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A Longitudinal Linear Model of Patient Characteristics to Predict Failure to Attend an Inner-City Chronic Pain Clinic

Naum Shaparin,*,† Robert White,† Michael Andreae,† Charles Hall,‡,§
and Andrew Kaufman¶

*Montefiore Pain Center, Montefiore Medical Center, Albert Einstein College of Medicine, Bronx, New York.
†Department of Anesthesiology, Montefiore Medical Center, Albert Einstein College of Medicine, Bronx, New York.
‡Department of Epidemiology and Population Health, Albert Einstein College of Medicine, Bronx, New York.
§Saul B. Korey Department of Neurology, Albert Einstein College of Medicine, Bronx, New York.
¶Department of Anesthesiology, New Jersey Medical School, Newark, New Jersey.

Abstract: Patients often fail to attend appointments in chronic pain clinics for unknown reasons. We hypothesized that certain patient characteristics predict failure to attend scheduled appointments, pointing to systematic barriers to accessing chronic pain services for certain underserved populations. We collected retrospective data from a longitudinal observational cohort of patients at an academic pain clinic in Newark, New Jersey. To examine the effect of demographic factors on appointment status, we fit a marginal logistic regression using generalized estimating equations with exchangeable correlation. A total of 1,394 patients with 3,488 total encounters between January 1, 2006, and December 31, 2009, were included. Spanish spoken as a primary language (alternatively Hispanic or other race) and living between 5 and 10 miles from the clinic were associated with reduced odds of arriving for an appointment; making an appointment for a particular complaint such as cancer pain or back pain, an interventional pain procedure scheduled in connection with the appointment, unemployed status, and continuity of care (as measured by office visit number) were associated with increased odds of arriving. Spanish spoken as a primary language and distance to the pain clinic predicted failure to attend a scheduled appointment in our cohort. If these constitute systematic barriers to access, they may be amenable to targeted interventions.
Perspective: We identified certain patient characteristics, specifically Spanish spoken as a primary language and geographic distance from the clinic, that predict failure to attend an inner-city chronic pain clinic. These identified barriers to accessing chronic pain services may be modifiable by simple cost-effective interventions.

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Patients often fail to attend appointments in chronic pain clinics for unknown reasons, frequently without calling to cancel beforehand. Failure to attend a scheduled appointment,[1,4,10,12,14,17-21,23,25,29,30,37,38,43,46] especially without the benefit of a cancellation call, can add to already considerable wait times for pain clinic appointments, a problem that is only magnified in resource-limited clinic settings. Overbooking is an imperfect answer in this situation; it can result in crowded waiting areas, patient frustration, and provider stress. More important, beyond the obvious excess cost associated with failure to attend is whether this phenomenon is pointing to unmet needs in the treatment of chronic pain for certain populations.

Inner-city pain clinics cater to underserved and minority populations with high Medicaid insurance rates, lower socioeconomic status, and a substantial level of hospital-provided charity care. These demographic groups have previously been identified as more likely to miss clinic appointments.[4,10,17,21,32,43,46] Health care disparities persist for these minorities and socioeconomically disadvantaged patients seeking pain treatment.[2,11,13,16,28,44] Minority patients often experience longer appointment wait times, hindered access to appropriate analgesic medications, increased requirements for physician referrals, and concerns about finance and about addiction/dependency to medications.[2,8,9,11,16,24,25,27,28,34,35,42,44,45] Long-term interventional trials and policy initiatives have been undertaken[6,9,18,19,26,40] in an attempt to improve attendance and to counteract the potential for systematic discrimination of vulnerable and underserved populations by our health care system.[33] Although there is some research on acute pain service utilization by minorities, for example, labor epidural delivery,[15,42,47] important questions still remain concerning experience and decision making by underserved populations in regard to utilization of individually offered chronic pain services.[11] This particularly holds for research concerning health care disparities with respect to access to chronic pain services; our literature search found no studies in this area.

On the basis of anecdotal personal experience and the literature, we hypothesized that certain patient characteristics such as belonging to an ethnic or racial minority and not speaking English as the preferred/primary language would predict failure to attend clinic appointments, pointing to systematic barriers to accessing chronic pain services for certain populations. Our retrospective observational cohort examined patients scheduled to attend an academic chronic pain clinic at the University Hospital of New Jersey Medical School in Newark, formerly the University of Medicine and Dentistry of New Jersey (UMDNJ), Newark, New Jersey, over a 4-year period. We fitted a longitudinal generalized linear regression model to investigate the association between certain patient-specific characteristics and arrival to appointment and likelihood of making a cancellation phone call for a missed appointment.

Methods

We collected retrospective data from a longitudinal observational cohort of patients with a scheduled appointment at the New Jersey Medical School Department of Anesthesiology's Pain Clinic in Newark, New Jersey. Following institutional review board approval, the study subjects were selected from the pain clinic administrative database (formerly General Electric Logitian Electronic Medical Record, now Centricity electronic medical record). Because of the retrospective nature of the study, the informed consent requirement was waived by the institutional review board. Patients were selected on the basis of the following criteria: 1) age 18 to 90 years; and 2) scheduled for the clinic's charity care/reduced-fee weekly (every Wednesday afternoon) clinic

during the period January 1, 2006, to December 31, 2009. We limited our analysis to charity care clinic patients because the results of an internal quality assessment revealed that the vast majority of insured patients arrived for their scheduled visits on time or called to cancel beforehand (unpublished data). The substantial no-show rate in our charity clinic, meanwhile, suggested barriers to access to care in this population. Data collection was implemented through chart review. Patients were not denied clinic appointments on the basis of prior clinic appointment outcome (arrived, cancellation call, no call). All patients with a pain clinic appointment during this time period were included in the analysis, regardless of race, ethnicity, and insurance status or if they attended, failed to attend, or cancelled the appointment. The following demographic data were collected for each patient: appointment date, patient age, sex, appointment status (arrived, cancelled, no-show), nature of pain complaint, whether a procedure was previously performed as part of treatment plan (yes, no), insurance type, ethnicity, primary spoken language, employment status (employed, unemployed, on disability), distance from clinic based on zip code data, and referring physician specialty. Patient's medical history was not transcribed. A total of 1,394 patients with 3,488 total encounters were included in this analysis.

Statistical Analysis

Analyses were performed using Stata software, version 12.1 (StataSoft, College Station, TX). Baseline characteristics were compared separately for appointment status of arrival versus failure to attend and for cancellation call versus no call. Continuous variables were compared using 2-sample t-test (or the Mann Whitney U test), and categorical variables were compared using the Pearson chi-square test or Fisher exact test.

To examine the effect of demographic factors on appointment status, we fit marginal logistic regression models to our data using generalized estimating equations (GEEs) with exchangeable correlation; odds ratios (ORs) with robust 95% confidence intervals were reported.[22] These models take into account the fact that individuals contribute repeated observations to the analyses. We developed separate models for arrival versus failure to attend and for cancellation call versus no call. We fit 2 additional models—a marginal logistic model with a lag 1 autoregressive correlation and a random-intercept logistic regression model; these models produced similar results (data not shown). As expected, we found strong collinearity between language spoken and race/ethnicity; hence, we ran separate models for spoken language and for race/ethnicity. We built our models using backward selection on the basis of the Wald statistic, including variables that had results of bivariate baseline testing $P < .25$, or variables, such as race and language, that were selected a priori, assigning statistical significance at an alpha level of .05 and interaction at .05. The following covariates were deemed time dependent, with visit number as the timescale: patient age, nature of pain complaint, whether a