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Telephone Smoking Cessation Quitline Use Among Pregnant and Non-pregnant Women

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Abstract

To describe characteristics, referrals, service utilization, and self-reported quit rates among pregnant and non-pregnant women enrolled in a smoking cessation quitline. This information can be used to improve strategies to increase pregnant and non-pregnant smokers' use of quitlines. We examined tobacco use characteristics, referral sources, and use of services among 1,718 pregnant and 24,321 non-pregnant women aged 18–44 years enrolled in quitline services in 10 states during

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2006–2008. We examined self-reported 30-day quit rates 7 months after enrollment among 246 pregnant and 4,123 non-pregnant women and, within groups, used Chi-square tests to compare quit rates by type of service received. The majority of pregnant and non-pregnant callers, respectively, smoked 10 cigarettes per day (62 %; 83 %), had recently attempted to quit (55 %; 58 %), smoked 5 or minutes after waking (59 %; 55 %), and lived with a smoker (63 %; 48 %). Of callers, 24.3 % of pregnant and 36.4 % of non-pregnant women were uninsured. Pregnant callers heard about the quitline most often from a health care provider (50 %) and non-pregnant callers most often through mass media (59 %). Over half of pregnant (52 %) and non-pregnant (57 %) women received self-help materials only, the remainder received counseling. Self-reported quit rates at 7 months after enrollment in the subsample were 26.4 % for pregnant women and 22.6 % for non-pregnant women. Quitlines provide needed services for pregnant and non-pregnant smokers, many of whom are uninsured. Smokers should be encouraged to access counseling services.

Keywords

Female; Pregnancy; Smoking cessation; Telephone counseling

Introduction

Women who quit smoking before pregnancy reduce their risk of reproductive health-related problems, such as conception delay and infertility [1], and those who quit before or during pregnancy reduce their risk of pregnancy complications, such as placenta previa, premature rupture of membranes, placental abruption, and poor pregnancy and infant outcomes [e.g. preterm delivery, fetal growth restriction, sudden infant death syndrome (SIDS)] [1, 2]. In addition, smokers face increased risks of developing chronic diseases such as cancer, cardiovascular disease, and respiratory disease [2]. Despite these well-known health risks, in the United States, approximately 10 % of pregnant and 19 % of non-pregnant women aged 18–44 years report smoking [3, 4].

Telephone quitlines offer effective, free smoking cessation services for the US population and several other countries [5, 6]. A Cochrane Collaborative meta-analysis of telephone counseling for smoking cessation concluded that telephone counseling was effective in helping smokers quit (OR = 1.33, 95 % CI = 1.21–1.47) [7], additionally, compared to self-help materials or minimal advice; telephone counseling increases quit rates by about 60 % among smokers [7, 8]. Characteristics and use of services among pregnant and non-pregnant female callers of reproductive age have not been previously described. Additionally, it is unclear how pregnant and non-pregnant women of reproductive age hear about quitlines and how satisfied they are with the services. Therefore, the purpose of our study is to describe characteristics, referral sources, and service use for pregnant and non-pregnant women of reproductive age in 10 states. We also report self-reported and adjusted quit rates at 7 months post-enrollment for these populations. This information can be used to improve strategies to increase pregnant and non-pregnant smokers' use of quitlines.

Methods

Data Source and Study Population

We analyzed telephone quitline data from the American Cancer Society (ACS) for callers seeking cessation services anytime during a 3-year period (January 1, 2006–December 31, 2008). ACS provided services for 11 states; for this analysis, 10 states (District of Columbia, Delaware, Florida, Kansas, Louisiana, Michigan, Nebraska, Pennsylvania, Texas, Vermont) approved the use of their data. Cessation services provided by the quitline included comprehensive, individualized phone counseling; mailed self-help materials; and direct order or vouchers for nicotine replacement therapy (NRT) for some non-pregnant women.

To be eligible for counseling services, all study states required that callers be at least 18 years of age and interested in quitting. The counseling protocols for pregnant callers were the same in all states. Based on self-reported pregnancy status at enrollment, pregnant women were offered self-help materials only, self-help materials with counseling, or counseling only. Pregnant women received pregnancy-tailored counseling, which included as many as eight telephone counseling sessions, three of which could be booster (additional) sessions [9]. Pregnant women were ineligible to receive NRT through the quitline, however, could receive NRT from their physician since the American College of Obstetrics and Gynecology recommends NRT use be considered under the close supervision of a physician [10]. The counseling protocol for non-pregnant women differed by state. In general, all non-pregnant callers were offered self-help materials and/or counseling. Non-pregnant women received as many as five telephone counseling sessions and the option of receiving 1–2 booster sessions [11]. Non-pregnant women automatically received self-help materials when they received counseling.

Data were collected by ACS during the initial enrollment telephone call and afterwards, as services were provided. At enrollment, callers self-reported information about demographics, tobacco use behaviors and characteristics, referral sources, and pregnancy status. Quitline services provided to the women were entered into the data system at time of service delivery by ACS. Self-reported current smoking status was recorded at each counseling session.

All states except Florida attempted to contact all enrolled quitline callers 4 and 7 months after enrollment. Due to a mass influx of callers following a media campaign promoting quitlines that began in April 2008, Florida selected a simple random sample of 600 callers (approximately 7 %) each month for follow-up. Using the telephone number provided at enrollment, approximately 15 call attempts were made to reach women during a 4–6 week period. Among women who were evaluated 7 months after enrollment, we chose to examine 30-day quit rates for measuring prolonged abstinence from smoking, as recommended by the North American Quitline Consortium (NAQC) [12]. Quitline satisfaction levels, NRT use, and self-reported quitting behavior was collected at follow-up.

We limited our study sample to female smokers aged 18–44 years who were interested in quitting, and had complete information about pregnancy status at enrollment and services received (i.e., counseling, self-help) after enrollment (Fig. 1). Of the 31,448 female smokers

aged 18–44 years, 5,409 (17.2 %) were ineligible, based on the above criteria, and excluded from our sample. Of 5,409 excluded women, 1,477 (4.7 %) indicated that they had already quit or were missing information on smoking status at enrollment; 1,648 (5.2 %) were missing pregnancy status information at enrollment; and 2,284 (7.3 %) were missing information on services received after enrollment. Our final sample included 26,039 women, of whom 1,718 (6.6 %) were pregnant and 24,321 (93.4 %) were not pregnant. Among pregnant women, 246 (14.3 %) completed follow-up. Among non-pregnant women, 4,123 (16.9 %) completed follow-up. Because the quitline project was developed at the University of Texas Health Science Center in Houston, this study was reviewed and approved by their institutional review board.

Definition of Variables

We classified services provided by quitlines as self-help only or telephone counseling sessions with or without self-help materials (i.e., self-help materials only; 1–2 counseling sessions; 3–4 counseling sessions; 5 or more counseling sessions). Referral sources were classified into four categories: health care provider, mass media, friends and family, or other source. At the 7-month follow-up, information about: satisfaction with the quitline (i.e., very, mostly, somewhat, not at all satisfied), NRT use, and current smoking status was collected. Women who reported they had not smoked during the prior 30 days were considered to have quit.

Based on previous studies that examined factors associated with use of telephone smoking cessation services [13, 14], we examined the following demographic characteristics: age (18–24, 25–34, 35–44 years), race/ethnicity (white non-Hispanic, black non-Hispanic, other), educational level (<12, 12, >12 years), marital status (married, other), and health insurance status (yes, no). Tobacco use behaviors and characteristics included prior attempt to quit anytime during the year preceding the enrollment phone call (yes, no); how soon a cigarette was smoked after waking up (within 5 minutes of waking up, 5 or more minutes after waking up); live with a smoker (yes, no); self-rated confidence in ability to quit or self-efficacy (<70, 70–99, 100 %); and smoking intensity level. For self-efficacy, women were asked, “On a scale of 0–100 %, where 0 is no chance and 100 is absolutely, what do you think your chances are for being able to quit for good this time?” Smoking intensity was created by combining responses about current smoking status (every day, non-daily) and the number of cigarettes smoked per day (1–9; 10) to create a variable with three discrete levels: non-daily smokers, women who smoked 1–9 cigarettes daily, and women who smoked ten or more cigarettes daily. The percentage of missing data for these characteristics ranged from 0 % (age) to 19 % (how soon smoke a cigarette after waking up, $n = 5,051$) for women at enrollment.

Data Analyses

Among callers at enrollment, we examined the following characteristics by pregnancy status: tobacco use, referral sources, services received, and distribution of callers from each state. For those quitline callers evaluated 7-months post-enrollment, we examined satisfaction with the quitline services, NRT use and self-reported 30-day quit rates. However, because the response rate at follow-up was low and our quit rates were not

biochemically validated, we also calculated self-reported quit rates adjusted for loss to follow-up and estimated non-disclosure of smoking. First, we estimated the quit rate, assuming all women who were not followed up at 7 months post-enrollment were still smoking. Second, we conducted a sensitivity analysis, assuming that 23 % of pregnant and 10 % of non-pregnant women at enrollment, who reported that they had quit at the 7 month follow-up, were still smoking, based on published nondisclosure rates among these groups [15]. We used Chi-square tests to compare quit rates by type of service received. SAS version 9.2 was used for all analyses.

Results

Among the 1,718 pregnant smokers who enrolled in the quitline, the majority were non-Hispanic white (65.9 %), unmarried (74.9 %), and had health insurance (75.8 %) (Table 1). Half (49.9 %) of pregnant callers were 18–24 years-old, and approximately a third (31.8 %) had less than a high school education. Among the 24,321 non-pregnant callers who enrolled in quitline services, the majority were non-Hispanic white (65.2 %), unmarried (67.3 %), and had health insurance (63.6 %). Approximately a fifth (19.6 %) of non-pregnant callers were aged 18–24 years and less than half (45.9 %) had more than 12 years of education (Table 1).

Among both pregnant and non-pregnant quitline callers, the majority recently attempted to quit (pregnant: 55.1 %, non-pregnant: 58.1 %) and smoked 5 or more minutes after waking (pregnant: 58.9 %, non-pregnant: 54.5 %) (Table 1). Pregnant callers most often lived with a smoker (63.2 %), whereas less than half (48.3 %) of non-pregnant callers lived with a smoker. Mean self-efficacy scores were similar for pregnant and non-pregnant women (pregnant: 77.5, non-pregnant: 79.5; data not shown), and approximately a third of both pregnant (33.3 %) and non-pregnant (33.2 %) callers were 100 % confident in their ability to quit smoking.

Pregnant quitline callers were referred to the quitline most often by a health care provider (50.4 %), whereas non-pregnant callers most often heard of the quitline from mass media (59.0 %) (Table 1). More than half of pregnant (51.8 %) and non-pregnant (57.1 %) callers received self-help materials only. On average, pregnant and non-pregnant women received 2–3 counseling sessions (pregnant: 2.3, non-pregnant: 2.5; data not shown), and only 7.4 % of pregnant and 6.5 % of non-pregnant callers received five or more counseling sessions (Table 1).

Among women at the 7-month follow-up, 51.6 % of pregnant and 64.0 % of non-pregnant women reported being very satisfied with quitline services. The remaining women reported being mostly (pregnant: 20.7 %, non-pregnant: 16.6 %), somewhat (pregnant: 20.7 %, non-pregnant: 13.6 %) or not at all satisfied with services (pregnant: 6.9 %, non-pregnant: 5.9 %) (data not shown). A high percentage of women who received self-help materials only (pregnant: 90.6 %, non-pregnant: 90.5 %) or counseling services (pregnant: 96.7 %, non-pregnant: 94.1 %) reported being very, mostly, or somewhat satisfied with quitline services. Thirteen percent of pregnant and 43.0 % of non-pregnant women reported use of NRT (data not shown).

At 7-month follow-up, 26.4 % of women pregnant at enrollment and 22.6 % of women not pregnant at enrollment self-reported quitting (Table 2). Assuming non-respondents continued smoking, and nondisclosure of current smoking status was 23 % for women pregnant at enrollment and 10 % for women not pregnant at enrollment, the adjusted quit rates were 2.9 % for women who were pregnant and 3.5 % for women who were not pregnant at enrollment. The adjusted quit rates were approximately twice as high for pregnant and non-pregnant women who received counseling versus self-help only ($P < .01$ for both pregnant and non-pregnant women).

Discussion

This is the first study to use telephone quitline data from 10 states to examine characteristics of female quitline callers by pregnancy status. Characteristics of pregnant and non-pregnant quitline callers can be used by quitlines to better understand who their services are reaching, how women are being reached, the need for free quitline services, the types of services preferred, and callers' satisfaction with those services. For pregnant women, we found a substantial percentage were young and less educated, and approximately a quarter were uninsured. Non-pregnant quitline callers were more often older and more educated, and over a third were uninsured. The majority of both pregnant and non-pregnant quitline callers smoked 10 cigarettes per day and more than half had attempted to quit in the previous year. Since approximately half of pregnant smokers quit smoking before entering prenatal care and others may reduce the number of cigarettes they smoke [16–18], pregnant quitline callers may represent a group of smokers with higher addiction levels and in need of additional help to quit than non-pregnant callers.

The prevalence of smoking among women in the states included in this analysis may differ from the prevalence among women for the entire U.S. While comparable data for national and state prenatal data are not available, the smoking prevalence among non-pregnant women from the states included in our analyses varies. Based on data from the Behavioral Risk Factor Surveillance System, population estimates of smoking among non-pregnant women in the 10 states included in our analysis ranged from 14.8 % (DC) to 26.2 % (Pennsylvania) [19] while the national average is 19 % [4].

We found more than half of all quitline callers elected to receive self-help materials only rather than telephone counseling, despite the low effectiveness of self-help materials [7, 8]. Callers may be hesitant to participate in counseling because of a lack of trust in the counselors or a lack of knowledge that counseling may increase their ability to quit smoking [20]. Callers may also be more interested in trying to quit on their own as most smokers quit without the use of counseling or medication [21]. Clinicians referring women to the quitline, as well as quitline promotional materials, may want to inform women of the effectiveness of and possible higher levels of satisfaction with counseling services.

We found that half of pregnant quitline callers received a referral from a health care provider. Prenatal care provides an opportune time for providers to ask about smoking and provide appropriate referrals to their patients. As an effective smoking cessation strategy, the American College of Obstetricians and Gynecologists recommends providers conduct a

short counseling session, provide educational materials, and refer pregnant smokers to a quitline (1–800-QUIT-NOW) for additional support [10]. Among non-pregnant smokers, approximately half heard about the quitline from mass media, which suggests that media campaigns are effective at reaching women of reproductive age. In contrast to pregnant women, only 22 % of non-pregnant women were referred to a quitline by a clinician. Our findings among non-pregnant women are similar to those from a descriptive study in California where 50 % of individuals cite mass media campaigns as their main source of referral, followed by health care providers (20 %), other sources (20 %), and family or friends (11 %) [22]. Approximately a third of non-pregnant quitline callers reported no health insurance and, therefore, may not have direct contact with a treating clinician, limiting opportunities for clinician referrals to quitlines. Thus, our data suggests that non-pregnant women should be reached through a variety of strategies including mass media, clinician referrals, and referrals through family, friends and social programs.

Our self-reported cessation rates at 7 months (26 % of women pregnant at enrollment and 23 % of women not pregnant at enrollment) are similar to self-reported cessation rates from two descriptive studies among all adults seeking assistance from a publicly available state telephone quitline [23, 24]. However, our adjusted rates among women who received telephone counseling (pregnant: 4.0 %, non-pregnant: 5.3 %) or self-help (pregnant: 1.9 %, non-pregnant: 2.1 %) were lower than adjusted quit rates among adults who received telephone counseling (12.3 %) or self-help (6.1 %) [23].

Even though we found overall low quit rates, smokers generally make several cessation attempts before quitting permanently [25]. In our study and others, a previous quit attempt was associated with smoking cessation [8, 26]. Therefore, any attempt at quitting, even if unsuccessful, may be a step toward permanent cessation. If a smoker successfully quits by the age of 30, she will not experience adverse long-term health effects and her life can be extended by approximately 10 years [27]. Finally, studies are needed to assess the cost-effectiveness of quitline services and their associated outreach campaigns, specifically for pregnant women and women who may become pregnant in the future.

Our results are subject to several limitations. First, our follow-up rate for pregnant (14 %) and non-pregnant women (17 %) was lower than follow-up rates from other studies [23, 24]. Our study analyzed existing administrative data, whereas other studies were planned before data collection began and may have had more rigorous follow-up methods. Second, among quitline callers, pregnancy status at follow-up was unknown. However, it is likely that most pregnant women were at least 1–2 months postpartum at the 7-month follow-up if they enrolled in services by the end of their first trimester. Additionally, 5 % of non-pregnant women may have become pregnant by the time of follow-up based on national estimates on the percentage of reproductive-age women who are pregnant at any given time [28]. Collecting information from pregnant women on month of pregnancy at enrollment and on pregnancy status from all women at follow-up may help quitlines better understand their clients and evaluate their services. Finally, our self-reported quit rates are likely overestimated because quit rates were not biochemically verified, follow-up rates were low and characteristics of women at follow-up differed from women lost to follow-up. However, we attempted to account for this bias by adjusting the quit rates based on published rates of

non-disclosure for our populations and assuming women not followed up continued to smoke.

In conclusion, quitlines offer a free smoking cessation service for pregnant and non-pregnant female smokers, and provide uninsured smokers services they may not have access to elsewhere. Quitline media campaigns should further target diverse groups of people, including pregnant and non-pregnant women of reproductive age. Additionally, clinicians should encourage both pregnant and non-pregnant patients who smoke to contact tobacco cessation quitlines (1-800-QUIT-NOW). The potential benefits of cessation telephone counseling over self-help alone should be emphasized, and clinicians and counselors should encourage smokers to talk with a trained counselor to increase their likelihood of quitting successfully.

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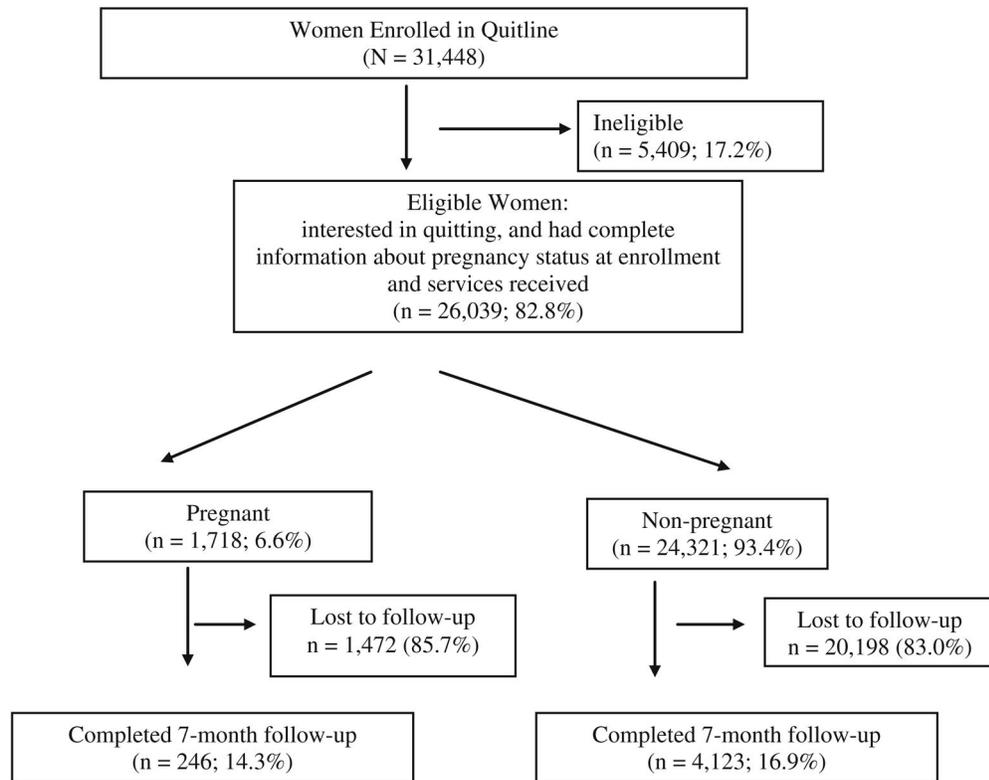


Fig. 1.
Flowchart of quitline caller eligibility and loss to follow up

Table 1

Characteristics of pregnant and non-pregnant women enrolled in telephone quitline services, 10 states (2006–2008)^a

	Pregnant (<i>n</i> = 1,718) (%)	Non-pregnant (<i>n</i> = 24,321) (%)
<i>All</i> ^b	6.6	93.4
<i>Characteristics</i>		
Age (years)		
18–24	49.9	19.6
25–34	40.7	36.8
35–44	9.4	43.7
Race/ethnicity		
White NH ^c	65.9	65.2
Black NH ^c	19.8	21.5
Other	14.2	13.2
Education (years)		
<12	31.8	18.7
12	35.6	35.5
>12	32.6	45.9
Marital status		
Married	25.1	32.7
Other	74.9	67.3
Health insurance		
Yes	75.8	63.6
No	24.3	36.4
Smoking intensity		
Nondaily	5.0	2.8
1–9 cigarettes daily	33.5	14.0
10 cigarettes daily	61.5	83.2
Attempted to quit in previous year		
Yes	55.1	58.1
No	44.9	41.9
How soon a cigarette was smoked after waking up (min)		
<5 ^d	41.1	45.5
5 ^d	58.9	54.5
Live with smoker		
Yes	63.2	48.3
No	36.8	51.7
Self-efficacy (%) ^e		
<70	30.6	26.1
70–99	36.1	40.7
100	33.3	33.2

	Pregnant (<i>n</i> = 1,718) (%)	Non-pregnant (<i>n</i> = 24,321) (%)
Source of referral to quitline		
Health care provider	50.4	21.5
Mass media	35.9	59.0
Family and friends	10.5	16.5
Other	3.2	3.0
Services received		
Self-help materials only	51.8	57.1
1–2 counseling sessions	30.2	26.4
3–4 counseling sessions	10.6	10.0
5+ counseling sessions	7.4	6.5

^aDistributions presented exclude missing data

^bDenotes row percentage

^cNon-Hispanic

^dSmoke within 5 minutes after waking up (<5 min) or smoke 5 or more minutes after waking up (≥ 5 min)

^eSelf-rated confidence in ability to quit

Table 2

Self-reported quit rates at the 7-month follow-up and adjusted quit rates, 10 states (2006–2008)

	Pregnant		Non-pregnant	
	Self-report quit rate	Adjusted quit rate^a	Self-report quit rate	Adjusted quit rate^b
Total	246	1,718	4,123	24,321
Quit total (n) and (%)	65 (26.4)	50 (2.9)	933 (22.6)	840 (3.5)
<i>Self-help materials only</i>				
Evaluated	92	890	1,829	13,887
Quit total (n) and (%)	22 (23.9)	17 (1.9)	318 (17.4)	286 (2.1)
<i>Counseling sessions</i>				
Evaluated	154	828	2,294	10,434
Quit total (n) and (%)	43 (27.9)	33 (4.0)	615 (26.8)	554 (5.3)
Chi-square <i>P</i> value ^c	0.4902 ^d	0.0109 ^e	<0.0001 ^f	<0.0001 ^g

^a Assumes pregnant women lost-to-follow up continued to smoke and a 23 % nondisclosure rate of current smoking status

^b Assumes non-pregnant women lost-to-follow up continued to smoke and a 10 % nondisclosure rate of current smoking status

^c Chi-square *P* value <.05 compares self-reported quit rates

^d Compares self-reported quit rates among pregnant women by services received

^e Compares adjusted self-reported quit rates among pregnant women by services received

^f Compares self-reported quit rates among non-pregnant women by services received

^g Compares adjusted self-reported quit rates among non-pregnant women by services received