Overcoming the Influence of Chronic Pain on Older Patients’ Difficulty With Recommended Self-Management Activities

Sarah L. Krein, PhD, RN,1,2 Michele Heisler, MD,1,2 John D. Piette, PhD,1,2 Amy Butchart, MPH,1 and Eve A. Kerr, MD1,2

Purpose: Many older patients with common chronic conditions also experience chronic pain. We examined how chronic pain affects patients’ difficulty with recommended self-management activities and the potential intervening role of self-efficacy (the level of confidence in one’s own ability to perform a specific task). Design and Methods: We obtained data from a cross-sectional nationwide survey of older patients, primarily older men, with chronic health conditions (N = 543). We defined chronic pain as pain present most of the time for 6 months or more during the past year. We assessed ability to follow self-management recommendations by asking respondents to rate their level of difficulty in performing three commonly recommended activities as suggested by their doctor. Results: More than 60% of survey respondents reported chronic pain. Chronic pain was significantly associated with difficulty exercising regularly (odds ratio [OR] = 1.57, 95% confidence interval [CI] = 1.04–2.37) and taking prescribed medications (OR = 3.08, 95% CI = 1.10–8.59) but not with following a recommended eating plan (OR = 1.16, 95% CI = 0.76–1.76). However, when we took self-efficacy into account, chronic pain was no longer significantly associated with either exercise or taking medications. Implications: Chronic pain is a prevalent condition among older patients and is associated with greater reported difficulty performing certain essential self-management activities. Self-efficacy, however, plays an important intervening role. Specifically, higher self-efficacy negated or reduced the association between chronic pain and reported difficulty exercising and taking medications. Promoting self-efficacy among older adults with multiple chronic health problems is a promising strategy to improve their ability to follow self-management recommendations.

Key Words: Self-efficacy, Multimorbidity, Mediator, Chronic conditions, Adherence

Among the many challenges faced by older patients with chronic health conditions and their health care providers is how best to improve adherence to recommended treatments, including taking prescribed medications as well as making lifestyle and behavioral modifications. Unlike acute conditions, for which treatment is generally of a limited duration, recommended treatments for chronic conditions require individuals to make long-term behavioral changes and consistently engage in important self-management activities. Following these self-management recommendations is often necessary to achieve optimal outcomes, including better quality of life and decreased morbidity (DiMatteo, Giordani, Lepper, & Croghan, 2002; Heisler, 2005; Heisler, Smith, Hayward, Krein, & Kerr, 2003; World Health Organization, 2003). Nevertheless, nonadherence is a pervasive problem as well as a common source of dissatisfaction for both patients and clinicians (DiMatteo, 2004; Hunt & Arar, 2001; Thorne, Harris, Mahoney, Con, & McGuinness, 2004; Wens, Vermeire, Royen, Sabbe, & Denekens, 2005; World Health Organization, 2003).
Professionals often attribute the failure of patients to effectively carry out recommended self-management activities to a lack of knowledge or motivation (Wens et al., 2005). This perception, in turn, leads to frustration on the part of providers and additional time spent trying to educate, motivate, and sometimes even scare patients in an effort to convince them to be more adherent (Hunt & Arar, 2001; Wens et al., 2005). In some cases, providers may even choose not to discuss self-management with certain patients based on the expectation that they will not be adherent (Wens et al., 2005). For patients, however, the reasons for not following self-management recommendations are often much more complex. Thus, provider strategies that rely solely on persuasion can be a waste of precious clinical time and effort or even prove to be counterproductive (Hunt & Arar, 2001; Jerant, von Friederichs-Fitzwater, & Moore, 2005; Thorne et al., 2004).

Patient characteristics that influence behavior or the ability to adhere to a recommended self-management activity include social and economic factors, cognitive status, and psychological factors (Bayliss, Steiner, Fernald, Crane, & Main, 2003; DiMatteo, 2004; Piette, Richardson, & Valenstein, 2004). The presence of comorbid conditions may also play an important role (DiMatteo, Lepper, & Croghan, 2000; Jerant et al., 2005; Krein, Heisler, Piette, Makki, & Kerr, 2005). However, despite increasing prevalence of multiple chronic conditions among older patients (Wolff, Starfield, & Anderson, 2002), researchers’ and clinicians understanding of how comorbid health conditions affect adherence to self-management recommendations is poor (Piette & Kerr, 2006). Although there are many potential ways in which multimorbidity might influence self-management, one hypothesis is that certain conditions, especially those that are symptomatic and of particular concern for patients, could potentially overwhelm management considerations related to other disorders (Piette & Kerr, 2006). One such symptomatic condition is chronic pain, which is both prevalent among older individuals and associated with considerable psychological distress and physical disability (Bair, Robinson, Katon, & Kroenke, 2003; Krein et al., 2005; Stewart, Ricci, Chec, Morganstein, & Lipton, 2003). Indeed, our prior work has suggested that chronic pain is associated with increased difficulty with self-management for patients with diabetes (Krein et al., 2005).

Among patients with multiple chronic conditions, self-efficacy may be a significant independent predictor of treatment adherence (Marks, Allegrante, & Lorig, 2005a, 2005b). Self-efficacy is the level of confidence a person has in his or her own ability to perform a task or specific behavior regardless of the circumstances (Bandura, 1997; Marks et al., 2005a, 2005b). Studies have shown that self-efficacy is amenable to intervention and that improving self-efficacy has a positive influence on outcomes (Allegrante & Marks, 2003; Lorig, Ritter et al., 2001; Lorig, Sobel, Ritter, Laurent, & Hobbs, 2001; Marks et al., 2005a, 2005b). However, there is little empirical work that examines whether self-efficacy might be an appropriate focal point for efforts to identify and address deficits in adherence or difficulty in following recommended self-management activities among older patients with multiple chronic conditions.

The objective of this study was to assess the prevalence of chronic pain among older patients who have other chronic conditions and to evaluate the association between chronic pain, self-efficacy, and reported difficulty with recommended self-management activities. We selected chronic pain because of the high symptom burden and the management challenges connected with chronic pain conditions, which we hypothesized would be associated with greater difficulty in following self-management recommendations. We also examined the potential mediating effect of self-efficacy on the hypothesized relationship between chronic pain and the difficulty patients might have in engaging in certain activities as recommended by their doctor. Specifically, we tested whether there is only a direct association between chronic pain and patients’ difficulty with following self-management recommendations or whether there might be an indirect association, whereby chronic pain is associated with lower self-efficacy, which in turn affects patients’ perceived difficulty with following self-management recommendations.

**Methods**

**Study Design and Participants**

We conducted a written survey of a stratified random sample of patients nationwide who received care within the Department of Veterans Affairs (VA) health care system. The local VA Human Studies Committee approved the study protocol, and we identified the patient sample by using VA national data sets. Given our interest in patients’ ability to follow recommended self-management activities, we constructed our sample to include equal numbers of patients with diabetes and chronic heart failure, conditions that often require a high level of self-management. For comparison we also included a general sample of VA primary care patients.

The survey sample consisted of 300 patients with a primary or secondary diabetes diagnosis code (i.e., ICD-9-CM [International Classification of Diseases] codes 250.x) associated with two outpatient visits or at least one inpatient visit in fiscal year (FY) 2003 (October 1, 2002, to September 30, 2003) and at least one outpatient visit in FY2004; 300 patients with a primary or secondary chronic heart failure diagnosis code (i.e., ICD-9-CM codes 401.01, 402.11, 402.91, 404.01, 404.11, 404.91, 428.0, 428.1, or 428.9) associated with two outpatient visits or at least one inpatient visit in FY2003 and at least one outpatient...
were coded as having difficulty with the activity or of the time) to so difficult (I couldn’t do it at all) to so easy (I got it exactly right). These questions varied across the different groups: 76% for the diabetes sample, 68% for the chronic heart failure sample, and 77% for the general sample. The respondents were comparable in age, marital status, and race to the VA patient populations they represented. We did not collect gender information as part of this study, but we expect the sample was similar to the population from which we derived it (and therefore approximately 98% male). However, because we conducted the survey anonymously to protect patient confidentiality, a more extensive nonrespondent comparison was not possible.

Because the main focus of this research was on patients with chronic health conditions, we excluded from our analysis 17 individuals who indicated that they had no chronic conditions. Missing data for our key independent variables, chronic pain and self-efficacy, resulted in the exclusion of 46 additional patients, while another 32 dropped out because of missing values for our other independent variables. The analytic sample was slightly younger (69 vs 72 years old) and was more likely to have had at least a high school education (77% vs 64%) compared to the full respondent sample, but it was similar with respect to race and marital status.

**Measurements**

**Difficulty Following Recommended Self-Management Activities.**—We asked patients to use a previously validated measure (Heisler et al., 2003) to rate their level of difficulty in performing a specified activity as suggested by their doctor (e.g., taking prescribed medications) on a scale ranging from 1 (so difficult that I couldn’t do it at all) to 5 (not difficult; I got it exactly right). These questions corresponded with the World Health Organization (2003) definition of adherence, which is “the extent to which a person’s behavior in terms of taking medication, following diets or executing lifestyle changes corresponds with agreed recommendations from the health care provider” (pp. 4). In this study, we focused on three specific self-management activities generally recommended for individuals with chronic health conditions: exercising regularly, taking medications, and following an eating plan. For the analysis, we dichotomized each of the self-management items so that respondents who indicated the activity was difficult (but I manage some of the time) to so difficult (I couldn’t do it at all) were coded as having difficulty with the activity or behavior. We excluded those who indicated that an activity was not recommended (i.e., did not apply) in our analysis of that activity only. This resulted in the elimination of 13, 23, and 44 patients for difficulty taking medications, exercising, and following an eating plan, respectively. We also excluded persons with missing responses (fewer than 10 patients per item) from the analysis of that specific activity.

**Chronic Pain.**—Consistent with other studies (Gureje, Von Korff, Simon, & Gater, 1998; Krein et al., 2005) we identified patients with chronic pain as those who reported having pain that was present most of the time for 6 months or more during the past year.

**Self-Efficacy.**—We measured self-efficacy by using three items from the six-item Self-Efficacy for Managing Chronic Disease scale (Lorig, Sobel et al., 2001). Specifically, we asked patients to rate their level of confidence (on a 10-point scale, where 1 = not at all confident and 10 = totally confident) that they could (a) keep other symptoms from interfering with the things they wanted to do; (b) do the different tasks and activities needed to manage their health condition(s); and (c) do things other than just taking medication to reduce how much their health condition(s) affected their everyday lives. We constructed a self-efficacy score, ranging from 1 to 10, using the mean of the three items, with higher scores indicating higher self-efficacy ($\alpha = .89$).

**Other Covariates.**—We also assessed the extent to which the number of chronic conditions and the presence of depressive symptoms influenced difficulty with recommended self-management activities (Ciechanowski, Katon, Russo, & Hirsch, 2003). We asked patients to select other health conditions that they had been told they had from a list that included heart disease, stroke, hypertension, diabetes, chronic heart failure, cancer, kidney disease, liver disease, ulcer or stomach disease, eye disease, lung disease, depression, anxiety or post-traumatic stress disorder, peripheral neuropathy, and arthritis or degenerative joint disease. We constructed a count variable, ranging from 1 to 14, to characterize patients' total burden of chronic disease. To assess depressive symptoms, we used the revised eight-item Center for Epidemiologic Studies–Depression measure and constructed a binary variable with patients reporting six or more symptoms considered to screen positively for depressive symptoms (Turvey, Wallace, & Herzog, 1999). We also collected patient age, race, level of education, height and weight (used to calculate body mass index), and marital or domestic status as part of the study survey.

**Statistical Analysis**

We conducted bivariate analyses, chi-square tests, and $t$ tests to examine the association between
chronic pain and patient characteristics, self-efficacy, and difficulty with recommended self-management activities. Next, we determined the extent to which self-efficacy might account for the observed relationship between chronic pain and self-management difficulty by using the method described by Baron and Kenny (1986) to test for mediation. From a statistical perspective, a mediator is a variable that meaningfully explains the relationship between an independent variable and the outcome of interest (i.e., when included in the analysis, a previously significant relationship between another independent variable and the outcome is no longer statistically significant).

Testing for a mediator involved the estimation of three regression equations (Baron & Kenny, 1986; Preacher & Hayes, 2004). First, we constructed a multivariable linear regression model to establish that the key independent variable, chronic pain, was associated with the mediator variable, self-efficacy. Second, we constructed multivariable logistic regression models to determine whether there was a significant association between chronic pain and difficulty taking prescribed medication, exercising regularly, and following a recommended eating plan (the outcomes of interest). Third, we constructed another logistic regression model that included both chronic pain and self-efficacy to test for the mediating effect of self-efficacy on difficulty with each specific self-management activity. In addition to the key variables of interest, we adjusted for age, race, education level, body mass index, marital or domestic status, and survey group (diabetes, chronic heart failure, or general patient population). We conducted all analyses using STATA 9.0 (Stata Corporation, College Station, TX).

For most of the covariates, the amount of missing data was 5% or less. However, because there were more missing responses for the number of comorbid conditions present and the depression measure, we used a single imputation procedure for these variables (impute procedure, STATA 9.0). We examined all regression models by using diagnostic procedures to assess potential model violations (e.g., non-linearity). We considered associations at \( p < .05 \) to be statistically significant.

**Results**

**Sample Description**

Overall, the study sample consisted of mostly older men (mean age 69), the majority of whom were White (82%); approximately one third were from each of the three survey groups. More than 60% of survey respondents reported having chronic pain (61% in the diabetes study group, 64% in the chronic heart failure group, and 64% in the general primary care study group; \( p = .81 \)).

**Bivariate Analysis**

Respondents who reported having chronic pain were significantly younger (68 vs 71 years old, \( p = .001 \)), had more chronic health conditions (4.5 vs 3.7, \( p < .001 \)), and were more likely to screen positive for depressive symptoms (18% vs 6%, \( p < .001 \)) compared to those without chronic pain (Table 1). The mean self-efficacy score was also statistically significantly lower (i.e., worse; 5.0 vs 6.9, \( p < .001 \)) for those with chronic pain compared to those without. The chronic pain group had a lower proportion of White patients and a higher mean body mass index in relation to the group without chronic pain, although neither of these differences was statistically significant. There were no differences in education level or marital/domestic status between persons with and without chronic pain.

Bivariate analyses also revealed statistically significant differences between persons with and without chronic pain in reported difficulty with each of the three self-management activities. Specifically, among those who reported that a given activity was recommended, a higher percentage of patients with chronic pain versus those without pain indicated that they had difficulty exercising regularly (70% vs 53%, \( p < .001 \)), taking prescribed medications (7% vs 3%, \( p = .03 \)), and following a recommended eating plan (44% vs 34%, \( p = .04 \)).

**Multivariable Analysis**

Linear regression results (Table 2) showed that, after adjusting for sociodemographic and other health factors, chronic pain had a statistically significant negative association with self-efficacy (\( p < .001 \)), thereby satisfying the first step in the mediation analysis. Both the number of chronic health conditions and the presence of depressive symptoms also had significant independent negative associations with self-efficacy.

In our main mediation analysis (Table 3), results from the models that excluded self-efficacy indicated that chronic pain had a statistically significant independent association with reported difficulty with exercising regularly (odds ratio [OR] = 1.57, 95% confidence interval [CI] = 1.04–2.37) and taking prescribed medications (OR = 3.08, CI = 1.10–8.59) but not following a recommended eating plan. Having more chronic health conditions also increased the odds of reporting difficulty exercising (OR = 1.32, CI = 1.16–1.50), whereas a positive depression screen was associated with greater difficulty both exercising (OR = 4.39, CI = 1.88–10.27) and following an eating plan (OR = 1.84, CI = 1.04–3.28).

In the second model (Table 3), which included self-efficacy, the association between chronic pain and difficulty exercising essentially disappeared due to the mediating effect of self-efficacy. Moreover, a
higher self-efficacy score was associated with a significantly lower odds of reporting difficulty exercising (OR = 0.72, CI = 0.65–0.79). Self-efficacy also appeared to partially mediate the negative relationship of having more chronic health conditions and the presence of depressive symptoms on exercise. With the medication model, although the inclusion of self-efficacy decreased the pain association, higher self-efficacy itself was not associated with reported difficulty taking prescribed medications. There was no significant association between self-efficacy and following a recommended eating plan.

Discussion

Chronic pain was an extremely prevalent condition among all patient groups studied, affecting more than 60% of patients in the study sample. As hypothesized, we found that chronic pain was associated with greater reported difficulty following important recommended self-management activities for older chronically ill patients. Having more chronic health conditions and depressive symptoms was also associated with increased difficulty with some self-management activities. However, we found that self-efficacy played an important mediating role such that it negated or reduced the association between chronic pain and difficulty with certain self-management activities. The association between chronic pain and difficulty exercising, in particular, appeared to function through patients’ level of self-efficacy.

These findings have several significant implications for clinical practice and health systems. First, they highlight the importance of adequately addressing other comorbid conditions that might complicate a patient’s ability to engage in recommended self-management activities. In particular, this study demonstrates the negative association of chronic pain, multimorbidity, and depression with patient self-management in the crucial areas of medication use, exercise, and diet. Both chronic pain and multimorbidity are becoming more and more common, and having multiple chronic illnesses increases patients’ odds of experiencing preventable complications, mortality, and high health care costs (Hoffman, Rice, & Sung, 1996; Wolff et al., 2002). Consequently, these results provide added support for a more comprehensive patient-centered rather

### Table 1. Social, Demographic, and Health Status Characteristics of Patients With and Without Chronic Pain

<table>
<thead>
<tr>
<th>Variable</th>
<th>With Chronic Pain (n = 340)</th>
<th>No Chronic Pain (n = 203)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years, M (SD)</td>
<td>68 (11.3)</td>
<td>71 (9.8)</td>
<td>.001</td>
</tr>
<tr>
<td>White</td>
<td>270 (79)</td>
<td>173 (85)</td>
<td>.09</td>
</tr>
<tr>
<td>Education, high school or greater</td>
<td>259 (76)</td>
<td>159 (78)</td>
<td>.42</td>
</tr>
<tr>
<td>Married or living with someone</td>
<td>236 (69)</td>
<td>144 (71)</td>
<td>.71</td>
</tr>
<tr>
<td>Number of chronic health conditions (range 1–14), M (SD)</td>
<td>4.5 (2.1)</td>
<td>3.7 (1.7)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>CES-D depression score ≥6a</td>
<td>63 (18)</td>
<td>12 (6)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Body mass index</td>
<td>29.8 (6.5)</td>
<td>28.6 (5.7)</td>
<td>.05</td>
</tr>
<tr>
<td>Survey group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>118 (35)</td>
<td>76 (37)</td>
<td>.52</td>
</tr>
<tr>
<td>Chronic heart failure</td>
<td>103 (30)</td>
<td>59 (29)</td>
<td>.76</td>
</tr>
<tr>
<td>General primary care</td>
<td>119 (35)</td>
<td>68 (34)</td>
<td>.72</td>
</tr>
<tr>
<td>Self-efficacy score (range 1–10, with higher scores indicating greater self-efficacy), M (SD)</td>
<td>5.0 (2.5)</td>
<td>6.9 (2.4)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Difficulty exercising regularlyb</td>
<td>223 (70)</td>
<td>103 (53)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Difficulty taking prescribed medicationsb</td>
<td>23 (7)</td>
<td>5 (3)</td>
<td>.03</td>
</tr>
<tr>
<td>Difficulty following recommended eating planb</td>
<td>134 (44)</td>
<td>64 (34)</td>
<td>.04</td>
</tr>
</tbody>
</table>

Notes: Data are given as number (column percentage) unless otherwise specified. SD = standard deviation.
| Notes: Center for Epidemiologic Studies–Depression (CES-D) eight-item measure, with six or more symptoms considered a positive screen for depressive symptoms. Reported values were following imputation for missing data but did not differ substantially from those obtained without imputation.  
  bDenominator varied due to the exclusion of those who indicated the activity was not recommended.

### Table 2. Linear Regression Results Demonstrating the Association Between Chronic Pain and Self-Efficacy

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression Coefficient (SE)</th>
<th>Standardized Regression Coefficient</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have chronic pain</td>
<td>-1.33 (0.21)</td>
<td>-.245</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Number of chronic health conditions (range 1–14)</td>
<td>-0.41 (0.06)</td>
<td>-.312</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>CES-D depression score ≥6a</td>
<td>-1.33 (0.30)</td>
<td>-.171</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Notes: Data were adjusted for age, race, education level, body mass index, married or living with someone, and survey group. SE = standard error.
| Notes: Center for Epidemiologic Studies–Depression (CES-D) eight-item measure, with six or more symptoms considered a positive screen for depressive symptoms.  
Vol. 47, No. 1, 2007 65
than disease-specific approach to care, including the treatments that are recommended and the strategies used to promote adherence and improve outcomes (Bodenheimer, Lorig, Holman, & Grumbach, 2002). In addition, self-management support as described in the chronic care model, which takes the totality of patients’ conditions into account, may be more effective than support that focuses on only one condition (e.g., diabetes, heart failure) at a time (Bodenheimer, Wagner, & Grumbach, 2002). Many commercial disease management products, for example, follow a “carve-out” condition-specific model that could lead to more fragmented, and ultimately ineffective, care for individuals with multiple chronic conditions (Casalino, 2005; Wolff & Boul, 2005). Additional research is needed on this topic to firmly establish which types of programs are best suited to improve the health and well-being of older patients with multiple chronic conditions.

Second, these results suggest that providers could use certain constellations of patient characteristics, such as having both chronic pain and low self-efficacy, to identify chronically ill older adults who are most likely to have difficulty with self-management and who may require additional targeted support from their health care providers. Moreover, these may be patients who would benefit most from self-management education programs or other supplemental services, such as care management. Appropriately targeting patients who require these services is important for health systems and providers as both service demand and resource constraints continue to rise.

Third, this study presents empirical support for promoting clinician and health system efforts to enhance patients’ self-efficacy rather than more commonly used strategies that focus exclusively on persuasion or providing information alone. This study provides only limited information about the degree to which self-efficacy mediates the association between pain and self-management, and more research to address this issue is needed. Nevertheless, our findings build on and reinforce prior research, which shows that self-management programs that seek to enhance patients’ self-efficacy lead to improved health outcomes, such as better health-related quality of life, better physical functioning, and decreased health service use (Farrell, Wicks, & Martin, 2004; Lorig, Ritter et al., 2001; Lorig, Sobel et al., 2001; Marks et al., 2005a, 2005b). Specific strategies for enhancing self-efficacy include reinforcing successful self-care accomplishments, facilitating observation or interaction with others who are managing their self-care successfully, providing positive feedback, and assisting with the adoption of new behaviors by ensuring that patients do not misinterpret physiological cues (Marks et al., 2005b). Use of these strategies by clinicians, along with other behavioral counseling approaches (Heisler, 2005), may be of considerable benefit for patients with chronic pain and other chronic conditions. In addition, further development and testing of self-management programs for patients with multiple chronic illnesses that use self-efficacy as an underlying theoretical construct is warranted. Rather than continuing to implement self-management education programs that are primarily focused on a specific condition, researchers should give increased attention to determining whether programs that target a common mediating factor such as self-efficacy are, in the long run, a more effective and more efficient use of resources.

### Table 3. Logistic Regression Results Demonstrating the Association Between Chronic Pain, Self-Efficacy, and Difficulty With Recommended Self-Management Activities

<table>
<thead>
<tr>
<th>Variable</th>
<th>Difficulty Exercising Regularly (n = 515)</th>
<th>Difficulty Taking Prescribed Medications (n = 524)</th>
<th>Difficulty Following Recommended Eating Plan (n = 493)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>OR</em></td>
<td><em>(95% CI)</em></td>
<td><em>(95% CI)</em></td>
<td><em>(95% CI)</em></td>
</tr>
<tr>
<td>Have chronic pain</td>
<td>1.57 (1.04–2.37)*</td>
<td>3.08 (1.10–8.59)*</td>
<td>1.16 (0.76–1.76)*</td>
</tr>
<tr>
<td>Number of chronic health conditions (range 1–14)</td>
<td>1.32 (0.69–1.68)</td>
<td>0.95 (0.75–1.20)</td>
<td>0.94 (0.67–1.07)</td>
</tr>
<tr>
<td>CES-D depression score</td>
<td>1.10 (1.01–1.20)</td>
<td>0.81 (0.33–2.87)</td>
<td>1.84 (1.04–3.28)*</td>
</tr>
<tr>
<td>Self-efficacy score (range 1–10)</td>
<td>0.84 (0.65–0.79)**</td>
<td>0.81 (0.71–1.01)</td>
<td>1.64 (0.84–1.00)</td>
</tr>
</tbody>
</table>

*Notes: Data were adjusted for age, race, education level, body mass index, married or living with someone, and survey group.

*OR = odds ratio; CI = confidence interval.

*aIndependent association of chronic pain and other comorbid conditions with each activity.

*bMediating effect of self-efficacy.

*cCenter for Epidemiologic Studies–Depression (CES-D) eight-item measure, with six or more symptoms considered a positive screen for depressive symptoms.

*p < .05; **p < .01; ***p < .001.
To place this work in context, one must consider some limitations of this generally exploratory study. First, this study was cross-sectional, and the potential exists for a bidirectional association between chronic pain and self-efficacy. However, although there are studies that demonstrate that self-efficacy may influence pain control (Keefe, Rumble, Scipio, Giordano, & Perri, 2004), it seems less likely that it would affect whether or not someone has a chronic pain condition. Second, the outcome measures were based on patient self-report. The use of self-report has a number of limitations, including the potential divergence between what the individual reports and their clinical condition based on more objective measures (Barsky, 2000; Rand, 2000), as well as the possibility of socially desirable responses. However, unless responding in a socially desirable manner is associated with having chronic pain, it is unlikely to have a major influence on the results. Third, the literature indicates that self-efficacy is not a trait but specific to a particular behavior or activity (Bandura, 1997). For example, having a high level of confidence about one’s ability to exercise does not mean that a person has a high level of confidence about taking medication. So, rather than using a global assessment of self-efficacy, it might be preferable to examine self-efficacy using a measure specific to each activity. Nonetheless, considering the high degree of internal consistency and strong associations exhibited by the global self-efficacy measure, we feel these findings are robust and, if anything, our results underestimate the effect of self-efficacy on patients' ability to perform recommended activities. Fourth, we based our mediation analysis on the well-established steps proposed by Baron and Kenny (1986); however, further examination, including the use of other methods (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002), is warranted to better delineate the mediation effect. Finally, these results are from a sample that consisted of patients receiving care in the VA and that was primarily composed of older men, which could limit their generalizability.

In conclusion, employing more effective strategies to promote adherence to important self-management activities is increasingly important for decreasing preventable morbidity and ensuring a better quality of life for older individuals with chronic health conditions. Providers often attribute patient non-adherence to a lack of knowledge or lack of motivation. However, our findings suggest that patients’ difficulty adhering to certain recommendations may be partly due to other health conditions, such as chronic pain, a prevalent condition among older adults. Incorporating strategies that focus on enhancing self-efficacy into clinical settings may be especially valuable in promoting more effective self-management among the growing number of older individuals with chronic pain and multiple other chronic conditions.

References


Received March 27, 2006

Accepted October 4, 2006

Decision Editor: Linda S. Noeker, PhD

---

**Mennonite College of Nursing**

Producing the Preferred Graduate

---

The Collaborative Doctoral Program: Focal Area Nursing in Aging

A collaboration between Mennonite College of Nursing at Illinois State University and The University of Iowa College of Nursing

This new program offers:

- A curriculum that leads to a Ph.D. in nursing with a focal area in aging
- An opportunity to take courses at both Illinois State University and The University of Iowa through the use of PolyCom, an Internet-based video conferencing technology, reducing the need to travel
- Access to expert faculty at both sites
- The opportunity to work with researchers funded by the National Institutes of Health, the U.S. Department of Education, the Health Resources and Services Administration, the John A. Hartford Foundation, the Illinois Department of Public Health, and the U.S. Department of Health and Human Services
- Scholarship and fellowship funding opportunities

This collaborative program is made possible by a three-year Advanced Education Nursing Grant awarded by the Health Resources and Services Administration.

Mennonite College of Nursing offers the following academic programs:

- Graduate programs
- Collaborative Doctoral Program
- Master of Science in Nursing
  - Family Nurse Practitioner sequence
  - Nursing Systems Administration sequence
- Graduate-level certificates
  - Post-Master's Family Nurse Practitioner Certificate
  - Nurse Educator Graduate Certificate
- Undergraduate programs
  - B.S.N.—prelicensure sequence
  - RN to B.S.N. completion sequence (online)
  - Accelerated B.S.N. sequence

---

Consider joining the faculty at Mennonite College of Nursing at Illinois State University!

Visit our Web site to learn more about our employment opportunities, programs, research, and practice at [www.mcn.ilstu.edu](http://www.mcn.ilstu.edu)