# Treatment Barriers Among Younger and Older Socioeconomically Disadvantaged Smokers

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Among US adults younger than 65 years, 30% of the medically uninsured and Medicaid enrollees are current cigarette smokers compared with 15% of adults with private health insurance.[1] Smokers with lower incomes are less likely to use evidence-based smoking cessation treatments, like pharmacotherapy and counseling, than smokers with higher incomes.[2-4] In an analysis of the 2010 National Health Interview Survey, among smokers who were attempting to quit, only 29.9% of Medicaid enrollees used a cessation aid compared with 37.1% of individuals with private health insurance.[3] The low rate of smoking cessation treatment utilization (CTU) among low-income smokers likely contributes to the socioeconomic disparity in smoking prevalence among US adults.

Socioeconomically disadvantaged smokers experience barriers to CTU at the healthcare provider and psychosocial levels. The present study organizes these barriers to CTU in a conceptual framework informed by elements of Social Cognitive Theory (SCT),[5,6] the Transtheoretical (Stages of Change) Model,[7] and the Biopsychosocial Model of Perceived Discrimination (**Figure**).[8] Drawing from SCT, the framework emphasizes the influence of healthcare provider and psychosocial factors on CTU. The Stages of Change Model highlights the roles that precontemplation, contemplation, and action play in enacting behavior change. The Biopsychosocial Model of Perceived Discrimination elucidates how perceptions of healthcare provider bias influence CTU.

Healthcare providers may lack the time or motivation to discuss smoking cessation treatments with their patients.[9] Competing treatment demands may play an especially important role with socioeconomically disadvantaged patients.[10] A lack of knowledge regarding insurance coverage for cessation treatment in this population and skepticism about treatment effectiveness[11] likely contribute to underadministration of treatment. Furthermore, not discussing smoking cessation treatments in a culturally sensitive manner can contribute to low CTU rates.[12]

Social environment characteristics also influence smokers' propensity to utilize cessation treatment. Indeed, smokers who live with another smoker are less likely to utilize cessation treatments

## ABSTRACT

**OBJECTIVES:** Underutilization of smoking cessation treatments contributes to high rates of smoking in socioeconomically disadvantaged populations. Guided by a conceptual framework, the present study explored how healthcare provider factors, social environment characteristics, and cessation beliefs influence treatment utilization among low-income smokers and whether these associations vary by age.

**STUDY DESIGN:** Analyses were conducted on baseline data from 2406 participants enrolled in a randomized controlled trial that evaluated the effectiveness of a proactive outreach cessation intervention among a sample of younger (18-34 years) and older (35-64 years) smokers enrolled in public healthcare assistance programs.

**METHODS:** Multivariable logistic regression models predicted past year cessation treatment utilization (CTU) among younger and older smokers. Independent variables included measures of healthcare provider factors, social environment characteristics, and cessation beliefs.

**RESULTS:** Younger smokers were less likely to have CTU than older smokers (27.2% vs 36.2%; *P* <.001). In both groups, number of cigarettes per day, more problems accessing healthcare, receiving medication-related cessation advice, and readiness to quit were positively associated with CTU (*P* <.05). Among younger smokers, living with another smoker was associated with lower odds of CTU while receipt of cessation advice was associated (*P* = .033) with higher odds of CTU.

**CONCLUSIONS:** In this sample of low-income smokers, interest in quitting was high but treatment utilization was low. Increasing utilization of cessation treatments via interventions that target issues specific to low-income smokers, including healthcare provider access and advice, the home environment, and motivation to quit, is an important step toward reducing smoking rates in this population.

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## TAKEAWAY POINTS

Underutilization of cessation treatments contributes to high rates of smoking in socioeconomically disadvantaged populations. A conceptual framework was developed to assess the influence of healthcare provider factors, social environment characteristics, and beliefs about cessation treatment among younger (18-34 years) and older (35-64 years) low-income smokers. Regression models using variables from our conceptual framework predicted baseline cessation treatment utilization (CTU) among younger and older smokers enrolled in a proactive outreach tobacco treatment randomized controlled trial. Results indicate that cessation advice from healthcare providers, characteristics of the home environment, and cessation beliefs predict treatment use and that these predictors are consistent across age groups.

‣ Younger and older socioeconomically disadvantaged smokers share common predictors of CTU.

‣ Difficulty accessing healthcare, receipt of medication-related cessation advice, and readiness to quit are positively associated with CTU.

‣ Bolstering rates of physician-delivered treatment advice may reduce socioeconomic disparities in smoking prevalence.

than those not living with a smoker.[13] It is hypothesized that other characteristics of smokers' social environments, including perceived social support and social norms, also influence CTU. Other data show that psychosocial factors pertaining to cessation beliefs, including readiness to quit and self-efficacy for quitting, influence smokers' CTU.[14,15] Smokers who believe that they will stop smoking in the next year are more likely to utilize treatment than those who do not believe they will quit in the next year.[16]

Although the conceptual framework asserts that socioeconomically disadvantaged smokers share many common barriers to CTU, it is hypothesized that the influence of these barriers may vary as a function of age. Younger smokers engage in frequent quit attempts,[17] but they use cessation treatments at lower rates than older smokers.[16,18-21] This age disparity in CTU could be due to age-related differences in nicotine dependence, use of healthcare resources, social environment, and cessation-related beliefs.[17,22]

As such, examining the factors that influence CTU separately for younger and older smokers may inform more effective cessation interventions for these smokers. The primary aim of the present study was to examine the predictors of CTU among smokers enrolled in publicly subsidized healthcare programs, with a focus on healthcare provider and psychosocial barriers. A secondary objective was to determine whether the predictors of CTU differ by age. Analyses are intended to inform future interventions designed to increase CTU in socioeconomically disadvantaged populations and to elucidate how healthcare provider factors influence the propensity with which these smokers utilize cessation treatment.

## METHODS

### Study Design

We used baseline data from a randomized controlled trial evaluating the effectiveness of a proactive care tobacco cessation outreach intervention in a sample of adult smokers enrolled in Minnesota Health Care Programs (MHCP).[23] MHCP is a state-funded health insurance plan for low-income Minnesota residents comprising 2 publicly subsidized healthcare programs: Medicaid and MinnesotaCare. The study population sample was stratified by age group (18-24, 25-34, and 35-64 years), gender, and healthcare program (Medicaid and MinnesotaCare). Institutional review board approval for the study was obtained from the University of Minnesota and the Minnesota Department of Human Services.
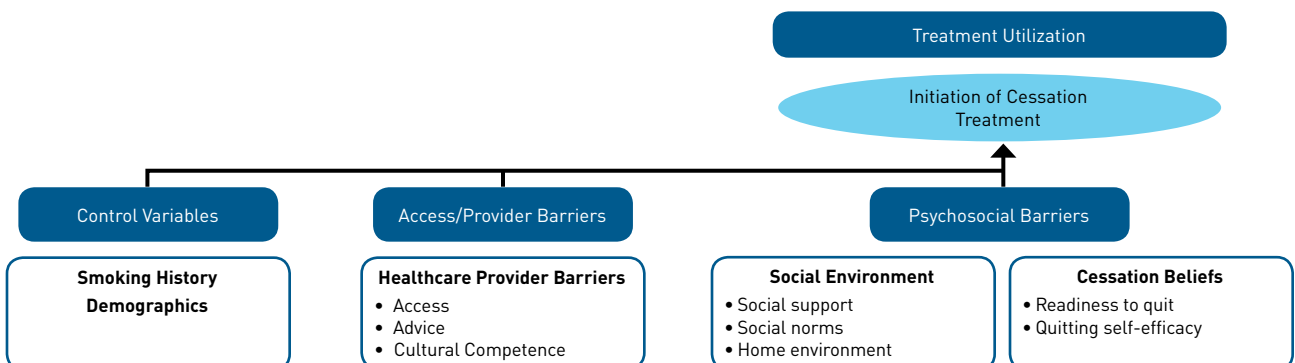
### Study Setting and Participants

Eligibility criteria included: 1) a valid home address, 2) proficiency in English, and 3) current cigarette smoking (having smoked a cigarette in the past 30 days, even as little as 1 puff). Baseline surveys were mailed to 21,181 prospective participants aged 18 to 64 years who were MHCP clients. A total of 9362 baseline surveys were returned. Of these, 6826 individuals did not meet study inclusion criteria and 130 declined to participate. The remaining smokers

**FIGURE.** Conceptual Framework: Predictors of Cessation Treatment Utilization

(n = 2406) were enrolled in the study and randomized to proactive outreach or usual care.

## Conceptual Framework: Predictors of Smoking Cessation Treatment Utilization

To conform to the proposed conceptual framework, distinct blocks of variables relating to healthcare provider factors and psychosocial characteristics were formed on the basis of their underlying constructs. Blocks assessing demographics and smoking history were also formed to enable block adjustment for known predictors of CTU. The demographic factors assessed were insurance type, gender, race/ethnicity, education, employment status, and income. In terms of smoking history, the California Tobacco Survey[24] and the CDC Behavioral Risk Factor Surveillance System[25] assessed lifetime duration of smoking, time until first cigarette upon waking, and quit attempts in the past year.

## Healthcare Provider Barriers

*Access to healthcare.* A composite variable measuring healthcare access was created by summing 5 items pertaining to cost of care, transportation, and ease of access. Each item was assessed on a 3-point scale, with higher scores indicating greater healthcare provider barriers. Participants also indicated whether they had a regular doctor.

*Healthcare provider cessation advice.* Healthcare Effectiveness Data and Information Set tobacco performance measures[26] were used to assess participants' past year healthcare experiences, including the receipt of advice to quit, to use cessation medications, to use ways (besides products) to help with quitting, and the receipt of any cessation-related care.

*Healthcare provider bias/cultural competence.* A composite variable measuring healthcare provider bias was created by taking the mean of 3 items from the Physician Bias and Interpersonal Cultural Competence Measures Scale.[27] Each item was assessed on a 5-point scale, with higher values indicating greater physician bias.

## Psychosocial Barriers: Social Environment

*Social support.* A composite variable measuring perceived social support for cessation was created by taking the mean of 2 support-related variables.[28] Another composite variable measuring overall social support was created by taking the mean of 6 general social support-related variables, pertaining to issues like help with housework, monetary assistance, and emotional support. Both of these variables were assessed on a 5-point scale, with higher scores indicating greater support.

*Social norms.* Participants reported the proportion of their close friends and family who smoke.

*Home environment.* Participants reported whether they lived with a child younger than 18 years, whether they lived with another smoker, and smoking rules within their home.

## Psychosocial Barriers: Cessation Beliefs

*Self-efficacy.* Self-efficacy for quitting was measured on a scale from 1 to 10, with higher values indicating greater confidence in quitting.[28]

*Readiness to quit.* Readiness to quit on a scale from 1 to 10 was assessed using the Contemplation Ladder (CL), with higher values indicating greater readiness to quit.[29]

*Treatment utilization.* Items assessed past-year use of nicotine replacement therapy (NRT) products, prescription cessation medications, and behavioral counseling.

## Statistical Analysis

The 2 younger age strata (18-24 and 25-34 years) were merged into a single group (n = 1320) due to similarities with respect to the independent variables of interest and to increase the power of the regression analyses; the older age group (35-64 years; n = 1086) was not altered. The younger and older groups were compared across baseline demographics, smoking history, healthcare provider barriers, social environment characteristics, and cessation beliefs using $t$ tests and $\chi^2$ tests.

Separately for the 2 age groups, we fitted a logistic regression model for past-year smoking CTU (ie, NRT, prescription medication, and/or behavioral counseling) at baseline using variables from the conceptual model as predictors. To evaluate the constructs presented in the conceptual model, we examined the contribution of each block of predictors using a likelihood ratio test comparing the fitted model with a model where a given block of predictors was dropped. Adjusted odds ratios (aORs) and 95% confidence intervals (CIs) are also reported for all individual predictors in the regression models.

In the regression models performed for the younger and older age groups, there were 252 (19%) and 249 (23%) missing observations, respectively. Due to this high percentage of missing data, an imputation procedure was performed and logistic regression models were run on the resulting imputed datasets, with results aggregated using standard methods for multiple imputation. In general, the estimates and associated CIs obtained with the imputed datasets were consistent in terms of direction, magnitude, and statistical significance compared with those obtained using the original dataset. One exception was the "presence of another smoker in the home" estimate obtained for the younger age group, which was no longer statistically significant in the regression model run on the imputed datasets, although similar to the original model in direction and magnitude.

# RESULTS

## Comparison of Younger and Older Age Groups

Younger smokers reported lower levels of nicotine dependence than older smokers and had lower rates of past year CTU (27.2% vs 36.2%; *P* <.001) (**Table 1**). The younger and older age groups differed on

**TABLE 1.** Demographics, Smoking History, and Treatment Utilization of Younger Versus Older Smokers

| Characteristic | Younger (n = 1320) | Older (n = 1086) | Total (N = 2406) | P |
|---|---|---|---|---|
| | N (%) or Mean ± SD (median) | | | |
| Demographics | | | | |
|   Insurance type | | | | |
|     Medicaid | 1018 (77.1) | 731 (67.3) | 1749 (72.7) | <.001 |
|     MinnesotaCare | 302 (22.9) | 355 (32.7) | 657 (27.3) | |
|   Male | 304 (23.0) | 403 (37.1) | 707 (29.4) | <.001 |
|   Race/ethnicity | | | | |
|     White | 1028 (77.9) | 857 (78.9) | 1885 (78.4) | <.001 |
|     Black or African American | 119 (9.0) | 137 (12.6) | 256 (10.6) | |
|     American Indian or Alaskan Native | 96 (7.3) | 71 (6.5) | 167 (6.9) | |
|     Hispanic or Latino | 28 (2.1) | 14 (1.3) | 42 (1.8) | |
|     Asian or Pacific Islander | 49 (3.7) | 7 (0.6) | 56 (2.3) | |
|   Education | | | | |
|     Grade 11/lower | 169 (13.1) | 153 (14.4) | 322 (13.7) | .003 |
|     High school grad/GED | 393 (30.4) | 388 (36.6) | 781 (33.2) | |
|     Some college | 576 (44.5) | 401 (37.8) | 977 (41.5) | |
|     College grad/higher | 156 (12.1) | 118 (11.1) | 274 (11.6) | |
|   Employment | | | | |
|     Employed/self-employed | 781 (60.4) | 425 (39.8) | 1206 (51.1) | <.001 |
|     Student | 136 (10.5) | 26 (2.4) | 162 (6.9) | |
|     Out of work | 187 (14.5) | 120 (11.3) | 307 (13.0) | |
|     Unable to work/disabled | 100 (7.7) | 453 (42.5) | 553 (23.4) | |
|     Homemaker | 90 (7.0) | 43 (4.0) | 133 (5.6) | |
|   Yearly income | | | | |
|     <$10,000 | 437 (35.0) | 420 (40.1) | 857 (37.3) | <.001 |
|     $10,001-$20,000 | 369 (29.5) | 351 (33.5) | 720 (31.4) | |
|     $20,001-$40,000 | 308 (24.6) | 184 (17.6) | 492 (21.4) | |
|     >$40,000 | 136 (10.9) | 92 (8.8) | 228 (9.9) | |
| Smoking history | | | | |
|   Cigarettes per day | 10.9 ± 7.4 (10) | 16.9 ± 10.0 (15) | 13.6 ± 9.2 (10) | <.001[a] |
|   Duration (years) | 10.6 ± 5.4 (33) | 32.1 ± 9.5 (11) | 20.3 ± 13.1 (17) | <.001[a] |
|   Time until first cigarette upon waking (minutes) | | | | |
|     ≤5 | 273 (30.0) | 344 (32.0) | 617 (26.0) | <.001 |
|     6-15 | 329 (25.3) | 360 (33.5) | 689 (29.0) | |
|     16-30 | 190 (14.6) | 166 (15.5) | 356 (15.0) | |
|     31-60 | 195 (15.0) | 90 (8.4) | 285 (12.0) | |
|     >60 | 316 (24.3) | 114 (10.6) | 430 (18.1) | |
|   Past year quit attempt | 765 (58.7) | 522 (49.0) | 1287 (54.3) | <.001 |
| Treatment utilization | | | | |
|   Medication (past year) | 348 (26.4) | 385 (35.5) | 733 (30.5) | <.001 |
|   Counseling (past year) | | | | |
|     Phone | 23 (1.9) | 31 (3.2) | 54 (2.5) | .055 |
|     Group | 7 (0.6) | 5 (0.5) | 12 (0.6) | .838 |
|     1-on-1 | 16 (1.3) | 21 (2.2) | 37 (1.7) | .133 |
|   Any cessation treatment used (past year) | 359 (27.2) | 393 (36.2) | 752 (31.3) | <.001 |

GED indicates general education diploma.
[a]Satterthwaite test.

measures of healthcare access, receipt of cessation advice from their healthcare provider, and perceptions of physician bias. The groups also differed on social support, social norms for smoking, and home environment (**Table 2**).

## Predictors of Past Year Treatment Utilization by Age Group

Evaluating the conceptual model in the younger age group, access to healthcare, physician cessation advice, and readiness to quit were significantly associated with CTU (all *P* <.05) (**Table 3**).

With respect to individual predictors, participants who received any form of cessation care from their healthcare provider had higher odds of CTU than those who had not received cessation care (aOR, 1.87; 95% CI, 1.19-2.94; *P* = .007). Participants whose healthcare provider had discussed smoking cessation medications had higher odds of CTU than those who indicated that their healthcare provider had not discussed these medications (aOR, 3.90; 95% CI, 2.46-6.20; *P* <.001). Surprisingly, difficulty of healthcare access was associated with higher odds of CTU (aOR, 1.12; 95% CI, 1.04-1.20; *P* = .004). Participants who live with another smoker had lower odds of CTU than those who do not live with another smoker (aOR, 0.69; 95% CI, 0.49-0.97; *P* = .033). Higher CL scores were associated with higher odds of CTU (aOR, 1.27; 95% CI, 1.17-1.37; *P* <.001) (**Table 4**).

Evaluating the conceptual model in the older age group, access to healthcare and physician cessation advice were significantly associated with CTU (all *P* <.05). Readiness to quit was also significantly associated with CTU (*P* <.001) (Table 3).

With respect to the individual predictors, participants whose healthcare provider had discussed smoking cessation medications had higher odds of CTU than those who indicated that their healthcare provider had not discussed these medications (aOR, 4.24; 95% CI, 2.70-6.67; *P* <.001). Higher CL scores were associated with higher odds of CTU (aOR, 1.38; 95% CI, 1.27-1.50; *P* <.001). Unexpectedly, higher scores on difficulty of healthcare access were associated with higher odds of CTU (aOR, 1.11; 95% CI, 1.03-1.19; *P* = .008) (Table 4).

**TABLE 2.** Healthcare Provider Barriers, Social Environment, and Cessation Belief of Younger Versus Older Smokers

| Characteristic | Younger (n = 1320) | Older (n = 1086) | Total (N = 2406) | P |
|---|---|---|---|---|
| **N (%) or Mean ± SD (median)** | | | | |
| **Healthcare Provider Barriers** | | | | |
| Access | | | | |
|   Regular physician | 879 (67.6) | 909 (85.4) | 1788 (75.6) | <.001 |
|   Problems with access | 2.3 ± 2.3 (2) | 2.6 ± 2.4 (2) | 2.4 ± 2.4 (2) | .002ᵃ |
| Advice | | | | |
|   Physician advised to quit | 826 (64.0) | 769 (73.4) | 1595 (68.2) | <.001 |
|   Physician discussed medication | 467 (36.3) | 506 (48.5) | 973 (41.8) | <.001 |
|   Physician discussed other treatment | 438 (34.0) | 443 (42.6) | 881 (37.9) | <.001 |
|   Receipt of cessation care | 862 (67.5) | 817 (78.3) | 1679 (72.3) | <.001 |
| Cultural competence | | | | |
|   Physician bias | 2.0 ± 0.9 (2) | 1.9 ± 0.9 (1.7) | 2.0 ± 0.9 (2) | .004 |
| **Psychosocial Barriers: Social Environment** | | | | |
| Social support | | | | |
|   Support of important others for quitting | 4.4 ± 0.7 (4.5) | 4.4 ± 0.9 (5) | 4.4 ± 0.78 (4.5) | .077ᵃ |
|   Overall social support | 3.6 ± 1.1 (3.7) | 3.1 ± 1.2 (3.2) | 3.7 ± 1.1 (3.5) | <.001ᵃ |
| Social norms | | | | |
|   Friends/family smokers | | | | |
|     Almost all | 270 (20.6) | 218 (20.3) | 488 (20.4) | <.001 |
|     Over half | 341 (26.0) | 172 (16.0) | 513 (21.5) | |
|     About half | 352 (26.8) | 266 (24.7) | 618 (25.9) | |
|     Less than half | 188 (14.3) | 179 (16.7) | 367 (15.4) | |
|     Very few | 147 (11.2) | 208 (19.4) | 355 (14.9) | |
| Home environment | | | | |
|   Other smoker in home | 775 (59.0) | 491 (45.8) | 1266 (53.1) | <.001 |
|   Child in home | 904 (69.6) | 412 (39.0) | 1316 (55.9) | <.001 |
|   Home smoking rules | | | | |
|     Smoking is not allowed | 822 (62.6) | 384 (35.7) | 1206 (50.5) | <.001 |
|     Smoking is allowed at times | 316 (24.1) | 311 (28.9) | 627 (26.2) | |
|     Smoking is allowed | 176 (13.4) | 381 (35.4) | 557 (23.3) | |
| **Psychosocial Barriers: Cessation Beliefs** | | | | |
| Self-efficacy | | | | |
|   Quitting self-efficacy | 5.5 ± 3.0 (5) | 4.6 ± 3.1 (5) | 5.06 ± 3.1 (5) | <.001 |
| Readiness to quit | | | | |
|   Contemplation Ladder | 6.4 ± 2.8 (7) | 6.2 ± 3.0 (7) | 6.3 ± 2.9 (7) | .090ᵃ |

ᵃSatterthwaite test.

## DISCUSSION

Although many socioeconomically disadvantaged smokers in our sample were interested in quitting smoking and reported a recent

**TABLE 3.** Predictors of Past Year Treatment Utilization by Block[a]

| Block | Younger (n = 1320) LR χ², DF (P) | Older (n = 1086) LR χ², DF (P) |
|---|---|---|
| Demographics and smoking history | | |
|     Demographics | 21.04, 15 (.136) | 22.44, 15 (.097) |
|     Smoking history | **27.00, 6 (<.001)** | **22.64, 6 (<.001)** |
| Healthcare provider barriers | | |
|     Access | **9.24, 2 (.010)** | **8.52, 2 (.014)** |
|     Advice | **76.87, 4 (<.001)** | **68.59, 4 (<.001)** |
|     Cultural competence | 1.46, 1 (.226) | 0.23, 1 (.631) |
| Psychosocial barriers: social environment | | |
|     Social support | 2.22, 2 (.329) | 1.14, 2 (.565) |
|     Social norms | 7.56, 5 (.182) | 4.09, 5 (.537) |
|     Home environment | 6.80, 4 (.147) | 4.91, 4 (.297) |
| Psychosocial barriers: cessation beliefs | | |
|     Readiness to quit | **38.32, 1 (<.001)** | **69.47, 1 (<.001)** |
|     Self-efficacy | 2.86, 1 (.091) | 0.57, 1 (.452) |

DF indicates degrees of freedom; LR, likelihood ratio test.
[a]Boldface indicates statistical significance (P <.05).

quit attempt, the majority had not used NRT products, prescription cessation medications, or behavioral counseling in the past year. Older smokers were more likely to have utilized cessation treatments in the past year than younger smokers; this result is consistent with past findings.[16,18-21]

A conceptual framework was developed to identify potential predictors of CTU (Figure). This framework describes the influence of healthcare provider and psychosocial barriers on the likelihood of utilizing cessation treatment among socioeconomically disadvantaged smokers. In evaluating the framework, it was found that access to healthcare, receipt of cessation advice from one's healthcare provider, and readiness to quit were significantly associated with CTU in both age groups. In the younger group, the presence of another smoker in the home was significantly associated with CTU.

We had posited that predictors of CTU would vary by age; however, the results for the 2 age groups are largely consistent with respect to aORs and CIs. This suggests that socioeconomically disadvantaged smokers, regardless of age, experience many common barriers to treatment access and utilization, particularly with respect to healthcare provider access and advice, as well as cessation beliefs.

Among socioeconomically disadvantaged smokers, knowledge regarding the availability and effectiveness of cessation treatments, like NRT and counseling, are positively associated with their use.[11] As such, increasing rates of physician-delivered cessation advice is critical for bolstering CTU. In the younger age group, receipt of cessation-related care from a healthcare provider was positively associated with CTU. Furthermore, in both age groups, smokers whose healthcare providers discussed the use of cessation medications had approximately 4 times higher odds of CTU than smokers whose healthcare providers did not discuss these medications.

However, for both age groups it was also found that greater difficulty accessing healthcare was associated with higher odds of CTU. This may be the result of the fact that in our sample, smokers who experience more barriers to healthcare tend to have poorer overall health and are greater consumers of healthcare resources (ie, to have a regular doctor and to have seen a doctor in the past year) as a result. Thus, the increased odds of CTU among smokers who experience greater difficulty accessing healthcare may be explained by the fact that these smokers are in more regular contact with a physician and therefore are more likely to receive cessation-related advice. With respect to psychosocial factors, it was found that readiness to quit was positively associated with CTU in both age groups, suggesting that being more motivated to quit results in a greater propensity to take concrete steps toward this goal.

Among younger smokers, having another smoker in the home was associated with lower odds of CTU. This finding is consistent with research showing that residing with another smoker is negatively associated with CTU[13] and suggests that the immediate home environment may influence CTU to a greater extent than perceived social support and smoking-related social norms. Although not significant, similar estimates were found for the older age group.

Past research suggests that counseling and medication-based cessation interventions are feasible and effective for smokers of all ages.[30,31] Results of our study can inform both cessation interventions and healthcare provider practices for low-income smokers, which are vital steps toward reducing smoking rates in this population. Indeed, the discussion of cessation medications by one's healthcare provider was a very strong predictor of CTU in this study. As such, bolstering rates of physician-delivered cessation advice, particularly regarding evidence-based cessation treatments, is a public health priority. It was also found that smokers in our study demonstrated a high readiness to quit and high rates of quit attempts. Therefore, it may be helpful to normalize the experience of multiple quit attempts in order to help smokers retain interest in engaging in future quit attempts, particularly those that include a cessation aid. Among younger smokers, living with another smoker was associated with lower odds of CTU. In light of this finding, interventions that stress the importance of the immediate home environment may be particularly effective for younger smokers.

## Limitations and Strengths

Dependent and independent variables were measured at the same time so temporal relationships among these variables

**TABLE 4.** Predictors of Past Year Treatment Utilization[a]

| Characteristic | Younger, (n = 1320) aOR (95% CI) | Older, (n = 1086) aOR (95% CI) | Characteristic | Younger, (n = 1320) aOR (95% CI) | Older, (n = 1086) aOR (95% CI) |
|---|---|---|---|---|---|
| **Demographics and Smoking History** | | | **Healthcare Provider Barriers** | | |
| Demographics | | | Access | | |
| Insurance type | | | Regular physician | 1.24 (0.85-1.82) | 0.75 (0.44-1.29) |
| MinnesotaCare | ref | ref | Problems with access | **1.12 (1.04-1.20)** | **1.11 (1.03-1.19)** |
| Medicaid | 0.80 (0.53-1.21) | 1.24 (0.81-1.88) | Advice | | |
| Gender | | | Physician advised to quit | 0.73 (0.48-1.13) | 0.81 (0.48-1.36) |
| Female | ref | ref | Physician discussed medication | **3.90 (2.46-6.20)** | **4.24 (2.70-6.67)** |
| Male | 0.81 (0.52-1.25) | **0.67 (0.46-0.98)** | Physician discussed other treatment | 0.87 (0.56-1.35) | 0.97 (0.64-1.47) |
| Race/ethnicity | | | Receipt of cessation care | **1.87 (1.19-2.94)** | 1.43 (0.82-2.51) |
| White | ref | ref | Cultural competence | | |
| Black | 0.59 (0.32-1.10) | 0.71 (0.40-1.23) | Physician bias | 0.89 (0.74-1.07) | 0.95 (0.78-1.17) |
| American Indian | 0.88 (0.47-1.64) | 0.88 (0.42-1.83) | **Psychosocial Barriers: Social Environment** | | |
| Asian/Hispanic | 0.58 (0.25-1.33) | 0.21 (0.02-1.89) | Social support | | |
| Education | | | Support of important others for quitting | 1.14 (0.87-1.48) | 1.06 (0.84-1.33) |
| Grade 11/lower | ref | ref | Overall social support | 0.91 (0.78-1.06) | 0.92 (0.78-1.08) |
| HS grad/GED | 1.20 (0.69-2.10) | 0.84 (0.47-1.49) | Social norms | | |
| Some college | 1.13 (0.66-1.93) | 0.68 (0.38-1.21) | Friends/family who smoke | | |
| College grad/higher | 1.04 (0.52-2.07) | 1.47 (0.70-3.06) | Almost all | ref | ref |
| Employment | | | Over half | 1.25 (0.78-2.00) | 0.93 (0.51-1.68) |
| Unemployed | ref | ref | About half | 0.96 (0.59-1.56) | 0.86 (0.51-1.48) |
| Employed/self-employed | 0.96 (0.60-1.54) | 0.77 (0.44-1.35) | Less than half | 1.55 (0.88-2.74) | 0.87 (0.48-1.57) |
| Student | 1.63 (0.87-3.06) | 1.79 (0.56-5.70) | Very few | 1.66 (0.90-3.06) | 1.33 (0.75-2.36) |
| Unable to work/disabled | **2.90 (1.42-5.91)** | 0.82 (0.46-1.46) | None | 3.02 (0.69-13.31) | 1.42 (0.46-4.42) |
| Homemaker | 0.81 (0.39-1.66) | 0.56 (0.19-1.65) | Home environment | | |
| Yearly income | | | Other smoker in home | **0.69 (0.49-0.97)** | 0.79 (0.56-1.13) |
| <$10,000 | ref | ref | Child in home | 1.34 (0.88-2.03) | 0.91 (0.60-1.37) |
| $10,001-$20,000 | 0.88 (0.58-1.33) | 0.87 (0.57-1.34) | Home smoking rules | | |
| $20,001-$40,000 | 0.91 (0.58-1.44) | 1.36 (0.78-2.37) | Smoking is allowed | ref | ref |
| >$40,000 | 1.14 (0.64-2.03) | 0.85 (0.42-1.71) | Smoking is allowed at times | 0.95 (0.55-1.63) | 0.95 (0.61-1.48) |
| Smoking history | | | Smoking is not allowed | 1.01 (0.60-1.69) | 1.34 (0.84-2.13) |
| Duration (years) | 1.00 (0.96-1.03) | 1.01 (0.99-1.03) | **Psychosocial Barriers: Cessation Beliefs** | | |
| Cigarettes/day (mean) | **1.04 (1.01-1.06)** | **1.03 (1.01-1.05)** | Readiness to quit | | |
| Time until first cigarette after waking (minutes) | | | Contemplation Ladder | **1.27 (1.17-1.37)** | **1.38 (1.27-1.50)** |
| ≤5 | ref | ref | Self-efficacy | | |
| 6-15 | 0.75 (0.48-1.20) | 0.87 (0.57-1.34) | Quitting self-efficacy | 0.94 (0.88-1.01) | 0.97 (0.91-1.05) |
| 16-30 | 0.75 (0.43-1.29) | 0.96 (0.56-1.65) | | | |
| 31-60 | 0.69 (0.40-1.21) | **0.40 (0.20-0.82)** | | | |
| >60 | **0.41 (0.23-0.76)** | **0.47 (0.23-0.95)** | | | |

aOR indicates adjusted odds ratio; GED, general education diploma; HS, high school; ref, reference.

[a]Boldface indicates statistical significance (*P* <.05).

are unknown. Additionally, participants who consented to be in the trial may not be representative of the general population of smokers on state-funded insurance plans. A strength of the study is that we were able to study a sample of low-income smokers with health insurance that provided access to at least some evidence-based cessation treatment. Given current tobacco use disparities, information on these groups is needed in order to guide interventions.

# CONCLUSIONS

Socioeconomically disadvantaged populations have a far higher prevalence of smoking compared with the general US population. One way to address this disparity is to increase the use of evidence-based tobacco treatments, which improve the likelihood that a smoker will be successful in their quit attempt. Increasing interest in or access to these treatments via interventions that target issues specific to these smokers, including healthcare access, provider-delivered cessation advice, the home environment, and cessation beliefs, could facilitate this process. As the majority of socioeconomically disadvantaged smokers do want to quit,[32] it is imperative that healthcare providers and policy makers develop ways of promoting and delivering cessation strategies that lead to success. ∎

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