



Electronic medical record reminders and smoking cessation activities in primary care



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HIGHLIGHTS

- The use of an EMR equipped with clinical reminders promotes smoking status documentation.
- EMR clinical reminder use increases smoking cessation counseling rates.
- EMR clinical reminder use increases the prescribing of drugs in support of smoking cessation.

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ABSTRACT

Purpose: The purpose of this paper is to assess electronic medical record (EMR) automatic reminder use in relation to smoking cessation activities among primary-care providers.

Background: Primary-care physicians are in the frontline of efforts to promote smoking cessation. Moreover, doctors' prescribing privileges give them additional tools to help patients successfully quit smoking. New EMR functions can provide automated reminders for physicians to counsel smokers and provide prescriptions to support quit attempts.

Sample and methods: Logit regression is used to analyze the 2012 National Ambulatory Medical Care Survey (NAMCS). Variables related to the EMR's clinical reminder capability, patient's smoking status, the provision of cessation counseling and the prescribing of drugs that support quitting are analyzed.

Results: For primary care visit documents, smoking status was recorded 77.7% of the time. Smoking cessation counseling was ordered/provided 16.4% of the time in physicians' offices using electronic reminders routinely compared to 9.1% in those lacking the functionality. Smoking cessation medication was ordered/prescribed for 3.7% of current smokers when reminders were routinely used versus 2.1% when no reminder was used. All the differences were statistically significant.

Conclusions: The presence of an EMR equipped with automated clinical reminders is a valuable resource in efforts to promote smoking cessation. Insurers, regulators, and organizations promulgating clinical guidelines should include the use of EMR technology as part of their programs.

1. Introduction

Smoking is among the most preventable risk behaviors to elevate premature mortality in the United States (US Department of Health Human Services, 2014, Carter et al., 2015). To promote tobacco use cessation, the U.S. Public Health Service (USPHS) Clinical Practice Guideline recommends that during every office visit, physicians should identify the patient's smoking status and provide tobacco cessation

assistance with behavioral counseling and/or medications to all those attempting to quit smoking (Steinberg, Nanavati, Delnevo, & Abaternarco, 2007, Fiore, Jaén, & Baker, 2008). According to the USPHS guideline, smoking cessation counseling or medications are both effective interventions, and they are more effective when are used together. Empirical evidence also supports the guideline's use by physicians (Johnson, Lando, Schmid, & Solberg, 1997, Walters, Wright, & Shegog, 2006). A recent Cochrane review examining 17

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studies found that even brief behavioral counseling from physicians improved the smoking quit rates (Stead et al., 2013). Furthermore, other meta-analyses found that the efficacy of smoking cessation interventions was enhanced when smoking cessation medications were combined with other smoking reduction interventions such as behavioral smoking cessation counseling (Richmond, 1996, Asfar, Ebbert, Klesges, & Relyea, 2011, Stead & Lancaster, 2012). As the frontline in health promotion, primary-care physicians can play unique and essential roles in smoking cessation interventions.

While the benefits of smoking cessation interventions in outpatient care are clearly demonstrated in the guideline and supported by empirical evidence, the prevalence of smoking cessation counseling provided and medications prescribed remains low in primary care settings (Walters et al., 2006, Fiore et al., 2008, Jamal, Dube, Malarcher, Shaw, Engstrom, and C. f. D. Control and Prevention, 2012a, 2012b, Jamal, Dube, Babb, & Malarcher, 2014, US Department of Health Human Services, 2014). Two challenges in providing smoking cessation interventions in the ambulatory-care setting are physician time constraints and ability to tailor a smoking cessation plan to each patient (Bae, Hockenberry, Rask, & Becker, 2017). Electronic Medical Records (EMRs) may reduce these barriers by providing timely and relevant patient information with clinical decision supports at the time of care (Chaudhry et al., 2006; Tang et al., n.d.). In particular, EMR prompted reminders potentially increase smoking status documentation, promote cessation counseling, and boost the prescribing of smoking cessation medications during primary-care visits.

The purpose of this paper is to assess EMR functionality use in relation to smoking cessation activities in ambulatory care settings. In particular, this research assesses if the use of clinical reminders improves behavioral counseling and prescribing medications to support cessation activities, and EMR's function of recording patient smoking status enhances smoking documentation. Data from the 2012 National Ambulatory Medical Care Survey (NAMCS) is analyzed to estimate the association of relevant EMR functionalities used with smoking cessation activities and documentation. Results are described and the implications discussed.

The study's findings address important interest areas for policy-makers promoting EMR Meaningful Use and clinicians. The 2009 Health Information Technology for Economic and Clinical Health (HITECH) Act established the Centers for Medicare and Medicaid Services' (CMS) electronic medical records (EMR) incentive program to encourage physicians to adopt and implement the technology. The Meaningful Use program consists of three stages with progressively more advanced goals for functionality implementation and a concomitant set of incentives/rewards. Stage 1 focused on using certified systems to capture and share patient health information. Stage 2 focused on using advanced EMR functionalities to improve clinical processes. Stage 3 focused on demonstrating improved clinical quality outcomes through meaningful use of EMRs. In particular, the stage 2 meaningful use criteria of the CMS EMR incentive program focus on advanced clinical processes and include "Record smoking status for patients 13 years old or older" and "Use clinically relevant information to identify patients who should receive reminders for preventive/follow-up care" among their core objectives. This study provides empirical evidence to assess the efficacy of EMR functionalities regarding these two core objectives of the stage 2 meaningful use criteria in enhancing clinical processes. Additionally, for clinicians, evidence that EMRs can help them deliver better care is needed to effectively assess the return on investment associated with owning and operating the technology.

2. Methods

2.1. Data source and sample

The study at hand analyzed the 2012 NAMCS to assess the use of

relevant EMR functionalities including 1) recording patient smoking status and 2) clinical reminders in relationship to key smoking related documentation and care activities. The NAMCS is a national probability sample survey administered by the National Center for Health Statistics (NCHS) on behalf of the Centers for Disease Control and Prevention (CDC). The NAMCS collects data on patient visits to non-federally employed office-based physicians in the United States. For each visit, physicians or staff members complete a one-page survey form containing patient demographics, reasons for the visit, physicians' diagnoses, types of health behavior counseling ordered or provided, and medications ordered, supplied, administered, or continued during patient encounters. The NAMCS uses a multistage probability sampling design, which allow for the generation of nationally representative estimates. This dataset has been used in previous research examining smoking cessation counseling and medication (Thorndike, Stafford, & Rigotti, 2001, Moran, Thorndike, Armstrong, & Rigotti, 2003, Steinberg, Akincigil, Delnevo, Crystal, & Carson, 2006, Thorndike, Regan, & Rigotti, 2007, Jamal et al., 2012a, 2012b, Rogers & Sherman, 2014, Nelson et al., 2015, Bae, Ford, & Huerta, 2016). The study examined the influence of clinical reminders with counseling ordered or provided for smoking cessation and medication ordered or continued as well as the influence of EMR's recording patient smoking status functions with the identification of the patient's smoking status in the ambulatory setting. The study examined 16,840 adult visits (2429 visits by current smokers) to primary care physicians (general practitioners, family practitioners, or general internists) by patients 18 years of age or older in 2012.

2.2. Measures

The study used three dichotomous variables as outcome measures: (1) identification of the patient's smoking status (*smoking status recorded*), (2) *smoking cessation counseling*, and (3) *smoking cessation medication*. The following section will describe these smoking outcome measures in greater detail, as well as the EMR variable of interest's specification. Detailed descriptions of the variables used to control for patient and practice characteristics are available from the authors and on the NAMCS website (<http://www.cdc.gov/nchs/ahcd.htm>).

2.2.1. Identification of the patient's smoking status (*smoking status recorded*)

The identification of the patient's smoking status was coded by examining physicians' response to the question, "Does patient use tobacco?" Smoking status was coded as "recorded" if the response was "current" or "not current" while the status was coded as "not recorded" if the response was "unknown" or the physician did not respond to the question.

2.2.2. Smoking cessation counseling

The NAMCS contains data on the ordering or provision of preventive health behavior counseling and education on topics related to tobacco use ("tobacco use/exposure" counseling) during patient encounters. Smoking cessation counseling is a dichotomous measure recorded as positive if "tobacco use/exposure" counseling is either provided or ordered. Smoking cessation counseling was coded based on physicians' responses to the question regarding types of counseling provided during the visit. If a physician indicated that he or she provided counseling on "tobacco use/exposure", it was coded as one. The NAMCS data does not differentiate between services provided at the point of care and referral to other health professionals for smoking cessation.

2.2.3. Smoking cessation medication

The NAMCS contains data on medications ordered, supplied, administered, or continued during patient encounters. Smoking cessation medication is a dichotomous measure, which identifies whether the

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