The Association Between Income and Distress, Mental Disorders, and Suicidal Ideation and Attempts: Findings From the Collaborative Psychiatric Epidemiology Surveys

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Objective: To examine the relationship between household income and psychological distress, suicidal ideation and attempts, and mood, anxiety, and substance use disorders.

Method: Data came from the Collaborative Psychiatric Epidemiology Surveys, a collection of 3 nationally representative surveys of American adults conducted between 2001 and 2003. Psychological distress, suicidal ideation, suicide attempts, and mood, anxiety, and substance use disorders were examined in relation to household income after adjusting for sex, marital status, race, age, and employment status.

Results: Analyses revealed an inverse association between income and psychological distress as measured by the Kessler Psychological Distress Scale, with those in the lowest income quartile demonstrating significantly more distress than any of the remaining 3 income quartiles ($P < .05$). Subsequent analysis of *DSM-IV*–diagnosed psychological disorders revealed a similar pattern of results, which were particularly strong for substance use disorders (adjusted odds ratio [AOR] = 1.74; 95% CI, 1.39–2.18), suicidal ideation (AOR = 1.77; 95% CI, 1.46–2.13), and suicide attempts (AOR = 2.15; 95% CI, 1.55–2.98). The association between income and mood and anxiety disorders was less consistent, and the relationship between income and suicidal ideation differed among the 5 race categories (non-Hispanic white, Hispanic, Asian American, black, and other). Non-Hispanic white persons showed a strong, negative relationship between income and suicidal ideation (AOR = 2.15; 95% CI, 1.66–2.80), while the association was considerably weaker or nonexistent for the other races.

Conclusions: Although conclusions cannot be drawn concerning causation, the strength of associations between income, suicidal ideation, suicide attempts, and substance abuse points to the need for secondary prevention strategies among low-income, high-risk populations.

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Income, both family and personal, has been examined in relation to a multitude of factors including happiness/well-being, suicide, and mental disorders. Although several studies have attempted to explain the relationship between income and happiness, the results are not definitive. The impact of income on happiness has been found to vary due to a number of factors, such as whether cross-sectional or time-series data were used,[1] the skew of the income distribution,[2] perceived financial situation, control over life,[3] and how one's income is spent.[4] A recent study of the psychological health of lottery winners found a statistically significant improvement in psychological health among those winning medium-sized prizes that remained significant 2 years later[5]; however, while personal income adjusted for inflation increased sharply between the years 1956 and 1998, the percentage of individuals who rated themselves as very happy declined slightly.[6]

Research concerning income and happiness has yielded many contradictory findings. This may be explained in part by focusing illusions; that is, the tendency for individuals to overestimate the importance of a given factor (eg, marital status, dating frequency, and health) in determining their level of happiness. To illustrate, when working women were asked to rate how much time they spent in a bad mood the previous day and, thereafter, estimate how much time people of high or low income typically spent in a bad mood, they significantly overestimated the percentage of time low-income individuals spend in a bad mood.[7] Thus, when individuals are queried about their income prior to making judgments about their level of happiness, they may overestimate the significance of income on their level of happiness.

The relationship between suicide and income is somewhat clearer, with the majority of studies indicating an increased risk of suicidal ideation and attempts among low-income individuals.[8] However, the direction of the relationship between income and suicide is unclear. Individuals who have attempted suicide and, to a lesser extent, those with suicidal ideation earn less personal income and have a reduced probability of employment compared to those without suicidal ideation or attempts.[9] In addition, the association between income and suicidal ideation and attempts is confounded by the increased rates of suicide among individuals with mental disorders,[10–13] who typically have lower income than their peers.[14]

The majority of studies have demonstrated higher levels of psychopathology among low-income individuals.[15–19]

This inverse association between mental disorders and income is thought to be strongest for mood and anxiety disorders and weakest for substance use disorders.[20,21] Other factors that have been found to influence susceptibility to mental disorders at lower income levels include organizational control and assets,[20] social support,[22] factors related to unemployment, and the inability to borrow money readily.[15] Despite numerous studies that have examined the relationship between mental disorders and income, consensus has not been reached, and much remains to be known about the impact of income on mental health.

The main objectives of this study were (1) to examine the impact of income on multiple mental disorders and suicidal behavior and (2) to investigate differences in psychological distress among various income levels. This study builds upon earlier studies in several ways. First, it uses a more recent nationally representative sample than many previous studies. Second, more mental disorders are included than can be found in most of the existing literature. Third, levels of psychological distress are investigated among individuals without a mental illness, allowing for an examination of the association between income and psychological distress without the confounding issue of increased distress among the mentally ill. Finally, whereas previous samples have been limited by underrepresentation of particular races, the Collaborative Psychiatric Epidemiology Surveys (CPES)[23] specifically targets respondents from a wide range of ethnicities.

METHOD

Sample

The CPES comprises 3 large, nationally representative surveys, including the National Comorbidity Survey Replication (NCS-R), National Survey of American Life (NSAL), and the National Latino and Asian American Study (NLAAS). All 3 surveys were conducted using participants 18 years and older from the United States, excluding institutionalized persons and those living on military bases. While the NCS-R (N = 9,282; response rate = 70.9%) provided a general survey of English-speaking Americans, the NSAL (N = 6,199; response rate = 71.5%) specifically targeted English-speaking African Americans, Afro-Caribbeans, and non-Hispanic white persons. The NLAAS (N = 4,649; response rate = 75.7%) further extended the breadth of the CPES dataset by examining Latino and Asian American adults, including those who could not speak English. The same data collection model was used for each of the 3 datasets that comprise the CPES, and, to promote consistency, the same procedures and materials were used when possible.[24] The NCS-R and NSAL were administered to participants between 2001 and 2003. The NLAAS was administered to participants between 2002 and 2003. All three surveys, which comprise the CPES, required informed consent from respondents. The NLAAS required written informed consent, while the NCS-R and NSAL required oral consent. All three surveys were approved by institutional review boards.

The core CPES questions were derived from the World Health Organization's World Mental Health Composite International Diagnostic Interview (WMH-CIDI).[25] The WMH-CIDI allows generation of diagnoses based on either *International Classification of Diseases, Tenth Revision* or *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (*DSM-IV*) criteria, the latter of which were used in this study to diagnose mental disorders. Although the WMH-CIDI was designed for administration by trained, nonclinician interviewers, it has shown good concordance with the clinician-administered Structured Clinical Interview for *DSM-IV* for the disorders included in the present study.[25] Additional information on the CPES methodology and psychometric properties of the WMH-CIDI can be found elsewhere.[24–26]

Income Categories

In order to ensure sufficient sample size for statistical analysis, 4 income levels were created by dividing into quartiles those participants who reported their yearly household income. In ascending order, these income quartiles were labeled low (< $17,000), low-average ($17,000–$37,098), high-average ($37,099–$67,000), and high (> $67,000). This method of income division has been used in several published, peer-reviewed journal articles.[11]

Sociodemographics

Age, sex, marital status, race, and employment status were all hypothesized to influence the distribution of income and were analyzed using χ^2 to determine their prevalence in each of the 4 income quartiles. These variables were found to be unequally distributed among the 4 quartiles and were subsequently adjusted for during statistical analysis.

Psychological Distress

The Kessler Psychological Distress Scale (K10)[27] was used to measure levels of psychological distress. The 10 questions included in this index cover the domains of depressed mood, motor agitation, fatigue, worthlessness/guilt, and anxiety. The individuals are asked to imagine 1 month in the past year when they experienced their worst depression, anxiety, or emotional distress and then to rate how often they experienced each of 10 symptoms on a 5-point scale (all of the time, most of the time, some of the time, a little of the time, or none of the time). Responses were reverse coded so that higher scores represented greater levels of psychological distress. The K10 has been shown to demonstrate consistent levels of severity across varying socioeconomic subsamples, is excellent at discriminating those with a *DSM-IV* disorder from those without in a community sample,[27] and is useful for identifying subclinical disorders.[28]

Mental Disorder Diagnosis

All diagnoses were made in accordance with *DSM-IV* diagnostic criteria and were calculated for lifetime prevalence. The mental disorders included in the analyses were mood disorders (dysthymia and major depression), anxiety

disorders (panic disorder without agoraphobia, agoraphobia without panic disorder, social phobia [social anxiety disorder], posttraumatic stress disorder [PTSD], and generalized anxiety disorder), and substance use disorders (alcohol abuse, alcohol dependence, drug abuse, and drug dependence). Each diagnostic category (mood, anxiety, and substance use disorders) was examined independently and was dichotomized into "no disorder" and "one or more disorders."

Suicidal Ideation and Attempts

Questions thought to be sensitive in nature, such as those concerning suicidal thoughts and behaviors, were asked differently depending on the literacy of the participant. Those who identified themselves as being literate were provided with a booklet that contained a list of sensitive behaviors (eg, seriously thought of committing suicide, attempted suicide). Participants were asked, "Three experiences are listed on this page labeled A, B, and C. Did experience A or C ever happen to you?" where experience A was "you seriously thought about committing suicide," and experience C was "you attempted suicide." Those who were self-identified as illiterate were asked the questions directly. Suicidal ideation and suicide attempt variables were created by merging together those questions asked of literate and illiterate participants and were calculated for lifetime prevalence.

Data Analysis

All statistical analyses were conducted with Software for Survey Data Analyses,[29] using the appropriate weights provided by the CPES in order to accurately represent the United States population. Estimates of variance were conducted using the Taylor Series Linearization procedure in order to correct for the complex statistical sampling procedures employed by the CPES.

Linear regressions were calculated to examine the association between K10 scores and income level. Contrast statements were utilized to determine whether the mean K10 scores from each of the 4 income levels differed significantly from each other after adjusting for sociodemographics (age, marital status, sex, race, and employment status). A race × income interaction was calculated and found to be significant for suicidal ideation; therefore, simple-effects analyses were conducted to determine the relationship between income and suicidal ideation for each of the 5 race categories.

Crosstabulations were calculated to determine the proportion of individuals in each income quartile who were diagnosed with a mood, anxiety, or substance use disorder, as well as those who endorsed suicidal ideation or attempts. Multiple logistic regressions were performed on each of the mental disorder categories (mood, anxiety, and substance use disorders), suicide ideation, and suicide attempt variables, after first adjusting for sociodemographics (discussed in text only for mood, anxiety, and substance use disorders), then, once again, after adjusting for sociodemographics and all other Axis I disorders simultaneously. The high income quartile was used as the reference group to determine the relative prevalence of each of the disorders mentioned in the remaining 3 quartiles.

RESULTS

Sociodemographics

Significant differences were found between each of the 4 income quartiles for each sociodemographic variable investigated (age, sex, marital status, race, and employment status). Age demonstrated an inverted U-shaped relationship with income. Each of the 4 age categories were nearly equally represented in the low income quartile; however, those in the middle 2 age categories (25–44 years and 45–64 years) together comprised 81.4% of the individuals in the high-income category. An examination of the gender distribution revealed that men were more likely to fall into the highest income quartile than the lowest (54.59% vs 35.08%), whereas the opposite was true for women. With regard to marital status, the number of individuals who reported that they were separated/divorced/widowed or never married decreased as income increased. The opposite pattern was evident for those who were married or cohabitating. While these individuals comprised only 28.27% of the low income quartile, they made up nearly 80% of the high income quartile. Analysis of the race variable revealed that, with the exception of Asian Americans, non-Hispanic white participants were the only race for which significantly more individuals were found at the highest income quartile than the lowest quartile (78.98% vs 57.36%). Asian Americans demonstrated a similar, weaker trend increasing from 4.31% to 6.20% through to the high income quartile. Finally, an exploration of employment status revealed that those in the upper quartiles were more likely to be employed than those in the lower quartiles, who were more likely to be unemployed (not currently working but seeking employment) or not in the labor force (not currently seeking employment) (Table 1).

Kessler Psychological Distress Scale

Mean K10 scores decreased in general as income increased, indicating lower levels of distress among those with high income compared to every other income level. No differences were found between the low-average (mean = 13.53, SE = 0.46) and high-average income quartiles (mean = 13.34, SE = 0.32); however, significant differences were found between all other groups (Figure 1). When examining K10 scores among individuals without mental disorders, a similar pattern emerged. Those in the low income quartile demonstrated significantly more psychological distress than any of the remaining 3 income quartiles ($P < .05$). K10 scores did not differ significantly among the 3 upper quartiles (Figure 2).

Mental Disorders

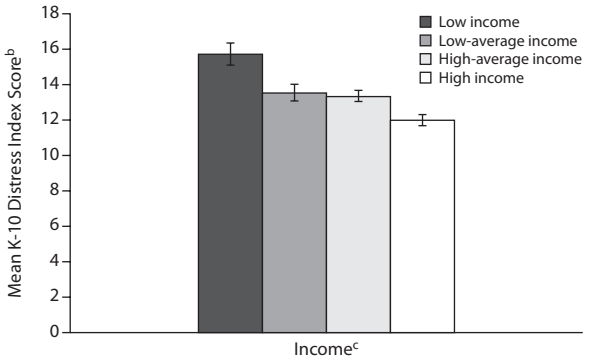
Mood, anxiety, and substance use disorders were examined by comparing the lowest 3 income quartiles against the high income quartile. Analysis of anxiety disorders revealed a greater number of anxiety disorders among those in the

Table 1. Sociodemographic Factors in Relation to Income[a]

Characteristic	Household Income				χ^2
	< $17,000 (n = 4,109), n (%)	$17,000–$37,098 (n = 4,102), n (%)	$37,099–$67,000 (n = 4,126), n (%)	> $67,000 (n = 4,086), n (%)	
Age, y					272.45***
18–24	834 (24.2)	622 (15.7)	463 (11.2)	373 (10.5)	
25–44	1,353 (26.7)	1,861 (37.0)	2,121 (44.2)	2,057 (41.4)	
45–64	1,097 (22.5)	1,066 (24.4)	1,253 (32.4)	1,449 (40.0)	
65+	825 (26.5)	553 (23.1)	289 (12.2)	207 (8.1)	
Sex					110.59***
Male	1,295 (35.1)	1,549 (43.0)	1,914 (51.4)	2,035 (54.6)	
Female	2,814 (64.9)	2,553 (57.0)	2,212 (48.6)	2,051 (45.4)	
Marital status					295.54***
Married/cohabitating	1,133 (28.3)	1,768 (46.2)	2,557 (64.6)	3,191 (79.6)	
Separated/divorced/widowed	1,499 (36.5)	1,169 (29.3)	743 (16.6)	325 (6.8)	
Never married	1,477 (35.2)	1,157 (24.5)	824 (18.8)	570 (13.6)	
Race					319.54***
Non-Hispanic white	824 (57.4)	1,079 (65.0)	1,516 (75.8)	1,652 (79.0)	
Asian American	420 (4.3)	307 (2.5)	501 (3.7)	950 (6.2)	
Hispanic	957 (18.2)	828 (14.5)	748 (9.2)	731 (8.2)	
Black	1,848 (17.4)	1,839 (16.2)	1,313 (9.7)	725 (5.4)	
Other	60 (2.7)	49 (1.9)	48 (1.7)	28 (1.2)	
Occupation					358.62***
Employed	1,569 (36.5)	2,721 (59.8)	3,226 (74.7)	3,316 (80.1)	
Unemployed	514 (9.8)	314 (6.6)	180 (4.5)	165 (3.8)	
Not in labor force	2,021 (53.7)	1,054 (33.6)	713 (20.8)	603 (16.1)	

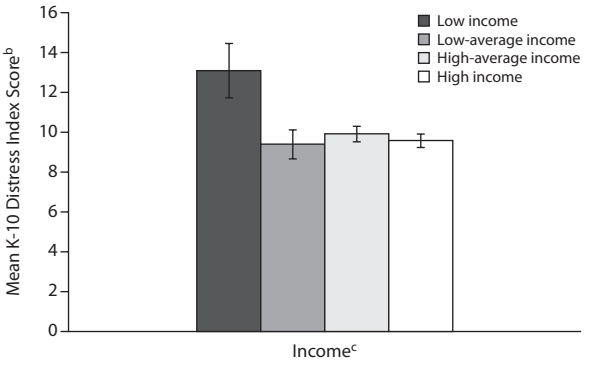
[a]All n's were unweighted. All percentages were weighted.
***$P \leq .001$.

Figure 1. Kessler Psychological Distress Scale (K10) Scores and Income Level[a]



[a]The association between income and psychological distress in the Collaborative Psychiatric Epidemiology Surveys.
[b]The adjusted mean K10 scores and standard errors (error bars) from multiple linear regression analyses, adjusted for age, race, gender, occupation, and marital status are presented.
[c]Psychological distress declined steadily as household income increased. Highly significant differences were observed between each of the 4 income levels except between the low-average and high-average levels.

Figure 2. Kessler Psychological Distress Scale (K10) Scores Among Those Without a Mental Disorder[a]



[a]The association between income and psychological distress in the Collaborative Psychiatric Epidemiology Surveys.
[b]The adjusted mean K10 scores and standard errors (error bars) from multiple linear regression analyses, adjusted for age, race, gender, and marital status are presented.
[c]Psychological distress declined significantly in the upper 3 quartiles. A highly significant difference ($P < .001$) was found between the mean K10 score for the low quartile and the low-average quartile. Significant differences were also found between the low income quartile and the remaining upper 2 quartiles ($P < .05$). No significant difference was found between the upper 3 quartiles.

second lowest quartile compared to the highest (adjusted odds ratio [AOR] = 1.33; 95% CI, 1.11–1.58); however, this association was attenuated after adjusting for the presence of all other Axis I disorders (AOR = 1.22; 95% CI, 1.01–1.48) (Table 2). Social phobia was the most prevalent anxiety disorder in this income category and was diagnosed in 10.8% of individuals, followed by generalized anxiety disorder (8.5%) and PTSD (7.0%).

Mood disorders demonstrated an opposite pattern. Although participants in the second-lowest quartile also differed from those in the highest income quartile, this difference only reached statistical significance ($P < .01$) after adjusting for sociodemographics and all other Axis I disorders simultaneously (AOR = 0.83; 95% CI, 0.73–0.95). In addition, the direction of this association was reversed, with lower levels of mood disorders occurring among those participants in the second-lowest quartile compared to the highest. Nevertheless, major depression was still commonly diagnosed among people in the second-lowest quartile (16.2%) with relatively lower rates of dysthymia (3.9%).

Table 2. Relationship Between Household Income and Mental Disorders[a]

	Household Income			
Mental Disorder	< $17,000	$17,000–$37,098	$37,099–$67,000	> $67,000
Mood disorder				
No mood disorder (n = 13,225), n (%)	3,295 (81.7)	3,316 (82.5)	3,324 (82.1)	3,290 (82.8)
Mood disorder (n = 3,002), n (%)	759 (18.3)	706 (17.5)	758 (17.9)	779 (17.2)
AOR (95% CI)[b]	0.90 (0.72–1.12)	0.83 (0.73–0.95)**	0.95 (0.81–1.11)	1.00
Anxiety disorder				
No anxiety disorder (n = 11,721), n (%)	2,863 (76.2)	2,884 (74.2)	2,948 (76.7)	3,026 (78.5)
Anxiety disorder (n = 3,800), n (%)	1,028 (23.8)	933 (25.8)	938 (23.3)	901 (21.5)
AOR (95% CI)[b]	1.05 (0.82–1.34)	1.22 (1.01–1.48)*	1.02 (0.84–1.24)	1.00
Substance use disorder				
No substance use disorder (n = 13,413), n (%)	3,321 (85.3)	3,297 (85.6)	3,344 (84.8)	3,451 (88.2)
Substance use disorder (n = 1,934), n (%)	529 (14.7)	467 (14.5)	492 (15.2)	446 (11.8)
AOR (95% CI)[b]	1.74 (1.36–2.17)***	1.47 (1.14–1.90)**	1.36 (1.07–1.72)*	1.00

[a]All n's were unweighted. All percentages were weighted.
[b]AOR indicates adjustments for age, marital status, race, sex, employment status, and every other disorder cluster.
*$P \leq .05$.
**$P \leq .01$.
***$P \leq .001$.
Abbreviation: AOR = adjusted odds ratio.

Table 3. Relationship Between Household Income and Suicidal Ideation and Attempts[a]

	Household Income			
	< $17,000	$17,000–$37,098	$37,099–$67,000	> $67,000
Suicidal ideation				
No suicidal ideation (n = 12,985), n (%)	3,178 (81.3)	3,167 (83.1)	3,262 (85.4)	3,378 (88.5)
Suicidal ideation (n = 2,341), n (%)	669 (18.7)	589 (16.9)	569 (14.6)	514 (11.5)
AOR 1 (95% CI)[b]	1.77 (1.46–2.13)***	1.61 (1.35–1.94)***	1.26 (1.04–1.53)*	1.00
AOR 2 (95% CI)[c]	1.66 (1.36–2.02)***	1.53 (1.26–1.86)***	1.24 (1.02–1.50)*	1.00
Suicide attempt				
No suicide attempt (n = 14,492), n (%)	3,558 (93.0)	3,539 (94.4)	3,637 (95.3)	3,758 (97.2)
Suicide attempt (n = 830), n (%)	286 (7.0)	217 (5.6)	193 (4.7)	134 (2.8)
AOR 1 (95% CI)[b]	2.15 (1.55–2.98)***	1.84 (1.34–2.53)***	1.58 (1.22–2.04)***	1.00
AOR 2 (95% CI)[c]	1.77 (1.30–2.42)***	1.62 (1.18–2.21)**	1.50 (1.16–1.94)**	1.00

[a]All n's were unweighted. All percentages were weighted.
[b]AOR 1 indicates adjustments for age, marital status, race, sex, and employment status.
[c]AOR 2 indicates adjustments for age, marital status, race, sex, employment status, and mental disorders.
*$P \leq .05$.
**$P \leq .01$.
***$P \leq .001$.
Abbreviation: AOR = adjusted odds ratio.

Substance use disorders were far more common among those from the low (AOR = 1.74; 95% CI, 1.39–2.18), low-average (AOR = 1.51; 95% CI, 1.18–1.93), and high-average (AOR = 1.36; 95% CI, 1.07–1.72) income quartiles compared to the high income quartile. Although this association was attenuated slightly after adjusting for sociodemographics and all other Axis I disorders (see Table 2), the association between income and substance use disorders remained significant across the income quartiles. Alcohol or drug abuse was more common than alcohol or drug dependence, with rates of alcohol abuse ranging from 10.7% to 13.7% across income quartiles. Drug abuse rates were somewhat lower, ranging from 6.6% to 8.2%.

Suicidal Ideation and Attempts

Compared to those in the highest income quartile, individuals in the low income quartile (AOR 1 = 1.77; 95% CI, 1.46–2.13), the low-average income quartile (AOR 1 = 1.61; 95% CI, 1.35–1.94), and the high-average income quartile (AOR 1 = 1.26; 95% CI, 1.04–1.53) reported significantly more lifetime suicidal ideation. The relationship between suicide attempts and income was even greater. Those in the low (AOR 1 = 2.15; 95% CI, 1.55–2.98), low-average (AOR 1 = 1.84; 95% CI, 1.34–2.53), and high-average (AOR 1 = 1.58; 95% CI, 1.22–2.04) income quartiles all reported significantly more suicide attempts than those in the high income quartile. All differences remained significant after adjusting for both sociodemographics and the presence of any Axis I disorders (Table 3).

A race × income interaction in predicting suicidal ideation was found to be significant, and the resulting simple-effects analyses revealed a different pattern of results for non-Hispanic white participants compared to each of the other 4 races after adjusting for sociodemographics. Non-Hispanic white persons from the low (AOR = 2.15; 95% CI, 1.66–2.80), low-average (AOR = 1.81; 95% CI, 1.42–2.32), and high-average (AOR = 1.36; 95% CI, 1.10–1.68) income quartiles reported significantly more suicidal ideation than those in the highest income quartile. No other race demonstrated a significant relationship between income and suicidal ideation at all income levels. Hispanic, Asian American, and black participants showed no increased

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likelihood of suicidal ideation at any income level. Those in the other race category demonstrated a significant decrease in suicidal ideation among those in the second-highest quartile compared to the highest (AOR = 0.28; 95% CI, 0.10–0.79).

DISCUSSION

This study contributes to the existing literature by demonstrating increased rates of anxiety disorders, substance use disorders, psychological distress, suicidal ideation, and suicide attempts among low-income Americans. Although several prior studies considered the individual contributions of each of these factors, few have simultaneously investigated all factors using a recent, large, nationally representative sample.

After adjusting for both sociodemographics and the presence of an additional Axis I disorder, individuals in the low-average income quartile were less likely ($P < .01$) to be diagnosed with a mood disorder when compared to those in the high income quartile (AOR = 0.83; 95% CI, 0.73–0.95). Rates of mood disorders did not differ significantly between those in low and high income quartiles, or the high-average and high income quartiles. This weak relationship between income and mood disorders is not surprising; 1 review found that only 5 out of 11 studies examining the association between socioeconomic status (SES) and depression demonstrated higher rates of depression in the low SES group.[30] Another recent study involving 2 large, nationally representative samples found a significant relationship between income and depression in 1 dataset ($P < .001$), but no relationship in the other.[20] Finally, recent meta-analytic findings suggest that low SES slightly increases the risk of developing depression.[31] The present study adds to the literature by demonstrating the impact of additional Axis I disorders on the association between income and mood disorders.

While the relationship between income and anxiety disorders in the existing epidemiologic literature is more consistent than the relationship between income and mood disorders, the results are not definitive. One study, conducted by Muntaner and colleagues,[20] examined the relationship between income and anxiety disorders in 2 separate nationally representative samples. While one sample demonstrated a strong inverse relationship between income and anxiety disorders across all income levels, the other demonstrated higher rates of anxiety disorders only among those in the lowest income bracket (< $17,000).[20] However, PTSD and social phobia, in particular, seem to show some of the strongest associations with income.[32,33] Analysis of anxiety disorders in the current study revealed an opposite pattern of results compared to the mood disorders, with individuals in the second-lowest quartile being more likely to be diagnosed with an anxiety disorder than those in the highest income quartile, even after adjusting for both sociodemographics and Axis I disorders simultaneously ($P < .05$). One possible explanation for this pattern could be related to health care service provision within the United States, where, in 2006, 47 million citizens could not afford health insurance.[34] While many of the most economically disadvantaged can receive government-sponsored health care services through state-run Medicaid programs, those who make too much money to qualify for government assistance, but too little to afford private health insurance, face an uncertain economic future. This may explain, at least in part, the high level of anxiety disorders among those in the low-average quartile.

The contradictory class location hypothesis[35] may also explain the elevated rates of anxiety disorder diagnoses in the low-average income quartile. This hypothesis divides workers into the 3 categories of managers, supervisors, and workers. While managers have both supervisory responsibilities and the ability to influence corporate policy, those in supervisory positions must deal with more responsibility than workers, but without the power afforded to managers. Although they earn a higher wage than workers, the pressure they receive from those above them combined with their inability to exact meaningful change can lead to an increase in mental disorders. This hypothesis has been investigated in 2 large, epidemiologic samples[36,20] and helps to elucidate the results of the current study.

In contrast to the relatively weak relationship between income and mood and anxiety disorders, substance use disorders exhibited a stronger association with income across all quartiles, with the highest prevalence of substance use disorders at the lowest income quartile and diminishing as income increased. This pattern of results remained even after adjusting for sociodemographics and all other Axis I disorders simultaneously. These findings run contrary to a number of previous studies that found either no relationship[18,20,21] or a weak relationship[17,20] between income and substance use disorders. However, these studies were all published more than a decade ago and may no longer accurately illustrate the current relationship between income and substance use disorders.

Our study found significantly greater levels of suicidal ideation and suicide attempts among the 3 lower income quartiles compared to the high income quartile. Even after adjusting for the presence of Axis I mental disorders, this relationship remained strong. The association between low income and increased rates of suicidal ideation and attempts has been demonstrated at both the individual[37] and national levels.[8] In addition, subsequent analyses revealed that the relationship between income and suicidal ideation is not uniform for all races. Among those of non-Hispanic white decent, there was a strong, negative association between income and suicidal ideation, while no such association existed among Hispanic, Asian American, and black individuals. Participants in the "other" race category showed lower levels of suicidal ideation when the high-average income quartile was compared to the high income quartile (AOR = 0.28; 95% CI, 0.10–0.79), with no differences between the remaining quartiles. A recent study of 61,673 Canadian adults supports our findings. Despite disadvantages in SES among visible minorities, lower rates of suicidality were reported among these individuals compared to Anglophone whites.[38]

An examination of psychological distress as measured by the K10 revealed greater levels of psychological distress among individuals in the lowest income quartile compared to the remaining 3 quartiles, while those in the upper quartile demonstrated significantly less psychological distress than any of the lower 3 quartiles. These results are not surprising in light of the fact that this study and others[15–17,30] have demonstrated that individuals in the lowest income quartile are more likely to have a mental disorder than those in the upper quartile, and individuals with a mental disorder are at greatest risk for suicide.[10–13] As a result, elevated levels of psychological distress would be expected among individuals in the lowest income quartile. However, after the removal of all individuals diagnosed with a mental disorder from the analysis, individuals in the lowest income quartile continued to report the highest level of psychological distress. Although it is not possible to determine whether psychological distress was a contributing factor to low income or a result of economic disadvantage, this study provides support for the link between psychological distress and income exclusive of mental disorder diagnoses.

Limitations of the present study include the cross-sectional nature of the data, the use of professional interviewers rather than trained clinicians, and the inclusion of only community-dwelling noninstitutionalized respondents. In addition, the time periods in which the variables were assessed were different. While mental disorders, suicidal ideation, and suicide attempts were lifetime variables, income was assessed using current household income, and psychological distress was defined according to the worst month in the past year. However, it should be noted that household income has been examined in relation to lifetime disorders in previous studies.[32,33] Another limitation was that only select mood and anxiety disorders were available for analysis, and *DSM* Axis II personality disorders were not included in the dataset. Finally, scores for the K10 were available for the NCS-R dataset only. Future studies should concentrate on the systematic delineation of the relationship between income and substance abuse and depression, which has shown some of the most contradictory findings.

The relationship between income and mental disorders, well-being, suicidal ideation, and suicide attempts has been examined previously, yielding contradictory and unclear findings. This is particularly true for the substance use disorders and mood disorders. Although much remains to be known about the direction of the association between income and mental disorders, the present study adds to the current knowledge base by demonstrating a clear relationship between income, anxiety disorders, mood disorders, substance use disorders, and suicidal behavior, as well as psychological distress in the absence of confounding mental disorder diagnoses. In addition, this study highlights the differential impact of race on the association between income and suicidal behavior. It is clear that low-income individuals are at a disadvantage with regard to psychological health. More research is required to elucidate the factors mediating this relationship.

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