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Severity of Psychological Distress among Adults with and without Disabilities

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Abstract

The aim of this study is to examine psychological distress and its individual symptoms between adults with and without disabilities, and among adults with disabilities, to examine whether an association exists between severity of distress and health-related factors. Cross-sectional data from the 2007 Behavioral Risk Factor Surveillance System were used for this study. Severity of psychological distress was assessed using the Kessler 6 scale of nonspecific psychological distress. Logistic regression analyses were performed to estimate predicted marginals and prevalence ratios. Nine percent of adults had mild to moderate psychological distress and 3.9% had serious psychological distress. The adjusted mean Kessler 6 total scores and individual item scores were higher for adults with disabilities, as was the average number of days that a mental health condition interfered with activities in the past 30 days. Among adults with disabilities, mild to moderate and serious psychological distress were particularly high among those who were unemployed or unable to work. Those who had either mild to moderate or serious psychological distress were significantly more likely than those with no psychological distress to be physically inactive, to smoke, and to report fair or poor health, life dissatisfaction, and inadequate social support. A dose-response relationship exists between categorical severity of psychological distress and examined health-related factors. These findings may inform the design of targeted public health strategies that aim to eliminate health disparities between people with and without disabilities.

Keywords

Psychological distress; mental health; disability; BRFSS; surveillance

INTRODUCTION

Of the more than one billion people in the world that experience disability, approximately 54 million live in the United States (Brault, 2008; World Health Organization & The World Bank, 2011). In 2000, the U.S. Department of Health and Human Services (USDHHS)

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established a goal to promote the health and well-being of people with disabilities (USDHHS, 2000; U.S. Department of Health and Human Services & Office of the Surgeon General, 2005). In setting out to accomplish this goal, USDHHS recognized the need to eliminate health disparities (or modifiable differences in health outcomes between groups that reflect social inequalities; Carter-Pokras & Baquet, 2002; Commission on Social Determinants of Health, 2008; Frieden, 2011) between people with and without disabilities. In 2007, the USDHHS report *Healthy People 2010 Midcourse Review* (*HP2010*; USDHHS, 2007) documented inadequate progress toward achieving several objectives to eliminate health disparities between people with disabilities and those without disabilities, as well as among select subpopulations of people with disabilities (e.g., sex, race/ethnicity, and education). Similarly, in 2011, the Centers for Disease Control and Prevention's (CDC) *Health Disparities and Inequalities Report* (Frieden, 2011) documented health disparities continued between people with disabilities and people without disabilities. The report identified data gaps that must be addressed to reduce these disparities, for example, the *HP2010's* mental health and mental disorders chapter was one of 10 that lacked objectives for people with disabilities (Frieden, 2011; USDHHS, 2007).

People with disabilities have higher rates of behaviors that put their health at risk, chronic physical and mental conditions, obesity, poor self-rated health, and decreased participation in valued life activities (Burgess et al., 2009; Okoro, Strine, McGuire, Balluz, & Mokdad, 2007; Rasul, Stansfeld, Hart, Gillis, & Smith, 2004; Reichard, Stolzle, & Fox, 2011; USDHHS, 2000; World Health Organization & The World Bank, 2011). For example, we previously reported that the prevalence of serious psychological distress (SPD), as assessed by the dichotomously coded Kessler 6 (K6) scale of nonspecific psychological distress, is nearly 7 times higher among adults with disabilities compared to those without (Okoro et al., 2009). The K6 scale identifies individuals who are likely to meet formal definitions for anxiety or depressive disorders as well as subclinical illness who may not meet formal criteria (Kessler et al., 2002; Kessler et al., 2003; Substance Abuse and Mental Health Services Administration, 1993). Among adults who have psychological distress, there is variation in psychological, behavioral, and emotional characteristics (severity, duration, remission, response, impairment, and diminished quality of life) (Kraemer, 2007). For example, among adults with self-reported disability those with SPD are more likely than those without SPD to have a higher prevalence of adverse health behavior (e.g., physical inactivity; smoking; and excessive alcohol consumption), inadequate social support, and life dissatisfaction (Okoro et al., 2009). Even so, for adults with disabilities, limited research exists on the association between the severity of psychological distress and these known predictors of health (Frieden, 2011; USDHHS, 2007; U.S. Department of Health and Human Services & Secretary's Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020, 2008); this information is needed to inform the development of targeted primary and secondary public health interventions designed to prevent or detect and treat psychological distress among people with disabilities. Furthermore, effective public health strategies and treatment protocols that reduce the severity of psychological distress among persons with disabilities may facilitate the adoption and maintenance of healthy behaviors (Nieuwenhuijsen, Zemper, Miner, & Epstein, 2006; Ravesloot et al., 2011), increase involvement in self-care and treatment plans (Thota et al., 2012), and

improve physical and psychosocial functioning (Institute of Medicine, 2007). This would contribute to better health and an enhanced quality of life and assist with eliminating health disparities adversely affecting people with disabilities, such as premature mortality (Frieden, 2011; Lewis, 2009).

Thus, the goals of this study were (a) to compare the mean K6 total score and individual item scores of psychological distress between adults with and without disabilities and (b) to examine the association between categorical severity of psychological distress and health risk behaviors, obesity, general health status, perceived social support and life satisfaction, and activity limitations due to poor mental health among those with disabilities.

METHOD

The Behavioral Risk Factor Surveillance System (BRFSS) is a state-based surveillance system operated by state health departments in collaboration with CDC. A detailed description of the survey methods is available elsewhere (Holtzman, 2004), but in summary, BRFSS collects data on many of the behaviors, conditions, and social determinants that place adults (age ≥ 18 years) at risk for chronic disease (Centers for Disease Control and Prevention [CDC], 2006; Mokdad, Stroup, & Giles, 2003). Trained interviewers collect data monthly using an independent probability sample of households with telephones among the community-dwelling U.S. adult population. All BRFSS questionnaires, data, and surveillance summaries are available at www.cdc.gov/brfss. The median Council of American Survey Research Organizations (CASRO) response and cooperation rates among states for the 2007 BRFSS were 50.6% and 72.1%, respectively (CDC, 2008). In 2007, 35 states, the District of Columbia, and Puerto Rico administered an optional BRFSS Mental Illness and Stigma (MIS) Module containing the K6 scale of nonspecific psychological distress (Kessler et al., 2002). Data were available for 202,383 respondents (52,456 with self-reported disability and 149,927 without self-reported disability) who responded to the MIS Module's K6 scale questions and the disability questions in 2007.

Assessment of Psychological Distress and Other MIS Module Measures

The K6 scale was developed for inclusion on the U.S. National Health Interview Survey as a short dimensional measure of mental health and illness (Kessler et al., 2002). In 2007, BRFSS began using the K6 to improve the surveillance and research of—as well as the scientific evidence base about—mental health and illness in the United States (Croft, Mokdad, Power, Greenlund, & Giles, 2009). The K6 scale identifies individuals who are likely meet the criteria for mental illness (i.e., anxiety and depression disorders) and those with subclinical illness who may not meet the threshold for clinical diagnosis (Kessler et al., 2002).

Psychological distress was assessed using the K6 scale, which consists of six questions about how frequently respondents experienced each of six symptoms of psychological distress during the past 30 days. The K6 uses a 5-point Likert-type scale (scores from 0 = *none of the time*-4 = *all of the time*) to measure six symptoms of psychological distress experienced by respondents in the 30 days before the interview. Respondents were asked if they experienced the following feelings: (a) nervous, (b) hopeless, (c) restless or fidgety, (d)

so depressed that nothing could cheer them up, (e) that everything was an effort, and (f) worthless. The K6 symptom scores are summed across the six questions to yield a score with a range from 0 to 24. Respondents who had missing data or responded "don't know" or "not sure" to any of the six questions were excluded from the analysis. Consistent with previous validation (Kessler et al., 2002) and epidemiologic studies (Dhingra, Zack, Strine, Pearson, & Balluz, 2010; Dhingra et al., 2011; Kessler et al., 2003; P. S. Wang et al., 2007), total K6 scores were categorized as (a) no psychological distress (0–7), (b) mild to moderate psychological distress ([MPD] 8–12), and (c) SPD (13–24).

Respondents to the MIS Module were also asked this question to assess activity limitation due to impaired mental health,

> The next question asks if any type of mental health condition or emotional problem has recently kept you from doing your work or other usual activities. During the past 30 days, for about how many days did a mental health condition or emotional problem **keep you from doing** your work or other usual activities?

If interviewers were asked for clarification on "usual activities," they were instructed to read this standard definition: "**'Usual activities'** includes housework, self-care, caregiving, volunteer work, attending school, studies, or recreation."

Disability

Respondents were considered to have a disability if they answered *yes* to either of these two questions: "Are you limited in any way in any activities because of physical, mental, or emotional problems?" or "Do you now have any health problem that requires you to use special equipment, such as a cane, wheelchair, special bed, or special telephone?" Persons for whom responses to both questions were missing or who answered "don't know" or who refused to respond were excluded from the analysis. A disability status variable was constructed that included adults who made one of the following responses: (a) they had activity limitation and used an assistive device, (b) they had activity limitation only, or (c) they used an assistive device only.

Sociodemographic Characteristics and Analysis Variables

Respondents were asked their age (18–24, 25–34, 35–44, 45–54, 55–64, 65–74, and ≥75), sex, race/ethnicity (non-Hispanic [NH] White, NH Black, Hispanic, and NH other), education (less than high school diploma, high school graduate or Graduate Equivalency Diploma [GED], some college or technical school, and college graduate), employment (employed, unemployed, homemaker or student, retired, and unable to work), and marital status (married, previously married, never married, and member of an unmarried couple).

Respondents also were asked their height and weight and about their cigarette smoking habits, alcohol consumption, fruit and vegetable consumption, physical inactivity, general health status, degree of life satisfaction, and perceived level of social and emotional support.

Respondents' body mass index (BMI = weight in kilograms [kg] divided by the square of height in meters [m^2]) was determined from self-reported height and weight. Respondents with a BMI ≥ 30 were classified as obese. Respondents' cigarette smoking status was

determined by answers to two questions: (a) “Have you smoked at least 100 cigarettes in your entire life?” and (b) “Do you now smoke cigarettes every day, some days, or not at all?” Respondents who reported ever smoking 100 cigarettes and responded that they now smoke some days or every day were classified as “current smokers.” Heavy drinkers were defined as women who reported drinking more than one drink per day and men who reported drinking more than two drinks per day (U.S. Department of Health and Human Services, U.S. Department of Agriculture, & U.S. Dietary Guidelines Advisory Committee, 2005). The respondent’s opinion of his or her general health status was elicited by the question, “Would you say that in general your health is: Excellent, Very Good, Good, Fair, or Poor?” Responses were dichotomized as *fair or poor* versus *excellent, very good, or good*. Respondents’ degree of life satisfaction was assessed with the question, “In general, how satisfied are you with your life?” Responses were dichotomized as *dissatisfied/very dissatisfied* versus *very satisfied/satisfied*. Respondents’ perceived level of social support was assessed by, “How often do you get the social and emotional support that you need?” Responses were dichotomized as *rarely/never* versus *always/usually/sometimes*.

Statistical Analyses

We used SAS (SAS Institute Inc., 2008) and SAS-callable SUDAAN (Research Triangle Institute, 2008) in all analyses to account for the varying probabilities of complex sampling design and nonresponse. We used the CROSSTAB procedure to obtain unadjusted prevalence estimates and their standard errors (SEs). To facilitate comparisons between adults with and without disabilities, the prevalence estimates of psychological distress levels were age adjusted to the standard 2000 U.S. population (Klein & Schoenborn, 2001). We used logistic regression analysis to obtain adjusted predictive marginal for each level of psychological distress in association with disability status after adjustment for age, sex, race/ethnicity, educational attainment, marital status, and employment status. We used the DESCRIPT procedure to estimate the mean K6 total score, individual item scores, and activity limitation days due to impaired mental health and SEs, and we used the REGRESS procedure to examine adjusted mean scores for adults with and without disabilities. Using only the subsample of adults with disabilities, we used the MULTILOG procedure in SUDAAN to obtain unadjusted prevalence estimates, adjusted predicted marginal, and adjusted prevalence ratios (APRs) and adjusted odd ratios (AORs) and 95% confidence intervals (CIs; Research Triangle Institute, 2008). Specifically, we used multinomial logistic regression analysis to estimate predicted marginal and APRs by level of psychological distress (i.e., 0–7, 812, ≥13) in association with each sociodemographic characteristic, and to estimate AORs for level of psychological distress (i.e., 0–7 [no distress, referent group], 8–12, and ≥13) in association with sociodemographic characteristics. We used binomial logistic regression analysis to estimate predicted marginals and APRs for each health determinant (e.g., health-risk behaviors [physically inactive vs. physically active], obesity [BMI 30 vs. BMI <30], perceived inadequate social support [*rarely/never* vs. *always/usually/sometimes*]); and activity limitation in the past 30 days due to mental health problem (≥14 days vs. 0–13 days) in association with each level of psychological distress, after adjusting for sociodemographic characteristics. For all analyses, we used an alpha of 0.05 to determine significance.

RESULTS

Among 202,383 participants age 18 years or older, 52,456 (weighted percent: 20.1%) reported disability. Among those with disability, 14,764 (25.7%) reported activity limitation and using assistive technology, 33,510 (66.7%) reported only activity limitation, and 4,182 (7.6%) reported only use of assistive technology. A full description of the characteristics of the study population can be found elsewhere (Okoro et al., 2009).

Overall, 87.5% had no psychological distress, 8.5% had MPD, and 3.9% had SPD. The overall prevalence of MPD was more than twice as high and the prevalence of SPD was almost 7 times higher among adults with disability compared with those without disability (MPD: 16.5% vs. 6.5%, respectively; SPD: 12.3% vs. 1.8%, respectively). Figure 1 presents the age-standardized prevalence of severity of psychological distress by disability status. After adjusting for age, sex, race/ethnicity, educational attainment, marital status, and employment status, adults with disabilities were more likely to report both MPD (16.1% vs. 6.7%, APR, 95% CI = 2.40 [2.23, 2.58]) and SPD (9.5% vs. 2.1%, APR, 95% CI = 4.63 [4.11, 5.22]) compared with adults without disabilities. Adults with disabilities who reported that they had activity limitation and used assistive technology had the highest prevalence estimates of MPD and SPD, followed by adults who only reported activity limitations; and finally, those who reported only a use of assistive technology had the lowest prevalence estimates of MPD and SPD (MPD adjusted prevalence: 19.2%, 12.3%, and 6.7%, respectively; APR: 2.87, 2.35, and 1.84, respectively; and SPD adjusted prevalence: 11.4%, 9.3%, and 6.1%, respectively; APR: 5.62, 4.57, and 2.99, respectively).

Participants with disability had higher K6 total scores and individual item scores than respondents without disabilities (Table 1). The mean unadjusted K6 scores were 5.67 (SEM = .05) and 2.84 (SEM = .02) for adults with and without disabilities, respectively. After adjusting for age, sex, race/ethnicity, educational attainment, marital status, and employment status, a statistically significant difference in the mean K6 total scores (an 81% relative difference) and individual item scores remained (relative difference ranged from 49% −150%, $p < .001$ for all comparisons between those with disability and those without). Compared with respondents without disabilities, those with disabilities reported more days that a mental health condition interfered with work or other usual activities in the past 30 days as well (unadjusted: 2.99 vs. 0.29, adjusted: 2.24 vs. 0.48; $p < .001$ for both; Table 1).

Sociodemographic Characteristics and Severity of Distress Among Adults with Disabilities

Table 2 shows the adjusted prevalence of sociodemographic characteristics by level of psychological distress. Among adults with disabilities, the prevalence of MPD and SPD was significantly higher among Hispanics (vs. White NH). In addition, the prevalence of MPD was significantly higher among adults in the “other” race group (vs. White NHs).

The prevalence of MPD and SPD was higher among those who were unemployed, those unable to work, and those who were homemakers or students (vs. those employed); and higher among those previously married (vs. those who were married). Also, the prevalence of SPD was higher among those who were retired (vs. those employed). Thus, we found particularly strong associations between employment status and mild to moderate and

serious psychological prevalence among adults with disabilities. The estimated odds of being in the mild to moderate versus no psychological distress categories was 2.37 (95% CI [1.89, 2.96]) for those who were unemployed and nearly tripled (AOR = 2.93, 95% CI [2.52, 3.41] for those who were unable to work (vs. employed). The estimated odds of being in the serious versus no psychological distress categories was 4.28 (95% CI [3.30, 5.55]) and 6.18 (95% CI [5.07, 7.52]) for those unemployed and unable to work (vs. employed), respectively.

The prevalence of MPD and SPD significantly decreased with increasing age and increasing levels of education ($p < .001$ for trend for both). Notably, the prevalence of SPD was highest among those age 25 to 44 years (18.4%) and declined to 5.3% among those age 75 years or older. Meanwhile, the prevalence of MPD was highest among adults age 25 to 34 years (25.6%) but did not decline below 11.3% (among adults age ≥75 years).

Health Determinants and Severity of Psychological Distress Among Adults with Disabilities

After adjusting for sociodemographic characteristics (age, sex, race/ethnicity, educational attainment, marital status, and employment status), among adults with disabilities age 18 years or older, those who had either MPD or SPD were significantly more likely than those with no psychological distress to be physically inactive and to be current smokers (all ps < .001; Table 3). Among adults with disabilities, those with MPD were no more likely than those without distress to practice the other adverse health behaviors examined (i.e., < five daily servings of fruits and vegetables, binge drinking, or heavy drinking). Differences in the adjusted prevalence of obesity by severity of psychological distress were not found.

Moreover, after adjusting for sociodemographic characteristics among adults with disabilities, we found that those with either MPD or SPD were significantly more likely than those with no psychological distress to report fair or poor health, to report dissatisfaction with life, to report receipt of an inadequate amount of social support, and to report 14 or more days in the past 30 days where mental health problems interfered with work or usual activities (all ps < .001; Table 4).

DISCUSSION

The results of our analysis confirm and extend the findings of previous studies (Fan, Strine, Jiles, Berry, & Mokdad, 2009; Okoro et al., 2009). First, this study found that adults with disabilities have a higher prevalence of mild to moderate and SPD than those without disabilities. They also have a higher mean K6 total score, individual item scores, and activity limitation days due to impaired mental health. Second, the relative 81% difference in mean K6 total score between adults with and without disabilities was driven primarily by feelings of worthlessness (relative difference 150%), depression (relative difference 136%), and hopelessness (relative difference 114%). Third, among adults with disabilities, increasing age and educational attainment were inversely related to MPD and SPD, with MPD, in particular, affecting adults in early adulthood. In addition, adults with disabilities who were unemployed or unable to work had significantly higher prevalence estimates of MPD and SPD. Last, the prevalence of physical inactivity, smoking, fair or poor health status, life

dissatisfaction, perceived inadequate social support, and ≥14 days of activity limitation due to poor mental health increased as the severity of psychological distress increased.

Previous research found that adults with disabilities have an increased prevalence of SPD compared with those without disabilities (Fan et al., 2009; Okoro et al., 2009; Rai et al., 2011), and adults with disabilities and comorbid SPD have an increased prevalence of unhealthy behaviors, fair or poor health, life dissatisfaction, and perceived inadequate social support (Fitzmaurice, Kanarek, & Fitzgerald, 2011; Okoro et al., 2009). Public health interventions designed to prevent adverse health behaviors or assist with smoking cessation and facilitate a physically active lifestyle may have considerable health benefits over the life course of persons with disabilities (Fitzmaurice, Kanarek, & Fitzgerald, 2011). In addition, early identification and treatment of psychological distress among those with disabilities may increase the adoption and maintenance of healthy behaviors and thereby lead to a decreased risk of adverse health outcomes (Nosek, Hughes, & Robinson-Whelen, 2008; Vriezekolk et al., 2010).

Persons with disabilities are often excluded from the labor market, and those with more severe impairment or mental disorders are at greatest risk for role impairment (e.g., work absences, difficulties with home duties, low educational attainment) (Asarnow et al., 2005; Caspi, Wright, Moffitt, & Silva, 1998; Institute of Medicine, 2007; Okoro et al., 2007; Rai et al., 2011; U.S. Department of Health and Human Services & Office of the Surgeon General, 2005; World Health Organization & The World Bank, 2011). Moreover, young adults with disabilities may have challenges and barriers with transitioning into the labor market as well as with other concurrent life course transitions—changes in social roles, changes in living arrangements, continued access to health care—and, thus, experience higher levels of psychological distress (Caspi et al., 1998; Institute of Medicine, 2007; G. Wang, Grembowski, & Watts, 2009; Wells, Sandefur, & Hogan, 2003). Notably, we found that among adults with disabilities, those with MPD and SPD had significantly higher prevalence estimates of ≥14 days in the past 30 days of activity limitation in work or usual activities due to a mental health condition compared with those with no psychological distress (12.8% and 41.1% vs. 1.7%, respectively). Public health efforts to assist adults with disabilities to enter or reenter the labor market may include strategies that involve a biopsychosocial approach, taking into account primary disabling conditions, work functions, and work environments (Sanderson, Nicholson, Graves, Tilse, & Oldenburg, 2008). Research by Ravesloot et al. (2011) suggests that by adding a “sense of meaningfulness” (p. 20) to the International Classification of Function Framework (World Health Organization, 2001) and other health behavior change theories, these frameworks might be more effective among people with disabilities by helping them to link their health behaviors to their ability to participate in meaningful life activities, such as work and community life. Further research in this area could be used to help develop public health strategies and policies that effectively address the personal, social, economic, and environmental factors that contribute to the disparate feelings of worthlessness, depression, and hopelessness reported by adults with disabilities.

This study has limitations. First, we used BRFSS data that were collected among households with landline telephones; therefore, cellular-only households were not included. However, we don’t feel that this significantly affects our findings because most cellular-only

households consist of young adults who are least likely to be living with disabilities (Blumberg et al., 2009; Brault, 2008). Second, the sample consists only of community-dwelling adults, excluding those who are institutionalized and those who are homeless, resulting in under-representation of possibly the most seriously ill people in the population (Roehrig, Miller, Lake, & Bryant, 2009). In addition, due to item nonresponse on the K6 scale; 14,313 respondents (6.6%) were excluded from the study. Excluded respondents were more likely to be age 25 to 35 years or age 75 years or older, male, NH Black or Hispanic, have a high school education or less, unable to work, and previously married. Many of these characteristics have also been associated with higher rates of disability, mental disorders, and psychological distress. Thus, these exclusions are likely to make the estimates and associations reported here conservative. Third, one of the questions used to identify adults with disability is subject to definition circularity: the question did not distinguish between persons for whom the primary basis of disability was a mental or emotional problem, and persons whose mental or emotional problems were secondary or associated with a physically disabling condition. Fourth, psychological distress may be temporary—a normal response to stress that resolves when a person adapts to the stressor or the stressor is removed, such as a life-changing event, ill infant, or job loss. Fifth, we were not able to examine the effect of mental health treatment. For example, a proportion of respondents classified as having no psychological distress or MPD may be receiving efficacious treatment for their mental health conditions. Sixth, BRFSS data are self-reported, and biases associated with self-report may apply. Finally, given that BRFSS is a cross-sectional survey, we could not examine the temporal relationship between disability and level of psychological distress.

It is important to note the existence of a bidirectional relationship between mental illness and disability (Field, Jette, & Martin, 2006; Gariepy, Wang, Lesage, & Schmitz, 2011; Kisely, 2010; Rai et al., 2011; USDHHS, 1999). Psychological distress may increase the risk of disability and disability may increase the risk of psychological distress (Gariepy et al., 2011; Rai et al., 2011). Moreover, disability and psychological distress are associated with an increased risk of morbidity, injury, mortality, and risk behaviors and, in combination, have substantial public health consequences (Marks, 2009; Okoro, et al., 2009; Pratt, 2009; Scott et al., 2007). Our findings may contribute to the development, implementation, and evaluation of targeted public health strategies that aim to eliminate disparities in health between people with and without disabilities. Further research is needed to examine whether current mental health treatment protocols are effective at reducing the disparate symptoms of psychological distress (i.e., feelings of worthlessness, depression, and hopelessness) reported by adults with disabilities. Given the increasing number of U.S. residents who are living longer due to medical advancements, many of whom are aging with disabilities or developing disabilities along the life course, it is essential from a population health perspective and from an economic health perspective to ensure that years lived are healthy years lived.

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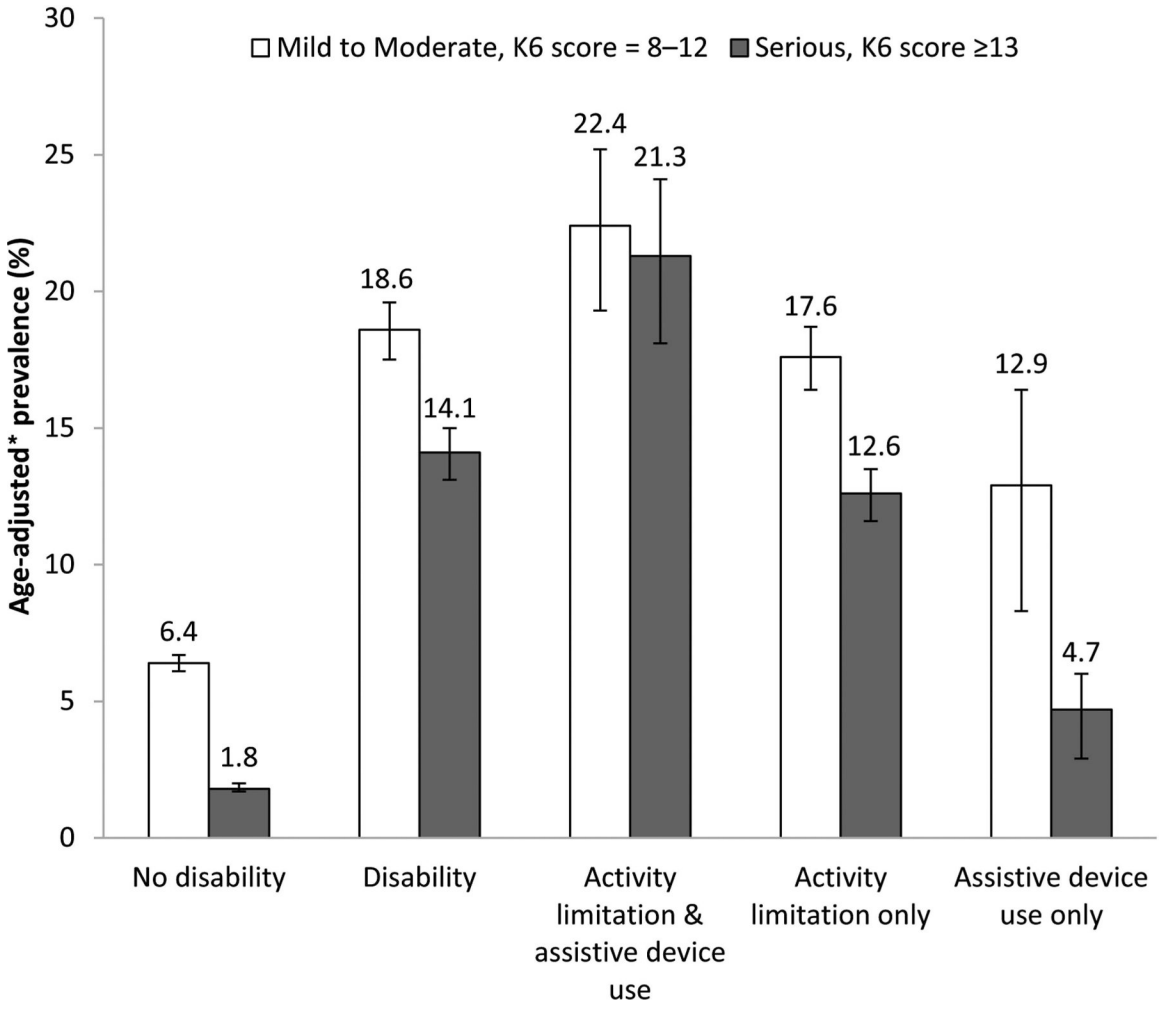

FIGURE 1.

Age-adjusted prevalence (%) of moderate and serious psychological distress assessed with Kessler 6 (K6) scores among U.S. adults aged 18 years or older with and without disability, and among those with disabilities by disability status. *Source:* Behavioral Risk Factor Surveillance System, 2007. *Age-adjusted to the 2000 U.S. standard population.

TABLE 1

Unadjusted and Adjusted[a] Kessler 6 (K6) Total Score, Individual Item Scores, and Number of Days in the Past 30 Days That Mental Health Problems Interfered With Work or Usual Activities (Mean, SEM) Among U.S. Adults Aged 18 Years or Older With and Without Disability

	Unadjusted					Adjusted				
		With Disability[b]					With Disability[b]			
Psychological Distress Indicators	**Without Disability**	**Overall**	**Activity Limitation & Assistive Device Use**	**Activity Limitation Only**	**Assistive Device Use Only**	**Without Disability**	**Overall**	**Activity Limitation & Assistive Device Use**	**Activity Limitation Only**	**Assistive Device Use Only**
K6 total score	2.84 (0.02)	5.67 (0.05)	6.62 (0.11)	5.51 (0.06)	3.90 (0.12)	2.93 (0.02)	5.30 (0.05)	5.89 (0.10)	5.24 (0.06)	4.17 (0.14)
Feel nervous?	0.79 (0.01)	1.23 (0.01)	1.30 (0.02)	1.24 (0.01)	0.95 (0.00)	0.80 (0.01)	1.19 (0.01)	1.22 (0.02)	1.20 (0.01)	1.04 (0.03)
Feel hopeless?	0.27 (0.00)	0.69 (0.01)	0.83 (0.02)	0.67 (0.01)	0.45 (0.03)	0.29 (0.00)	0.62 (0.01)	0.69 (0.02)	0.62 (0.01)	0.47 (0.03)
Feel restless or fidgety?	0.80 (0.01)	1.27 (0.01)	1.38 (0.03)	1.28 (0.01)	0.91 (0.03)	0.80 (0.01)	1.25 (0.01)	1.33 (0.02)	1.25 (0.01)	1.05 (0.03)
Feel so depressed that nothing could cheer you up?	0.20 (0.00)	0.60 (0.01)	0.73 (0.02)	0.57 (0.01)	0.37 (0.02)	0.22 (0.00)	0.52 (0.01)	0.57 (0.02)	0.52 (0.01)	0.36 (0.03)
Feel that everything was an effort?	0.61 (0.01)	1.28 (0.01)	1.59 (0.03)	1.20 (0.01)	0.87 (0.03)	0.62 (0.01)	1.22 (0.01)	1.46 (0.03)	1.17 (0.02)	0.93 (0.04)
Feel worthless?	0.17 (0.00)	0.60 (0.01)	0.80 (0.03)	0.55 (0.01)	0.35 (0.02)	0.20 (0.00)	0.50 (0.01)	0.62 (0.02)	0.49 (0.01)	0.33 (0.03)
Number of days in the past 30 days mental health problems interfered with work or usual activities, mean	0.29 (0.01)	2.99 (0.08)	4.10 (0.21)	2.79 (0.09)	0.99 (0.11)	0.48 (0.01)	2.24 (0.07)	2.68 (0.18)	2.25 (0.08)	0.92 (0.12)

Source. Behavioral Risk Factor Surveillance System, 2007.

SEM = standard error of mean.

[a]Adjusted for age, sex, race/ethnicity, educational attainment, marital status, and employment status.

[b]$p < .001$ for all comparisons between adults with disabilities (regardless of status) and those without disabilities.

TABLE 2

Adjusted[a] Distribution of Population Characteristics Among U.S. Adults Aged 18 Years or Older With Disability by Severity of Psychological Distress (None, Moderate, or Serious) Assessed With Kessler 6 (K6) Scores

	Severity of Psychological Distress					
	None (K6 score = 0–7)		Mild to Moderate (K6 score = 8–12)		Serious (K6 score = ≥13)	
Characteristic	**n**	**Weighted % (95% CI)**	**n**	**Weighted % (95% CI)**	**n**	**Weighted % (95% CI)**
All	38,533	71.2 [70.3, 72.0]	8,139	16.5 [15.8, 17.2]	5,784	12.3 [11.7, 13.0]
Sex						
Men	13,851	72.2 [70.9, 73.6]	2,609	15.7 [14.5, 16.8]	1,884	12.1 [11.0, 13.2]
Women	24,682	70.4 [69.4, 71.4]	5,530	17.1 [16.3, 18.0]	3,900	12.5 [11.7, 13.3]
Age, years						
18–24	446	66.4 [61.0, 71.8]	166	21.6 [16.5, 26.6]	138	12.0 [8.4, 15.6]
25–34	1,287	55.9 [52.1, 59.8]	485	25.6 [21.9, 29.3]	390	18.5 [15.3, 21.7]
35–44	3,222	63.2 [60.6, 65.7]	1,024	18.6 [16.6, 20.5]	897	18.3 [15.9, 20.6]
45–54	6,565	67.4 [65.7, 69.2]	1,898	17.2 [15.7, 18.7]	1,671	15.3 [13.9, 16.8]
55–64	9,576	73.5 [72.0, 75.1]	2,007	15.7 [14.3, 17.1]	1,516	10.8 [9.7, 11.9]
65–74	8,054	80.3 [78.5, 82.2]	1,219	12.7 [11.3, 14.1]	585	7.0 [5.4, 8.5]
≥75	8,984	83.4 [81.8, 85.0]	1,249	11.3 [9.9, 12.7]	507	5.3 [4.4, 6.2]
Race/ethnicity						
White, non-Hispanic	31,650	72.5 [71.6, 73.4]	5,949	15.7 [15.0, 16.5]	4,030	11.8 [11.1, 12.4]
Black, non-Hispanic	2,534	71.3 [68.4, 74.2]	795	16.6 [14.5, 18.8]	577	12.1 [9.5, 14.6]
Hispanic	1,824	66.2 [62.8, 69.5]	663	18.8 [15.9, 21.7]	646	15.0 [12.6, 17.4]
Other, non-Hispanic[b]	2,134	66.3 [62.8, 69.8]	620	20.5 [17.3, 23.8]	462	13.1 [10.8, 15.4]
Education						
< High school	4,208	59.9 [57.5, 62.3]	1,556	21.8 [19.6, 24.0]	1,489	18.3 [16.5, 20.2]
High school or Graduate Equivalency Diploma	11,874	69.8 [68.5, 71.2]	2,872	17.1 [16.0, 18.2]	2,096	13.1 [12.0, 14.2]
Some college or technical school	10,766	73.1 [71.7, 74.6]	2,155	15.8 [14.5, 17.0]	1,450	11.1 [10.0, 12.1]
College graduate	11,622	77.8 [76.1, 79.5]	1,543	13.9 [12.5, 15.2]	733	8.3 [6.7, 9.9]
Employment status						
Employed	12,880	80.7 [79.4, 82.1]	2,022	13.0 [11.9, 14.2]	987	6.2 [5.4, 7.1]
Unemployed	1,304	60.4 [56.7, 64.1]	565	21.5 [18.4, 24.6]	539	18.0 [15.2, 20.9]
Retired	15,631	75.5 [73.6, 77.4]	2,090	15.0 [13.4, 16.5]	922	9.5 [8.1, 11.0]
Unable to work	5,444	54.1 [52.1, 56.1]	2,740	23.3 [21.6, 25.1]	2,903	22.6 [20.6, 24.5]
Homemaker/Student	3,173	72.9 [70.0, 75.8]	701	16.4 [13.9, 19.0]	421	10.7 [8.5, 12.8]
Marital status						
Married	18,886	74.1 [73.0, 75.3]	3,255	15.2 [14.3, 16.2]	1,985	10.6 [9.8, 11.5]
Previously married	15,385	67.3 [65.8, 68.8]	3,580	18.3 [17.0, 19.6]	2,782	14.5 [13.3, 15.6]
Never married	3,494	69.4 [66.8, 72.0]	1,092	17.3 [15.3, 19.4]	857	13.3 [11.2, 15.4]
Unmarried couple	656	66.0 [60.8, 71.1]	194	19.2 [13.5, 25.0]	144	14.8 [10.4, 19.2]

Source. Behavioral Risk Factor Surveillance System, 2007.

Note. *n*, unweighted sample size; 95% confidence interval.

[a]Adjusted for age, sex, race/ethnicity, educational attainment, marital status, and employment status.

[b]Other includes Asian, Native Hawaiian or Pacific Islander; American Indian/Alaska Native; multiracial; and other race.

TABLE 3

Unadjusted Prevalence (%) and Adjusted[a] Prevalence (%) and Prevalence Ratios (APRs) of Health-Risk Behaviors and Obesity Among U.S. Adults Aged 18 Years or Older With Disability, by Severity of Psychological Distress

	Severity of Psychological Distress		
Health-Risk Behaviors	**None (K6 Score = 0–7)**	**Mild to Moderate (K6 Score = 8–12)**	**Serious (K6 Score = ≥13)**
<5 Fruit or vegetable servings per day			
% (95% CI)	74.2 [73.3, 75.1]	77.9 [75.8, 79.9]**	80.9 [78.7, 83.0]***
Adjusted prevalence, % (95% CI)	74.8 [73.8, 75.7]	76.9 [74.8, 79.0]	78.7 [76.2, 81.2]**
APR (95% CI)	1.00	1.03 [1.00, 1.06]	1.05 [1.02, 1.09]
Physically inactive			
% (95% CI)	33.6 [32.7, 34.5]	46.1 [43.8, 48.5]***	52.2 [49.3, 55.1]***
Adjusted prevalence, % (95% CI)	34.9 [33.9, 35.9]	43.8 [41.6, 46.0]***	46.2 [43.2, 49.1]***
APR (95% CI)	1.00	1.25 [1.18, 1.33]	1.32 [1.23, 1.42]
Current smoker			
% (95% CI)	19.1 [18.3, 19.9]	35.1 [32.9, 37.4]***	43.9 [41.2, 46.7]***
Adjusted prevalence, % (95% CI)	21.6 [20.7, 22.5]	29.2 [27.4, 31.1]***	32.3 [30.1, 34.5]***
APR (95% CI)	1.00	1.35 [1.26, 1.46]	1.50 [1.38, 1.62]
Binge drinker			
% (95% CI)	10.4 [9.6, 11.2]	12.2 [10.5, 14.0]	15.1 [13.0, 17.4]***
Adjusted prevalence, % (95% CI)	10.7 [9.7, 11.2]	11.1 [9.6, 12.7]	14.4 [12.2, 16.6]***
APR (95% CI)	1.00	1.07 [0.92, 1.24]	1.38 [1.16, 1.63]
Heavy drinker			
% (95% CI)	4.4 [4.0, 4.9]	4.7 [3.8, 5.7]	6.0 [4.9, 7.5]*
Adjusted prevalence, % (95% CI)	4.3 [3.8, 4.8]	4.5 [3.6, 5.5]	6.5 [5.0, 8.0]**
APR (95% CI)	1.00	1.06 [0.84, 1.34]	1.52 [1.17, 1.96]
Obese (BMI ≥ 30 kg/m^2)			
% (95% CI)	35.3 [34.3, 36.2]	38.3 [36.0, 40.6]***	41.2 [38.4, 44.1]*
Adjusted prevalence, % (95% CI)	36.4 [35.3, 37.4]	37.0 [34.7, 39.2]	37.5 [34.7, 40.2]
APR (95% CI)	1.00	1.02 [0.95, 1.09]	1.03 [0.95, 1.12]

Source. Behavioral Risk Factor Surveillance System, 2007.

95% CI = 95% confidence interval; APR = adjusted prevalence ratio; BMI = body mass index.

[a]Adjusted for age, sex, race/ethnicity, education, marital status, and employment status.

*$p < .05$.

**$p < 0.01$.

***$p < .001$ for comparisons with no psychological distress (K6 score = 0–7).

TABLE 4

Unadjusted Prevalence (%) and Adjusted[a] Prevalence (%) and Prevalence Ratios (APRs) of Fair or Poor Health Status, Dissatisfaction With Life, Perceived Inadequate Social Support, and Impaired Functioning Due to Mental Health Problem Among U.S. Adults Aged 18 Years or Older With Disability, by Severity of Psychological Distress

	Severity of Psychological Distress		
	None (K6 Score = 0–7)	**Mild to Moderate (K6 Score = 8–12)**	**Serious (K6 Score = ≥13)**
Fair or poor health status			
% (95% CI)	35.2 [34.3, 36.1]	58.7 [56.3, 60.9] *	71.8 [69.2, 74.2] *
Adjusted prevalence, % (95% CI)	37.6 [36.6, 38.6]	55.5 [53.4, 57.7] *	63.9 [61.1, 66.7] *
APR (95% CI)	1.00	1.48 [1.41–1.54]	1.70 [1.61, 1.79]
Dissatisfaction with life			
% (95% CI)	4.7 [4.3, 5.2]	24.5 [22.5, 26.5] *	54.7 [51.8, 57.6] *
Adjusted prevalence, % (95% CI)	5.0 [4.5, 5.5]	22.9 [21.0, 24.9] *	49.7 [46.6, 52.7] *
APR (95% CI)	1.00	4.62 [4.04, 5.29]	10.00 [8.85, 11.29]
Perceived inadequate social support			
% (95% CI)	7.0 [6.5, 7.5]	18.9 [17.1, 21.0] *	34.8 [31.8, 37.8] *
Adjusted prevalence, % (95% CI)	7.2 [6.6, 7.8]	17.8 [16.0, 19.7] *	31.0 [28.0, 33.9] *
APR (95% CI)	1.00	2.48 [2.16, 2.84]	4.31 [3.77, 4.92]
≥14 Days in the past 30 days mental health problem interfered with work or usual activities			
% (95% CI)	1.4 [1.2, 1.7]	15.7 [14.0, 17.3] *	53.1 [50.2, 56.1] *
Adjusted prevalence, % (95% CI)	1.7 [1.4, 2.0]	12.8 [11.5, 14.2] *	41.1 [38.2, 43.9] *
APR (95% CI)	1.00	7.61 [6.16, 9.40]	24.34 [19.97, 29.66]

Source. Behavioral Risk Factor Surveillance System, 2007.

95% CI = 95% confidence interval; APR = adjusted prevalence ratio.

[a]Adjusted for age, sex, race/ethnicity, education, marital status, and employment status.

*$p < .001$ for comparisons with no psychological distress (K6 score = 0–7).