ORIGINAL RESEARCH

Primary Care Physicians' Assessments of Older Patients' Health and Psychological Status and Recommendation of Mammography

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Background: Recommendation of mammography may be particularly important for older women; nevertheless, physicians are less likely to recommend mammography to older women. Our objective was to examine the characteristics of older patients for whom primary care physicians recommend mammography.

Methods: Two hundred sixteen women aged 65 to 80 years were screened for depressive symptoms in primary care offices and invited to participate. They then completed a baseline in-home assessment between 2001 and 2003. At the time of the baseline in-home assessment, mammogram use and psychological status were assessed with commonly used and validated standard questionnaires. At the time of the index visit, physicians were asked to provide assessments of the patients.

Results: Patient-reported physician recommendation of mammography was more likely among patients the physicians rated as anxious than among patients the physicians rated as not being anxious (unadjusted odds ratio, 2.08; 95% confidence interval, 1.10–3.94). In multivariate models that controlled for physician ratings of knowledge of the patient, the association between physician rating of anxiety with patient-reported physician recommendation of mammography remained significant. Patient-reported physician recommendation of mammography was not significantly more likely among patients the physicians rated as depressed than among patients the physicians rated as not being depressed (unadjusted odds ratio, 1.57; 95% confidence interval, 0.86–2.85).

Conclusions: Identification of anxiety may influence the recommendation of mammography among primary care physicians. An understanding of factors that influence the recommendation of mammography by primary care physicians may have important implications for interventions to improve rates of mammography use among older women. (J Am Board Fam Med 2008;21:17–23.)

Breast cancer incidence increases with age and more than half of breast cancer incidents occur in women aged 65 years and older.[1] The United States Preventive Services Task Force found fair

evidence that mammography screening every 12 to 33 months significantly reduces mortality from breast cancer. The United States Preventive Services Task Force also found this evidence to be generalizable to women aged 70 years and older if life expectancy was not compromised by comorbid disease.[2] Mammography screening after the age of 65 has also been found to be cost-effective, although no studies have specifically examined the cost-effectiveness of mammography among women older than 80 years of age.[3] Older women continue to be underscreened for breast cancer.[4]

Previous studies have shown that the use of mammography is associated with a higher family income, 12 or more years of education, having health insurance coverage, having a usual source of care, and urban residence.[4–7] Studies have differed on whether ethnicity[6,8,9] or mental illness[10–16] affect mammography use. Women with depression

have been found to have an increased likelihood of late-stage diagnosis of breast cancer whereas women with anxiety have been found to have a decreased likelihood of late-stage diagnosis, but it is unclear whether this is caused by differences in mammography use.[17] None of the cited studies on mental illness and mammography use focused on older primary care patients.

One important predictor of mammography use is whether physicians recommend mammograms.[18–20] The recommendation of mammography may be particularly important for older women[21]; nevertheless, physicians are less likely to recommend mammography to older women.[22] Our goal was to compare the characteristics of women aged 65 to 80 years who reported their primary care physicians did or did not recommend mammography. This investigation differs from other investigations about physician recommendation of mammography. First, we have excellent measures of both psychological status and potentially influential characteristics, for which we could adjust our measures of association. Second, we do not have to rely on chart reviews because we have obtained physician ratings of patients' health and psychological status. Consistent with previous research on the stage of breast cancer diagnosis[17] and use of mammography,[16] we hypothesized that physicians would be more likely to recommend mammography to older women who they identify as anxious and would be less likely to recommend mammography to older women who they identify as depressed.

Methods
The Spectrum Survey
Primary care practices recruited from the community provided the venue for the sampling of older patients. In-home interviews were obtained for 357 older patients between the years 2001 and 2003; 2 broke off the interview before it was completed, leaving a sample of 355 older patients, of whom 216 were women aged 65 to 80 years. In all, 47 physicians (28 family physicians and 19 internists) from 13 practices contributed patients who participated in the Spectrum Study. Details of the study design of the Spectrum Study are available elsewhere.[23,24] The study protocols were approved by the Institutional Review Board of the University of Pennsylvania School of Medicine.

Measurement Strategy: Mammography Use and Recommendation
An instrument was designed using questions from the National Health Interview Survey, an ongoing survey of the civilian, noninstitutionalized population of the United States. Participants were asked, Have you ever had a mammogram? and How long ago did you have your most recent mammogram? Reasons for not obtaining a mammogram in the past 2 years were assessed. Participants were also asked, In the last 2 years, has a doctor or other health professional recommended that you have a mammogram?

Physician Assessment of Patient
Physicians were asked to provide an assessment of the patient at the index office visit. The average time between the physician survey and the home interview was 1.16 weeks, with a standard deviation of 2.2 weeks. Physicians were asked, How well do you know this patient?, and were asked to choose among the following response categories: very well, somewhat, or not at all. Physicians rated the patient's overall physical health as poor, fair, good, very good, excellent. The patient's level of depression and anxiety at the index visit was rated by physicians on a 4 point scale: 1 = none at all, 2 = mild, 3 = moderate, or 4 = severe. For this investigation, physician identification of depression or anxiety was defined as including ratings of mild, moderate, or severe.

Patient Assessment
We used standard questions to obtain information from the participants about age, marital status, self-reported ethnicity, and education. Participants were asked, In general, would you say your health is. . . ?, and they were asked to choose among the following response categories: poor, fair, good, very good, excellent. Participants were asked, During the past 6 months, how many visits did you make to primary care or family doctors, internists, surgeons or other medical specialists? This question referred only to office visits or clinic visits. The Mini-Mental State Examination was administered to assess cognitive status.[25] The Medical Outcomes Study Short Form has been used in studies of outcomes of patient care[26–30] and seems to be reliable and valid even when assessing frail, elderly patients.[31] We used the scales representing physical functioning, role disability caused by physical

health problems, bodily pain, general health perceptions, social functioning, and role disability caused by emotional problems.[27] The Medical Outcomes Study Short Form was scored using previously described techniques.[32] The Centers for Epidemiologic Studies Depression scale was developed by the Center for Epidemiologic Studies at the National Institute of Mental Health for use in studies of depression in community samples.[33–35] The Beck Anxiety Inventory was developed to measure the severity of anxiety symptoms.[36]

Analytic Strategy

Our analysis proceeded in 2 phases. In the first phase, bivariate associations between patient-reported physician recommendation of mammography and function, cognition, depressive symptoms, anxiety symptoms, and other variables were examined. In phase 2, bivariate associations between patient-reported physician recommendation of mammography and physician assessments of patients' health and psychological status were examined. As appropriate χ^2 or t tests were used to calculate categorical data or means. We set α at 0.05 to denote statistical significance, recognizing that tests of statistical significance are approximations that serve as aids to interpretation and inference. An estimate of association (the odds ratio) was produced for physician rating of anxiety and depression with patient-reported physician recommendation of mammography produced by the method of logistic regression, along with a corresponding standard error and a P value (2-tailed). Odds ratios were adjusted for physicians' knowledge of the patients. Goodness-of-fit diagnostics and plots of the deviance residuals versus fitted values predicted by the model were used to show that the coefficient estimates were not influenced appreciably by any one observation. Data analysis was performed using SPSS version 10 (SPSS Inc., Chicago, IL). As in previous work,[37,38] we provide both unadjusted P values and P values adjusted for the 2 comparisons we make by multiplying P by 2 (the Bonferroni method[39,40]).

Results

Study Sample

Our study sample included 216 women aged 65 to 80 years who had completed a baseline in-home interview. Five women were excluded because of

incomplete information about physician recommendation of mammography or incomplete physician assessment forms, and 2 women were excluded because they had undergone a bilateral mastectomy. This left a sample size of 209 for this analysis. We did not include 53 women older than 80 because of the limited data on the benefits, harms, and costs of regular mammography screening in this age group.[3]

Baseline Characteristics

The mean age of our study sample was 73.2 years (SD, 4.4 years). Eighty-two (39.2%) of the participants self-identified as African-American. One hundred seventy-four older women reported the use of mammography in the past 2 years whereas 35 women did not report use of mammography in the past 2 years. One hundred forty-five women reported that their physician recommended a mammogram in the last 2 years whereas 64 women reported that their physician had not recommended a mammogram in the last 2 years. Of the 145 older women who reported that their physician had recommended a mammogram in the past 2 years, 130 women reported use of mammography in the past 2 years. Women who reported their physician had recommended mammography in the past 2 years were more likely to report having had a mammogram in the last 2 years than were women who reported their physician had not recommended a mammogram ($P < .001$).

Patient Characteristics and Patient-Reported Physician Recommendation of Mammography

Sociodemographic characteristics, cognitive and functional status, and psychological status were compared among women who reported physician recommendation of mammography and those who did not report physician recommendation of mammography (Table 1). Patient characteristics did not significantly differ among respondents who reported that their physician recommended mammography in the past 2 years and those respondents who reported their physician did not recommend mammography in the past 2 years.

Physician Ratings and Patient-Reported Physician Recommendation of Mammography

Physician ratings of patients were compared among women who reported physician recommendation of mammography and those who did not report

Table 1. Characteristics of Women Aged 65 to 80 Years According to Patient-Reported Physician Recommendation of Mammography (N = 209)

Characteristics	Physician Recommended Mammogram in Last 2 Years (n = 145)	Physician Did Not Recommend Mammogram in Last 2 Years (n = 64)	P*
Demographics			
Age (mean [SD])	73.0 (4.5)	73.5 (4.4)	.511
Married or living with partner (% [n])	35.9% (52)	35.9% (23)	.992
Less than high school education (% [n])	38.6% (56)	39.1% (25)	.952
African-American ethnicity (% [n])	35.9% (52)	46.9% (30)	.133
Health and behavior and use of medical care			
Self-Rated Health (5 = excellent, 1 = poor) (mean [SD])	2.50 (0.8)	2.53 (0.9)	.830
Number of office visits within the past 6 months (mean [SD])	3.05 (2.9)	3.0 (3.1)	.914
Functional status (mean [SD])			
Physical functioning	56.5 (28.4)	63.4 (30.6)	.120
Role Physical	40.1 (40.0)	50.4 (40.2)	.108
Role Emotional	72.4 (39.7)	81.8 (34.6)	.105
Social functioning	72.5 (26.6)	74.0 (28.8)	.710
Bodily pain	52.6 (25.1)	54.9 (26.9)	.551
General health	52.0 (20.2)	50.5 (20.8)	.617
Cognitive status (mean [SD])			
MMSE	27.4 (2.7)	26.7 (3.4)	.124
Psychological status (mean [SD])			
Anxiety (Beck Anxiety Index)	9.1 (7.7)	8.2 (8.4)	.455
Depression (CESD)	16.1 (11.1)	13.8 (11.1)	.578

Data were gathered from the Spectrum Survey, 2001 to 2003.
MMSE, Mini-Mental State Examination; CESD, Center for Epidemiologic Studies Depression Scale.
*All P values are based on χ^2.

physician recommendation of mammography (Table 2). Patients the physicians rated as anxious were more likely to report that the physician recommended a mammogram compared with patients the physicians rated as not being anxious ($P = .023$; adjusted for multiple comparisons, $P = .046$). The association of physician ratings of anxiety and patient-reported physician recommendation of mammography was further evaluated using multiple logistic regression. Patient-reported physician recommendation of mammography was more likely among patients the physicians rated as anxious than

Table 2. Physician Ratings of Women Aged 65 to 80 Years According to Patient-Reported Physician Recommendation of Mammography (N = 209)

Physician Ratings	Physician Recommended Mammogram in Last 2 Years (n = 145)	Physician Did Not Recommend Mammogram in Last 2 Years (n = 64)	P*
Physician knows patient very well	77.2 (112)	65.6 (42)	.079
Rating of patient's overall health excellent or very good	10.3 (15)	7.9 (5)	.588
Identification of patient depression at this visit	61.8 (89)	50.8 (32)	.139
Identification of patient anxiety at this visit	74.5 (105)	58.3 (35)	.023[†]

Data were gathered from the Spectrum Survey, 2001 to 2003. All data presented as % (n).
*All P values are based on χ^2.
[†]$P < .05$.

among patients the physicians rated as not being anxious (unadjusted odds ratio [OR]) = 2.08; 95% confidence interval [CI], 1.10–3.94). These findings remained significant in the final model after adjusting for physician ratings of knowledge of the patient (OR = 1.99; 95%CI, 1.05–3.80). Patient-reported physician recommendation of mammography was not significantly more likely among patients the physicians rated as depressed than among patients the physicians rated as not being depressed (unadjusted OR = 1.57, 95% CI [0.86, 2.85]).

Discussion

The principal finding of this study was that patient-reported physician recommendation of mammography was more common among patients the physicians rated as having anxiety compared with patients the physicians rated as not having anxiety. This finding supports our original hypothesis, and the association persists after controlling for physician ratings of their knowledge of the patient. However, we did not find that physician assessments of patients' overall health and depression were associated with recommendation for mammography. Therefore, our study suggests that physician assessment of anxiety—but not other physician assessments of health and psychological status—may influence recommendation of mammography.

Before discussing our findings, the results must first be considered in the context of some potential study limitations. First, we obtained our results only from primary care sites in Maryland whose patients may not be representative of most primary care practices. However, these practices were not academically affiliated and are probably similar to other practices in the country. Second, physician recommendation of mammography was self-reported by the patient and thus subject to the biases inherent to this form of measurement. There is the potential for all the sources of error associated with retrospective interview data, including imperfect recall and response bias (eg, socially desirable responding). In particular, women with lower participation in breast cancer screening may be less likely to recall physician recommendation for mammography. Third, we did not have prospective data about the physician assessment of anxiety so we were unable to fully delineate temporal relationships between the physicians' identification of anx-

iety and patient-reported physician recommendation of mammography. Fourth, selection bias is a potential limitation because although the larger project was based on a random sample of primary care patients, the data about the use of mammography consisted of all the women aged 65 to 80 years who were selected for the larger project, who agreed to participate, and who had complete information about mammography use. Furthermore, we do not have data regarding diagnosed breast disease, the history of abnormal mammograms, or family history of breast cancer. It is possible that women with breast disease, a history of an abnormal mammogram, or a family history of breast cancer might be rated by their physicians as being more anxious than other women.

Nonetheless, despite limitations our results deserve attention because we attempted to further evaluate the characteristics of older patients for whom physicians recommend mammography. Consistent with previous reports,[18–20] an important predictor of mammography use was whether physicians recommended mammograms. Although some women obtain breast cancer screening regularly on their own, our findings underscore the critical role of the primary care physician in breast cancer screening for many women. However, our results are not wholly consistent with our initial hypotheses. Summarizing our findings, we found that the physicians' identification of anxiety but not depression was associated with patient-reported physician recommendation of mammography, even when controlling for physician ratings of their knowledge of the patient. Our study suggests that physician-identified anxiety influences recommendations for mammography. Physician identification of depression does not seem to influence patient-reported physician recommendations of mammography. However, it is important to note that women with more severe mental illness (such as major depression) may not be able to connect with a primary care provider and therefore would not be captured in our study.

Previous studies have shown varying results with respect to the differences in mammography rates among women who have mental illnesses.[10–16] We found that patients whose physicians rated them as anxious were more likely to report that their physician recommended mammography. This finding suggests that physicians' perceptions of a patient's psychological status may play an important role in

preventative health recommendations. Morris and Greer[41] examined the role of psychological characteristics in breast cancer screening and found that higher levels of state anxiety predicted screening for women with benign breast disease. Morris and Greer also hypothesized that patients with anxious characteristics might have a heightened perception of their vulnerability to breast cancer, which would lead them to be more likely to adhere to screening recommendations. Our findings build on the hypotheses of Morris and Greer that patients with anxiety symptoms might perceive themselves as more vulnerable to breast cancer and as having an increased need for breast cancer screening. We hypothesized that patients who are perceived by their physicians as anxious may evoke among their physicians a heightened perception of the need for screening recommendations; not because the physicians believe such patients are at an increased risk for breast cancer but perhaps because they feel that screening will help curtail any anxiety related to breast disease.

Our study indicates the importance of targeting older women to increase the use of mammography services. The strong association between physicians' ratings of anxiety and patient-reported physician recommendation of mammography illustrates the importance of psychological factors in the delivery of breast cancer screening. Our findings highlight the importance of primary care physician behavior in the promotion of breast cancer screening and support future research on efforts in physician education regarding the delivery of preventive services. Further studies would be helpful to try to better understand the relationship between physicians' perceptions of their patients' anxiety and recommendations for mammograms. Sorting out how the interplay of the physician and the patient can influence recommendation of mammography would lay the groundwork for interventions aimed at increasing physician recommendation of mammograms to older primary care patients.

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