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Psychological Distress and Trends in Healthcare Expenditures and Outpatient Healthcare

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Abstract

Objectives—To determine whether trends in psychological distress exist in the United States and whether trends in healthcare expenditures and outpatient visits were associated with psychological distress.

Study Design—Sequential cross-sectional study of nationally representative data.

Methods—We examined data from the National Health Interview Survey (NHIS) from 1997 to 2004 linked to 2 years of subsequent Medical Expenditure Panel Survey (MEPS) data. Psychological distress was measured in the NHIS using the K6, a 6-item scale of the Kessler Psychological Distress Scale, which we classified as no/low, mild-moderate, or severe. We examined subsequent annualized total, outpatient, and office-based expenditures, and outpatient and office-based visits from MEPS.

Results—Psychological distress remained stable from 1997 to 2004. There were upward trends in overall healthcare expenditures (P <.001) and outpatient expenditures (P <.001), but not outpatient visits. Overall healthcare expenditures, outpatient expenditures, and outpatient visits significantly increased as psychological distress increased from no/low to mild-moderate to severe. The interaction between psychological distress strata and year was not significant for expenditures or for visits.

Conclusions—The upward trend in total and outpatient healthcare expenditures in the United States appears unrelated to psychological distress, although healthcare expenditures are consistently higher among those with greater psychological distress. Future work will explore the impact of treatment on costs and stability of the nation's mental health over time.

A critical first step in assessing the value of healthcare in the United States as it relates to mental health is determining whether trends in mental health symptoms have had an impact

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on changes in healthcare expenditures over time. It is well recognized that healthcare costs have been increasing,[1] with an average growth rate of 5.4% in healthcare expenditures between 1993 and 2000.[2] Mental health spending has increased as part of total spending, though at a lower rate.[3] Spending on prescription drugs to treat mental health and substance abuse conditions increased markedly between 1996 and 2000.[4] Mental health conditions—including depression,[5–7] anxiety,[5,8] bipolar disorder,[9–11] and schizophrenia[12]—have been linked to higher healthcare costs. These higher costs are not attributable solely to higher mental health costs. While some reports suggest that the prevalence of mental health conditions in the United States is stable,[13] there is also evidence that mental distress has increased over time.[14]

Given the increased use of prescription medications to treat depression, anxiety, psychotic illnesses, and other mental health conditions, one might expect that while the prevalence of mental health conditions might not change, the overall burden of mental health symptoms might decline over time. Therefore, since healthcare costs are known to be increasing, a trend toward improving value of healthcare as it relates to mental health would be reflected by a relationship between mental health symptoms and expenditures; that is, either the proportion of those with elevated mental health symptoms would decrease over time or the spending for those with a greater burden of mental health symptoms would drop over time relative to those individuals with fewer symptoms.

Quantifying how mental health plays a role in changing healthcare costs is not easily done. Consideration of the impact of diagnosed mental health conditions over time may be influenced by changes in screening and in recognition, as well as shifts in nosology. Examining only diagnosed or self-reported conditions also misses the impact of mental health conditions that are undiagnosed or unreported. Furthermore, how mental health may be related to healthcare expenditures is not solely determined on the basis of having a mental health condition, but on the burden of mental health–related symptoms; that is, severity of symptoms may be a key determinant for related expenditures, which has been shown, for example, in depression[15] and bipolar disorder.[16] Because healthcare expenditures and utilization in those with known mental health conditions tend to be higher, overall costs must be evaluated.

We sought to examine trends in overall mental health and subsequent healthcare expenditures in the United States by using linked data from 2 nationally representative surveys of noninstitutionalized individuals, the National Health Interview Survey (NHIS) and the Medical Expenditure Panel Survey (MEPS). These linked surveys are well suited to address trends in mental health and expenditures. Starting in 1997, a 6-item scale of the Kessler Psychological Distress Scale (K6), a shortened form of a previously developed 10-question psychological distress scale, was introduced into NHIS, which provides a measure of psychological distress that has been validated with respect to mental health diagnoses.[17] Starting in 1996, MEPS used the NHIS sampling frame to track national health expenditures. Using these linked data sets, we sought to examine whether there has been a change over time in psychological distress in the United States and whether adjusting for factors known to be associated with mental disorders would impact a trend in psychological distress if it were observed. We also sought to examine whether there were trends in healthcare expenditures and outpatient visits associated with the level of psychological distress, with the expectation that good value in healthcare related to mental health symptoms would be reflected by either a decrease over time in the population burden of psychological distress or a reduction over time in subsequent healthcare costs and expenditures among those with greater psychological distress.

METHODS

Data Source and Study Sample

We performed a sequential cross-sectional study wherein we examined 8 consecutive years of data. Data are from NHIS and MEPS, both of which provide nationally representative data. NHIS data are collected on a new sample each year, and MEPS uses a subset of this sample in the 2 subsequent years. While the MEPS data are a subset of the NHIS sample, MEPS still uses a survey sample design such that the weighted values are nationally representative, which minimizes selection bias that might occur with selection of the MEPS subsample.[18] We obtained NHIS data from 1997 through 2004, which provided information on psychological distress (described below), and the 2 subsequent years of MEPS data for each of these samples to obtain subsequent utilization and expenditure data. We limited our study to those persons 18 years and older, resulting in weighted data representing 25,618,369 adults. The study was exempted from institutional review board approval as the data were publicly available and participants could not be identified from the data.

Psychological Distress

Psychological distress was measured using the K6, a 6-item scale of the Kessler Psychological Distress Scale. It was developed for use in general-purpose health surveys because it is short, has strong psychometric properties, and can discriminate *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* cases from noncases with consistency across sociodemographic subsamples.[19] The K6 was demonstrated to detect more than 90% of *DSM-IV* diagnoses as determined by the Structured Clinical Interview for *DSM-IV* criteria.[17] The K6 asks how often during the past 30 days the respondent felt nervous, hopeless, restless, or fidgety; so depressed that nothing could cheer them up; or that everything was an effort; or worthless. Responses are on a 4-point scale (none of the time, a little of the time, most of the time, or all of the time). The sum of the response codes for the 6 items gives a score with a range of 0 to 24, with higher scores indicating greater psychological distress. We used cut-points previously reported in the literature to stratify K6 scores into no/low psychological distress (0–6), mild-moderate psychological distress (7–12), and severe distress (13–24).[17,20] Of note, the threshold K6 score of less than 12 versus 13 or greater was found to be optimal for discerning a serious mental illness diagnosis, with a total classification accuracy of 0.92[20]; this definition has been used in other reports as well.

Other Measures

To better characterize the population and to account for potential confounders in the relationship between expenditures and psychological distress over time, we obtained a number of variables from the baseline (ie, NHIS) data. These characteristics included age, sex, marital status, race/ethnicity, yearly income, insurance status, medical comorbidity, and psychiatric diagnoses. Our choice of potential confounders was primarily based on prior literature regarding affective disorders. Age, race, and income were related to affective disorders in the National Comorbidity Survey,[21] and sex and marital status were related to affective disorders in the National Comorbidity Survey Replication.[22] The relationship between greater medical comorbidity and depression is well recognized.[23]

Age was divided into decades (18–29, 30–39, 40–49, 50–59, 60–69, 70–79, 80+). Race/ethnicity was coded as white, black, nonblack Hispanic, and other. Marital status was married, single, separated, divorced, widowed, or unknown. We categorized yearly income relative to poverty status: less than 200% Federal Poverty Level (FPL), 200%–400% FPL, more than 400% FPL, and unknown. Health insurance status was divided into private, public only (ie, not covered by a commercial insurer and covered by a federal, state, or local

program), or none. We determined medical comorbidity using the Charlson Comorbidity Index applied to the *International Classification of Diseases, Ninth Revision (ICD-9)* codes for reported medical conditions.[24] We wanted to account for the presence of psychiatric conditions, which were broadly captured (either present or absent) as affective disorders; psychoses, schizophrenia, and related disorders; and anxiety, somatoform, dissociative, and personality disorders (see the eAppendix at www.ajmc.com for the *ICD-9* codes for each of these categories).

Expenditures and Visits

We examined (1) total expenditures (which include inpatient, outpatient, office-based, emergency department, home health, prescriptions, dental, and other expenditures), (2) outpatient and office-based expenditures, and (3) outpatient and office-based visits. The total expenditures category is composed of all health services expenditures associated with office-based visits, hospital outpatient visits, emergency department visits, inpatient hospital stays, dental visits, home healthcare, prescription medicines, vision aids, and other medical supplies and equipment. Note that we will combine outpatient and office-based categories and herein refer to these simply as outpatient. As we had 2 years of follow-up data, we chose to handle these as the per person average of the 2 years. Expenditures were annualized and expressed in 2006 dollars.

Statistical Analysis

We initially examined how demographic and clinical characteristics, total expenditures, outpatient expenditures, and outpatient visits differed across the 3 strata of psychological distress (K6 scores 0–6, 7–12, or >12). To do this, we used analysis of variance for normally distributed continuous values, the Mann-Whitney *U* test for non–normally distributed continuous values, and χ^2 tests for categorical data.

We then examined our data for trends over time using bivariate linear regression models where each characteristic was treated as the dependent variable and the year was handled as the independent variable. Similarly, to determine whether psychological distress changed over time, we examined for a linear trend in mean K6 by year in a simple regression model with K6 as the dependent variable and year as the independent variable. To assess whether other factors influenced the trend in psychological distress, we added to the model covariates (age, sex, marital status, race/ethnicity, yearly income, insurance status, medical comorbidity) that have been observed to be associated with various mental health conditions. In addition, we created a polytomous model with the 3 K6 groups as the dependent variable and time as independent variable while adjusting for these other factors.

For expenditures and utilization, we performed 3 sets of regression analyses, 1 set for each: (1) total expenditures, (2) outpatient expenditures, and (3) outpatient visits. To test trends, we first examined a simple model examining whether there was a significant relationship between expenditures and strata of psychological distress (which was expected, with greater expenditures for those with greater psychological distress) and between expenditures and year. We then tested the interaction of strata of psychological distress and year in a model that also included these as main effects. Lastly, we ran a complete model with the year by psychological distress interaction fully adjusted for potential confounders. Because we did not wish to exclude those with zero expenditures over the 2-year study period, we used fully adjusted 2-part models[25] to estimate the mean value of total and outpatient expenditures by psychological distress strata. In part 1 of the 2-part model, we calculated predicted probabilities of incurring any expenditure using logistic regression. In part 2 of the 2-part models, we transformed the non-zero expenditure data using the natural log and accounted for heteroscedasticity by including Duan's smearing estimator in the calculation of the

retransformed expected values. Results from part 1 (predicted probability of incurring any expenditures vs none) and part 2 (predicted expenditure conditional on having any expenditures) were multiplied to produce each person's expected expenditures.

As the data were from a survey sample, all analyses were adjusted for this design using generalized estimating equations.[26,27] We used SAS version 9.2 (SAS Institute Inc, Cary, NC) for data management and descriptive statistics and Stata SE version 10 (StataCorp, College Station, TX) for the modeling. We used a 2-sided alpha of .05.

RESULTS

The characteristics of the noninstitutionalized US population are shown by year in Table 1. Some demographic characteristics have shifted over time. Insurance status also has shifted, such that the proportion with private insurance declined while publicly funded insurance and lack of insurance increased. Of note, the prevalence of some categories of diagnosed mental health conditions (specifically, affective disorders as well as anxiety, somatoform, dissociative, and personality disorders) trended upward over time.

In Table 2, we show characteristics of the population across the strata of psychological distress. In our sample, 86.2% of the population was classified as having no/low psychological distress, 9.7% had mild-moderate psychological distress, and 4.1% had severe psychological distress. Every characteristic we examined differed significantly across the strata of psychological distress. Those with higher levels of distress were more likely to be older, female, unmarried, minority, poorer, uninsured, sicker both medically and psychiatrically, less educated, and living in a rural area; these characteristics are consistent with previous reports.[28] All of these factors were therefore selected as covariates in our models adjusting for factors associated with psychological distress. Note that the frequencies for the K6 strata in the subset population of those with linked NHIS and MEPS data were similar to those in the NHIS population who were not in the linked MEPS data: in the NHIS-MEPS data, there were 86.2% in the no/low distress group (K6 score 0–6), 9.7% in the mild-moderate group (K6 score 7–12), and 4.1% in the severe group (K6 score >12) compared with 87.9% in the no/low group, 8.7% in the mild-moderate group, and 3.4% in the severe group among the NHIS-only population.

Time was not significantly related to psychological distress in any of our analyses. It remained stable over the period from 1997 to 2004 (Table 3). In addition, the mean psychological distress score was flat over this time period. This indicates that despite an increase in diagnosed mental health conditions over time, the symptom burden did not appear to increase.

The Figure shows how expenditures and utilization changed over time within each stratum of psychological distress (unadjusted values are shown). Note that we present mean values, as these could be weighted using the survey sample. As expected, the fully adjusted model for total per person overall healthcare expenditures showed a significant upward trend over time (0.05, 95% confidence interval [CI] 0.04, 0.06; P <.001). Outpatient expenditures also trended upward in the fully adjusted model (0.04, 95% CI 0.03, 0.05; P <.001). However, we did not observe any change over time in the number of outpatient visits (in the fully adjusted model, 1.01, 95% CI 0.99, 1.02; P = .26).

There was a gradient in total per person expenditures across strata of psychological distress. The fully adjusted mean annualized per person total healthcare expenditure (in 2006 US dollars) was $4820 (95% CI $3830, $4986) for those in the group with no/low distress. Compared with the no/low-distress group, these mean expenditures were significantly higher among the group with mild-moderate distress ($8549, 95% CI $5645, $9261; P <.001) and

the group with severe distress ($11,954, 95% CI $7704, $13,646; *P* <.001). The mean total expenditures for the groups with mild-moderate distress and severe distress also differed significantly (*P* <.0001).

Our findings for outpatient expenditures were similar to our findings for total expenditures. The mean annualized outpatient expenditures in 2006 US dollars were $1396 (95% CI $1354, $1434) for the group with no/low distress, $2090 (95% CI $1924, $2263) for the group with mild-moderate distress, and $2766 (95% CI $2445, $3105) for the group with severe distress. These expenditures differed significantly between each group (*P* <.0001).

For outpatient visits, the strata of psychological distress also differed. With the no/low-distress group as the referent, the incremental relative risk for an office-based or outpatient visit for those in the group with mild-moderate distress was 1.27 (95% CI 1.19, 1.37; *P* <. 001) and that for the group with severe distress was 1.54 (95% CI 1.37, 1.72; *P* <.001). Of note, the groups with mild-moderate and severe distress also differed significantly (*P* = . 003).

We examined the interaction of psychological distress strata and year for total expenditures, outpatient expenditures, and outpatient visits to test whether changes in psychological distress over time were related to expenditures and utilization. Given that we found that psychological distress scores were relatively stable over time, it was not surprising to find that the interaction between psychological distress strata and year was not significant for total expenditures, outpatient expenditures, or office-based and outpatient visits.

DISCUSSION

Despite the marked increase in total and outpatient expenditures between 1997 and 2004, the relationship between psychological distress and subsequent expenditures and outpatient visits remained stable over time. Higher psychological distress was associated with greater subsequent healthcare expenditures and more outpatient visits even after adjustment for several factors associated with higher psychological distress, most notably mental health conditions. It is notable that psychological distress remained stable over nearly a decade, which suggests that the mental health of Americans has neither worsened nor improved. Our work is concordant with the findings of Kessler and colleagues, who compared data from the National Comorbidity Survey conducted from 1990 to 1992 with data from the National Comorbidity Survey Replication conducted from 2001 to 2003, and did not find an increase in the prevalence of mental disorders.[13] However, data from Behavioral Risk Factor Surveillance System surveys from 1993 to 2001 indicated that frequent mental distress, defined as half the days in the preceding month as being days in which respondents reported their mental health was not good, increased over this time period.[14]

Numerous studies have demonstrated the relationship between mental health conditions and higher expenditures. In a study of primary care patients, those with depression or anxiety had higher outpatient costs than those without depression or anxiety, even after adjusting for comorbid medical conditions.[5] In a cross-sectional study using 1994 NHIS data, those with self-reported depressive syndromes had greater inpatient and outpatient costs.[6] Observational studies in primary care practices also reported a higher number of primary care visits, outpatient charges, and total charges for those with a depression diagnosis compared with those without one,[7] and higher medical charges for those with more symptoms of depression and with a physician diagnosis of depression.[29] In a study of more than 1000 primary care patients, Olfson and Gameroff found that those with generalized anxiety disorder had significantly higher median medical care charges than those who did not.[8] Bryant-Comstock and colleagues reported that individuals with bipolar disorder had

yearly healthcare costs that were quadruple those for individuals without bipolar disorder; however, only slightly less than a quarter of the bipolar patient's costs were mental health–related costs.[10]

A large study of an insurance plan's claims data concluded that bipolar disorder was the most expensive mental health condition, with the 3% of patients with bipolar disorder accounting for 12.4% of total costs to the plan.[11] In a study using Medicare and Medicaid data from New Hampshire that compared schizophrenia with depression, dementia, and other medical conditions, Bartels and colleagues found that overall and outpatient expenditures for patients with schizophrenia were generally higher than expenditures for other groups, with the only exception being the comparison with patients who had early-onset dementia.[30] Using 2001–2002 MEPS data limited to those with a schizophrenia diagnosis, patients with schizophrenia had mean yearly expenses of $3726[12] compared with $3302 for the general population[31] (both amounts in 2002 US dollars). Substance Abuse and Mental Health Services Administration reports have shown that the rate of increase in mental healthcare spending is lower than the overall increase in healthcare spending,[3] but there has been a marked increase in prescription drug costs for mental health medications.[4] This can be explained by shifts over this time in how mental health conditions are treated as well as the availability of treatments. Our work showed a lack of an interaction between year and psychological distress strata with respect to overall and outpatient expenditures and outpatient visits (ie, strata of psychological distress were not related to changes in these utilization measures over time). In the context of previous work, this suggests the value of overall healthcare as it relates to mental health symptoms may be neutral.

It is essential to consider the role of treatment when assessing value in care, but that was beyond the scope of this study. However, some previous research on depression sheds some light on this issue. A small study tested whether treatment of depression with antidepressants would change service use by patients with high medical expenditures.[32] They found that for the 20 participating patients, medical service use costs fell from $13.28 per day to $6.75 per day when the patients were treated for depression, not including cost of depression treatment (with that included, the daily cost was $12.55). A larger study found that among 385 patients started on antidepressants, those who had received at least the minimum recommended therapy for 3 months had lower total medical costs over 6 months compared with those who received less than adequate treatment ($1872 vs $2622).[33] The investigators in that study found that the difference between the 2 groups was due to lower non–mental health-related costs. In another study that enrolled individuals with high rates of healthcare utilization, those who received treatment for depression gained 47.7 depression-free days over the course of a year.[34] The authors concluded that treating this population represented good value; the incremental cost per depression-free day was $51.84. In total, however, the evidence supporting a "cost offset" (eg, reduction in medical costs) from depression treatment is controversial, as several studies suggest that depression treatment does not lead to cost reductions for patients with other diseases.[35,36]

We must acknowledge the limitations of our work. First, we had no serial measurement of psychological distress over time; we examined the effect of a single, dynamic state on an annualized assessment of the 2 subsequent years of healthcare expenditures and outpatient visits. Despite this, there were clear differences in the expenditures associated with strata of psychological distress from year to year, meaning that the relationship between psychological distress and subsequent expenditures is relatively stable. Second, we did not account for the impact of treatment, as that was beyond the scope of what we were able to address; however, we intend to investigate this issue further. Third, as with all observational studies, we may not have accounted for unmeasured confounding factors, though we were able to adjust for many known factors. Finally, the population included in this analysis was a

subsample of the NHIS participants; therefore, selection bias may be a concern. However, the survey methodology of MEPS mitigates this bias in general. Furthermore, the frequency of psychological distress in our sample was similar to that in non-MEPS NHIS participants, which also suggests this bias was not a concern.

In summary, we found that the upward trend in total and outpatient healthcare expenditures in the United States appears to be unrelated to psychological distress, although healthcare expenditures are consistently higher among those with greater psychological distress. Furthermore, we did not observe a change in psychological distress in the United States from 1997 to 2004. Our findings do not reflect a trend toward an improving value of healthcare as it relates to mental health symptoms, as we found neither a decrease over time in the population burden of psychological distress nor a reduction over time in subsequent healthcare costs and expenditures among those with greater psychological distress. In future work, we will seek to determine the impact of mental health treatment on costs and stability of the nation's mental health over time.

Take-Away Points

The upward trend in total and outpatient healthcare expenditures in the United States appears to be unrelated to psychological distress.

- Our findings do not reflect a trend toward an improving value of healthcare as it relates to mental health symptoms.
- Future work will seek to determine the impact of mental health treatment on costs and stability of the nation's mental health over time.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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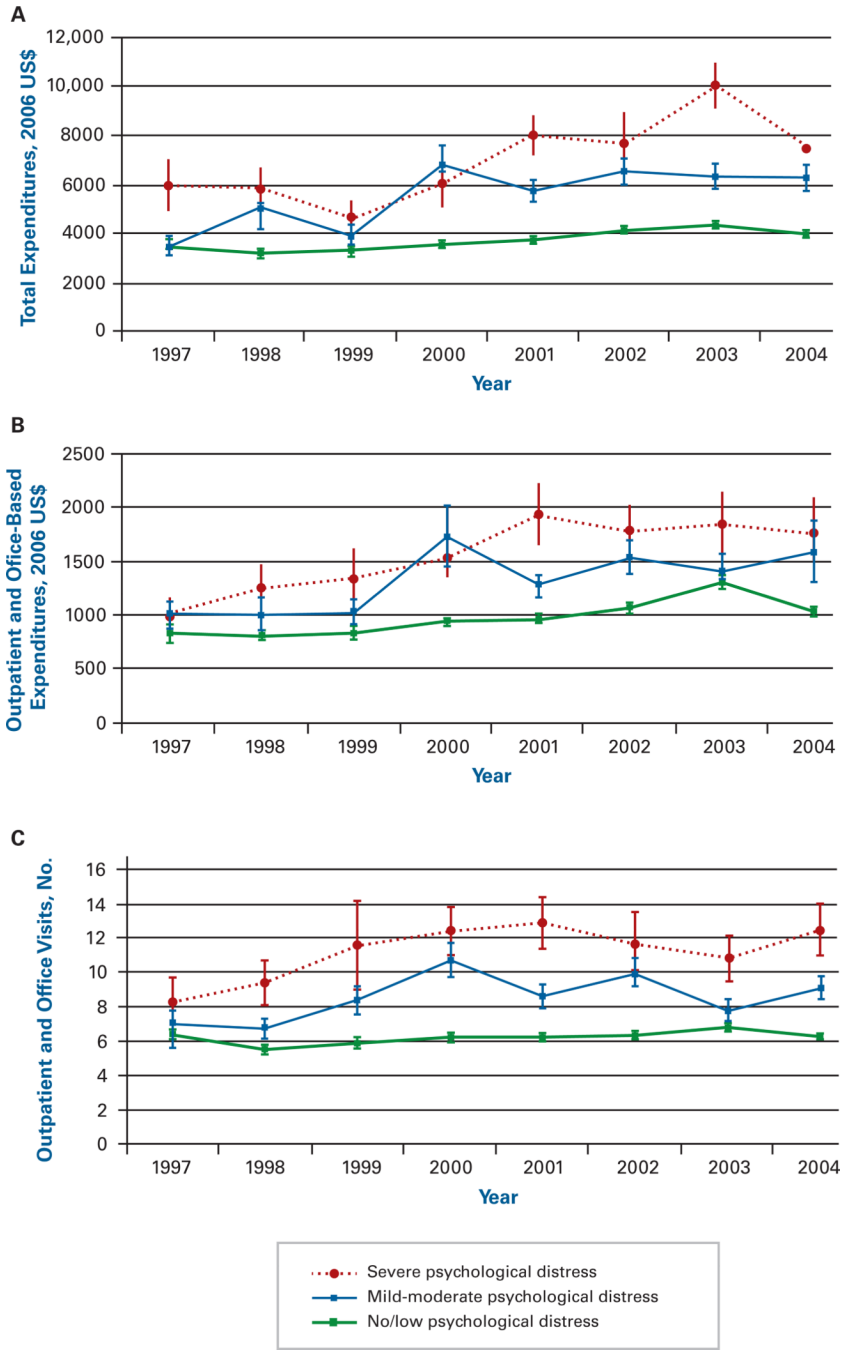

Figure.

Strata of Psychological Distress (No/Low, Mild-Moderate, Severe) Versus Subsequent Total Expenditures (Panel A), Outpatient and Office-Based Expenditures (Panel B), and Outpatient and Office Visits (Panel C)a

[a]**Panel A** shows unadjusted mean annualized total per person expenditures by strata of psychological distress. **Panel B** displays unadjusted mean annualized outpatient and office-based per person expenditures by strata of psychological distress. **Panel C** shows mean annualized outpatient and office-based per person visits. Note that the dates correspond to the year in which psychological distress was measured in National Health Interview Survey,

while the annualized expenditures and visits were determined from the Medical Expenditure Panel Survey data in the 2 years following the index year.

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Table 1

Sociodemographic Characteristics of US Adults, by Year of the National Health Interview Survey[a]

	Year of the National Health Interview Survey								
Sociodemographic Characteristics	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	***P*[b]**
Total number of subjects (weighted)	1,547,772	2,234,491	2,151,220	4,189,077	3,018,937	3,997,849	4,237,104	4,241,919	
Total number of subjects (unweighted)	2275	2850	2583	5269	4071	5083	5122	5013	
Age, y									.002
18–29	23.4	20.4	22.0	21.1	22.8	21.3	21.5	20.8	
30–39	21.7	22.5	20.5	21.1	20.1	20.2	19.3	19.8	
40–49	20.1	21.3	21.7	20.7	21.0	20.4	20.9	21.4	
50–59	13.2	14.4	14.5	15.2	14.9	15.9	16.5	16.2	
60–69	10.1	10.1	9.8	10.3	9.9	10.0	10.4	10.3	
70–79	7.6	7.6	8.1	8.2	8.0	8.7	7.8	7.4	
80+	3.7	3.6	3.4	3.4	3.5	3.4	3.6	4.1	
Male	47.4	48.2	46.2	47.9	46.2	46.1	45.6	46.2	.09
Marital status									<.0001
Married	63.6	66.5	64.4	66.3	61.7	62.0	63.3	62.1	
Widowed	6.7	6.3	6.8	7.1	7.4	6.9	7.0	6.8	
Divorced	7.9	8.1	7.6	7.8	9.2	9.0	9.1	9.4	
Separated	2.2	1.9	2.5	2.0	2.4	2.5	2.4	2.9	
Single	19.4	17.1	18.5	16.8	19.1	19.4	18.1	18.5	
Unknown	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.3	
Race/ethnicity									<.0001
White (non-Hispanic)	73.7	74.9	72.5	72.8	65.9	65.1	63.4	65.7	
Black (non-Hispanic)	11.6	11.7	12.3	11.7	12.2	12.2	12.6	14.4	
Other (non-Hispanic)	3.2	2.4	3.2	4.6	9.5	10.1	10.7	6.7	
Hispanic	11.5	10.9	11.9	10.9	12.4	12.6	13.3	13.2	
Ratio of family income to Federal Poverty Level									<.0001
Below 100%	11.5	9.3	8.7	7.9	13.9	12.1	12.4	12.5	
100%–199%	15.5	14.5	13.5	14.9	14.6	14.9	15.3	15.8	

Sociodemographic Characteristics	Year of the National Health Interview Survey								P^b
	1997	1998	1999	2000	2001	2002	2003	2004	
200%–399%	38.3	37.8	36.1	34.9	31.0	31.2	31.5	31.6	
400% or more	20.4	20.4	21.6	22.6	21.1	21.3	18.8	19.6	
Unknown	14.2	18.1	20.1	19.8	19.5	20.4	22.1	20.7	
Health insurance status									<.0001
Private insurance only	73.7	76.5	73.4	73.8	68.3	67.7	68.0	66.6	
Any publicly funded insurance	14.7	13.2	13.6	13.8	16.8	17.8	17.4	18.4	
No insurance	11.6	10.3	13.0	12.4	14.9	14.5	14.5	15.0	
Charlson Comorbidity Index >2	3.6	3.7	3.8	4.9	5.1	5.6	5.2	3.6	<.0001
Affective disorders	5.0	5.5	5.6	7.7	8.3	8.6	9.3	7.1	<.0001
Psychoses, schizophrenia, and related disorders	0.2	0.3	0.4	0.3	0.5	0.5	0.4	0.3	.14
Anxiety, somatoform, dissociative, and personality disorders	7.6	7.1	8.5	10.3	11.5	11.8	12.8	9.0	<.0001
Education status									<.0001
No or some high school	19.4	19.1	19.4	19.8	22.6	20.2	20.2	20.1	
High school graduate	34.6	32.0	33.0	34.2	33.3	32.5	34.0	31.1	
Some college	23.2	23.5	23.1	22.5	21.1	22.5	22.3	22.9	
College or beyond	22.7	24.4	23.9	23.0	22.4	23.9	23.1	25.2	
Unknown	0.1	0.9	0.6	0.5	0.7	0.9	0.5	0.7	
Region of United States									<.0001
Northeast	17.5	18.6	16.3	17.5	16.4	16.0	16.9	17.1	
Midwest	25.2	24.1	25.9	24.8	22.7	23.4	22.5	22.6	
South	37.0	40.1	39.0	37.6	40.1	40.2	39.8	36.7	
West	20.3	17.1	18.7	20.1	20.8	20.3	20.8	23.6	
Metropolitan Statistical Area	77.8	75.8	77.2	76.8	76.3	76.4	79.0	80.7	<.0001

[a] Values are percentages unless indicated otherwise.

[b] Overall χ^2 test for characteristic and years.

Table 2

Sociodemographic Characteristics of US Adults, by Level of Psychological Distress[a]

	Psychological Distress[b]			
Sociodemographic Characteristics	**No/Low**	**Mild-Moderate**	**Severe**	***p*[c]**
Percent of subjects (unweighted)	22,438,539	2,273,532	906,299	
Total number of subjects (weighted)	27,825	3118	1323	
Total number of subjects (unweighted)	86.2	9.7	4.1	
Age, y				<.0001
18–29	21.5	22.8	17.4	
30–39	20.6	20.2	16.0	
40–49	20.5	22.6	27.9	
50–59	15.1	15.7	21.3	
60–69	10.4	8.1	8.5	
70–79	8.5	7.0	5.6	
80+	3.4	3.7	3.2	
Male	47.9	38.2	35.6	<.0001
Marital status				<.0001
Married	65.2	53.0	48.9	
Widowed	6.7	8.5	9.2	
Divorced	8.0	11.4	16.2	
Separated	2.0	4.2	6.5	
Single	17.8	22.6	18.8	
Unknown	0.2	0.2	0.4	
Race/ethnicity				.0002
White (non-Hispanic)	68.7	66.3	63.4	
Black (non-Hispanic)	12.3	13.8	14.5	
Other (non-Hispanic)	6.9	7.8	7.8	
Hispanic	12.2	12.2	14.2	
Ratio of family income to Federal Poverty Level				<.0001
Below 100%	9.4	20.3	30.0	
100%–199%	13.9	21.5	25.0	
200%–399%	34.0	30.5	24.3	
400% or more	22.2	11.4	5.8	
Unknown	20.5	16.3	14.9	
Health insurance status				<.0001
Private insurance only	73.0	54.8	41.5	
Any publicly funded insurance	13.8	28.6	41.3	
No insurance	13.2	16.6	17.2	
Charlson Comorbidity Index >2	4.0	7.5	11.7	<.0001

	Psychological Distress[b]			
Sociodemographic Characteristics	**No/Low**	**Mild-Moderate**	**Severe**	***P*[c]**
Affective disorders	5.9	16.7	23.9	<.0001
Psychoses, schizophrenia, and related disorders	0.3	1.0	2.4	<.0001
Anxiety, somatoform, dissociative, and personality disorders	8.7	19.6	26.8	<.0001
Education status				<.0001
No or some high school	18.7	27.9	38.8	
High school graduate	32.5	36.9	35.8	
Some college	23.0	20.8	16.4	
College or beyond	25.3	13.5	8.2	
Unknown	0.6	0.9	0.8	
Region of United States				.01
Northeast	17.2	15.6	14.8	
Midwest	23.7	24.5	20.6	
South	38.7	39.2	42.3	
West	20.5	20.8	22.3	
Metropolitan Statistical Area	78.4	73.0	70.0	<.0001

[a] Values are percentages unless indicated otherwise.

[b] Psychological distress was defined using the Kessler Psychological Distress Scale (K6), with strata classified as no/low (K6 score 0 to 6), mildmoderate (7 to 12), or severe (13 or more).

[c] χ^2 *P* for difference between categories of psychological distress.

Table 3

Unadjusted Trends in Psychological Distress Among US Adults, 1997 to 2004

	Year of the National Health Interview Survey							
Trend	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Mean (SD) psychological distress[a] score	2.7 (0.10)	2.5 (0.09)	2.1 (0.08)	2.3 (0.08)	2.8 (0.08)	2.5 (0.07)	2.5 (0.08)	2.6 (0.07)
Psychological distress[a] (%)								
No/low	85.8	88.4	90.1	88.9	86.6	87.6	87.1	86.4
Mild-moderate	10.5	8.3	7.8	7.8	9.6	8.4	9.1	9.8
Severe	3.7	3.3	2.2	3.3	3.8	3.9	3.8	3.7

[a]Psychological distress was defined using the Kessler Psychological Distress Scale (K6), with strata classified as no/low (K6 score 0 to 6), mild-moderate (7 to 12), or severe (13 or more).