Causal Effect Analysis of Demographic Concordance on Patient Perception of Physician Trust and Respect in an Emergency Care Setting

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Abstract

Objectives: Patient perceptions of physician trust and respect are important factors for patient satisfaction evaluations. We aim to determine the causal effect on patient-physician demographic concordance and patient perceptions of physician trust and respect in an emergency care setting. A near real-time patient satisfaction survey was sent via telephone to patients within 72 hours of discharge from an Emergency Department (ED). Patient-trust-physician (PTP) and physician-show-respect (PSR) scores were measured. Patient and physician demographics (age, gender, race, and ethnicity) were matched. We employed genetic matching to assign patients appropriately to the treatment (demographic concordance) and control (demographic discordance) groups. Causal effect was analyzed to determine the direct effect of patient-physician demographic concordance on PTP/PSR scores.

Result: We enrolled 1815 patients. The treatment effect of patient-physician demographic concordance on patient perception of physician trust and respect ranged from -0.02 to -0.2 (p>0.05). In general, patient-physician demographic concordance has minimal effect on patient perceptions of physician trust and respect.

Introduction

Patient satisfaction is measured by after-care satisfaction surveys and has been used as a core metric to determine better quality patient-centered care.[1;2] Further examining patient satisfaction scores linked to these subjective questions revealed that it could be affected by both patient and provider demographics.[3;4] Results from McFarland and his colleagues showed that younger, white patients were predictive of a favorable healthcare rating, while non-English speaking patients were predictive of unfavorable healthcare satisfaction scores.[5;6] Moreover, a national cancer patient experience survey revealed that ethnic patients may report lower satisfaction and less positive experiences of their overall care, similar to the McFarland outcomes.[7] However, findings are quite controversial in other studies. A retrospective study done at ED showed that elderly patients (>65 years old) had higher patient satisfaction than younger patients.[8] However, such findings could be biased without analyzing healthcare provider demographics in relation to patient satisfaction.

In recent years, more studies have reported patient and physician demographic concordance affecting patient satisfaction. An HIV study conducted in New York city found that HIV patients rated their quality of healthcare higher if they are racially/ethnically concordant with their providers.[9] A primary care physician study found that race concordance seemed to be the primary predictor of perceived ethnic similarity, thus associated with higher ratings of provider trust, satisfactions, and intention to adhere to healthcare management.[10] Unfortunately, these findings were not corroborated in other studies which showed less association between patient-physician demographic concordance and general healthcare satisfaction.[11;12] However, among all these studies, common association analytical methods such as

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correlation and regression were used with no direct causal effect reported between patient-physician demographic concordance and patient satisfaction.

Among patient satisfaction survey questions, some questions are asked to determine patient satisfaction with respect to their healthcare providers. Patient responses to these questions can be very subjective, particularly on ratings describing trust and respect between the physicians and the patients. Trust and respect could be highly variable across different demographics. Therefore, it is important to consider cross-cultural disparities between patients and healthcare providers. Such disparities could further affect patient-physician communications, thereby subsequently affect patient-centered care.[13] Therefore, in this study, we aim to determine patient-physician demographics affecting patient perceptions of provider trust and respect by using a causal effect methodology, a more accurate association analysis.

Methods
Study design and setting

This is a secondary data analysis from a quality improvement project. Data were collected prospectively from October 1, 2018 to September 31, 2019 but were analyzed retrospectively. This study was performed in an urban tertiary public funded hospital ED. The study ED has approximately 125,000 visits per year and is a level 1 trauma center, a comprehensive stroke center, and chest pain center. Due to secondary data analysis from a quality improvement project, approval for this study was waived by the local Institutional Review Board.

Study participants

We enrolled patients who had been discharged from the study ED and agreed to participate in a patient satisfaction survey delivered via their personal phones. We excluded patients who: 1) refused to participate in this survey; 2) did not know who their physicians were; 3) refused to answer whether they trusted their physicians' care; and 4) refused to answer whether their physicians showed respect to patients. In addition, physicians with less than 10 patient satisfaction surveys were excluded due to lack of statistical significance.

Study outcomes

Patient satisfaction surveys were measured as the study outcomes. We used the National Research Corporation (NRC) Picker patient satisfaction survey via telephone to recently discharged ED patients. NRC patient satisfaction surveys is one of the most used patient satisfaction survey in the market.[14–16] NRC picker surveys have several different formats and can be delivered either by mail or telephone. All these surveys have been validated externally and used broadly across national EDs. There are 11 questions delivered to patients. In this study, two outcomes from the survey were measured. One is patient trust physicians' care (hereinafter referred to as "Patient-Trust-Physician", PTP) and the other is physician showing respect to patients (hereafter referred to as "Physician-Show-Respect", PSR). Both

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questions are answered using a 4-point Likert scale ranging from 1 to 4. A score of 1 is defined as patients do not trust their physician or a physician does not show any respect to the patient. A score of 4 is defined as patients definitely trust physicians' care and physicians definitely show respect to patients.

Study variables

We included both patient and ED physician general demographics including age, gender, race, and ethnicity. The time interval between patient discharge and their completed survey was calculated. Age was divided into three groups: 1) < 40 years old, 2) between 40 and 54 years old, inclusive (40–54 years old), and 3) equal to or greater than 55 years old (≥ 55 years old). Race was classified into three groups: 1) White, 2) African American, and 3) Others. "Others" includes Asian, American Indian or Alaska Native, Native Hawaiian or Other Pacific Islanders. Ethnicity was divided into Hispanic and non-Hispanic groups.

Causal effect analysis

We used a counterfactual approach to examine the causal effects of patient-provider demographic concordance on patient perception of physician trust and respect. The counterfactual approach is grounded on the counterfactual theories of causation, which explains the meaning of causal claims in terms of counterfactual conditionals of the form.[17;18] We denoted Y_i^T the outcome (i.e., perceived trust and respect by patients) for unit i if the unit receives a treatment T. The treatments of particular interest included the patient-physician concordance on four demographical attributes: age, gender, race, and ethnicity. We denoted Y_i^C the potential outcome for unit i in the control regime C (e.g., demographic discordance). Hence, the treatment effect on unit i can be derived by $\tau_i = Y_i^T - Y_i^C$. We employed genetic matching (GM) to assign patients appropriately to the treatment and control groups.[19] The absolute standardized mean differences were measured for all covariates before and after the matching to determine the matching performance.[19] We then calculated the estimated treatment effect and t statistics to determine the causal effects after the matching with p value < 0.05 indicating the occurrence of such causal effect. Whereas p value > 0.05 indicates no causal effect exists based on statistical evidence. All analyses were performed using R package (x64 3.2.5) or STATA 14.2 software (College Station, TX) with p-value < 0.05 considered statistically significant.

Results

A total of 1815 patients and 33 ED providers were enrolled in this study. The median time interval from patient discharged from ED to their response to the survey was 67 hours (IQR 43, 104). A detail study flow diagram was shown in Supplemental Figure.

The general demographics were different between patients and physicians. In patients, females were predominant, approximately 40% were 40–54 years old, and nearly 40% were Hispanic/Latino patients. Whereas, in physicians, most were male (70%), White (73%), and non-Hispanic/Latino (94%) providers (See Table 1).

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Table 1
Study population demographics

	Physicians (n = 33)	Patients (n = 1815)
Age — n (%)	12 (36.4)	725 (39.9)
<40 years old	16 (48.5)	488 (26.9)
40–54 years old	5 (15.2)	595 (32.8)
≥55 years old		7 (0.4)
Unknown		
Gender — n (%)	23 (69.7)	810 (44.6)
Male	10 (30.3)	1005 (55.4)
Female		
Race — n (%)	24 (72.7)	619 (34.1)
White	1 (3.0)	528 (29.1)
African American	8 (24.2)	662 (36.5)
Others*		5 (0.3)
Unknown or Refused		
Ethnicity — n (%)	2 (6.1)	699 (38.5)
Hispanic or Latino	31 (93.9)	1108 (61.1)
Not Hispanic/Latino		8 (0.4)
Unknown or Refused		

*Others in Physicians indicate Asian, Others in Patients indicates Non-white Hispanic/Latino, Asian, American Indian or Alaska Native, Native Hawaiian or Other Pacific Islanders, etc.

Figure 1 presented the absolute standardized mean differences for all covariates before and after the GM. According to the plots, the value of absolute standardized mean differences for all the covariates decreased significantly after the GM, indicating a desirable balance was achieved and the treatment and control groups were prepared for a reliable causal analysis.

Tables 2 show the treatment effects of gender, age, race, and ethnicity concordance on patient perception of physician trust and respect. In all cases, the treatment effect is negative. However, only the treatment effect of age concordance on physician trust is statistically significant (p = 0.036). The rest of the estimated effects are not statistically significant.

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Table 2
Treatment effects on patient perceptions of patient-trust-physician and physician-show-respect

Treatments	Estimated effect	T-stat	p-value
Patient perceptions of patient-trust-physician			
Gender concordance	-0.024	-0.484	0.629
Age concordance	-0.119	-2.097	0.036
Race concordance	-0.043	-0.729	0.466
Ethnicity concordance	-0.181	-1.595	0.111
Patient perceptions of physician-show-respect			
Gender concordance	-0.022	-0.423	0.672
Age concordance	-0.102	-1.805	0.071
Race concordance	-0.051	-0.882	0.378
Ethnicity concordance	-0.200	-1.516	0.129

Discussion

Physicians showing respect to patients and gaining patients trust during healthcare process are critical to establish patient-physician rapport, which subsequently affects patient healthcare outcomes.[20–22] However, patient perceptions of physician trust and respect are quite subjective and can be affected by multiple factors. Each potential factor can have interactions thus making routine association analyses (e.g., correlation, regression, etc.) less reliable.[23] Therefore, we performed a causal effect analysis in this study. We found that patient-physician demographics, in general, minimally affected patient perceptions of physician trust and respect. To the best of our knowledge, such direct causative effect analyses, specifically on patient perceptions of physician trust and respect in related to patient-physician demographics, has not been reported before. Our findings add extra evidence to the literature on demographics affecting patient-physician rapport. Such findings might help future improving physician communication training during emergency care.

The study's strength is using causal effect analysis in an observational data setting. Such counterfactual analysis to causation for a general problem was reported before, but not widely used due to the strict model requirement.[24] Causal models are constructed separately to identify the causal relationship between each outcome and each treatment, it is ideal to measure cause effects on random samples. However, in an observational data setting, the baseline variables are almost never balanced across the treatment and control groups because the two groups are not ordinarily drawn from the same population. Therefore, matching – a procedure used to derive a balance of the baseline variables across treatment nation of causal effects. This study employs

genetic matching (GM) – a well-known matching method – to select patient-physician encounters from the observational data and assign them appropriately to the treatment and control groups.[19;25] Using such matched samples could thus determine the direct causal effects accurately.

Previous studies favored patient-physician demographic concordance in certain specialties (e.g., gynecology, family practice).[26;27] It can be inferred that patient-physician demographic concordance may affect communication patterns and perception of quality of care, that can further affect patient-physician relationship and health outcomes. However, such perceptions may not be duplicated in an emergent care setting. In an emergent care setting, patient-physician rapport is temporary and can be affected significantly by limited time and communication. At present, the influence of ED physician demographics affecting patient centered care is not as well studied. A recent report of an ED study showed patient-advocator demographic concordance has no effect on the promotion of ED patients' HIV screening, though this is not strictly patient-provider related.[28] On the other hand, we are unclear of patient-physician age concordance having negative effect on patient perception of physician trust and respect in our study. A previous study reported that patients' views regarding age concordance were varied and unrelated to gender or racial/ethnic group.[27] Our future study will be particularly focused on the patient-physician age concordance in related to ED patient-centered care.

Conclusion

When patient near real-time satisfaction was performed in an emergent care setting, patient-physician demographic concordance has minimal causal effect on patient perceptions of physician trust and respect.

Limitation

Our study has its limitations. This is a retrospective observational study with secondary data analysis. Given the nature of this study design, patient selection bias, missing data, and inaccurate information inevitably exist. Although this study enrolled significant patient samples, our physician sample size is limited, which could potentially affect patient physician generic matching. Moreover, while this study was focused on PTP/PSR, overall patient satisfactions were not specifically investigated, which might be hard to compare with other studies. Therefore, to accurately determine the role of patient-physician demographic concordance in related to patient-centered care, a larger multi-center prospective study is warranted for further validation.

Abbreviations

ED, Emergency Department; PTP, Patient-trust-physician; PSR, Physician-show-respect; NRC, National research corporation; GM, genetic matching.

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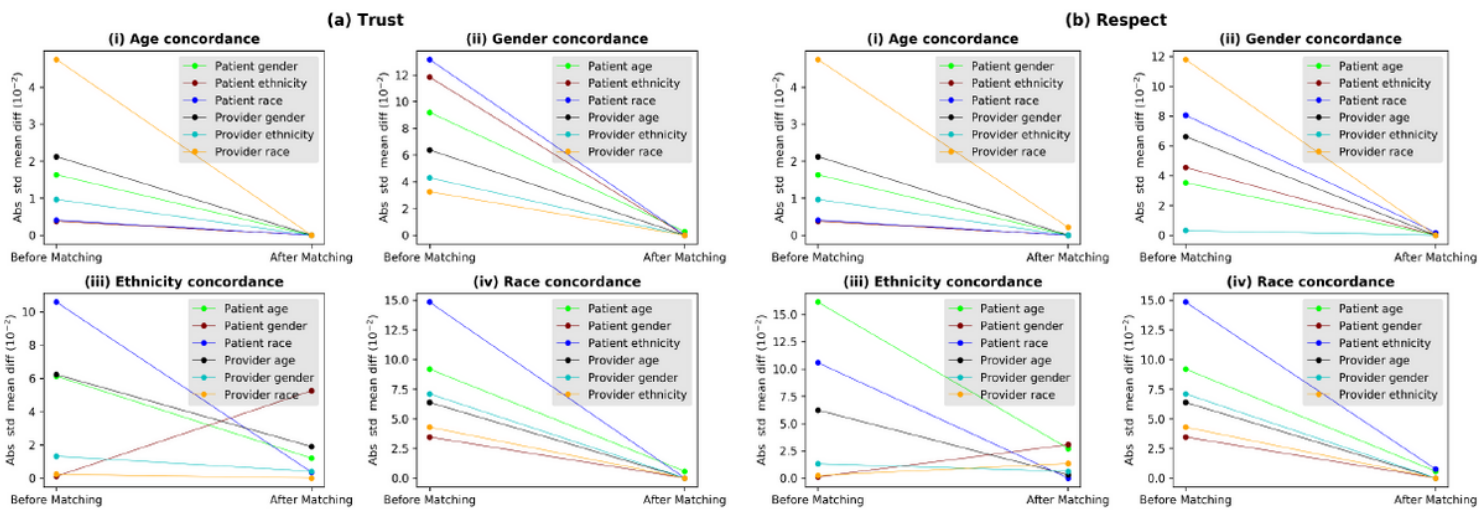
Figures

Figure 1

The absolute standardized mean differences for all covariates before and after the genetic matching

Supplementary Files

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- SupplementalFigure.pdf

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