Comorbid Depression, Chronic Pain, and Disability in Primary Care

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Objectives: The objectives of this study were to provide estimates of the prevalence and strength of association between major depression and chronic pain in a primary care population and to examine the clinical burden associated with the two conditions, singly and together. **Methods:** A random sample of Kaiser Permanente patients who visited a primary care clinic was mailed a questionnaire assessing major depressive disorder (MDD), chronic pain, pain-related disability, somatic symptom severity, panic disorder, other anxiety, probable alcohol abuse, and health-related quality of life (HRQL). Instruments included the Patient Health Questionnaire, SF-8, and Graded Chronic Pain Questionnaire. A total of 5808 patients responded (54% of those eligible to participate). **Results:** Among those with MDD, a significantly higher proportion reported chronic (i.e., nondisabling or disabling) pain than those without MDD (66% versus 43%, respectively). Disabling chronic pain was present in 41% of those with MDD versus 10% of those without MDD. Respondents with comorbid depression and disabling chronic pain had significantly poorer HRQL, greater somatic symptom severity, and higher prevalence of panic disorder than other respondents. The prevalence of probable alcohol abuse/dependence was significantly higher among persons with MDD compared with individuals without MDD regardless of pain or disability level. Compared with participants without MDD, the prevalence of other anxiety among those with MDD was more than sixfold greater regardless of pain or disability level. **Conclusions:** Chronic pain is common among those with MDD. Comorbid MDD and disabling chronic pain are associated with greater clinical burden than MDD alone. **Key words:** major depression, chronic pain, comorbidity, disability, epidemiologic comorbidity.

MDD = major depressive disorder; **HRQL** = health-related quality of life; **HMO** = health maintenance organization; **PHQ** = Patient Health Questionnaire; **GCPS** = Graded Chronic Pain Scale; **CP** = chronic pain; **DCP** = disabling chronic pain; **GAD** = generalized anxiety disorder; **SCID** = Structured Clinical Interview for DSM-III-R; **PRIME-MD** = Primary Care Evaluation of Mental Disorders; **CI** = confidence interval; **DSM-IV** = *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*; **DSM-III-R** = *Diagnostic and Statistical Manual of Mental Disorders, Third Edition Revised*.

INTRODUCTION

Comorbid conditions are the norm rather than the exception among patients with major depressive disorder (MDD). Findings from the World Health Organization Collaborative and the National Comorbidity Studies revealed that a substantial majority of patients with MDD also met criteria for at least one or more concurrent psychiatric disorders (1,2). There is also growing evidence that MDD and chronic pain frequently coexist (3,4).

However, the strength of the relationship between chronic pain and MDD is unclear. This is in part because of variability in case definitions for both conditions (5). Other factors leading to inconsistency of research results on the association between depression and pain include small sample sizes and sampling from tertiary care settings restricted to select groups of patients with chronic pain (6). In a recent review of depression and pain comorbidity, Bair et al. (7) reported highly variable estimates of the association between the two conditions; the prevalence of pain in patients presenting with depression ranged from 15% to 100%, whereas the prevalence of depression among patients with pain was 1.5% to 100%.

Most cases of depression are treated in primary care settings (8). Recognition of depression in primary care is complicated by the presentation of somatic complaints (9), a majority of which are pain-related (10). A substantial majority of patients with chronic pain are also treated in primary care settings (11), yet few studies investigating the prevalence of comorbid chronic pain and depression have been conducted in primary care settings.

Furthermore, the clinical burden of comorbid depression and chronic pain remains largely unexplored. Although both depression (12) and chronic pain (13) are known to be independently associated with decrements in quality of life and increased somatic preoccupation (10), the impact of the presence of both conditions on these outcomes has rarely been investigated. Similarly, little is known about the association of comorbid depression and pain with other psychiatric conditions.

This study involved two main objectives. First, we provided estimates in a primary care patient population of the strength of the association between MDD and chronic pain. We hypothesized nonrandom co-occurrence, or epidemiologic comorbidity (14), i.e., that those with chronic pain would be significantly more likely to meet criteria for MDD than those without pain and, conversely, that those with MDD would be significantly more likely than those without MDD to report chronic pain. Second, we investigated the impact of MDD and chronic pain, singly and together, on quality of life, severity of somatic symptoms, and three psychiatric conditions: panic disorder, other anxiety disorder, and probable alcohol abuse/dependence. We included two levels of pain-related disability in our analyses to capture differences in the extent to which pain interferes with everyday activity (15). We hypothesized that respondents reporting MDD and disabling (i.e., moderate

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to high activity interference) chronic pain would report a significantly lower quality of life, a significantly higher level of somatic symptom severity, and a significantly higher prevalence of panic disorder, other anxiety, and probable alcohol abuse/dependence than all other groups.

METHOD

Study Sample

Over a 12-week period in 2002, a total of 12,000 members of Kaiser Permanente, a health maintenance organization (HMO) in Northern California, were randomly selected within 1 week of a primary care visit to receive a mailing that included a cover letter, a consent form with an option to decline participation, and self-report questionnaires. Participants were drawn from 31 outpatient clinics in Northern California representing urban, suburban, and rural areas. In addition to being a member of the HMO and visiting an internal medicine or family practice clinic, inclusion criteria included being between the ages of 21 to 75, being sufficiently literate in English to complete the self-report questionnaires, and having an available current home address and phone number. Exclusion criteria included a diagnosis of schizophrenia or other psychotic disorder, a diagnosis of bipolar disorder, dementia, pervasive developmental disorder, or pregnancy-related diagnosis over the prior 1-year period. The Institutional Review Boards of both Stanford University Medical Center and Kaiser Foundation Research Institute approved the study.

If there was no response to the first mailing, a second full packet was mailed out after 21 days. At 35 days, if there was no response, potential respondents were contacted by phone and offered the opportunity to decline participation, complete the questionnaire by telephone, or fill it out and return it by mail.

Of the individuals sampled, a total of 1290 (11%) were ineligible as a result of literacy barriers ($n = 428$) or incorrect contact information ($n = 862$). Of the 10,710 eligible participants, 3808 (35.6%) refused to participate and 1094 (10.2%) failed to respond, leaving 5808 members (54% of those eligible) as study respondents.

Measures

Psychiatric Disorders

The primary mental health measure we used was the Patient Health Questionnaire (PHQ) (16). The PHQ is a self-administered version of the Primary Care Evaluation of Mental Disorders (PRIME-MD) (17) and provides *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) diagnoses of MDD as well as diagnoses of several other psychiatric disorders (e.g., panic disorder), subthreshold disorders (e.g., probable alcohol abuse), and somatic symptom severity. Its diagnostic validity is comparable to the PRIME-MD and it has been validated in primary care patients (16).

Depression

We included the eight-item version of the depression module (PHQ-8) that omits the original item of suicide, which may be more appropriate in mailed questionnaires that are not reviewed by a clinician for purposes of treatment (18). For each item, respondents were asked how often, over the last 2 weeks, they had been bothered ("not at all," "several days," "more than half the days," or "nearly every day." Items were scored zero ("not at all") to 3 ("nearly everyday"). To qualify for a diagnosis of MDD in this study, respondents had to endorse being bothered by five or more of eight symptoms more than half the days (i.e., a score ≥ 10) for the previous 2 weeks with at least one of those five items, including depressed mood or anhedonia. Scores ≥ 10 on the PHQ-8 have $>99\%$ sensitivity and 92% specificity for identifying patients with major depression when compared with interviews with health professionals using questions from the Structured Clinical Interview for DSM-III-R (SCID) and the PRIME-MD (19).

Somatic Symptom Severity

The severity of somatic complaints often encountered in primary care was assessed using the PHQ-15 (20). Respondents were asked how much they were bothered ("not bothered," "bothered a little," or "bothered a lot") in the last month by 13 of the original 15 symptoms (two items queried in the depression section were omitted). We assessed the number of physical symptoms by summing the number among those 13 physical symptoms to which each respondent endorsed as "bothered a lot." Although the measure does not permit discriminating between explained and unexplained symptoms, the total number of physical complaints is a predictor of somatoform disorders (21).

Anxiety Disorders

The PHQ scales were used to determine whether respondents met threshold criteria for panic disorder, as well as another anxiety disorder, within the last 4 weeks.

Probable Alcohol Abuse or Dependence

To meet PHQ criteria for probable alcohol abuse/dependence, the respondent had to report one of a number of problematic behaviors over the past 6 months (e.g., "you had a problem getting along with other people while you were drinking").

Chronic Pain

Respondents were asked whether they were "currently troubled by pain or discomfort, either all the time or on and off." A separate question assessed whether the pain had persisted for more than 6 months. Participants who endorsed both of these were defined as suffering from chronic pain. This definition is generally consistent with the one advanced by The International Association for the Study of Pain (22), with two exceptions. First, following the recommendations of Elliott et al. (23), we included respondents with intermittent pain. Second, consistent with other recent studies (3), we used the more conservative 6-month threshold rather than 3 months.

Pain-Related Disability

Pain-related severity and disability were assessed with the Graded Chronic Pain Scale (15), a seven-item questionnaire that measures both pain intensity and interference with daily activities. The Graded Chronic Pain Scale (GCPS) has a hierarchical structure allowing classification of respondents into one of four classes: grade 1 (low intensity, low interference), grade II (high intensity, low interference), grade III (moderate interference), or grade IV (severe interference). In the current study, those who met criteria for grades III and IV on the GCPS were defined as having disabling pain.

Health-Related Quality of Life

Health-related quality of life (HRQL) was assessed with the SF-8 (24). This eight-item instrument uses a single item to query participants about each of the following: general health, physical functioning, physical role, bodily pain, vitality, social functioning, mental health, and emotional role. Although validation studies of the SF-8 suggested the presence of two summary factors, a factor analysis for the current sample indicated a unitary factor structure (eigenvalue = 4.6, 57% of variance explained). Thus, we report a single summary score. Higher scores denote a lower quality of life.

Statistical Methods

A logistic regression model was used to test for the comorbidity of depression, chronic pain, and disabling chronic pain while accounting for the effects of age, gender, and all two-way interactions. Gender was coded $-1/2$ = females and $+1/2$ = males, and all ordinal predictors were centered at their means. Disabling chronic pain was nested within chronic pain. Thus, simple effects represent the association of the predictor with the outcome at the centered values of all other predictors.

For comparison, six clinically defined groups were then formed: no pain or major depression (neither), nondisabling chronic pain only (CP only), disabling chronic pain only (DCP only), major depression only (MDD only), major depression and comorbid nondisabling chronic pain (MDD plus CP), and major depression and comorbid disabling chronic pain (MDD plus DCP). Analyses of covariance, adjusting for age and gender, were used to compare the six groups on HRQL and somatic symptom severity. Three logistic

TABLE 1. Demographic Characteristics of Study Respondents

Characteristic	All Patients (n = 5808)	Neither (n = 3048)	Nondisabling Chronic Pain Only (n = 1786)	Disabling Chronic Pain Only (n = 561)	MDD Alone (n = 142)	MDD + Nondisabling Chronic Pain (n = 101)	MDD + Disabling Chronic Pain (n = 170)
Female gender (%)	57.6	53.4	59.3	66.1	69.7	68.3	69.4
Age (yr)	53.3 ± 13.6	52.1 ± 14.3	55.6 ± 12.3	34.3 ± 13.0	49.6 ± 13.5	51.8 ± 13.2	50.9 ± 11.9
Marital status							
Married/cohabitating (%)	66.4	67.4	68.1	64.7	48.6	61.6	56.8
Single (%)	12.6	14.0	9.9	10.8	26.8	11.1	11.2
Widowed (%)	6.3	5.5	7.2	5.9	5.8	8.1	10.7
Divorced/separated (%)	14.7	13.1	14.8	18.6	18.8	19.2	21.3
Ethnicity							
White (%)	65	59.8	75.4	62.9	56.5	72.7	57.6
Asian (%)	9.1	11.7	5.5	7.0	8.7	9.1	6.7
Black (%)	9.8	10.7	6.5	12.8	14.5	9.1	14.5
Native American (%)	1.6	1.2	1.6	2.5	2.2	3.0	3.0
East Indian (%)	0.8	1.3	0.3	0.2	0	0	0.6
Hispanic (%)	11.8	13.0	9.1	13.2	15.9	5.1	15.2
Other (%)	1.9	2.2	1.5	1.4	2.2	1.0	2.4

MDD = major depressive disorder.

regression analyses tested the effects of group membership, adjusting for age and gender, on the presence/absence of other psychiatric conditions, including probable alcohol abuse/dependence, other anxiety, and panic disorder. Group comparisons were tested using deviation contrasts, which compare the mean of a specified group with the grand mean of other specified groups. All hypothesis testing was conducted at the .05 significance level (two-tailed).

RESULTS

Demographics and Response Bias

Survey respondents (n = 5808) ranged in age from 21 to 75 years (mean = 53.3, standard deviation = 13.6). Fifty-seven percent (57.6%) were female. Descriptive statistics are presented in Table 1. Compared with those who were ineligible and nonrespondents (n = 6192), study respondents were older (mean age 53.3 years [13.6] versus 49.5 years [14.1], $p < .001$) and more likely to be female than male (57.6% versus 54.6%, $p < .01$), respectively.

Depression, Pain, and Epidemiologic Comorbidity

Of the 5808 respondents, 413 (7.1%; 95% confidence interval [CI]: 6.4–7.7%) met criteria for MDD, 1887 (32.5%; 95% CI: 31.3–33.7%) reported experiencing nondisabling chronic pain, and 731 (12.6%; 95% CI: 11.8–13.4%) reported disabling chronic pain. The six groups differed significantly in mean age (F = 20.4, df = 5,5808, $p < .0001$). Scheffe post hoc tests indicated that the two groups with pain and no depression (i.e., CP only and DCP only) were significantly older than the other four groups. The three groups meeting criteria for MDD had higher proportions of females than the other groups (X [2] = 62.9, df = 5, $p < .0001$).

Compared with those without chronic pain, respondents who reported pain were more likely to report depression (DCP only: odds ratio [OR] = 5.4, $p < .0001$; CP only: OR = 3.0, $p < .001$). Younger patients and females were also more likely to be depressed (age: OR per year = 0.9, $p < .0001$, gender: OR = 0.6, $p < .0001$). No two-way interactions were significant indicating that the degree of comorbidity between pain and depression did not differ according to age or gender. Figure 1 shows the prevalence of chronic pain among those with and without MDD.

The Clinical Burden Associated With Depression and Chronic Pain

Health-Related Quality of Life and Somatic Symptoms

Respondents with MDD plus DCP had significantly worse HRQL than all other groups (F = 485.9, df = 7,5558, $p < .0001$; $p < .0001$ all five contrasts).[1] A similar pattern was detected regarding somatic symptom severity (F = 359.6, df = 7,5808, $p < .0001$; all five contrasts $p < .0001$).[2] Scheffe post hoc tests further elucidated group differences. Group means and standard deviations for the HRQL and somatic symptoms measures, as well as the Scheffe test results, are presented in Table 2.

Panic Disorder

Criteria for panic disorder were met by 3.6% (211) of the sample, whereas 6.2% (359) met criteria for other anxiety and 6.0% (348) met criteria for probable alcohol abuse/dependence. Table 3 shows the prevalence of these psychiatric conditions across the six groups.

In the logistic regression model for panic, group membership was a significant predictor (Wald = 302.2, df = 5, $p < .0001$). Those most likely to report panic were younger (B = −0.017,

[1] Because the HRQL contains two items that query pain and emotional problems, the group comparison was also done without these items. Similar to the eight-item version, the six-item version had a unitary factor structure. The same pattern of results was observed, with the MDD plus DCP group having the poorest HRQL (all p's $< .01$).

[2] Because the Somatic Symptom Severity scale contained several items that query pain (e.g., back pain, stomach pain), the group comparison was also done without these items. The same pattern of results was observed, with the MDD plus DCP group having the highest somatization scores (all p's $< .001$).

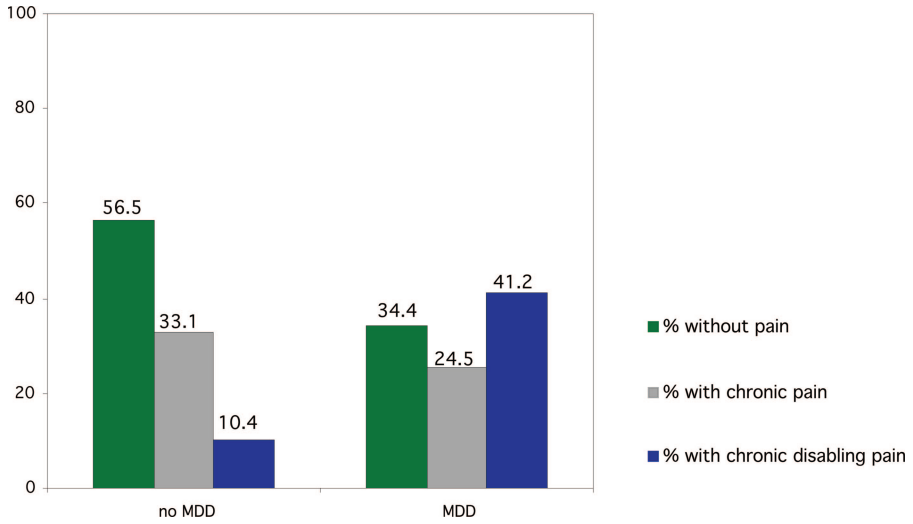

Figure 1. Comorbidity of pain and depression: pain status among respondents with and without major depressive disorder.

TABLE 2. Group Means (±standard deviation) on Measures of Quality of Life and Somatization

	Neither (*N* = 3048; 52.5%)	Nondisabling Chronic Pain Only (*N* = 1786; 30.8%)	Disabling Chronic Pain Only (*N* = 561; 9.7%)	MDD Alone (*N* = 142; 2.4%)	MDD + Nondisabling Chronic Pain (*N* = 101; 1.7%)	MDD + Disabling Chronic Pain (*N* = 170; 2.9%)	F	*p*	Contrasts
HRQL[a]	16.8 ± 6.1	19.4 ± 5.1	26.0 ± 5.2	26.7 ± 6.4	27.9 ± 4.9	31.3 ± 4.3	493[b]	<.0001	6 > 5 = 4 = 3 > 2 > 1
Som	0.6 ± 1.1	1.1 ± 1.3	2.4 ± 1.7	2.5 ± 2.2	2.8 ± 2.1	3.8 ± 2.3	376[c]	<.0001	6 > 5 = 4 = 3 > 2 > 1

[a] Higher scores denote lower quality of life.
[b] ANCOVA test statistic, main effect of group (*df* = 7,5558) adjusting for age and gender, data missing at random.
[c] ANCOVA test statistic, main effect of group (*df* = 7,5808) adjusting for age and gender.
MDD = major depressive disorder; HRQL = health-related quality of life; ANCOVA = analysis of covariance.

df = 1, *p* = .002, OR = 0.98) and female (B = −0.53, *df* = 1, *p* = .002). A deviation contrast comparing the depressed groups versus nondepressed groups showed the impact of depression (B = 2.4, *df* = 1, *p* < .001, OR = 11.9). A second deviation contrast showed that the prevalence of panic was significantly higher in the group with MDD plus DCP (B = 0.85, *df* = 1, *p* < .0001, OR = 2.3) compared with the two other depressed groups.

Other Anxiety

When predicting other anxiety, group membership (Wald = 718.9, *df* = 5, *p* < .0001) was again a statistically significant predictor when covarying for age and gender (age: B = −0.02, *df* = 1, *p* < .0001, OR = 0.98; gender: B = −0.25, *df* = 1, *p* = .07, OR = 0.78). The deviation contrast indicated a substantially higher prevalence of other anxiety among the three groups with MDD relative to those without depression (B = 3.5, *df* = 1, *p* < .0001, OR = 33.6). Unlike the model predicting panic, the deviation contrast comparing those with MDD plus DCP versus the other respondents with depression was not statistically significant (*p* = .90).

Alcohol Abuse/Dependence

Again, group membership (Wald = 16.8, *df* = 1, *p* = .005) was a statistically significant predictor when covarying for the effects of age and gender (age: B = −0.03, *df* = 1, *p* < .0001, OR = 0.97; gender: B = 1.4, *df* = 1, *p* < .0001, OR = 3.99). The deviation contrast indicated that the three depressed groups were more likely to report alcohol abuse than the

TABLE 3. Prevalence of Psychiatric Syndromes by Group

	Neither (*n* = 3048)	Nondisabling Chronic Pain Only (*n* = 1786)	Disabling Chronic Pain Only (*n* = 561)	MDD Alone (*n* = 142)	MDD + Nondisabling Chronic Pain (*n* = 101)	MDD + Disabling Chronic Pain (*n* = 170)	Total Sample
Panic	42 (1.4%)	36 (2.0%)	40 (7.1%)	22 (15.5%)	18 (17.8%)	53 (31.2%)	211 (3.6%)
Alcohol abuse	178 (5.8%)	102 (5.7%)	28 (5.0%)	14 (9.9%)	9 (8.9%)	17 (10.0%)	348 (6.0%)
Anxiety	47 (1.5%)	60 (3.4%)	42 (7.5%)	64 (45.1%)	55 (54.5%)	85 (50.0%)	353 (6.1%)

MDD = major depressive disorder.

nondepressed groups (B = 0.71, $df = 1$, $p < .0001$, OR = 2.03). Respondents with MDD plus DCP did not have a higher prevalence of alcohol abuse relative to other respondents with depression ($p = .74$).

DISCUSSION

Our study had two aims: 1) examining the prevalence and strength of association between chronic pain and MDD in primary care patients, and 2) describing the clinical burden of comorbid MDD and chronic pain. Regarding aim 1, we found evidence of a nonrandom association between depression and chronic pain, i.e., epidemiologic comorbidity (14). Approximately two thirds of those meeting criteria for MDD also reported chronic pain and, among those with chronic pain, the prevalence of those with MDD was significantly higher than was observed among those without chronic pain. Regarding aim 2, evidence that the clinical burden associated with MDD and chronic pain is significantly greater than for those with either condition alone was mixed. Specifically, respondents with MDD plus DCP had significantly poorer HRQL and greater somatic symptom severity than all other groups. Additionally, the prevalence of panic disorder among those with MDD plus DCP was approximately twice as high as in the other two depressed groups and four times as high as the prevalence among those with disabling pain who did not meet criteria for MDD. However, the prevalence of probable alcohol abuse/dependence and other anxiety was substantially higher among those with MDD compared with those without MDD regardless of pain or disability level.

The prevalence of MDD in our sample was 7.1%. Our findings are similar to those (i.e., 7.3%) reported by Olfson and colleagues (25) whose sample was drawn from the same HMO and used a modified version of the Structured Clinical Interview for DSM-III-R (26). In general, the prevalence of MDD in primary care samples is 5% to 10% (27).

Chronic pain was present in 45% of our sample. In an epidemiologic study in the United Kingdom (23) that used a similar, although less restrictive (i.e., 3 months versus 6 months), definition of pain, the prevalence of chronic pain was 50%. Also, similar to Elliott and colleagues, we found that nearly 28% of those with chronic pain reported moderate to severe disability on the Graded Chronic Pain Scale (15).

We found that a substantial majority of those patients who met criteria for MDD also reported chronic pain. Specifically, among participants with MDD, 41% reported disabling chronic pain and 25% nondisabling chronic pain. Among those not meeting criteria for MDD, 10% reported having disabling chronic pain and 33% reported nondisabling chronic pain. Although fewer studies have investigated the prevalence of chronic pain symptoms among those with MDD than the converse (7), our findings are consistent with growing evidence suggesting that a large percentage of patients with MDD experience comorbid symptoms of chronic pain (3). Moreover, our findings revealed that pain was more likely to be disabling when MDD is present. Among those reporting chronic pain but not MDD, 23.9% met criteria for moderate to severe disability, whereas among those with MDD and chronic pain, 62.7% reported disability in the moderate to severe range.

Although we found clear evidence of epidemiologic comorbidity (14) or nonrandom co-occurrence of MDD and chronic pain, the magnitude of the relationship between chronic pain and MDD differed depending on which group of participants was examined. Among those with MDD, nearly 66% reported chronic pain. Among participants reporting any chronic pain, the overall percentage of those who also met criteria for MDD was 10.4%, whereas the prevalence of MDD among those without pain was 4.5%. However, among those with chronic pain, the prevalence of MDD was considerably different depending on whether the individual had nondisabling (5.4%) or disabling (23.3%) chronic pain. Although our findings underscore the importance of disability in the pain–depression association, the direction of effect is unclear. It is possible that those who are disabled by pain become depressed, and it is possible that those who are depressed are more likely to become disabled.

Our findings on HRQL are consistent with those of others who have reported significant decrements in quality of life associated with depressive disorders (12). However, we also found that when depression and disabling chronic pain are comorbid, the HRQL is even lower. In addition, those with disabling chronic pain who were not depressed showed HRQL impairment that was similar to those with MDD alone and MDD plus CP.

The pattern of findings on somatic symptom severity was similar for the MDD plus DCP group. That is, we found significant differences in the hypothesized direction among those with MDD plus DCP compared with all other groups. Consistent with findings that depressed patients in primary care settings often present somatic complaints (28), depressed participants without pain were as high on somatic symptom severity as nondepressed patients with disabling chronic pain.

The prevalence of panic disorder in our sample was 3.6%. Our findings on the prevalence of panic among those with MDD only, as well as MDD plus CP, are similar to those reported from the National Comorbidity Study data (29). However, the prevalence of panic among those with MDD plus DCP (31.2%) was nearly twice as high as in the two other depressed groups.

One explanation for the striking comorbidity of panic disorder among those with MDD plus DCP is that catastrophic thinking may be a feature of both panic disorder and disabling chronic pain. A number of investigators have conceptualized panic in terms of catastrophic appraisal of somatic sensations associated with elevated autonomic arousal (30). In addition, catastrophic thoughts regarding pain are related to increased pain intensity and disability, often independent of physical impairment (31). Although anxiety researchers and pain investigators have independently found catastrophic thinking to be a factor in appraising autonomic and painful somatic cues, respectively, it is possible that the propensity for such thinking extends to both types of experiences.

The prevalence of other anxiety in our sample was 6.2%. This is similar to the 7% PHQ-derived prevalence rate in the PHQ Primary Care Study (16). Unlike the findings for panic disorder, those with MDD plus DCP were not different than the other groups with MDD.

Consistent with prior studies (16,25), the prevalence of probable alcohol abuse/dependence in our sample was 6%. In the absence of MDD, we did not find that the presence of chronic pain, whether disabling or nondisabling, was associated with increased prevalence of alcohol abuse. The three depressed groups reported significantly more alcohol abuse/dependence than the nondepressed groups, but again, neither presence nor level of pain was associated with increased prevalence. Thus, in our sample, MDD was associated with increased levels of alcohol use, but chronic pain was not.

Strengths of our study included: 1) examining both the prevalence of chronic pain among those with depression and, conversely, the prevalence of depression among those with chronic pain in the same sample; 2) sampling in primary care, in which the majority of these patients are encountered; and 3) examination of the clinical burden associated with comorbid MDD and chronic pain, singly and together.

There are several limitations to be considered in interpreting our findings. First, our sample is restricted to HMO members who made a recent visit to their physician. The extent to which the findings may be generalized to uninsured populations or HMO patients in general is unclear. Second, we exclusively used self-report measures as opposed to interview-administered assessment. However, our findings on the prevalence of the psychiatric disorders we assessed were similar to other studies. Third, a substantial number of potential participants did not return questionnaires. Compared with nonrespondents, our participants were somewhat older and more likely to be female. We cannot rule out the possibility that respondents and nonrespondents differed on the measures of clinical interest. Finally, because patients with chronic pain frequently report difficulties in areas such as concentration, energy, and sleep, questions have been raised regarding the probability of false-positives when assessing the prevalence of MDD within this population (32).

The significance of our findings is underscored by previous evidence that, compared with either condition singly, comorbid chronic pain and depression are associated with a more malignant course and poorer response to treatment. The presence of depression among those with chronic pain is associated with longer pain duration (33) and nonrecovery (7). Symptoms of depression are associated with poor treatment response in patients with pain (34). Also, the presence of comorbid pain in depressed patients treated in primary care was associated with poor response to standard antidepressant medications (35), although Lin and colleagues (36) found improvements in pain severity and functioning among older depressed primary care patients with arthritis receiving treatment for depression that included medication, psychotherapy, in-person and telephone follow up. Attention to both chronic pain and depression among those presenting either condition singly is likely to be necessary to achieve better outcomes.

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