Flaks-Manov, Natalie 2020 Identification of patients at risk for 30-day readmission: clinical insight beyond big data prediction *International Journal of Integrated Care, 21(S1)* : A311, pp. 1-8, DOI: doi.org/10.5334/ijic.ICIC20401

CONFERENCE ABSTRACT

Identification of patients at risk for 30-day readmission: clinical insight beyond big data prediction

ICIC20 Virtual Conference – September 2020

Natalie Flaks-Manov[1,2]

1: Faculty of Social Welfare and Health Sciences, University of Haifa, Haifa, Israel

2: Clalit Research Institute, Clalit Health Services, Tel-Aviv

Introduction

Automated models based on electronic health records (EHR) predict high-risk readmission patients with moderate accuracy, however, clinicians alone do not have the ability to predict readmissions more effectively. The potential benefit of combining providers' and automated capabilities in readmission risk prediction has not been previously investigated. Therefore, this study evaluates an automated predictive model coupled with clinicians' assessments of whether such a combination leads to a more accurate prediction of high-risk patients. This study examines the potential contribution of personal and clinical factors collected during hospitalization and identified by clinicians, beyond the contribution of Preadmission Readmission Detection Model (PREADM).

Methods

This is a prospective multi-source study, based on self-reported surveys of hospital nurses and physicians and EHR data. The survey was administered between May 2016 and June 2017. The study population included patients 65 years or older hospitalized for more than one night at one of the 15 internal medicine wards at three general Clalit hospitals. Dependent variables included nurses' readmission risk (NRR) and physicians' readmission risk (PRR) scores. Four decision-tree algorithms were developed for nurses' and physicians' assessments when patients were stratified based on PREADM high and low-medium scores. The actual readmission rate (ARR) were extracted from Clalit's EHR data, in order to compare the NRRs and PRRs with the patient's actual outcome of readmission within 30 days.

Results

Our cohort included 371 patients with 694 hospital healthcare provider surveys (371 from nurses; 323 from physicians). The decision-trees of nurses identified 27% of all high PREADM score patients as low-medium risk patients and 22% of low-medium PREADM patients as high-risk patients (the accuracy was 0.75 and 0.80 respectively). The decision-trees of physicians identified 27% of high PREADM patients as low-medium risk patients (accuracy 0.73) and 9% of low-medium PREADM patients as high-risk patients (accuracy 0.76).

Discussion

Our findings show that combining the readmission predictive model based on the information before admission with the clinical insight during the admission improves the ability to predict high-risk readmission patients: the combination of PREADM and NRR improves the accuracy of readmission risk better than the combination of PREADM and PRR. This study also provides four different algorithms for the decision-making process for selecting high-risk patients based on nurses' and physicians' evaluations in addition to EHR data.

Conclusions

Our study demonstrates the benefit of combining clinicians' perspectives, especially nurses' assessments, with PREADM to produce a more effective decision-making algorithm.

Lessons learned

The combined decision- making algorithm can allow a better selection of patients and can provide direction for action among various segments of patients.

Limitations

We focused on internal medicine patients thus results may not be applicable to populations from other wards.

Suggestions for future research

Future research may explore the contribution of such tools to actual risk-reduction efforts.