or increasing positive outcomes, play a central role in learned helplessness theory (Abramson, Metalsky & Alloy, 1989). The inclusion of the Internality Subscale in the present study was thus designed to expand our general knowledge of the usefulness of this measure and to determine, specifically, its contribution to explaining health outcomes in FM, a condition in which control beliefs have not been investigated.

OBJECTIVES

The major aim of the present research was to examine the role of helplessness and internality in explaining the psychosocial adjustment of persons with FM. We attempted to replicate the finding that helplessness would mediate the relationship between health status and depression in FM. In addition, we also explored the mediational role of internality. As a departure from previous research, two separate measures of health status were employed: a composite pain index, incorporating a standardized measure of tender point pain used in the clinical evaluation of FM patients; and a measure of the functional capacity of patients, indicative of their overall Quality-of-Well-Being (QWB; Kaplan, Anderson, Wu, Mathews, Kozin, & Orenstein, 1989). The inclusion of pain and disability as distinct indices of health status made it possible to determine if helplessness and internality mediated the effects of pain and/or impact of the condition on clinical outcomes.

This research also applied helplessness theory to an examination of pain behavior. The pain behavior construct, referring to the overt behaviors exhibited by individuals during movement or while stationary that are directly reflective of pain (Keefe & Block, 1982), has assumed a significant role in understanding the functional impairment of chronic pain patients. Even though learned helplessness theory has focused primarily on depression, behavioral ineffectiveness and passive responsiveness may result from appraisals of helplessness. The same model was, therefore, applied to the prediction of pain behavior in FM. To investigate potential differences between subjective and objective aspects of pain behavior, self-report and observer-based measures of pain behavior were included.

METHODS

Procedures

This study is based on data gathered from a comprehensive psychosocial research program on FM that has been described in detail elsewhere (Nicassio et al., 1997). Participants with FM were recruited from the community via public service announcements published in local newspapers, support groups, rheumatology private practices, and university-based rheumatology clinics. Independent confirmation of the FM diagnosis was obtained by contacting each participant's treating physician by telephone or by physician's letter.

Confirmed FM participants were invited to participate in an evaluation session at a clinical research center of a major university medical center. This session involved (1) a physical examination conducted by a rheumatology nurse, adopting the Wolfe et al. (1990) FM criteria of 11 of 18 tender points and widespread musculoskeletal pain (upper and lower body) of 3 months' duration or greater, (2) an assessment of pain, disability, and psychosocial adjustment using standardized measures, and (3) an objective pain behavior assessment protocol. Participants were excluded if they had been diagnosed with other rheumatologic illnesses such as RA, SLE, Hashimoto's disease, Sjogren's syndrome, or scleroderma, or other serious

conditions such as cardiovascular disease, central nervous system disorders, or psychiatric disorders such as psychosis or bipolar illness.

Application of inclusion and exclusion criteria resulted in the elimination of 13 participants, yielding a final sample of 122. The sample consisted of 109 females and 13 males with an average age of 52 years, and illness duration (time since diagnosis) of 12 years. Sixty-three percent of the participants were married, and 88% were of Caucasian descent. The sample was well-educated, with greater than 80% having graduated high school and/or pursued a college degree. All participants resided in San Diego County or in neighboring areas of Southern California. To control FM symptoms, 89% of the participants reported use of analgesics, and 39% reported use of antidepressants.

Assessment of Constructs

Doctoral-level psychology research assistants administered the pain behavior protocol and a battery of self-report and interview measures to FM participants during a 2-hour psychosocial evaluation. A rheumatology nurse, working under the supervision of a clinical rheumatologist, administered the clinical examination in which tender points, pain, and other medical illnesses were evaluated. The assessment focused on the constructs of health status, illness beliefs, depressive symptoms, and pain behavior.

Predictor Variables

Health Status

Pain and disability were conceptualized as distinct components of health status and were measured as separate variables. Pain was measured by an index consisting of the composite of the standardized scores of five separate measures, each of which was correlated significantly with the total index score ($ps < .001$): (1) The Pain Rating Index of the McGill Questionnaire (Melzack, 1975), which consists of the ranked values associated with adjectives selected by the participant as describing sensory, cognitive–evaluative, and affective components of the pain experience; (2) a body area score derived from identifying distinct painful sites on a human figure drawing from the McGill Questionnaire; (3) the four-item pain subscale from the Fibromyalgia Impact and Assessment Questionnaire (Mason, Silverman, Weaver, & Simms, 1992) assessing the degree and impact of pain over the previous week; (4) a flare-up index, consisting of the product of the number of flare-ups and the square of their average intensity over the previous month, measured on a 10 cm visual analog scale; and (5) tender point severity, a measure resulting from the application of the tender point examination according to the protocol established by Wolfe et al. (1990). In this procedure, the rheumatology nurse manually palpated 18 muscle sites, applying approximately 4 kg of pressure, and queried participants regarding the magnitude of the pain they experienced, using the following metric: 0 = no pain, 1 = mild pain, 2 = moderate pain, and 3 = severe pain. An overall score was established by summing across sites.

Disability was assessed with the QWB Scale (Kaplan et al., 1989), a comprehensive, interview-based measure of functional status, consisting of a scale of symptoms, and separate scales of physical activity, social activity, and mobility, based on a report of the participant over the previous week. An algorithm is used to combine data from the four scales, yielding an overall QWB score, ranging from 0 (death) to 100 (optimal functioning). A significant advantage of the QWB is that the metric allows for comparisons to be made across health conditions. The inverse of QWB was used in this study as an index of disability because higher scores indicate better functioning.

Intervening/Mediating Variables

Health Beliefs

The Helplessness and Internality subscales of the RAI assessed beliefs about the symptoms and impact of FM. The RAI is a derivation of the AHI (Nicassio et al., 1985), and differs from the AHI only by its use of the term *condition* rather than *arthritis*. Separate factor analyses of the AHI (Stein, Wallston, & Nicassio, 1988) and RAI (DeVellis & Callahan, 1993) have confirmed the existence of the Helplessness and Internality subscales in both measures. The Helplessness Subscale is comprised of five items assessing the extent to which participants feel helpless in affecting important symptoms and outcomes of their condition (e.g., “I would feel helpless if I couldn’t rely on other people for help with my condition,” “No matter what I do or how hard I try, I just can’t get relief from my pain”). In contrast, the seven-item Internality Subscale taps beliefs measuring illness controllability (e.g., “If I do all the right things, I can successfully manage my condition,” “I can do a lot of things to cope with my condition”). Three of the items do not load on either the helplessness or internality factor and are not used in the scoring of either subscale (see Stein et al., 1988).

Item analyses of the two subscales were conducted to examine reliability and item-total statistics. Cronbach’s alpha for the Helplessness Subscale was .53, indicative of lower internal consistency than the alphas of .63 and .67 reported by Stein, Wallston, and Nicassio (1988) and DeVellis and Callahan (1993), respectively. However, because all items correlated significantly with the total, and each item, when removed, lowered the alpha for the scale, all five items were retained. Application of the Spearman–Brown prophecy formula yielded an alpha of .77, an acceptable level of reliability, when the five-item scale was projected to a scale of 15 items. The 15-item RAI had an alpha in this research of .66. Analysis of the Internality Subscale revealed that item 2, “Managing my condition is my own responsibility,” and item 11, “Usually I can tell when my condition will flare up,” did not correlate with the scale total and increased scale alpha when they were removed. The subtraction of these items resulted in an alpha for the 5-item version of the scale of .70, the equivalent of an alpha of .88 for a 15-item measure. The correlation between helplessness and internality was $-.34$, indicative of an opposite pattern, yet substantial independence, in the two measures.

Outcomes

Depression

The Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) was used to assess the prevalence of depressive symptoms. The CES-D was designed for research evaluating depressive symptomatology in community samples and has been effectively adopted in studies of patients with chronic illness (Derogatis, Fleming, Sudler, & DellaPietra, 1995) and chronic pain (Turk & Okifuji, 1994). Four dimensions—depressed affect, positive affect, somatic problems, and interpersonal problems—have been identified as fundamental to the scale. The participant reports the frequency of 20 symptoms reflecting these dimensions over the previous week.

Pain Behavior

Pain behaviors are responses of the individual resulting from the subjective experience of pain. Two methods of assessing pain behavior were adopted in this research. *Self-reported pain behavior* was measured by the Pain Behavior Checklist (PBCL) (Kerns, Haythornthwaite, Rosenberg, Southwick, Giller, & Jacob, 1991), a 17-item scale divided into four dimensions: affective distress, distorted ambulation, seeking help, and facial/body distortion. Participants rate the frequency with which they exhibit specific responses (e.g., walk with a limp) when they have pain on 6-point Likert scales, ranging from 0 = never to 6 = very often. A total pain behavior score was derived by summing across the four dimensions. In addition, *observed pain behavior* was assessed with the protocol developed by Keefe and Block (1982). Participants were videotaped in a clinical office over a 10-minute interval while being directed by research assistants to stand, walk across the room, and sit and recline on an examining table. Research assistants rated each videotaped segment, divided into 30-second scoring intervals, for the occurrence of five discrete pain behaviors (guarded movement, bracing, facial grimacing, rubbing, and sighing). A total pain behavior score was achieved by summing across pain behaviors for each 10-minute segment. Interrater reliability was consistently high, ranging between .80 and .95 between all pairs of raters.

RESULTS

Descriptive Findings

Descriptive data on key study variables are presented in Tables I and II. Of particular significance are scores on helplessness, depression, and QWB. Helplessness scores ($M = 17.93$) are higher than scores reported by Tayer (1996) for SLE patients ($M = 14.45$) with the RAI, and by Stein, Wallston, Nicassio, and Castner (1988) for RA patients ($M = 15.03$) with the Helplessness Subscale of the AHI. CES-D and QWB scores also reflect significant psychosocial impairment. The mean CES-D score (20.13) is substantially higher than the cutoff score of 16 for detecting depression in community samples (Radloff, 1977) and surpasses a revised

Table I. Descriptive Statistics for Variables in the Model

Variable	Mean	SD	Range
Pain	-.01	3.34	-7.13 to +7.85
Quality of Well-Being (QWB)	.57	.07	.41-.71
Helplessness	17.93	4.83	6-30
Internality	18.87	5.14	5-30
Depression	20.13	10.74	2-49
PBCL	38.07	16.31	11-83
Obs. PB	5.23	5.00	0-20

Note: PBCL = Pain Behavior Checklist scores; Obs. PB = Observed Pain Behavior scores.

cutoff of 19 that Turk and Okifuji (1994) recommended for chronic pain patients. Similarly, QWB scores ($M = .57$) are far below those found for a range of populations, including normals and those with a range of chronic conditions such as arthritis, diabetes, and hypertension (Fryback et. al., 1993). Using the formula developed by Orenstein and Kaplan (1991), a QWB score of .57 is equal to approximately 11 well-years lost due to illness for the sample, indicative of a high degree of functional impairment.

Zero-order correlations among the variables in the model are presented in Table II. As anticipated, high pain and low QWB were associated with higher levels of depression and greater self-reported and observed pain behavior. Helplessness was negatively correlated with QWB and positively correlated with depression, pain, and self-reported pain behavior (all $ps < .01$). In contrast, internality was negatively correlated with pain and PBCL scores, but was unrelated to QWB, depression, and observed pain behavior. The outcomes of depression, self-reported pain behavior and observed pain behavior, were slightly to moderately correlated with each other.

Test of the Model

The hypothesized model describing the relationship between health status variables, health beliefs, and depression is depicted in Fig. 1. The model predicted that helplessness and internality would mediate the contribution of pain and disabil-

Table II. Correlations among Variables in the Model

	Pain	QWB	Helplessness	Internality	Depression	PBCL	Obs. PB
Pain	—	—	—	—	—	—	—
QWB	-.46 ^a	—	—	—	—	—	—
Helplessness	.44 ^a	-.37 ^a	—	—	—	—	—
Internality	-.25 ^b	.12	-.34 ^a	—	—	—	—
Depression	.55 ^a	-.50 ^a	.54 ^a	-.15	—	—	—
PBCL	.46 ^a	-.46 ^a	.48 ^a	-.19 ^c	.56 ^a	—	—
Obs. PB	.31 ^b	-.37 ^a	.06	-.13	.18 ^c	.28 ^b	—

^a $p < .001$.

^b $p < .01$.

^c $p < .05$.

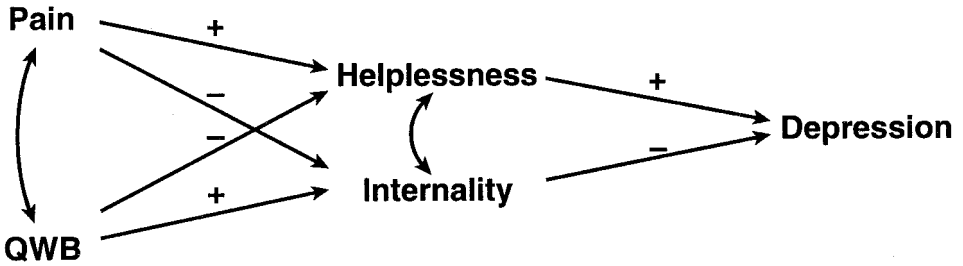


Fig. 1. Hypothetical model of the relationship between health status, health beliefs, and depression in FM. Note: → indicates hypothesized path between constructs; \curvearrowright indicates zero-order correlation among constructs.

ity to depression. Specifically, higher levels of pain and disability (low QWB) were expected to contribute to higher helplessness and low internality, which, in turn, would lead to higher depression.

Before the model was tested, hypothesized paths between uncorrelated variables were removed. Thus, the path from QWB to internality was eliminated, as were the paths from internality to depression and internality and helplessness to observed pain behavior. In all cases, sociodemographic variables that covaried with outcomes were removed before the model was evaluated.

Hierarchical multiple regression analyses using path analytic procedures were conducted separately for each outcome. According to a mediational paradigm (Baron & Kenny, 1986), helplessness and/or internality would qualify as mediators of pain and QWB on outcomes provided that: (1) pain and QWB independently predicted helplessness and/or internality, (2) pain and QWB independently predicted outcomes, (3) helplessness and/or internality independently predicted outcomes, and (4) the paths between pain and QWB and outcomes would become nonsignificant after including helplessness and/or internality in the regression equation.

Prediction of Helplessness and Internality

The paths from pain and QWB to helplessness and internality were examined in separate regressions. After controlling for age, which was negatively correlated with helplessness ($r = -.19$) on the first step of the analysis, $F(1,120) = 4.33$, $p < .05$, pain and QWB were highly significant, $F(3,118) = 15.47$, $p < .001$, explaining 20% of the variance in helplessness scores. High pain, $t(118) = 3.36$, $p < .01$, and low QWB, $t(118) = -2.42$, $p < .05$, were independently related to greater helplessness, as predicted in the model. High pain also predicted low internality, $F(1,120) = 7.96$, $p < .001$, explaining 6.2% of the variance in internality scores.

Depression

After removing the effects of age ($r = -.23$) on depression scores, $F(1,120) = 7.03$, $p < .01$, pain and QWB jointly explained 34.5% of the variability in depression, $F(3,118) = 33.90$, $p < .001$ (R^2 change). As anticipated, higher pain, $t(118) = 4.60$, $p < .001$, and low QWB, $t(118) = -3.98$, $p < .001$, independently predicted greater

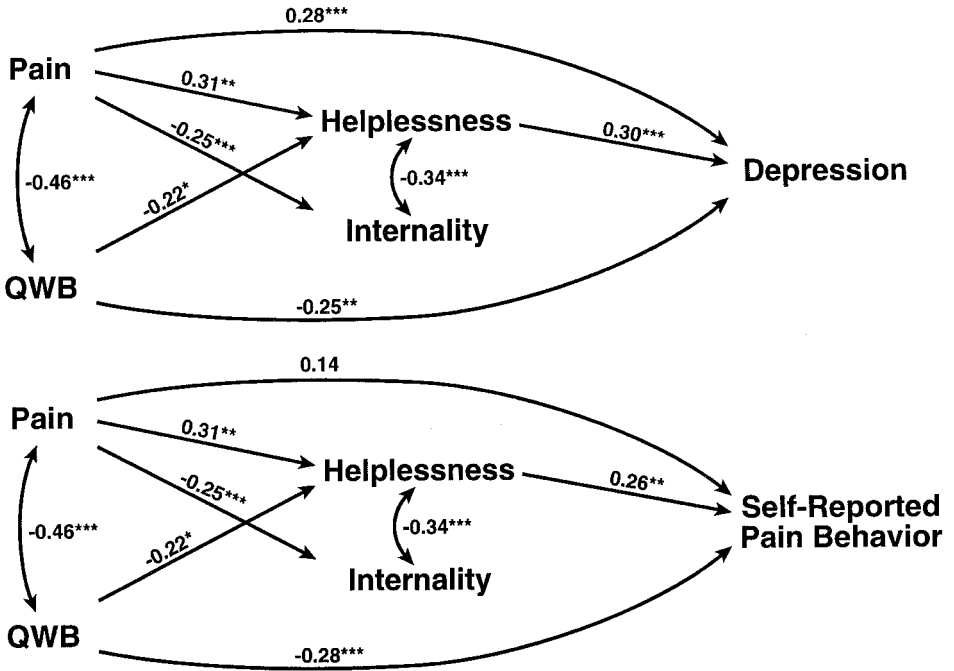


Fig. 2. Empirical model illustrating the role of health status and helplessness in depression and self-reported pain behavior in FM. Note: Direct and mediational paths between constructs are represented by standardized regression coefficients. Relationships between Pain and QWB, and Helplessness and Internality, are represented by correlation coefficients. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

depression. When helplessness was entered on the next step, it uniquely contributed 6.9% variance in depression $\{F(4,117) = 15.25, p < .001\}$. However, because the paths from pain and QWB remained significant, helplessness only partially mediated the relationship between health status measures and depression. Despite their independent effects, a large proportion of the variance previously accounted for by pain and QWB was explained by helplessness, as reflected by a reduction in sr^2 from .108 to .056 for pain, and from .081 to .048 for QWB, after helplessness entered the equation. The derived model depicting significant paths between variables is presented in Fig. 2. The model explained 46.9% of the variance in depression (Table III).

Table III. Multiple Regression Analysis Predicting Depression

Step	Variable	df	R^2	R^2 Change	F	sr^{2a}	sr^{2b}	β
1	Age	(1,120)	.055	—	7.03 ^a	.053	.008	-.09
2	Pain	(3,118)	.400	.345	33.90 ^b	.108	.056	.28 ^b
3	QWB	(4,117)	.469	.069	15.25 ^b	.081	.048	-.25 ^a
	Helplessness						.069	.30 ^b

Note: sr^{2a} before mediator; sr^{2a} after mediator.

^a $p < .01$.

^b $p < .001$.

Self-Reported Pain Behavior

The direct paths of pain and QWB to PBCL scores were examined after controlling for age and race (caucasian/other), which were significant on the first step of the analysis, $F(2,119) = 11.64, p < .001$. Lower age was associated with higher PBCL scores, $t(119) = -4.23, p < .001$, but race did not uniquely predict this criterion. On the following step, pain and QWB predicted pain behavior, $F(4,117) = 21.91, p < .001$, contributing 22.8% of the variability in PBCL scores (R^2 change). High pain, $t(117) = 2.72, p < .01$, and low QWB, $t(117) = -4.11, p < .001$, separately predicted greater pain behavior. Helplessness and internality were significant on the next step, $F(6, 115) = 5.46, p < .01$, although only helplessness uniquely predicted PBCL scores, $t(115) = 3.18, p < .01$, explaining 4.9% of the variance.

The entry of helplessness into the equation caused the path from pain to pain behavior to become nonsignificant, whereas the direct effect of QWB was preserved. The unique contribution of QWB to pain behavior, however, was reduced from an sr^2 of .088 to .058 with helplessness in the equation. Therefore, the findings indicate that helplessness fully mediated the effects of pain on pain behavior, but only partially mediated the effects of QWB on PBCL scores (see Fig. 2 and Table IV). The full model accounted for 44.4% of the variance in PBCL scores.

Because depression and PBCL scores were moderately ($r = .56$) correlated, the path from helplessness to pain behavior was reexamined after partialing out the effects of depression from PBCL scores. Higher helplessness continued to be associated with higher pain behavior, $F(6,115) = 5.30, p < .05$, after controlling for depression.

Observed pain behavior

Sociodemographic factors were unrelated to observed pain behavior scores. Pain and QWB jointly accounted for 16.6% of the variance in this criterion, $F(2,113) = 11.26, p < .001$. Only QWB $t(113) = -3.05, p < .01$, uniquely contributed to pain behavior, accounting for 6.9% of the variance. The contribution of pain, $t(113) = 1.82, p = .07$, did not reach significance (Table V).

RAI Items as Predictors of Depression and PBCL Scores

In order to shed light on the role of specific helplessness beliefs, Table VI presents zero-order and partial correlations illustrating the relationship between

Table IV. Multiple Regression Analysis Predicting Self-Reported Pain Behavior

Step	Variable	<i>df</i>	R^2	R^2 Change	<i>F</i>	sr^{2a}	sr^{2b}	β
1	Race	(2,119)	.164	—	11.64 ^a	.002	.003	-.06
	Age					.129	.062	-.28 ^a
2	Pain	(4,117)	.391	.227	21.90 ^a	.038	.014	.14
	QWB					.088	.058	-.28 ^a
3	Internality	(6,115)	.444	.053	5.46 ^b		.000	.00
	Helplessness						.049	.26 ^b

Note: sr^{2a} = before mediators; sr^{2b} = after mediators.

^a $p < .001$.

^b $p < .01$.

Table V. Multiple Regression Analysis Predicting Observed Pain Behavior

Step	Variable	<i>df</i>	R^2	R^2 Change	<i>F</i>	sr^2	β
1	Pain					.025	.18
	QWB	(2,113)	.166	—	11.26 ^a	.069	-.30 ^a

^a $p < .01$.

individual Helplessness Subscale items and depression and self-reported pain behavior. All zero-order relationships between RAI items and depression and PBCL scores were significant and in the positive direction. The strongest correlation for both depression and PBCL scores was with item 13, "I am coping effectively with my condition." The partial correlations with this item retained significance after controlling for pain, QWB, and demographics. The partial correlation of item 1, "My condition is controlling my life," also remained significant with PBCL scores. Partial correlations with other RAI items were not significant. Thus, appraisals of coping efficacy and the degree to which participants felt controlled by their condition uniquely explained variability in outcomes, independently of other items in the scale, health status parameters, and demographic variables.

DISCUSSION

It was anticipated that levels of helplessness would be high in this population due to the uncertainty about the nature of FM, its troublesome symptoms, and course of management. The study confirmed that helplessness scores were considerably higher than those reported for RA (Stein, Wallston, Nicassio, & Castner,

Table VI. Correlations Between Individual Helplessness Items, Depression, and Self-Reported Pain Behavior

Item		Depression		Pain behavior	
		<i>r</i>	Partial r^2	<i>r</i>	Partial r^b
1.	"My condition is controlling my life."	.32 ^c	.17	.38 ^d	.23 ^c
10.	"I would feel helpless if I couldn't rely on other people for help with my condition."	.27 ^c	-.09	.29 ^c	.03
12.	"No matter what I do or how hard I try, I just can't seem to get relief from my pain."	.35 ^d	.12	.21 ^c	.00
13.	"I am coping effectively with my condition."	.41 ^d	.30 ^c	.39 ^d	.24 ^c
14.	"It seems as though fate and other factors beyond my control affect my condition."	.29 ^c	.15	.18 ^c	.03

^aAdjusted for age, pain, and QWB.

^bAdjusted for age, race, pain, and QWB.

^c $p < .01$.

^d $p < .001$.

^e $p < .05$.

1988) and SLE samples (Tayer, 1996). The findings also illustrated the role that helplessness beliefs play in augmenting the impact of pain and disability in this condition.

A model was tested in which helplessness was postulated as a mediator of health status on depression. Although framework was similar to the one examined by Smith et al. (1990) with RA patients, it provided unique information on the role of helplessness in mediating the effects of pain and disability separately. The data showed that high pain and low QWB were each related to higher helplessness, which, in turn, was associated with higher depression scores. However, because both pain and disability retained their unique relationship with depression, helplessness served as only a partial mediator of their impact. In contrast, Smith et al. (1990) showed that helplessness fully explained the relationship between disease severity and depression in RA. Our findings showed that although helplessness may serve as one mechanism through which pain and disability may affect depression in FM, it does not function as an exclusive linkage to mood disturbance.

A reason for the independent contribution of pain and disability to depression may be attributable to the inherently impactful nature of these problems in the day-to-day functioning of FM patients. FM pain is comparable in intensity to RA pain, but at the same time, is more distressing and dispersed spatially over a greater number of body regions (Leavitt, Katz, Golden, Glickman, & Layfer, 1986). Moreover, QWB scores for this sample were lower than those found for a variety of other serious medical conditions (Fryback et al., 1993) with known pathophysiologies. Loss may be a particularly important factor in explaining depression in FM. High levels of disability may pose significant losses in key role performances that may be particularly distressing to FM patients who may be searching for a medical basis to their impairment. Although helplessness may compound the effects of such loss, disability may lead to depression in the absence of such beliefs. Other pathways to depression may thus be operative.

The application of the model to an analysis of pain behavior revealed some new insights on the contribution of the learned helplessness paradigm to the expression of pain. The role of helplessness varied, depending on the mode of measurement of pain behavior. Helplessness fully mediated the impact of pain on self-reported pain behavior in that pain had no relationship with PBCL scores independently of helplessness. Helplessness was partly responsible for the relationship between QWB and self-reported pain behavior, but QWB also retained a significant and independent relationship with PBCL scores.

It is interesting that helplessness plays a key role in explaining the impact of pain and disability on how participants characterize the behavioral expression of their pain. An explanation for this association may be that the Helplessness Subscale and PBCL both measure appraisals of the pain problem. For example, the belief that one is helpless in controlling pain and the belief that pain interferes with ambulation are judgments. Depression was not responsible for this relationship because the effect of helplessness on self-reported pain behavior was maintained after controlling for depression. Supporting evidence for this position was found in the significant partial correlations of RAI items, "My condition is controlling my life," and "I am coping effectively with my condition," with PBCL scores.

Negative appraisals may reflect the existence of higher-order illness schemas that may influence illness behaviors and functional impairment (Clemmey & Nicassio, 1997).

In contrast, helplessness was unrelated to observed pain behavior. In fact, only QWB independently predicted observed pain behavior scores, although the effect of pain was not significant. These findings, coupled with the independent association of QWB with self-reported pain behavior described, indicate that pain behavior is a more accurate barometer of function than pain in FM. The lack of an independent association between pain and pain behavior in this sample raises a question concerning the construct validity of both pain behavior measures that were primarily designed to assess the impact of pain rather than functional aspects of the adjustment of chronic pain patients (Keefe & Block, 1982; Kerns et al., 1991). However, because these measures were developed for use with other kinds of chronic pain populations, they may lack sensitivity to the unique behavioral features of FM pain and may need to be adapted for this condition. Unlike chronic low back pain and arthritis, FM is a chronic pain disorder involving the entire body in which other forms of pain behavior may be evident (e.g., shifting of body weight, restless movement in legs). Further assessment of the pain behavior construct in FM is thus needed.

Internality had no impact on outcomes in the model. Although high pain and low QWB were associated with lower perceived control over FM, internality had no independent relationship with depression, self-reported pain behavior, and observed pain behavior. These findings coincide with results reported by Stein, Wallston, and Nicassio (1988), who found helplessness to be more strongly related to clinical outcomes than internality in their psychometric analysis of the AHI with RA patients. As indicated by their modest correlation, low internality and high helplessness are not assessing the same construct. Their distinctiveness may explain why they do not have a similar impact on mood and functional aspects of adjustment in RA and FM. Evidence points to the need to reconceptualize the role of control in learned helplessness theory. Perhaps low perceived control should be seen as an antecedent of helplessness rather than as a variable that functions in parallel fashion with helplessness to predict outcomes. Alternatively, Wallston, Wallston, Smith, and Dobbins (1987) have emphasized the importance of control as a moderator of other variables in predicting health outcomes, and of distinguishing between control over symptoms, the performance of health behaviors, and health-related situations. Further analysis of the Internality Subscale as it interacts with illness stressors or as a determinant of health behaviors (e.g., health-care seeking) may lead to new information on the relevance of this construct in FM.

SUMMARY

This study emphasizes the need for further research on the helplessness construct in FM and has provided partial support for learned helplessness theory in chronic illness as articulated by Peterson (1982) and as examined by Smith et al. (1990) in RA. The evidence suggested that helplessness may act as a mechanism through which pain and disability may affect mood disturbance and self-reported

pain behavior. However, although these data are consistent with other chronic illness research, they should be interpreted cautiously. Because the study was cross-sectional in nature, the directionality between constructs could not be determined. Depression, for example, may be a contributing factor to helplessness, pain, and disability, suggesting that the findings may be indicative of a reverse causal sequence. Additional research on the impact of helplessness on changes in mood and the functional adaptation of FM patients is therefore needed in longitudinal research in which mediational processes can be prospectively examined. Alternate theoretical models are recommended for the study of internality which are distinct from the learned helplessness paradigm.

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