



RESEARCH BRIEF

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Text-mining of psychosocial information from patients' clinical notes improved prediction of readmission risk

Research article: Prediction of readmission in geriatric patients from clinical notes: retrospective text mining study. Published in *Journal of Medical Internet Research* in October 2021. Click [here](#) to view the published article online.

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KEY FINDINGS

1. Psychosocial information extracted from patients' clinical notes using text-mining improved prediction of readmission risk.
2. Combining psychosocial information captured by non-physicians and physicians improved prediction the most.
3. Improvements in predicting readmission risk were observed for all types of patients, with the highest improvements observed for geriatric patients.

IMPLICATIONS AND SIGNIFICANCE OF FINDINGS

1. Psychosocial information can be used to improve the traditional means of predicting readmission risk, allowing for the early identification of patients with a high risk of readmission.
2. Since psychosocial information can predict readmission risk, this would suggest that psychosocial interventions can help to reduce such risk, thus increasing the quality of care and decreasing unnecessary use of healthcare resources.
3. Limited healthcare resources can be given to those needing them the most.
4. Future research could perform a comprehensive assessment for patients to offer tailored care management to manage patients' psychosocial needs and observe if readmission decreases.
5. Alternatively, future research could use a quasi-experimental design to compare a prediction model with text-mined psychosocial factors to a prediction model without.

BACKGROUND

Hospital readmission of older adults aged 65 and above is a significant issue as it can be distressing and costly for patients and their caregivers. Readmission also takes up limited healthcare resources that can be better allocated elsewhere, increasing the financial burden on the health system. Risk factors for readmission in older adults are: a) sociodemographic factors such as older age, male, ethnicity, and poor living conditions; (b) health-related factors such as poor overall condition, comorbidity, functional disability, and recent hospital admissions; and (c) organisational factors such as prolonged length of stay in the hospital and the discharge destination. Recently, psychosocial factors have been identified as another possible risk.

Psychosocial factors can be broadly divided into three dimensions: (a) individual psychological well-being, (b) social structures, and (c) resources. An individual's mood, attitude, level of distress, and perceived control over their life all contribute to their individual well-being. Social structures refer to the environment that an individual lives in and the social support available to them. Resources refer to the types of resources an individual has at their disposal, such as financial resources or accessibility to healthcare services.

Previous research indicated that psychosocial factors such as depressive symptoms, lack of social support, and financial stress contributed to hospital readmission for specific patients, such as those with chronic kidney disease or heart failure. Hence, it is likely that psychosocial factors could have a significant impact on readmission for older adults.

FOCUS OF PROJECT

The objective was to use a text-mining approach to identify key psychosocial factors from clinical notes to predict readmission risk for older adults. To determine the effectiveness of including psychosocial factors as a predictor, these factors were added to the commonly used LACE (Length of stay, Acuity of the admission, Comorbidity of the patient, and Emergency department use) Index for Readmission. Findings contributed to improvements in predicting readmission risk and can potentially be used to improve quality of care and reduce unnecessary healthcare utilisation.

PARTICIPANTS

The sample consists of the electronic medical records of 9,393 patients (aged 68 years old on average) who had a total of 43,216 admissions among them in a 26-month period from January 1, 2017 to February 28, 2019 at Ng Teng Fong General Hospital.

STUDY DESIGN

This is a retrospective analysis of electronic medical records.

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