Impact of Work Conditions and Minority Patient Populations on Quality and Errors

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Abstract

Objectives: To determine whether workplace conditions affect care quality and errors, especially in primary care clinics serving minority patients.

Methods: We conducted a 3-year assessment of work conditions and patient outcomes in 73 primary care clinics in the upper Midwest and New York City. Study participants included 287 physicians and 1204 patients with hypertension and/or diabetes. Chart audit data were contrasted between clinics with ≥30% minority patients (minority-serving clinics, or MSCs) and those with <30% (nonminority-serving clinics, or NMSCs). Physicians reported on time pressure, work control, clinical resources, and specialty referral access; managers described room availability; and chart audits determined care errors and quality. Two-level hierarchical models tested work conditions as mediators between MSC status and clinical outcomes.

Results: Error rates were higher in MSCs than NMSCs (29.6% vs 24.8%, \(P < .05\)). Lack of clinical resources explained 41% of the effect of MSC status on errors (\(P < .05\)). Diabetes control was poorer in MSCs than in NMSCs (53.8% controlled vs 76.1%, \(P < .05\)); lack of clinical resources explained 24% of this difference (\(P < .05\)). Room availability increased quality in both MSCs and NMSCs by 5.95% for each additional room per clinician per session. Lack of access to rooms and specialists decreased the likelihood of blood pressure control in MSCs.

Conclusion: Work conditions such as clinical resources, examination room availability, and access to referrals are significantly associated with errors and quality, especially in MSCs.

Keywords
practice management, primary care, quality improvement, health disparities, minorities, quality, errors

Introduction

Racial disparities in health care may be influenced by the sites where patients receive care.\(^1\)\(^-\)\(^2\) One study showed that black patients were more likely to attend hospitals with lower rates of evidence-based medical treatments,\(^2\) while another showed that risk-adjusted mortality after acute myocardial infarction was greater in hospitals with high proportions of black patients.\(^3\) Health disparities research has recently focused on addressing these decrements in quality.

The Minimizing Error Maximizing Outcome (MEMO) Study found more challenging work conditions in primary care clinics that served minority patients.\(^4\) Physicians practicing in these clinics had less access to specialists, clinical resources, and examination rooms. Doctors in these clinics reported more chaotic workplaces, less control, and lower job satisfaction. Based on these troubling findings, we examined data from MEMO to answer the following questions: Are there differences in quality of care or errors between clinics serving large proportions of minority patients and those serving mainly non-minority patients, and, if so, how far do work conditions explain these differences?

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Submitted December 11, 2015. Accepted December 11, 2015.

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Method

The 2002-2005 MEMO study was a longitudinal investigation of primary care clinics in New York city; Chicago, Illinois; and rural, academic, and urban settings in Wisconsin. Eligible participants were family practitioners or general internists with at least 4 sessions per week in ambulatory care. Up to 6 patients per physician were recruited by mail or in person. Eligibility criteria included age 18 or older; ability to read English, Spanish, or Cantonese; at least 2 outpatient visits with a study physician in the previous year; and a diagnosis of hypertension, diabetes mellitus, and/or congestive heart failure. (Heart failure patients were eventually eliminated from analysis due to systematic challenges in data collection.) Clinics serving ≥30% minority populations based on manager data were deemed minority-serving clinics (MSCs). This threshold resembles the 2005 U.S. proportion of Blacks plus Hispanics.

A physician survey queried satisfaction, stress, burnout, work control, referral access, office pace (calm to chaotic), access to clinical resources, and likelihood to leave within 2 years. Managers reported on examination room availability. Patient records were audited retrospectively over 18 months for errors, quality, diabetes control, and hypertension control based on national guidelines. Error points were assigned for missing processes of care, including depression screening, diet/exercise advice, tobacco use documentation, and cancer screening. Quality points were assigned for control of diabetes (Hemoglobin A1c ≤7.5%) and hypertension (blood pressure <140/90 or <130/85 for diabetic patients) for ≥50% of recorded measurements.

Two-level hierarchical patient–physician structural models tested the following: (1) associations between MSC status and errors, quality, diabetes control, and hypertension control and (2) the mediating effects of time pressure, chaos, work control, resources, referral access, and examination rooms. Models were adjusted for patient and physician demographics. Figure 1 illustrates the analysis’ conceptual basis.

Results

The MEMO recruited 119 clinics, 422 physicians (54% of those approached), and 1795 patients. Seventy-three clinics had complete data (287 physicians and 1204 patients). Among physicians, 63% were general internists and 48% were females. Among patients, 65% were females, 54% had diabetes, 90% had hypertension, and 44% had both. Of the 73 clinics, 36% were MSCs. Parameter estimates for the models are available from the authors upon request.

Error Models

The MSC status was associated with more time pressure and chaos; less room availability, work control, and referral access; and fewer resources. Adjusted error rates were almost 5% higher in MSCs (29.6% vs 24.8%, P < .05). Fewer clinical resources explained 41% of this effect.

Quality models

Each additional examination room per physician increased quality scores by 5.95%. Of note, there were fewer rooms in MSCs (2.2 per clinician vs 2.7 in non-MSCs [NMSCs], P < .05).

Hypertension Control Models

Blood pressure control was similar between MSCs and NMSCs. Referral access and number of examination rooms (both P < .05) partially explained blood pressure control in MSC patients.

Diabetes Control Models

Diabetes control was poorer in MSCs (53.8% controlled vs 76.1%, P < .05). Resource access partially mediated this effect, explaining 24% of the difference.

Figure 1. Conceptual model.
Discussion

Our previous work has uncovered challenging work conditions in MSCs,4 in this study of 287 primary care physicians and 1204 patients, we found greater overall errors and poorer diabetes control in clinics serving larger proportions of minority patients. The study provides evidence that one of these conditions, access to clinical resources, explains in large part the 5% difference in overall errors between MSCs and NMSCs and partially accounts for better diabetes control in NMSCs. Our data also provide evidence that examination room availability and access to specialists are associated with improved control of blood pressure and higher overall quality.

One key finding from this study is the importance of sufficient examination rooms. Fewer examination rooms were found per provider per session in MSCs. Diminished room availability was linked to lower quality of care. We thus encourage all clinics, especially those serving minority patients, to allow sufficient space for conducting clinical examinations and providing high-quality care.

Limitations of our study include self-reported physician data and patients residing in few geographical regions. While data are from 2002 to 2005, they remain pertinent due to the strong study design and likely stability of relationships between predictor variables and clinical outcomes. The MEMO’s many strengths (including a diverse patient population, a large number of clinics, and objective outcome data) support the importance of the findings.

Authors’ Note

Drs Varkey and Ibrahim and Ms Baier Manwell designed and conducted the study. Dr Brown performed the statistical analyses and data monitoring. Drs Varkey and Ibrahim analyzed the data. Drs Montague, Laiteerapong, and Burgess reviewed the data. Drs Varkey and Brown and Ms Baier Manwell drafted the manuscript, with specific contributions from the following coauthors: Drs Montague and Ibrahim (disparities), Laiteerapong (work conditions), and Burgess (work conditions leading to disparities). Data accuracy: Drs Varkey and Brown had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Data access: Complete data are available from Drs Varkey and Brown upon request.

Role of the funder: Funders had no role in design or conduct of the study; collection, management, analysis, or interpretation of data; or preparation, review, or approval of the manuscript. The contents do not represent the views of the US Department of Veterans Affairs or the United States Government. The abstract from this manuscript was presented at the 34th Society of General Internal Medicine Annual Meeting in Phoenix, AZ in May 2011 and at the 36th Society of General Internal Medicine Annual Meeting in Denver, CO in April 2013. Abstracts from these presentations were published in the Journal of General Internal Medicine as part of the SGIM meeting proceedings.

Acknowledgments

The authors gratefully acknowledge the contributions of the following researchers, who provided invaluable support in designing the study, conducting the analyses, and/or reviewing the manuscript: Sara Poplau, BA; Jacqueline Wiltshire, PhD; Mark Schwartz, MD; Eric S. Williams, PhD; and Mark Linzer, MD.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Design and conduct of the study was supported by the Agency for Healthcare Research and Quality grant # 5 R01 HS011955. Interpretation of the data and preparation of the manuscript was funded by the Robert Wood Johnson Foundation grant # 053253. Dr. Ibrahim was supported by grant # K24AR055259 from the National Institute of Arthritis and Musculoskeletal and Skin Diseases. Dr. Laiteerapong was supported by grant # K23DK097283 from the National Institute of Diabetes and Digestive and Kidney Disease and by a University of Chicago John A. Hartford Centers of Excellence Award. This material is the result of work supported with resources and use of facilities at the US Department of Veterans Affairs.

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