

BURDEN OF ILLNESS OF DEPRESSION SYMPTOMS AMONG PATIENTS WITH TYPE 2 DIABETES MELLITUS

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INTRODUCTION

- Prevalence of depression is higher among patients with type 2 diabetes mellitus (T2DM) than the general population. A recent study estimated that 22% of patients with diabetes also experience depression symptoms¹.
- Depression is unrecognized and untreated in the majority of patients with T2DM and depression².
- Depression symptoms in patients with T2DM are associated with poorer diet, exercise, glucose monitoring, and medication adherence³, which result in worse clinical outcomes⁴.

OBJECTIVE

- The purpose of this analysis was to quantify the additive burden associated with experiencing depression symptoms in patients with type 2 diabetes mellitus (T2DM) on healthcare resource utilization, lost work productivity, and health related quality of life (HRQOL).

METHODS

Study Design

- Data were obtained from the 2008 U.S. National Health and Wellness Survey (NHWS), an annual cross-sectional study of the disease status, healthcare attitudes, behaviors, and outcomes of a nationwide sample of adults (aged 18+).
- Data were collected through self-administered, Internet-based questionnaires.
- The study sample included only respondents who were diagnosed with T2DM.

Study Measures

Depression Symptoms

- Respondents were asked if they experienced the following symptoms in the past month:
 - Bothered by feeling down, depressed or hopeless
 - Bothered by having little interest or pleasure in doing things.
- Respondents who experienced one or both symptoms were classified as experiencing depression symptoms, and respondents who did not experience either were classified as not experiencing depression symptoms.

Demographics and Comorbidity

- Demographics included gender, age, and race.
- Comorbidity was assessed using the Charlson Comorbidity Index⁴ (CCI).

Outcomes

- Healthcare resource utilization was assessed for the past six months and included emergency room use, hospitalization, and number of visits to all medical providers.
- The Work Productivity and Activity Impairment (WPAI)⁵ questionnaire was used to assess absenteeism (work time missed), presenteeism (impairment at work), and work productivity loss (overall work impairment) for full-time employees and activity impairment for all respondents.
- The SF-12v2⁶ was used to assess HRQOL.

Statistical Analysis

- Diabetes patients with and without depressive symptoms were compared on demographics, comorbidity, and outcomes using chi-square for categorical variables and ANOVA for continuous variables.
- The independent effects of depression symptoms on outcomes among patients with T2DM were assessed using linear and logistic regression analyses to adjust for gender, age, race, and CCI.

RESULTS

Sample Characteristics

- Among 7,122 patients with T2DM, 2,712 (38.1%) experienced depression symptoms and 4,410 (61.9%) did not experience depression symptoms. Among those employed full-time, 625 experienced depression symptoms and 1,135 did not experience depression symptoms.
- Patients with T2DM experiencing depression symptoms were more likely to be female, younger, non-white, and experienced greater comorbidity compared with those who did not experience depression symptoms.

Table 1: Sample Characteristics

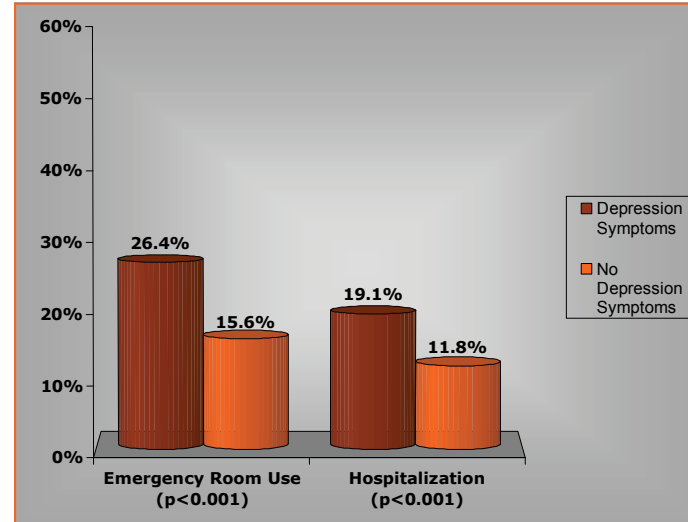
	PATIENTS WITH T2DM		p-VALUE
	DEPRESSION SYMPTOMS (n=2,712)	NO DEPRESSION SYMPTOMS (n=4,410)	
% Female	48.2%	39.7%	<0.001
Age – Mean (SD)	55.0 (12.4)	60.3 (12.1)	<0.001
% Non-white	24.2%	19.6%	<0.001
CCI – Mean (SD)	2.3 (1.9)	2.0 (1.5)	<0.001

RESULTS (continued)

Healthcare Resource Utilization

- Among patients with T2DM, those experiencing depression symptoms had greater healthcare resource utilization than those without depression symptoms.
- Adjusting for demographics and comorbidity, T2DM patients with depression symptoms were 1.7 (p<0.001) times as likely to visit the emergency room, 1.6 (p<0.001) times as likely to be hospitalized, and had 2.2 (p<0.001) additional provider visits compared to T2DM patients without depression symptoms.

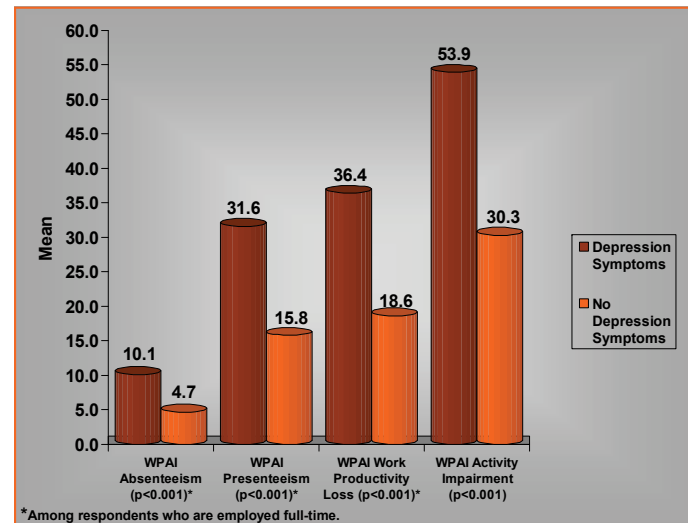
Figure 1: Unadjusted Effects of Depression Symptoms on Healthcare Resource Utilization in the Past Six Months



Work Productivity Loss and Activity Impairment

- Among patients with T2DM who were employed full-time, those with depression symptoms experienced substantial work impairment that was significantly greater than that experienced by those without depression symptoms.
- Adjusting for demographics and comorbidity, depression symptoms were associated with 4.3% (p<0.001) greater missed work time, 15.2% (p<0.001) greater lost productivity while working, and 13.4% (p<0.001) greater overall work impairment.
- Patients experiencing depression symptoms also experienced significant impairment in their daily activities. Adjusting for demographics and comorbidity, patients with depression symptoms also experienced 21.4% (p<0.001) greater impairment in daily activities when compared to T2DM patients without depression symptoms.

Figure 2: Unadjusted Effects of Depression Symptoms on Work Productivity Loss and Activity Impairment



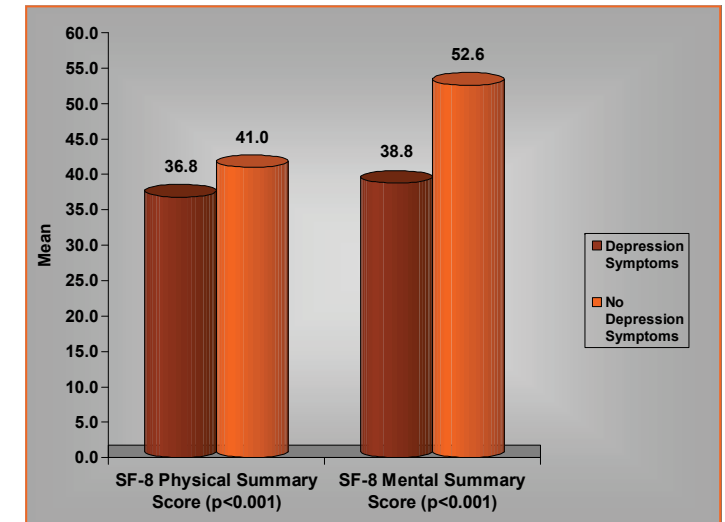
*Among respondents who are employed full-time.

RESULTS (continued)

Health-Related Quality of Life

- Patients with T2DM who experienced depression symptoms had average SF-12v2 physical and mental component summary scores that were not only significantly poorer than those without depression symptoms but notably lower than the normative means of 50 for the U.S. adult population.
- Adjusting for demographics and comorbidity, depression symptoms were associated with a decrease in SF-12v2 physical and mental summary scores of 4.0 (p<0.001) and 12.7 (p<0.001) points, respectively.

Figure 3: Unadjusted Effects of Depression Symptoms on HRQOL (SF-8)



DISCUSSION and CONCLUSION

- Among patients with T2DM, depression symptoms are associated with a significant burden on healthcare resource utilization, work productivity, and HRQOL.
 - The greater healthcare resource utilization corresponds to an increase in direct healthcare costs.
 - Assuming a 40 hour work week and a work year of 50 weeks, the 13.4% greater work productivity loss of T2DM patients with depression symptoms was associated with an additional 268 hours or 6.7 weeks of lost productivity per year per patient compared to patients with T2DM but no depression symptoms.
 - It has been suggested that a three point change in SF-36 score, and by extension in SF-12v2 score, is clinically meaningful⁷. The adjusted differences in SF-12v2 physical and mental component summary scores between T2DM patients with and without depression symptoms were not only statistically different but had meaningful clinical implications.
- Follow-up analyses of T2DM patient with both depression symptoms versus patients with neither demonstrated even greater burden of illness.
- Proper management of patients with both T2DM and comorbid depression may reduce humanistic and economic burden of disease.

REFERENCES

- Collins MM, Corcoran P, Perry JJ. Anxiety and depression symptoms in patients with diabetes. *Diabet Med* 2009;26(2):153-61.
- Katon WJ. The comorbidity of diabetes mellitus and depression. *Am J Med* 2008;121(11 Suppl 2):S8-15.
- Gonzalez JS, Safren SA, Delahanty LM, et al. Symptoms of depression prospectively predict poorer self-care in patients with Type 2 diabetes. *Diabetes* 2008;25(9):1102-7.
- Charlson ME, Pompei P, Ales KL, MacKenzie CR. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. *J Chronic Dis* 1987; 40:373-383.
- Reilly MC, et al. The validity and reproducibility of a work productivity and activity impairment instrument. *Pharmacoeconomics* 1993;4:353-65.
- Ware JE, et al. How to Score and Interpret Single-Item Health Status Measures: A Manual for Users of the SF-8TM Health Survey. Lincoln, RI: QualityMetric Incorporated, 2001.
- Samsa G, Edelman D, Rothman ML, et al. Determining clinically important differences in health status measures: a general approach with illustration to the Health Utilities Index Mark II. *Pharmacoeconomics* 1999; 15 (2): 141-55.

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