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Berry, Jonathan
Hilts, Katy
Thoma, Lynn
et al.

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Patient Awareness, Perceptions, and Attitudes Towards Pharmacists Prescribing Tobacco Cessation Medications

Jonathan Berry[a], **Katy Ellis Hilts**[b], **Lynn Thoma**[a,c], **Robin L. Corelli**[d], **Timothy E. Stump**[e], **Patrick O. Monahan**[e], **Karen Suchanek Hudmon**[c,d]

[a]Pharmacy Department, HealthLinc, Valparaiso, IN 46383, USA

[b]School of Public Health, Indiana University, Indianapolis, IN 46202, USA

[c]Department of Pharmacy Practice, College of Pharmacy, Purdue University, West Lafayette, IN 47902

[d]Department of Clinical Pharmacy, University of California-San Francisco, San Francisco, CA 94143

[e]Biostatistics and Data Management Core, Indiana University Simon Comprehensive Cancer Center, Indianapolis, IN 46202

Abstract

Background—Recent legislative advances now permit pharmacists to prescribe tobacco cessation medications in 17 states. While national initiatives are underway to prepare the pharmacy profession for this expanded role, patient perceptions of this role have not been explored.

Objective—The objective of this study was to characterize patient perceptions, attitudes, and awareness of pharmacists prescribing for tobacco cessation medications.

Corresponding author: Karen Hudmon, Purdue University College of Pharmacy, 575 Stadium Mall Drive, West Lafayette, IN 47902, hudmon@purdue.edu.

CRediT author contributions:
Conceptualization: JB, KSH, KEH, RLC, LT
Methodology: JB, KSH, KEH, RLC, LT
Formal analysis: KSH, TES, POM
Writing—Original draft: JB, KSH
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Jonathan Berry, Katy Hilts, Lynn Thoma, Robin Corelli, Timothy Stump, Patrick Monahan, and Karen Hudmon declare no conflicts of interest.

Declaration of interests
The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Methods—A cross-sectional survey of English and Spanish-speaking patients was conducted at 12 locations of a federally-qualified health center in Northwest Indiana. Survey measures assessed sociodemographics, tobacco use history and interest in quitting, prior interactions with pharmacists and awareness of pharmacists' ability to prescribe tobacco cessation medications, and perceptions of pharmacists assisting with cessation. The Theory of Planned Behavior (TPB) served as a framework for item development. Multivariable logistic regression was used for modeling.

Results—A total of 2082 individuals (1878 English, 204 Spanish) completed the survey (42.4%). Among current users (n=592; 28.4%), 46.2% had made a quit attempt in the past year, and 41.0% reported having used a tobacco cessation medication in the past. Over half (60.5%) of current users would be comfortable talking with a pharmacist about quitting, 31.9% intended to talk with a pharmacist about quitting, and 31.7% intended to ask a pharmacist to prescribe a medicine to help with quitting. In multivariable modeling, intention to (a) talk with a pharmacist about quitting and (b) ask a pharmacist to prescribe a medication were significantly associated with TPB constructs. Current tobacco users were receptive to pharmacist-facilitated assistance with quitting, including prescribing of tobacco cessation medications.

Conclusions—Patients' attitudes, subjective norms, and perceived behavioral control, from the Theory of Planned Behavior, were important predictors of intention to engage with pharmacists for quitting and intention to ask a pharmacist to prescribe a cessation medication.

Keywords

Scope of Practice; Pharmacist Prescribing; Pharmacist Prescriptive Authority; Smoking Cessation; Tobacco Cessation

INTRODUCTION

For decades, tobacco use has remained a significant public health concern in the United States. In 2020, approximately 47.1 million adults (19.0%) currently used at least one form of tobacco, with high variability in use and tobacco-related disease across population subgroups.[1] In particular, the prevalence of smoking among underserved populations receiving care at federally qualified health centers (FQHCs) in 2014 was 67% higher compared to the overall US population (28.1% versus 16.8%).[2]

Despite the known negative health effects of smoking, little progress has been made in recent decades toward increasing the number of patients who receive advice to quit smoking or who use evidence-based medications to assist with quitting.[3] To address these gaps in care, in 2017, the U.S. Centers for Medicare and Medicaid Services (CMS) encouraged states to increase access to "medically necessary" drugs, including smoking cessation therapies, through expanded scope of practice for pharmacists.[4] In doing this, CMS acknowledged pharmacists are a largely untapped resource to increase utilization of smoking cessation medications among Medicaid beneficiaries.[4] Indeed, pharmacists are perhaps the most accessible healthcare professionals (88.9% of Americans live within 5 miles of a pharmacy[5]) and can address barriers that patients face when attempting to engage with primary care providers. These include long waits for appointments, time and travel to see providers, and limited availability of physician appointments outside of typical

working hours.[6,7] As such, there is increased interest in pharmacist-facilitated tobacco treatment services across healthcare settings, especially those providing care to underserved populations.[2]

In 2004, New Mexico became the first state to enhance access to tobacco cessation treatments through a statewide protocol permitting pharmacists to prescribe all tobacco cessation medications.[8] Since then, 16 additional states have adopted a similar approach through the use of statewide protocols or standing orders that allow pharmacists to prescribe tobacco cessation medications without a collaborative practice agreement.[9,10]

Published data support the role of pharmacists in prescribing cessation medications. Two studies conducted in New Mexico estimated that pharmacists could help patients achieve quit rates of 18% to 25%.[11,12] However, few studies have evaluated patient perspectives on the role of pharmacists in the delivery of tobacco cessation interventions.[13–15] Tobacco users who have received cessation counseling perceive community pharmacists to be a viable and accessible resource for assistance with quitting.[14,15] Similarly, 63% of individuals purchasing nonprescription nicotine replacement therapy products reported that receiving assistance from a pharmacist would increase the likelihood of a successful quit attempt.[13] While evidence suggests that tobacco users are receptive to cessation counseling delivered by pharmacists, no studies have evaluated patient perceptions of pharmacists *prescribing* tobacco cessation medications. To address this gap and to inform the development of future tobacco cessation initiatives that meet the needs of patients, the objective of this study was to characterize patient awareness, perceptions, and attitudes towards pharmacists prescribing tobacco cessation medications, including the intention to engage in pharmacy-based cessation services.

METHODS

Study Design

This cross-sectional survey, conducted at 12 locations of a FQHC serving vulnerable patient populations in Northwest Indiana, e.g., individuals who have minimal access to care, such as no insurance or under-insured, low income, housing instability, and/or lack of transportation. English- and Spanish-speaking adult patients (≥18 years) were recruited at the point of registration for primary care appointments. Eligible patients included current, former, and never tobacco or nicotine users. While registering for their clinic appointments, patients were asked via the web-based registration platform to participate in a research survey. They also were provided with an option to be entered into a drawing to receive one of ten $50 online gift cards. Individuals who opted to participate immediately received a link to a consent document and the survey, sent either by text or to the email address in their patient profile. The survey, administered online using Qualtrics[16] was piloted at one location for two weeks prior to launching to the remaining sites. Pilot testing, which began on March 21, 2022, ensured feasibility of distribution of the survey at the point of registration for patient appointments. No changes were needed, and recruitment continued through May 26, 2022. Survey responses were anonymous, and the study was approved by the Purdue University Human Research Protection Program.

Survey Development and Measures

The study investigators developed survey items, described below, based on standard survey development practices,[17] a previous tobacco cessation survey,[13] and core constructs from the Theory of Planned Behavior[18]: perceived behavioral control, subjective norms, attitudes, and behavioral intention. While not part of the main survey, interested patients had an opportunity to request follow-up from a pharmacy team member to receive assistance with quitting. However, to protect the anonymity of responses, this information was not connected to responses in the main survey.

The survey was iteratively reviewed by three researchers with extensive backgrounds in tobacco cessation research and two pharmacists working in a FQHC. Text was forward-translated into Spanish, then back-translated into English by certified translators.

Sociodemographics, tobacco use history, and interest in quitting.— Respondents were asked to report their gender, age, ethnicity, and race. Current tobacco use status, assessed by asking, “Do you currently smoke cigarettes, use e-cigarettes or vape products, or any other type of tobacco?,” classified respondents as current, former, or never users. Respondents who indicated they were current or former users and had tried to quit in the past were also asked (a) if they had used a medicine to help with quitting, and, if yes, (b) which medication(s) had been used, and (c) if current tobacco users, whether they were interested in quitting.

Prior interactions with pharmacists and awareness of pharmacists’ ability to prescribe tobacco cessation medications.—All respondents, regardless of their current tobacco use status, were asked if they had ever been asked by a pharmacist if they smoke, vape, or use any other types of tobacco. Current and former users were also asked if they had ever been advised by a pharmacist to quit (response options for both items: yes, no, I don’t remember). Respondents who answered “yes” were then questioned on the context in which the pharmacist asked and/or advised (response options: while picking up or dropping off a prescription, when purchasing an over-the-counter medication, when discussing health-related issues, other, I don’t remember; categories not mutually exclusive). All respondents were asked if they were aware that pharmacists could prescribe tobacco cessation medications, and current tobacco users were asked if they were aware that tobacco cessation medications might be covered by their insurance.

Perceptions of pharmacists assisting with tobacco cessation.—All current tobacco users responded to a list of statements developed from the Theory of Planned Behavior,[18] for which they could respond agree, disagree, or unsure. Items included were (a) I am confident I would be able to receive help from my pharmacist with quitting (perceived behavioral control), (b) I would be comfortable talking with a pharmacist about quitting (attitude), (c) My pharmacist could increase my chances of quitting for good (attitude), (d) People who are important to me would be supportive of me receiving help from a pharmacist for quitting (subjective norms), (e) I intend to talk with a pharmacist about quitting (intention), and (f) I intend to ask a pharmacist to prescribe a medicine to help me

quit (intention). One additional item was included: “It would be convenient for me to get help with quitting at my pharmacy.”

Statistical Analyses

Descriptive statistics were used to characterize the study population and their responses to survey items. Reported data include English- and Spanish-survey respondents, except where indicated. The two dependent variables consisted of (a) intention to talk with a pharmacist about quitting smoking and (b) intention to ask a pharmacist about prescribing a medicine to quit smoking. Characteristics of independent variables are reported for the overall sample and separately for two groups (agree versus disagree/unsure) for each dependent variable. Bivariate analyses between independent and dependent variables were performed with the two-sided Fisher’s exact and Pearson chi-squared test for categorical variables. Perceived behavioral control, subjective norms, and attitude items were entered into a multivariable logistic regression model to test whether these items were associated with the two dependent variables. Covariates in both regression models included age, gender, race, ethnicity, prior attempt to quit, prior use of a medicine to quit, awareness that pharmacists can prescribe quit-smoking medications, and awareness that medicines to help quit smoking might be covered by insurance. These covariates, selected *a priori,* were either known to be associated with tobacco use[1] and/or were factors that were hypothesized to contribute to engagement with pharmacists for cessation assistance. For each predictor, results are displayed for the odds ratios and 95% confidence intervals, p-values for the likelihood ratio omnibus test over all categories, and the Wald test p-values for specific categories compared to a reference category. These are reported for the multivariable models as well as the bivariate models, for comparison. Data were analyzed using SPSS version 28.0[19] and R version 4.3.0.[20]

RESULTS

Study Population

Of 4914 patients who received a study invitation at their appointment registration, 2171 (n=1950 English; n=221 Spanish) consented to participate (44.2%). Of these, 89 records (n=72 English, n=17 Spanish) were deleted because the tobacco use status question was not completed. This yielded a sample size for analysis of 2082 (42.4% of 4914; n=1878 English, n=204 Spanish). Sociodemographic data, stratified by English versus Spanish respondents, indicate that the majority of respondents were women, ages 25–44, non-Hispanic/Latino, and White (Table 1).

Of the total population, 28.4%, 21.3%, and 50.2% were current, former, and never tobacco users, respectively (Table 1). Among current tobacco users, cigarettes were the most commonly-used form of tobacco followed by e-cigarettes or other vaping products (Table 2; omits n=12 Spanish-survey respondents because of small numbers). Among English-survey respondents, approximately 10% reported using more than one form of tobacco/vaping products. Nearly half reported having tried to quit in the past year, and 41.0% had used a medicine in the past to help with quitting. The most common were the nicotine patch, followed by varenicline, bupropion SR, nicotine gum, and lozenge. The nicotine inhaler and nasal spray were used infrequently (≤2.1%).

Nearly one third (30.6%) wanted to quit in the next month. Via the separate and unlinked survey, 221 study participants (37.3% of all current tobacco users) requested assistance from a pharmacist for quitting.

Prior Interactions with Pharmacists and Awareness of Pharmacists' Ability to Prescribe Tobacco Cessation Medications—Of all respondents, 390 (18.8%) reported that they had ever been asked by a pharmacist if they smoke, vape, or use any other types of tobacco. Of these, 177 (45.4%) indicated that they were asked when discussing health-related issues, while picking up a prescription (n=111; 28.5%), while dropping off a prescription (n=26; 6.7%), when purchasing an over-the-counter medication (n=14; 3.6%), at other times (n=31; 7.9%), or they didn't remember (n=90; 23.1%).

Among current and former tobacco users, 153 (14.9%) reported having been advised to quit by a pharmacist. Advising occurred when discussing health-related issues (n=78; 51.9%), picking up a prescription (n=41; 26.8%), dropping off a prescription (n=14; 9.2%), purchasing an over-the-counter medication (n=8; 5.2%), at other times (n=15; 9.8%), or they didn't remember (n=29; 19.0%). Just over half (53.5%) of current tobacco users reported being aware that tobacco cessation medications might be covered by their insurance, and 35.1% of all respondents were aware that pharmacists can prescribe tobacco cessation medications in Indiana. This included 35.7% of current tobacco users.

Perceptions of Pharmacists Assisting With Tobacco Cessation—Nearly half of current tobacco users (47.7%) indicated that they were confident they would be able to receive help from a pharmacist with quitting, and 60.5% would be comfortable talking with a pharmacist about quitting (Table 3). Furthermore, 43.8% believe that a pharmacist could increase their chances of quitting for good, and 75.3% thought that people who are important to them would support receiving assistance with quitting from a pharmacist. Regarding intentions, almost one third intended to talk with a pharmacist about quitting and have a pharmacist prescribe them a medicine to help with quitting (Table 3). Finally, 65.4% believed that it would be convenient to get help with quitting at their pharmacy.

Bivariate Analyses.—Tables 4 and 5 show results for bivariate associations between predictors (demographics, quit behaviors, and scales scores) and the two dependent outcome variables. The intention outcomes are defined as agreeing (versus disagreeing or being unsure) to the question, "I intend to talk with a pharmacist about quitting" (outcome #1; Table 4) and the question, "I intend to ask a pharmacist to prescribe a medicine to help me quit" (outcome #2; Table 5).

Those who reported intention to talk with a pharmacist (outcome #1) were significantly more likely (Tables 4 and 5) to be in the 25–44 age range (marginally significant in Table 5), to be black or African American, to have tried quitting in the past year, and to have ever used a cessation medicine. With respect to the TPB constructs, they were more (a) confident in their ability to receive help from a pharmacist with quitting (perceived behavioral control), (b) likely to agree that people important to them would be supportive of them receiving help from a pharmacist with quitting (subjective norms), (c) likely to feel comfortable talking with a pharmacist about quitting (attitude), and (d) likely to believe

that a pharmacist could increase their chances of quitting for good (attitude). The second dependent variable, “intention to ask a pharmacist to prescribe a medicine to help with quitting” (outcome #2) exhibited similar significant relationships with the same set of independent variables; however, respondents who were unaware “that medicines for quitting, including non-prescription medicines, might be covered on your insurance” were more likely to intend to ask a pharmacist to prescribe a medicine for quitting.

The final three sets of rows in Tables 4 and 5 illustrate the bivariate exploration of combining the two attitude items into a combination. All three combination attitude variables were strongly associated with both intention outcomes; however, there was sparseness in the number who agreed to neither attitude variable among those who agreed to the intention variables; furthermore, the multivariable models described next demonstrated narrower confidence intervals for the parsimonious third version with 2-categories (agree to both attitude items [1] versus agree to neither or only one [0]), and exhibited comparable model fit to the less parsimonious (extra degree of freedom) and sparser-category first option of scoring neither (0), only one (1), or both (2). Thus, we used this two-category combination attitude scale score (both vs neither or only one) in the multivariable models.

Logistic Regression Models.—Tables 6 and 7 display results for the multivariable models for testing associations between predictors and behavioral intention. After adjusting for other variables in the model, those who intended to talk with a pharmacist about quitting (outcome #1, Table 6) had a 3.5 greater odds of being in the 25–44 age category (vs age 18–24), were 3 times more likely to be black or African American (vs white), and had nearly twice the odds of having ever (vs not) used medicine to help quit. With respect to the TPB constructs, they were nearly twice as confident (vs not confident; perceived behavioral control) in their ability to receive help from their pharmacist with quitting, had almost 5 times the odds of feeling supported (vs not) to talk with a pharmacist (subjective norms), and approximately 12 times the odds of endorsing (vs not endorsing) both attitude statements (Table 6).

After adjusting for other variables in the model, those who intended to ask a pharmacist to prescribe a medicine to help them quit (outcome #2; Table 7) had nearly 3 times greater odds to be black or African American (vs white), had approximately 2.3-fold higher odds of trying to quit in the past year (vs never trying), had twice the odds of having ever (vs not) used medicine to help quit, were less likely to be aware that medicines could be covered by insurance (OR = 0.37). They exhibited approximately 9 times the odds of endorsing (vs not endorsing) both attitude statements (Table 6). They also were marginally ($0.05 < p < 0.10$) more confident that they would be able to receive help from a pharmacist (perceived behavioral control) and had more normative support.

DISCUSSION

In recent decades, the role of the pharmacy profession in assisting patients with tobacco cessation has evolved substantially. The various initiatives fall under three umbrellas: (a) developing and disseminating a shared, comprehensive tobacco cessation curriculum for integrating into pharmacy school coursework,[21–24] (b) implementing widespread trainings

for practicing pharmacists and their support staff (e.g., pharmacy technicians),[25,26] and (c) advancing legislation permitting pharmacists to prescribe the FDA-approved tobacco cessation medications.[9,27] Given that the average wait time for a physician appointment in 2022 was 26 days,[7] prescriptive authority for pharmacists substantially broadens patients' access points for obtaining medications at the time when they are ready to quit. As of July 2023, pharmacists in 16 states have this authority,[9,10] and more states have legislation in process. While research has shown that pharmacists' prescribing is effective,[11,12] and the quit rates of various providers are comparable, [2828] no published research has described patients' perceptions of engaging with pharmacists who can prescribe tobacco cessation medications.

In multivariable modeling, the Theory of Planned Behavior constructs (perceived behavioral control, subjective norms, and attitudes) were informative in predicting patients' reported intentions. Adjusting for covariates, individuals who intended to talk with a pharmacist about quitting were more confident that they would be able to receive help with quitting from their pharmacist, more likely to feel supported by others who are important to them to talk with a pharmacist, and were more likely to endorse both attitude statements (comfort in talking with a pharmacists about quitting, and belief that a pharmacist can increase chances of quitting for good). Those who intended to ask a pharmacist to prescribe medicine also were much more likely to endorse both attitude statements. Individuals who were unaware that cessation agents might be covered by insurance were more likely to intend to ask a pharmacist to prescribe a medicine, possibly because they were interested to learn more about their prescription drug benefits. These results will inform the design of practice-based interventions, including modified tobacco screening processes and messaging to raise patient awareness and advertise tobacco cessation services provided by pharmacists.

Across practice settings, there is significant room for improvement in screening for tobacco use. [28 27] In this study, fewer than 1 in 5 patients reported having been asked by a pharmacist about tobacco use. This is not surprising, because historically pharmacies have inconsistently integrated tobacco use assessments into routine workflow,[13] perhaps in large part due to time-related barriers to implementation.[29] One study, conducted within a community pharmacy, demonstrated that systematically asking all patients about tobacco use led to interventions that more than doubled sales of non-prescription nicotine replacement therapy products ($p < 0.015$).[30] Other research has shown pharmacies to be effective in generating referrals to the tobacco quitline, as a result of asking patients about tobacco use.[31,32] One proposed solution to enhance identification of tobacco users, which appears to be effective, is to integrate pharmacy technicians into the screening process.[33,34] Additionally, enhanced effort is needed to work toward viable business models that provide reimbursement for this cognitive service.

Although future engagement with a pharmacist for cessation assistance and actual quit attempts were not assessed in this cross-sectional study, integrating the survey into appointment registrations effectively identified 221 patients (37.3% of current smokers) who, at the conclusion of the survey, requested to be contacted by a pharmacist for assistance with quitting. This unanticipated positive finding from the research itself suggests that adding routine screening for tobacco use in community pharmacy settings will

increase the likelihood of identifying patients who would benefit from assistance. Finally, an important consideration is that while the majority of current tobacco users smoked cigarettes, nearly one third used e-cigarettes or other vaping devices, and just over 10% used more than one form of tobacco and/or vaping device. As vaping continues to rise in the US,[1] this reveals a need for pharmacy-based cessation services to target vaping as well as dual product use.

Strengths of the study include the large sample size, 12 clinical sites with varying patient populations, and robust representation from current, former, and never tobacco users. Additionally, this study focused on a priority population at FQHCs, which exhibits a differentially higher prevalence of tobacco use.[2] Despite these strengths, participant responses were self-reported and therefore might be subject to recall or social desirability biases. Furthermore, it is possible that individuals who are less likely to visit healthcare facilities were under-represented. Finally, our ability to more closely examine specific tobacco-related factors among Hispanic populations was limited by the relatively small number of Spanish survey respondents who reported tobacco use. Future studies should attempt to characterize workflow processes for implementation of tobacco cessation services, approaches to enhancing referrals to prescribing pharmacists for assistance with quitting, and the impact of these interventions on long-term cessation outcomes among under-resourced populations.

Conclusions

Current tobacco users in FQHCs were receptive to the concept of pharmacist-facilitated assistance with quitting, including prescribing of tobacco cessation medications. Patients' attitudes, subjective norms, and perceived behavioral control, from the Theory of Planned Behavior, were important predictors of intention to engage with pharmacists for quitting and intention to ask a pharmacist to prescribe a cessation medication. Integration of a brief survey into the patient registration process was an effective means for identifying tobacco users and gauging their interest in receiving assistance from a pharmacist for quitting.

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Table 1

Sociodemographic characteristics and tobacco use status (n=2082), stratified by English versus Spanish survey respondents (n, %)

Characteristic	Category	English (n=1878)	Spanish (n=204)
Gender[a]	Male	395 (21.7)	45 (22.7)
	Female	1408 (77.2)	142 (71.7)
	Other	12 (0.7)	2 (1.0)
	Prefer not to say	8 (0.4)	9 (4.5)
Age[a]	18–24	180 (9.9)	14 (7.1)
	25–44	829 (45.5)	112 (56.6)
	45–64	632 (34.7)	64 (32.2)
	65 or older	158 (8.7)	7 (3.5)
	Prefer not to say	24 (1.3)	1 (0.5)
Hispanic or Latino[a]	Yes	247 (13.5)	195 (98.5)
	No	1536 (84.3)	1 (0.5)
	Prefer not to say	40 (2.2)	2 (1.0)
Race[a]	White	1383 (75.9)	84 (42.4)
	Black or African American	214 (11.7)	3 (1.5)
	American Indian or Alaska Native	24 (1.3)	1 (0.5)
	Asian	9 (0.5)	0 (0.0)
	Native Hawaiian or other Pacific Islander	3 (0.2)	1 (0.5)
	More than one race	80 (4.4)	2 (1.0)
	Other	72 (3.9)	77 (38.9)
	Prefer not to say	38 (2.1)	30 (15.2)
Tobacco use status	Current	580 (30.9)	12 (5.9)
	Former	424 (22.6)	20 (9.8)
	Never	874 (46.5)	172 (84.3)

[a] n=1823 English and n=198 Spanish items were completed (<3% missing data).

Table 2

Tobacco use history among current tobacco users who responded to the English language survey (n=580[a,b])

Characteristic	Category	n (%)
Tobacco product(s) used[c]	Cigarettes	440 (75.9)
	E-cigarettes or other vaping products	171 (29.5)
	Any other type of tobacco such as cigars, hookah, or snuff	35 (6.0)
	Use of more than one type of product	60 (10.3)
Last quit attempt	In the past year	268 (46.2)
	More than a year ago	212 (36.6)
	I have not tried to quit	100 (17.2)
Past use of cessation medication	Yes	238 (41.0)
	No	329 (56.7)
	Not sure	13 (2.2)
Cessation medication(s) used[c]	Nicotine gum	92 (38.7)
	Nicotine lozenge	31 (13.0)
	Nicotine patch	157 (66.0)
	Nicotine inhaler	5 (2.1)
	Nicotine nasal spray	0 (0.0)
	Bupropion SR	101 (42.4)
	Varenicline	114 (47.9)
Are you considering quitting?	Yes, in the next month	170 (30.6)
	Yes, in the next 6 months	164 (29.5)
	Yes, but not in the next 6 months	117 (21.1)
	No, I'm not interested in quitting	104 (18.7)

[a] Because of small cell sizes, omits n=12 Spanish-survey respondents who were current tobacco users.

[b] Missing data < 5%.

[c] Categories not mutually exclusive.

Table 3

Current tobacco users' (n=555[a]) perceptions of pharmacists assisting with tobacco cessation: Theory of Planned Behavior constructs.

"Please indicate whether you agree or disagree with the following statements about receiving help from a pharmacist for quitting (smoking, vaping, or using other types of tobacco)."			
Survey item (construct)	**Disagree**	**Unsure**	**Agree**
I am confident I would be able to receive help from my pharmacist with quitting (perceived behavioral control)	50 (9.0%)	240 (43.2%)	265 (47.7%)
I would be comfortable talking with a pharmacist about quitting (attitude)	82 (14.8%)	137 (24.7%)	336 (60.5%)
I believe that a pharmacist could increase my chances of quitting for good (attitude)	76 (13.7%)	236 (42.5%)	243 (43.8%)
People who are important to me would be supportive of me receiving help from a pharmacist for quitting (subjective norms)	35 (6.3%)	102 (18.4%)	418 (75.3%)
I intend to talk with a pharmacist about quitting (intention)	120 (21.6%)	258 (46.5%)	177 (31.9%)
I intend to ask a pharmacist to prescribe a medicine to help me quit (intention)	130 (23.4%)	249 (44.9%)	176 (31.7%)

[a]Missing data < 5%; because of small cell sizes, omits n=12 Spanish-survey respondents who were current tobacco users.

Table 4

Variable characteristics by “behavioral intention” outcome #1: “I intend to talk with a pharmacist about quitting.”

Characteristic	Overall N = 555[1]	Disagree/Unsure N = 378[1]	Agree N = 177[1]	p-value[2]
What is your age? (in years)				0.017
18–24	43 (7.8%)	37 (9.9%)	6 (3.4%)	
25–44	261 (47.5%)	165 (44.1%)	96 (54.5%)	
45–64	231 (42.0%)	161 (43.0%)	70 (39.8%)	
65 or older	15 (2.7%)	11 (2.9%)	4 (2.3%)	
(Missing)	5	4	1	
Which of the following best describes you?				0.163
Female	418 (76.0%)	290 (77.7%)	128 (72.3%)	
Male	132 (24.0%)	83 (22.3%)	49 (27.7%)	
(Missing)	5	5	0	
Are you Hispanic or Latino?				0.359
No	490 (90.7%)	335 (91.5%)	155 (89.1%)	
Yes	50 (9.3%)	31 (8.5%)	19 (10.9%)	
(Missing)	15	12	3	
Which of the following best describes you?				0.017
White	437 (80.3%)	308 (83.7%)	129 (73.3%)	
Black or African American	57 (10.5%)	32 (8.7%)	25 (14.2%)	
Other	50 (9.2%)	28 (7.6%)	22 (12.5%)	
(Missing)	11	10	1	
When was the last time you tried to quit?				<0.001
I have not tried to quit	96 (17.3%)	73 (19.3%)	23 (13.0%)	
In the past year	254 (45.8%)	150 (39.7%)	104 (58.8%)	
More than a year ago	205 (36.9%)	155 (41.0%)	50 (28.2%)	
Have you ever used a medicine to help you with quitting?				0.004
No/not sure	322 (58.0%)	235 (62.2%)	87 (49.2%)	
Yes	233 (42.0%)	143 (37.8%)	90 (50.8%)	
Are you aware that pharmacists in Indiana can prescribe medicines to help you quit smoking, vaping, or using other types of tobacco?				0.267
No	358 (64.5%)	238 (63.0%)	120 (67.8%)	

Characteristic	Overall N = 555[1]	Disagree/Unsure N = 378[1]	Agree N = 177[1]	p-value[2]
Yes	197 (35.5%)	140 (37.0%)	57 (32.2%)	
Are you aware that medicines for quitting, including non-prescription medicines, might be covered on your insurance?				0.140
No	355 (64.0%)	234 (61.9%)	121 (68.4%)	
Yes	200 (36.0%)	144 (38.1%)	56 (31.6%)	
I am confident I would be able to receive help from my pharmacist with quitting. (perceived behavioral control)				<0.001
Disagree/Unsure	290 (52.3%)	241 (63.8%)	49 (27.7%)	
Agree	265 (47.7%)	137 (36.2%)	128 (72.3%)	
People who are important to me would be supportive of me receiving help from a pharmacist for quitting. (subjective norms)				<0.001
Disagree/Unsure	137 (24.7%)	130 (34.4%)	7 (4.0%)	
Agree	418 (75.3%)	248 (65.6%)	170 (96.0%)	
I would be comfortable talking with a pharmacist about quitting. (attitude1)				<0.001
Disagree/Unsure	219 (39.5%)	203 (53.7%)	16 (9.0%)	
Agree	336 (60.5%)	175 (46.3%)	161 (91.0%)	
I believe that a pharmacist could increase my chances of quitting for good. (attitude2)				<0.001
Disagree/Unsure	312 (56.2%)	284 (75.1%)	28 (15.8%)	
Agree	243 (43.8%)	94 (24.9%)	149 (84.2%)	
combination of attitude1 and attitude2				<0.001
Agree to neither	183 (33.0%)	175 (46.3%)	8 (4.5%)	
Agree to only one	165 (29.7%)	137 (36.2%)	28 (15.8%)	
Agree to both	207 (37.3%)	66 (17.5%)	141 (79.7%)	
combination attitude binary, 1 or more agree				<0.001
Agree to neither	183 (33.0%)	175 (46.3%)	8 (4.5%)	
Agree to 1 or more	372 (67.0%)	203 (53.7%)	169 (95.5%)	
combination attitude binary, both agree				<0.001
Agree to neither or only one	348 (62.7%)	312 (82.5%)	36 (20.3%)	
Agree to both	207 (37.3%)	66 (17.5%)	141 (79.7%)	

[1] n (%)

[2] Fisher's exact test; Pearson's Chi-squared test

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Table 5

Variable characteristics by “behavioral intention” outcome #2: “I intend to ask a pharmacist to prescribe a medicine to help me quit.”

Characteristic	Overall N = 555[1]	Disagree/Unsure N = 379[1]	Agree N = 176[1]	p-value[2]
What is your age? (in years)				0.064
18–24	43 (7.8%)	35 (9.3%)	8 (4.6%)	
25–44	261 (47.5%)	169 (45.1%)	92 (52.6%)	
45–64	231 (42.0%)	158 (42.1%)	73 (41.7%)	
65 or older	15 (2.7%)	13 (3.5%)	2 (1.1%)	
(Missing)	5	4	1	
Which of the following best describes you?				0.421
Female	418 (76.0%)	288 (77.0%)	130 (73.9%)	
Male	132 (24.0%)	86 (23.0%)	46 (26.1%)	
(Missing)	5	5	0	
Are you Hispanic or Latino?				0.528
No	490 (90.7%)	335 (91.3%)	155 (89.6%)	
Yes	50 (9.3%)	32 (8.7%)	18 (10.4%)	
(Missing)	15	12	3	
Which of the following best describes you?				0.007
White	437 (80.3%)	310 (84.0%)	127 (72.6%)	
Black or African American	57 (10.5%)	32 (8.7%)	25 (14.3%)	
Other	50 (9.2%)	27 (7.3%)	23 (13.1%)	
(Missing)	11	10	1	
When was the last time you tried to quit?				<0.001
I have not tried to quit	96 (17.3%)	77 (20.3%)	19 (10.8%)	
In the past year	254 (45.8%)	154 (40.6%)	100 (56.8%)	
More than a year ago	205 (36.9%)	148 (39.1%)	57 (32.4%)	
Have you ever used a medicine to help you with quitting?				<0.001
No/not sure	322 (58.0%)	238 (62.8%)	84 (47.7%)	
Yes	233 (42.0%)	141 (37.2%)	92 (52.3%)	
Are you aware that pharmacists in Indiana can prescribe medicines to help you quit smoking, vaping, or using other types of tobacco?				0.071
No	358 (64.5%)	235 (62.0%)	123 (69.9%)	

Characteristic	Overall N = 555[1]	Disagree/Unsure N = 379[1]	Agree N = 176[1]	p-value[2]
Yes	197 (35.5%)	144 (38.0%)	53 (30.1%)	
Are you aware that medicines for quitting, including non-prescription medicines, might be covered on your insurance?				0.003
No	355 (64.0%)	227 (59.9%)	128 (72.7%)	
Yes	200 (36.0%)	152 (40.1%)	48 (27.3%)	
I am confident I would be able to receive help from my pharmacist with quitting. (perceived behavioral control)				<0.001
Disagree/Unsure	290 (52.3%)	235 (62.0%)	55 (31.2%)	
Agree	265 (47.7%)	144 (38.0%)	121 (68.8%)	
People who are important to me would be supportive of me receiving help from a pharmacist for quitting. (subjective norms)				<0.001
Disagree/Unsure	137 (24.7%)	124 (32.7%)	13 (7.4%)	
Agree	418 (75.3%)	255 (67.3%)	163 (92.6%)	
I would be comfortable talking with a pharmacist about quitting. (attitude1)				<0.001
Disagree/Unsure	219 (39.5%)	201 (53.0%)	18 (10.2%)	
Agree	336 (60.5%)	178 (47.0%)	158 (89.8%)	
I believe that a pharmacist could increase my chances of quitting for good. (attitude2)				<0.001
Disagree/Unsure	312 (56.2%)	277 (73.1%)	35 (19.9%)	
Agree	243 (43.8%)	102 (26.9%)	141 (80.1%)	
combination of attitude1 and attitude2				<0.001
Agree to neither	183 (33.0%)	173 (45.6%)	10 (5.7%)	
Agree to only one	165 (29.7%)	132 (34.8%)	33 (18.8%)	
Agree to both	207 (37.3%)	74 (19.5%)	133 (75.6%)	
combination attitude binary, 1 or more agree				<0.001
Agree to neither	183 (33.0%)	173 (45.6%)	10 (5.7%)	
Agree to 1 or more	372 (67.0%)	206 (54.4%)	166 (94.3%)	
combination attitude binary, both agree				<0.001
Agree to neither or only one	348 (62.7%)	305 (80.5%)	43 (24.4%)	
Agree to both	207 (37.3%)	74 (19.5%)	133 (75.6%)	

[1] n (%)

[2] Fisher's exact test; Pearson's Chi-squared test

Table 6

Univariable and multivariable logistic regression modeling of intent outcome #1: “I intend to talk with a pharmacist about quitting.”

Characteristic	N	Bivariable models			Multivariable models		
		OR[1]	95% CI[1]	p-value	OR[1]	95% CI[1]	p-value
What is your age? (in years)	550			**0.014**			**0.017**
18–24		—	—		—	—	
25–44		3.59	1.56, 9.73	**0.005**	3.52	1.23, 11.3	**0.024**
45–64		2.68	1.16, 7.32	**0.033**	1.89	0.63, 6.24	0.271
65 or older		2.24	0.50, 9.37	0.269	5.87	0.82, 37.9	0.069
Which of the following best describes you?	550						
Female		—	—		—	—	
Male		1.34	0.88, 2.01	**0.164**	1.26	0.71, 2.23	0.431
Are you Hispanic or Latino?	540						
No		—	—		—	—	
Yes		1.32	0.71, 2.40	0.360	1.40	0.56, 3.43	0.462
Which of the following best describes you?	544			**0.020**			**0.008**
White		—	—		—	—	
Black or African American		1.87	1.06, 3.27	**0.030**	2.99	1.37, 6.61	**0.006**
Other		1.88	1.03, 3.39	**0.038**	2.37	0.93, 5.99	0.069
When was the last time you tried to quit?	555			**<0.001**			**0.011**
I have not tried to quit		—	—		—	—	
In the past year		2.20	1.31, 3.81	**0.004**	1.88	0.90, 4.00	0.095
More than a year ago		1.02	0.59, 1.83	0.935	0.86	0.39, 1.90	0.702
Have you ever used a medicine to help you with quitting?	555						
No/not sure		—	—		—	—	
Yes		1.70	1.19, 2.44	**0.004**	1.84	1.06, 3.21	**0.031**
Are you aware that pharmacists in Indiana can prescribe medicines to help you quit smoking, vaping, or using other types of tobacco?	555						
No		—	—		—	—	
Yes		0.81	0.55, 1.18	0.268	0.90	0.49, 1.67	0.748
Are you aware that medicines for quitting, including non-prescription medicines, might be covered on your insurance?	555						
No		—	—		—	—	

Characteristic	N	Bivariable models			Multivariable models		
		OR[1]	95% CI[1]	p-value	OR[1]	95% CI[1]	p-value
Yes		0.75	0.51, 1.09	0.140	0.57	0.31, 1.04	0.071
I am confident I would be able to receive help from my pharmacist with quitting. (perceived behavioral control)	555						
Disagree/Unsure		—	—		—	—	
Agree		4.60	3.13, 6.84	**<0.001**	1.82	1.03, 3.20	**0.036**
People who are important to me would be supportive of me receiving help from a pharmacist for quitting. (subjective norms)	555						
Disagree/Unsure		—	—		—	—	
Agree		12.7	6.23, 30.7	**<0.001**	4.96	2.07, 13.9	**<0.001**
Combination attitude score	555						
Agree to neither or only one		—	—		—	—	
Agree to both		18.5	11.9, 29.5	**<0.001**	11.6	6.76, 20.4	**<0.001**

[1]OR = Odds Ratio, CI = Confidence Interval

Table 7

Univariable and multivariable logistic regression modeling of intent outcome #2: “I intend to ask a pharmacist to prescribe a medicine to help me quit.”

Characteristic	N	Bivariable models			Multivariable models		
		OR[1]	95% CI[1]	p-value	OR[1]	95% CI[1]	p-value
What is your age? (in years)	550			**0.047**			0.339
18–24		—	—		—	—	
25–44		2.38	1.11, 5.72	**0.036**	1.63	0.64, 4.49	0.324
45–64		2.02	0.93, 4.88	**0.091**	1.10	0.41, 3.13	0.857
65 or older		0.67	0.09, 3.14	0.643	0.72	0.07, 5.09	0.755
Which of the following best describes you?	550						
Female		—	—		—	—	
Male		1.18	0.78, 1.79	0.421	1.13	0.65, 1.94	0.665
Are you Hispanic or Latino?	540						
No		—	—		—	—	
Yes		1.22	0.65, 2.21	0.529	1.15	0.48, 2.68	0.747
Which of the following best describes you?	544			**0.009**			**0.001**
White		—	—		—	—	
Black or African American		1.91	1.08, 3.34	**0.024**	2.92	1.41, 6.12	**0.004**
Other		2.08	1.14, 3.76	**0.016**	3.19	1.35, 7.49	**0.008**
When was the last time you tried to quit?	555			**<0.001**			**0.047**
I have not tried to quit		—	—		—	—	
In the past year		2.63	1.53, 4.72	**<0.001**	2.35	1.15, 4.96	**0.022**
More than a year ago		1.56	0.88, 2.86	**0.138**	1.63	0.76, 3.56	0.214
Have you ever used a medicine to help you with quitting?	555						
No/not sure		—	—		—	—	
Yes		1.85	1.29, 2.66	**<0.001**	2.03	1.21, 3.44	**0.008**
Are you aware that pharmacists in Indiana can prescribe medicines to help you quit smoking, vaping, or using other types of tobacco?	555						
No		—	—		—	—	
Yes		0.70	0.48, 1.03	**0.072**	0.98	0.55, 1.73	0.934
Are you aware that medicines for quitting, including non-prescription medicines, might be covered on your insurance?	555						
No		—	—		—	—	

Characteristic	N	Bivariable models			Multivariable models		
		OR[1]	95% CI[1]	p-value	OR[1]	95% CI[1]	p-value
Yes		0.56	0.38, 0.82	**0.004**	0.37	0.20, 0.65	**<0.001**
I am confident I would be able to receive help from my pharmacist with quitting. (perceived behavioral control)	555						
Disagree/Unsure		—	—		—	—	
Agree		3.59	2.47, 5.28	**<0.001**	1.65	0.97, 2.81	0.065
People who are important to me would be supportive of me receiving help from a pharmacist for quitting. (subjective norms)	555						
Disagree/Unsure		—	—		—	—	
Agree		6.10	3.45, 11.7	**<0.001**	2.04	1.01, 4.37	0.054
Combination attitude score	555						
Agree to neither or only one					—	—	
Agree to both					9.32	5.52, 16.2	**<0.001**

[1]OR = Odds Ratio, CI = Confidence Interval