More positive words in discharge summaries associated with reduced suicide risk

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Words in narrative hospital discharge notes may help to identify patients at high risk for suicide, according to an article published online by *JAMA Psychiatry*.

Suicide is the 10th leading cause of death in the United States (12.6 cases per 100,000) and one of the most dreaded outcomes of psychiatric illness. The challenge is in identifying patients at high risk for suicide. Because there is an elevated risk for suicide after hospital discharge, discharge from a hospital is a moment for increased intervention.

Roy H. Perlis, M.D., M.S., of the Massachusetts General Hospital, Boston, and coauthors examined whether computer-aided natural language processing of narrative hospital discharge notes could help identify patients at risk for death by suicide after medical or surgical discharge from the hospital.

They used a curated list of about 3,000 words conveying valence (i.e. emotion). Positive valence included terms such as glad, pleasant and lovely; negative valence included terms such as gloomy, unfortunate and sad.

Authors analyzed clinical data for patients from two large academic medical centers from 2005 through 2013, resulting in 845,417 hospital discharges in the study group for 458,053 unique individuals.

The overall rate of death from all causes was 18 percent during the nine

years of the study. For the whole study group, there were 235 (0.1 percent) deaths by suicide during the follow-up, according to the results.

Positive emotion reflected in the narrative notes was associated with a 30 percent decrease in risk for suicide in analytical models, the authors report.

Study limitations include potential misclassification, not examining the specific features of psychopathology, and having results based on patients at two academic centers so questions of generalizability arise.

"While the value of large data sets in health care has undoubtedly been the subject of substantial hyperbole, our results add to a growing body of work indicating the feasibility of leveraging such data sets with standard computational tools to make predictions that may be applied to stratify risk. … Automated tools to aid clinicians in evaluating these risks may assist in identifying high-risk individuals," the study concludes.

More information: Thomas H. McCoy et al. Improving Prediction of Suicide and Accidental Death After Discharge From General Hospitals With Natural Language Processing, *JAMA Psychiatry* (2016). DOI: 10.1001/jamapsychiatry.2016.2172

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