Effect of Direct Physician Involvement on Tobacco Abstinence Rates and Other Variables Affecting Participants of a Freedom from Tobacco Class

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Abstract

Context: Kaiser Permanente measures how often tobacco users are offered strategies to quit but not the success of such strategies.

Objective: To compare tobacco abstinence rates for participants of the Kaiser Permanente Riverside (California) Medical Center's Freedom from Tobacco Class in 2008, before direct physician involvement, and in 2009, after direct physician involvement, and to compare other variables affecting these rates.

Design: In a retrospective study, participants were divided into two groups based on year of participation. Data were collected using electronic medical records and phone interviews.

Main Outcome Measures: Tobacco use status between both groups at 1, 3, 6, and 12 months after the classes started and within groups by sex, number of classes attended, medication received, and class teacher.

Results: The 12-month abstinence rates were 27% in 2008 and 33% in 2009 ($p = 0.3$). The abstinence rate for men improved from 23% to 38% (2008 vs 2009; $p = 0.05$), whereas for women it was 30% vs 27% ($p = 0.7$). Abstinence rates decreased over time for the group as a whole ($p < 0.001$). Attendance of 6 or more classes was associated with higher abstinence rates. There was no significant impact on abstinence rates due to age, body mass index, class teacher, or medications used.

Conclusion: Direct physician involvement improved men's but not women's abstinence rates among class participants. The relapse rate was significant over the first year after the class. Further research is needed to study the difference between sexes and the factors affecting relapse.

Context

Kaiser Permanente (KP) has invested substantial time and money for the prevention of tobacco-related illnesses. It regularly checks how many of its Health Plan members use tobacco, how many are advised to quit by their physicians, and how many are offered specific strategies to quit during routine office visits. Current available strategies include the Living Well: Freedom from Tobacco (FFT) class, a seven-week behavior change program led by a certified health educator; a telephone counseling service (Healthier Living Helpline); and an online program (Health-Media Breathe). All are offered at no additional cost to Health Plan members and offer Food and Drug Administration-approved tobacco dependence treatment medications at standard copayment.

Although the programs are consistent within the 12 KP Southern California (KPSC) hospital systems, there are a few variations, among which is the type of physician involvement in the FFT class. In most KP centers, the FFT class runs without direct physician involvement. (See Table 1 for a description of the FFT class.) Participants requesting prescription medications inform the class teacher, who then forwards their charts to their primary care physician to be ordered. In a few centers, physicians experienced in treating tobacco dependence are directly involved in the program and are responsible for prescribing the medications, as is explained in detail in the Methods section.

There are several publications that review the rate of delivering various tobacco dependence treatment interventions by KP researchers, but few have looked at tobacco abstinence rates over time and none were designed to measure the abstinence or relapse rates for those who attended the FFT classes.[1-8] Knowing the outcomes of these programs and the impact of variations on them is critical for those seeking to help more members become tobacco abstinent.

We chose to study the outcome of the FFT classes at the KP Riverside Medical Center in Riverside, CA, as it had recently introduced direct physician involvement in the FFT classes (in January 2009) and had collected preliminary abstinence data for attendees 1 year before and after this direct involvement. Only a few facilities in the 12 KPSC service areas used physicians directly in their program, and the data collected at the Riverside Medical Center provided a chance to study the outcomes of a program with and without physician involvement. A retrospective design was chosen for this study because outcome data had already been collected for these periods. These data were collected as part of a quality-improvement project before being used for research analysis. This analysis could then be used as the basis for future research.

Objectives

The primary objective of this retrospective study was to compare 12-month tobacco abstinence for all participants of the KP Riverside Medical Center FFT class in 2008 before direct physician involvement and in 2009 after direct physician involvement. Secondary objectives were to compare the abstinence rates at 1, 3, and 6 months after the class in 2008 and 2009,

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the cumulative relapse rate for all subjects, and the effect of certain subject-related variables (age, sex, body mass index [BMI], number of classes attended, and medications used) as well as program variables (class teacher) on the abstinence rates in 2008 and 2009.

Methods

We searched PubMed for articles using the following terms: *Kaiser, Kaiser Permanente, tobacco, tobacco cessation rates, tobacco cessation,* and *smoking cessation* to find articles that addressed similar questions.

To assess abstinence rates, we used an existing database, with data collected during a quality-improvement project at the KP Riverside Department of Preventive Medicine. These data had been collected as follows. A query was done in the electronic medical record (EMR) database for all members who were scheduled for the FFT class at any time between January 1, 2008, and December 31, 2009. A database of these members was created using both telephone interviews and review of their EMRs. The database had the following information: age, sex, BMI, number of classes attended (with a comparison of those who attended at least 5 of the 7 classes), date of first class, class teacher, medications used to treat nicotine dependence (bupropion, varenicline, and nicotine replacement therapy as evidenced by pharmacy records of medication receipt by the subject), satisfaction with the program, and whether they were still using tobacco at 1, 3, 6, and 12 months after the class. All telephone surveys were conducted by the same person, a graduate-level student who was doing an internship at our facility during the time of the quality-improvement project. She had a list of questions to ask. All EMR reviews were done by the principal investigator (MI) in the study, who was also the physician who participated in the classes in 2009. Having the same individuals do these tasks helped ensure uniformity in data collection.

We divided the participants into 2 study groups: those who attended at least 1 session of the FFT class between January 1, 2008, and December 31, 2008 (before direct physician involvement), and those who attended at least 1 session of the FFT class between January 1, 2009, and December 31, 2009 (after direct physician involvement). The rates of tobacco abstinence were compared between both groups at 1, 3, 6, and 12 months after the time of class attendance. Those participants from whom we could not collect abstinence data at the 12-month mark (after class attendance) were excluded from the main analysis, although an analysis at 12 months was done assuming all missing values were tobacco users. Subjects who attended the FFT classes in both 2008 and 2009 were also excluded to avoid placing the same member in both cohorts. Baseline characteristics were compared between the 2 groups.

For the secondary outcomes, analysis was done in each of the 2 groups (2008 and 2009) by dividing them into subgroups based on sex, number of classes attended, type of medication received (if any), and the instructor teaching the class to see if these factors affected the tobacco abstinence rates.

Table 1. Overview of Kaiser Permanente tobacco cessation program, Living Well: Freedom from Tobacco[a]

Session	Focus	Description
1	Orientation	Provides an overview of the six remaining sessions of the Freedom from Tobacco program. Also, information regarding medication is covered, such as how it works, dosing, and precautions. Participants complete questionnaires that will help to determine how prepared they are to become tobacco free and their reasons for wanting to quit. They receive tools to use between sessions to track behaviors, moods, and triggers for using tobacco. *A physician may be involved in the teaching at some centers.*
2	Preparing to quit	Enables participants to identify habit patterns and triggers, and identify substitute activities for smoking. They learn the practice of visualizing themselves as tobacco free and the process of becoming tobacco free. After they leave the session, they will prepare for their quit date, and if they choose, collect smoking paraphernalia to bring to the next session.
3	Becoming tobacco free	Guides participants in acknowledging quit-day challenges and discusses the benefits of becoming tobacco free. If they choose, they will perform the ritual of throwing away smoking paraphernalia, thereby demonstrating their commitment to becoming tobacco free.
4	Developing peer support	Provides a forum to share nonsmoking experience and review short-term strategies for staying tobacco free. Participants will learn to draw on their support system to help get past a craving for tobacco. They will document trigger situations for slipping and develop a plan to avoid smoking in the future.
5	Healthy eating and physical activity	Enables participants to continue to assess their success at not smoking, and learn how healthy eating and physical activity play a role in improving health and in dealing with stress reduction.
6	What to expect when quitting	Enables participants to assess their success at not smoking and learn to deal with the physical affects as the body continues to heal and repair itself. Participants will also add more tools and strategies to their "staying tobacco free survival kit."
7	Staying tobacco free: long-term strategies and support	Provides a chance for participants to share their nonsmoking experience, develop a relapse prevention plan, and review the many resources available to them during their journey of becoming tobacco free. At the end of this session there will be a short celebration acknowledging their extraordinary accomplishment of becoming tobacco free.

[a] Each session lasts typically one to two hours and is taught by a health educator.

Analysis was also done to see if the year of participation was associated with the attendance of more classes or the prescription of different medications. To protect the identity of the 4 health educators who taught the classes during both years, they were designated by numbers as Teacher 1, Teacher 2, Teacher 3, and Teacher 4.

Definitions and Detailed Program Description

Abstinence was defined as a cessation of tobacco use when evidenced by either 1) patient self-report during a telephone survey or 2) clear medical record documentation of tobacco abstinence without any contradictory medical records. Generally, there were 3 common scenarios encountered during the data search: 1) members who had several clear progress notes all consistent with either cessation of tobacco or continuous use, 2) members who had no clear mention of tobacco use in their medical record during the time in question, and 3) members who had conflicting documentation of their tobacco use status. As an example of conflicting documentation, a physician's note might state in the history section that the member had quit smoking but in the current plan would include "smoking cessation counseling" without indicating whether that was counseling to stop current use or to prevent relapse. Only the clear data (Scenario 1) were used to base our results on. When Scenario 2 or 3 was encountered, it was considered either a missing value (if conflicting data did not suggest cessation or use) or the member was considered a tobacco user (if data suggested continuous use without being clearly stated).

Any use of tobacco (even a single puff of a cigarette) was considered a *relapse* at that time interval.

Direct physician involvement is described as follows. At the KP Riverside Medical Center, a preventive medicine physician gives a talk during the first session (orientation) of the FFT program. S/he explains the addiction triad of habit, physical, and psychological dependence to tobacco, and how the different tobacco cessation medications available can help. The physician goes into detail about the proper use as well as potential harms of these medications. S/he then goes around the classroom, spending individual time with each participant, reviewing a questionnaire the participant fills out, and discussing his/her best treatment. The class continues during this time so that other participants are not bored waiting too long for their turn. The discussion maintains patient privacy and if confidential topics need to be opened, the participant is booked for an appointment with the same physician at a later time. Once the class is over, the physician inputs the information from the patient questionnaires into each patient's EMR and orders their medications. Patients are given the e-mail and telephone contact methods for the physician if they need to contact him/her for any questions.

The health educator's main role in this first session at KP Riverside is mainly program overview. In KP centers that do not have this direct physician involvement, the health educator gives an overview about the medications (without going into the fine details such as dosing), and the members still fill out a questionnaire. The health educator then contacts (usually via a messaging utility in the EMR) the member's primary care

Table 2. Baseline characteristics and variables for 293 subjects included in the study

Variable	2008 subjects	2009 subjects	p value[a]
Total number of subjects who participated in class that year (no. of those with tobacco abstinence data available at 12 months)	208 (149)	191 (144)	0.4
Sex (no. of men:women)	65:84	67:77	0.6
Mean age (years)	50	53	0.06
Mean body mass index (kg/m^2)	29	31	**0.01**
Percentage of subjects taught by Teacher 1	42	83	**< 0.0001**
Percentage of subjects taught by Teacher 2	17	16	0.7
Percentage of subjects taught by Teacher 3	30	1	**< 0.0001**
Percentage of subjects taught by Teacher 4	11	0	**0.0001**
Use of nicotine patch alone	55	39	**0.006**
Use of nicotine (Nicotrol) inhaler alone	0	6	**0.002**
Use of bupropion alone	11	3	**0.005**
Use of varenicline	30	22	0.15
Use of nicotine patch/bupropion combination	19	19	0.9
No medications received	21	20	0.8
Percentage who attended at least 5 of the 7 classes[b]	38	51	**0.02**
Percentage who attended at least 6 of the 7 classes	29	39	0.07
Percentage of men who attended at least 6 of the 7 classes	26	40	0.08
Percentage of women who attended at least 6 of the 7 classes	30	38	0.37
Satisfaction with program	93	87	0.2

[a] Significant p values are in bold.

[b] Percentage of women who attended at least 5 classes was 38% in 2008 and 52% in 2009 (p = 0.07); for men, the rate was 37% and 49% (2008 vs 2009; p = 0.15). This variable was collected as part of the participant's baseline characteristics but can also be seen as an outcome result as the attendance of more classes may be linked to a more effective class structure or teacher.

physician requesting that the physician fill (or consider filling) the member's medication request.

In all centers, the remaining 6 sessions do not involve physicians directly. Those sessions are taught by the health educator alone with the exception that at KP Riverside, the physician would sometimes drop by on Session 5 to check on member progress briefly and answer any medication-related questions. (By this time, most participants had started medications.)

Statistical Analysis

Chi-squared analysis and analysis of the generalized estimating equation model for linear time trend were used to test for statistical significance (α level of 0.05).

Results

A total of 407 class participants were in the database. All 407 participants had their EMRs surveyed and an attempted telephone survey, but the latter was successful in reaching only 133 of them. Four of these (2 men and 2 women) were excluded for attending classes in both years, leaving 129. The remaining 274 participants could not be reached by phone. Data for 12-month abstinence were available in the medical records of 164 of those 274 participants. Thus, 293 subjects of the original 407 were included in the data analysis: 149 who attended class in 2008 and 144 who attended class in 2009. The remaining 110 class participants were excluded from the analysis because of a lack of 12-month abstinence data.

Baseline Characteristics

There were significant differences between those who participated in the classes in 2008 and those who participated in 2009 (Table 2). They were as follows: mean BMI (29 vs 31 kg/m^2); class teacher (Teachers 3 and 4 taught only in 2008, and Teacher 1 taught most of the 2009 subjects); percentage of participants using the nicotine patch alone (55% vs 39%), the nicotine (Nicotrol) inhaler alone (0% vs 6%), and bupropion alone (11% vs 3%); and the percentage of participants attending at least 5 of the 7 classes (38% vs 51%).

Primary Outcome

The 12-month tobacco abstinence rate was 27% (40/149) for 2008 participants and 33% (47/144) for 2009 participants (p = 0.28; Table 3 and Figure 1). The abstinence rates for these groups at the 1-, 3-, and 6-month intervals also were not statistically significant. If all missing values that were excluded from this analysis were assumed as tobacco users, the 12-month abstinence rates would be 19% (40/208) for 2008 participants and 25% (47/191) for 2009 participants (p = 0.19).

Concordance between Telephone Surveys and Medical Record Review

Documentation of tobacco abstinence in the medical record was compared with telephone survey reports for the 129 patients reached by phone. These reports in all but 5 cases were concordant with the medical record review, which had been classified by phone survey as abstinent but proved to be tobacco users by the medical record.

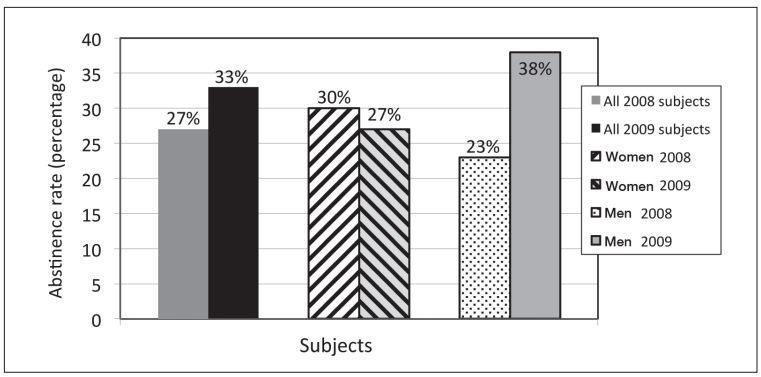

Figure 1. Tobacco abstinence rates at 12 months comparing subjects who attended classes in 2008 and 2009.[a]

[a] Comparison groups (from left): p = 0.3 (all 2008 vs all 2009 subjects); p = 0.7 (women: 2008 vs 2009) and p = 0.05 (men: 2008 vs 2009).

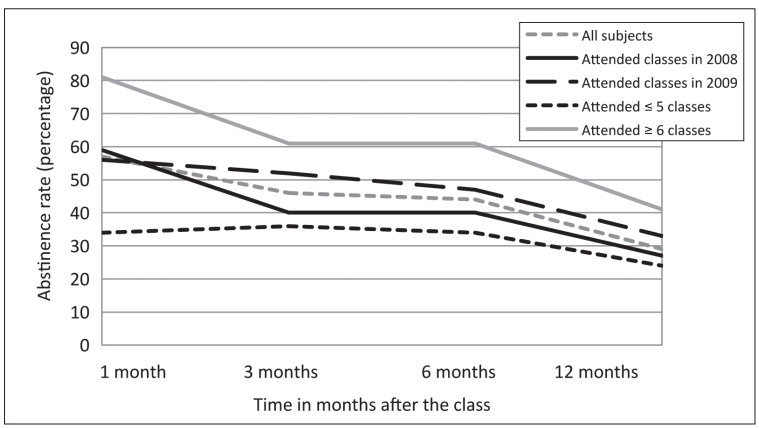

Figure 2. Abstinence rates over 12 months compared by year of class attendance and by number of classes attended.[a]

[a] Rate: 1 = 100%.

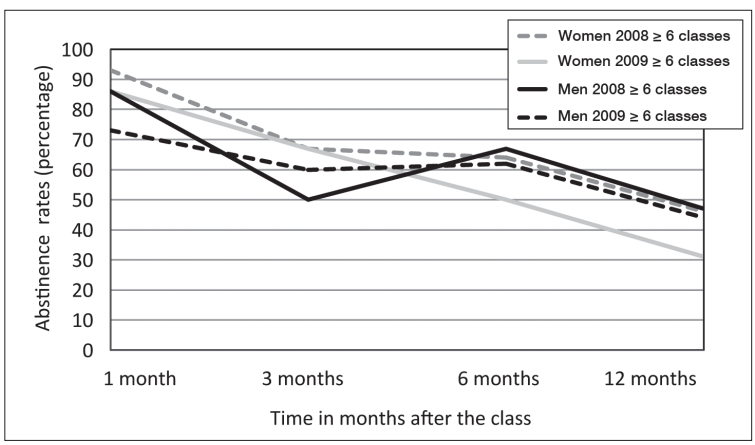

Figure 3. Abstinence rates over time for participants who attended 6 or more classes.[a]

[a] Rate: 1 = 100%.

Secondary Outcomes

When subdivided by subjects' sex, the 12-month abstinence rates in 2008 and 2009 for males were 23% vs 38% (p = 0.05) and for women were 30% vs 27% (p = 0.7; Table 3 and Figure 1).

Twelve-month abstinence rates when comparing women and men were, respectively, 30% vs 23% (p = 0.36) in 2008 and in 2009 were 27% vs 38% (p = 0.14). The breakdown by sex was further subdivided by class teacher at the 12-month interval. For Teacher 1, the 12-month abstinence rate for women was 28% in both 2008 and 2009, whereas for men, the rates were 23% (2008) and 44% (2009); p = 0.07. For Teacher 2, the 12-month abstinence rates for women were 18% (2008) and 25% (2009), and for men, they were 9% (2008) and 31% (2009); p = 0.2. Teacher 3 taught only in 2008 and had abstinence rates of 35% for women and 27% for men. Teacher 4 taught only in 2008 and had rates of 33% for women and 14% for men.

Higher abstinence rates at 1, 3, 6, and 12 months were observed for patients who attended 6 or more classes than those who attended 5 or fewer classes (Figures 2 to 4). The probability of abstinence increased with increasing class numbers (p < 0.0001). The association of abstinence with the attendance of 6 or more classes was significant in both women and men in 2008 (at 1 and 12 months). It was not significant for either men or women in 2009 at 12 months but was significant for women in 2009 at the 1- and 3-month intervals. The use of different medications did not influence abstinent rates significantly.

Relapse Rates

The abstinence rates for all class participants (both 2008 and 2009) decreased significantly over time: 57% at 1 month, 46% at 3 months, 44% at 6 months, and 29% at 12 months (p < 0.0001). When the subjects were subdivided by the number of

Table 3. Tobacco abstinence rates at 1, 3, 6, and 12 months after class compared by year of class attendance, sex, and total number of classes attended

	No. abstinent / No. with data available (percentage abstinent)[a]			
	Months after class			
Group; total surveyed	**1 month[b]**	**3 months[c]**	**6 months[d]**	**12 months[e]**
Subjects 2008 or 2009; N = 293	50/117 (57)	52/113(46)	51/116(44)	87/293 (30)w
Year of attendance				
Subjects 2008; total = 149	32/54 (59)	20/51 (39)	20/50 (40)	40/149 (27)
Subjects 2009; total = 144	35/63 (56)	32/62 (52)	31/66 (47)	47/144 (33)
p value[f]	0.7	0.19	0.45	0.28
Women 2008; total = 84	23/32 (72)	15/30 (50)	14/29 (48)	25/84 (30)
Women 2009; total = 77	18/34 (53)	15/34 (44)	17/ 39 (44)	21/77 (27)
p value[f]	0.1	0.6	0.7	0.7
Men 2008; total = 65	9/22 (41)	5/21 (24)	6/21 (29)	15/65 (23)
Men 2009; total = 67	17/29 (59)	17/28 (61)	14/27 (52)	26/67 (38)
p value[f]	0.2	**0.01**	0.1	**0.05**
Number of classes attended				
Subjects (2008 or 2009) attended ≤ 5 classes; total = 194	22/65 (34)	24/67 (36)	24/71 (34)	46/194 (24)
Subjects (2008 or 2009) attended ≥ 6 classes; total = 99	43/53 (81)	28/46 (61)	27/44 (61)	41/99 (41)
p value[f]	**< 0.0001**	**0.008**	**0.003**	**0.001**
Women (2008) who attended ≤ 5 classes = 58	9/17 (53)	7/17 (41)	5/15 (33)	13/58 (22)
Women (2008) who attended ≥ 6 classes = 26	14/15 (93)	8/12 (67)	9/14 (64)	12/26 (46)
p value[f]	**0.01**	0.17	0.09	**0.02**
Men (2008) who attended ≤ 5 classes = 48	3/15 (20)	2/15 (13)	2/15 (13)	7/48 (15)
Men (2008) who attended ≥ 6 classes = 17	6/7 (86)	3/6 (50)	4/6 (67)	8/17 (47)
p value[f]	**0.003**	**0.07**	**0.01**	**0.006**
Women (2009) who attended ≤ 5 classes = 48	6/20 (30)	7/22 (32)	11/27 (41)	12/48 (25)
Women (2009) who attended ≥ 6 classes = 29	12/14 (86)	8/12 (67)	6/12 (50)	9/29 (31)
p value[f]	**0.001**	**0.05**	0.6	0.5
Men (2009) who attended ≤ 5 classes = 40	6/13 (46)	8/13 (62)	6/14 (43)	9/40 (23)
Men (2009) who attended ≥ 6 classes = 27	11/15 (73)	(9/15 (60)	8/13 (62)	12/27 (44)
p value[f]	0.1	0.9	0.3	0.057

[a] Other than p values, results are presented as number of abstinent subjects/total number of subjects with data available, followed by the percentage of abstinent subjects from those with data available. The missing values can be calculated by subtracting the No. with data available from the total number.
[b] Missing values out of the total available for survey = 176.
[c] Missing values out of the total available for survey = 180.
[d] Missing values out of the total available for survey = 117.
[e] Missing values out of the total available for survey = 0.
[f] Significant p values are in bold.

classes attended, as shown in Table 3, a significant drop in the abstinence rate was noted for the group who had attended 6 or more classes between 1 and 3 months and between 6 and 12 months (81% at 1 month, 61% at 3 months and 6 months, and 41% at 12 months), whereas the abstinence rate for the group that attended 5 or fewer classes did not change statistically (34% at 1 month, 36% at 3 months, 34% at 6 months, and 24% at 12 months). The decrease in the abstinence rates also appeared less in 2009 than in 2008, but this was not statistically significant.

Sixty-two participants from among all participants in 2008 and 2009 who were smoking at 12 months had data available at the earlier time intervals (1, 3, and 6 months after class; Figure 5). Of these, 35% (22/62) were quit at 1 month, 22% (14/62) were quit at 3 months, and 8% (5/62) were quit at 6 months. P values were as follows: 0.1 (1 vs 3 months); < 0.001 (1 vs 6 months); 0.02 (3 vs 6 months); and 0.02 (6 vs 12 months).

Discussion

This retrospective review attempted to include every participant of the class in the analysis, rather than use a sample set. The baseline characteristics, number of women and men who attended the classes, and the total number of attendees in both years were similar across groups. This makes the study representative of our program attendees. The results cannot be generalized to the population of smokers at large as those who agree to join such a program may be different from those who do not. The purpose here was to evaluate the effectiveness of the program itself and to set the stage for future evaluations and modifications.

There are 2 main areas of discussion raised by this study. The first relates to the improvement in abstinence rates in 2009 for men only. The trend toward an overall improvement in the abstinence rate in 2009, after direct physician involvement, compared with 2008, before such involvement (33% vs 27%), can be attributed to a significant increase in the abstinence rate for men (38% vs 23%), whereas the rate among women decreased (27% vs 30%). Although not statistically significant, there was a trend in 2008 to favor women's abstinence compared with that of men, and in 2009 this was reversed, favoring men. The difference in the male abstinence rate was not explained by the difference in class teachers between the 2 years. Teacher 1, who taught most of the participants in 2009 had a very different 12-month abstinence rate that year for men compared with that in 2008 (44% in 2009 vs 23% in 2008). It could not be explained by medication prescription, the rate of which was almost identical in both 2008 and 2009. It could also not be explained by the improved class attendance (which was associated with better abstinence rates), as the percentage of subjects who attended 6 or more classes increased in 2009 for both men and women. Also, it is possible that improved class attendance is a result of improved abstinence because those who do not quit may be more likely to drop out of the class.

Thus, the main factor affecting male abstinence rates appears to be the direct physician involvement in 2009. Why this occurred and via what mechanism is not clear. The relation of physician participation to class attendance and abstinence is also not clear. The typical "quit date" for class participants is Week 3 out of 7. Physician participation may have been directly responsible for improved class attendance, which in turn led to better abstinence rates. This is supported by the data that showed that men who attended 6 or more classes did just as well in 2008 as they did in 2009 at all the intervals after the class. (This, however, would still not explain why female abstinence rates did not improve in 2009.) It is also possible that better abstinence rates by Week 3 of the class led more men to continue until the end of the program, but there still has to be a cause for the higher abstinence rates. The male participants may have responded better with a male physician leading the class; in 2008, almost all participants were taught by female teachers. It is not known if prescriptions (including high-dose nicotine replacement therapy, which was available only in 2009) were ordered in a more timely fashion in 2009, leading to better abstinence rates early on and thus affecting class attendance.

It is also possible that the class structure or curriculum, or both, were biased toward female success over male success in 2008 with a change that evened the field or favored men in 2009. The limited power of this study regarding the subdivision analyses makes it possible to only guess at the factor or factors responsible. For example, female class participation increased

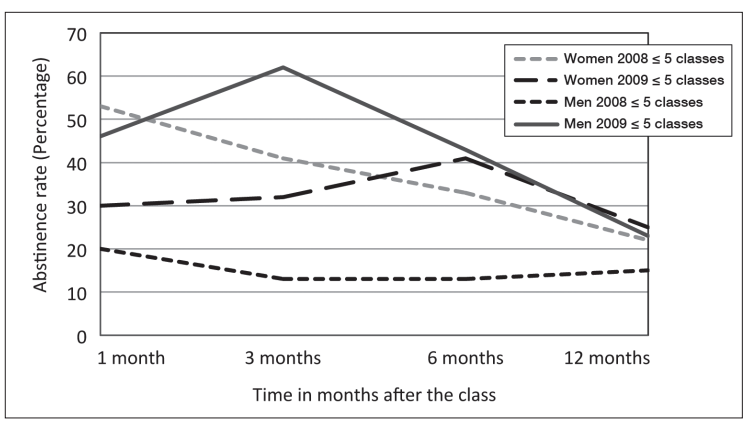

Figure 4. Abstinence rates over time for participants who attended 5 or fewer classes.

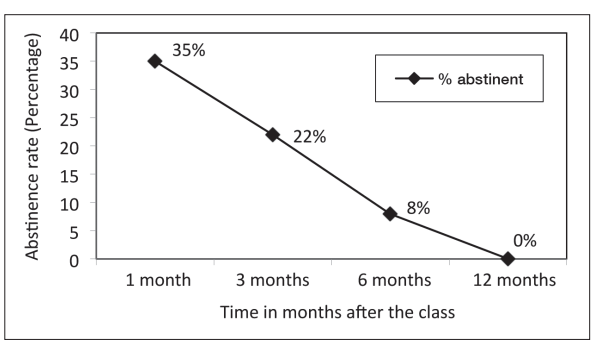

Figure 5. Abstinence rates over 12 months after Freedom from Tobacco class for a subset of 62 subjects who were using tobacco at 12 months.[a]

[a] Statistically significant differences were found between 1 and 6 months (p = 0.002) and between 6 and 12 months (p = 0.02).

in 2009, but the rate of 12-month abstinence for those women who attended 6 or more classes decreased from 46% (2008) to 31% (2009) despite a high 1-month abstinence rate in both years (93% in 2008 and 86% in 2009). This would suggest a late relapse factor affecting women more in 2009 vs 2008, but none of these results were statistically significant.

Whitlock et al[9] showed that men and women were equally likely to participate in each step of the recommended smoking cessation *intervention* and to report quit attempts and cessation at 3 and 12 months and had no difference in relapse at 12 months. Yet they also found that women attempting to quit used a greater number and variety of *smoking* cessation strategies than did men. Augustson and colleagues[10] found differences in male vs female "hard-core" smokers and between female "hard-core" and female "other" smokers, including the level of physical dependence. It is possible that between 2008 and 2009, the worsening economy affected the amount of tobacco smoked, which may have affected the outcomes in the current study. The number of cigarettes smoked was not sought out in this study. Bjornson[11] found several demographic differences between men and women smokers, including level of education, marriage, nicotine burden, prior quit attempts, and "emotional" scores and found men to have a better 3-year abstinence rate. Other studies showed no difference by sex in abstinence and relapse rates.[12-14]

Physician participation may have been directly responsible for improved class attendance, which in turn led to better abstinence rates for men.

The second area of discussion is the reduction in abstinence rates over time and how this can be improved in the future. It is apparent that there was a significant decrease in abstinence rates for those attending 6 or more classes between the 1- to 3-month interval (81% vs 61%; p = 0.02) and then the 6- to 12-month intervals (61% vs 41%; p = 0.02). For those attending 5 or fewer classes, the biggest drop was between 6 and 12 months, but this was not significant (34% vs 24%, p = 0.09). Regardless of how many classes are attended or the presence or absence of direct physician involvement, it seems that the abstinence rate at 12 months is about half of what it is at 1 month after class, and this is the case in both 2008 and 2009 for men as well as for women. This suggests that whatever factor or factors influenced the improvement in men's abstinence in 2009 did not protect against relapse. Because of missing data at some time intervals for most subjects, the best group to see the dramatic impact of relapse is the group of 62 subjects who had documentation at all 4 postclass intervals and who were all smoking at 12 months. Of this group, 35% were abstinent at 1 month and 22% at 3 months.

There are several strategies that can be attempted to improve the overall abstinence rates for participants of these classes. It is important to keep in mind that out of all who started the program, two-thirds of them attended 5 or fewer classes and one-third attended 6 or more classes and also that there was no scheduled follow-up for class attendees beyond Week 7. On the basis of this, 3 possible strategies include:

1. Find a way to increase the attendance of at least 6 classes or to compress the information taught in the current 7 classes into 5 classes to make it easier to complete the program. Completion may be promoted via patient and staff incentives, telephone follow-up for anyone who misses a class, and the collection of detailed feedback from members as to how the classes can be made more appealing to them.
2. Aggressively follow-up participants between 1 and 3 months after the class via a support group invitation, follow-up class, phone call, e-mail, text message, or letter.
3. Follow-up again between 6 and 12 months after the class in the same fashion.

Limitations

This study was retrospective and observational. It may not be adequately powered for the subjects' sex and other subdivision comparisons done. There may be other potentially influencing factors on the abstinence rates that were not studied. Of the 407 participants, 114 had no 12-month abstinence data as they could not be reached by phone and lacked tobacco use documentation on their medical records. Phone interviews depended on patient self-report of tobacco use status throughout the first year after the FFT class, which is subject to recall bias. In most of the 5 cases where the phone survey results were overturned by medical record review, the telephone surveyor had taken the patient's lack of tobacco use on the actual day of the phone call (which was more than 1 year out from their class) as evidence for successful abstinence, but it turned out that these subjects had been using tobacco at the 12-month mark after the class but later became abstinent. They were thus reclassified as tobacco users at 12 months.

Medical record documentation was sometimes vague regarding tobacco use status. For instance, a physician encounter one year after the class might have noted the tobacco use status at that point only without exact dates as to when the patient quit, or different encounters within days or weeks of each other contradicted each other regarding the member's tobacco use status. A larger sample size may have detected more significant differences, as there were many consistent trends that did not show statistical significance. This was compounded by the missing values, about 25% at 1 year out but much more for the 1-, 3-, and 6-month analyses. Because these missing values were excluded from the analysis, it is possible that the accuracy of results is suboptimal.

The amount of tobacco use was not documented and should be included in any further such study. This is mainly because of the practice at that time of not including the amount of tobacco use in the medical record.

Missing values in this study, although problematic for the power analysis, may not have affected the accuracy of the outcomes as much as may be feared because of the following:

1. The inability to collect data in this retrospective study was not because of subject dropout but often because of inaccurate phone numbers or poor chart documentation, neither of which suggests a higher tendency to quit or to continue tobacco use.
2. Subjects who attended even one class and then dropped out were still included in the analysis, despite that this may be a predictor of continued tobacco use.

3. The rates of missing values were similar across the groups.
4. The primary outcome (12-month abstinence rates) included approximately 75% of the original dataset in the analysis, much more than a random sample would have included.

Conclusion

Direct physician involvement in FFT tobacco cessation classes appeared beneficial for men, but further research is needed to determine the reproducibility of this finding and possible influencing factors. Improving the initial class attendance and extending the length of follow-up after the FFT classes may be beneficial to reduce the high-relapse rate noted after class attendance. A long-term follow-up study to see the effects of these factors is essential. ❖

Disclosure Statement

The author(s) have no conflicts of interest to declare.

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The Risk of Developing Lung Cancer

Cigarette smoking is causally related to lung cancer in men; the magnitude of the effect of cigarette smoking far outweighs all other factors. The data for women, though less extensive, point in the same direction.

The risk of developing lung cancer increases with duration of smoking and the number of cigarettes smoked per day, and is diminished by discontinuing smoking.

— *Smoking and Health: Report of the Advisory Committee to the Surgeon General of the Public Health Service,* Surgeon General's Advisory Committee on Smoking and Health United States. Office of the Surgeon General, Luther L Terry, MD, 1964