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Health screening, counseling, and hypertension control for people with serious mental illness at primary care visits

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ABSTRACT

Objective: This study sought to determine if primary care visits for people with serious mental illness (SMI) demonstrate different rates of basic physical health services compared to others, and to determine factors associated with differing rates of these measures in people with SMI.
Method: The study used 2005–2010 visit-level primary care data from the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey. The provision of health counseling, receipt of any diagnostic or screening test, measurement of blood pressure or weight and evidence of hypertension control were assessed, adjusting for identified patient, provider and visit-level factors.
Results: After adjustment for covariates, we found no significant differences between visits for people with SMI and those without for any outcome. Probability of blood pressure measurement and diagnostic or screening testing significantly increased over time.
Conclusion: The lack of significant differences found here might be due to adjustment for covariates, a focus only on primary care visits, the use of visit-level data or evolution over time. Mortality differences for people with SMI may be attributable to those not receiving primary care, self-management of disease or subsets of the population requiring targeted interventions.

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1. Introduction

Over the last two decades, there has been increasing concern about the physical health of people with serious mental illness (SMI). People with SMI have an age-adjusted risk of mortality 2 to 2.5 times higher than the general population, with the primary causes of excess mortality being cardiovascular disease and cancer, and with rates increasing over time [1–6]. One important reason for this excess mortality may be a lack of sufficient primary care assessment and management, such as basic physical health screening, health counseling, and management of chronic medical conditions. Prior studies using Medicaid claims data, 1990s Veterans Administration data and United Kingdom primary care data have shown lower rates of basic health screening, health counseling and immunization after adjusting for basic factors [7–13]. However, Daumit et al. [14] used nationally representative data from 1993 to 1998 and showed in an unadjusted comparison between those with SMI and those without that rates of health counseling by primary care physicians were not significantly different. No study has thus far used nationally representative data to assess primary care for people with SMI since adoption of screening guidelines in 2004 [15,16]. Furthermore, no study has controlled for the wide variety of patient-level, provider-level and system-level factors that may influence receipt of services for people with SMI.

Thus, this study sought to use nationally representative data after 2005 to determine if people with SMI have different rates of basic physical health assessment, health counseling, and hypertension control in primary care settings, compared to the general population, after adjusting for a broad array of potential confounders. Furthermore, this study sought to determine what factors might contribute to differing rates of screening, health counseling and hypertension control in people with SMI. The ultimate goal was to identify potential targets for intervention to improve primary care for people with SMI, in order to influence their high rates of mortality.

2. Methods

2.1. Study design

This study is a cross-sectional analysis of data from two annual US national health care surveys conducted by the Centers for Disease Control and Prevention, the National Ambulatory Medical Care Survey (NAMCS) and the National Hospital Ambulatory Medical Care Survey (NHAMCS). NAMCS contains data obtained from office-based

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outpatient medical providers. NHAMCS includes data from both emergency departments and hospital-based outpatient clinics. In both of these studies, specially trained interviewers complete or assist providers in completing Patient Record Forms (PRFs) for patient visits. These visit-level data are the unit of analysis for both surveys. Both studies use a multistage probability design, with probability samples collected within each stage. For NAMCS, these stages are geographical probability sampling units (PSUs), physician practices and patient visits; for NHAMCS, the stages are PSUs, hospitals, clinics and patient visits. The NAMCS data set includes sample weights for each reported visit to correlate each data point with a representative number of patient visits. These sample weights have been adjusted since 2003 to allow for single sampling stage analysis using ultimate cluster design. Prior studies have shown that these data sets can be used successfully to evaluate care for people with SMI [14,17].

In this study, we combined NAMCS data and office-based outpatient NHAMCS data — emergency department data were excluded. NAMCS and outpatient NHAMCS data are similar in structure, thus allowing the combining of these data sets. Only data from 2005 to 2010 were combined, ensuring the analysis covers data collected after the publication of screening guidelines in 2004. NAMCS and NHAMCS surveys are revised yearly, including minor changes in variable coding; all variables of interest were recoded as possible to reflect their status in 2010. Singly-imputed race and ethnicity variables were provided in the NAMCS and NHAMCS data sets themselves. Inclusion criteria for the study were visits in which consumers were at least 16 years old and in which the visit provider was indicated on the PRF to be the consumer's primary care provider.

2.2. Study variables

The five primary outcome variables were evidence in a visit of the provision of any type of health counseling, the provision any diagnostic or screening test, the measurement of weight, the measurement of blood pressure and evidence of blood pressure readings below 140/90 in consumers diagnosed with hypertension. Identification of provision of health counseling was based on selection of a check box labeled as such on the PRF, or of any of several related subcategory checkboxes. Identification of provision of any diagnostic or screening test was based on any of the following being selected on the PRF: examination of the breast, foot, retina, pelvis, rectum or skin; screening for depression; any imaging test; any laboratory test; biopsy; sexually transmitted disease testing; Papanicalou testing; any scope procedure; spirometry; or urine testing. Identification of blood pressure or weight measurement was based on the presence or absence of a measurement on the PRF. Hypertension diagnosis was based on a check box labeled as such on the PRF. The primary predictor was diagnosis of SMI, defined as schizophrenia and related primary psychotic disorders (ICD-9 295.xx) or mood disorders including major depressive disorder and bipolar disorder (ICD-9 296.xx) but excluding single major depressive episodes (ICD-9 296.2x) and mild, moderate, or remitted recurrent major depression (ICD-9 296.30-296.32, 296.35-296.36). Each PRF allows for the coding of up to three ICD-9 diagnoses per visit.

Covariates of interest were adapted from the Andersen Behavioral Model of Health Services Utilization, which has been used in prior studies evaluating health screening in primary care, as well as existing literature on barriers to adoption of screening for people with SMI [18–24]. Covariates used in this analysis were age (including a squared term to account for nonlinear relationships), sex, race, ethnicity, location in (or not in) a metropolitan statistical area (MSA), US geographical region (with NAMCS-defined categories of Northeast, Midwest, South and West), total number of chronic medical conditions, the Deyo modification of the Charlson comorbidity index, total number of medications, receipt of antipsychotic medications, use of tobacco, number of prior visits in the last year, having seen a physician during the patient visit, primary reason for presenting for the visit, primary type of insurance used for the visit, type of practice office setting (with three categories of government-funded or federally qualified health center, private provider or clinic, and HMO, hospital-based, or faculty clinic), clinical use of electronic medical records (EMRs) and year of visit. For the outcome of weight measurement, a diagnosis of obesity was also included as a covariate, and for the outcome of blood pressure measurement, a diagnosis of hypertension was included.

2.3. Analysis

This study used logistic regressions and accounted for study design using provided sampling weights. Analyses were performed using STATA 13 (College Station, TX, USA). Correlations between all predictors in the model, including all covariates and SMI diagnosis, were assessed using Pearson correlations for continuous variables and Cramer's phi for categorical variables, with no correlations higher than 0.5. Weighted univariate analysis with adjusted Wald tests was performed to compare visits for people with SMI to those without for all covariates and outcomes. Weighted unadjusted and adjusted logistic regressions were performed on the outcomes of interest, with adjustment for the covariates listed above.

We used interaction effects in order to determine what factors may affect the outcomes of interest specifically in visits for people with SMI. To screen for interaction effects of interest, separate weighted adjusted logistic regressions were performed with one interaction effect included at a time for each of the identified covariates. Covariates with interaction effects demonstrating absolute coefficient t scores greater than 1.5 were identified as being potentially meaningful for each outcome of interest. Final models were then created for each outcome of interest including interaction effects for all potentially meaningful factors. Predictive margins for diagnosis of SMI were calculated using Taylor series approximations in order to demonstrate the predicted differences in outcomes for each significant interaction effect between visits for people with SMI and those without. Specification error link tests were performed for all adjusted models.

3. Results

3.1. Study population description

We identified 86,901 visits meeting inclusion criteria, with 1133 visits identified as including diagnoses of SMI, representing 2.14 billion and 14.9 million nationwide visits, respectively. We identified 31,547 visits as meeting inclusion criteria and noting a diagnosis of hypertension, representing 825 million nationwide visits. Table 1 provides a description of the sample, comparing primary care visits for people with SMI to those without, after accounting for survey weighting. Factors are grouped by domains of the Andersen Behavioral Model. Visits for people with SMI, as compared to those without SMI, included individuals that were significantly younger, had more medications and were more likely to be prescribed antipsychotic medication. There were significant differences between visits for people with SMI and those without across insurance type, office setting, number of visits in the last year and reason for visit.

3.2. Impact of SMI on outcomes of interest

Table 2 demonstrates the unadjusted and adjusted effect of SMI diagnosis on the outcomes of interest. The covariates for the adjusted models were all covariates noted in the methods above. In the unadjusted analyses, SMI diagnosis is associated with a significant increase in the odds of receiving health counseling and a significant decrease in the odds of receiving any diagnostic testing, blood pressure measurement and weight measurement. SMI diagnosis is not associated with hypertension control. However, the significance of the association between SMI diagnosis and all outcome findings are lost after adjusting for