

# Depression may be both consequence of and risk factor for diabetes

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Diabetes appears to be associated with the risk of depression and vice versa, suggesting the relationship between the two works in both directions, according to a report in the November 22 issue of *Archives of Internal Medicine*.

An estimated 23.5 million U.S. adults—more than 10 percent—have [diabetes](#), including 23 percent of those ages 60 and older, according to background information in the article. Major depressive disorder affects about 14.8 million U.S. adults each year. "Although it has been hypothesized that the diabetes-depression relation is bidirectional, few studies have addressed this hypothesis in a prospective setting," the authors write.

An Pan, Ph.D., of the Harvard School of Public Health, Boston, and colleagues assessed the relationship between the two diseases among 65,381 women who were age 50 to 75 in 1996. Participants completed an initial questionnaire about their medical history and health practices, and then follow-up questionnaires every two years through 2006. They were classified as having [depression](#) if they reported symptoms of depression, using antidepressant medication or being given a diagnosis of depression by a physician. Women who reported a new diagnosis of diabetes completed a supplementary questionnaire about symptoms, diagnostic tests and treatments.

During the 10-year follow-up, 2,844 women were diagnosed with type 2 diabetes and 7,415 developed depression. Women with depression were

about 17 percent more likely to develop diabetes after controlling for other risk factors, such as physical activity and body mass index (BMI). Those who were taking antidepressants had a 25 percent higher risk of developing diabetes than those who did not have depression.

After controlling for other risk factors for mood disorders, women with diabetes were 29 percent more likely to develop depression. Women who took insulin for diabetes had a further increased risk—53 percent higher than women without diabetes.

"The findings from this well-characterized cohort of more than 55,000 U.S. women with 10 years' follow-up add to the growing evidence that depression and diabetes are closely related to each other, and this reciprocal association also depends on the severity or treatment of each condition," the authors write. "All the associations were independent of sociodemographic, diet and lifestyle factors."

The results indicate that lifestyle factors such as physical activity and BMI may partially mediate the association between depression and new cases of diabetes, but since the association remained significant after adjusting for these factors, depression may have an effect on risk for diabetes beyond weight and inactivity. In addition, the findings reinforce the idea that diabetes is related to stress, the authors note. "A diagnosis of diabetes may lead to the symptoms of depression for the following reasons: depression may result from the biochemical changes directly caused by diabetes or its treatment, or from the stresses and strains associated with living with diabetes and its often debilitating consequences," they write.

"Future studies are needed to confirm our findings in different populations and to investigate the potential mechanisms underlying this association," the authors conclude. "Furthermore, depression and diabetes are highly prevalent in the middle-aged and elderly population,

particularly in women. Thus, proper lifestyle interventions including adequate weight management and regular physical activity are recommended to lower the risk of both conditions."

**More information:** *Arch Intern Med.* 2010;170[21]:1884-1891.

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