

Improving Medication Adherence for Chronic Disease Using Integrated e-Technologies

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Abstract and Objective

Diabetes mellitus (DM) is a chronic disease affecting more than 285 people worldwide and the fourth leading cause of death. Increasing evidence suggests that many DM patients have poor adherence with prescribed medication therapies, impacting clinical outcomes. Patients' barriers to medication adherence and the extent to which barriers contribute to poor outcomes, however, are not routinely assessed. We designed a dashboard for an electronic health record system to integrate DM disease and medication data, including patient-reported barriers to adherence. Processes to support routine capture of data from patients are also being explored. The dashboard is being evaluated at multiple ambulatory clinics to examine whether integrated electronic tools can support patient-centered decision-making processes involving complex medication regimens for DM and other chronic diseases.

Keywords:

Diabetes Mellitus; Medical Records Systems, Computerized; Decision Support Systems, Clinical.

Introduction

Diabetes mellitus (DM) is a chronic disease affecting more than 285 people worldwide and the fourth leading cause of death. Globally the prevalence of DM continues to rise at nearly epidemic rates, driven by urbanization, growing increases in obesity, and aging of populations.

Findings from several studies investigating the quality of DM care reveal a discrepancy between system-level disease management strategies and outcomes. In essence, even though there are improved treatment strategies, expected outcomes are not occurring at a commensurate level. Therefore greater emphases on patient-level factors that may explain DM intervention outcomes are being explored.

One such factor is adherence to complex medication regimens. Increasing evidence suggests that patients with diabetes often have poor adherence with prescribed medication therapies. However, patient barriers to medication adherence and the extent to which barriers contribute to poor DM outcomes is not currently being assessed routinely in clinical practice.

Our project aims to electronically capture and present information to clinicians regarding DM patients' disease management, medication adherence, and perceived barriers to adher-

ence. By integrating information at the point-of-care, we seek to better inform DM therapy decision-making processes.

Methods

We designed a dashboard to electronically integrate relevant information from three distinct sources: 1) physiologic values from an electronic health record (EHR); 2) pharmacy claims information from a national data warehouse; and 3) patient self-reported barriers to medication adherence. The patient reported data was entered into an online e-health application, OpenMRS (www.openmrs.org), used globally in over 100 nations for EHR management.

The dashboard was deployed within an EHR system used by primary care clinicians at urban clinics in Indianapolis, Indiana. The dashboard will be evaluated during a six month pilot study which began in March 2013.

During the study, patients' physiologic data (e.g., HbA1c, blood pressure), medication adherence rates, and self-reported barriers to adherence will be collected. The barriers data will be collected using a short, validated questionnaire [1]. We will further collect feedback from patients and clinicians regarding conversations about medication adherence as well as usability of the DM dashboard.

Conclusions

This is the first study to assess medication adherence by combining patient medication history data from a combination of electronic data sources with subjects' responses to a short validated questionnaire that assesses possible barriers to medication adherence. It is further a novel examination of a clinical dashboard for delivering targeted, context-specific decision support to an integrated primary care team.

References

- [1] Monohan PO, Lane KA, Hayes RP, McHorney CA, Marrero DG. Reliability and validity of an instrument for assessing patients' perceptions about medications for diabetes: The PAM-D. *Qual Life Res.* 2009 Sep;18(7):941-52.