

Women's Reports of Smoking Cessation Advice During Reproductive Health Visits and Subsequent Smoking Cessation

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Objective: To examine associations of women's characteristics with reports of provider advice to quit smoking and smoking cessation 1 year after a reproductive health visit.

Study Design: Prospective survey.

Methods: As part of a randomized smoking cessation trial, 432 women smokers completed telephone surveys 1 month and 1 year after their reproductive health visit. Most women were white (85%) with a mean age of 36 years.

Results: Women more likely to report their provider advised them to quit smoking were white rather than another race (adjusted risk ratio, [RR] = 1.4, confidence interval [CI] = 1.14-1.64), employed versus unemployed (RR = 1.3, CI = 1.04-1.49), engaged in safer versus riskier sexual practices (RR = 1.3, CI = 1.09-1.54), were more rather than less ready to quit (RR = 1.3, CI = 1.08-1.44), and saw family physicians versus gynecologists (RR = 1.3, CI = 1.12-1.41). Reported provider advice to quit smoking was not associated with subsequent cessation. Women were more likely to have quit smoking by the 1-year follow-up if at baseline they reported an annual Papanicolaou test in the prior 3 years (RR = 1.6, CI = 1.02-2.26), were more rather than less ready to quit smoking (RR = 2.0, CI = 1.36-2.62), and were less rather than more dependent on nicotine (RR = 0.7, CI = 0.59-0.84).

Conclusions: Provider advice to quit is being directed to women who are most likely to quit and contributes little in explaining subsequent cessation. Providers may not be giving enough cessation advice to minority women, those not considering cessation, and those not prevention oriented. Interventions and system improvements are needed to increase providers' counseling of smokers who are unmotivated and from racial/ethnic minorities.

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ages 18 to 44,² and almost 30% of high school senior girls report having smoked in the prior 30 days.¹ For these young women smokers, gender-specific consequences that include infertility, negative birth outcomes, and cervical cancer pose additional smoking-related health threats.³⁻⁶ As is illustrated by the high rates of cessation observed among women during pregnancy,⁷⁻⁹ there is potential to capitalize on women's desire to protect reproductive health as a motivator for smoking cessation.

Considerable evidence indicates that provider advice to quit smoking significantly increases smoking cessation for male and female patients.¹⁰⁻¹³ Studies indicate that smokers who are older, more nicotine dependent, have poor health status, and are motivated to quit are most likely to be advised about smoking.¹⁴⁻²¹ Because most studies have been conducted in adult medicine clinics that serve older patient populations, little is known about patterns of provider advice with younger adults, particularly young adult women and whether advice is associated with subsequent cessation for this age group.

Reproductive health visits may be opportune times for providers to reach young women smokers to encourage cessation. Most women (69%) are seen

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Since 1980, approximately 3 million US women have died prematurely from smoking-related causes.¹ Despite widespread awareness of the health harms of smoking, 22% of US women continue to smoke.¹ Rates of smoking are particularly high (approximately 27%) among women of reproductive

by healthcare providers for annual Papanicolaou (Pap) screening,²² and women who have sought screening have tended to be young, healthy, and interested in preventive care.²³ Further, for many young women, a reproductive health visit is the only contact they have with a healthcare provider. Thus, these visits are a logical context to raise women's awareness of the association between smoking and reproductive problems that include cervical cancer. A recent study showed that during reproductive healthcare visits, counseling services (eg, diet and exercise; smoking cessation counseling was not included in the report) were offered the least frequently of all preventive services (eg, Pap tests, mammograms, etc.).²⁴ Rates of provider smoking cessation advice during these visits are unknown.

Several factors could influence whether providers advise smokers to quit during reproductive visits. Women are seen for reproductive health visits by providers of different specialty groups (eg, family physicians, obstetricians/gynecologists, and nurse practitioners) who may have different norms about counseling smokers. Several studies have found that women seen by general internists are more likely to be advised to quit smoking than those seen by ob/gyn physicians or surgeons.²⁵⁻²⁷ Women also receive their Pap tests in different types of visits, some during routine visits and others in acute visits. Smoking cessation is more likely to be addressed during well-care visits than during acute-care visits.^{27,28} These differences may be due, in part, to patient characteristics and needs that vary by visit type and medical specialty. To date, no studies have examined whether provider advice to quit smoking during reproductive health visits varies by providers' medical specialty (eg, family physician vs ob/gyn physicians) and whether medical specialty is associated with smoking cessation among young women.

The current report examines patient-reported advice to quit and subsequent smoking cessation in a population-based sample of women smokers who were receiving healthcare in a large health maintenance organization (HMO). Women were surveyed at baseline on average 1 month and again 12 months later after a reproductive health visit. Three questions were addressed: (1) Which patient and provider characteristics were associated with women's reports of provider advice to quit smoking? (2) Was reported provider advice related to subsequent cessation? and (3) Which patient and provider characteristics were related to cessation 1 year later?

METHODS

Sampling and Data Collection

The sample was recruited at a large HMO in western Washington state as part of a randomized intervention trial that presented the risk of developing cervical cancer to motivate women to stop smoking.²⁹ Eligible women were 18 years or older, self-reported smoking at least 100 cigarettes in their lifetime and smoking every day or some days, had a Pap test in the prior month as determined by the HMO's cytology database, and had Pap test results of class 1 (within normal limits) through class 4 (mild or moderate dysplastic changes). Women with evidence of more invasive conditions (class 5) were excluded due to their high risk of developing cervical cancer. An advance letter explained to potential participants that they would be called to complete a women's health survey. Those who did not call to decline participation were called approximately 2 weeks later (within 1 month of the visit) to complete a 15-min survey. Trained telephone interviewers conducted the baseline and follow-up surveys.

Women randomized to the intervention arm received a self-help booklet, a smoking and reproductive health information card, and up to 3 telephone counseling calls; those in the usual care arm received no formal smoking cessation materials. Providers' involvement in the intervention was minimal. Study investigators attended clinic staff meetings to explain the rationale of the study, namely that smoking is linked to abnormal Pap test results and cervical cancer and to alert them that their patients might be study participants. One year after the baseline survey, interviewers called women to conduct a follow-up survey. All study protocols were reviewed and approved by the HMO's institutional review board.

Measures

Patient Characteristics. Participants' age, marital status, race, employment, education, personal income, parity, frequency of Pap testing (in past 3 years), lifetime occurrence of an abnormal Pap test or a sexually transmitted disease (STD), and reason for the most recent Pap test (part of a routine visit vs other) were assessed. Unmarried participants were asked whether in the prior 12 months they had been sexually active, the number of male partners, and condom use during vaginal sex with a male.

Smoking Characteristics. Consistent with the transtheoretical model of behavior change,³⁰ participants answered 2 questions to assess readiness to stop smoking: "Are you seriously considering quit-

ting smoking in the next 6 months?” and “Are you planning to quit smoking in the next 30 days?” Those who answered that they were not considering quitting in the next 6 months were staged as precontemplation. Those who were considering but not planning to quit in the next 30 days were staged as contemplation. Those who were planning to quit in the next 30 days were staged as preparation. Two questions measured nicotine dependence, “How many cigarettes do you smoke a day?” and “How soon after waking do you smoke your first cigarette?” Both continuous variables were categorized into 4 groups.³¹ Minutes after waking to first cigarette was grouped as: >60 minutes, 31 to 60 minutes, 6 to 30 minutes, and ≤5 minutes. Number of cigarettes per day was categorized into 4 groups: ≤10 cigarettes, 11 to 20 cigarettes, 21 to 30 cigarettes, and ≥31 cigarettes. These 2 items were then summed to make a dependence score, which ranged from 0 = not dependent to 6 = heavily dependent.

Provider Specialty. Healthcare provider was defined as the person seen for the visit during which the Pap test was conducted. Provider specialty was gathered from the healthcare system database. The 3 specialties were: (1) family practitioner, (2) gynecologist, and (3) nurse or midwife.

Smoking Cessation Advice. Two questions were asked of women at baseline to assess provider advice about smoking cessation given during the visit. Women who reported “yes” that their provider discussed quitting smoking and “yes” that their provider advised them to stop smoking were coded as having been advised. Those who reported “no” to either of the 2 questions were coded as not having been advised.

Smoking Cessation. At follow-up, women were asked whether they had smoked a cigarette in the past 7 days (yes/no), and those who reported not smoking were asked to submit a saliva sample by mail to assess cotinine levels for biochemical confirmation of their abstinence. Only 15% of the samples returned disconfirmed self-reported abstinence, and this rate did not differ for the 2 arms. Therefore, we relied on self-reported cessation.

Analyses

No intervention effects were found in the randomized trial (ie, 7-day point prevalence abstinence rates for the usual care and self-help arms were 10.5 and 10.9, respectively, at the 6-month follow-up and 15.5 and 10.6 at the 15-month follow-up).²⁹ Three sets of analyses were conducted. One set tested the relationship of patient characteristics and provider specialty

with patients’ reports of smoking cessation advice. All patient characteristics (eg, age, race, ever had an abnormal Pap test, and stage of readiness to quit), and 2 comparisons of provider specialty (gynecologist vs family practitioner; physician vs. nurse/midwife) were tested in separate multivariate models. Each of the patient characteristics, except age and nicotine dependence, was dichotomized (eg, ≤ high school vs > high school education). Three multivariate logistic regression models were tested to determine which characteristics were associated with being advised to quit smoking—one with patient characteristics, another with provider specialty, and one with significant characteristics from the 2 individual blocks.

Second, the prospective association of provider advice and subsequent smoking cessation was tested using the χ^2 statistic. Finally, a third set of multivariate analyses that mirrored the first set was conducted with smoking cessation regressed on patient characteristics, then provider specialty and then the significant associations from those 2 models. Arm was included as a covariate in all analyses, but did not affect the results and was omitted. For all analyses, $\alpha = .05$ was used to determine statistical significance.

RESULTS

Sample Characteristics

For the larger trial, 6753 women were identified from the cytology database. Of those, 2697 were ineligible, refused the survey, or were not reached. Of the remaining 4053 who completed the baseline survey, 580 were randomized to the trial. For more detail of the sampling, see McBride et al.²⁹ The total sample of smokers from the larger trial²⁹ ($n = 580$) was reduced to include only participants seen by a family physician, gynecologist, or nurse/midwife ($n = 565$). Those excluded were seen by general internists ($n = 11$), a pediatrician ($n = 1$), a psychiatrist ($n = 1$), an urgent care physician ($n = 1$), and a provider of unknown specialty ($n = 1$). The sample was reduced further to include those who had completed the follow-up survey ($n = 432$). Compared with those who completed the survey, noncompleters were significantly more likely to be younger, to be unemployed, to have engaged in unprotected intercourse, and to have had multiple male partners (data not shown).

Most women were white (86%), and most had their Pap test as part of a routine visit (70%) (Table 1). More than half were employed (78%), married (59%), college-educated (61%), adherent for their annual

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Pap tests (55%), and thinking of quitting smoking (62%). Some reported using nicotine replacement therapy in the past 12 months (32%). In addition, 56% reported having a prior abnormal Pap test result. Women smoked on average 12.9 (SD = 8.2) cigarettes per day. More than one third reported ever having had an STD (36%); a smaller proportion reported engaging in unprotected sex in the prior 12 months (19%). Most women had seen family physicians for their visit (71%), with fewer being seen by gynecologists (14%) and nurses/midwives (16%). Less than half of the women reported being advised to quit smoking during their Pap-screening visit (47%). At

the 1-year follow-up, 16% (n = 70) reported not having smoked any cigarettes in the prior 7 days.

Characteristics Associated With Smoking Cessation Advice

Multivariate logistic regression models tested associations between women's characteristics and their reports of being advised to quit smoking. Race (white vs other), employment status (yes/no), having unprotected sex (yes/no), reason for the visit (routine vs other), readiness to quit smoking (contemplation or preparation vs precontemplation), nicotine dependence (continuous), and provider specialty (family physician vs ob/gyn physician) were independently associated with being advised to quit.

When all significant associations were included in a multivariate model, all factors, except nicotine dependence and reason for visit, were independently associated with reports of being advised to quit (Table 2). White women were 1.4 times more likely to report being advised than minority women. Employed women were 1.3 times more likely to report receiving advice than those who were unemployed. Women who had protected sex or were married were 1.3 times more likely to report being advised than women who had unprotected sex. Women who were more ready to quit smoking were 1.3 times more likely to report having been advised than those

Table 1. Subject Characteristics

Characteristic	Total (n = 432)	Family Practitioner (n = 306)	Gynecologist (n = 59)	Nurse (n = 67)
Age, mean (SD), years*†	36.9 (12.2)	38.3 (12.6)	32.9 (11.4)	34.6 (9.9)
College educated (%)	60.7	59.8	55.9	68.7
Married (%)*	58.8	60.4	55.9	64.2
Race (%)‡				
White	85.7	84.3	83.1	94.0
Black	6.7	6.9	11.9	1.5
Asian	2.6	2.9	3.4	0.0
Hispanic	1.6	2.0	0.0	1.5
Other	3.5	3.9	1.7	1.5
Employed (full or part time) (%)	77.7	76.4	81.4	80.6
Income >\$30,000 (%)	64.7	66.9	54.4	63.5
No live births (%)	18.3	17.7	20.3	19.4
Had 3 Pap tests in past 3 years (%)*†	55.3	55.2	72.9	59.7
Ever had an abnormal pap test (%)*	55.9	53.6	76.3	48.5
Ever had an STD (%)*	35.7	33.0	47.5	37.3
Routine visit (%)*	69.9	74.5	40.7	74.6
No condom use in 12 months (%)§	19.0	18.0	20.3	22.4
>1 male partner in 12 months (%)*	11.4	9.5	25.4	7.5
Not thinking of quitting (%)*	37.5	40.9	23.7	34.3
Nicotine dependence, mean (SD)*	1.7 (1.7)	1.8 (1.7)	1.3 (1.5)	1.6 (1.8)
Cigarettes per day (SD)	12.9 (8.2)	13.3 (8.3)	10.6 (6.5)	13.2 (9.5)
Ever used NRT to quit (%)	31.9	32.7	25.4	34.3

*Significant difference between family physicians and gynecologists, *P* < .05.

†Significant difference between physicians and nurses, *P* < .05.

‡Based on chi-square test with 1 *df* (white vs minority).

§Among unmarried women who had at least 1 male partner in the past 12 months.

||Nicotine dependence level was measured on a 7-point scale where 0 = low and 6 = high.

STD indicates sexually transmitted disease; NRT, nicotine replacement therapy.

who were not ready to stop smoking. Women who were seen by family physicians were 1.3 times more likely to report being advised to quit smoking than those who were seen by gynecologists. Rates of patient-reported smoking cessation advice did not differ among women seen by family practitioners or gynecologists and those seen by nurses/midwives (Table 2). Analyses were conducted comparing women who reported that their physician discussed smoking with those who reported no discussion ($n = 57$ vs $n = 375$). The results were the same as those reporting receipt of provider advice to quit at the outcome (data not shown).

Relationship of Women-Reported Provider Advice and Subsequent Smoking Cessation

The association of reported provider advice and smoking cessation 1 year postvisit was found to be not significant ($P < .79$). That is, women who reported at baseline that their provider advised them to quit smoking were no more likely to quit smoking than women who did not report receiving provider advice. Further, because women were not randomly assigned to receive provider advice, characteristics associated with being advised also could be associated with quitting smoking. To control for this confound, the relationship between provider advice and smoking cessation was tested in a multivariate logistic regression model while controlling for patient characteristics. After controlling for patient characteristics, the association remained nonsignificant ($P < .96$).

Patient and provider characteristics were tested as predictors of cessation at follow-up in multivariate logistic regression models. Having had annual Pap tests in the prior 3 years, never having had an abnormal Pap test, being ready to quit smoking, and being nicotine dependent distinguished women who reported having quit smoking from those who were still smoking. Provider specialty was not associated with cessation. When all significant predictors were includ-

ed in 1 multivariate model, annual Pap tests, readiness to quit smoking, and nicotine dependence level remained significant predictors of cessation. Women who reported having annual Pap tests in the prior 3 years were 1.6 times more likely to report having quit smoking than those who had less frequent Pap tests. Women who were in the contemplation or preparation stage of readiness were 2 times more likely to report having quit smoking than women who were in the precontemplation stage (17% vs 8%). Women who were more nicotine dependent were 0.7 times less likely to have quit than those who were less dependent (Table 3).

DISCUSSION

Patient-reported smoking cessation advice rates in this sample (47%) were relatively low but comparable to prior studies that focused on adult medicine patient populations.^{16,33-35} Consistent with previous findings,^{19,36-38} women who were white, employed, preventively oriented (eg, used condoms), were ready to quit, and saw family practitioners were most likely to report being advised to quit smoking. In contrast to prior research, however, reported provider advice was not associated with later cessation. Quitting was associated with participant characteristics. Women who were most likely to quit smoking were those who were ready to quit and were less nicotine dependent.

Taken together, these results suggest that reproductive healthcare providers may be advising smok-

Table 2. Final Multivariate Model of Associations With Provider Smoking Cessation Advice

Characteristics	Risk Ratio*	CI	P
Race (white vs minority)	1.42	1.14-1.64	.0004
Employed (yes/no)	1.28	1.04-1.49	.02
Routine visit (yes/no)	1.22	0.94-1.52	.12
Used a condom once in 12 months (yes/no)	1.33	1.09-1.54	.009
Stage (contemplation & preparation vs precontemplation)	1.27	1.08-1.44	.007
Nicotine dependence level (0-6 scale, 0 = low dependence)	1.11	0.99-1.25	.09
Physician type: family practitioner vs gynecologist	1.27	1.12-1.41	.0007

$n = 429$. Odds ratios were converted to risk ratios using a method recommended by Zhang and Yu.³²

*Risk ratio greater than 1.0 indicates that those in the category listed first were more likely to report being advised. If less than 1.0, they were less likely to report being advised.

CI indicates confidence interval.

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ing cessation to young women who are already inclined or on their way to cessation. In a similar vein, Pederson and colleagues³⁹ asked recent quitters via a random-digit dialing population-based telephone survey why they had quit, and most did not mention advice from a physician as an important motivator. Most had already decided to quit smoking and attributed their success at quitting to reasons such as personal willpower. Thus, provider advice may contribute little to successful cessation among smokers who are most motivated to quit.

Providers may face additional challenges in counseling unmotivated smokers. Providers may feel that discussing smoking cessation with patients who do not want to quit smoking may undermine rapport.¹⁷ They also may be pessimistic that young healthy smokers will be influenced by their advice. An additional challenge in counseling young smokers may be that providers find few illness symptoms or “triggers” to prompt them to offer cessation advice.⁴⁰ Yet, provider advice and linking smoking cessation to salient health concerns such as reproductive health could cue young women to think about cessation or take initial steps toward quitting.

Counseling rates differed by physician specialty. Patients seen by ob/gyn physician providers were less likely to recall smoking cessation counseling than those seen by family physicians. These differences may have been due to differences in patient characteristics. For example, patients seen by ob/gyn physician providers, though more motivated to quit, also were significantly more likely to have other risk factors (eg, greater likelihood of prior STDs, more male partners, etc.) for cervical cancer that providers may have thought needed addressing.⁴¹ Thus, patients’ smoking may have been given lower priority by ob/gyn physician

providers. Unfortunately, this high-risk population of young women would benefit greatly from smoking cessation.

Although some provider specialties did better than others in counseling smokers, overall rates of counseling were suboptimal. To improve cessation counseling rates for all providers, additional training may be necessary to raise provider awareness of how to incorporate discussions of smoking cessation into reproductive healthcare visits. For example, providers might be trained to include discussions of smoking cessation when they address contraceptive choices. Further, the generally low rate of provider counseling suggests that system changes may be necessary to ensure that all smokers receive counseling. Emphasizing the smoking cessation counseling Health Plan Employer Data and Information Set (HEDIS) measure, which assesses whether health organizations are meeting care standards, could be one strategy. In this way, organizations and providers would be made accountable for assuring that smoking cessation counseling occurs.

Results of this study replicate several studies that have shown that minority patients are less likely to report having been counseled about smoking cessation than white patients.^{19,21,36-38,42} Yet few explanations for these disparities have been offered. One study⁴³ found that physicians viewed their African American and lower socioeconomic status patients more negatively than their white and/or higher socioeconomic status patients. The authors argued that physicians might be relying on stereotypes in interactions with ethnic minority and lower socioeconomic patients. Increasing providers’ awareness of their outcome expectancies for different patient groups and how stereotyping influences the priority

given to preventive health topics discussed might improve their counseling of ethnic minority patients. Development of such training programs in formats amenable to provider attendance, such as academic detailing⁴⁴ and train-the-trainer approaches, is needed.

These data should be interpreted with some caution. Patient

Table 3. Final Multivariate Model of Predictors of Smoking Cessation

Characteristics	Risk Ratio*	CI	P
Pap tests (>3 in 3 years vs. <3 in 3 years)	1.56	1.02–2.26	.04
Never had an abnormal Pap test	0.93	0.83–1.04	.19
Stage (contemplation & preparation vs. precontemplation)	1.98	1.36–2.62	.0008
Nicotine dependence level (0–6 scale, 0 = low dependence)	0.71	0.59–0.84	.0001

n = 429. Odds ratios were converted to risk ratios using a method recommended by Zhang and Yu.⁴⁶

*Risk ratio greater than 1.0 indicates that those in the category listed first were more likely to report being abstinent from cigarettes. If less than 1.0, they were less likely to report being abstinent.

CI indicates confidence interval.

recall was the only indicator of advice; neither exit interviews nor provider reports were collected. Thus, observed differences may reflect lack of recall or other recall biases (eg, patients who were more motivated to quit might be more likely to recall advice) rather than actual provider behavior. However, virtually all other studies, with the exception of those that involved exit interviews with patients, have relied on patient recall to evaluate the prevalence of provider smoking cessation advice. Also, women's perceptions indicated only whether advice was given, not any assessment of the quality of the discussion of smoking. Reports of advice were collected at 1 time point; thus, providers may have advised smoking cessation in other visits with the woman.

The study also has several notable strengths. The sample was population-based and included a heterogeneous sample of women smokers that increases the generalizability of the results. Provider advice was assessed 1 year prior to cessation, enabling prospective assessment of the impact of the advice on women's likelihood of quitting. Further, a broad set of behavioral and smoking-specific characteristics were assessed.

The public health significance of reducing rates of smoking among young women makes reproductive health visits a possible "teachable moment"⁴⁵ for smoking cessation. However, providers may be missing the teachable moment to increase motivation to quit for smokers who are less motivated. If the Public Health Service's Clinical Practice Guidelines recommendations on provider smoking cessation advice¹³ are to be fully implemented, providers may need additional training to counsel unmotivated, young, healthy, and minority smokers. Further, system improvements may be needed to encourage counseling behavior. In fact, the updated guidelines specify 5 A's (ask, advise, assess, assist, arrange) for those who are motivated to quit and 5 R's (relevance, risks, rewards, roadblocks, repetition) for those who are not ready to quit. The development and evaluation of effective approaches will be challenging given the time constraints and competing priorities of healthcare visits.⁴⁶ However, the enormous potential benefits of smoking cessation while women are young suggest the need for further refinement of provider interventions.

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