Health-Related Quality of Life in Primary Care Patients With Mental Disorders

Results From the PRIME-MD 1000 Study

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Objective.—To determine if different mental disorders commonly seen in primary care are uniquely associated with distinctive patterns of impairment in the components of health-related quality of life (HRQL) and how this compares with the impairment seen in common medical disorders.

Design.—Survey.

Setting.—Four primary care clinics.

Subjects.—A total of 1000 adult patients (369 selected by convenience and 631 selected by site-specific methods to avoid sampling bias) assessed by 31 primary care physicians using PRIME-MD (Primary Care Evaluation of Mental Disorders) to make diagnoses of mood, anxiety, alcohol, somatiform, and eating disorders.

Main Outcome Measures.—The six scales of the Short-Form General Health Survey and self-reported disability days, adjusting for demographic variables as well as psychiatric and medical comorbidity.

Results.—Mood, anxiety, somatiform, and eating disorders were associated with substantial impairment in HRQL. Impairment was also present in patients who only had subthreshold mental disorder diagnoses, such as minor depression and anxiety disorder not otherwise specified. Mental disorders, particularly mood disorders, accounted for considerably more of the impairment on all domains of HRQL than did common medical disorders. Finally, we found marked differences in the pattern of impairment among different groups of mental disorders just as others have reported unique patterns associated with different medical disorders. Whereas mood disorders had a pervasive effect on all domains of HRQL, anxiety, somatiform, and eating disorders affected only selected domains.

Conclusions.—Mental disorders commonly seen in primary care are not only associated with more impairment in HRQL than common medical disorders, but also have distinctive patterns of impairment. Primary care directed at improving HRQL needs to focus on the recognition and treatment of common mental disorders. Outcomes studies of mental disorders in both primary care and psychiatric settings should include multidimensional measures of HRQL.

HEALTH-RELATED quality of life (HRQL) is increasingly recognized as a major outcome in patient care and clinical research1-5 and as a term embraces the concepts of functional status, health status, quality of life, and well-being. A comprehensive assessment of HRQL typically measures the effects of health on a number of domains, including physical, social and role functioning, freedom from bodily pain, the subject’s perception of general health, and mental health.5-8 In addition, the number of disability days is frequently used as another measure of functional impairment.6,11 Specific medical disorders have been shown to have different effects on these components of HRQL. For example, arthritis is associated with increased bodily pain and impairment in physical functioning but little impairment in social or role functioning, whereas cardiac disease results in marked impairment across multiple domains of HRQL.11,12

For editorial comment see p 1557.

An important question is whether different mental disorders are also associated with different patterns of impairment in the domains of HRQL. If so, this would not only identify the particular areas in which patients with different mental disorders are impaired, but also the domains that one would focus on when evaluating treatment. Since most primary care patients with mental disorders have more than one type of mental disorder, an important additional question is the extent to which the overall impairment associated with a particular group of mental disorder (eg, mood, anxiety, eating, somatiform, and alcohol) is explained by the co-occurrence of other groups of mental disorders (psychiatric comorbidity) frequently present in patients with that type of mental disorder. For example, to what extent is the impairment associated with anxiety disorders actually a function of the common occurrence of mood disorders among patients with anxiety disorders?

A third question is how the impairment associated with common mental disorders compares with that in patients with general medical disorders. The Medical Outcomes Study (MOS) demonstrated that patients with depressive symptoms had impairment in multiple domains of HRQL, equal to or exceeding that associated with patients with chronic general medical conditions.11,12 However, the MOS focused only on depression and did not assess the effects of other mental disorders common in primary care, such as anxiety, somatiform, and alcohol disorders. A recent World Health Organization (WHO) collaborative study14 in 15

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countries showed that impairment in functional status was observed with a variety of mental disorders, but there were only modest differences in the measures of functional status among the mental disorders when controlling for psychiatric comorbidity. However, important differences in the patterns of impairment might have emerged had this study included additional HRQL constructs, such as measures of well-being.

In this article, we use data from the PRIME-MD 1000 study to address three major questions: What is the degree of impairment in HRQL associated with specific mental disorders commonly seen in primary care? Are certain groups of mental disorders associated with distinctive patterns of impairment in the components of HRQL, after adjusting for psychiatric comorbidity? How does the impairment associated with different mental disorders compare with that seen in general medical disorders?

**METHODS**

One thousand patients at four primary care sites were evaluated with PRIME-MD (an acronym for Primary Care Evaluation of Mental Disorders), a two-stage screening and interview procedure that enables a primary care physician to rapidly diagnose 18 specific mental disorders in five major groups: mood, anxiety, somatoform, alcohol, and eating disorders (see Table 1 for a list of the 12 most common specific PRIME-MD diagnoses). The 1000 patients were selected from 1360 patients who presented to the four sites from January 1992 to March 1993. The patients were selected by convenience (n=369) and by site-specific methods (n=631) to avoid sampling bias. These two groups of patients did not differ significantly in terms of age, sex, ethnicity, education, functional status, or frequency of PRIME-MD diagnosis. The PRIME-MD evaluations were made by 31 primary care physicians (seven to nine per site). Their mean age was 40 years. At three of the sites (76% of the 31 physicians), all were trained in internal medicine; the remainder were trained in family practice. The mean age of the patients was 55 years with a range of 18 to 91 years; 60% were women, 56% were white, and 28% were college graduates. Of the total sample, 77% were established clinic patients; the remainder were seen for the first time. The physician noted the presence of eight types of general medical disorders (plus “other”), the most common being hypertension (45% of all patients), arthritis (23%), diabetes (17%), and cardiac disease (18%). The number of types of current medical disorders was none in 18% of the patients, one in 34%, two in 29%, three in 14%, and four or more in 5%. Details of the PRIME-MD 1000 study, including data validating the diagnostic procedure, have been described previously.

One or more PRIME-MD disorders were diagnosed in 39% of the patients, including a mood disorder in 26%, anxiety disorder in 18%, somatoform disorder in 14%, alcohol disorder in 5%, and eating disorder in 3%. Whereas 26% of the patients had a mental disorder that met the full criteria for a specific disorder according to the criteria for diagnosis of the Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition (DSM-III-R), 13% of the patients had only a “subthreshold” diagnosis, such as minor depression or anxiety disorder not otherwise specified (NOS). Subthreshold diagnoses encompass fewer symptoms than are required for any specific DSM-III-R diagnosis but were included because they are associated with considerable impairment, and patients with these disorders may benefit from monitoring or treatment.

Psychiatric comorbidity was common. Among patients with a psychiatric diagnosis, 56% had a diagnosis from more than one major diagnostic group (eg, both a mood and an anxiety disorder), and 28% had diagnoses from three or more groups. The co-occurrence rates (ie, percentage of patients who had a disorder from another major group) was high for all major diagnostic groups; eating disorders, 54%; anxiety, 82%; somatoform, 78%; mood, 59%; and alcohol, 47%.

The domains of HRQL were evaluated with the MOS Short-Form General Health Survey (SF-20). This 20-item self-report instrument includes six scales measuring the effect of health on physical and role functioning, bodily pain, general health perception, social functioning, and mental health. The six scales are scored from 0 (maximal impairment) to 100 (no impairment). The physical functioning scale consists of six items describing limitations due to health in activities, such as sports, climbing stairs, walking, dressing, and bathing. The role functioning scale consists of two items describing the extent to which health interferes with work, housework, or schoolwork. The bodily pain scale is a single item measuring the degree to which the patient is free of pain. The

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**Table 1.** Association of Specific Mental Disorders With Health-Related Quality of Life

<table>
<thead>
<tr>
<th>Mental Disorder</th>
<th>No. of Patients*</th>
<th>Physical Functioning</th>
<th>Bodily Pain</th>
<th>Role Functioning</th>
<th>General Health</th>
<th>Social Functioning</th>
<th>Mental Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>No mental disorder, mean (SD)</td>
<td>614</td>
<td>77.8 (19.4)</td>
<td>66.2 (23.7)</td>
<td>84.4 (29.9)</td>
<td>80.8 (20.8)</td>
<td>67.0 (20.0)</td>
<td>65.3 (12.9)</td>
</tr>
</tbody>
</table>

**Average Difference in SF-20 Score Between Patients With No Mental Disorders and Patients With a Specific Mental Disorder†**

<table>
<thead>
<tr>
<th>Mental Disorder</th>
<th>No. of Patients*</th>
<th>Physical Functioning</th>
<th>Bodily Pain</th>
<th>Role Functioning</th>
<th>General Health</th>
<th>Social Functioning</th>
<th>Mental Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major depression</td>
<td>115</td>
<td>-21.8</td>
<td>-22.7</td>
<td>-45.5</td>
<td>-30.4</td>
<td>-31.7</td>
<td>-36.5</td>
</tr>
<tr>
<td>Dysthymia</td>
<td>78</td>
<td>-25.1</td>
<td>-21.8</td>
<td>-52.6</td>
<td>-33.4</td>
<td>-34.3</td>
<td>-39.7</td>
</tr>
<tr>
<td>Minor depression</td>
<td>64</td>
<td>-17.7</td>
<td>-19.8</td>
<td>-23.0</td>
<td>-21.8</td>
<td>-15.8</td>
<td>-19.0</td>
</tr>
<tr>
<td>Partial depression§</td>
<td>63</td>
<td>-17.1</td>
<td>-14.7</td>
<td>-32.3</td>
<td>-22.1</td>
<td>-16.2</td>
<td>-22.1</td>
</tr>
<tr>
<td>Anxiety, not otherwise specified</td>
<td>90</td>
<td>-16.5</td>
<td>-21.3</td>
<td>-25.7</td>
<td>-22.4</td>
<td>-27.6</td>
<td>-25.8</td>
</tr>
<tr>
<td>Panic</td>
<td>36</td>
<td>-24.5</td>
<td>-18.7</td>
<td>-43.1</td>
<td>-29.6</td>
<td>-30.3</td>
<td>-36.3</td>
</tr>
<tr>
<td>Somatoform, not otherwise specified</td>
<td>42</td>
<td>-16.0</td>
<td>-15.9</td>
<td>-36.1</td>
<td>-29.0</td>
<td>-16.0</td>
<td>-12.4</td>
</tr>
<tr>
<td>Hypochondriasis</td>
<td>22</td>
<td>-17.3</td>
<td>-14.0</td>
<td>-28.9</td>
<td>-36.1</td>
<td>-29.8</td>
<td>-23.2</td>
</tr>
<tr>
<td>Alcohol</td>
<td>51</td>
<td>-11.2</td>
<td>-6.4</td>
<td>-17.7</td>
<td>-12.9</td>
<td>-13.5</td>
<td>-10.8</td>
</tr>
<tr>
<td>Binge eating</td>
<td>30</td>
<td>-19.2</td>
<td>-27.7</td>
<td>-20.8</td>
<td>-24.5</td>
<td>-36.7</td>
<td>-27.5</td>
</tr>
</tbody>
</table>

*Number in total sample with disorder; numbers are slightly less for each SF-20 scale due to missing data (see text).
†Average decrease in SF-20 scale score in patients with each disorder compared with the 614 patients with no mental disorder, adjusted for age, sex, education, site, and of nine types of major medical disorders (see text). To determine the predicted score for a patient with a particular disorder, subtract the deviation score from the mean score for patients with no mental disorder.
§Partial depression indicates major depression in partial remission.
||Alcohol indicates probable alcohol abuse or dependence.
social functioning scale is a single item describing the extent to which health interferes with social activities, such as visiting friends or relatives. General health perceptions is a five-item scale describing the patient’s overall rating of their current health. Finally, the mental health scale consists of five items describing general mood or affect, including depression, anxiety, and positive well-being. In the tables and figures in this article, the scales are ordered as presented herein to facilitate interpretation of the scales from left to right, as moving from the best indicators of physical health status (physical and role functioning and bodily pain) to measures that equally tap physical and mental health status (general health perceptions and social functioning) to the best measure of mental health status (mental health). As an additional measure of functional status, disability days were estimated by asking patients how many days in the past 3 months they were unable to pursue their usual activities because of not feeling well.

For each SF-20 scale, as recommended by the authors, total scores were estimated by prorating the available data if information was available for more than 60% of the scale items; this resulted in missing data on 7% to 12% of the subjects for the different scales. There was missing data on 10% of the subjects for disability days.

RESULTS

Impairment Associated With Specific Mental Disorders

Table 1 shows the association of the 12 most common mental disorders included in PRIME-MD and the six SF-20 scales, without adjusting for psychiatric comorbidity, demonstrating the severity of impairment compared with patients with no mental disorder. The mean SF-20 score for patients with each of the disorders was calculated and compared with a single reference group: the 614 patients without a mental disorder. The first row presents the mean SF-20 scores for the patients without a mental disorder (most of whom had a medical disorder). The remainder of Table 1 presents the average difference of SF-20 scores for the 12 mental disorders, adjusted by regression analysis for age, sex, education, site, and each of nine types of physical disorders with the SF-20 scale. For example, the patients with major depression have an adjusted mean physical score 22 points lower than patients without a mental disorder. (A decrement of 10 points on most SF-20 scales is generally similar to that associated with various chronic medical disorders)

As can be seen, all mental disorders are associated with substantial decrements in SF-20 scores across all six scales. Although in general the impairment is greatest for threshold diagnoses, even subthreshold diagnoses, such as minor depression, anxiety disorder NOS, somatoform disorder NOS, and binge eating disorder, have considerable impairment.

Patterns of Impairment in HRQL Uniquely Associated With Specific Mental Disorders

For the remainder of the analyses, our primary aim was to estimate the unique association of each type of mental and medical disorder with the components of HRQL. The unique association of psychiatric and medical disorders with the components of HRQL was estimated by regressing each of the six SF-20 scores on the five major groups of mental disorders and the nine general medical disorders, again adjusting for age, sex, education, and site. Indicator (dummy) variables were used for each of the mental and general medical disorders. This method of adjusting for comorbidity identifies the independent association of each type of mental and medical disorder with each of the HRQL domains. Since the SF-20 scales have different variability, to make comparisons across the scales the results are presented as effect size (rather than as the raw scores used in Table 1). The effect size is the difference in scale score between patients with and without the disorder, divided by the SD of the scale in the total sample. Effect sizes 0.20, 0.50, and 0.80 or greater are considered small, moderate, and large, respectively. It should be noted that whereas in Table 1 all patients with a particular disorder were contrasted to the same reference group (patients with no mental disorder), in Table 2 the reference group is patients without the disorder being examined.

The unique association of the five major groups of mental disorders and the nine types of general medical disorders with the six SF-20 scales is presented in Table 2. Patients with a mood disorder had adjusted scores on the physical functioning scale that were half (0.50) of an SD lower than patients without a mood disorder, a moderately large difference.

After adjusting for demographic variables and psychiatric and medical comorbidity, each of the five groups of mental disorders produces a distinctive

Table 2—Unique Association of Mental and Medical Disorders with Health-Related Quality of Life

<table>
<thead>
<tr>
<th>Disorder</th>
<th>No. of Patients*</th>
<th>Physical Functioning</th>
<th>Bodily Pain</th>
<th>Role Functioning</th>
<th>General Health</th>
<th>Social Functioning</th>
<th>Mental Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mood</td>
<td>260</td>
<td>-0.501</td>
<td>-0.371</td>
<td>-0.581‡</td>
<td>-0.61‡</td>
<td>-0.481†</td>
<td>-0.971</td>
</tr>
<tr>
<td>Anxiety</td>
<td>178</td>
<td>-0.245</td>
<td>-0.259</td>
<td>-0.246§</td>
<td>-0.20</td>
<td>-0.491</td>
<td>-0.821</td>
</tr>
<tr>
<td>Somatoform</td>
<td>139</td>
<td>-0.22</td>
<td>-0.421</td>
<td>-0.471</td>
<td>-0.67‡</td>
<td>-0.24</td>
<td>+0.04</td>
</tr>
<tr>
<td>Alcohol</td>
<td>51</td>
<td>-0.13</td>
<td>+0.07</td>
<td>-0.09</td>
<td>-0.13</td>
<td>-0.17</td>
<td>-0.01</td>
</tr>
<tr>
<td>Eating</td>
<td>32</td>
<td>-0.23</td>
<td>-0.495</td>
<td>+0.17</td>
<td>-0.21</td>
<td>-0.67‡</td>
<td>-0.34</td>
</tr>
<tr>
<td>Hypertension</td>
<td>480</td>
<td>-0.04</td>
<td>+0.02</td>
<td>+0.03</td>
<td>-0.05</td>
<td>+0.07</td>
<td>+0.09</td>
</tr>
<tr>
<td>Arthritis</td>
<td>230</td>
<td>-0.39§</td>
<td>-0.594</td>
<td>-0.28‡</td>
<td>-0.22§</td>
<td>-0.17</td>
<td>-0.12</td>
</tr>
<tr>
<td>Diabetes</td>
<td>170</td>
<td>-0.13</td>
<td>+0.07</td>
<td>-0.10</td>
<td>-0.32‡</td>
<td>-0.17</td>
<td>-0.06</td>
</tr>
<tr>
<td>Cardiac</td>
<td>150</td>
<td>-0.41†</td>
<td>-0.259</td>
<td>-0.35§</td>
<td>-0.35‡</td>
<td>-0.12</td>
<td>-0.14</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>78</td>
<td>-0.42‡</td>
<td>-0.07</td>
<td>-0.30§</td>
<td>-0.10</td>
<td>-0.14</td>
<td>-0.13</td>
</tr>
<tr>
<td>Renal</td>
<td>33</td>
<td>-0.33</td>
<td>-0.32</td>
<td>-0.23</td>
<td>-0.46§</td>
<td>-0.17</td>
<td>+0.09</td>
</tr>
<tr>
<td>Cancer</td>
<td>20</td>
<td>-0.52</td>
<td>+0.03</td>
<td>-0.40</td>
<td>-0.54</td>
<td>-0.10</td>
<td>-0.03</td>
</tr>
<tr>
<td>Hepatic</td>
<td>19</td>
<td>-0.24</td>
<td>-0.05</td>
<td>-0.54</td>
<td>-0.35</td>
<td>+0.10</td>
<td>-0.20</td>
</tr>
</tbody>
</table>

*Number in total sample with disorder; numbers are slightly less for each SF-20 scale due to missing data (see text).
†Patients with each disorder are compared with patients without that disorder, adjusted for age, sex, education, site, and each of the other disorders. Effect size (see text) is average deviation divided by SD on that scale for entire sample. For example, patients with a mood disorder have an adjusted score on the SF-20 physical functioning scale that is half (0.50) of an SD lower than patients without a mood disorder.
§P<.01.
§P<.001.
Alcohol indicates probable alcohol abuse or dependence.
Table 3.—Unique Association of Mental and General Medical Disorders With Self-reported Disability Days in the Past 3 Months

<table>
<thead>
<tr>
<th>Disorder</th>
<th>No. of Patients</th>
<th>Excess Disability Days Uniquely Due to Disorder*</th>
<th>95% Confidence Interval</th>
<th>Standardized Regression Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatic</td>
<td>19</td>
<td>12.51</td>
<td>5.7 to 19.4</td>
<td>0.120</td>
</tr>
<tr>
<td>Cancer</td>
<td>20</td>
<td>9.02</td>
<td>1.2 to 16.8</td>
<td>0.075</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>78</td>
<td>6.29</td>
<td>2.4 to 9.9</td>
<td>0.111</td>
</tr>
<tr>
<td>Mood</td>
<td>260</td>
<td>4.39</td>
<td>1.7 to 6.9</td>
<td>0.125</td>
</tr>
<tr>
<td>Somatoform</td>
<td>139</td>
<td>4.01</td>
<td>0.8 to 7.1</td>
<td>0.090</td>
</tr>
<tr>
<td>Anxiety</td>
<td>178</td>
<td>3.51</td>
<td>0.5 to 6.5</td>
<td>0.090</td>
</tr>
<tr>
<td>Cardiac</td>
<td>150</td>
<td>2.8</td>
<td>-0.1 to 5.7</td>
<td>0.068</td>
</tr>
<tr>
<td>Renal</td>
<td>33</td>
<td>1.9</td>
<td>-3.7 to 7.5</td>
<td>0.023</td>
</tr>
<tr>
<td>Arthritis</td>
<td>230</td>
<td>1.5</td>
<td>-1.0 to 4.0</td>
<td>0.041</td>
</tr>
<tr>
<td>Hypertension</td>
<td>480</td>
<td>-0.1</td>
<td>-2.3 to 2.1</td>
<td>0.004</td>
</tr>
<tr>
<td>Diabetes</td>
<td>170</td>
<td>-0.6</td>
<td>-3.4 to 2.1</td>
<td>0.016</td>
</tr>
<tr>
<td>Eating</td>
<td>32</td>
<td>-1.1</td>
<td>-6.6 to 4.3</td>
<td>0.014</td>
</tr>
<tr>
<td>Alcohol</td>
<td>51</td>
<td>-4.1</td>
<td>-8.4 to 0.3</td>
<td>0.062</td>
</tr>
</tbody>
</table>

*Patients with each disorder are compared with patients without that disorder, adjusted for age, sex, education, site, and each of the other disorders. For example, patients with mood disorders report 4.3 excess disability days compared with patients without a mood disorder, while those with an alcohol disorder report 4.1 fewer disability days than those without an alcohol disorder. The entire patient sample had a mean of 5.0 disability days.

+P<.001.
+P<.05.
§P<.01.

[Alcohol indicates alcohol abuse or dependence.]

pattern of impairment. Whereas mood disorders are associated with all components of HRQL, anxiety disorders primarily are associated with impaired social functioning and mental health. Somatoform disorders have a prominent association with role functioning, bodily pain, and general perception of health but have no association with the mental health scale. The unique impairment associated with eating disorders is limited to social functioning and bodily pain. Surprisingly, alcohol disorder did not have a significant association with any of the measures. The patterns of impairment associated with medical disorders is generally similar in this sample to that previously reported in the MOS, even though the two study samples differed in the prevalence of medical disorders, and in the MOS, the data were not controlled for mental disorders.12

In a separate analysis, the 12 most common medical disorders were entered into the regression equation to determine if, within each major diagnostic group, specific mood, anxiety, or somatoform disorders had different profiles from the larger diagnostic group (data not shown, available on request). Of interest, the unique impairment associated with dysthymia was considerably less than the other three mood disorders (average effect size for SF-20 scales for dysthymia, 0.32; major depression, 0.61; partial remission of major depression, 0.60; minor depression, 0.56). This suggests that much of the impairment seen in patients with dysthymia may be due to frequent comorbidity with other mental disorders (such as major depression in patients with "double depression"). In addition, the unique impairment associated with specific anxiety disorders, such as panic disorder and generalized anxiety disorder, was substantially lower than any of the mood disorders (mean effect size for panic disorder, 0.13; generalized anxiety disorder, 0.19; anxiety disorder NOS, 0.32).

The unique association of mental and general medical disorders with the number of self-reported disability days in the past 3 months is shown in Table 3, using the same regression analysis that was used to predict the SF-20 scores presented in Table 2. The excess number of disability days is the difference between the number of disability days of patients with and without each type of disorder, adjusted for demographic characteristics and comorbidity, and is presented in rank order. For example, patients with mood disorders, compared with patients without mood disorders, report 4.3 excess disability days. The fourth column is the standardized regression coefficient and allows for comparisons among the disorders, adjusting for prevalence. Thus, cancer, while associated with a larger number of excess disability days compared with mood disorders (9.0 vs 4.3 days), accounts for a smaller amount of the overall variation in disability days because of its much lower prevalence (β=0.75 vs β=125). Because mood, somatoform, and anxiety disorders are all prevalent and associated with a statistically significant number of excess disability days, they account for a substantial amount of the overall impairment in our primary care patients.

Considering both SF-20 scales and disability days, the common mental disorders are associated with greater impairment than several common medical disorders, such as cardiac disease, arthritis, hypertension, and diabetes, on most measures except physical functioning. However, even for physical functioning, mood disorders are associated with impairment comparable with that seen in patients with cardiac disease and arthritis. Figure 1 illustrates the data from Table 2 for the three most common groups of mental disorders and for three common medical disorders, cardiac disease, arthritis, and diabetes.

To determine the extent to which the impairment associated with different groups of mental disorders is explained by the co-occurrence of other groups of mental disorders (psychiatric comorbidity), the drop in the average effect size for the SF-20 scales was calculated for the five groups of mental disorders, adjusting for psychiatric comorbidity. For example, the unadjusted average effect size of mood disorders on the six SF-20 scales was 0.58; after adjusting for comorbidity, it was 0.59, a drop of 29%. The drop in the other four groups of mental disorders was larger: anxiety, 53% (0.78 to 0.37), somatoform, 52% (0.69 to 0.38); alcohol, 53% (0.17 to 0.08); and eating, 52% (0.63 to 0.30).

Comparison of Impairment in Mental Disorders With Impairment in General Medical Disorders

To compare the impairment in HRQL associated with various mental disorders with the impairment associated with general medical disorders, the unique proportion of variance in impairment accounted for by mental disorders and medical disorders was calculated. The unique proportion of variance explained by the mental disorders was determined by calculating the difference between the variance explained by entering all factors (the five groups of mental disorders and the nine types of general medical disorders, as well as age, sex, education, and site) and the proportion explained by entering all but the mental disorders. An analogous procedure was done to calculate the unique proportion of variance explained by the medical disorders. For all scales, Figure 2 shows that more of the variance was uniquely accounted for by the mental disorders than by the medical disorders. This would be expected for the mental health scale, but the amount of variance accounted for by mental disorders is also dramatically greater for the role functioning, social functioning, and general health scales.

COMMENT

Similar to previous studies,9,11,14,17,18 we found that depressive disorders in primary care are associated with substan-
tial impairment in HRQL. Second, we found that significant impairment is also seen in patients with anxiety, somatoform, and eating disorders. Third, the considerable impairment present in patients who only had subthreshold mental disorder diagnoses adds to the growing body of evidence that primary care patients with subthreshold disorders also merit clinical attention.\textsuperscript{9,11,17,19} Fourth, mental disorders, particularly depressive disorders, accounted for considerably more of the impairment than did common medical disorders on all of the domains of HQRL. Finally, we found that there are marked differences in the pattern of impairment among different groups of mental disorders just as others have reported unique patterns associated with different medical disorders.\textsuperscript{12}

There are two reasons to believe that the results of our study are generalizable to other primary care settings. In comparing our sample with patients seen by internists in the United States overall as determined by the National Ambulatory Medical Care Survey,\textsuperscript{26} our patients were nearly identical in terms of sex (60\% vs 58\% women) and age (55 vs 54.8 years). Although our sample had more minority patients (42\% vs 19\%), minority status rarely had a significant association with any of the outcome variables. The most common chronic medical conditions in our sample (hypertension, arthritis, diabetes, and cardiac disease) are also the leading diagnoses in internal medicine practice overall.\textsuperscript{21} In addition, the patterns and magnitude of impairment across the SF-20 scales that we observed in patients with common general medical disorders were generally similar to that seen in the MOS, a landmark study of health outcomes in large samples of medical patients from multiple practice sites.\textsuperscript{18}

We recognize that the cross-sectional design of our study does not prove that the mental disorders in our patients caused the associated impairment in HRQL. It is possible that for some patients impaired functioning itself could result in psychopathology. However, multiple studies,\textsuperscript{22,26} primarily with depressive disorders, as well as a wealth of clinical experience, indicate that effective treatment of mental disorders frequently improves functional status. Therefore it is reasonable to assume that mental disorders, as do general medical disorders, result in impaired HRQL.

Our study has important implications for the primary care clinician. Mental disorders are not only common in primary care but are frequently overlooked because primary care patients with mental disorders typically present with physical symptoms rather than psychological symptoms.\textsuperscript{27} Decrements in HRQL from mental disorders are usually greater than the decreases in HRQL resulting from common physical disorders. In short, mental disorders, such as depression, anxiety, and somatoform, may be the most important determinants of how our patients feel about themselves, their lives, and the efficacy of their health care. If the goal of primary care practice is to improve HRQL, then our study suggests the value of more widespread screening for mental disorders (eg, in new patients, patients with poorly explained symptoms, and periodic health examinations) using a validated and efficient instrument. While a number of instruments are available to screen for depression in primary care,\textsuperscript{28} an advantage of PRIME-MD is that it also assesses other common mental disorders.

In addition to screening for mental disorders, should primary care clinicians incorporate measures of HRQL in their practice? Self-administered versions of the SF-36\textsuperscript{30} (and even briefer SF-12) as well as other simple HRQL measures\textsuperscript{30} are now available in versions that can be computer scored for easier use in the busy outpatient setting. As for impairment in
HRQL that is the result of psychopathology, our study suggests two uses of measures of HRQL in clinical practice. First, in patients being treated for one or more mental disorders, the pattern of HRQL impairment may suggest parameters with which to follow the patient's progress toward recovery and perhaps even which aspects of management should be emphasized. For example, restoration of normal role function may be an important therapeutic goal for a patient diagnosed with a somatoform disorder, whereas efforts at normalization of social functioning may be a management focus for patients with mood, anxiety, and eating disorders. Second, in the patient without a diagnosed mental disorder, unexpectedly low scores of HRQL or a deterioration in scores over time not accounted for by a general medical disorder, even on non–mental health subscales such as physical pain or role functioning, should immediately suggest undetected mental illness. The clinician may suspect a specific mental illness according to the patterns just described, but because the patterns of impairment do not approach the level of specificity necessary for making a mental disorder diagnosis, the use of a diagnostic procedure, such as PRIME-MD, would then be indicated. This use of HRQL measures as a screen for mental disorders would justify its use in periodic health examinations and in evaluating new patients.

Beyond its potential utility in screening for or managing the care of patients with mental disorders, HRQL assessment is increasingly being recognized as an important indicator of the quality of primary care.18 While impairments in HRQL are associated with increased utilization of health care services, such impairment is often not recognized by the clinician.29–31 When surveyed, patients actually report that they would like their physicians to assess their functional performance and emotional well-being as a part of medical care.29 Future studies may strengthen the argument that there are multiple clinical uses justifying broader use of HRQL measurements in primary care.

Our findings have important implications for outcomes research in psychiatry. Although the SF-20 has been used extensively in evaluating patients with medical disorders, our data clearly show that the multiple domains assessed by the instrument are relevant to studying the relationship between mental disorders and patient functioning and well-being. There may be value in routinely including multiple dimensions of HRQL in psychiatric outcomes studies rather than relying solely, as is often the case, on a single global measure of functioning, such as the Global Assessment Scale.5,30

Different groups of mental disorders were each uniquely associated with distinct patterns of impairment. Mood disorders were characterized by large associations with all measures of HRQL and, compared with the other common mental disorders, had the smallest drop in overall impairment when adjusting for psychiatric comorbidity. This indicates that the impairment seen in patients with mood disorders is less attributable to psychiatric comorbidity than it is for the other mental disorders. These findings justify the current emphasis on the recognition and treatment of mood disorders in primary care.37

The unique impairment associated with anxiety disorders was limited to three domains: social and role functioning, mental health, and an increase in disability days. On the other hand, in a large study of mental disorders in the community,18 anxiety disorders had a substantial and independent association with physical functioning and general health perception, even though major depression had an even larger association. Whereas other studies have focused on the disability associated with panic disorder,30,31 in our primary care sample, patients who had generalized anxiety disorder or anxiety disorder NOS experienced comparable or even greater impairment. Clearly, further research is needed to clarify the independent association of specific anxiety diagnoses as well as anxiety disorders as a group with the multiple domains of HRQL.

Somatoform disorders were associated with impairment in role functioning, bodily pain, and general health perceptions. The absence of any impairment on the mental health scale of the SF-20 in these patients is not surprising, considering that this scale consists of five items that primarily assess mood and anxiety symptoms. Since somatoform disorders are characterized by multiple unexplained physical symptoms, the impairment shown on the role functioning scale is also expected, but it is curious that such patients did not report significant impairment on the physical functioning scale. It is possible that the symptoms reported by such patients are not severe enough to interfere with the type of activities included in the physical functioning scale, such as walking, climbing stairs, or bathing.

Eating disorders, which in our sample consisted almost entirely of patients with binge eating disorder, were characterized by significant impairment in social functioning, mental health, and bodily pain. The impairment in social functioning is consistent with the fact that such patients, who are usually markedly overweight, are extremely sensitive about their weight and appearance.41

The lack of impairment in any of the domains for patients with alcohol disorders, after controlling for psychiatric comorbidity, is puzzling since one would certainly expect impairment in social and role functioning. This might in part be due to the less severe nature of alcohol disorders seen in primary care settings14,36 or, more likely, to poor sensitivity of our measure of alcohol problems caused by patient denial, commonly present in patients with alcohol abuse or dependence.

In contrast to our findings, the recent WHO study found that differences in impairment among specific mental disorders diminished considerably after controlling for psychiatric comorbidity.42 One reason that we were able to identify unique patterns while the WHO study did not may in part be due to the fact that their study included only measures of functional status, whereas ours also included measures of well-being. In addition, we used multivariate analysis, and they used a different method to adjust for psychiatric comorbidity. First they compared impairment among all patients with different groups of mental disorders. Then they restricted their analysis to examining impairment among patients with only “pure” forms of each disorder (a single mental disorder), thus excluding all patients with psychiatric comorbidity. Although our sample size does not allow us to perform this type of analysis, it is not clear which method of controlling for psychiatric comorbidity gives the most valid results. It is possible that patients with only a single disorder are not representative of all patients with that disorder.

Our study has several possible limitations. Although our physicians noted the presence or absence of specific groups of medical disorders, we had no measures of illness severity. Clearly, patients with more serious medical disorders would be expected to have greater impairment. However, we also had no measures of severity of mental disorders, and it would also be expected that patients with more severe mental disorders would also have greater impairment. Since our study group was a primary care sample, the majority of patients with mental and medical disorders had illnesses that were mild to moderate in severity. Therefore, we believe that our comparisons of the association of mental and medical disorders with HRQL were probably not biased by a lack of severity measures. However, in future studies it would be valuable to explore the effects that severity of both medical and mental disorders have on impairment.

A second potential limitation of our study is that measures of impairment in HRQL relied solely on patient self-report. There is the possibility that many patients with mental disorders exaggerate and patients with alcohol disorders...
minimize the actual amount of their disability. However, the different patterns of impairment across different groups of mental disorders argue against simple reporting bias on the part of our patients with mental disorders. Furthermore, virtually all studies of impairment in HRQL rely solely on patient self-report, whether assessed by questionnaire or direct interview. This is because of the difficulty in obtaining independent observations of functional status by others (family members or friends) and the lack of objective ways to measure the relevant domains. Finally, the patient’s perception of his or her functional status, even if discordant with independent measures, clearly cannot be ignored. Despite the limitations of self-report, the instrument that we used, the SF-20, has been the major measure of HRQL in leading studies, such as the MOS.11,22 Although the somewhat longer SF-36 is increasingly being used as a criterion standard for assessing HRQL in clinical research, the SF-20 scales correlate highly with those of the SF-36,21,40 particularly when measuring differences between groups rather than changes within an individual patient.

Mental disorders are not only prevalent in primary care but are responsible for a large proportion of the impairment in HRQL experienced by patients, often exceeding the impairment associated with common medical disorders. Therefore, primary care directed at improving HRQL needs to focus on the recognition and treatment of common mental disorders. While effective treatment has been developed for major depression and panic disorder, our study provides additional evidence that there is also a need to develop treatment strategies for somatoform disorders, subthreshold mood and anxiety disorders, and chronic conditions, such as dysthymia and generalized anxiety disorder.42 Primary care patients frequently have multiple psychiatric and medical diagnoses. However, after adjusting for this comorbidity, the patterns of impairment differ substantially among the common groups of mental disorders. Mood disorders are characterized by impairment in all areas of HRQL, while other mental disorders affect only selected domains. Outcome studies of mental disorders in both primary care and psychiatric settings should include multidimensional measures of HRQL.

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