Using Physician Correspondence and Postcard Reminders to Promote Mammography Use

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A B S T R A C T

Objectives. In a health maintenance organization that mails letters to women recommending that they schedule mammograms, we conducted a randomized trial to evaluate simple methods of increasing the use of screening mammography.

Methods. Using a 2 × 2 factorial design, we tested the effects of (1) mailing the recommendation letter from each woman's primary care physician rather than from the program director and (2) sending a subsequent reminder postcard.

Results. Sending a reminder postcard nearly doubled the odds that women would get mammograms within 1 year (participate). The letter from the woman's personal physician had no effect. Attending a clinic more than 45 minutes from the screening center, being a current smoker, or being in fair or poor health were negatively associated with subsequently obtaining a mammogram. The odds of participation doubled if women had had previous mammograms.

Conclusions. When preceded by written recommendations to schedule mammograms, reminder postcards effectively increased participation. Future randomized trials to promote use of screening mammography should compare interventions with a reminder condition. (*Am J Public Health.* 1994;84:571–574)

Introduction

Breast cancer mortality remained constant from 1973 through 1988, partly because of the underuse of mammography.[1–7] By 1990, only about one third of women reported having had more than one mammogram.[6,7]

Mailing recommendations directly to women offers a promising approach to increasing mammography use. Such recommendations increased the use of blood pressure checks, influenza vaccines, and cancer screening tests.[8–19] In a Swedish randomized trial of mammography, mailed recommendations resulted in 92% of the women in the study getting mammograms.[20,21] In the United States, 21% to 65% of women obtain mammograms after mailed recommendations.[8,11,12,16,17,22]

We undertook a randomized trial to test whether we could increase participation in an established screening program that routinely mails recommendations to women due for mammograms.[12,23,24] We tested two enhancements: (1) mailing the recommendation letter from each woman's primary care physician rather than from the program director and (2) sending a subsequent reminder postcard. We based the interventions on the Health Belief Model, which suggests that cues to action promote preventive care behavior.[25,26]

Methods

Setting

Group Health Cooperative of Puget Sound is a staff model health maintenance organization with over 375 000 enrollees and the full complement of health care services. Adult Group Health Cooperative members choose from among family physicians or internists who each care for 1600 to 1800 enrollees. The populations of both the Group Health Cooperative and Puget Sound have a higher proportion of Caucasians (91%) than national figures (83%).[27,28] The Cooperative has a greater proportion of enrollees with more than 15 years of education (Group Health Cooperative = 34%, Puget Sound = 24%, and United States = 16%). There are also slightly fewer Cooperative enrollees with incomes below $15 000 (in 1984 dollars: Group Health Cooperative = 20%, Puget Sound = 23%, United States = 24%) and above $50 000 (in 1984 dollars: Group Health Cooperative = 13%, Puget Sound = 19%, and United States = 18%).[27,28]

Screening Program

In 1985, the Group Health Cooperative initiated a Breast Cancer Screening Program for women age 40 years and older.[12,23,24] Eighty-seven percent of women age ≥40 years complete an enrollment questionnaire that elicits breast cancer risk factors, perceived health status, smoking history, and previous mammography use. Once they are

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TABLE 1—Baseline Characteristics, by Study Group

	Study Group				
	Control (n = 329)	Letter from Physician (n = 329)	Postcard Reminder (n = 335)	Both (n = 334)	P
Demographic					
Mean age, y	61.2	60.7	60.2	60.9	.39
Age ≥ 65 y, %	35	27	33	34	.17
Self-report of fair or poor health, %	14	13	14	15	.83
Behavioral influences					
Are current smokers, %	28	27	27	26	.95
History of breast cancer in aunt or grandmother,[a] %	4	3	4	4	.95
History of breast biopsy, %	1	3	2	2	.71
History of having mammograms, %	28	25	29	28	.64
Do breast self-examinations ≥ 12 times/y, %	28	24	24	26	.65
Logistic barriers					
Use clinic that is ≥ 45 min from BCSP[b] center, %	15	12	17	16	.26
Appointment wait time was ≥ 4 wk at time of invitation, %	53	43	48	48	.10

[a]Second-degree family history. Women with first-degree family history (mother, sister, daughter) of breast cancer were excluded from the study.
[b]BCSP = Breast Cancer Screening Program.

enrolled, an automated system sends letters to women due for mammograms. The letter is signed by the Breast Cancer Screening Program medical director, recommends scheduling a mammogram at one of three screening centers, and emphasizes the importance of the test.

Study Population and Design

We randomized women who were (1) age 50–79 years and had completed the questionnaire more than 1 year before randomization, (2) current Group Health Cooperative enrollees who had not been previously invited to a screening center, and (3) without a mammogram in the year before randomization. In order to have adequate numbers of women eligible for first invitations, we restricted the study to women who did not have a first-degree family history of breast cancer or more than one minor risk factor (early menarche, late menopause, second-degree family history of breast cancer).[24]

By making small changes in the Breast Cancer Screening Program correspondence, we tested the independent and combined effects of (1) having the recommendation letter come from the woman's physician rather than from the Breast Cancer Screening Program medical director (primary physician invitation) and (2) sending a reminder postcard to women 2 months after the recommendation letter (reminder postcard).

A sample of 1500 women was identified through the breast cancer program database, and these women were randomly allocated to four groups: (1) primary physician invitation (n = 329); (2) reminder postcard (n = 335); (3) primary physician invitation plus reminder postcard (n = 334); and (4) usual-care control group (n = 324). Subsequent to randomization, 11.5% of women were excluded from the study because they terminated Group Health Cooperative coverage (n = 34) or obtained a mammogram before being sent the recommendation letter (n = 135). Study data came exclusively from the program database and the risk factor questionnaire. All women were blinded to the study and received identical care to other women being invited at the same time.

Recommendation letters and reminder postcards were mailed directly to study women. When the primary care physician personally signed the letter, it also included a paragraph that emphasized the importance of the screening visit in the woman's overall health care. Reminder postcards were sent to all women in the appropriate study group without checking participation status beforehand.

Analysis

We compared baseline demographic characteristics, health status, screening history, and logistical barriers to participation among study groups. We dichotomized all characteristics (Table 1) and compared proportions among intervention populations using chi-square tests. We compared mean age and enrollment length using analysis of variance.

Using receipt of a mammogram within 12 months of the invitation letter (yes/no) as the dependent variable in a logistic regression model, we tested for the main effects of the primary physician letter, the reminder postcard, and the interaction of the physician letter and the reminder postcard. We then used chi-square tests with 1 *df* to compare each of the interventions with the control condition. These pairwise comparisons were repeated with a logistic regression model that included all the baseline characteristics. In addition, we fit five separate logistic models to test for these interactions: (1) physician letter with patient age and (2) reminder postcard with patient age, appointment wait time, travel time, or history of mammography.

Results

The groups did not differ significantly with respect to mean age (61 years) or average length of enrollment (10.4 years). As shown in Table 1, there were no significant differences among the four treatment groups on any of the baseline characteristics (Table 1).

The groups that received the reminder postcard had significantly greater rates of mammography use compared with control subjects (Table 2, $P < .001$). The odds of getting a mammogram increased at least 60% in the groups receiving a reminder postcard. The use of a letter from the woman's personal physician did not increase participation.

Adjusting for baseline covariates increased the odds ratio for both postcard groups to nearly 2 (Table 3). We did not find significant interactions between the physician letter and patient age, nor between the postcard reminder and the variables of age, appointment wait time, distance from the screening center, or having had a prior mammogram.

The covariate analysis also identified three baseline characteristics associated with a lower likelihood of obtaining a mammogram: reporting fair or poor health ($P = .02$), current cigarette smoking ($P = .0001$), and living more than 45 minutes from the screening center ($P = .0001$). Women who had had a previous mammogram were significantly more likely to participate ($P = .0001$). Because women had an average enrollment of 10 years, most of the previous mammograms occurred at the Group Health Cooperative.

Discussion

A letter from the woman's primary care physician did not increase the likelihood that she would get a mammogram within 1 year. In contrast, sending a subsequent reminder postcard nearly doubled the odds of participation.

McPhee and Detmer[29] recently demonstrated that mailed recommendations nearly doubled the odds that women would get a mammogram (62% vs 46%). Our study suggests that adding a reminder postcard 2 months after mailed recommendations would increase the rate even more.

Our results should encourage the evaluation of mailed reminders in economic or racial subgroups who were not represented in this study. Efforts to promote mammography use in Hispanic and Black populations currently emphasize encouraging physician recommendations.[30,31] However, a physician recommendation alone may not be sufficient to change behavior. Testing the effectiveness of reminders among these populations, once they receive the recommendation, would be a logical extension of our work.

The lack of effect of personal physician letters in this health maintenance organization setting may not generalize to the fee-for-service practice. In this study, the letter from the screening program medical director largely reflects the recommendation of the woman's physician. However, in fee-for-service practice, direct correspondence with women by a third party such as a radiology facility would be contrary to accepted notions of continuity. The role of continuity in achieving cancer screening goals needs closer evaluation, especially in fee-for-service practice.[32,33]

When considered in a national context, the results of this study suggest that future work to promote mammography must continue to be concentrated on women who have never obtained a mammogram. Our results demonstrate that the odds of getting a mammogram double if the woman has had a previous mammogram. Automated systems that mail reminders may be sufficient to encourage repeat mammography once a woman has had her first examination. Identifying and encouraging women who have not had the first mammogram should continue to be a priority.

Physician recommendations alone are not sufficient to ensure that women obtain a mammogram. Less than half the women who received that intervention participated, which is far less than the rates achieved in randomized trials.[20,22] More needs to be done to test methods of promoting participation. Interventions that address access barriers and patient characteristics should be compared with postcard reminders in future intervention trials.[34]

TABLE 2—Proportion of Study Group Women Who Obtained Mammograms within 1 Year

Intervention Group	Mammogram within 1 y of Recommendation, %	Odds Ratio[a]	95% Confidence Interval	P
Control[b] (n = 329)	46.8	1	...	
Primary physician invitation[c] (n = 329)	45.6	0.95	0.74, 1.36	.75
Postcard reminder[d] (n = 335)	58.5	1.60	1.18, 2.18	.003
Both[e] (n = 334)	61.7	1.83	1.34, 2.49	.0001

[a]Odds ratios were calculated from logistic regression model.
[b]All women received a letter signed by the program director that recommended they schedule a screening mammogram.
[c]The standard letters were modified to include the signature of the woman's physician.
[d]Women received reminder postcards subsequent to the recommendation letter.
[e]Women received both the letter from the woman's physician and the reminder postcard.

TABLE 3—Logistic Regression Analysis Comparing Odds of Obtaining Mammograms among Treatment Groups, With Baseline Characteristics Controlled

	Odds Ratio[a]	95% Confidence Interval	P
Interventions[b]			
Control	1.00	...	...
Primary physician invitation	0.98	0.69, 1.38	.89
Postcard reminder	1.92	1.36, 2.71	.0002
Physician letter + reminder	1.95	1.38, 2.74	.0001
Sociodemographics[c]			
If age ≥ 65 y	1.06	0.73, 1.53	.53
If have fair or poor health	0.63	0.45, 0.90	.02
Behavioral influences[c]			
If current smoker	0.48	0.37, 0.63	.0001
If second-degree family history of breast cancer	1.21	0.62, 2.33	.57
If history of breast biopsy	0.43	0.18, 1.05	.07
If history of mammograms	1.87	1.41, 2.48	.0001
If do breast self-examination ≥ 12 times/y	1.19	0.90, 1.58	.22
Logistic barriers			
If clinic was ≥ 45 min away	0.44	0.31, 0.62	.0001
If appointment wait was ≥ 4 wk	1.04	0.74, 1.47	.68

[a]From logistic regression calculated by using all variables and 1150 subjects.
[b]Coded so that control subjects are the reference group.
[c]Coded so that the reference group is the one without the characteristic.

A variety of surveys demonstrate that older women are least likely to get screening mammography.[7,35] Our work suggests that participation rates are similar across age categories if the recommendation is given. But the recommendation alone will not be sufficient to achieve high rates of participation among women of any age group.

Automated reminder systems applied to populations show promise as a technique for putting the potential mortality reductions afforded by screening mammography within reach. Improved interventions and the use of reminders in the fee-for-service setting need future evaluation. □

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