Disparities in knowledge and use of tobacco treatment among smokers in California following healthcare reform

Kelly C. Young-Wolff[a,b,*], Sara R. Adams[a], Andy S.L. Tan[c], Alyce S. Adams[a], Daniella Klebaner[a], Cynthia I. Campbell[a], Derek D. Satre[a,b], Ramzi G. Salloum[d], Lisa Carter-Harris[e], Judith J. Prochaska[f]

[a] Division of Research, Kaiser Permanente Northern California, Oakland, CA, USA
[b] Department of Psychiatry, Weill Institute for Neurosciences, University of California, San Francisco, CA, USA
[c] Department of Social and Behavioral Health, Harvard T.H. Chan School of Public Health, Medical Oncology, Dana-Farber Cancer Institute, Boston, MA, USA
[d] Department of Health Outcomes and Biomedical Informatics, University of Florida College of Medicine, Gainesville, FL, USA
[e] Memorial Sloan Kettering Cancer Center, New York, NY, USA
[f] Stanford Prevention Research Center, Stanford University, Stanford, CA, USA

ABSTRACT

The Affordable Care Act (ACA) promised to narrow smoking disparities by expanding access to healthcare and mandating comprehensive coverage for tobacco treatment starting in 2014. We examined whether two years after ACA implementation disparities in receiving clinician advice to quit and smokers' knowledge and use of treatment resources remained.

We conducted telephone interviews in 2016 with a stratified random sample of self-reported smokers newly enrolled in the Kaiser Permanente Northern California's (KPNC) integrated healthcare delivery system in 2014 ($N = 491$; 50% female; 53% non-white; 6% Spanish language). We used Poisson regression with robust standard errors to test whether sociodemographics, insurance type, comorbidities, smoking status in 2016 (former, light/nondaily [< 5 cigarettes per day], daily), and preferred language (English or Spanish) were associated with receiving clinician advice to quit and knowledge and use of tobacco treatment. We included an interaction between smoking status and language to test whether the relation between smoking status and key outcomes varied with preferred language.

Overall, 80% of respondents received clinician advice to quit, 84% knew that KPNC offers cessation counseling, 54% knew that cessation pharmacotherapy is free, 54% used pharmacotherapy, and 6% used counseling. In multivariate models, Spanish-speaking light/nondaily smokers had significantly lower rates of all outcomes, while there was no association with other demographic and clinical characteristics.

Following ACA implementation, most smokers newly enrolled in KPNC received clinician advice to quit and over half used pharmacotherapy, yet counseling utilization was low. Spanish-language outreach efforts and treatment services are recommended, particularly for adults who are light/nondaily smokers.

1. Introduction

More than two-thirds of smokers want to quit, and more than half make at least one 24-hour quit attempt annually (Babb et al., 2017; Clinical Practice Guideline Treating Tobacco Use and Dependence 2000 Update Panel, Liaisons, and Staff, 2008). National guidelines recommend that clinicians advise smokers to quit and recommend smoking cessation counseling and pharmacotherapy, as these interventions are associated with improved quitting success (Clinical Practice Guideline Treating Tobacco Use and Dependence 2000 Update Panel, Liaisons, and Staff, 2008; Stead et al., 2013; Aveyard et al., 2012). However, groups identified as priorities for tobacco control, including young adults, racial/ethnic minorities, and low-income individuals often lack access to or cannot afford appropriate treatments. As a result, they rarely receive clinician advice to quit smoking (Browning et al., 2008; Chase et al., 2007; Cokkinides et al., 2008; Danesh et al., 2014; Houston et al., 2005; Kruger et al., 2012; Lopez-Quintero et al., 2006; Tran et al., 2010; King et al., 2013) and tend not to use pharmaceutical aids or cessation counseling (Levinson et al., 2006; Levinson et al., 2004; Rabius et al., 2004; Murphy et al., 2005).

Disparities are especially evident among Hispanic/Latino smokers, who often report interest in utilizing smoking cessation treatment (Cox et al., 2011; Cupertino et al., 2010), but are less likely than other racial/ethnic groups to receive advice to quit smoking from a healthcare professional (Houston et al., 2005; Kruger et al., 2012; Lopez-Quintero et al., 2006; Tong et al., 2006) and are less likely to use cessation treatments (Cokkinides et al., 2008; Levinson et al., 2004; Thorndike et al., 2002). This may because Hispanics/Latinos are overrepresented among light/nondaily smokers (Zhu et al., 2007; Daza et al., 2006; Gilpin et al., 1997; Myers et al., 2013; Trinidad et al., 2009), groups who also tend not to receive clinician advice to quit smoking or use cessation treatment (Danesh et al., 2014; Tong et al., 2006; Cummings et al., 1987; Koontz et al., 2004; Owen et al., 1995) despite significant light smoking-related health risks, including cardiovascular disease, cancer, respiratory and reproductive diseases and mortality (Schane et al., 2010).

Health reform holds significant promise for increasing receipt of clinician advice to quit smoking and improving access to effective tobacco treatment for all smokers. The Patient Protection and Affordable Care Act (ACA) included three provisions important for increasing smoking cessation among vulnerable populations in 2014: Medicaid expansion, the implementation of health insurance exchanges, and removal of coverage limits and pre-existing condition exclusions. The ACA also required comprehensive coverage for tobacco treatments by most private health plans and for newly eligible Medicaid beneficiaries (American Lung Association, 2014), covering at least four smoking cessation counseling sessions and 90 days of FDA-approved tobacco cessation pharmacotherapies. The law prohibited cost-sharing and prior authorization restrictions for tobacco cessation pharmacotherapy beginning in 2014 (Centers for Medicare and Medicaid Services, 2014).

Whether the ACA succeeds in reducing disparities in tobacco treatment utilization depends on the extent to which clinicians provide advice to quit smoking equitably to all smokers and whether priority populations utilize tobacco treatments at equal rates. Recent US data show that the percentage of adult smokers who reported receiving advice to quit from a health professional increased from 2010 to 2015. However, persistent inequalities in receiving cessation advice among light/non-daily smokers, Hispanics/Latinos, young adults, low-income adults, and uninsured smokers remained (Tan et al., 2018). Further, 30-day smoking prevalence declined and pharmacotherapy fills increased in states that expanded Medicaid (Young-Wolff et al., 2018; Simon et al., 2017; MacLean et al., 2017). Our prior work with smokers enrolled in California exchange or non-exchange commercial plans found that the ACA's elimination of pharmacotherapy copayments was associated with a small increase in pharmacotherapy prescription fills with a greater effect among lower-income smokers (Young-Wolff et al., 2018).

This study adds to prior work by examining whether vulnerable subgroups of smokers enrolled in healthcare in the post-ACA era are less likely than other groups to receive clinician advice to quit smoking or to know about and use tobacco treatment. In addition, because the ACA resulted in significant gains in healthcare coverage for Spanish speakers with limited English proficiency in California (The Henry J. Kaiser Family Foundation, 2013), and Spanish-speaking Hispanics/Latinos are more likely to be light smokers than English-speaking Hispanics/Latinos (Palinkas et al., 1993), we tested for an interaction between language and smoking frequency to examine whether the association of smoking status and key outcomes varied by Spanish versus English speakers.

2. Methods

2.1. Setting

The study was based in Kaiser Permanente Northern California (KPNC), an integrated healthcare system providing comprehensive health services to > 4 million members (Kaiser Permanente, 2018). KPNC membership is diverse and representative of the population living in its geographic area (Selby et al., 2005). The study was approved by the KPNC Institutional Review Board.

KPNC prioritizes smoking cessation (Goldstein et al., 2005) and provides cessation counseling in Spanish to serve the ~5% of KPNC members who prefer to speak Spanish. While most Medicaid smokers already had zero cost-sharing for FDA-approved smoking cessation pharmacotherapy in 2014, KPNC eliminated cost-sharing for all members with ACA-compliant plans on January 1, 2015, following national guidance issued in May 2014 (Centers for Medicare and Medicaid Services, 2014).

2.2. Sample

In 2016 we conducted a telephone survey of KPNC members newly enrolled in KPNC in the first six months of 2014 and identified through the electronic health record (EHR) as current smokers in the six months following enrollment. KPNC members are routinely screened for smoking at outpatient appointments by medical assistants. The survey was part of a larger study on the impact of the ACA on smoking and tobacco treatment utilization (Young-Wolff et al., 2017) and assessed patients' experiences since joining KPNC in 2014, a period which included the elimination of pharmacotherapy copayments in 2015.

Participants included "current smokers" enrolled in KPNC in 2014 through a Medicaid, California exchange, or non-exchange commercial plan, who had not been KPNC members in the 12-months prior to enrollment. Inclusion also required English or Spanish primary language and active KPNC membership in 2016. To increase statistical power with underrepresented groups, we oversampled smokers who obtained coverage through the California exchange or Medicaid and those with preferred to speak Spanish, given research indicating low pharmacotherapy use among Hispanic/Latino smokers (Young-Wolff et al., 2017). We selected and contacted patients in eleven waves using simple random sampling within language-insurance categories. Patients were assigned sample weights that were inversely proportional to the probability of selection within their language-insurance strata.

Eligible patients were mailed letters that included an explanation of the survey, a notice that they would be called in two weeks, and a toll-free number to call for more information or to decline participation. Patients were called between August 29, 2016 and December 30, 2016, by a trained interviewer who further explained the project, obtained verbal consent, and completed the ~20-minute telephone survey in English or Spanish. Of the 1114 eligible patients, 96 (9%) could not be located due to incorrect address and phone number, 327 (29%) did not respond to telephone calls, 3 were too ill to participate, and 178 (17%) declined participation or did not complete the survey. The response rate among contacted patients was 50%, yielding 509 completed surveys. Of those, 17 who indicated they were not smokers at the time of enrollment in 2014, and one patient missing income were excluded. A total of 491 surveys were included in this analysis. Spanish-speaking (70%) and Hispanic/Latino patients (62%) were more likely to complete the survey than English-speaking (45%) and non-Hispanic/Latino patients (45%) (χ^2 $ps < .001$); there were no differences in completion by other demographics.

2.3. Patient characteristics

We included tobacco-related questions on the survey and linked patients' demographic data (age, gender, race/ethnicity, median neighborhood household income, language, and insurance) from the EHR. We included the number of KPNC outpatient visits between 2014 and survey completion in 2016 (0–5, 6–10, 11–24, 25+), and comorbidities identified via International Classification of Diseases, Ninth Revision and Tenth Revision codes from the EHR: psychiatric disorders (depression, anxiety, attention deficit hyperactivity, bipolar spectrum, and psychotic disorders), substance use disorders (drug and alcohol use disorders), and medical conditions (arthritis, hypertension, chronic

Table 1

Characteristics and weighted proportions of newly enrolled health plan members who had knowledge of or used tobacco cessation treatments[a].

	Patient characteristics, N (weighted column %)	Knowledge or use of tobacco cessation treatments, N (weighted row %)							
		Clinician advised quitting	p value[b]	Patient knew about counseling/ classes	p value[b]	Patient knew pharmacotherapy was free	p value[b]	Patient used pharmacotherapy	p value[b]
Overall	491 (100)	376 (80)		396 (84)		237 (54)		233 (54)	
Gender			.08		.14		.59		.01
Female	242 (50)	195 (85)		204 (87)		120 (55)		126 (62)	
Male	249 (50)	181 (75)		192 (80)		117 (52)		107 (46)	
Age			.26		.56		.23		.09
18–25	33 (7)	23 (80)		24 (81)		16 (46)		10 (35)	
25–35	116 (31)	89 (73)		95 (79)		50 (43)		49 (45)	
35–45	107 (20)	76 (79)		85 (86)		52 (61)		52 (54)	
45–55	137 (23)	105 (82)		106 (82)		66 (59)		69 (62)	
55 +	98 (19)	83 (89)		86 (90)		53 (59)		53 (64)	
Race/ethnicity			.14		.16		.06		< .001
Non-Hispanic white	195 (47)	155 (78)		163 (82)		117 (61)		127 (68)	
Hispanic	165 (18)	111 (73)		121 (76)		50 (38)		47 (31)	
Black	63 (15)	54 (91)		54 (91)		35 (56)		29 (49)	
Other/unknown	68 (19)	56 (82)		58 (88)		35 (48)		30 (45)	
Insurance			.20		.23		.23		.39
California exchange	161 (24)	128 (86)		134 (89)		78 (60)		74 (57)	
Non-exchange commercial	164 (62)	125 (78)		133 (83)		75 (50)		67 (51)	
Medicaid	166 (14)	123 (77)		129 (79)		84 (57)		92 (60)	
Median household income			.92		.58		.01		.10
< $40 K	141 (29)	110 (78)		112 (80)		66 (44)		64 (43)	
$40 K–60 K	174 (30)	132 (80)		143 (86)		81 (47)		86 (57)	
> $60 K	176 (41)	134 (81)		141 (85)		90 (65)		83 (60)	
Any psychiatric disorder			.76		.70		.31		.18
Yes	107 (19)	85 (82)		91 (86)		61 (60)		64 (63)	
No	384 (81)	291 (79)		305 (83)		176 (52)		169 (52)	
Substance use disorder			.13		.02		.19		.11
Yes	34 (8)	30 (90)		32 (97)		22 (68)		24 (72)	
No	457 (92)	346 (79)		364 (82)		215 (52)		209 (52)	
Any medical comorbidity			.46		.34		.29		.05
Yes	255 (47)	198 (82)		208 (86)		127 (57)		136 (61)	
No	236 (53)	178 (78)		188 (82)		110 (50)		97 (48)	
Number of outpatient visits between joining KPNC in 2014 and completing the survey in 2016			.41		.50		.50		.04
0–5	89 (17)	60 (75)		67 (85)		39 (55)		29 (43)	
6–10	118 (26)	91 (75)		97 (78)		56 (45)		49 (48)	
11–25	168 (35)	125 (81)		131 (84)		79 (57)		80 (54)	
> 25	116 (22)	100 (87)		101 (88)		63 (57)		75 (70)	
Preferred language			< .001		.005		< .001		< .001
English	368 (94)	300 (81)		310 (85)		210 (55)		206 (56)	
Spanish	123 (6)	76 (59)		86 (68)		27 (27)		27 (23)	
2016 smoking status			.41		.70		.85		.01
Daily	200 (44)	165 (83)		172 (86)		107 (55)		124 (65)	
Light/nondaily	125 (19)	84 (80)		89 (82)		42 (50)		36 (39)	
Quit	166 (37)	127 (76)		135 (82)		88 (54)		73 (49)	

Abbreviation: KPNC = Kaiser Permanente Northern California.

[a] Unweighted frequencies and weighted percentages.

[b] p values from Rao-Scott $\chi 2$ tests of independence.

pain, diabetes, asthma, heart disease, and chronic obstructive pulmonary disease).

2.4. Smoking status

Among identified smokers in 2014 from EHR data (see Sample section), smoking status in 2016 was categorized as "daily", "light/nondaily", or "former" using two questions from the survey: "Do you currently smoke cigarettes?" (every day, some days, not at all) and "How many cigarettes do you usually smoke per day, on the days that you smoke?" Patients who indicated that they smoked ≥ five cigarettes every day were categorized as daily smokers. Patients who smoked some days or < five cigarettes every day were categorized as light/nondaily smokers. Patients who indicated that they smoked "not at all"

were considered former smokers.

2.5. Outcomes

All outcomes were categorized as "Yes" or "No" based on 2016 survey responses concerning patients' experiences since joining KPNC in 2014. Receipt of clinician advice to quit smoking was determined from the question, "Since joining Kaiser in 2014, has a healthcare clinician talked with you about quitting smoking cigarettes?" Knowledge of smoking cessation counseling/classes based on answering yes to either of the following questions: "Do you know that local Kaiser facilities offer in-person groups to help people quit smoking?" and "Do you know that Kaiser offers personal telephone counseling to help people quit smoking?" Patient use of cessation classes/counseling was determined

from the question, "Since joining Kaiser, which of the following methods/resources have you used to help you quit smoking cigarettes? [check all that apply]". Patients who affirmed "Kaiser health education class for quitting smoking" or "Kaiser telephone wellness coaching for quitting smoking" were considered to have used counseling/classes. Patient knowledge that pharmacotherapy was free was derived from the question, "Do you know that medications to help people quit smoking (for example, the nicotine patch) are free for most Kaiser members if they're prescribed by your doctor and filled at a Kaiser pharmacy?" Finally, pharmacotherapy use was determined from the question, "For quitting smoking have you used: nicotine gum, nicotine patch, nicotine nasal spray, nicotine inhaler, nicotine lozenge, bupropion (e.g., Zyban, Wellbutrin), varenicline or Chantix?" This question was asked of all respondents even though pharmacotherapy may not be indicated for patients who smoke < 10 cigarettes a day and includes pharmacotherapy from a source other than a KPNC pharmacy.

2.6. Statistical analysis

We first determined unweighted frequencies and weighted percentages of the survey respondents' baseline characteristics using normalized sample weights. Next, we examined the unweighted frequencies and weighted percentages for each outcome for the overall sample and for each level of the baseline characteristics. We used Rao-Scott χ^2 tests to examine the association between outcomes and patient characteristics (Rao and Scott, 1981). To examine outcomes by language and smoking status, we combined the language and smoking status variables to form a six-level variable (English-speaking daily smoker, English-speaking light/nondaily smoker, English-speaking former smoker, Spanish-speaking daily smoker, Spanish-speaking light/nondaily smoker, and Spanish-speaking former smoker) and present the weighted percentages.

We report the relative risks (RRs) of each outcome adjusted for gender, age, race/ethnicity, insurance type, income, any psychiatric disorder, substance use disorder, medical comorbidity, language, smoking status, outpatient visits, and the interaction of language and smoking status, as defined above. We used a modified Poisson regression approach with robust error variance (Zou, 2004), which provides a direct assessment of the RRs along with the 95% CIs. To account for the sampling design, we adopted a model-based strategy that does not use the weights but includes key covariates including the variables used to construct the sample weights (Winship and Radbill, 1994). Analyses were performed using SAS software, version 9.4 (SAS Institute, Inc.).

3. Results

The 491 respondents were 50% male; 47% non-Hispanic white, 18% Hispanic, 15% black, and 19% other or unknown race/ethnicity. Six percent completed the survey in Spanish and 94% in English (Table 1). Respondents were 44% daily smokers, 19% light/nondaily smokers (4% light, 15% nondaily), and 37% had quit smoking between the time of enrollment (2014) and the time of the 2016 survey (i.e., former smokers). By the combined language and smoking status strata, respondents were 42% English-speaking daily smokers, 17% English-speaking light/nondaily smokers, 35% English-speaking former smokers, 2% Spanish-speaking daily smokers, 3% Spanish-speaking light/nondaily smokers, and 2% Spanish-speaking former smokers (Fig. 1).

Overall, 80% of patients reported that their clinician had advised them to quit smoking, 54% knew pharmacotherapy was free, and 54% had used pharmacotherapy (Table 1). While 84% of patients knew KPNC offered cessation counseling, only 6% had used these services. In bivariate comparisons, Spanish-speakers and those without a substance use disorder were less likely to know about cessation counseling/classes. Patients with lower income and Spanish-speakers were less likely to know that pharmacotherapy was free at KPNC pharmacies, and males, patients with Hispanic, black or other/unknown race/ethnicity, Spanish-

speakers, and light/nondaily smokers were less likely to have used pharmacotherapy. Due to the small number of patients who used counseling/classes ($n = 20$), the bivariate comparisons resulted in small cell counts and were suppressed from Table 1 for privacy concerns.

Next, we stratified outcomes by language and smoking status. Relative to English-speaking patients regardless of smoking status and Spanish-speaking daily smokers, Spanish-speaking patients who were light/nondaily or former smokers were less likely to report that their clinician had advised them to quit (55% vs. 70%–84%), less likely to know about cessation counseling/classes (61%–65% vs. 83%–86%), less likely to use cessation counseling/classes (0% vs. 5%–7%), less likely to know that pharmacotherapy is free (17%–24% vs. 48%–55%), and less likely to have used pharmacotherapy (11%–15% vs. 44%–65%) (Fig. 1).

The adjusted relative risks (aRRs) for each outcome from multivariate models that included an interaction between language and smoking status are presented in Table 2. Patient use of counseling/classes was not modeled due to low overall prevalence (6%) and the lack of use by Spanish-speaking light/nondaily or former smokers (Fig. 1). While the interaction of language and smoking status was only statistically significant for knowledge that pharmacotherapy was free ($p = .03$) and use of pharmacotherapy ($p = .006$), there were significant differences between language-smoking status strata for all four outcomes. Spanish-speaking light/nondaily smokers were less likely to receive clinician advice to quit than other groups. English-speaking smokers (daily, aRR = 1.55, 95%CI = 1.16–2.06; light/nondaily, aRR = 1.39, 95%CI = 1.03–1.90; and former, aRR = 1.51, 95%CI = 1.14–2.01) were more likely to receive clinician advice to quit compared to Spanish-speaking light/nondaily smokers. Spanish-speaking light/nondaily smokers were also less likely to know about counseling/classes. English-speaking daily smokers (aRR = 1.37, 95%CI = 1.06–1.77) and former smokers (aRR = 1.36, 95%CI = 1.06–1.76), and Spanish-speaking daily smokers (aRR = 1.34, 95%CI = 1.02–1.75) were more likely to know about counseling/classes compared to Spanish-speaking light/nondaily smokers.

Spanish-speaking light/nondaily smokers were less likely to know pharmacotherapy was free and less likely to use pharmacotherapy compared to other categories of smokers. English-speaking smokers (daily, aRR = 4.67, 95%CI = 2.06–10.58; light/nondaily, aRR = 4.15, 95%CI = 1.79–9.58; former, aRR = 5.33, 95%CI = 2.36–12.05), and Spanish-speaking daily smokers (aRR = 3.14, 95%CI = 1.31–7.55) were more likely to know that pharmacotherapy was free compared to Spanish-speaking light/nondaily smokers. English-speaking smokers (daily, aRR = 7.09, 95%CI = 2.55–19.70; light/nondaily, aRR = 5.15, 95%CI = 1.79–14.80; former, aRR = 5.66, 95%CI = 2.02–15.81), and Spanish-speaking daily smokers (aRR = 6.03, 95%CI = 2.21–16.48) were more likely to use pharmacotherapy than Spanish-speaking light/nondaily smokers.

A few demographic or clinical characteristics were marginally associated with the outcomes. Clinician advice to quit was higher among black patients (aRR = 1.15, 95%CI = 1.00–1.32), patients with insurance through the California exchange (vs. those with Medicaid, aRR = 1.14, 95%CI = 1.00–1.29), and patients with > 25 outpatient visits (vs. ≤5, aRR 1.21, 95% CI = 1.01–1.45). Knowledge of counseling/classes was higher among patients with versus without a substance use disorder (aRR = 1.12, 95%CI = 1.00–1.26). Use of pharmacotherapy was higher among adults aged 45–54 than those aged 18–24 (aRR = 1.77, 95%CI = 1.05–2.97) and patients with > 25 outpatient visits relative to those ≤5 visits (aRR 1.50, 95%CI = 1.07–2.09).

4. Discussion

This study of disparities in receiving clinician advice to quit smoking and knowledge and use of tobacco treatment among insured smokers with easy access to tobacco treatments post-ACA implementation has three key findings. First, most smokers were advised
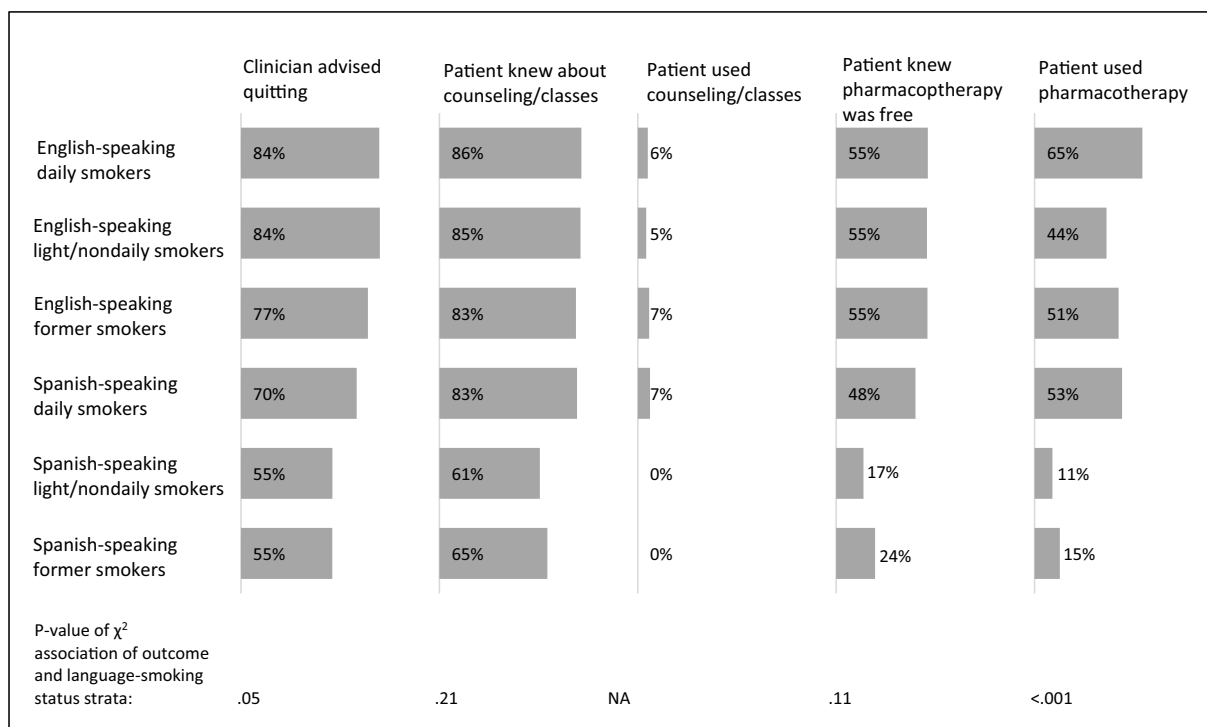
Fig. 1. Knowledge or use of tobacco cessation treatments by preferred language-smoking status strata.
Note: percentages in the figure are weighted; the unweighted frequencies and weighted percentages of the overall cohort for each of the language-smoking status strata are as follows: English-speaking daily smokers: 167 (42%), English-speaking light/nondaily smokers: 74 (17%), English-speaking former smokers: 127 (35%), Spanish-speaking daily smokers: 33 (2%), Spanish-speaking light/nondaily smokers: 51 (3%), Spanish-speaking former smokers: 39 (2%).

to quit smoking by their healthcare provider and over half knew that pharmacotherapy was free and used it, yet use of cessation counseling/ classes was low. Smoking cessation counseling is strongly associated with improved quitting success (Clinical Practice Guideline Treating Tobacco Use and Dependence 2000 Update Panel, Liaisons, and Staff, 2008) and the low usage of counseling among smokers in our study is concerning. Strategies to increase patient use of free cessation counseling are needed, including outreach to patients (e.g., via secure messages) and provider referrals and linkages to counseling services. Second, Spanish-speakers who were light/nondaily smokers or former smokers reported the lowest receipt of clinician advice to quit smoking, lowest awareness of free pharmacotherapy and counseling/classes, and lowest use of counseling/classes and pharmacotherapy. Third, accounting for language and light/non-daily smoking, there were few differences in receipt of quit smoking advice, knowledge of smoking cessation classes/counseling and free pharmacotherapy, or use of cessation treatments by age, race/ethnicity, insurance coverage, or median household income, suggesting that healthcare reform may have helped to equalize access to and use of tobacco treatments for many at-risk groups. These findings differ from our prior study of non-Medicaid patients, which found lower knowledge about free cessation pharmacotherapy among lower income commercially insured patients (Young-Wolff et al., 2018), suggesting that Medicaid patients may have greater awareness that pharmacotherapy is free than commercially insured patients.

While smoking prevalence continues to decrease in the US, the proportion of light/nondaily smokers has increased (Substance Abuse and Mental Health Services Administration, 2018; Jamal et al., 2016), and in California, most Hispanic/Latino smokers are light smokers (Zhu et al., 2007). Compared to heavier smokers, light smokers experience fewer symptoms of nicotine withdrawal (Shiffman et al., 1994), are more likely to quit without cessation interventions (Mikkelsen et al., 2015), and do not consider themselves to be at risk for smoking-related diseases (Ayanian and Cleary, 1999; Hamilton et al., 2000). Yet, light

smoking is not associated with greater quitting success among Spanish-speaking Hispanic/Latino smokers (Reitzel et al., 2009; Hayes and Borrelli, 2013). Thus disparities in receiving advice and lower awareness of cessation treatments among Spanish-speaking light/nondaily smokers is a significant issue given the adverse health effects associated with light and nondaily smoking (Schane et al., 2010). Although pharmacotherapy is not indicated for light/nondaily smokers (although some evidence suggests that light smokers benefit from use of nicotine lozenge and gum) (Shiffman et al., 2002; Shiffman, 2005; Krupski et al., 2013), there is strong clinical evidence that quitting smoking is beneficial for this group. Additional research is needed to explore factors underlying these disparities among Spanish-speakers, which could be due to language barriers, provider discrimination, patient denial or mistrust of medicine or clinicians, and differential recall of clinician advice among Spanish-speakers (Levinson et al., 2004). Beyond the health benefits, providing consistent clinician smoking cessation advice to Spanish-speaking light/nondaily smokers may have the added benefit of enhancing patient satisfaction, as smokers who talk to their healthcare providers about quitting during clinical visits report greater satisfaction with their care (Winpenny et al., 2017; Solberg et al., 2001; Barzilai et al., 2001; Holla et al., 2018).

Our analyses adjusted for Hispanic ethnicity, and findings suggest that commonly identified ethnic disparities in receiving advice to quit smoking and using cessation treatments may be explained in part by language barriers and the higher prevalence of light smoking among Spanish-speaking populations. This is consistent with prior research indicating that disparities in physician advice to quit among Hispanics/ Latinos are reduced after accounting for health status and light smoking (Levinson et al., 2004). Among Hispanics/Latinos, smokers with less acculturation are more likely to be light smokers (Rodriquez et al., 2015), and future studies should tease apart effects of preferred language versus acculturation. If Spanish-speakers are less likely to receive advice to quit smoking, it is possible that other prevention messages also are not being delivered. The extent to which Spanish-speakers are

Table 2
Adjusted relative risks of knowledge or use of tobacco cessation treatments.

	Clinician advised quitting		Patient knew about counseling/classes		Patient knew pharmacotherapy was free		Patient used pharmacotherapy	
	aRR (95% CI)	p value	aRR (95% CI)	p value	aRR (95% CI)	p value	aRR (95% CI)	p value
Gender								
Female	1.06 (0.95, 1.17)	.29	1.08 (0.99, 1.19)	.10	0.92 (0.76, 1.11)	.39	0.96 (0.80, 1.13)	.60
Male	Ref.		Ref.		Ref.		Ref.	
Age								
18–24	Ref.		Ref.		Ref.		Ref.	
25–34	1.11 (0.88, 1.41)	.37	1.12 (0.90, 1.39)	.33	0.96 (0.64, 1.44)	.84	1.45 (0.85, 2.46)	.17
35–44	1.08 (0.84, 1.38)	.56	1.12 (0.89, 1.40)	.34	1.15 (0.78, 1.72)	.48	1.67 (0.99, 2.81)	.05
45–54	1.18 (0.93, 1.49)	.18	1.10 (0.88, 1.37)	.42	1.20 (0.81, 1.78)	.36	1.77 (1.05, 2.97)	.03
55+	1.24 (0.97, 1.58)	.08	1.20 (0.96, 1.50)	.11	1.22 (0.81, 1.84)	.35	1.57 (0.92, 2.67)	.09
Race/ethnicity								
Non-Hispanic white	Ref.		Ref.		Ref.		Ref.	
Hispanic	1.09 (0.93, 1.27)	.28	1.02 (0.88, 1.18)	.78	0.93 (0.69, 1.24)	.61	0.82 (0.58, 1.16)	.26
Black	1.15 (1.00, 1.32)	.04	1.09 (0.96, 1.25)	.18	1.04 (0.79, 1.36)	.78	0.74 (0.55, 1.00)	.05
Other/unknown	1.11 (0.96, 1.28)	.16	1.07 (0.94, 1.22)	.29	0.92 (0.70, 1.22)	.56	0.85 (0.63, 1.13)	.26
Insurance								
California exchange	1.14 (1.00, 1.29)	.04	1.11 (0.99, 1.25)	.07	1.04 (0.83, 1.30)	.73	0.90 (0.73, 1.11)	.32
Non-exchange commercial	1.10 (0.96, 1.25)	.17	1.10 (0.98, 1.23)	.12	1.01 (0.80, 1.29)	.92	0.85 (0.68, 1.07)	.16
Medicaid	Ref.		Ref.		Ref.		Ref.	
Median household income								
< $40 K	Ref.		Ref.		Ref.		Ref.	
$40 K–60 K	0.99 (0.87, 1.11)	.81	1.04 (0.93, 1.16)	.52	1.03 (0.81, 1.31)	.81	1.12 (0.89, 1.40)	.33
> $60 K	0.99 (0.87, 1.12)	.88	1.01 (0.90, 1.14)	.82	1.12 (0.89, 1.41)	.35	1.09 (0.87, 1.37)	.44
Any psychiatric disorder								
Yes	0.98 (0.87, 1.11)	.79	1.03 (0.93, 1.15)	.58	1.12 (0.90, 1.38)	.32	1.03 (0.84, 1.25)	.79
No	Ref.		Ref.		Ref.		Ref.	
Substance use disorder								
Yes	1.06 (0.92, 1.23)	.42	1.12 (1.00, 1.26)	.049	1.15 (0.88, 1.51)	.31	1.14 (0.87, 1.48)	.35
No	Ref.		Ref.		Ref.		Ref.	
Any medical comorbidity								
Yes	0.96 (0.86, 1.07)	.46	0.99 (0.90, 1.09)	.82	0.97 (0.80, 1.17)	.74	1.06 (0.88, 1.28)	.56
No	Ref.		Ref.		Ref.		Ref.	
Number of outpatient visits between joining KPNC in 2014 and completing the survey in 2016								
0–5	Ref.		Ref.		Ref.		Ref.	
6–10	1.09 (0.91, 1.30)	.35	1.04 (0.90, 1.21)	.58	0.97 (0.73, 1.30)	.84	1.06 (0.76, 1.49)	.73
11–25	1.06 (0.89, 1.26)	.54	0.98 (0.85, 1.14)	.81	0.95 (0.71, 1.26)	.72	1.24 (0.89, 1.73)	.20
> 25	1.21 (1.01, 1.45)	.04	1.06 (0.91, 1.24)	.47	0.98 (0.71, 1.35)	.90	1.50 (1.07, 2.09)	.02
Preferred language-smoking status strata[a]								
English-speaking daily smokers	1.55 (1.16, 2.06)	.003	1.37 (1.06, 1.77)	.02	4.67 (2.06, 10.58)	< .001	7.09 (2.55, 19.70)	< .001
English-speaking light/nondaily smokers	1.39 (1.03, 1.90)	.03	1.26 (0.96, 1.66)	.10	4.15 (1.79, 9.58)	< .001	5.15 (1.79, 14.80)	.002
English-speaking former smokers	1.51 (1.14, 2.01)	.005	1.36 (1.06, 1.76)	.02	5.33 (2.36, 12.05)	< .001	5.66 (2.02, 15.81)	< .001
Spanish-speaking daily smokers	1.30 (0.94, 1.79)	.11	1.34 (1.02, 1.75)	.04	3.14 (1.31, 7.55)	.01	6.03 (2.21, 16.48)	< .001
Spanish-speaking light/nondaily smokers	Ref.		Ref.		Ref.		Ref.	
Spanish-speaking former smokers	1.10 (0.77, 1.56)	.60	1.17 (0.87, 1.57)	.29	2.03 (0.79, 5.21)	.14	2.22 (0.72, 6.91)	.17

Abbreviations: aRR = adjusted relative risk; CI = confidence interval; KPNC = Kaiser Permanente Northern California.

Note: Results for each outcome are from one model that included an interaction between language (English or Spanish) and smoking status (daily, light/nondaily, former).

[a] Language-smoking status multiplicative interaction terms: clinician advised quitting (Spanish-speaking by daily smoker: $p = .39$, Spanish-speaking by former smoker: $p = .94$); patient knew about counseling (Spanish-speaking by daily smoker: $p = .19$, Spanish-speaking by former smoker: $p = .64$); patient knew pharmacotherapy was free (Spanish-speaking by daily smoker: $p = .03$, Spanish-speaking by former smoker: $p = .006$, Spanish-speaking by former smoker: $p = .24$); patient used pharmacotherapy (Spanish-speaking by daily smoker: $p = .37$); patient knew about counseling (Spanish-speaking by daily smoker: $p = .37$).

affected by other disparities in health services access and preventive care is unclear. Some research suggests that while the ACA helped to reduce disparities in healthcare access and utilization among English-speaking Hispanics/Latinos, disparities among Spanish-speakers remained (Alcala et al., 2017).

While KPNC clinical visits and smoking cessation classes and counseling are available in Spanish, results from this study suggest that additional work is needed to engage Spanish-speaking light/nondaily smokers in cessation treatment. This could include Spanish-language outreach efforts and consistent clinician advice to quit, education for Spanish-speakers about the harms of light/nondaily smoking, and culturally sensitive smoking cessation interventions for Spanish-speaking light/nondaily smokers. Further, because light smokers tend to minimize their own smoking risks, messages focused on the harms of secondhand smoke exposure may be more effective in helping them quit smoking than messages focused on personal health risks (Tong et al., 2006; Schane et al., 2013; Schane and Glantz, 2008). This may be especially important because Latino light daily smokers are less likely than Latino heavy daily smokers to believe that their smoking may negatively affect their children's health (Hayes and Borrelli, 2013), suggesting that Spanish-language outreach that highlights the harms of secondhand smoke associated with light smoking may be particularly effective.

4.1. Limitations

This study has several limitations. Our survey was limited to self-reported data in 2016 among smokers newly enrolled in KPNC in 2014, and findings may not be generalizable to uninsured smokers or those who have been enrolled in KPNC for longer periods of time. Cost-sharing for pharmacotherapy was eliminated in KPNC in 2015 for most patients, and we are not able to differentiate whether use of pharmacotherapy occurred before versus after cost-sharing elimination. Further, consistent with national surveys on behavioral risk factors (Substance Abuse and Mental Health Services Administration, 2018; Centers for Disease Control and Prevention, 2017), our survey response rate was 50%; however, while English-speaking and non-Hispanic patients were less likely to complete the survey than Spanish-speaking and Hispanic patients, there were no other demographic differences in survey completion rates. Outcomes were not measured prior to enrollment in KPNC, so we cannot evaluate changes over time in patient receipt of clinician advice to quit smoking, or knowledge or use of tobacco cessation interventions. The survey assessed patient use of KPNC smoking cessation counseling/classes and may have underestimated patients' use of services. Our smoking status variables are self-reported, which may result in misclassification of quitting. Our sample size did not allow us to look at light and non-daily smokers separately. However, cessation pharmacotherapy is not recommended for nondaily and very light smokers, and we anticipate similar challenges in engaging these types of smokers into counseling because of low perceived harm relative to daily and moderate/heavy smokers.

5. Conclusions

Clinician advice to quit smoking and patient use of smoking cessation interventions are associated with improved quitting success (Stead et al., 2013; Aveyard et al., 2012) and the ACA holds promise to narrow disparities in smoking cessation by equalizing access to effective treatments. Our findings suggest that following ACA implementation, most self-reported smokers newly enrolled in KPNC were advised to quit by their healthcare provider and over half used pharmacotherapy, yet counseling was underutilized. We did not find disparities related to clinician advice or patient use or knowledge of tobacco control services by race/ethnicity, age, gender or income; however, we did find that Spanish-speaking light smokers were less likely than other groups to receive advice to quit and had lower knowledge and use of cessation

treatments, suggesting missed intervention opportunities. To maximize the potential benefit of the ACA on tobacco control, clinicians should provide Spanish-language advice to quit and tailor outreach efforts to enhance access and extend treatment services to Spanish-speaking adults who are light or nondaily smokers.

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