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Disparities in Hospital Smoking Cessation Treatment by Immigrant Status

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Abstract

Background—Despite the efficacy of Nicotine Replacement Therapy (NRT) in promoting smoking cessation, no studies have been done to evaluate NRT prescribing rates among immigrants, a vulnerable minority population in the US. The aim of this study is to explore for differences in NRT prescribing behavior by immigrant status.

Methods—Participants were enrolled in a smoking cessation trial for hospitalized patients between July 2011 and April 2014 at two NYC hospitals. For this analysis, we used baseline data from patient surveys and electronic medical-record reviews to examine associations between immigrant status and prescription of NRT in-hospital, on discharge, as well as acceptance of NRT in-hospital. We included age, gender, education, health literacy, race, ethnicity, English language ability, inpatient service, and site insurance in the models as potential confounders.

Results—Our study population included 1608 participants, of whom 21% were not born in the US. Bivariate analysis found that non-immigrants were more likely to be prescribed NRT in the hospital than immigrants (46.1% vs. 35.7%, $p=.0006$) and similarly on discharge (19.4% vs. 15.3%, $p=.09$). Both groups were equally likely to accept NRT in-hospital when prescribed. On multivariable analysis, being an immigrant (OR 0.65), black race (OR 0.52), and Hispanic ethnicity (OR 0.63) were associated with lower likelihood of being prescribed NRT in-hospital. Multivariable analysis for provision of NRT prescription at discharge showed no significant difference between immigrants and non-immigrants.

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Declaration of Interests:

All authors have reviewed the submitted manuscript and approve the manuscript for submission. This manuscript has not been published elsewhere and is not under submission elsewhere. The authors have no conflicts of interests to report.

Conclusion—These findings show differences in in-hospital smoking cessation treatment between immigrants and non-immigrants.

Background

Cigarette smoking is the leading cause of preventable death in the United States (US), and it is a particular problem for many immigrant groups. Although overall smoking prevalence in the US has declined from 20.9% in 2005 to 15.1% in 2015,¹ a high prevalence of smoking still persists among certain subpopulations in the US.¹ There are very few large scale surveys or surveillance systems designed to monitor the health status of immigrants, a vulnerable minority population in the US; less that provide disaggregate health statistics for immigrants by country of birth, citizenship status, and gender.^{2–5} The healthy migrant effect, which proposes that healthier individuals with more socioeconomic resources are more likely to migrate, ascribes to the generally known low rates of smoking among immigrants in the US⁴; however, recent studies have shown smoking rates increase among certain subpopulations of immigrants with increasing time US.⁶ This increase may be attributable to differences in smoking stigma and gender roles between the native country and the US, or acculturative stress.⁶ These data point to an increased need for evaluation and treatment of tobacco use among the immigrant population.

Immigrants, especially undocumented immigrants or those from racial and ethnic minorities, are vulnerable to many health issues but treatment is often eluded due to the barriers faced when attempting to get treatment. Immigrants are more likely to suffer from chronic disease and disability, which are exacerbated by unmet social needs, while also have a higher likelihood of poor mental health.^{7–10} Immigrant status is a multi-dimensional variable that encompasses various socio-economic, cultural, acculturative, and behavioral factors which all contribute to the barriers in healthcare and social services utilization.^{7,10} Barriers to obtaining health care include the fear of deportation, inability to speak English, differing culture and beliefs about health and medical care, limited financial means, and mistrust of health-care providers.^{7,11,12} The 2010 Patient Protection and Affordable Care Act expanded healthcare coverage to many previously uninsured citizens as well as long-term immigrants. However, despite this expansion of health insurance coverage, undocumented immigrants and legally documented immigrants residing in the US for less than five years remain ineligible for publicly-funded insurance. As a result, there exists an overutilization of emergency care services and less use of preventive care options by immigrants.¹² Smoking and treatment for chronic illnesses often take a back seat to more acute and immediate distress in this population.^{9,10}

The use of medications, including nicotine replacement therapy (NRT), has been shown to significantly assist with smoking cessation and improve quit rates.¹³ Despite the importance of this health concern, few studies have been performed to ensure adequate NRT prescribing rates among vulnerable minority populations in the US. The aim of our study is to explore whether there are differences in NRT prescribing behavior for immigrants as compared to non-immigrants (i.e. US born), and determine whether this relationship is explained by other socioeconomic/demographic factors. Our study fills a gap regarding a critical preventive health concern among immigrants, a high-risk vulnerable population. We hypothesized that,

after adjusting for potential confounders, immigrant smokers were less likely to be prescribed NRT during hospitalization and at discharge.

Methods

This is a cross-sectional study examining NRT prescribing behavior according to immigrant status. We used data from the “Effectiveness of Smoking Cessation Interventions among Urban Hospital Patients” study, which is part of the Consortium of Hospitals to Advance Research on Tobacco (CHART).^{14,15} The main CHART-New York study was a randomized controlled trial comparing the effectiveness and cost effectiveness of two approaches to smoking-cessation counseling after discharge from the hospital.¹⁶

Participants

Participants in the CHART-New York study were enrolled between July 2011 and April 2014. Those enrolled were adult inpatients at two safety-net hospitals in New York City (Bellevue Hospital Center and Veterans Affairs [VA] New York Harbor Healthcare System) who (1) smoked at least one puff of a cigarette in the last 30 days, (2) were 18 years or older, (3) spoke English, Spanish, or Mandarin, (4) had a working telephone number to enable participation in telephone counseling, (5) were not incarcerated or in police custody, (6) were not pregnant or breastfeeding, and (7) were not being discharged to a nursing facility or other institution where they would not have control over their ability to smoke. Participants were not required to be interested in quitting. For this analysis, we used baseline data from all enrolled participants collected through participant surveys (completed at bedside in the hospital, at the time of study enrollment) and electronic medical record reviews. All data reflect ‘usual care’ as it occurred in the two study hospitals; study-related interventions occurred only after discharge, and are not described here.

Defining immigrant status and outcome measures

For this analysis we compared NRT prescribing behavior by immigrant status. Immigrant status was identified via the question: “In what country were you born?” Anyone answering with a country outside of the US was considered an immigrant for the purposes of our analysis. In compliance with New York City Health and Hospitals Corporation policy, we did not ask any questions to assess legal vs. illegal immigrant status.

To measure the outcomes of interest, we conducted a systematic explicit medical record review, which was performed for each participant immediately after discharge. The primary outcome of interest was NRT prescribing behavior. We assessed two separate outcomes in NRT prescribing behavior: (1) Was NRT prescribed during hospitalization? and (2) Was a NRT prescription provided on discharge? A secondary outcome of interest was NRT acceptance rate, which we defined according to whether NRT was accepted on at least half of the days it was prescribed in the hospital. NRT acceptance rate was based on a subsample of those that were prescribed NRT during hospitalization.

At both study hospitals, NRT patches were on the inpatient hospital pharmacy formulary and easily obtainable if ordered; NRT gum and lozenges were available at one study hospital. Due to coverage by New York State Medicaid and the VA, as well as Bellevue’s outpatient

formulary for the uninsured, NRT was easily accessible in the outpatient (post-discharge) setting as well.

Covariables of Interest

The covariates of interest included age, gender, English language ability (defined by preferred language used for the study's informed consent), education (dichotomized as high school graduate/GED or less vs. some college or more), health literacy, race/ethnicity, inpatient hospital service (dichotomized as psychiatric vs. non-psychiatric), and insurance. We did not include study enrollment site as a covariable of interest. Due to the collinearity between site and insurance (those enrolled at the VA had VA insurance) we assumed insurance would be an appropriate proxy for the effects of enrollment site. Age, gender, English language ability, education, and insurance were all measured from self-report during the baseline CHART survey. Race and ethnicity were based on self-report when provided, or taken from EMR review if missing. Several studies have shown an effect of acculturation on immigrant health.^{18–21} As an exploratory analysis we also looked at time since immigration.

Age was a continuous variable that we categorized into four groups: 18–40, 41–50, 51–60, and 60 and above.

Health literacy was measured by one item: “How confident do you feel filling out medical forms?” Possible answers range from “extremely confident” to “not at all confident,” and were categorized as high/moderate/low. This single question can be a useful proxy for assessing health literacy in clinical research, and correlates with other health literacy measures.¹⁷

Time since immigration was measured with the question “How long have you lived in the US?” which was asked of all participants who had been born outside the US. We defined the periods of acculturation as less than 5 years, 5–15 years, and more than 15 years in the US; a recent study identified a plateau effect of time since immigration at 15 years.²⁰

Statistical Analysis

Descriptive statistics were used to present baseline characteristics of the participants. Chi-squared tests were performed for categorical variables and Wilcoxon Rank Sum tests were performed for continuous variables. Bivariate and multivariate logistic regressions were performed to examine associations between immigrant status and prescription of NRT. Age, gender, education, health literacy, race/ethnicity, English language ability, inpatient service, and insurance were predictors of interest.

We implemented a variable selection method where bivariate analysis was performed for each outcome with all covariates of interest. Each covariate with a p-value < 0.10 in bivariate analysis was included into the multivariate model. We used a broader limit of p-value in our bivariate analysis to create a more inclusive multivariate model. A p-value < 0.05 was considered statistically significant for our multivariate analysis. All analyses were implemented by using SAS (version 9.3). This research was reviewed and approved by the NYU institutional review board (IRB).

Results

Our study population included 1,608 participants, of whom 343 (21%) were not born in the US. Seventy-nine percent were male, 53% had a high school diploma or less, and 19% had no health insurance. More than half (56%) of our immigrant population was Hispanic and 25% did not speak English [Table 1].

Unadjusted bivariate analysis found that immigrants were less likely to be prescribed NRT in the hospital than non-immigrants (35.7% vs. 46.1%, $p<0.001$) and similarly on discharge (15.3% vs. 19.4%, $p=0.09$). Both groups were similarly likely to accept the NRT in-hospital when prescribed [Table 2].

On multivariate analysis, being an immigrant (Odds Ratio [OR]=0.65, 95% CI 0.48–0.88) was associated with a lower likelihood of being prescribed NRT in-hospital. In addition, being Black (OR=0.52, 95% CI 0.38–0.70), other race (OR=0.57, 95% CI 0.37–0.90) or Hispanic (OR=0.63, 95% CI 0.46–0.85) was associated with lower likelihood of being prescribed NRT in-hospital (as compared to non-Hispanic whites). Being admitted to a psychiatric inpatient service was associated with greater likelihood of being prescribed NRT in hospital (OR=3.35, 95% CI 2.66–4.22) [Table 3a].

Multivariate analysis for provision of NRT prescription at discharge showed no significant differences between immigrants and non-immigrants (OR = 0.94, 95% CI 0.65–1.38). We note that age >50 years (OR=1.69, 95% CI 1.16–2.46) was associated with greater likelihood of being prescribed NRT on discharge. Having public (as compared to private) insurance (OR=0.60, 95% CI 0.37–0.98) was associated with a lower likelihood of being prescribed NRT at discharge [Table 3b].

In multivariate analysis of NRT acceptance (>50% of days offered), we found no significant differences between immigrants and non-immigrants. However, we do note that having VA insurance vs. Private insurance (OR=0.38, 95% CI 0.17–0.88) and admission to a psychiatric inpatient service (OR=0.59, 95% CI 0.39–0.88) were significantly associated with a lower likelihood of accepting NRT once prescribed [Table 4].

Though not statistically significant, immigrants who have been in the US more than 15 years were somewhat more likely to be prescribed NRT in the hospital than immigrants who have been in the US for less than 15 years (38% vs. 29%), with a similar trend on discharge (17% vs. 13%). Once prescribed, the likelihood of accepting NRT was similar for immigrant groups with differing time since immigration (76% and 77%) [Table 5].

Discussion

Our analysis showed that, even after controlling for potential confounders, immigrants have a lower likelihood of being prescribed NRT in-hospital than persons born in the US – and both groups accept the NRT at similar rates. Rates of NRT prescription on discharge are similarly low for both immigrants and non-immigrants, with no significant differences found.

Our findings are similar to those in other studies which have shown differences in medication prescribing and health care utilization by immigrants as compared to those born in the US.^{22–24} Immigrants have a lower antidepressant prescription and consumption rate than the native population of the same age and sex.²⁵ Immigrants are also more likely to use relief asthma medication rather than preventive medications.²⁶ Several studies have shown differences in perceived care, actual care, and continuous/follow up treatment between immigrants and natives, which may be a result of physician prescribing behavior.^{9,10,22} Similarly, studies have shown that providers serving minority populations that are at higher risk of certain diseases or conditions are not routinely recommending appropriate vaccines or treatment plans to their patients.^{22,27,28} The lack of time to educate patients and the cost of care are two commonly reported barriers that affect whether providers will offer vaccines and other preventive care options.^{27,29} This line of thinking may also translate to the treatment of tobacco use among immigrant populations.

One could hypothesize that insurance status could explain some of these differences in prescribing behavior, but this does not seem to be entirely the case here. During the inpatient stay, we found differences in prescribing behavior independent of insurance status – which makes sense since once a patient is in the hospital, insurance status matters less for day-to-day care than it does in the outpatient setting. On discharge, where we did not find any differences by immigrant status, we did find evidence of less prescribing for those with Medicaid or Medicare as compared to those with private insurance. If there is indeed a pattern for under-prescribing towards the publicly insured, then immigrants may be disproportionately under-prescribed medications – and we are unable to detect a statistically significant difference in our sample merely because prescribing rates were so low.

Some of the differences in care that we see may be explained by problems in communication between immigrant patients and health-care providers. Fear of deportation acts as a major barrier to undocumented immigrants' access to health care; this fear can also make it less likely that undocumented immigrants establish a consistent relationship with healthcare providers.^{30,31} Several studies have shown that it is very important for immigrant patients to have a physician who speaks their native language and understands their cultural values.^{7,31,32} One of the biggest barriers to caring for patients from diverse racial and ethnic backgrounds is overcoming cultural barriers; appropriate cultural competency training is often not stressed in many aspects of medical education.^{28,32} In addition, the immigrant population is often exposed to hazardous living and working conditions, as well as a higher risk of exclusion from social services.^{28,33} These circumstances may foster a feeling of distrust in social service systems and result in low healthcare utilization. There is often a lower priority placed on adapting health services to specific immigrant populations,³³ and provider prescribing patterns may be affected by these economic, social or political norms.

We note that migration is a multidimensional process that includes many acculturative processes and we aimed to gauge the effects of time in the US. In our analysis we found that participants who have been in the US for 15 years or more tended to have higher NRT prescription rate during hospitalizations. These results were consistent with other studies that suggest that immigrants reach the rates of activities observed among natives after 15 years of stay.²⁰ Given that the overall rate of prescribing among our immigrant population is

low, significant differences in small numbers were difficult to detect based on length of time in the US. Our results, though not statistically significant, may suggest that acculturation increases the NRT prescription rate for immigrants and that the longer one is in the US, the more like a native they are treated in the health-care system. Similarly, English speaking ability was also positively associated with higher NRT prescription rate on discharge. This is consistent with other studies that suggest a positive correlation between language and acculturative behavior.¹⁸

Our study has several limitations. Several reports describe relatively low participation rates for immigrants in research studies in general^{7,34,35}; thus, there may be differences between the immigrants that do choose to participate in research and those that don't – perhaps limiting the generalizability of our results. Our primary outcome is based on review of an electronic medical record: there may be variability in the recording of NRT acceptance rate, but it is difficult to imagine that nursing staff record medication administration differently for immigrants and those US-born. Further, there may be unmeasured confounders that would provide better explanation of the relationship between immigration status and NRT prescription, which we are unable to capture. Finally, we recognize that the act of prescribing medications reflects a complex provider-patient interaction that we cannot describe completely; unfortunately, for this analysis we used data from a parent study that did not require interest or disclosure of interest in quitting smoking. It is possible that the differences in prescription rates reflect patient-doctor discussions and higher rates of medication refusal among immigrants – rather than decreased prescription rates among physicians.

The immigrant population is one that is often hard to reach and known for its lack of civic participation.^{28,34} To address disparities in preventive care among immigrants, it is important that there be accurate collection and reporting of data on patient race and ethnicity, supportive language interpretation services, increasing awareness of health disparities and cultural competency through education of health care professionals, and increasing diversity among those delivering healthcare.^{28,32} Barriers to effective treatment may include confusion about eligibility rules, inability to communicate in English, fear that benefits will affect naturalization, and provider prescribing behavior. Our findings show differences in smoking cessation treatment between immigrants and non-immigrants (even in a safety net hospital context). Tobacco use and tobacco-related illnesses are global public health issues, and in the US, the quality of tobacco treatment for immigrants (and patient acceptance of this treatment) is one that is not well known or studied. We suggest that future studies need to be done to understand these disparities and help to ensure that immigrants in the US receive care of the same quality as the native-born.

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Table 1

Demographic characteristics of study participants at baseline, by immigrant status

		Immigrants N= 343	Non-Immigrants N= 1265	p-value
Gender	Male	276 (80.9%)	988 (78.3%)	0.30
Age	18–40	106 (30.9%)	341 (27.0%)	0.09
	41–50	87 (25.4%)	291 (23.0%)	
	50–60	86 (25.1%)	403 (31.9%)	
	60+	64 (18.7%)	230 (18.2%)	
Education	High school graduate/ GED or less	190 (55.6%)	658 (52.1%)	0.27
Health Literacy *	High	176 (51.5%)	884 (70.0%)	<0.001
	Moderate	120 (35.1%)	292 (23.1%)	
	Low	46 (13.5%)	87 (6.9%)	
Insurance *	None	103 (30.2%)	157 (12.4%)	<0.001
	VA	58 (17.0%)	412 (32.6%)	
	Private	33 (9.7%)	104 (8.2%)	
	Public	147 (43.1%)	591 (46.8%)	
Race / Ethnicity *	Hispanic	192 (56.3%)	373 (30.1%)	<0.001
	Non-Hispanic White	47 (13.8%)	302 (24.4%)	
	Non-Hispanic Black	47 (13.8%)	457 (36.9%)	
	Non-Hispanic Asian	36 (10.6%)	10 (0.8%)	
	Non-Hispanic Other	19 (5.6%)	96 (7.8%)	
English Ability *	No	87 (25.4%)	1 (0.1%)	<0.001
Inpatient Service	Psychiatry	125 (36.4%)	506 (40.1%)	0.24
Site *	Bellevue	285 (83.09%)	853 (67.43%)	<0.0001
	VA	58 (16.91%)	412 (32.57%)	
Length of time in US *	Mean (SD)	28.24 (16.73)	47.46 (13.90)	<0.0001

* Denotes P < 0.05

Table 2

Differences in tobacco use treatment received in the hospital by immigrant status

	Immigrants	Non-Immigrants	p-value
NRT Prescription Rate during Hospitalization	122 (35.7%) *	580 (46.1%) *	<0.001
NRT Acceptance Rate during Hospitalization (> 50% days accepted)	95 (79.2%)	459 (79.6%)	0.90
NRT Prescription Rate on discharge	52 (15.3%)	242 (19.4%)	0.09

* Denotes P < 0.05

Table 3

a. NRT Prescription Rates During Hospitalization: Multivariable Analysis				
		OR Estimate	95% Confidence Limits	
Immigrant status	Immigrant Yes vs No	0.65 *	0.48	0.88
Age	41–50 vs 18–40	1.30	0.96	1.77
	51–60 vs 18–40	1.01	0.741	1.37
	60+ vs 18–40	0.97	0.67	1.41
Education	Some college or greater vs High school graduate, GED, or less	0.95	0.76	1.19
Insurance	None vs Private	1.28	0.81	2.01
	Public vs Private	1.00	0.67	1.50
	VA vs Private	1.49	0.96	2.29
Race / Ethnicity	Hispanic vs Non-Hispanic White	0.63 *	0.46	0.85
	Non-Hispanic Asian vs Non-Hispanic White	0.75	0.38	1.48
	Non-Hispanic Black vs Non-Hispanic White	0.52 *	0.38	0.70
	Non-Hispanic Other vs Non-Hispanic White	0.57 *	0.37	0.90
English Ability	English language No vs Yes	0.98	0.56	1.72
Inpatient Service	Psychiatric vs Other	3.35 *	2.66	4.22

b. NRT Prescription Rates at Discharge: Multivariable Analysis				
		OR Estimate	95% Confidence Limits	
Immigrant status	Immigrant Yes vs No	0.94	0.65	1.38
Age	41–50 vs 18–40	1.20	0.79	1.82
	51–60 vs 18–40	1.69 *	1.16	2.46
	60+ vs 18–40	1.63 *	1.06	2.50
Insurance	None vs Private	0.78	0.45	1.37
	Public vs Private	0.60 *	0.37	0.98
	VA vs Private	1.48	0.89	2.43
Race / Ethnicity	Hispanic vs Non-Hispanic White	0.81	0.56	1.16
	Non-Hispanic Asian vs Non-Hispanic White	0.89	0.36	2.18
	Non-Hispanic Black vs Non-Hispanic White	0.69 *	0.49	0.98
	Non-Hispanic Other vs Non-Hispanic White	0.69	0.39	1.21
English Ability	English Language No vs Yes	0.59	0.26	1.33

* Denotes P <0.05

Table 4

NRT Acceptance Rate during Hospitalization (Accepted >50% of days offered)

		OR Estimate	95% Confidence Limits	
Immigrant status	Immigrant Yes vs No	0.92	0.52	1.61
Gender	Male vs Female	0.63	0.34	1.17
Education	Some college or greater vs High school graduate, GED, or less	0.60 [*]	0.40	0.91
Insurance	None vs Private	1.22	0.48	3.11
	Public vs Private	1.06	0.45	2.45
	VA vs Private	0.37 [*]	0.16	0.86
Race / Ethnicity	Hispanic vs Non-Hispanic White	0.42 [*]	0.24	0.74
	Non-Hispanic Asian vs Non-Hispanic White	0.57	0.16	2.08
	Non-Hispanic Black vs Non-Hispanic White	0.38 [*]	0.22	0.66
	Non-Hispanic Other vs Non-Hispanic White	0.87	0.36	2.11
Inpatient Service	Psych vs Nonpsych	0.59 [*]	0.39	0.89

* Denotes P <0.05

Table 5

Effects of Acculturation on NRT prescription and Acceptance

	Time since immigration		p-value
	<=15 years	>15 years	
NRT prescribed in hospital	25 (29.41%)	93 (37.5%)	0.19
>50% of NRT days accepted in hospital	19 (79.17%)	72 (78.26%)	0.99
NRT prescribed on discharge	11 (12.94%)	41 (16.73%)	0.49