Medical Xpress

Mental disorder symptoms present in predictable ways, according to study

August 8 2024, by Mallory Locklear

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Mental disorders like depression and anxiety are characterized by a variety of different symptoms, and individuals receiving the same diagnosis may experience different combinations of those symptoms.

This way of defining mental disorders has been a subject of contentious debate, with some in the field concerned the symptom definitions are too broad.

A new Yale study finds that while there may be many possible combinations of symptoms that can lead to a particular diagnosis, most of these combinations are rarely, if ever, observed in the real world. The finding, say researchers, means broad criteria for mental disorders may not be negatively affecting diagnoses in practice but symptom combinations may need to be considered when conducting studies.

The study was published Aug. 7 in the journal *JAMA Psychiatry*.

The current approach to defining and diagnosing mental disorders originated in the third edition of the "Diagnostic and Statistical Manual of Mental Disorders (DSM)," published in 1980. The manual, currently in its fifth edition, remains one of the most commonly used classification systems for mental disorders.

"The core idea was to increase diagnosis reliability," said Tobias Spiller, co-lead author of the study and a postdoctoral fellow in the lab of Ilan Harpaz-Rotem, professor of psychiatry at Yale School of Medicine. "So, for example, if two patients with the same symptoms went to different doctors, they would end up with the same diagnosis, which wasn't always the case previously."

The result was a system wherein multiple symptoms were associated with a mental disorder and patients had to have certain symptoms or a certain number of possible symptoms to meet the criteria for a diagnosis.

"So while the approach resulted in more reliable diagnoses, it also means that people with vastly different symptoms can qualify for the same diagnosis," said Spiller.

Spiller and his colleagues suspected there might be patterns in symptom combinations that could be observed across all mental disorders.

"One theory in mental health is that there is some kind of latent quality that generates a disorder," said Or Duek, co-lead author of the study and an assistant professor of psychiatry at Yale School of Medicine.

In other words, disorders are not random. Among the list of symptoms for a particular disorder, some symptoms will be more common than others and certain symptoms will be more likely to occur together than others. Therefore, said the researchers, some symptom combinations should be more common and some should be rare.

To test this, the researchers first built a simulation for a fictitious mental disorder defined by five symptoms of which at least two of those symptoms had to be present to prompt a diagnosis. They then simulated 500 patients and calculated their symptom combinations, repeating this analysis 100 times.

They found that some of the symptom combinations—of which there were 32 possibilities—were highly prevalent while most were uncommon.

This pattern held true in real world data as well. In datasets for post-traumatic stress disorder (PTSD), major depressive disorder, schizophrenia, and generalized anxiety disorder, most symptom combinations occurred rarely and less than 10% of possible combinations were frequently observed.

For example, in the PTSD dataset, 99.8% of all of the possible symptom combinations were observed in less than 1% of individuals. Meanwhile, the most common 1% of combinations were reported by 46.2% of individuals.

"People have criticized the DSM for introducing so much heterogeneity, saying it doesn't make sense to include so many symptoms," said Spiller. "But here we show that while there are many different symptom combination possibilities, only a few are actually probable, and the heterogeneity is not a relevant issue."

But there could be implications for research, said the researchers.

"We need to be cautious when trying to generalize findings from a particular study," said Duek.

In primary care settings, clinicians may often see the "textbook" cases—or the patients with the most common symptom combinations. But specialized clinics may attract patients with the atypical combinations.

If researchers conduct a study in one of the more specialized settings, their findings may not generalize to the broader population, said Duek. It could also contribute to the reproducibility problem in psychological research, in which many findings from studies cannot be replicated in subsequent research.

While scientists should consider symptom variability when designing research, the overall finding from this study is that this variability is not chaotic—it has structure and predictability.

"It seems abstract, but this is really just a description for what clinicians have had gut feelings about," said Spiller. "It's a formalized framework for understanding the assumptions and problems clinicians are dealing with on a daily basis."

10.1001/jamapsychiatry.2024.2047

Provided by Yale University