

A Two-Step Intervention to Increase Mammography among Women Aged 65 and Older

ABSTRACT

Objectives. This study evaluated a two-step intervention for mammography screening among older women.

Methods. Four hundred and sixty women, identified from physician practices, were randomized to a control or a two-step intervention (physician letter and peer counseling call) group. Women in the intervention group who obtained a mammogram received a grocery coupon.

Results. Over the 12 months of the study, more women in the intervention group than in the control group obtained mammograms (38% vs 16%). The most dramatic difference was in the higher odds that women in the intervention group would obtain a mammogram within 2 months (odds ratio = 10.5).

Conclusions. The intervention significantly increased screening mammography. Future efforts must be multifaceted and incorporate the unique concerns of older women. (*Am J Public Health*. 1997;87:1683-1686)

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Introduction

Death rates from breast cancer are approximately three times higher among women aged 65 years and older than among women aged 35 through 64 years.¹ Older women are less likely to obtain screening mammograms, although such screening could reduce breast cancer mortality by at least 30%.²⁻⁴ In national surveys, the two most common reasons offered by older women for not having a mammogram were that they did not know they needed a mammogram and that their physician had not recommended one.^{5,6} Other barriers cited by older women include cost, concern about bad news, fear of radiation, and issues of access.

Because most older women rely on physicians' guidance, several studies suggest employing physicians' recommendations in different formats to try to improve screening mammography rates.⁷⁻¹⁰ Results have been mixed, and some studies have shown that as age increases, women are less likely to report that their physician recommended a mammogram.¹¹ Intervention studies using physician letters to alert women to the need for mammography have been modestly effective.¹²⁻¹⁵ Few mammography-related interventions have targeted women aged 65 years and older.¹⁶ Several investigations have focused on populations in health maintenance organizations,^{12,14,16} and most studies have low minority representation.^{12,14,15}

This study evaluated the effectiveness of a two-step intervention designed to improve mammography utilization among women aged 65 years and older. Genesee County, Michigan, was chosen because of its high percentage of low-socioeconomic, minority populations with high breast cancer mortality.¹⁷

Methods

Eligible women were those identified from the medical records of 17 primary care practices who were 65 through 85 years of age, had no known

personal history of breast cancer, had not had a mammogram in the previous 24 months, were not institutionalized, and were Genesee County residents. After review by the primary physician to exclude women on the basis of extenuating medical reasons, eligible women were randomly assigned within each practice to the intervention or a "usual-care" control group. A total of 635 women were randomized to the study groups; however, 175 women were deemed ineligible because they had obtained a confirmed mammogram within 24 months, died, moved, or resided in a nursing home (93 in the intervention group, 82 in the control group). The final sample consisted of 460 women, 223 in the intervention group and 237 in the control group.

The two-step intervention consisted of (1) a personal letter from the primary care physician with a coupon incentive and (2) for women who did not respond to the letter within 2 months, a telephone counseling session conducted by a community peer.

Step 1. A physician letter developed by the research team and participating physicians contained recommendations regarding clinical breast exam and mammography for women over age 50, a statement that the participant had not had a mammogram in the last 24 months, information on where and how to sched-

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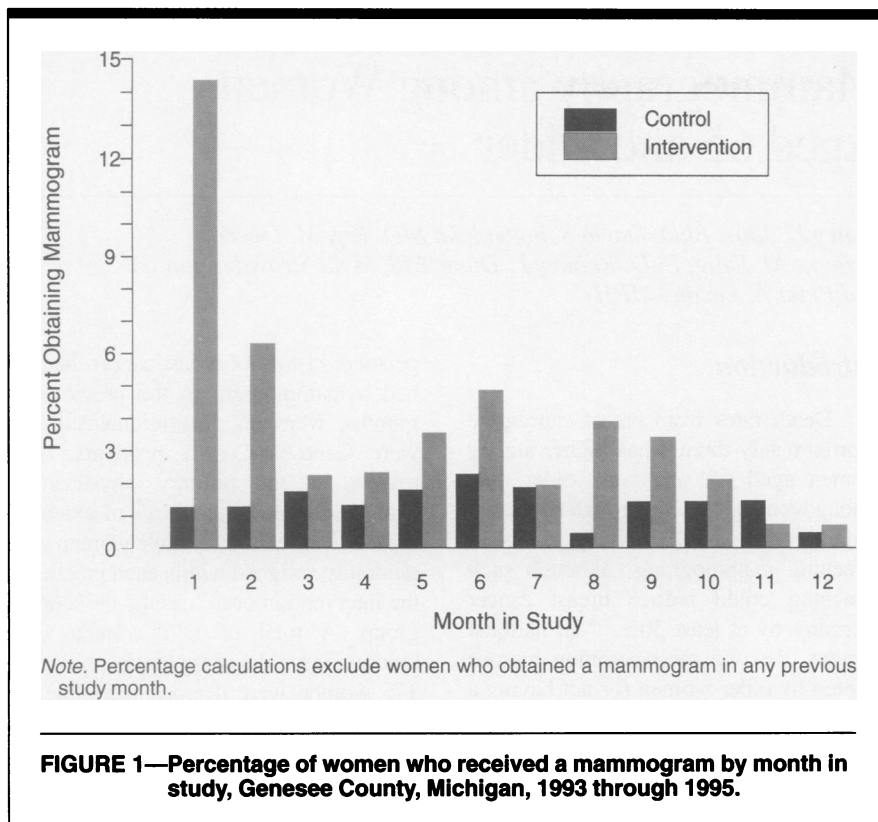


FIGURE 1—Percentage of women who received a mammogram by month in study, Genesee County, Michigan, 1993 through 1995.

ule a mammogram, and a number to call with questions. A postcard was enclosed for the patient to complete after obtaining a mammogram. On confirmation of the mammogram, participants received a \$15 coupon redeemable at a local grocery.

Step 2. Five women living in Genesee County were hired to conduct the peer telephone counseling (four were retired health professionals, one an American Cancer Society educator; they were 51 through 68 years old; three were White and two were African-American). Peer counselors received \$8 an hour. Whenever possible, peer counselors were matched with study participants with regard to race.

Counselors were trained to identify each woman's primary reasons for not scheduling a mammogram and to tailor the telephone counseling to her concerns. A standardized set of responses corresponded to three of the Health Belief Model's major dimensions—susceptibility, benefits, and barriers.¹⁸ Women who did not recall receiving the letter or who requested another copy were sent a second letter.

The effectiveness of the intervention was evaluated according to two end points: obtaining a mammogram within 1 year of study entry and obtaining a mammogram within 2 months; the 2-

month end point reflects the potential impact of step 1, the physician letter with a coupon incentive. Only women who obtained a mammogram confirmed by medical or radiology records were considered responders. (All records were checked at the study's conclusion.) Despite efforts to obtain complete information, race was unknown for 10 women and mammography history was unknown for 72. Multiple imputation, a method that adjusts for missing data,^{19,20} was employed to preserve the data's sampling variability while providing unbiased model parameter estimates. Analyzing only patients with complete information could have introduced bias if missing values were systematic.²¹

A multiple logistic regression model was used to evaluate the intervention and possible interactions with demographics. Each two-way interaction was evaluated and added to the final model on the basis of a 10% significance level.

Results

Mean age of the 460 participants was 73.6 years. Approximately 74% of participants were White; 24% were non-White (African Americans composed 95% of the non-White sample). There was no significant difference between groups with regard to race; however, the control group

was somewhat younger than the intervention group (mean age 73.0 years vs 74.1 years; $P = .036$). Among participants whose mammography history was known, approximately 25% had never had a previous mammogram.

Eighty-five women in the intervention group (38%) and 37 in the control group (16%) obtained a confirmed mammogram during the 1-year study period ($P < .001$). Figure 1 displays the percentages of women in each group who received a mammogram in each month. The most dramatic difference in the percentages of women obtaining mammograms was during the first 2 months, when 44 women in the intervention group (20%) and 6 women in the control group (3%) obtained mammograms ($P < .001$).

The effect of the intervention across four age groups (Figure 2) shows that a higher percentage of women in the intervention group obtained mammograms during the study period. In the age categories older than 70 years, the proportion of women obtaining mammograms was at least 25 percentage points higher in the intervention group than in the control group; the largest improvement occurred among women aged 80 through 85. The second graph in the figure depicts the percentage of women by age group who obtained a mammogram within 2 months. Again, in all age categories, a higher percentage of women in the intervention group obtained mammograms.

In both the intervention and control groups, women with at least one confirmed mammogram in the past were five times as likely as others to obtain a mammogram within the 12-month study period. Significant interactions were found between race and intervention and between age and intervention (Table 1). Therefore, the odds ratio estimates in the first column of Table 1 can be used to construct the relevant odds ratios for the effect of intervention vs usual care for each age-race combination. For White women, the odds ratios for obtaining a mammogram within 12 months for women in the intervention group vs those in the control group were 2.11 for women aged 65 through 69 (95% confidence interval [CI] = 0.88 to 5.05), 5.97 for women aged 70 through 79 (95% CI = 3.03, 11.76), and 24.98 for women aged 80 through 85 (95% CI = 2.98, 209.12). Similarly, for non-White women, the model's estimated odds ratios were 0.78 for women aged 65 through 69 (95% CI = 0.26, 2.35), 2.20 for women aged 70 through 79 (95% CI = 0.76, 6.44), and

9.23 for women aged 80 through 85 (95% CI = 0.97, 88.04). Thus, the intervention was associated with higher odds of obtaining a mammogram in White women aged 70 through 85. However, it appears that the intervention was effective, although the effect was not statistically significant, in all other groups except non-White women aged 65 through 69.

No significant interactions were found for the odds of obtaining a mammogram within 2 months. The last three columns of Table 1 present the model results for this end point, simultaneously adjusting for all factors included in the model. The intervention was the most significant factor associated with the odds of obtaining a mammogram in 2 months (odds ratio [OR] = 10.5; $P < .0001$). Having had a mammogram in the past and being White predicted approximately four times higher odds of obtaining a mammogram within 2 months.

Discussion

The combination of a physician letter with a coupon incentive and, when necessary, a peer counseling call significantly increased the number of older women who obtained a screening mammogram. A physician letter with a coupon incentive is an effective initial way to alert older women to the need for mammography. The peer counseling call can be reserved for women who require a more intensive intervention. The mean time that peers spent counseling women was 5.2 minutes. Employing retired health professionals as counselors is less costly than using medical office personnel and provides an important peer component. The awarding of a coupon was an integral component of the two-step intervention. The costs were covered, in part, by a local grocery.

A more intensive intervention may be required for women who have never had a mammogram, since no interaction was observed between the two-step intervention and a past history of mammography. The intervention improved the likelihood of women's obtaining a mammogram in all age groups, particularly older age groups. White women in the intervention group were more likely to obtain a mammogram than were non-White women; this difference was not observed in the control group. Unfortunately, assessment of the intervention's effectiveness among non-White women was hampered by the restricted sample size. While not statistically significant, the results suggest

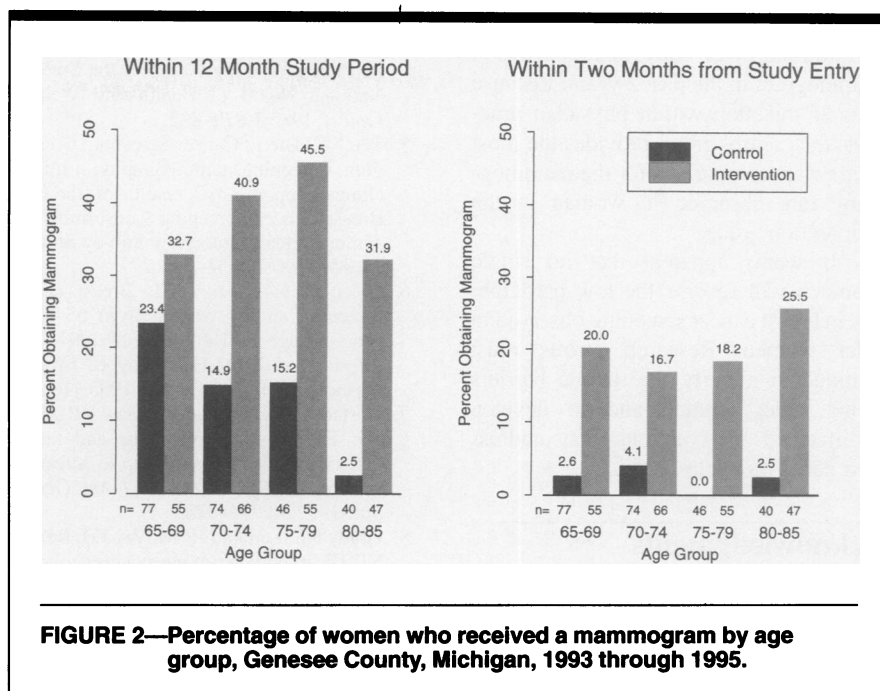


FIGURE 2—Percentage of women who received a mammogram by age group, Genesee County, Michigan, 1993 through 1995.

TABLE 1—Multiple Logistic Regression Results for Obtaining a Mammogram during the Study Period and within 2 Months: Women Aged 65 Years and Older (n = 460), Genesee County, Michigan, 1993 through 1995

Patient Characteristic	12-Month Period			Within 2 Months		
	OR ^a	95% CI	P	OR ^a	95% CI	P
Intervention, yes vs no	0.780	(0.26, 2.34)	.6589	10.497	(4.31, 25.56)	<.0001
Past mammogram, yes vs no	5.526	(2.73, 11.20)	.0009	4.048	(1.37, 11.95)	.0119
Race, White vs non-White	0.857	(0.37, 1.98)	.7189	4.243	(1.58, 11.39)	.0021
Age, 70–79 vs 65–69	0.530	(0.25, 1.12)	.1007	0.737	(0.34, 1.59)	.2183
Age, 80–85 vs 65–69	0.096	(0.01, 0.76)	.0269	1.488	(0.60, 3.68)	.1948
Intervention/race interaction	2.706	(0.91, 8.02)	.0734			
Intervention/age 70–79 interaction	2.826	(1.01, 7.91)	.0487			
Intervention/age 80–85 interaction	11.836	(1.25, 112.09)	.0314			

Note. OR = odds ratio; CI = confidence interval.

^aEstimated odds ratio from multiple logistic regression model.

that the intervention increased the likelihood that non-White women over 70 years of age would obtain a mammogram.

Major strengths of the study include its focus on an underrepresented subset of women (those aged 65 years and older), the inclusion of a substantial percentage of minority women, the randomized design, and the use of radiology and medical records to confirm mammograms. Limitations include the inability to determine the independent effect of peer

counseling or the precise role of the coupon incentive.

The decision in 1991 to add screening mammograms on a biennial basis as a benefit covered under Medicare was an important step in reducing the cost barrier to older women. Among Medicare beneficiaries, the overall biennial rate of mammography for 1992 and 1993 was 37%.²² The rate of mammography in the control group during the 1-year study period was 16%. This somewhat lower rate was as

expected, since women were eligible for the study only if they had not had a mammogram in the past 2 years. Because of randomization within physician practices, the control group provides the most appropriate comparison for the mammography rate observed in women in the intervention group.

It seems apparent that no single approach will reverse the low participation in breast cancer screening observed in older women. Research efforts must continue to identify the unique barriers facing older women and to develop multifaceted interventions that address their needs more closely. □

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