Undertreatment of Mental Health Problems in Adults With Diagnosed Diabetes and Serious Psychological Distress

The Behavioral Risk Factor Surveillance System, 2007

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OBJECTIVE — To assess the prevalence and correlates of undertreatment for mental health problems among adults with diabetes and serious psychological distress (SPD).

RESEARCH DESIGN AND METHODS — We analyzed data of adults aged ≥18 years from the 2007 Behavioral Risk Factor Surveillance System. SPD was assessed with the Kessler-6 scale.

RESULTS — The prevalence of untreated SPD was estimated to be 2.1 ± 0.1% (mean ± SE), 3.4 ± 0.3%, and 2.0 ± 0.1% in the total population, diabetic population, and nondiabetic population, respectively. Among people with SPD, those with diagnosed diabetes had a lower rate of undertreatment for mental health problems (45.0%) than those without diabetes (54.9%) ($P = 0.002$). Nonwhite race/ethnicity, advanced age, lack of health insurance, and currently being employed were associated with increased likelihood of undertreatment for mental health problems ($P < 0.05$).

CONCLUSIONS — People with diagnosed diabetes may be screened for SPD and treated for specific mental health problems in routine health care.

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People with diagnosed diabetes are about twice as likely as people without the condition to have depression, anxiety, and serious psychological distress (SPD) (1–3). According to the National Comorbidity Survey (4), ~24.3% of people with a serious mental illness received any treatment during 1990 and 1992, and the rate of treatment increased to 40.5% during 2002–2003 in the general population. However, the extent of undertreatment for mental health problems among people with diagnosed diabetes and SPD remains unknown. We sought to estimate the prevalence and correlates of undertreatment for mental health problems among people with diagnosed diabetes and SPD using data from the 2007 Behavioral Risk Factor Surveillance System.

RESEARCH DESIGN AND METHODS

— The Behavioral Risk Factor Surveillance System data were obtained from an independent household probability sample drawn from the noninstitutionalized U.S. adult population (aged ≥18 years) to assess the prevalence of key behavioral risk factors and chronic disease conditions in all U.S. states and territories annually (5,6). The Kessler-6 (K6) scale, a six-item measure for nonspecific psychological distress (7), correlates highly with the World Health Organization Comprehensive International Diagnostic Interview–Short Form ($r = 0.65$) and Disability Assessment Schedule ($r = 0.67$) for anxiety and mood disorders. The K6 scale has demonstrated an excellent internal consistency reliability (Cronbach's $\alpha = 0.89$) (7). People with a total score of the K6 scale ≥13 were considered to have SPD. A participant's treatment status for mental health problems was ascertained by a positive answer to the question, "Are you now taking medicine or receiving treatment from a doctor or other health professional for any type of mental health condition or emotional problem?"

Participants' diabetes status was determined by self-report. We examined the following variables as potential correlates: demographic and socioeconomic characteristics (sex, race/ethnicity, age, education, and employment status), health insurance, diabetes type (type 1, type 2 with use of insulin, and type 2 without use of insulin), diabetes duration, cardiovascular risk factors (obesity, high blood pressure, high cholesterol, current smoking, and no leisure-time physical activity), microvascular complications (foot sores and retinopathy), and macrovascular complications (myocardial infarction, angina or coronary heart disease, and stroke).

We estimated the crude prevalences of undertreatment for mental health problems and the prevalence ratios (PRs) and 95% CIs of each correlate using log-linear models with a robust error variance estimator (8). We considered results to be statistically significant if $P \leq 0.05$. All of the analyses were conducted with the use of SAS (Version 9.1; SAS, Cary, NC) and SUDAAN software (Release 9.0; RTI International, Research Triangle Park, NC) to account for the complex sampling design.

RESULTS

— Of the total participants ($n = 202,922$), we estimated that the population prevalence of diagnosed diabetes ($n = 21,766$) was 8.3 ± 0.1% (per-

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Table 1—*Prevalence and prevalence ratios of receiving no treatment for mental health problems among adults aged ≥20 years with diagnosed diabetes and SPD in the U.S.: 2007 Behavioral Risk Factor Surveillance System*

	Prevalence of untreated SPD in adults with diagnosed diabetes										Prevalence of receiving no treatment for mental health problems in adults with both diagnosed diabetes and SPD									
	Unadjusted prevalence				Unadjusted prevalence ratio*			Adjusted prevalence ratio†			Unadjusted prevalence				Unadjusted prevalence ratio			Adjusted prevalence ratio		
	n	%	SE	*P*	PR	95% CI		PR	95% CI		*n*	%	SE	*P*	PR	95% CI		PR	95% CI	
All	21,766	3.4	0.3								1,598	45.0	2.7							
Sex																				
Male	8,547	2.8	0.4	Ref.	1.0	Ref.		1.0	Ref.		508	44.0	4.1	Ref.	1.0	Ref.		1.0	Ref.	
Female	13,219	3.9	0.5	0.08	1.4	1.0	2.0	0.9	0.9	1.0	1,090	45.7	3.5	0.75	1.0	0.8	1.3	1.0	0.8	1.2
Race/ethnicity																				
Non-Hispanic white	15,386	2.0	0.2	Ref.	1.0	Ref.		1.0	Ref.		976	32.7	2.5	Ref.	1.0	Ref.		1.0	Ref.	
Non-Hispanic black	2,571	5.1	1.1	<0.01	2.6	1.7	4.1	1.1	1.0	1.1	215	54.3	6.7	<0.01	1.7	1.3	2.2	1.4	1.0	1.9
Hispanic	2,055	7.7	1.4	<0.01	3.9	2.6	5.9	1.1	1.1	1.1	262	65.3	5.4	<0.01	2.0	1.6	2.5	1.6	1.2	2.0
Other	1,475	3.1	1.0	0.24	1.6	0.9	3.0	1.1	1.0	1.1	128	39.3	9.2	0.49	1.2	0.7	2.0	1.6	1.1	2.4
Age (years)																				
18–44	1,853	4.0	0.8	Ref.	1.0	Ref.		1.0	Ref.		216	42.1	5.9	Ref.	1.0	Ref.		1.0	Ref.	
45–64	9,699	3.9	0.5	0.87	1.0	0.6	1.5	1.0	0.9	1.1	965	40.6	3.3	0.80	1.0	0.7	1.3	1.0	0.7	1.3
≥65	10,106	2.6	0.5	0.11	0.6	0.4	1.1	1.1	1.0	1.2	411	60.8	5.5	0.02	1.4	1.0	2.0	1.5	1.1	2.2
Education level																				
Less than high school	3,672	9.2	1.4	<0.01	6.1	3.6	10.6	1.0	1.0	1.1	503	58.9	4.7	0.04	1.4	1.0	2.0	1.2	0.8	1.7
High school	7,453	2.4	0.3	0.07	1.6	0.9	2.7	1.0	0.9	1.1	569	34.8	3.7	0.38	0.8	0.6	1.2	0.9	0.6	1.3
Some college	5,660	2.4	0.4	0.10	1.6	0.9	2.9	1.0	0.9	1.1	353	36.8	5.0	0.57	0.9	0.6	1.4	0.7	0.5	1.1
College graduate or higher	4,940	1.5	0.4	Ref.	1.0	Ref.		1.0	Ref.		168	41.8	7.1	Ref.	1.0	Ref.		1.0	Ref.	
Employment																				
Employed	6,769	1.5	0.3	Ref.	1.0	Ref.		1.0	Ref.		229	56.1	6.3	Ref.	1.0	Ref.		1.0	Ref.	
Not employed‡	5,841	8.1	1.0	<0.01	5.4	3.3	8.7	0.8	0.8	0.9	1,045	41.1	3.5	0.04	0.7	0.6	1.0	0.6	0.5	0.8
Retired	9,108	1.7	0.2	0.59	1.1	0.7	1.9	0.9	0.9	1.0	320	52.0	4.5	0.59	0.9	0.7	1.2	0.6	0.5	0.9
Health insurance coverage																				
Yes	19,844	2.6	0.3	Ref.	1.0	Ref.		1.0	Ref.		1,342	39.3	2.9	Ref.	1.0	Ref.		1.0	Ref.	
No	1,882	8.8	1.5	<0.01	3.3	2.3	5.0	1.1	1.0	1.1	255	64.0	5.5	<0.01	1.6	1.3	2.0	1.5	1.2	1.9
Type of diabetes																				
Type 1	713	4.2	1.9	0.84	0.9	0.3	2.6	1.0	0.9	1.1	74	37.4	12.4	0.84	0.9	0.4	2.0	1.0	0.6	1.7
Type 2, no use of insulin	3,358	4.6	1.3	Ref.	1.0	Ref.		1.0	Ref.		313	40.4	7.8	Ref.	1.0	Ref.		1.0	Ref.	
Type 2, use of insulin	11,534	2.7	0.4	0.16	0.6	0.3	1.1	1.0	1.0	1.1	697	47.0	4.1	0.45	1.2	0.8	1.8	1.2	0.9	1.5
Duration of diabetes (years)																				
<5	5,464	3.0	0.5	Ref.	1.0	Ref.		1.0	Ref.		391	46.1	5.0	Ref.	1.0	Ref.		1.0	Ref.	
5–9	3,536	2.0	0.6	0.19	0.7	0.4	1.3	1.0	0.9	1.0	212	34.5	7.1	0.18	0.8	0.5	1.2	0.6	0.4	0.8
10–14	2,461	3.1	1.5	0.97	1.0	0.4	2.8	1.0	0.9	1.1	164	45.3	13.1	0.96	1.0	0.5	1.8	0.7	0.5	1.0
≥15	4,106	4.4	0.9	0.20	1.4	0.9	2.4	1.0	0.9	1.1	315	46.7	6.3	0.94	1.0	0.7	1.4	1.0	0.8	1.3
Cardiovascular risk factors§																				
≤1	4,952	1.4	0.3	Ref.	1.0	Ref.		1.0	Ref.		171	42.8	6.9	Ref.	1.0	Ref.		1.0	Ref.	
2	6,769	3.7	0.7	<0.01	2.6	1.5	4.7	1.0	0.9	1.1	372	59.6	5.4	0.06	0.8	0.5	1.2	1.4	0.9	2.0
3	6,516	3.2	0.5	<0.01	2.3	1.3	4.0	0.9	0.9	1.0	521	40.2	4.7	0.76	1.0	0.5	1.8	1.0	0.7	1.4
≥4	3,529	6.2	0.8	<0.01	4.4	2.6	7.4	0.9	0.9	0.9	534	38.2	3.9	0.56	1.0	0.7	1.4	1.1	0.7	1.6

(continued)

Table 1—*Continued*

	Prevalence of untreated SPD in adults with diagnosed diabetes									Prevalence of receiving no treatment for mental health problems in adults with both diagnosed diabetes and SPD								
	Unadjusted prevalence				Unadjusted prevalence ratio*			Adjusted prevalence ratio†			Unadjusted prevalence				Unadjusted prevalence ratio			Adjusted prevalence ratio		
	n	%	SE	*P*	PR	95% CI		PR	95% CI		*n*	%	SE	*P*	PR	95% CI		PR	95% CI	
Microvascular complications‖																				
0	11,722	2.6	0.4	Ref.	1.0	Ref.		1.0	Ref.		591	49.8	4.9	Ref.	1.0	Ref.		1.0	Ref.	
1	3,684	3.8	0.9	0.21	1.5	0.8	2.6	1.0	0.9	1.0	377	34.6	6.0	0.05	0.7	0.5	1.0	0.6	0.5	0.8
2	674	8.7	2.0	<0.01	3.4	1.9	5.9	1.0	0.9	1.1	144	46.2	6.9	0.68	0.9	0.7	1.3	1.0	0.8	1.4
Macrovascular complications¶																				
0	15,677	2.5	0.3	Ref.	1.0	Ref.		1.0	Ref.		923	43.1	3.2	Ref.	1.0	Ref.		1.0	Ref.	
1	3,723	6.3	1.3	<0.01	2.5	1.6	3.9	1.0	0.9	1.0	389	51.3	6.2	0.24	1.2	0.9	1.6	1.1	0.9	1.4
≥2	2,360	4.7	0.7	<0.01	1.9	1.3	2.7	1.0	0.9	1.0	284	41.3	4.8	0.75	1.0	0.7	1.3	0.9	0.7	1.2

*Unadjusted PR and 95% CI were estimated from univariate analyses. †Adjusted PR and 95% CI were estimated from multiple-variable analyses adjusting for all variables listed. ‡People who were not employed include those out of work, homemakers, students, and those unable to work. §Cardiovascular risk factors include obesity, high blood pressure, high cholesterol, current smoking, and no leisure-time physical activity. ‖Microvascular complications include foot ulcers and retinopathy. ¶Macrovascular complications include myocardial infarction, angina, and stroke. PR, prevalence ratio; Ref., referent.

cent ± SE) in U.S adults in 2007. The population prevalences of total SPD and untreated SPD were estimated to be 3.9 ± 0.1 and 2.1 ± 0.1%, 7.6 ± 0.4 and 3.4 ± 0.3%, and 3.6 ± 0.1 and 2.0 ± 0.1% in the total population, among people with diabetes, and among people without diabetes, respectively. Among people with SPD (n = 8,235), 53.4 ± 1.2% were estimated to receive no treatment for mental health problems. Among people with both diagnosed diabetes and SPD (n = 1,598), the prevalence of receiving no treatment for mental health problems was 45.0 ± 2.7%, which was lower than the prevalence among people with SPD but without diabetes (54.9 ± 1.4%) (P = 0.002).

The prevalence and prevalence ratio of untreated SPD among people with diabetes and the prevalence and prevalence ratio of undertreatment for mental health problems among people with both diabetes and SPD yielded similar patterns in the association between the outcome variables and the correlates (Table 1). Non-Hispanic blacks, Hispanics, and other racial/ethnic adults were more likely to receive no treatment for mental health problems than non-Hispanic whites (P < 0.01). In addition, people aged ≥65 years were more likely to receive no treatment than people aged 18–44 years (all P < 0.05). Moreover, people without health insurance coverage had a higher likelihood of receiving no treatment than individuals having health insurance coverage (P < 0.01). In contrast, people who were not currently employed or retired were less likely to receive no treatment than people who were currently employed (P < 0.05).

CONCLUSIONS — Our results indicated that among U.S. adults with diagnosed diabetes and SPD (~1.4 million), about 45% (~0.6 million) received no treatment for any mental health problems. The prevalence of undertreatment was more pronounced among non-Hispanic blacks, Hispanics, people aged ≥65 years, and people without health insurance coverage. The high prevalence of undertreatment may largely be due to the lack of recognition of mental health problems, as shown in our previous study, where ~45% of diabetic patients with depression were undiagnosed (9).

The correlates of undertreatment of mental health problems are not fully understood. According to the National Comorbidity Survey (10), lack of perceived need, situational barriers, financial barriers, perceived lack of effectiveness, thinking the problem would get better by itself, and wanting to solve the problem on one's own are the major reasons for failing to seek treatment for serious mental illness. Similarly, our results that people without health insurance had a higher prevalence of undertreatment than those having coverage underscores the role of insufficient health care access in the treatment of mental health problems. In addition, the high prevalence of undertreatment among non-Hispanic blacks and Hispanics with diabetes may suggest racial/ethnic disparities in medical care services.

Our results are subject to two limitations. First, because physician-diagnosed diabetes and treatment for mental health problems were ascertained by participants' self-report, information bias may be possible. Second, the Behavioral Risk Factor Surveillance System survey excludes institutionalized adults and people with no landline telephones. Thus, our estimated prevalence of undertreatment may be underestimated.

In conclusion, our results demonstrated that a large number of adults with diagnosed diabetes and SPD received no treatment for any mental health problems. People with diagnosed diabetes may be screened for SPD and treated for specific mental health problems in routine health care. Special attention may be needed in the minority population, elderly people, and people without health insurance.

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