See commentary by Skodol p1516

Reductions in Quality of Life Associated With Common Mental Disorders:

Results From a Nationally Representative Sample

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ABSTRACT

Objective: Traditional burden-of-disease estimates often exclude personality disorders, which are associated with significant mortality and morbidity. The aim of this study was to estimate the health-related quality of life (HRQoL) and annual population-level quality-adjusted life-year (QALY) losses associated with different mental and physical health conditions. In particular, it sought to quantify the impact of personality disorders on quality of life, at an individual and population level.

Method: This was a secondary analysis of data from the National Epidemiologic Survey on Alcohol and Related Conditions, a nationally representative survey of the US general population collected from 2001 to 2005 (N = 34,653). Health-related quality of life (measured using the Short-Form Health Survey-6D) was the main outcome of interest. Regression analysis assessed the impact of various mental (based on *DSM-IV* criteria) and physical health conditions on HRQoL scores, and this impact was combined with the prevalence of disorders to estimate the population-level burden of disease.

Results: Mood disorders were associated with the highest decrease in HRQoL scores, followed by strokes, psychotic illness, and arthritis ($P < .01$). The greatest annual population QALY losses were caused by arthritis, mood disorders, and personality disorders.

Conclusions: Quality-adjusted life year losses associated with personality disorders ranked behind only mood disorders and arthritis. Personality disorders were associated with significant reductions in quality of life, despite the fact that they are often excluded from traditional burden of disease estimates.

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Over the past few decades, the focus on the worldwide burden of disease has shifted from premature death to disability,[1] which has led to an increasing interest in measures of health that quantify both mortality and morbidity. As Robberstad[2(p184)] points out, the traditional life-years approach, which deals only with mortality, ignores improvements in physical and mental health and reductions in pain, or "ignores the obvious fact that health is more than merely staying alive." One prominent example of such a combined measure is the disability-adjusted life-years (DALYs) being used in the Global Burden of Disease study, which estimates the population health of the entire world.[3] Another combined measure is quality-adjusted life-years (QALYs), which assigns each life year a value between 0 and 1, representing states equal to death and perfect health, respectively. More information on QALYs can be found elsewhere.[4,5] Quality-adjusted life-years are used in economic evaluations, such as cost-effectiveness and cost-benefit analyses, which are becoming increasingly important in mental health, as shown, for example, by Anderson and colleagues.[6] Mental health has substantial economic impact in the United States and worldwide,[7–9] and tools such as QALYs have the potential to compare the burden of mental illness across different disorders.[10]

A series of recent articles have attempted to quantify the morbidity burden of psychiatric and chronic physical diseases and describe health states for various conditions by using health-related quality of life (HRQoL) as an outcome. In these articles, different measures of HRQoL have been used with different populations. Subramaniam et al[11] and Saarni et al[12,13] use the EQ-5D and 15D in Singapore and Finland, respectively. In Spain, Fernández et al[14] used the 12-item Short-Form Health Survey (SF-12), a briefer version of the SF-36 that measures physical and mental dimensions of quality of life.[15] These HRQoL scores are combined with a utility scoring formula from a reference population to compare average HRQoL losses associated with different disorders.[16] These articles then combine HRQoL losses associated with different health conditions with the prevalence of these conditions to estimate annual population-level QALY losses. The 2 most recent articles found pain conditions, mood disorders, and anxiety disorders to be associated with the largest marginal effects on HRQoL and also with population-level QALY losses, along with hypertension.[11,14]

The present study follows these publications and extends them in several important ways. First, no such analysis has yet been done in the United States or North American context. Second, all earlier articles have focused on mood, anxiety, and substance use disorders as the psychiatric conditions evaluated. They have found repeatedly that mental illness has a profound impact on quality of life, although some of this impact is reduced when controlling for comorbidity.[17] However, no article has included personality disorders, an important category of psychiatric disorder associated with considerable morbidity, suicidal behavior, and

Clinical Points

- As individuals with psychotic illness have the lowest quality of life scores, management of these patients will benefit from attention to quality of life.
- Similarly, as mood disorders have the largest marginal effects, management of patients will need to address the decreased quality of life that occurs during a mood episode.
- At a resource level, personality disorders have a large burden of disease, and clinical resourcing will need to account for their large impact on the population.

poorer quality of life.[18–22] Third, our sample (N = 34,653) has sufficient power to evaluate conditions with low prevalence (ie, < 1%).

We hypothesize that certain individual personality disorders, especially borderline personality disorder, will be associated with low quality of life, along with other disorders that have been found to have significant impact on quality of life in the literature, such as chronic pain disorders, mood disorders, and anxiety disorders. The impact of personality disorders as a category is uncertain, due to the considerable variation in functional impairment within the category.[23]

METHOD

Population

Data come from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC, www.HealthData.gov), a nationally representative survey conducted by the National Institute on Alcohol Abuse and Alcoholism. Face-to-face interviews were conducted by trained members of the US Census Bureau on the study population, which included noninstitutionalized individuals over the age of 18 years living in the United States. Data were collected in 2 waves: participants were first interviewed in Wave 1 (2001 and 2002) and were reinterviewed in Wave 2 (2004 and 2005). Wave 1 included 43,097 individuals, and Wave 2 included 34,653 individuals, with an overall cumulative response rate of 70.2% for the 2 waves. With the exception of personality disorder diagnoses (described in the Measures section), data from Wave 2 were used in this analysis. Data were adjusted to represent the civilian population based on the 2000 US Census. More detailed information about the NESARC can be found elsewhere.[24,25]

Measures

Quality of life. Health-related quality of life was assessed using the 12-item Short Form Health Survey (SF-12), which consists of 12 questions concerning quality of life (including physical functioning, role functioning, mental health, vitality, and social functioning) over the preceding 4-week period. Responses to each question are on a 5- or 3-point scale ranging from "very limited" to "not limited at all." The SF-12 provides the 7 questions needed for the SF-6D (How much of the time have you been limited in the kind of work or other activities you could do as a result of your physical health? How much does your health limit you in moderate activities? How much of the time have you accomplished less than you would like as a result of emotional problems? How much of the time during the past 4 weeks have you had a lot of energy? Felt downhearted and depressed? During the past 4 weeks, how much of the time have your physical health and emotional problems interfered with social activities? During the past 4 weeks, how much did pain interfere with your normal work, including both work outside the home and housework?). Brazier and Roberts[26] derived a scoring formula that gives different values to different dimensions of the SF-6D, using a standard gamble technique on a representative sample of the UK population. This formula results in a single number representing quality of life. In 2008, Brazier et al[27] revised the scoring formula, and a copy was obtained from the University of Sheffield. This revised formula was utilized for the current study.

Sociodemographic variables. The sociodemographic variables included in this analysis were sex, age, household income, marital status, education level, and race/ethnicity. These variables were chosen based on their significance in studies that used the same methodology[11,13,14] and the NESARC data.[28] Age was divided into 3 categories (< 45 years, 45–65 years, and > 65 years). Annual household income was divided into 4 categories (< $20,000, $20,000–$34,999, $35,000–$59,999; and $60,000 or more). Race/ethnicity was divided into 4 categories (white; Black; Hispanic; and American Indian, Alaskan, Asian, or Hawaiian or other Pacific Islander). Marital status was defined as 1 of 3 categories: never married, previously married, or currently married or cohabiting. Education was divided into 3 categories: less than high school, high school or equivalent, or more than high school.

Mental and physical health conditions. The Alcohol Use Disorders and Associated Disabilities Interview Schedule-IV (AUDADIS-IV) was used to make *DSM-IV* diagnoses. The reliability of this schedule has been found to be fair to excellent, depending on the condition assessed.[24,25] We included past year mood disorders (major depressive disorder, dysthymia, bipolar disorder [defined as mania or hypomania]), anxiety disorders (panic disorder, specific phobia, social phobia, agoraphobia, generalized anxiety disorder, posttraumatic stress disorder), substance use disorders (alcohol abuse or dependence, drug abuse or dependence), and nicotine dependence. Psychotic illness was assessed with the following question: "In the last 12 months, did a doctor or other health professional tell you that you had schizophrenia or a psychotic illness or episode?" All 10 lifetime personality disorders were assessed: avoidant, antisocial, narcissistic, borderline, histrionic, dependent, schizotypal, schizoid, obsessive-compulsive, and paranoid personality disorder. Past year physical health conditions were assessed with the following questions: "In the past 12 months, did you have . . . ?" and "Did a doctor or other health professional tell you that you had . . . ?" In order to meet criteria for a physical health condition in the current study, the condition must have been confirmed by a health

professional. We divided the physical conditions into several categories: (1) arteriosclerosis, (2) diabetes, (3) hypertension, (4) high cholesterol, (5) hepatic disease (cirrhosis of the liver, liver disease), (6) cardiovascular disease (angina pectoris, tachycardia, myocardial infarction, heart disease), (7) sexually transmitted infection (HIV, AIDS, or other sexually transmitted infection), (8) gastrointestinal disease (gastritis or stomach ulcer), (9) stroke, and (10) arthritis. Physical and mental health conditions were assessed at Wave 2 with the exception of certain conditions that were assessed only in Wave 1 (avoidant, antisocial, dependent, obsessive-compulsive, paranoid, schizoid, and histrionic personality disorders).

Statistical Analysis

Mean SF-6D scores were calculated for each condition, both unadjusted and adjusted for sociodemographic characteristics. Second, regression analysis was performed, with SF-6D scores used as the dependent variable. We used a Tobit regression model to account for the censoring of data at a perfect health score of 1.[29] Three models were used: an unadjusted model, a model controlling for sociodemographics, and a model controlling for sociodemographics and comorbid mental and physical health conditions. The third model contained all 10 physical health conditions as comorbid conditions, as well as either each individual mental condition (for example, major depressive disorder or borderline personality disorder) or each category of mental health condition (for example, mood disorder or personality disorder). Finally, the marginal effects of each condition on quality of life were multiplied by the prevalence of the condition, following methods used by existing literature,[11–14] giving a cross-sectional annual QALY loss per 100,000 people.

RESULTS

Our overall sample included 34,533 individuals (120 were classified as *missing* due to missing SF-6D questions). The mean SF-6D score was 0.8017, with 2,989 individuals receiving a score of 1.00, implying full health. Table 1 demonstrates mean SF-6D scores across sociodemographic groups. Men had higher scores than women. Older, less educated individuals with lower incomes had worse HRQoL scores. Being married was associated with the highest HRQoL score, and previously married with the worst. Hispanic individuals had the highest mean HRQoL.

Table 2 demonstrates the mean SF-6D scores for mental and physical health conditions. After adjusting for sociodemographics, psychotic illness (0.6280), dysthymia (0.6318), and agoraphobia (0.6407) were associated with the lowest mean SF-6D scores, followed by dependent personality disorder (0.6429), panic disorder (0.6651), and generalized anxiety (0.6654). Although in further models we go on to control for comorbid conditions, in a clinical sense, this mean score gives the most information about the typical presentation of a particular mental or physical illness in terms of quality of life.

Table 1. Sociodemographics and Associated Mean Short-Form Health Survey-6D (SF-6D) Scores of Sample

Variable	N (Unweighted)	% (Weighted)	Mean SF-6D Score (95% CI)
Total	34,533		0.8017 (0.7991–0.8044)
Sex			
Female	20,012	52.06	0.7847 (0.7816–0.7877)
Male	14,521	47.94	0.8203 (0.8168–0.8237)
Income			
Less than $20,000	7,989	18.51	0.7324 (0.7275–0.7373)
$20,000–$34,999	6,857	18.49	0.7846 (0.7793–0.7899)
$35,000–$59,999	8,420	25.19	0.8117 (0.8082–0.8153)
$60,000+	11,267	37.82	0.8374 (0.8343–0.8405)
Marital status			
Married or living together	18,809	63.81	0.8157 (0.8127–0.8188)
Previously married	9,107	18.84	0.7491 (0.7443–0.7538)
Never married	6,617	17.35	0.8075 (0.8028–0.8122)
Education			
Less than high school	5,486	13.99	0.7599 (0.7516–0.7683)
High school or equivalent	9,416	27.47	0.7915 (0.7875–0.7955)
More than high school	19,631	58.54	0.8165 (0.8137–0.8193)
Age			
Less than 45 y	15,479	46.12	0.8237 (0.8204–0.8269)
45–65 y	11,921	34.62	0.7955 (0.7915–0.7994)
65+ y	7,133	19.26	0.7604 (0.7561–0.7648)
Race/ethnicity			
White	20,100	70.97	0.8009 (0.7983–0.8035)
Black	6,565	11.03	0.7855 (0.7798–0.7912)
American Indian, Alaskan Native, Asian, Hawaiian or other Pacific Islander	1,527	06.41	0.8023 (0.7916–0.8130)
Hispanic	6,341	11.59	0.8221 (0.8156–0.8287)

The marginal effects of each condition on quality of life are shown in Table 3. Mood disorders were associated with a 0.0807 decrease in HRQoL score; strokes were associated with a 0.0758 decrease; and psychotic illness was associated with a 0.0715 decrease. When individual conditions were evaluated, major depressive disorder, stroke, and arthritis were associated with the largest HRQoL score loss.

Table 4 shows the QALY loss per 100,000 people for each condition. Arthritis was associated with the highest burden (1,384.201), followed by major depressive disorder (618.674) and cardiovascular disease (483.364). Borderline personality disorder (196.137) was associated with the highest loss among all of the personality disorders, which together accounted for a loss of 783.328 QALYs.

DISCUSSION

This study followed the example of several articles that aimed to study the burden of different mental and physical conditions using population-level QALY losses. Our results show that significant quality of life reductions are found in individuals with mental and physical health conditions, especially those with psychotic illness and mood disorders. Mental disorders were associated with the poorest quality of life; they accounted for many of the conditions associated with the

Table 2. Mental and Physical Health Conditions and Associated Mean Short-Form Health Survey-6D (SF-6D) Scores[a]

Health Condition	N (Unweighted)	% (Weighted)	Mean SF-6D Scores, Adjusted (SE)
Any psychotic illness	241	0.63	0.6280 (0.0121)
Stroke	289	0.76	0.6807 (0.0112)
Hepatic disease	317	0.88	0.6833 (0.0099)
Any mood disorder	3,791	10.36	0.6861 (0.0028)
Major depressive disorder	3,019	8.26	0.6772 (0.0030)
Dysthymia	477	1.17	0.6318 (0.0106)
Bipolar disorder	1,230	3.40	0.6957 (0.0046)
Cardiovascular disease	3,192	8.54	0.7093 (0.0033)
Arteriosclerosis	728	2.01	0.7112 (0.0070)
Any anxiety disorder	5,516	15.12	0.7199 (0.0026)
Specific phobia	2,754	7.50	0.7432 (0.0035)
Social phobia	943	2.54	0.6822 (0.0056)
Generalized anxiety disorder	1,360	3.78	0.6654 (0.0046)
Panic	950	2.58	0.6651 (0.0062)
Posttraumatic stress disorder	1,712	4.45	0.7000 (0.0049)
Agoraphobia	39	0.12	0.6407 (0.0377)
Gastrointestinal disease	2,403	6.44	0.7247 (0.0042)
Arthritis	7,806	21.73	0.7351 (0.0026)
Sexually transmitted infection	305	0.78	0.7358 (0.0119)
Diabetes	3,191	8.18	0.7451 (0.0035)
Any personality disorder	7,767	21.52	0.7455 (0.0023)
Antisocial	1,224	3.84	0.7470 (0.0050)
Narcissistic	2,448	6.18	0.7365 (0.0038)
Avoidant	817	2.32	0.7031 (0.0056)
Schizotypal	1,530	3.93	0.6902 (0.0049)
Borderline	2,226	5.89	0.6785 (0.0038)
Dependent	145	0.43	0.6429 (0.0158)
Obsessive-compulsive	2, 747	8.07	0.7556 (0.0035)
Schizoid	1,142	3.06	0.7346 (0.0070)
Paranoid	1,682	4.33	0.7313 (0.0049)
Histrionic	648	1.80	0.7227 (0.0072)
Nicotine dependence	4,509	13.89	0.7563 (0.0027)
Any substance use disorder	3,480	10.73	0.7637 (0.0029)
Alcohol abuse/dependence	3,142	9.67	0.7693 (0.0031)
Drug abuse/dependence	747	2.39	0.7213 (0.0067)
Hypertension	9,247	24.93	0.7685 (0.0024)
High cholesterol	7,146	20.58	0.7787 (0.0023)

[a]Mean SF-6D scores adjusted for sociodemographics listed in Table 1.

lowest SF-6D scores. Our results lend support to the hypothesis that personality disorders have significant effects on quality of life. While the marginal effects of personality disorders were not as large as those of other mental health disorders, their high prevalence leads to a high overall burden in society. When mental health conditions were grouped, personality disorders had an annual QALY loss second only to mood disorders and arthritis. Individual personality disorders, such as borderline personality disorder, are responsible for some of the highest QALY losses among individual mental conditions.

Mean SF-6D scores in this sample were consistent with other studies. Fernández et al[14] found a slightly lower SF-6D median score compared to our mean score, as well as larger marginal effects for certain conditions, such as mood disorders, possibly due to the study population being primary-care attendees. These larger effects resulted in larger estimates of QALY losses for mood disorders, although other estimates, such as those for anxiety disorders, were fairly consistent with the present study.

More generally, our results are consistent with other studies that found mood and anxiety disorders to have a significant burden on quality of life. Subramaniam et al[11] found dysthymia, generalized anxiety disorder, major depressive disorder, and bipolar disorder to be associated with the lowest HRQoL scores, along with cardiovascular disease. Fernández et al[14] found dysthymia, major depressive disorder, panic disorder, and social phobia to be associated with the lowest HRQoL.

In terms of marginal effects, our estimates were quite close to those in the most recently published article of Subramaniam and colleagues,[11] who found the effects of major depressive disorder to be the highest, followed by obsessive-compulsive disorder, bipolar disorder, and chronic pain; the magnitudes of the effects were also similar as were the QALY loss estimates. Arthritis or chronic pain had the highest loss of QALYs, followed by hypertension. There were some differences: major depressive disorder and cardiovascular disorders had much smaller effects in the Subramaniam et al study[11] as compared to ours, which makes sense given that the prevalence rates of these disorders were much higher in our sample. This could be due to the location of the other study being Singapore, which has a lower prevalence of certain health conditions. A global study examining the prevalence of disease using the WHO Composite International Diagnostic Interview survey estimated the prevalence rate of mood disorders in the United States in 2004 to be 9.6 and in Asia to range from 1.7 to 3.1, although Singapore specifically was not evaluated.[30] Consistent with this, the Singapore Mental Health Study reported the prevalence of major depressive disorder to be 2.01% in 2009–2010,[11] compared to 8.26% in our study.

Another possible explanation for the discrepant results between the current study and previous ones has to do with the disorders assessed in each study. The breadth of the mood and anxiety conditions covered in other articles was much smaller, compared to the current study. As mentioned above, no personality disorders were included in other articles. Moreover, when QALY losses were evaluated in other articles, many conditions were excluded due to insignificant marginal effects, most likely due to overall sample sizes under 7,000. Additionally, different measures of HRQoL may result in different estimates of QALY losses.

Strengths of the current study include a large sample size and information about a wide variety of conditions as well as sociodemographic information. The large sample size in particular was important as it allowed us to make inferences about mental conditions individually, instead of grouping them into categories, which has been done in the past due to low prevalence rates of certain disorders. The NESARC is 1 of only 2 national surveys that assess for all personality disorders, and while imperfect, is the best available survey.[31] Additionally, this is the first study of its kind in North America.

The current study has several limitations that should be noted. Physical health conditions and psychotic illness were assessed though self-report, which may have introduced bias. In addition, we

Table 3. Regression Results for Conditions Alone, Conditions Adjusted for Sociodemographics, and Conditions Adjusted for Sociodemographics and Comorbidity[a,b]

	Model 1 β (SE)	Model 2 β (SE)	Model 3a β (SE)	Model 3b β (SE)
Mental health conditions				
Any psychotic illness	−0.2090 (0.0116)	−0.1811 (0.0121)	−0.0488 (0.0127)	−0.0715 (0.0114)
Any mood disorder	−0.1451 (0.0031)	−0.1357 (0.0030)	…	−0.0807 (0.0031)
Major depressive disorder	−0.1540 (0.0031)	−0.1422 (0.0032)	−0.0749 (0.0034)	…
Dysthymia	−0.2052 (0.0106)	−0.1781 (0.0106)	−0.0456 (0.0104)	…
Bipolar disorder	−0.1227 (0.0049)	−0.1161 (0.0047)	−0.0066 (0.0047)[c]	…
Any anxiety disorder	−0.1111 (0.0029)	−0.1035 (0.0028)	…	−0.0490 (0.0027)
Specific phobia	−0.0770 (0.0037)	−0.0699 (0.0036)	−0.0160 (0.0032)	…
Social phobia	−0.1392 (0.0060)	−0.1289 (0.0057)	−0.0141 (0.0055)[d]	…
Generalized anxiety disorder	−0.1621 (0.0051)	−0.1479 (0.0048)	−0.0402 (0.0048)	…
Panic	−0.1592 (0.0068)	−0.1465 (0.0066)	−0.0323 (0.0066)	…
Posttraumatic stress disorder	−0.1289 (0.0051)	−0.1129 (0.0051)	−0.0375 (0.0049)	…
Agoraphobia	−0.1739 (0.0376)	−0.1674 (0.0378)	−0.0420 (0.0305)[c]	…
Any personality disorder	−0.0770 (0.0024)	−0.0794 (0.0023)	…	−0.0364 (0.0022)
Antisocial	−0.0539 (0.0055)	−0.0633 (0.0049)	−0.0123 (0.0046)	…
Narcissistic	−0.0710 (0.0041)	−0.0761 (0.0039)	−0.0142 (0.0038)	…
Avoidant	−0.1197 (0.0064)	−0.1073 (0.0057)	−0.0236 (0.0059)	…
Schizotypal	−0.1303 (0.0051)	−0.1225 (0.0050)	−0.0164 (0.0054)	…
Borderline	−0.1467 (0.0040)	−0.1373 (0.0039)	−0.0333 (0.0046)	…
Dependent	−0.1929 (0.0166)	−0.1657 (0.0157)	−0.0200 (0.0138)[c]	…
Obsessive-compulsive	−0.0554 (0.0037)	−0.0569 (0.0034)	−0.0135 (0.0036)	…
Schizoid	−0.0836 (0.0071)	−0.0756 (0.0069)	−0.0034 (0.0063)[c]	…
Paranoid	−0.0905 (0.0054)	−0.0800 (0.0049)	−0.0043 (0.0046)[c]	…
Histrionic	−0.0868 (0.0080)	−0.0868 (0.0072)	−0.0155 (0.0068)[d]	…
Nicotine dependence	−0.0638 (0.0031)	−0.0599 (0.0029)	−0.0274 (0.0025)	−0.0264 (0.0025)
Any substance use disorder	−0.0303 (0.0031)	−0.0495 (0.0030)	…	−0.0237 (0.0028)
Alcohol abuse/dependence	−0.0226 (0.0033)	−0.0427 (0.0032)	−0.0199 (0.0031)	…
Drug abuse/dependence	−0.0822 (0.0068)	−0.0887 (0.0069)	−0.0165 (0.0066)[d]	…
Physical conditions				
Stroke	−0.1677 (0.0111)	−0.1282 (0.0112)	−0.0756 (0.0097)	−0.0758 (0.0098)
Hepatic disease	−0.1422 (0.0101)	−0.1258 (0.0096)	−0.0588 (0.0092)	−0.0620 (0.0092)
Gastrointestinal disease	−0.1094 (0.0046)	−0.0892 (0.0043)	−0.0359 (0.0037)	−0.0370 (0.0037)
Arthritis	−0.1127 (0.0026)	−0.0931 (0.0029)	−0.0642 (0.0027)	−0.0637 (0.0027)
Diabetes	−0.0927 (0.0037)	−0.0685 (0.0037)	−0.0383 (0.0034)	−0.0383 (0.0033)
Sexually transmitted infection	−0.0810 (0.0130)	−0.0727 (0.0120)	−0.0241 (0.0107)[d]	−0.0248 (0.0112)[d]
Cardiovascular disease	−0.1322 (0.0034)	−0.1079 (0.0034)	−0.0552 (0.0034)	−0.0566 (0.0034)
Arteriosclerosis	−0.1269 (0.0071)	−0.0991 (0.0070)	−0.0361 (0.0065)	−0.0370 (0.0066)
Hypertension	−0.0732 (0.0025)	−0.0525 (0.0026)	−0.0180 (0.0022)	−0.0183 (0.0022)
High cholesterol	−0.0493 (0.0026)	−0.0373 (0.0025)	−0.0064 (0.0023)	−0.0064 (0.0022)

[a]All results have $P < .01$ unless noted.
[b]Model 3a includes mental disorders individually, and Model 3b includes mental disorders in groups.
[c]$P > .05$.
[d]$.01 < P < .05$.

were not able to examine all physical and mental conditions as the NESARC did not include respiratory conditions or obsessive-compulsive disorder. The NESARC covered a period from 2001 to 2005, and the results of this study could be outdated. However, no more recent survey is available that contains personality disorders as well as all other variables assessed. Moreover, institutionalized individuals were excluded from this sample, and this could affect the estimates of QALY losses, as people with the highest impairment may be excluded. The choice of HRQoL measure used to create QALYs is open to discussion. There are several different instruments that can be used to create QALYs, including the SF-6D and EQ-5D, which have been found to be correlated but not perfectly.[32] One issue when using an instrument such as the SF-6D is that it does not measure all dimensions of quality of life, so the effects of certain conditions, such as personality disorders, may be underestimated. The methodology used does not take into account the severity of the final health state, so an illness that causes 10 people to lose 0.01 HRQoL units is valued the same as one that causes 1 person to lose 0.1 units. This may not be realistic because people care more about individuals with low QALY scores. For example, they value a 0.45 QALY gain in a sick group more than a 1.0 QALY loss in a healthy group.[33] The SF-6D scoring system is based on research done by Brazier and Roberts[26] in the United Kingdom, and differences in preferences could exist in the United States. Finally, when estimating the QALY burden, the methodology used in this article estimates losses only among those still living, so mortality is not taken into account. An area of further research would be to extend the analysis including mortality using healthy adjusted life expectancy (for example, Muennig et al[34]).

In conclusion, mental and chronic physical health conditions have a big impact on quality of life. Mental disorders, in particular, are associated with low quality of

Table 4. Annual Quality-Adjusted Life-Year Loss Per 100,000 People

	Marginal Effects[a]	Prevalence	Overall Burden
Mental health conditions			
Any psychotic illness	−0.0715	.0063	−45.045
Any mood disorder	−0.0807	.1036	−836.052
Major depressive disorder	−0.0749	.0826	−618.674
Dysthymia	−0.0456	.0117	−53.352
Any anxiety disorder	−0.0490	.1512	−740.880
Specific phobia	−0.0160	.0750	−120.000
Social phobia	−0.0141	.0254	−35.814
Generalized anxiety disorder	−0.0402	.0378	−151.956
Panic	−0.0323	.0258	−83.334
Posttraumatic stress disorder	−0.0375	.0445	−166.875
Any personality disorder	−0.0364	.2152	−783.328
Antisocial	−0.0123	.0384	−47.232
Narcissistic	−0.0142	.0618	−87.756
Avoidant	−0.0236	.0232	−54.752
Schizotypal	−0.0164	.0393	−64.452
Borderline	−0.0333	.0589	−196.137
Obsessive-compulsive	−0.0135	.0807	−108.945
Histrionic	−0.0155	.0180	−27.900
Nicotine dependence	−0.0264	.1389	−366.696
Any substance use disorder	−0.0237	.1073	−254.301
Alcohol abuse/dependence	−0.0199	.0967	−192.433
Drug abuse/dependence	−0.0165	.0239	−39.435
Physical conditions			
Stroke	−0.0758	.0076	−57.608
Hepatic disease	−0.0620	.0088	−54.560
Gastrointestinal disease	−0.0370	.0644	−238.280
Arthritis	−0.0637	.2173	−1,384.201
Diabetes	−0.0383	.0818	−313.294
Sexually transmitted infection	−0.0248	.0078	−19.344
Cardiovascular disease	−0.0566	.0854	−483.364
Arteriosclerosis	−0.0370	.0201	−74.370
Hypertension	−0.0183	.2493	−456.219
High cholesterol	−0.0064	.2058	−131.712

[a]Marginal effects is β coefficient from models 3a (for individual mental conditions) and 3b (for grouped mental and physical health conditions).

life. At a population level, arthritis, and mental disorders such as mood, anxiety, and personality disorders, are causing a profound burden of disease in the United States. At an individual level, persons with these disorders are living with significant impairment in quality of life. These findings have implications for both policymakers and clinicians. In particular, the fact that personality disorders have a significant quality of life burden is important, both for clinicians who provide services to these individuals and for future burden of disease estimates. Notably, individuals with borderline personality disorder have been found to consume an inordinate amount of health service resources,[35] in addition to the burden of disease associated with this disorder as found in this study. Effective treatments for personality disorders exist,[36] and, given the burden of disease, consideration of policy level changes regarding the dissemination and implementation of evidence-based treatments for these disorders could be considered. Personality disorders are a category of mental illness that should not be ignored.

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