EFFECTIVENESS OF PHYSICIANS-IN-TRAINING COUNSELING FOR SMOKING CESSATION IN AFRICAN AMERICANS

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This study examined the effectiveness of smoking cessation counseling by physicians-in-training (residents) with African-American patients. One hundred fifty-eight family and internal medicine residents at a large urban public general hospital participated in the study; two thirds of the residents underwent a 2-hour smoking cessation training program. Ninety-two of the trained physicians counseled from 1 to 18 patients. The majority of physicians were male, with 8% being current smokers. Over a 26-month period, 1086 patients were randomly assigned to intervention and control (usual care) groups. Mean patient age was 44 years, mean years smoking was 25, and mean number of cigarettes smoked per day was 14. There were no differences in biochemically validated smoking cessation rates between the intervention and control groups at 3 or 12 months postenrollment (2% versus 1.8% and 2.2% versus 2.8%, respectively). Losses to follow-up were high at both 3 and 12 months (38% and 40% respectively). Implications for future trials in minority populations are discussed. A brief physician-based smoking cessation message does not appear to be an effective strategy for use with African-American smokers in a large urban public general hospital. (*J Natl Med Assoc.* 1998;90:597-604.)

Key words: smoking cessation ◆ African Americans ◆ residents

Smoking and smoking-related cancers are significant health problems in the African-American community. Smoking accounts for approximately 30% of all cancer deaths in this country and is especially implicated in cancers of the lung, mouth, pharynx, esophagus, pancreas, and bladder. African Americans die disproportionately from smoking-related cancers (especially lung cancer) than any other population group in America,[1] and recent figures on smoking among adult African Americans indicate that this situation is not about to change in the near future.[2] Smoking prevalence is higher in African-American males than any other group, and they make more attempts to quit smoking but are less successful than their white counterparts.[3] Consequently, the problem of smoking and cancer is likely to persist for a considerable time into the future.

Physicians are viewed as a legitimate source of information about health promotion and disease prevention. Approximately 70% of adults visit a physician at least once a year and 90% do so within 5 years.[4] It is reasonable to assume that smokers require medical care at least as frequently as nonsmokers. If physicians counsel smokers to quit smok-

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ing during office visits, nearly 35 million of the approximately 50 million smokers would receive such counseling in a given year; with a 5% success rate, 1.75 million people would quit each year.[5] In fact, more than 75% of smokers report that they would try to quit smoking if their physician advised them to do so.[6]

However, many physicians do not counsel their patients to quit smoking because of lack of confidence in their abilities to do so or underestimation of their impact.[6-9] Physicians tend to give advice about smoking cessation as treatment for smoking-related health problems rather than prevention of future diseases. Even in circumstances in which physicians are given a specific algorithm, they are unlikely to follow suggested regimens.[10]

In a recent study of 512 patients who smoked, McIlvain et al[11] reported that 79% of patients indicated that their physicians counseled them about smoking cessation but this counseling had no effect on the rate of successful attempts to quit. Non-Hispanic whites and individuals with serious health problems were more likely to receive such counseling.

Several studies[6-10,12-16] have evaluated physician effectiveness in smoking cessation in a wide variety of situations. While it appears that physicians are more effective agents of change with their patients who have a smoking-related disease, those caring for patients without such conditions also have an impact. In a meta-analysis of 39 controlled trials of cessation interventions in medical practice settings, Kottke et al[13] concluded that "program success 12 months after the initiation of the intervention was related to the type of intervention session (group and individual sessions combined were better than either alone), intervention modalities, and the number of reinforcing sessions." This overall conclusion has been supported by research in the 1990s.[10,12,15]

In a literature search, only one intervention trial specifically directed toward minority populations was found. A one-time physician-delivered cessation message was given to young African-American women in three Baltimore public family planning clinics[17] resulting in self-reported long-term cessation rates ranging from 3.1% to 9.9%, with the higher rates found in groups receiving a structured physician-delivered message.

Hence, the development and implementation of a structured protocol designed specifically to be delivered by physicians to their patients might provide the basis for major inroads into a significant health problem. This study evaluated the effectiveness of a brief (3 to 5 minute) antismoking counseling intervention by physicians in an urban, African-American clinic patient population using a detailed, rigorously controlled field trial with long-term follow-up and biochemical testing to validate cessation.

MATERIALS AND METHODS

The study setting was the Martin Luther King, Jr General Hospital and the Charles R. Drew University of Medicine and Science, both located in south-central Los Angeles. The hospital is a county facility serving residents who require publicly-financed health services. Patients from the family medicine and internal medicine clinics were later joined by otorhinolaryngology (ENT) and general surgery patients to bolster recruitment.

Study Design

A randomized design was used with blocking on type of clinic and year of residency of the participating physicians. The total estimated sample size (474 patients per group) was based on smoking cessation rates for the control and treatment groups of 5% and 10%, respectively, with α=.05, and β=.20. From pilot study information, it was expected that a period of 18 months would be necessary to reach this sample size.

Because there were only four clinics and it was not possible to assess their equivalence in terms of populations, diseases treated, etc, randomization of clinics was deemed inappropriate. For family and internal medicine, random assignment of individual patients within the same clinic was considered to be administratively infeasible. Consequently, in these clinics, individual physicians were either trained or not trained in the intervention. However, it was not possible to randomly assign physicians in ENT and general surgery because physicians were not routinely scheduled to attend outpatient clinics. Thus, the random assignment of patients was adopted.

The Intervention

A 2-hour training session was developed to provide physicians with information about:

- well-known health effects of smoking as well as several less-known consequences (such as periodontal disease and premature wrinkling of the skin),
- benefits of quitting,

- complementary roles of addiction and behavior in smoking,
- ways of dealing with withdrawal,
- precautions about relapse, and
- procedures for making an individual assessment for each patient.

During training, didactic presentations were used as were videotapes of counseling sessions and rehearsals of the procedures by the participants. Gift certificates, lotteries, and newsletters were included to reinforce and help maintain physician motivation.[10]

The major elements in the physician-delivered message were: expressing concern about cigarette smoking and the patient's health, soliciting a commitment to quit smoking by setting a target date to quit cold turkey or at least thinking about quitting, and giving patients a pamphlet on quitting smoking. Physicians were told to modify the message to suit their own style of communication and the individual patient's needs. Physicians in the treatment group were instructed to begin counseling at the initial clinic visit and provide reinforcement at subsequent visits.

Procedures

Patients in the control group continued to receive usual medical care and underwent follow-up at the same intervals as those in the intervention group. For patients in the treatment group, the procedures were as follows: at entry, they were asked to complete a baseline questionnaire about smoking and to have carbon monoxide (CO) levels assessed. This was followed by a 3-to 5-minute counseling session focusing on the smoker's own symptoms and health risks, advising cessation, and establishing a target quit date. A patient-physician agreement was signed, and patients were given a self-help pamphlet reinforcing the physician message. Postcards were given to the patient to be mailed back at specified intervals to report on progress. A list of community cessation programs was provided to each patient along with information on costs and schedules. The carbon monoxide test and personalized message were repeated at subsequent visits.

Physicians in the treatment group were notified when their patient was a smoker. A summary sheet of the patient's smoking history was placed on the outside of the patient's medical record. Control group physicians in family and internal medicine received no training or smoking cessation materials. In general surgery and ENT, since all physicians were trained, prompts were provided concerning whether a given patient should be counseled. Exit interviews with all patient participants served as a vehicle for collecting information on whether any cessation counseling had occurred and whether a target date for quitting had been set.

Follow-up telephone interviews in the intervention and control groups occurred at 3 and 12 months postenrollment to assess current smoking behavior. Every effort was made to minimize losses to follow-up by obtaining three contact names, addresses, and telephone numbers, and searching hospital records. Initial attempts to use other methods such as mail contact prior to telephone follow-up, and tracking through the postal service, department of motor vehicles, voter registration records, or property tax records proved unsuccessful and were not pursued.

Because deception rates among smokers participating in cessation studies are generally high,[18] a biochemical measure was used to validate self-reports of abstinence. Jarvis et al[19] showed that cotinine measurements in plasma, saliva, and urine are the best indicators of smoking with high sensitivity and specificity rates. Salivary cotinine was adopted for use in this study. Saliva samples were collected from treatment and control subjects who reported not smoking at 3 months and 12 months postenrollment. Samples were analyzed at the American Health Foundation's laboratory in Valhalla, New York. Expired carbon monoxide measurements were taken on all intervention subjects at initial and return clinic visits.

Letters of congratulations were mailed to the patient and physician when smoking cessation was confirmed. The postcard and congratulatory letters were intended to reinforce physician counseling activities and prevent relapse among patients.

Measures

Physicians were asked to complete a self-administered questionnaire at entry into the study to measure their smoking history, knowledge, and attitudes about counseling. Similarly, a smoker's questionnaire was administered to all consenting patients. It included measures of demographic characteristics, smoking history and current behavior, smoking knowledge, strength of intention to quit, and probability of success, as well as environmental cues and supports for smoking cessation. A research assistant administered the questionnaire, answered questions,

Table 1. Physician Participants by Department and Study Group*

Department	No. Physicians		
	Intervention Group	Control Group	Total
Family medicine	19	14	33
Internal medicine	46	39	85
General surgery	32*	32*	32
ENT	8*	8*	8*
Total	105*	93*	158*

*All physicians in ENT and general surgery participated in both the intervention and control groups.

and filled out the records that were kept on each patient.

After the office visit, an exit interview was conducted with participants in the intervention group. The interview measured intention to quit, the probability of becoming a nonsmoker within the next 3 months, and a brief checklist indicating knowledge of intervention content. The postexamination checklist was used to monitor physician compliance with the protocol. A modified version also was administered to control subjects to determine if they had been exposed to smoking cessation information.

Analysis

Data entry and editing were conducted using dBase; SAS and BMDP were used for the outcome evaluations. To assess the effectiveness of the intervention, logistic regression was used to analyze abstinence; analysis of variance or covariance was used for amount smoked at follow-up and for abstinence. Both self-reported and biochemically validated abstinence were analyzed as the dependent variable.

Potential confounders examined were: quitting history, presence of other smokers in the household, amount smoked, intention to quit, and number of contacts with physician during the study. When outcome information was missing due to refusals or losses to follow-up, the intention to treat principle was followed in the analysis; in addition, an analysis that included only those individuals with complete information was conducted. Constant monitoring of process measures (such as patient accrual rate, exit interviews, and postexamination checklist) helped to ensure delivery of key intervention components and maximum adherence to protocols by physicians. Potential contamination resulting from the patient, physician, and study environment were monitored through questionnaires.

RESULTS

A pilot study was conducted to test the feasibility of procedures, psychometric properties of the instruments, and response rates with smokers from the internal medicine and family medicine clinics. One hundred thirty-nine eligible patients were identified during the 7-week recruitment period; 8 (5.8%) refused to participate in the study. Despite the larger number of physicians assigned to the treatment group, there were 72 patients in the control condition and 59 in the treatment group. Data entry and analysis packages were tested; the data entry error rate was 0.2%.

Statistical analysis of the smoking history and sociodemographic characteristics of the two groups revealed that they were indeed similar. More than 85% of the treatment participants indicated that the physician had discussed health risks of smoking and methods of cessation. A similar proportion reported receiving self-help guides; more than half had set a quit date. Some modifications were made to the number of response categories based on pilot results. It was concluded that the required sample size could be accrued in an 18-month period.

Process Evaluation

Physician Participants. Implementation of the main study began in the family medicine and internal medicine departments. Later, the ENT and general surgery departments were added to facilitate participant accrual. A total of 158 physicians-in-training were eligible and consented to participate in the study (Table 1). Demographic characteristics of the physicians are presented in Table 2. No statistically significant differences were found between the groups.

When asked if they had ever smoked cigarettes on a daily basis, 15% in the treatment group and 13% in the control group reported having done so. Eight percent of both groups reported smoking during the past 7 days, and 58% of the current smokers smoked <10 cigarettes per day. No one reported smoking >1 pack a day.

Patient Participants. One thousand eighty-six patients were enrolled in the study during a 26-month recruitment period. More than 83% of the

1304 patients who were eligible agreed to participate. The average quarterly recruitment rate was approximately 121 patients. The distribution of intervention and control subjects by department is presented in Table 3. It should be noted that almost half of the patients were recruited in the internal medicine clinic.

In all four departments, the number of men exceeded the number of women; the intervention group was 55% men and the control, 57.3%. Mean age for both groups was virtually identical (43.6 years for the intervention group and 43.5 years for the controls). Individuals in both groups were on the average 18 years old when they started smoking regularly, smoked 14 cigarettes per day, and had been smoking for >25 years. Approximately half of both groups reported smoking their first cigarette within 15 minutes of waking up and at least three quarters smoked within an hour, indicating a high level of nicotine dependency. Nearly 90% had tried to quit smoking for various lengths of time; the groups were similar with regard to these variables.

Physicians' Adherence to Protocol. The results of exit interviews with patients in both groups revealed that physicians adhered to the protocol requirements with reasonable consistency. Nearly 70% in the intervention group reported that their doctor either somewhat strongly or very strongly urged them to quit smoking, with only 16% of the control group reporting receipt of such advice. Ninety-nine percent of the physicians in the intervention group reported that they sometimes or often discussed the risks of smoking with their patients who smoke but only 75% recommended alternatives to smoking and only 32% gave pamphlets or other educational materials to their patients who smoke.

Outcome Evaluation

A total of 960 patients (457 intervention and 503 control) were eligible for 3-month interviews, and 756 patients (369 intervention, 387 control) were eligible for 12-month interviews. Because of protocol violations, 126 patients enrolled during weeks 24 through 38 inclusive were not evaluated at 3 months. A sizable percentage of participants (37.8%) eligible for 3-month interviews were lost to follow-up because of missing or erroneous telephone numbers (12.5%) and nonresponse to repeated telephone and mail contacts (19.4%). Approximately 2% refused to complete an interview at 3 months, and 5 participants had died. Of those who were interviewed at 3 months, 39.9% were lost to follow-up at 12 months. Also at 12 months, more patients were unreachable because of incorrect or no telephone (18.3%), and 13% did not respond to repeated phone calls. Nearly 2% refused to complete the 12-month evaluation, and 21 of the participants had died during that time.

Table 2. Physician Characteristics by Study Group

Characteristic	Intervention Group	Control Group
Mean age (years)	33.7	32.6
Female (%)	28.6	22.6
Race (%)		
Asian	29.5	31.2
Black	48.6	40.9
Hispanic	4.8	12.9
White	13.3	13.9
Other	3.8	1.1

A total of 28 patients in the intervention group and 26 patients in the control group reported at 3 months that they had quit smoking (Table 4). Patients in the intervention group had slightly higher self-reported quit rates for those interviewed and for all of those eligible for interview (10% and 6.1%, respectively) than in the control group (8.2% and 5.2%, respectively). The self-reported quit rates for patients in the control group were higher than in the intervention group for those patients interviewed (17.1% versus 14.4%) and for all patients eligible for interview (10.6% versus 8.4%) at 12 months postenrollment. None of these differences were statistically significant.

At both the 3- and 12-month follow-ups, roughly half of the self-reported quitters in each group provided saliva samples. At 3 months, biochemically validated smoking cessation rates ranged from 2% to 3.2% in the intervention group and 1.8% to 2.8% in the control group (Table 5). At 1 year, the comparable rates ranged from 2.2% to 3.7% in the intervention group and 2.8% to 4.6% in the control group. Deception rates ranged from 42.9% to 74.2% in the intervention group and from 31.3% to 73.2% in the control group, depending on the method of estimation used and whether those who did not provide saliva samples were eliminated or considered to be deceivers.

Three specific hypotheses concerning variables related to cessation were tested. It was anticipated

Table 3. Distribution of Patient Participants by Department and Study Group

Department	Intervention Group	Control Group	Total (%)
Family medicine	192	179	371 (34.2)
Internal medicine	230	280	510 (47.0)
General surgery	43	62	105 (9.6)
ENT	50	50	100 (9.2)
Total (%)	515 (47.4)	571 (53.6)	1086 (100.0)

Table 4. Self-Reported Quit Rates by Study Group for Patients Interviewed and for All Patients Eligible for Interview

Study Group	Quit Rate (No. Interviewed)	Quit Rate (No. Eligible)
Three-month interval		
Intervention group	10.0 (279)	6.1 (457)
Control group	8.2 (318)	5.2 (503)
One-year interval		
Intervention group	14.4 (216)	8.4 (369)
Control group	17.1 (240)	10.6 (387)

that those individuals who smoked <1 pack a day would be more likely to quit following cessation counseling than would heavier smokers. The results supported this hypothesis: more light smokers reported quitting 3 and 12 months postenrollment than heavy smokers at the .05 level of significance, regardless of whether validated or unvalidated rates were used.

It was expected that patients who set target dates for cessation would be more likely to quit than those who did not. At both follow-up points, there was no difference in quit rates between those who set target dates and those who did not. Finally, the number of clinic visits was examined to determine the cumulative effect of physician counseling. In general, those individuals who visited a physician three or more times during their enrollment in the study had higher validated quit rates than those who visited a physician only once or twice. While the smoking cessation rate increased with the number of clinic visits, this trend was not statistically significant, probably because of the small sample sizes.

The relationship of physician and patient gender was examined: at 3 months postenrollment, male physicians were slightly more successful counseling male patients to quit smoking than they were with female patients (1.3 versus 0.0%). Female physicians were more successful counseling female patients to quit smoking than they were with male patients at 3 months (7.3% versus 0.0%). However, at 12 months postenrollment, male physicians were more successful in counseling their female patients to quit smoking than male patients (2.4% versus 0.0%). Female physicians were much more successful with female patients than with male patients at 12 months (6.1% versus 1.2%). Overall, female physicians were more effective counseling patients to quit smoking than were their male counterparts, particularly at 3 months ($P<.05$). The differential is due primarily to the effectiveness of female physicians with female patients.

Several hypotheses were examined relating to comparisons between the intervention and control groups for those patients who did not quit smoking. It was anticipated that patients in the intervention group who continued to smoke during the study would report lower levels of cigarette consumption than patients in the control group, report more quit attempts, and be more likely to change smoking behavior. Patients in the intervention group smoked fewer cigarettes at 3 and 12 months than those in the control group; however, the differences were not statistically significant. Patients in the intervention group who continued to smoke at 3 and 12 months postenrollment reported more attempts to quit smoking than patients in the control group. However, again, the differences were not statistically significant.

DISCUSSION

Several important methodological issues should be considered in relation to the results of this study. First, higher than expected loss-to-follow-up rates of 38% and 40% were experienced at 3 and 12 months postenrollment, respectively. Possibly, the use of incentives would have improved the follow-up rates given that telephone messages were left for many patients who failed to return the calls. Second, higher than expected weighted average deception rates (nonbiochemically validated and those who failed to provide saliva samples) of 55% at 3 months and 60% at 12 months also were experienced. Finally, despite the intense recruitment efforts and the findings from

Table 5. Biochemically Validated Smoking Cessation Rates for Patients Interviewed and for All Patients Eligible for Interview

Study Group	No. Validated Quitters	Quit Rate (No. Interviewed)	Quit Rate (No. Eligible)
Three-month interval			
Intervention group	9	3.2 (279)	2.0 (457)
Control goup	9	2.8 (318)	1.8 (503)
One-year interval			
Intervention group	8	3.7 (216)	2.2 (369)
Control group	11	4.6 (240)	2.8 (387)

the pilot study concerning rate of recruitment, in 26 months, the desired sample size was not achieved. It was estimated that a sample of 351 more patients at 3 months and 492 more patients at 12 months would be required to reach 80% power in the analyses. In fact, the actual power of the comparisons at 3 months was 61% and at 12 months, only 26%. Consequently, insufficient power is one possible explanation for the failure to detect significant differences between the intervention and control groups.

Despite the apparent lack of effect of the intervention, the following findings are noteworthy for future studies in similar populations.

- All physicians-in-training in the targeted departments asked to participate in the study did so.
- Eighty-seven percent of all eligible patients voluntarily enrolled in the study. Research assistants were on-site to identify and recruit study participants and encourage physician counseling.
- Seventy-three percent of the patients who were supposed to be counseled reported on exit interviews that they were actually counseled by their doctor.
- High loss-to-follow-up rates of 38% and 40% at 3 and 12 months, respectively, should be expected. Some attempt should be made to ensure that follow-ups are completed. One possible approach might be the use of incentives following provision of required information.
- Weighted average deception rates (nonbiochemically validated and no saliva sample given) of 55% to 60% might be found at 3 and 12 months. It therefore is important that such validation be incorporated as a routine part of any evaluation.

Our experience also leads us to believe that a brief physician-delivered smoking cessation message alone is not an effective method to use in a large urban public general hospital among adult African-American patients. We have demonstrated, along with others,[13,15,16,20-22] that training of physicians with regard to specific intervention approaches does increase the amount of communication with patients about smoking and smoking cessation. However, there is still room for improvement, as not all patients report that they were counseled. It is not possible to determine whether this is due to the physicians' lack of effort in this area or the patients' lack of attention to the information provided.

The effects of gender on validated quit rates were mixed. Overall, female physicians were more effective than their male counterparts. Both sexes, though, were remarkably ineffective in getting male patients to quit smoking.

It is hardly surprising that one brief counseling session with a physician does not result in a permanent behavior change, but repeated advice, along with information in the media, legislated restrictions on smoking and increased taxation may combine to increase the likelihood that individual smokers will quit.[7] The addition of other procedures such as individual counseling by health educators, nicotine polacrilix, and nicotine transdermal patches may lead to increased effectiveness of the physician's message. The use of focus groups to provide suggestions for future interventions should be an integral part of any evaluation.

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