WISCONSIN MEDICAL JOURNAL

Helping Wisconsin Women Quit Smoking: A Successful Collaboration

Michael C. Fiore, MD, MPH, Sue Ann Thompson, Daniel L. Lawrence, PhD, Samuel Welsch, MS, Kristine Andrews, Meg Ziarnik, Barbara Korberly, PharmD, Eric Englund, Ann E. Schensky, Timothy Baker, PhD

ABSTRACT

The cost of treatments for tobacco dependence frequently presents a financial barrier to their use. To overcome such barriers, the Wisconsin Women's Health Foundation, the Wisconsin Bureau of Public Health, the McNeil Consumer Healthcare, and the University of Wisconsin Center for Tobacco Research and Intervention collaborated in an initiative to distribute nicotine patches to Wisconsin women at no cost. As a result of this collaborative effort, approximately 19,000 women received a 6-week course of Nicotrol Patches. To evaluate the effectiveness of this initiative, a sample of 500 recipients were contacted and surveyed by telephone 6 months after receiving their patches. Approximately 22% of these women reported total abstinence at 6 months, and another 77% reported they had reduced their smoking. At follow-up, women who had successfully quit rated their health status significantly better than women who were still smoking. More than 99% of respondents recommended that the program be repeated. Extrapolating the observed abstinence rate to the 19,000 patch recipients, an estimated 4000 Wisconsin women successfully quit smoking as a result of this program.

INTRODUCTION

The deleterious health effects resulting from tobacco use were first widely reported over 35 years ago in the first *Surgeon General's Report on the Health Consequences of Smoking*.[1] Since that time, smoking prevalence among adults in the State of Wisconsin has declined, falling from about 45% in the early 1960s to about 25% today. This decline has varied, however, based on demographic characteristics. In particular, smoking among women has declined at a rate only about one-fourth of that observed among men.[2] As a result, an estimated 440,000 women in our state currently smoke (22% of adult women), and lung cancer mortality rates, which are declining among men, will continue to rise among Wisconsin women over the next decade.[3] In Wisconsin, more women now die from lung cancer caused by smoking each year than die from breast cancer.

More than 70% of Wisconsin smokers have expressed a desire to quit, and over one-third attempt to quit each year.[4] Unfortunately, only about 6% of those who attempt to quit each year do so successfully, in part because they try to quit on their own (i.e., "self-quit"). In contrast, recent federal guidelines[5] urge smokers to utilize brief counseling and FDA-approved pharmacotherapy such as nicotine replacement therapy (NRT) or bupropion SR in their quit attempts. Cost has been cited as one reason that smokers don't utilize these more effective treatments. [6]

To confront these barriers and help Wisconsin women quit smoking, the Wisconsin Women's Health Foundation, the Wisconsin Bureau of Public Health, McNeil Consumer Healthcare, and the University of Wisconsin Center for Tobacco Research and Intervention (UW-CTRI), collaborated on an initiative designed to distribute nicotine patches at no cost to women in Wisconsin who were motivated to quit. This paper describes the results of that initiative.

METHODS

In December 1998, approximately 800,000 Nicotrol Patches were donated by McNeil Consumer Healthcare as a non-restricted grant to the UW-CTRI. The patches were then bundled into approximately 19,000 nicotine patch kits, each consisting of a 6-week course of patch therapy consistent with FDA approved labeling. In collaboration with the Wisconsin Women's Health Foundation and the Wisconsin Bureau of Public Health, UW-CTRI embarked on an effort to distribute these kits free of charge to Wisconsin women.

Each patch kit contained forty-two 15 mg nicotine patches, a 6-week course of treatment. This included a starter kit consisting of 2 weeks of patches packaged with an informational audio cassette and 2 refill kits containing patches for the remaining 4 weeks. In addition to the package insert instruction sheet, a pamphlet entitled "You can stop smoking," published by the United States Agency for Health Care Policy and Research (AHCPR), [7] was provided to recipients.

Authors are with the Center for Tobacco Research and Intervention, Department of Medicine, University of Wisconsin Medical School. Reprint requests to Michael Fiore, MD, MPH, Center for Tobacco Research and Intervention, University of Wisconsin Medical School, 7278 Medical Sciences Center, 1300 University Ave, Madison, WI 53706-1532; 608.262.8673

Finally, information on other women's health issues including breast cancer, osteoporosis, domestic violence, depression and cardiovascular disease, was provided by the Wisconsin Women's Health Foundation.

Over a 2-day period in February, 1999, Sue Ann Thompson, First Lady of the State of Wisconsin and President of the Wisconsin Women's Health Foundation, and Dr. Michael Fiore, Director of the UW Center for Tobacco Research and Intervention, traveled to the five health regions of Wisconsin (Northern-Rhinelander, Northeastern-Green Bay, Southeastern-Milwaukee, Central-Madison, and Western-La Crosse) to promote the availability of the nicotine patch program at no cost to women who wanted to stop smoking. These announcements were made in concert with local health officials. In each health region, a news conference was held, resulting in extensive television, radio, and local print media coverage of the program. These news conferences also provided information regarding locations where patches were available for pick-up. The patch kits were available at the county health offices of each region and at other health-care settings. Prior to accepting the nicotine patches, the women were asked to read and sign a data sheet that included demographic information, confirmation of being at least 18 years of age, a recommendation to use the patches only as described in the instructions included in the patch boxes, specific instructions to not use the patches if pregnant and to not smoke while using the patches, and permission to contact them 6 months later for a follow-up survey.

About 19,000 Nicotrol Nicotine Patch kits were distributed and approximately 5000 participants returned data forms to the UW-CTRI where the information was entered into a data base including health region information based on address zip codes. This low return rate of the data forms was primarily a result of the forms not being available at many patch distribution sites and incomplete mailing of the data forms to the UW - CTRI. A random sampling procedure was then used to obtain 100 successful telephone follow-up contacts per region. A total of 500 surveys were completed statewide.

Follow-up contact was made by telephone. Five unsuccessful attempts at telephone contact were made before selecting another participant. To obtain 500 successfully completed surveys, contact with 727 randomized individuals was attempted. From those attempts, 227 individuals were not successfully contacted because of no answer after 5 attempts (42%), disconnected service (22%), moved (15%), or refusal (14%). Participants were queried regarding their past and current tobacco use. They also were asked about their use of the free nicotine patches and their perception of their usefulness in promoting smoking cessation.

Table 1. Sociodemographic data.

Age (years)	**N**	**(%)**
< 20	4	(0.8)
20-29	73	(14.6)
30-39	137	(27.4)
40-49	149	(29.8)
50-59	84	(16.8)
60-69	40	(8.0)
70+	13	(2.6)
Total	500	(100)
Race/Ethnicity	**N**	**(%)**
White	484	(97.0)
Hispanic	1	(0.2)
Native American	5	(1.0)
African American	8	(1.6)
Asian	0	(0)
Other	499	(100)
Education	**N**	**(%)**
< High School	34	(6.8)
High School Degree	255	(51.2)
Some College	163	(32.7)
College Degree	46	(9.2)
Total	498	(100)

Means, standard deviations, and percentages were computed for the overall sample. For selected comparisons involving continuous-level variables, two-sided t-tests were computed to test for differences between groups. When an independent sample t-test was used, equal variances were not assumed. Significance was considered to be achieved at $p<0.01$.

RESULTS

There was a high response rate to the statewide announcements of the patch program. Ultimately, more than 19,000 nicotine patch kits were distributed to Wisconsin women, with about 90% of those kits picked-up within 30 days of the initial announcements. Data forms were received from 5162 recipients (27%), giving UW-CTRI permission to obtain follow-up information. Of these women, 500 (100 from each of the five health regions) were then surveyed by telephone at 6 months.

Sociodemographic data for the 500 respondents is presented in Table 1. Most respondents were between age 20 and 59 with the average age of 43 years. Ninety-seven percent of respondents were white and almost 60% had a high school education or less. Over 50% lived in households where children resided.

The average number of years participants had smoked was 23 (Table 2). Most women smoked between 10 and 20 cigarettes per day, (mean = 22 cigarettes per day). Over 85% of the women had previously attempted to quit smoking, with almost half reporting 3 or more previous quit attempts. Prior to

Table 2. Smoking History

Year Smoked (years)	years	(%)
< 10	62	(12.4)
10-19	115	(23.0)
20-29	167	(33.4)
30-39	91	(18.2)
40-49	50	(10.0)
50-59	13	(2.0)
60-69	2	(0.4)
Total	500	(100)
No. of Cigarettes Per Day, Prior to Receiving Patches	**cigs/day**	**(%)**
< 10	23	(4.6)
10-20	347	(69.4)
21-30	72	(14.4)
31-40	45	(9.0)
> 40	13	(2.6)
Total	500	(100)
Previous Quit Attempts	**attempts**	**(%)**
0	66	(13.2)
1	94	(18.8)
2	96	(19.2)
3	98	(19.6)
4	44	(8.8)
5	33	(6.6)
6-9	23	(4.6)
10+	46	(9.2)
Total	500	(100)
Urged by Healthcare Provider to Quit	**N**	**(%)**
Yes	282	(56.7)
No	215	(43.3)
Total	497	(100)

Table 3. Utilization of Nicotine Patches, Remaining Patches, and Counseling

ALL SUBJECTS		
Utilized Patches	N	(%)
Yes	417	(83.4)
No	83	(16.6)
Total	500	(100)
Abstinent at Follow-Up	**N**	**(%)**
Yes	109	(21.8)
No	388	(78.1)
Total	497	(100)
SUBJECTS STILL SMOKING		
Any Patches Left	N	(%)
Yes	283	(73.1)
No	104	(26.9)
Total	387	(100)
Planned to Use Remaining Patches for a Later Quit Attempt	**N**	**(%)**
Yes	253	(90.0)
No	28	(10.0)
Total	281	(100)
Would Free Counseling be Important in Making Another Quit Attempt	**N**	**(%)**
Yes	166	(44.5)
No	207	(55.5)
Total	373	(100)

picking up the patches, only 56.7% of the women reported that they had been urged by a health care provider to stop smoking.

Of the 500 women surveyed, 83.4% reported that they had used the nicotine patch kit patches; 21.8% (109 women) reported that they were totally abstinent from smoking at 6 months.

Of the 387 women surveyed who were still smoking, 283 (73.1%) reported having some nicotine patches left. Among these, 253 women (90%) stated they planned to use the remaining patches during a future quit attempt. Of the 373 women who responded to this query, free counseling was considered important by 144 women (44.5%).

A number of factors were associated with successful cessation. Individuals who successfully quit used the patch for a longer period of time than women who were smoking at 6 months (means = 4.8 versus 3.4 wks, respectively, $p<0.001$) (Table 4). In addition, successful quitting was associated with improved self-reported health status. At follow-up, women who had successfully quit rated their health significantly better than did women who were still smoking (7.4 versus 8.0, respectively, on a scale where 1 is poor and 10 is excellent, $p<.001$). Both groups had reported similar health ratings at baseline. Finally, women who were still using tobacco at 6 months reported that their smoking had declined significantly since the program had begun (from mean of 22.2 at baseline to 16.4 at 6 months, $p<.001$).

Participant satisfaction with the program is shown in Table 5. Overall satisfaction was high with a large majority of recipients reporting that the free nicotine patch program helped them make a quit attempt (87.6%). Almost everyone indicated that she would recommend the program to friends and that the free nicotine patch program should be repeated in the future (99.0% and 98.8% respectively).

DISCUSSION

In an innovative program designed to encourage smoking cessation among women, the Wisconsin Women's Health Foundation, the Wisconsin Bureau of Public Health, McNeil Consumer Healthcare, and the University of Wisconsin Medical School's Center for Tobacco Research and Intervention collaborated in an effort to distribute 19,000 Nicotrol Patch treatment kits at no cost to Wisconsin women who wanted to quit smoking. Among a sample of 500 of these women contacted 6 months later, approximately 22% reported they had successfully quit smoking. Extrapolating this cessation rate to the total population of program participants, approximated 4,000 Wisconsin women quit smoking as a result of this program. The 21.8% cessation rate achieved by these women compares very favorably

with nicotine patch success rates reported in the literature [8] and is markedly better than success rates achieved when individuals attempt to quit on their own. Another notable finding was that women who had not successfully quit reported that they had decreased the number of cigarettes they smoked each day (from an average of 22.2 to 16.4 cigarettes per day). If sustained, this decrease might be beneficial in two ways; first, it might decrease the health risks from tobacco use that are related to smoking rate; second, this decrease may increase women's success in subsequent quit attempts.

The program particularly targeted socioeconomically disadvantaged women for whom cost barriers may prevent the purchase of effective therapies such as the nicotine patch. While we did not collect data on the economic status of participants, most patch recipients had a high school education or less, a factor correlated with lower income. Moreover, 50% of patch recipients had at least one child in their household, suggesting that the health benefits of such a program may extend to the smoker's family.

This program also provides population-based experience regarding interest in adjuvant counseling as well as the effectiveness of the nicotine patch when used without formal counseling. While it has been documented that intensive counseling improves cessation outcomes when used with nicotine patches, many smokers have been unwilling to participate in such counseling.[8] In this program, about half of Wisconsin women reported that they would be receptive to cessation counseling if it was readily available.

Survey data also documented that women who successfully quit were more likely to have used the patches for a longer period of time. This dose-response finding was observed for this population of women who were given enough patches to last 6 weeks. Previous data suggest that no increased therapeutic benefit is observed when patch treatment is extended beyond 8 weeks.[8]

Over 85% of the women surveyed had made at least 1 and almost 50% had made at least 3 quit attempts prior to participating in this program. A history of frequent unsuccessful smoking cessation attempts has been commonly reported in the literature.[9,10] These data attest to the nicotine dependence of the women who participated in this research.

The results also highlight a previously reported lost opportunity–the lack of universal intervention by health care providers with smokers during their health care visits. It has been well documented that even brief counseling from a health-care provider can increase smoking cessation rates significantly.[11] It was disappointing to note in this survey that only 56.7% of patch recipients reported ever being urged to stop smoking by a health-care provider. Research suggests that both clinician education as well as institutional changes (such as recording smoking status with the vital signs[5]) can increase clinician intervention rates.

Table 4. Comparison of Time of Patch Use, Quit Time, Cigarettes Per Day, and Ratings of Current Health. (* p< .001; Non-Smokers compared to Smokers for - Time of Patch Use, Quit Time, and Rating of Current Health; Past Week compared to Prior To Program for - Cigarettes Per Day of Smokers)

	Non-Smokers	Smokers
Time of Patch Use (wks)	4.8* wks	3.4 wks
(Respondants: Non-smk 103, Smk 311)		
Quit Time (wks)	18.5* wks	4.6 wks
(Respondants: Non-smk 103, Smk 312)		
Cigarettes Per Day		
Past Week	0 cig/ day	16.4* cig/day
Prior To Program	22.0 cig/ day	22.2 cig/day
(Respondants: Non-smk 109, Smk 388)		
Rating of Current Health		
10 pt. scale; 1=poor, 10=good	8.0*	7.4
(Respondants: Non-smk 109, Smk 388)		

Table 5. Participant Satisfaction

Do You Feel the Free Patches Helped You Make a Quit Attempt	N	(%)
Yes	366	(87.6)
No	52	(12.4)
Total	418	(100)
Did the Free Patches Help Reduce Your Smoking	**N**	**(%)**
Yes	364	(87.5)
No	52	(12.5)
Total	416	(100)
Would You Recommend the Program to Your Friends	**N**	**(%)**
Yes	495	(99.0)
No	5	(1.0)
Total	500	(100)
Should We Run the Program Again	**N**	**(%)**
Yes	494	(98.8)
No	6	(1.2)
Total	500	(100)

Overall, the participants expressed strong satisfaction with this free nicotine patch program. Greater than 97% indicated they would recommend the program to their friends and that the program should be repeated in the future. In addition, over 85% indicated that the program had helped them to make a quit attempt or reduce their previous level of smoking.

Certain limitations of the study should be highlighted. First, the population surveyed was homogeneous from a racial and ethnic perspective; more than 95% were white. Therefore, it would be inappropriate to generalize these findings to non-white populations. Second, data forms providing demographic information

and permission to follow-up were received only from about 27% of the 19,000 women who picked up free patches. This may have resulted in a selection bias as this group of patch recipients may have differed in a systematic way from other patch recipients or smokers in general. Third, follow-up was possible only among those patch recipients who had access to a home telephone. However, this impact would be modest as over 97% of the occupied housing units in Wisconsin has one or more telephones. In addition, the women who were available for the phone follow-up surveys may have differed from women who could not be contacted. Finally, no biochemical verification of abstinence was used in this study. Research suggests that people may modestly over-report abstinence in the absence of biochemical verification.

In summary, a collaborative effort between the Wisconsin Women's Health Foundation, the Wisconsin Bureau of Public Health, McNeil Consumer Healthcare, and the University of Wisconsin Medical School's Center for Tobacco Research and Intervention resulted in the distribution of Nicotrol Patch kits at no cost to over 19,000 women in Wisconsin. As a result, an estimated 4000 women successfully quit smoking. In addition, women who were not abstinent had significantly reduced the amount that they smoked. The vast majority of women were very satisfied with this initiative and wanted the program repeated.

ACKNOWLEDGMENTS

The co-authors would like to acknowledge the important contributions to this project provided by Jane Algiers, Project Manager, and the five Wisconsin Regional Health Office Directors: Yvonne Eide (Madison-Central), Larry Gilbertson (Eau Claire-Western), Dennis Hibray (Green Bay-Northeastern), Robert Harris (Milwaukee-Southeastern), and Terri Timmers (Rhinelander-Northern).

REFERENCES

1. U.S. Public Health Service. *Smoking and Health, Report of the Advisory Committee to the Surgeon General of the Public Health Service*. U.S. Department of Health, Education and Welfare, Public Health Service, Center for Disease Control PHS Publication No. 103, 1964.
2. US Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Chronic Disease Prevention and Health Promotion, Office of Smoking and Health. *Reducing the Health Consequences of Smoking: 25 Years of Progress.* A report of the surgeon general. DHHS Publication No. (CDC) 89-8411, 1989.
3. Remington PL, Fiore MC. Trends in lung cancer mortality in Wisconsin. Wis Med J, June 1989; 34-38.
4. Wetter DW, Remington PL, Pessino G. The smoking continuum in Wisconsin, 1990. Wis Med J 1992; 91(4):121-123.
5. Fiore MC, Bailey WC, Cohen SJ, et cl. Smoking Cessation. Clinical Practice Guideline No. 18. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research. 1996. AHCPR Publication No. 96-0692.
6. Jorenby DE, Leischow SJ, et al. A Controlled Trial of Sustained-Release Bupropion, A Nicotine Patch, or Both for Smoking Cessation, 1999. NEJM 340(9):685-691.
7. Smoking cessation during previous year among adults-United States, 1990 and 1991. MMWR. Morb Mortal Wkly Rep 1993; 42:504-507.
8. Fiore MC, Smith SS, et al. The effectiveness of the nicotine patch for smoking cessation. JAMA 1994 271(24):1940-1947.
9. Fiore MC, Movotny T, et al. Smoking cessation: data from the 1986 adult use of tobacco survey. Excerpta Medica International Congress Series No. 780, 1987:189-194.
10. US Department of Health and Human Services. *The health benefits of smoking cessation*. USDHHS, PHS, CDC, CCDPHP, DHSS Publication No. (CDC) 90-8416, 1990.
11. Hurt RD, Dale LC, et cl. Nicotine patch therapy for smoking cessation combined with physician advice and nurse follow-up. One-year outcome and percentage of nicotine replacement. JAMA 1994; 271:595-600.
12. Fiore MC, Jorenby DE, et al. Smoking status as the new vital sign: effect on assessment and intervention in patients who smoke. Mayo Clin Proc 1195; 70:209-213.

The mission of the *Wisconsin Medical Journal* is to provide a vehicle for professional communication and continuing education of Wisconsin physicians.

The *WMJ* (ISSN 1098-1861) is the official publication of the State Medical Society of Wisconsin and is devoted to the interests of the medical profession and health care in Wisconsin. The managing editor is responsible for overseeing the production, business operation and contents of *WMJ*. The editorial board, chaired by the medical editor, solicits and peer reviews all scientific articles; it does not screen public health, socioeconomic or organizational articles. Although letters to the editor are reviewed by the medical editor, all signed expressions of opinion belong to the author(s) for which neither the *WMJ* nor the SMS take responsibility. The *WMJ* is indexed in Index Medicus, Hospital Literature Index and Cambridge Scientific Abstracts.

For reprints of this article contact the *WMJ* Managing Editor at 800.362.9080 or e-mail wmj@wismed.org.