SEX DIFFERENCES IN THE PRESENTATION OF CHRONIC LOW BACK PAIN

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Sex differences in 351 patients with chronic low back pain were examined. Biological, psychological, and psychosocial factors were considered. Sex differences in adaptive functioning were consistent with traditional gender roles. Significant interactions were found for sex and employment status, and sex and marital status. Retired women reported more pain and less activity than retired men. Retired men reported the least pain of any group. Outdoor work and social activities show opposite within-group patterns for men and women when stratified by employment status. Marriage was associated with more household work for women and less for men. The financial and social contexts of employment status and marriage are different for men and women. Results suggest the treatment of women with chronic low back pain requires attention to work in the home and the financial and social context of work outside the home.

Although sex differences are now recognized as important variables in health-related research, sex is still not routinely included as a factor in studies of chronic pain. Sex is often considered a “fuzzy” variable inasmuch as sex comprises many differences in anatomy, physiology, and hormonal makeup as well as the cumulative effects of experience (McHugh, Koeske, & Frieze, 1986). Sex differences indicate that there is something about the experience of being a man or a woman that needs to be identified (Fagley & Miller, 1990). Knowledge of sex differences in chronic low back pain has the potential to affect treatment, outcome expectations, and outcome measures. This study was undertaken in order to understand the nature and quality of sex differences in the presentation of chronic low back pain.

**Psychosocial Factors**

Any examination of sex differences needs to account for prominent psychosocial factors related to sex. Employment and marriage have considerable psychosocial influence. Ample evidence suggests that women and men are likely to experience employment and marriage differently. Arguably, an investigation of sex differences needs to consider the interactions among sex, marriage, and employment.

In the U.S., large sex differences continue to exist in employment. The majority of employed women are still clustered in low-paying, female dominated positions (Women Employed Institute, 2000). Women earn less than men despite equivalent education. Moreover, as level of education for men and women increases, the gap in wages between the sexes increases as well (Women Employed Institute, 2000). Although there has been some improvement in the past 30 years, women still earn less than 73% of every dollar earned by men (National Council of Women’s Organizations, 2001; U.S. Bureau of the Census, 2000; Women’s Bureau, 2001; Women Employed Online, 2001).

Even though women earn less than men, women continue to shoulder a large proportion of the financial responsibility for their families. Nearly two-thirds of employed women report they provide at least half of their family’s income and nearly one in five U.S. families is headed by a single woman (Women Employed Institute, 2000).
Incongruities in the pay scale translate to increased financial stress throughout the lifespan into old age as lower lifetime earnings reduce Social Security benefits and access to pension plans (Women Employed Institute, 2000). Older women today prepared for retirement when women were paid less than 73% of every dollar earned by men. Only 32% of women retirees receive a pension, compared with 55% of men retirees. The median pension benefit paid to women is also less than half that paid to men (Women Employed Institute, 2000). Significantly more retired women than men are economically dependent on Social Security benefits (Barusch, 1994; National Council of Women’s Organizations, 2001; The Office of Policy, 2001a; The Office of Policy, 2001b).

Employment status, including retirement, is associated with different income levels for women and men. A significant number of women live in poverty or financial stress despite employment or retirement benefits (Women Employed Institute, 2000). A large body of literature spanning numerous specialties and disciplines indicates that poverty and financial stress are consistently associated with increased stress and depressive symptoms, increased pain, and other health and mental health related problems (McGrath, Keita, Strickland, & Russo, 1991; Meana, 1998).

The experience of marriage is another prominent psychosocial factor related to sex differences. Married persons generally have higher household incomes than unmarried persons. The economic benefits of marriage are greater for women than for men. Marriage appears to predict health-related resilience for both married men and women (Basic Behavioral Science Task Force of the National Advisory Mental Health Council, 1996). Married persons generally report greater overall well-being and less psychological distress than unmarried persons; however, these relationships are stronger and more consistent for men than for women (Basic Behavioral Science Task Force of the National Advisory Mental Health Council, 1996; McRae & Brody, 1989). Numerous factors appear to mediate relations among sex, marriage, and health outcomes, including relationship quality and the employment status of women (Dennerstein, 1995; Flowers, 1991; Hibbard & Pope, 1993; Levenson, Carstensen, & Gottman, 1993; McRae & Brody, 1989; Muller, 1986; Waldron, Hughes, & Brooks, 1996).

Whatever the various processes behind these differences, marriage remains associated with different health and mental health outcomes in women and men.

**Biological Factors**

There is substantial evidence for a biological basis for sex differences in pain perception (Berkley, 1997). In laboratory studies, women demonstrate: (a) greater ability to discriminate among pain intensities, (b) lower pain thresholds, (c) higher pain ratings, and (d) less tolerance of noxious stimuli than men (Ellermeier & Westphal, 1995; Feine, Bushnell, Miron, & Duncan, 1991; Fillingim & Maixner, 1995; Goolkasian, 1985; Lander, Fowler-Kerry, & Hill, 1990; Lautenbacher & Rollman, 1993; Maixner & Humphrey, 1993; Procacci, Buzzelli, Passeri, Sassi, Voegelin, & Zoppi, 1972; Rollman, 1993; Velle, 1987). There are significant sex differences in the pain responses of other animals as well (Bodnor, Romero, & Kramer, 1988). In both humans and other animals, sex differences in pain perception are modulated by sugar consumption, menstrual or estrous phase, and reproductive status. Women report more multiple pains in more body regions than men (Berkley, 1997; Meana, 1998). A number of pain disorders such as rheumatoid arthritis, Raynaud’s disease, and migraine show differential sex prevalences. Additionally, many diseases such as coronary heart disease, irritable bowel syndrome, and acute appendicitis present with actual differences in reported pain symptoms for men and women (Berkley, 1997). Berkley (1997) presents a convincing deductive argument for biological differences in pain perception based on structural and hormonal composition including the neuroactive agents associated with analgesia. Also considered is the temporal role of hormonal action in the conditioning of pain perception. Although there is much that is not understood, there is clearly a sex-linked biological element in pain perception.

On the other hand, there is no evidence that sex-linked differences in pain perception generalize to the clinical presentation of chronic pain. Many of the laboratory-induced pain differences are relatively minor and inconsistently observed (Berkley, 1997; Miaskowski, 1999). There is also no accepted theoretical foundation for these sex differences, or for sex differences in pain perception that vary as a function of hormonal and nutritional status in both women and men. Sex differences in pain often vary as a function of: (a) what is being measured, for example, psychological or physiological assessments of pain; (b) where the measures are taken, for example, home, survey in waiting room, and so forth; (c) who is being studied, for example, age, ethnicity, and health condition; (d) when they are studied, for example, time of day, interval of time over which pain is assessed, retrospective report versus current report; and (e) how they are studied, for example, diaries, visual analogue, brain imaging, questionnaires (Berkley, 1997, p. 372). Sex differences also exist in willingness to report, coping, and treatment response (Berkley, 1997; Ellermeier & Westphal, 1995; Miaskowski, 1999). There is also evidence that clinicians respond differently to men’s and women’s pain (Miaskowski, 1999).

These factors have led some to throw up their hands and conclude that sex is inconsequential in the presentation of chronic pain (Turk & Okifuji, 1999). In fact, one multisample analysis strongly suggests sex differences in clinical pain intensity are not clinically significant (Robinson, Wise, Riley, & Atchison, 1998). Nevertheless, consideration must be given to existing sex prevalence ratios of pain disorders as well as the sex differences in the clinical presentation of several diseases. Disregarding sex entirely seems
premature without a clear, full understanding of the role of sex and gender in the presentation of chronic pain.

Psychological Functioning

Both depression and pain disorders occur more frequently in women than men. Women suffer from depression at nearly twice the rate of men (American Psychiatric Association, 1994; Meana, 1998). Evidence suggests that the comorbidity of pain disorders and depression is also higher in women than men (Fishbain, Goldberg, Meagher, Steele, & Rosomoff, 1986; Magni, Caldieron, Rigatti-Luchini, & Merskey, 1990; Magni, Moreschi, Rigatti-Luchini, & Merskey, 1994). Although there is no widely accepted explanatory model of the nature of the relations among pain and depression and their sex-linked frequencies, the evidence suggests that women with low back pain will report more depressive symptoms than men.

Symptoms of anxiety occur at a relatively high frequency in patients with chronic low back pain (Krishnan, France, Pelton, McCann, Davidson, & Urban, 1985; Novy, Nelson, Goodwin, & Rowzee, 1993). Although anxiety disorders occur more frequently in women, there is little exploration of the sex differences in anxiety symptoms between women and men with chronic pain. A psychometric examination of the State-Trait Anxiety Inventory (STAI) with pain patients found no significant differences by sex (Novy et al., 1993). However, anxiety symptoms are strongly associated with symptoms of depression in patients with chronic pain (Krishnan et al., 1985), and there is evidence that depressive symptoms occur more frequently in women with chronic pain (Magni et al., 1990; Magni et al., 1994; Meana, 1998). This suggests that anxiety symptoms may occur more frequently in women.

Pain expectancy models propose that expectancies of potential harm modulate resources allocated to activities (Lackner, Carosella, & Feuerstein, 1996; Turk & Rudy, 1992). Strong expectancies of pain often reduce effort and persistence and increase avoidance associated with established adaptive behavioral goals. Avoidance behaviors such as lying down, reclining, or sitting in response to pain are associated with increased pain expectancy (Linton & Melin, 1982). Although an imperfect correspondence exists between reported pain intensity and actual physical activity, the pain expectancy model suggests that persons who experience and expect more pain will engage in more frequent avoidance behaviors and less adaptive functioning.

Summary

Biological evidence suggests that women and men may experience chronic low back pain differently. The biological model predicts that women will experience more pain, will experience more psychological dysfunction because they are in more pain, and will demonstrate less adaptive functioning because they expect more pain. Psychosocial evidence suggests that women are at a disadvantage when coping with chronic low back pain. Due to the effects of unequal wages, women are more likely to suffer from financial stress across the lifespan whether employed, unemployed, or retired. Women are also less likely than men to benefit physically and psychologically from marriage. If marriage and employment status are significant psychosocial factors in the examination of sex differences in chronic low back pain, the results will show significant interactions between sex and these factors. If marriage and employment status do not contribute to sex differences and there are simply broad biologically based sex differences in pain perception, then the results are likely to show uniform differences in pain and dysfunction between women and men and no significant interactions between sex and these psychosocial variables.

This study examines the nature of sex differences in patients with chronic low back pain on: (a) pain intensity as measured by the short form of the McGill Pain Questionnaire (SF-MPQ), (b) psychological functioning as measured by the Beck’s Depression Inventory (BDI) and the State-Trait Anxiety Inventory-State scale (STAI-S), and (c) adaptive functioning as measured by the four activity level scales of the Multidimensional Pain Inventory (MPI). These instruments are widely used to best capture chronic pain patients’ experience on each of these dimensions (Mikail, DuBreuil, & D’Eon, 1993).

METHOD

Participants

Three hundred fifty-one consecutive new patients (N = 351; 199 women and 152 men) from two pain rehabilitation clinics in the Chicago metropolitan area participated in this study over a two-year period. All participants presented for assessment and treatment of low back pain. The measures used were part of routine practice. No incentives were provided. All patients held some form of insurance or made arrangements to pay their medical bills themselves. Mean patient age was 50.65 years. Mean duration of pain was 42.27 months. The majority of patients (77%) identified themselves as Caucasian, 13% as African American, 5% as Hispanic, and 5% as Asian or Native American. Most participants (40%) worked outside the home full- or part-time, or were full-time homemakers. Thirty-three percent (33%) were permanently/temporarily disabled or unemployed. Twenty-seven percent (27%) were retired. The majority of patients (59%) were married. Most patients reported having attended some postsecondary schooling, trade school, and/or college (58%).

The most frequent diagnosis was radiculopathy (38.7%), followed by spinal stenosis and herniated disk (21.5% and 12.9%, respectively). Other diagnoses occurring with relative infrequency (<4%) included failed back syndrome, myofascial pain syndrome, neuralgia, arthritis, and multiple diagnoses. Patients most often (76%) reported a history of no back surgery, 22% had one prior surgery, and 2% had...
more than one prior surgery. Seven percent reported that they were involved in present or past litigation related to their pain.

**Measures**

**Beck Depression Inventory (BDI).** The BDI is a self-report measure widely used to assess cognitions associated with depression (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; Beck, Steer, & Garbin, 1988; Novy, Nelson, Francis, & Turk, 1995; Turner & Romano, 1984). The BDI demonstrates internal consistency (.86) and reliability. Test-retest coefficients range from .48 to .86 depending upon retesting interval and population. Content, concurrent, and discriminant validity is generally favorable (Groth-Marnat, 1997). Moderate correlations (.72 to .76) are found with other popular measures of depression as well as clinician ratings of depression (Beck et al., 1988). Scores range from 0 to 63 with higher scores indicating greater levels of depression.

**State-Trait Anxiety Inventory-State Score (STAI-S).** The STAI comprises two self-report scales measuring state (STAI-S) and trait (STAI-T) anxiety (Novy et al., 1993; Spielberger, 1988). Only the STAI-S scale was used in this study. The STAI-S assesses a transitory emotional condition characterized by subjective, consciously perceived feelings of tension, apprehension, nervousness, worry, and heightened activation of the autonomic nervous system. The internal consistency of the STAI-S is quite high (.90). Test-retest reliabilities have been low with the STAI-S and high with the STAI-T as would be expected. Construct and concurrent validity of the STAI have been demonstrated (Spielberger, Gorsuch, & Lushene, 1970). There are 20 STAI-S items requiring persons to rate the intensity of a feeling at a particular moment on a four-point scale. Scores range from 20 to 80. Higher scores indicate greater levels of anxiety.

**Short Form–McGill Pain Questionnaire (SF-MPQ).** The SF-MPQ is a 15-item adjective checklist of pain descriptors (11 sensory; 4 affective) rated on a 4-point intensity scale (0 = none to 3 = severe). Three pain scores assess the sensory (SF-MPQ-Sen), affective (SF-MPQ-Aff), and total (SF-MPQ-Tot) dimensions of the pain experience (Melzack, 1987). The SF-MPQ-Sen rates sensory or noxious aspects of pain with scores ranging from 0 to 33. The SF-MPQ-Aff rates emotional aspects of pain with scores ranging from 0 to 12. The SF-MPQ-Tot provides a summary measure ranging from 0 to 45. Correlation coefficients between the SF-MPQ and the Long Form-MPQ range from .77 to .92. Similar to the Long Form, SF-MPQ is sensitive to the effects of traditional therapies and is able to provide discriminatory information about different pain syndromes (Melzack, 1975; Melzack, 1987). Higher scores indicate greater pain intensity.

**Multidimensional Pain Inventory (MPI).** The MPI is a comprehensive, 61-item questionnaire with 13 subscales assessing the impact of pain on psychosocial and behavioral functioning. The four subscales designed to assess adaptive activity level were utilized in this study: Household Chores (MPI-Chor), Outdoor Work (MPI-Out), Activities Away from Home (MPI-Act), and Social Activity (MPI-Soc). These subscales consist of 19 items that assess the effects of pain on each adaptive domain. Each question is rated on a 7-point frequency scale that ranges from 0 = never to 6 = very often. Item frequencies in each domain are totaled and divided by the number of items. Subscale scores range from 0 to 6. Adequate reliability and discriminant validity have been demonstrated for the MPI and these four subscales in particular (Deisinger, Cassisi, Lofland, Cole, & Bruehl, 2001; Kerns, Turk, & Rudy, 1985; Turk & Rudy, 1990). Higher scores indicate a higher level of activity.

**Procedure**

Patients were administered the BDI, STAI-S, MPI, and SF-MPQ as part of routine clinical intake procedures. Summary scores and medical diagnoses were entered into a computerized record system. Identifying information was deleted after being exported into the database.

**RESULTS**

**Preliminary Analyses**

In order to alleviate unbalanced cell sizes and provide for parsimonious analysis and interpretation, the demographic categories of employment and marital status were consolidated. Originally, there were five categories of marital status, six categories of employment, and several unbalanced and/or empty cells. Because of the traditional albeit truncated categories offered to participants and the lack of guidance from the literature, this task was the cause of much deliberation which resulted in the following: Employment status was categorized as employed (working outside the home part-time or full-time, full-time homemaker, and not self-reporting as retired), unemployed (temporarily or permanently disabled or unemployed), or retired (retired by self-report or eligible for Social Security retirement benefits due to age > 61). Marital status was categorized as married (living with spouse) or unmarried (not living with spouse, separated, divorced, widowed, single).

In much of the literature, retirement is excluded from the employment categories, however, retirement was thought to be a significant psychosocial variable in this study. Two primary themes of employment categorization are financial security and age. Potential retirement benefits, while maybe not bounteous, provide for a type of security and a number of choices not afforded other employment categories whether working in or outside of the home. Being over the age of 61 qualifies most people for
Social Security retirement benefits. Consequently, older patients with retirement options have different psychosocial circumstances than younger patients and need to be categorized differently. All participants who either self-reported being retired or were over age 61 were then categorized as retired.

Fifteen women were not employed or seeking employment outside the home, married, and not disabled. Seven of these women were under the age of 61 and classified as full-time homemakers. They were categorized as employed because their work has economic value and their profiles more closely resembled employed rather than unemployed participants. Eight of these women were over the age of 61 and classified as retired. Together this group made up 4% of the participants.

Preliminary descriptive analyses of the continuous and discrete variables were conducted to assess for homogeneity between the groups of men and women prior to hypothesis testing. Sex differences in duration of pain, age, and level of education were assessed with one-way analyses of variance (ANOVs). No sex differences were found in duration of pain and education level. However, a significant difference was found by age, \( F(1,350) = 4.45, p = .03 \). The mean age of the women (\( M = 52, SD = 16 \)) was greater than the mean age of the men (\( M = 49, SD = 15 \)).

Chi-square analyses were used to assess for homogeneity of the categorical variables between the groups of men and women. No significant sex differences were found in frequency of medical diagnoses, prior surgery, litigation, and race. Congruent with the age difference in this population, there were more retired women than retired men, \( \chi^2(2) = 6.01, p = .05 \). There were also more unmarried women than unmarried men, \( \chi^2(1) = 13.77, p < .001 \).

The preliminary descriptive analyses revealed significant differences between men and women in employment status, marital status, and age. The variance associated with these differences was accounted for by including these factors in a multivariate model. Sex, employment status, and marital status were entered as factors in a three-way Multivariate General Linear Model ANOVA with age as a covariate (MANCOVA). The BDI, STAI-S, SF-MPQ-Aff, SF-MPQ-Sen, SF-MPQ-Tot, MPI-Chor, MPI-Out, MPI-Act, and MPI-Soc were entered as dependent measures. The alpha error rate was set at .05. Pillai's trace was used to test for multivariate significance (Tabachnick & Fidell, 1989). Followup ANOVAs and Fisher's LSDs were used for tests of between-subjects effects and post hoc testing (Rice Virtual Lab in Statistics, 2001; Siegel & Castellan, 1988).

Initial results revealed robust differences in employment status in need of further investigation. Retirement and age are ordinarily correlated. Older persons have also often experienced pain for longer durations simply due to the increased opportunity afforded by increased years. Consequently, the possibility exists that duration of pain might vary by employment status, particularly retirement. Although age was entered in the original model, duration of pain was not and had the potential to confound the results. An ANOVA revealed significant differences in pain duration by employment, \( F(1,350) = 4.21, p = .01 \). Retired patients (\( M = 58 \) months) reported longer pain duration than the employed patients (\( M = 30 \) months). The pain duration of the unemployed patients (\( M = 44 \) months) was not significantly different from either the retired or the employed patients. As expected, age was significantly correlated with duration of pain, \( r = .16, p = .003 \). The variance associated with age was then tested by the addition of age as a covariate. When the effects of age were accounted for, significant differences in pain duration by employment status disappeared, \( F(1,350) = 1.09, p = .33 \). Although statistically insignificant, pain duration accounted for a small, but unique portion of variance not accounted for by age. Consequently, the overall model was reconceptualized to include pain duration as a second covariate in the model.

The Multivariate Model

A three-way MANCOVA with age and pain duration as covariates was tested. Multivariate tests revealed significant main effects for sex, \( F(8,328) = 11.37, p < .001 \), and employment status, \( F(16,658) = 4.22, p < .001 \). Age was the only significant covariate, \( F(8,328) = 3.37, p < .001 \). Interactions were significant for sex by employment status, \( F(16,658) = 2.68, p < .001 \), and sex by marital status, \( F(8,328) = 5.72, p < .001 \).

Among the two measures of psychological functioning, a significant sex difference was found on the BDI, \( F(1,335) = 4.05, p = .05 \). Women (\( M = 11.6 \)) scored significantly higher on the BDI than men (\( M = 10.1 \); see Table 1). Among the three measures of pain, no significant sex differences were found. Among the four measures of adaptive functioning, significant sex differences were found on the MPI-Chor, \( F(1,335) = 8.43, p = .004 \), and the MPI-Out, \( F(1,335) = 39.13, p < .001 \). Women (\( M = 3.3 \)) performed more household chores than men (\( M = 2.5 \)), whereas men (\( M = 1.7 \)) performed more outdoor work than women (\( M = 8 \); see Tables 1 and 2).

The effect of employment status was robust. Employment status differences were found for measures of pain, SF-MPQ-Sen, \( F(2,335) = 3.45, p = .03 \), SF-MPQ-Tot, \( F(2,335) = 3.81, p = .02 \); psychological functioning, BDI, \( F(2,335) = 17.22, p < .001 \), STAI-S, \( F(2,335) = 10.36, p < .001 \); and adaptive functioning, MPI-Out, \( F(2,335) = 6.20, p = .002 \), MPI-Act, \( F(2,335) = 9.85, p < .001 \). Post hoc testing revealed that unemployed patients, as a whole, reported significantly more impairment than the employed and retired patients across all measures except the MPI-Out and the MPI-Soc (see Table 1 and Figures 1, 2, and 3).

Significant interactions between sex and employment status were also found on two of the pain measures, the SF-MPQ-Sen, \( F(2,335) = 5.69, p = .004 \), and the SF-MPQ-Tot, \( F(2,335) = 4.89, p = .008 \), and on three of the adaptive
measures, the MPI-Out, $F(2,335) = 11.11$, $p < .001$, the MPI-Act, $F(2,335) = 4.43$, $p = .01$, and the MPI-Soc, $F(2,335) = 3.86$, $p = .022$. Post hoc testing revealed that retired men reported significantly less pain than all groups of women and unemployed men on the SF-MPQ-Sen and SF-MPQ-Tot scales (see Table 1 and Figures 4 and 5). Retired and employed men performed the most outdoor work, significantly more than all groups of women and unemployed men (see Table 1 and Figure 6). Retired men also reported engaging in the most activities away from home, significantly more than unemployed men and women, and retired women (see Table 1 and Figure 7). Retired women reported the least number of social activities, significantly less than all other groups except for unemployed men (see Table 1 and Figure 8).

A significant interaction was found between sex and marital status on one adaptive functioning measure, the MPI-Chor, $F(1,335) = 29.10$, $p < .001$. Post hoc testing revealed married women perform significantly more household chores than married men and unmarried women. Married men performed significantly less household work than unmarried men (see Table 2 and Figure 9).

### Table 1

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<th>Instrument/Category</th>
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<th>Female ($n = 199$)</th>
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<td>Total</td>
<td>2.3</td>
<td>1.2</td>
<td>2.2</td>
</tr>
</tbody>
</table>

**Note:** Means with the same superscripts differ at $p < .05$. BDI = Beck's Depression Inventory; STAI-S = State-Trait Anxiety Inventory-State score; SF-MPQ-Sen = Short form McGill Pain Questionnaire Sensory scale; SF-MPQ-Tot = Short form McGill Pain Questionnaire Total scale; MPI-Out = Multidimensional Pain Inventory—Outdoor Work subscale; MPI-Act = Multidimensional Pain Inventory—Activities Away from Home subscale; MPI-Soc = Multidimensional Pain Inventory—Social Activities subscale.

### Table 2

<table>
<thead>
<tr>
<th>Instrument/Category</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
</tr>
<tr>
<td>MPI-Chor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Married</td>
<td>3.3c</td>
<td>1.6</td>
<td>3.0de</td>
</tr>
<tr>
<td>Married</td>
<td>2.1bced</td>
<td>1.4</td>
<td>3.7bde</td>
</tr>
<tr>
<td>Total</td>
<td>2.5b</td>
<td>1.5</td>
<td>3.3a</td>
</tr>
</tbody>
</table>

**Note:** Means with the same superscripts differ at $p < .05$ on LSD. MPI-Chor = Multidimensional Pain Inventory—Household Chores subscale.
Sex Differences in Chronic Low Back Pain

DISCUSSION

Biological Factors

The biological model suggests that women with chronic low back pain will experience more pain than men and will experience more psychological dysfunction and less adaptive functioning than men because they are in more pain. The data did not support these predictions. There were no broad, uniform sex differences in psychological and adaptive functioning. There was no evidence that women demonstrated increased pain in the presentation of chronic low back pain.

Psychological Functioning

Base rates for depression and anxiety are notably higher in women. The women in this study presented with significantly more depressive symptoms than men but did not present with significantly more anxiety symptoms than the men. Nevertheless, the clinical significance of the 1.5 point difference on the BDI is unremarkable at best. Both the men's and women's mean scores fell into the mild2 range of depressive symptoms (see Table 1).

These results raise important questions concerning the expectation of depressive symptoms in the assessment of
women with chronic low back pain. These results do not support the contention that women with chronic pain present with higher depressive comorbidity than men. These results may diverge from results found in other studies of women, chronic pain, and depression due to the method of assessment. This study assessed the endorsement of depressive symptoms, not the diagnosis of depression. Studies demonstrating higher rates of comorbidity have often utilized the frequency of depressive diagnoses as a criterion for presence of depression (Fishbain et al., 1986; Meana, 1998). Although the BDI is highly correlated with diagnosis of depression, the BDI and diagnosis are clearly not one and the same. Many other factors need to be considered in making a diagnosis of depression that were not assessed in this study. On the other hand, the contrast between rates of diagnosis in one study and endorsement of depressive symptoms in another may indeed reflect the often suggested sex-driven diagnosis bias. Or perhaps these differences may simply indicate a difference in the two populations of women studied. Nevertheless, given the higher base rates for both anxiety and depression, the women with
Sex Differences in Chronic Low Back Pain

chronic low back pain in this particular population appear to be managing quite well in the domain of psychological functioning.

In the domain of adaptive functioning, no evidence was found indicating that women demonstrate less adaptive functioning than men. The significant sex differences found in the adaptive functioning scales were consistent with traditional sex-role expectations. Men engaged in more outdoor work and women engaged in more household work.

Psychosocial Factors

The experience of marriage and employment status are clearly different for men and women. Marital status was found to interact significantly with household work in men and women. Marriage was associated with more household work for women and less for men (see Table 2 and Figure 9). Despite significant health concerns, married women with chronic low back pain appear to shoulder a heavier burden of household responsibilities than men with similar difficulties. A complementary marital interaction did not exist for the traditionally male adaptive functioning measure, Outdoor Work. These results are similar to those found with women with a recent Myocardial Infarction (Rose, Suls, Green, & Lounsbury, 1996). Women, particularly married women, appear to continue to perform their household work regardless of health status.

Although not the primary focus of this study, and not surprising, the effect of employment status was robust across all domains. Unemployed patients fared the worst, employed patients fared the best, and retired patients were usually somewhere in the middle (see Table 1 and Figures 1, 2, and 3). These results are congruent with a large body of research demonstrating that employed patients demonstrate better treatment outcomes than unemployed patients (Osterweis, Kleinman, & Mechanic, 1987).

However, the significant interaction between sex and employment status revealed divergent results in pain intensity and adaptive functioning. On the SF-MPQ-Tot and the SF-MPQ-Sen, unemployed men and women reported the highest levels of pain, as expected. Employed men and women reported similarly low levels of pain, as expected. However, retired men and women reported very different levels of pain (see Table 1 and Figures 4 and 5). Retired men reported the least amount of pain of any group (SF-MPQ-Tot, $M = 17.6$, SF-MPQ-Sen, $M = 13.7$). Retired women reported significantly more pain than retired men. In fact, there were no significant differences in reported pain among the retired women and the unemployed groups. In the domain of pain intensity, retirement appears to bode well for men whereas retirement has no apparent positive associations for women. Given the economic disparities that exist for women in general and retired women in particular as well as the evidence that poverty and financial stress are consistently associated with depression, increased pain, and other health problems, it is unsurprising that the retired women in this study reported greater pain.

An interaction between employment status and sex also emerged on three of the four measures of adaptive functioning: Outdoor Work, Activities Away from Home, and Social Activities (see Table 1 and Figures 6, 7, and 8). Retired women performed worse than any other group on most of these measures. Of particular interest is the contrasting pattern of activity associated with employment status in men and women on two of the adaptive scales. Outdoor Work and Social Activities actually reveal opposite within-group patterns in men and women (see Figures 6 and 8). Again, retirement was associated with more positive outcomes for men than women.

In the domain of adaptive functioning, unemployment was associated with more positive outcomes for women than men. Speculatively, women with chronic low back pain may simply not derive the same financial and psychosocial benefits from employment as do men. They are paid less and more often are employed in lower status positions despite equivalent education. Adding low-paying, low-status employment outside the home to managing chronic pain and managing a household may tax these women’s coping resources and limit their ability to achieve the benefits often associated with employment.

This study reveals that sex differences in chronic low back pain patients exist when examined in relation to employment and marital status. This is not surprising given the large sex differences associated with these psychosocial variables. However, strong causal evidence does not as yet exist to support the contention that sex differences in the presentation of chronic pain are indeed moderated by the financial and/or psychosocial effects of retirement, unemployment, employment, and/or marriage. There are
numerous psychosocial factors in the workplace and during retirement that perhaps contribute to these differences that need to be explored. This examination revealed that women with chronic low back pain, especially married women, carry a larger burden of household work than men with similar pain disorders without regard to employment status. Whether this situation interacts with these women’s experiences of work outside the home or not is uncertain, but also worth inquiry.

Strengths and Limitations

The strengths of this study lie in the relatively large number and variety of participants lending generalizability to the results. However, limitations of this study also emerge from these qualities. With a large sample size, statistically significant differences can emerge with smaller quantitative differences. The statistically significant sex difference found on the BDI exemplifies this situation and needs to be viewed cautiously.

Additional strengths and limitations include exemplifying the ongoing conundrum about how to classify men and women by marriage and employment status. The traditional categories used in data collection are outdated and do not reflect current lifestyles. However, adequate discrete alternative categories are yet to be constructed. Additionally, alternate categories will take some time to be accepted, integrated, and utilized in traditional medical settings. Considerable deliberation went into the decisions about how to categorize the participants in this study. A review of the literature revealed that there is little to no explanation for how most studies categorize full-time homemakers, retired persons, and the partnered, but not married. The lack of adequate categories is a persistent problem that may continue to inhibit the inclusion of sex and the appropriate psychosocial variables in research until it is adequately addressed.

The categorization decisions made in this study represent the best possible in the view of the authors given the information available and attempting to acknowledge the variety of the psychosocial meanings and contexts of the participants. This is a strength because it is an attempt to advance the discussion of categorization, but it is also a limitation because the decisions about categorization are not without flaws.

Financial security is an important psychosocial variable. Patients unable to make payment arrangements were not included in this study. These may be persons who are unable or unwilling to navigate the bureaucracy required to obtain Medicaid or Medicare benefits, or who may be ineligible for such benefits. They need to be included in future studies. This is clearly a limitation of this study.

Summary

Sex differences and the differential effects of employment status and marriage on men and women are important factors to consider in the assessment and management of chronic pain. The differences found in this study indicate that there is something about the experience of being a man or a woman that interacts with employment status and/or marriage that needs to be considered when assessing and treating persons with chronic low back pain. Studies of patients with chronic pain do not routinely include sex as a variable and rarely, if ever, have considered the interaction of sex and psychosocial variables.

Employment is routinely considered as positive for patients with chronic pain (Osterweis et al., 1987). However, our data suggest that employment and retirement may not be associated with the same positive outcomes for women as for men with chronic low back pain. Perhaps this is due to the amount of work performed inside the home and/or other psychosocial variables that interact with their compromised health status.

The financial and social contexts of work and retirement are clearly different for men and women and are important to consider when establishing treatment goals. Married women with chronic low back pain are likely to be performing an extraordinary amount of household work relative to men with chronic low back pain. The treatment of women with chronic low back pain may require particular assessment and attention to the amount and type of work done at home and the financial and social context of work outside the home. Strategies to manage these responsibilities without inadvertently reinforcing pain behaviors may be indicated in the treatment of women and the education of their partners.

These findings challenge emerging and contemporary notions in the literature of increased psychological dysfunction, pain sensitivity, and adaptive dysfunction for women with chronic low back pain and highlight the different experiences of men and women with chronic pain in reference to employment status and marriage. Further inquiry is required to elucidate the role of the laboratory findings of increased pain sensitivity for women in the clinical presentation of pain as well as the role of employment status for women with chronic pain. Of particular interest are the adaptations made by women with chronic low back pain because women as a whole appear to shoulder both the household responsibilities as well as greater financial stress, and they do not appear to suffer from increased psychological dysfunction or decreased adaptive functioning. Much can be learned from the apparent resiliency of women in these contexts.

Given these results and the relative economic disparities that continue to exist for women, there are questions as to whether studies reporting increased pain intensity and greater psychological dysfunction in women have been confounded by employment status and/or income level. Women in these studies may have appeared to have greater dysfunction due to psychosocial variables that were not assessed such as financial stress, employment status, or stress associated with continuing to engage in multiple roles despite serious health problems.
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Final acceptance: March 11, 2002

NOTES

1. The term sex will be used throughout the text to describe the grouping variable. Sex, rather than gender, is used because it was deemed to more accurately reflect the distinctions being made by the analysis. Sex refers to biologically determined sexual assignment. In contrast, gender refers to the social role. Social role often manifests in reference to biological sex, but gender can not be assumed by biological sex (Hansen & Gama, 1996; Twenge, 1999). The actual gender role of the participants in this study was not assessed, but the biological sex of the participants was assessed and included in the analysis.

2. The following scores on the BDI can be used to indicate level of depression (Groth-Marnat, 1997):

   - 5 to 9: no or minimal depression
   - 10 to 18: mild to moderate depression
   - 19 to 29: moderate to severe depression
   - 30 to 63: severe depression

REFERENCES


