

Rates of Enrollment in Smoking Cessation Services Following Fax Referrals From a Children's Hospital

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Objective.—The aim of this study was to describe the rates of enrollment in tobacco dependence treatment among smoking adults who accepted a fax referral from health care providers at a children's hospital, and to examine smoker characteristics associated with enrollment.

Methods.—Secondary analysis of the state-sponsored fax referral and treatment program data on all referrals from Arkansas Children's Hospital in 2005 to 2007 was conducted. Enrollment was defined as attendance at 1 or more counseling sessions within 1 year of referral. Logistic regression analyses were used to identify demographic and tobacco-related characteristics associated with enrollment versus nonenrollment in a treatment program among those contacted by the program.

Results.—Of the 749 faxed referrals to the program, 157 (21.0%) enrolled in a treatment program and received 1 or more treatment sessions; 505 were contacted by the program, and of these, 147

(29%) enrolled. Women were more likely to enroll than men (odds ratio [OR] 1.81; 95% confidence interval [95% CI], 1.09–3.01). Whites were twice as likely to enroll than African Americans (OR 2.35; 95% CI, 1.28–4.33). Older age (OR 1.04; 95% CI, 1.01–1.06) and higher self-efficacy scores (OR 1.13; 95% CI, 1.02–1.26) increased the likelihood of enrollment.

Conclusions.—Approximately 1 in 5 smokers who accepted a fax referral enrolled in and received intensive treatment services for tobacco dependence. Thus, innovative approaches are needed to increase enrollment among younger, African American, and male smokers.

KEY WORDS: enrollment; fax referral; tobacco use cessation; telephone counseling; pediatric

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Exposure to secondhand smoke is a major cause of childhood morbidity and mortality, causing childhood pneumonia, bronchiolitis, asthma, otitis media with effusion, as well as extended hospital stays and recovery times.^{1–3} Approximately one third of children in the United States are exposed to secondhand tobacco smoke in the home.⁴

Brief interventions for smoking cessation are recommended by the US Public Health Service clinical practice guideline for the treatment of tobacco use and dependence and endorsed by the American Academy of Pediatrics.^{5,6} All health care providers should ask patients and caregivers (ie, foster parents, grandparents, and other relatives who care for children) about tobacco use at every visit and offer advice and assistance to those who use tobacco; however, in practice, pediatricians seldom refer caregivers to cessation programs.⁷ Pediatricians cite

numerous barriers to referring caregivers to smoking cessation programs, including perceptions that caregivers are not interested and will ignore pediatricians' advice.⁷

Telephone counseling services (quit lines) are now widely available in North America, and nearly all quit lines provide a special fax referral form for health care providers to conveniently refer patients to treatment.⁸ Upon receipt of a faxed referral, the program initiates contact with the smoker and assists him/her with enrollment. Although this process makes practical sense, there is little in the published literature on the outcome of referrals, especially those faxed from a pediatric setting.

In this study, we provide a descriptive report on the enrollment status in a 2-year period of faxed referrals from a large, tertiary children's hospital to state-sponsored referral and treatment services for tobacco dependence. We also describe smoker characteristics associated with enrollment in treatment for tobacco dependence. Based on the transtheoretical model of behavior change,^{9,10} we hypothesized that persons with higher levels of self-efficacy (confidence to quit smoking and stay quit when tempted) and persons in the "preparation" and "action" stages of readiness (intend to quit in the next 30 days or have already made a quit attempt, respectively) would be more likely to enroll in treatment.

METHODS

Study Design, Setting, and Data Sources

We conducted a secondary analysis of data collected on all smokers who accepted a referral to the Arkansas fax

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referral program (SOSWorks) from personnel at Arkansas Children's Hospital (ACH) over the 2-year period from May 6, 2005 to July 25, 2007 ($n = 749$). During the study period, statewide tobacco referral and treatment services in Arkansas were directed by the second author (Christine E. Sheffer) at the University of Arkansas for Medical Sciences. The University of Arkansas for Medical Sciences Institutional Review Board approved this study.

ACH is a large tertiary pediatric hospital and teaching affiliate of University of Arkansas for Medical Sciences. ACH employs a tobacco interventionist to assist ACH health care providers in addressing smoking cessation. The tobacco interventionist provides one 5-minute counseling session to smokers, written materials, and an offer to fax a referral. All ACH providers can order a tobacco intervention consultation for inpatients, outpatients, relatives, and caregivers. Most consultations are requested by the General Pediatric Clinic. Although the General Pediatric Clinic has a systematic method (clinic note prompts) of identifying and documenting caregiver tobacco use, there is no hospital-wide policy or procedure at ACH. Providers also have the option of faxing a referral directly without the assistance of the tobacco interventionist.

Following receipt of the faxed referral, tobacco treatment specialists at the referral program, SOSWorks, made up to 6 attempts to contact the smoker by telephone. Once a smoker was contacted, the tobacco treatment specialists collected demographic and tobacco-related information on the referred smoker. Following data collection, the tobacco treatment specialists offered to schedule an appointment for the smoker to receive either telephone counseling through the quit line or in-person counseling at a treatment clinic near his/her home, in accordance with the smoker's preferences.

Outcome Measure

The primary outcome measure was the proportion of referred smokers who enrolled in treatment within 1 year of referral. Enrollment in treatment was defined as attending 1 or more structured, evidence-based treatment sessions. Attendance was determined by treatment program record review.

Predictor Measures

Variables included in our analyses were gender, race/ethnicity (white, African American, Hispanic/Latino, Pacific Islander, American Indian/Alaskan Native, multi-ethnic, or other), usual number of cigarettes smoked per day, readiness to quit, motivation to quit, self-efficacy for quitting, and, for women, pregnancy status.

To determine usual number of cigarettes smoked per day, smokers were asked, "How many cigarettes do you smoke on a usual day?" Readiness to quit was assessed with the transtheoretical model by asking the smoker, "Tell me about your plans to quit using tobacco." Options included standard responses used with the transtheoretical model to assess readiness: "have already stopped" (action), "plan on stopping, or stopping again, in next 30 days"

(preparation), "plan on stopping in next 6 months" (contemplation), "plan on stopping but not in next 6 months" (precontemplation), and "no plans to stop smoking" (precontemplation).^{9,10} Readiness to quit status was dichotomized as action/preparation or contemplation/precontemplation. We included persons in the action stage because they were seeking assistance, still in the process of quitting, and at high risk of relapse. These smokers were likely to have made a quit attempt in response to the health care provider advice between the time of the referral and contact by SOSWorks. Motivation and self-efficacy were measured by asking the questions, "On a scale from 0 to 10, where 0 is none at all and 10 is the most ever, how much do you want to quit smoking?" and "... how confident are you that you can quit and stay quit for good?" respectively.^{11,12}

Statistical Analyses

SAS version 9.2 (SAS Institute Inc, Cary, NC) was used for all analyses, with 2-sided alpha at the .05 level for statistical significance. Summary statistics were calculated to describe the characteristics of referred smokers. Univariate analyses were performed using χ^2 for categorical variables and 2-sample t test for normally distributed continuous variables. Because motivation and self-efficacy scores were not normally distributed, the Wilcoxon signed rank test was used to test distributional equality between smokers who did and did not enroll.

We used multivariate logistic regression to predict enrollment among those contacted. Predictor variables included age, gender, race/ethnicity, cigarettes smoked per day, readiness to quit, motivation to quit, and self-efficacy. Race/ethnic categories were collapsed into white, African American, and unknown/other for analysis. We conducted separate sensitivity analyses to assess the effect of including those of unknown race/ethnicity first in the African American category and second, in the white category.

RESULTS

During the 2-year period, 749 smokers accepted a referral to SOSWorks from ACH. The majority of referrals were white (53.7%), 21% were African American, 0.9% other (5 Hispanic, 2 Asian, 1 other), whereas race/ethnicity was unknown for 24.4%. Two thirds of referrals were female (69.4%). The mean age was 31.4 years $\pm$ 9.3 (range, 14–64, with 10 aged less than 18 years of age). Nearly all were Arkansas residents (99.3%) and reported English as their preferred language (99.2%). Of the 749 smokers referred, 21.0% enrolled in a treatment program. Most enrolled within 30 days of the faxed referral (137/157), 11 enrolled between 30 and 60 days, and 9 enrolled between 60 and 310 days of the referral. SOSWorks was able to contact 67.4% ($N = 505$) of referred smokers. Those contacted did not differ from those not contacted in terms of race, gender, or language preference; however those *not* contacted were significantly younger than those contacted (mean age, 30.2 vs 31.9 years, $P = .02$).

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