Digital depression intervention may improve symptoms

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A mental health smartphone app developed by a team of Northwestern Medicine investigators helped improve depressive symptoms in patients in Brazil and Peru with diabetes and hypertension, according to a recent clinical trial published in *JAMA*.

The findings suggest that using such digital mental health interventions may help treat depressive symptoms more effectively than standard care alone, as well as address treatment gaps in low- and middle-income countries where mental health care is currently lacking.

"This is not just giving people an app, it is giving people tools for self-management and is also connecting people with a human inside the care system and that's important," said David Mohr, Ph.D., professor of Preventive Medicine in the Division of Behavioral Medicine, of Medical Social Sciences, of Psychiatry and Behavioral Sciences and a co-author of the study.

Depression is a leading contributor to disease burden globally, especially in low- and middle-income countries, and has been commonly associated with the development of diabetes and cardiovascular disease.

"Depression can increase a lot of unhealthy behaviors, such as increasing smoking, unhealthy eating, or decreasing physical activity, which can impact diabetes and cardiovascular disease. Depression affects immune and endocrine function in ways that can have adverse effects on disease processes, so there are potentially both direct as well as indirect pathways through behavior," said Mohr, who is also director of the Center for Behavioral Intervention Technologies and a member of the Robert H. Lurie Comprehensive Cancer Center of Northwestern University.

While the use of digital mental health interventions has increased over time, their effectiveness in reducing depressive symptoms in this patient population has remained understudied.

For the current clinical trial, the investigators provided a mental health smarphone app called CONEMO to patients with hypertension and diabetes in Sao Paulo, Brazil and Lima, Peru. The app was developed by a team led by Mohr in collaboration, with input from patients and nurses in Brazil and Peru. The app's design is based on the principles of behavioral activation, a common behavior therapy framework for treating depression. The app connected patients to a team of healthcare providers in their respective countries through the app's main dashboard. The app's platform is also multilingual, providing support to patients and management tools to nurses in both Spanish and Portuguese.

Patients were randomized to receive standard care or CONEMO via a provided smartphone for six weeks. In both countries, almost half of patients were between the ages of 41 and 60 years old and more than 85 percent were women. Additionally, 62 percent of patients in Brazil and 35 percent of

patients in Peru had fewer than nine years of education.

After three-month follow-up period, the investigators found that more patients in both countries who used CONEMO saw a 50 percent decrease in their PHQ-9 score and overall depressive symptoms from baseline, compared to patients who received standard care alone.

After six months, however, the difference between groups was not significant, prompting the investigators to extend the treatment and follow-up period after the app is delivered for future trials.

"Six weeks of treatment for depression is not long. For many people, depression is a chronic relapsing, remitting disorder, and they need a longer-term follow-up," Mohr said.

More information: Ricardo Araya et al, Effect of a Digital Intervention on Depressive Symptoms in Patients With Comorbid Hypertension or Diabetes in Brazil and Peru, *JAMA* (2021). DOI: 10.1001/jama.2021.4348

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