

Association of Social Determinants of Health with Electronic Patient Portal Adoption

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What might the attendee be able to do after being in your session?

Attendees will be able to identify key social determinants of health and chronic disease diagnoses associated with electronic patient portal adoption among adult patients in the context of a large, urban non-integrated healthcare system in the U.S.

Description of the Problem or Gap

Recent studies suggest electronic patient portals have low adoption rates and indicate that disparities in portal use exist across patient diagnostic groups.¹ To improve equitable adoption, there is a need to better understand the impact of social determinants of health on patient portal adoption in order to identify patients who will benefit most from clinical or health system interventions to increase engagement with electronic patient portals.²

Methods: What did you do to address the problem or gap?

We conducted a cross-sectional study using data obtained from the Cedars-Sinai Health System's (CSHS) electronic health record (EHR) and patient portal logs (My CS-Link) between August 1, 2017 – July 31, 2019. Patients sampled were age 18 and over, had at least 2 outpatient visits during the study period, have a primary care provider documented in the EHR, and live in Los Angeles County. We estimated a multivariate logistic regression model (N=154,189) to examine associations between portal adoption (defined as having an activated My CS-Link account) and a sociodemographic index calculated using patients' zip codes³, healthcare utilization, and 23 comorbid conditions derived from validated ICD-10 code groupings.⁴ Missing data were handled using multiple imputation, and the model's performance was compared to a boosted decision tree machine learning model robust to missing data.

Results: What was the outcome(s) of what you did to address the problem or gap?

Patients less likely to have adopted the patient portal were older adults (age 55 years and over), male, non-White, Hispanic, widowed, insured by Medicare or Medicaid, unemployed, current smokers, living in lower socioeconomic status neighborhoods, had higher inpatient and emergency department utilization, and had fewer comorbidities. Adjusted odds ratios (OR) of adoption were lowest among patients with complicated hypertension (OR=0.648, 95% CI [0.593 – 0.709]), diabetes with chronic complications (OR=0.626, 95% CI [0.585 – 0.670]), hemiplegia or paraplegia (OR=0.494, 95% CI [0.411 – 0.594]), metastatic cancer (OR=0.462, 95% CI [0.403 – 0.530]), and psychoses (OR=0.317, 95% CI [0.258 – 0.390]). The predictive accuracy of logistic regression was within 2% of the boosted decision tree model.

Discussion of Results

Our findings corroborate with theories of adoption of consumer health technologies⁵, showing that extrinsic conditions, including social determinants of health, influence the adoption of electronic patient portals. We extend the findings of previous studies of patient portal adoption to show that patients who are most socio-economically disadvantaged and may benefit the most from patient portals are concerningly less likely to use them. Further, those with fewer chronic conditions were less likely to use the portal, suggesting that electronic patient portals are not currently being used for early prevention of long-term chronic diseases. The results of this study can be used by researchers, policy makers, and healthcare practitioners to better understand the types of patients who use electronic patient portals for management of chronic conditions.

Conclusion

Social determinants of health play an important role in predicting the adoption of electronic patient portals among adults in the U.S. Clinical and health systems interventions are needed to improve equitable access to their benefits.

Attendee's Take-away Tool

The multivariate logistic regression model may be tailored to other practice settings to predict electronic patient portal adoption using patient characteristics obtained from the EHR and social determinants of health. The strategy of employing machine learning algorithms (i.e., decision tree analysis) to cross-validate the predictive accuracy of the model may be applied to similar projects in other practice settings.

References

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