Knowledge and Attitude on Screening Mammography among Low-Literate, Low-Income Women

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Preliminary results of the data were presented as abstracts at the 1995 Southern Section of American Federation for Clinical Research, New Orleans, LA, February 3, 1995, and the 1995 National Society of General Internal Medicine, San Diego, CA, May 6, 1995.

Supported in part by the National Cancer Institute, Bethesda, Maryland, Grant no. 1R03-CA59235 and by the Cancer Center for Excellence and Research, Treatment and Education, LSUMC-S.

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Received December 1, 1995; revisions received March 11, 1996, June 3, 1996, and July 22, 1996; acccepted July 22, 1996

BACKGROUND. Low-income women utilize screening mammography less frequently, present at more advanced stages of disease, and have higher breast cancer mortality rates than women with higher incomes. The purpose of this study was to examine the relationship of reading ability to the knowledge and attitudes that low-income women have regarding screening mammography.

METHODS. A convenience sample of 445 women were interviewed for this study. These women, age 40 years and older, had not had a mammogram in the past year. They were waiting to see a doctor in one of two outpatient clinics at Louisiana State University Medical Center in Shreveport when they were interviewed. A structured questionnaire assessed mammography knowledge and attitudes. Each patient's reading ability was assessed with the Rapid Estimate of Adult Literacy in Medicine (REALM).

RESULTS. The women interviewed had a mean age of 56 years. Sixty-nine percent were African American, and 97% lived in households with annual incomes of less than $20,000. On the average, the highest grade completed in school was tenth grade. The average reading level was fourth to sixth grade, with 76% reading below a 9th-grade level. Lower reading ability correlated significantly with less mammography knowledge ($P < 0.0001$). A lack of accurate information about mammography was prevalent among low-level readers. Thirty-nine percent of women reading at or below a third-grade level did not know why women are given mammograms, compared with 12% of those reading at or above a ninth-grade level. Cost was a great concern in general, but cost concerns did not vary by reading level; 41% of all participants were very concerned about cost.

CONCLUSIONS. Limited literacy skills and lack of knowledge about screening mammography may contribute considerably to the underutilization of screening mammograms in low-income women. Screening for reading level may identify a subset of low-income patients who could benefit from specialized education. These results could help guide effective educational interventions and better provider-patient communication about screening mammography for low-literate, low-income women. ***Cancer* 1996; 78:1912–20.** © *1996 American Cancer Society.*

KEYWORDS: low literacy, low income, mammography, knowledge, attitudes.

Low literacy is a pervasive and underrecognized problem in health care today.[1] The National Adult Literacy Survey found that 21% of adults are functionally illiterate and another 27% have marginal literacy skills.[2] These rates are almost twice as high for people living in the inner city and those older than 65 years.[2] This unfortunately is the group of women least likely to get cancer screening.[3,4] Low-income women make less use of screening mammography, present at more advanced stages of disease, and have higher rates of breast carcinoma mortality compared with women with higher incomes.[3–10] Low-income women also tend to have disproportionately lower educational attainment and literacy skills than women with higher incomes.[11–13]

A distinct link between poor reading skills and poor health has been reported.[14,15] People with low literacy skills may lack essential information regarding cancer screening and prevention.[6,10] They may misunderstand the instructions of their physicians, be unable to comprehend current patient education, and have misconceptions related to health.[6,10,13–21] The National Cancer Institute has challenged health professionals to identify the cancer information needs of adults with low literacy skills and to promote cancer prevention, early detection, and early treatment seeking behaviors.[22]

The purpose of the current study was to determine the relationship of low literacy to knowledge and attitudes concerning breast carcinoma and screening mammography in low-income women. The study was conducted at Louisiana State University Medical Center in Shreveport (LSUMC-S), which is a state-funded public hospital serving primarily indigent and Medicaid populations in Northwest Louisiana.

METHODS

During the summer of 1994, women aged 40 and older who had not had a mammogram in the past year and who were waiting to see a doctor in 1 of 2 outpatient clinics (the Ambulatory Care Clinic and the Eye Clinic) at LSUMC-S were interviewed. A convenience sample of 595 women were invited to participate in a study regarding mammography. Thirty-five women refused to participate in the study because they felt too sick and 115 were ineligible because they had had a mammogram in the past year. The response rate was 92.7% of those eligible for the study. The 445 women who agreed to participate were informed about the study and signed a LSUMC Institutional Review Board Consent Form. All were then interviewed by research assistants. Six research assistants received 20 hours of training including practice interviews.

A 30-item structured questionnaire was used to assess knowledge and attitudes regarding mammography. The questionnaire was extensively pilot tested and revised before the initiation of the study, and was designed to be understandable for a low-literate audience to insure comprehension and cultural sensitivity. All attitude questions were written in Likert format on a 5-point scale. The anchors for Scale A were "very poor" to "very good", for Scale B, "extremely concerned" to "not at all concerned"; and for Scale C, "not at all" to "for sure." Extensive testing of the Likert scales was done before administering the questionnaire to insure comprehension among low-income, low-literate women. As a result of pilot testing, the wording of the scales was simplified and, in addition, the scales were converted from a horizontal to a vertical layout, because the patients indicated that this was easier to use. The questionnaire was administered as a structured face-to-face interview.

Patients' reading ability was assessed with the Rapid Estimate of Adult Literacy in Medicine (REALM), an individually administered reading screening test designed especially for use in busy public health clinics.[23] The REALM is a reading recognition test comprised of a list of 66 health-related words. Reading ability is an indicator of functional literacy skills.[24] The REALM is highly correlated with the Test of Functional Health Literacy in Adults.[25] The raw REALM score (0–66) can be converted into four reading grade levels (3rd grade and below [0–18]; 4th to 6th grade [19–44]; 7th to 8th grade [45–60]; and 9th grade and above [61–66]), which correlate with literacy skills. The REALM can be administered and scored in 1–3 minutes by personnel with minimal training.

Analysis

Statistical Analysis System (SAS), Version 6.11,[26] on IBM PC was used for the analysis of the data. Descriptive statistics (mean, standard deviation, range, and/or frequency) were calculated. The Spearman correlation coefficient (r_s) was estimated to evaluate the relation between the REALM score and the knowledge and attitude variables. A chi-square test for trend (Mantel–Haenszel) was used to estimate the association between reading/literacy levels (as derived from the REALM) and other variables. Finally, to estimate the relationship between the REALM score and knowledge and attitude variables after controlling for age, income, and education, the Cochran-Mantel-Haenszel (CMH) test, essentially a chi-square test for trend that allows for the control of other factors, was used.

RESULTS

Demography

Demographic characteristics of the study population are presented in (Table 1).

The mean age of the women interviewed was 56 years; 69% were African American and 97% lived in a household with an annual income of less than $20,000. The average last grade completed in school was the 10th grade; 16% of the participants had not gone further than the 6th grade, whereas 58% had not graduated from high school.

REALM

Twenty-eight participants refused to take the REALM; therefore, the sample size in estimating the effect of literacy was 417 women. The mean REALM raw score for the study population was 40, indicating a 4th–6th grade reading level. The distribution of REALM scores by grade level is shown in (Table 2). It is disturbing to note that

TABLE 1
Demographic Characteristics of the Study Population (n = 445)

	No.	
Age (yrs)		
40–49	158	36%
50–59	117	26%
60–69	97	22%
≥70	71	16%
Range		40–92 yrs
Mean		56 yrs
Race		
Arican American	301	69%
White	132	30%
Other	4	1%
Income ($)		
<10,000	357	83%
10,000–20,000	60	14%
>20,000	13	3%
Education (grade)		
Elementary school (≤ 6th)	69	16%
Junior high (7th–8th)	64	15%
Senior high (9th–11th)	118	27%
High school graduate/college	181	42%
Mean grade completed		10th
Median		11th

TABLE 2
Results of Literacy Test (REALM)

REALM raw score	Grade level	No.	%
0–18	0–3	102	25%
19–44	4–6	91	22%
45–60	7–8	126	30%
61–66	≥ 9	98	24%

REALM: Rapid Estimate of Adult Literacy in Medicine.

10% of the women in the current study population could not read any of the words on the test.

The raw REALM score correlated significantly (r_s = 0.61; $P < 0.001$) with the highest grade completed in school. Despite the fact that the average educational level in the study population was the 10th grade, according to the REALM 76% of the women read below a 9th grade level and 24% read at a 3rd grade level or lower. This indicates that the functional literacy of many participants in the current study was considerably lower than their educational level suggested.

Knowledge

Women's knowledge about mammography was assessed with four questions (see Appendix). Approximately 7% of the women n = 32 had never heard of a mammogram (two–thirds of these were reading on less than a 4th grade level) and were excluded from the analysis of knowledge. A "don't know" answer was judged to be an incorrect response. Knowledge of mammography in general was limited even among those who reported that they had heard about a mammogram; 22% of the women did not know why women undergo mammograms; and 72% did not know at what age women should start having mammograms. For example, 59% thought a woman should start having mammograms before the age of 40. Lack of knowledge about mammography was further illustrated by the fact that 11% thought that they needed several mammograms a year; only 25% knew how often mammograms are needed. A highly significant negative correlation (r_s = 0.71; $P < 0.0001$) existed between self-reported knowledge regarding a mammogram and knowledge regarding reasons for having a mammogram. This means that women who say they know what a mammogram is often in actual fact do not know why mammograms are given.

The raw REALM score was significantly correlated with knowledge of why women are given mammograms (r_s = 0.22; $P < 0.0001$) but not with knowledge of when to have the first mammogram, nor with how often to have a mammogram (Table 3). Because age, education, and income level are associated with low literacy,[2] these factors were controlled for in an analysis using an overall knowledge index (KI). The KI was constructed based on the knowledge questions.

Because one of the four knowledge questions, "Do you know what a mammogram is?", was highly negatively correlated with knowledge about reasons for mammography, and is in fact, not verifiable and may not reflect actual knowledge, a KI was constructed by summing the three remaining factual knowledge questions. The between the 3-item KI and REALM raw score was 0.17 and was highly significant (P = 0.0008). This reinforces the inference of a relationship between literacy and mammography knowledge. Adjustment for age, education, and income level did not alter the relation between the reading ability and knowledge index.

Attitudes

Women's attitudes toward mammography were assessed in six questions (see Appendix). The 32 women who had never heard of a mammogram were again excluded from the analysis. Overall, 7% were concerned about a mammogram being embarrassing, 10% were concerned it would be harmful, 19% painful, and 14% troublesome. The cost of a mammogram was of great concern in this low-income study population, with 41% reporting concerns about cost. In addition, 32% were concerned that a mammogram might detect cancer.

Chi-square tests for trend between reading grade level and attitude variables found a significant association between reading grade level and the concern about a mammogram being painful (P = 0.007), harmful (P = 0.036), and troublesome (P = 0.026). This

TABLE 3
Knowledge about Mammography by Literacy Level (among Women Who Said They Had Heard of a Mammogram)

	Literacy level			
REALM (Grade level)	0–18 (≤ 3rd)	19–44 (4th–6th)	45–60 (7th–8th)	61–66 (≥ 9th)
Knowledge question:				
What is a mammogram? (n = 387)[a]				
Yes	74%	87%	91%	95%
No	26%	13%	9%	5%
Why are mammograms given? (n = 389)[a]				
Correct	61%	79%	80%	88%
Incorrect	39%	21%	20%	12%
Starting age (n = 385)				
Correct	27%	21%	33%	31%
Incorrect	74%	79%	67%	69%
Frequency (n = 388)				
Correct	71%	72%	75%	77%
Incorrect	29%	28%	25%	23%

[a] $P < 0.0001$.

indicates that women with the lowest literacy skills were most concerned about a mammogram being embarrassing, harmful, or painful. These low-literature women were also more likely to feel that it would be a lot of trouble to get a mammogram (Table 4). However, after controlling for age, education, and income the relationship between reading grade level and these attitude variables was no longer statistically significant.

Influence

Four questions assessed who would influence the women to have mammograms (see Appendix). The majority of the women reported they would be very likely to get a mammogram if a physician recommended it (71%). They would be less likely to get a mammogram if a friend (20%) or relative (29%) recommended it.

It is interesting to note that literacy was inversely correlated with self-reported influence of friends (r_s = 0.14; P = 0.007) and relatives (r_s = −0.16; P = 0.002) on the decision to get a mammogram. As the literacy level of women decreases, the influence of their friends and/or relatives in their reported preventive health behavior increases. There was no significant correlation between reading ability and the influence of the physician. Similar results were observed with the chi-square test for trend, even after adjusting for age, income, and education (Table 5).

DISCUSSION

Screening mammography has been shown both to detect tumors at earlier stages and to decrease mortality from breast carcinoma. However, only 8–22% of low-income women receive regular screening mammograms.[3,27] Limited literacy skills and lack of knowledge regarding mammography may account for part of this. In the current study women with the most limited literacy skills who said they knew what a mammogram was actually did not know. In other words, many of the people with the lowest literacy did not know they lacked knowledge or did not want to admit their ignorance. This finding is an important reminder to all health care providers to verify patients' self-reported knowledge. In addition, because of shame, patients with limited literacy may try to hide their literacy problems.[28] It is unrealistic to expect these patients to volunteer this information to providers.[29] Therefore patients' lack of adequate knowledge will not be detected unless they are asked to give more details about mammography.

Greater than one-third (39%) of the women reading below a 4th grade level could not answer very basic questions, such as "Why do women get screening mammograms?" They did not know that mammography was associated with cancer, looking for a lump, or an examination of the breast. The results of the current study indicate that knowledge of mammograms is lowest in women with the lowest reading levels. Conversely, women reading at least a 9th grade level appeared to be adequately informed about mammography. In the authors' view, this indicates that current educational programs and materials are not effective with the most disadvantaged group in society, those with a low income and low literacy skills.

A large percentage of patients had limited reading ability, with 76% reading on a lower than 9th grade level. Women with the lowest reading levels not only had the least knowledge about screening

TABLE 4
Attitudes about Mammography by Literacy Level (among Women Who Said They Had Heard of a Mammogram)

	Literacy level			
REALM (Grade level)	0–18 (≤ 3rd)	19–44 (4th–6th)	45–60 (7th–8th)	61–66 (≥ 9th)
How concerned are you that a mammogram will:				
Be embarrassing (n = 383)				
Very concerned	10%	5%	5%	8%
Hardly/not concerned	90%	95%	95%	92%
Be harmful (n = 373)[a]				
Very concerned	16%	11%	9%	6%
Hardly/not at all	84%	89%	91%	94%
Be painful (n = 378)[b]				
Very concerned	32%	17%	13%	20%
Hardly/not at all	68%	83%	88%	80%
Be costly (n = 372)				
Very concerned	35%	41%	44%	43%
Hardly/not at all	65%	59%	56%	57%
Be troublesome (n = 370)[a]				
A lot	23%	10%	13%	11%
Hardly/none	77%	90%	87%	89%
Find cancer (n = 362)				
Very concerned	32%	43%	34%	22%
Hardly/not at all	68%	57%	66%	78%

[a] $P < 0.05$.
[b] $P < 0.01$.

TABLE 5
Influences on Decision to Have a Mammogram By Literacy Level (among Women Who Said They Had Heard of a Mammogram)

	Literacy level			
REALM (Grade level)	0–18 (≤ 3rd)	19–44 (4th–6th)	45–60 (7th–8th)	61–66 (≥ 9th)
How likely would you be to get a mammogram if:				
A doctor recommended one (n = 388)				
Not	4%	8%	5%	7%
Maybe	10%	9%	9%	12%
Very	87%	83%	86%	81%
A doctor told you that you might have cancer (n = 387)				
Not	4%	2%	1%	3%
Maybe	4%	6%	5%	2%
Very	93%	92%	94%	95%
A friend recommended one (n = 383)[a]				
Not	29%	25%	31%	35%
Maybe	20%	29%	33%	35%
Very	51%	46%	36%	31%
A relative recommended one (n = 385)[a]				
Not	18%	24%	25%	32%
Maybe	20%	21%	26%	23%
Very	62%	55%	50%	45%

[a] $P < 0.05$.

mammography, they also exhibited the most negative attitudes regarding mammograms. They were more concerned about mammography being embarrassing, harmful, and painful than the women with higher reading levels. They were also more likely to think that it would be a lot of trouble to get a mammogram. These findings are disturbing in light of the fact that women with low income and low education levels present with more advanced disease and have a higher breast carcinoma mortality rate than their

higher income, more educated counterparts.[4-10] These low-income and low-literate women are exactly the target group that the Centers for Disease Control-sponsored programs on breast and cervical carcinoma screening need to reach.

Based on qualitative data obtained from the open-ended questions in the structured questionnaire, many patients appeared to have misconceptions about mammography. Many women confused screening mammography with a Papanicolaou (Pap) smear. Women with low literacy commonly linked the need for mammography with reaching puberty, starting to menstruate, having sex, or bearing children. Many women stated that mammograms were not necessary when one has already had a Pap test or is not having sex. Other common misconceptions were that a mammogram was not necessary when you were in good health, your breasts looked good or felt fine, or when your breasts were small.

Even though knowledge alone is not enough to change patients' health behaviors, without basic knowledge of screening guidelines patients will be unlikely to follow through with recommended screening behaviors. Public health information may be available to these patients, yet their low reading skills prevent them from reading the materials or comprehending them.[18,30-31] Similarly, women with limited literacy skills are less likely to understand verbal education by the physician.[1,18] In that regard, it was interesting to note that although many women said that they would likely get a mammogram if the doctor recommended it, a large percentage of the low-literate women indicated that recommendation by friends (51%) and/or relatives (62%) has a major impact on getting a mammogram. This finding is consistent with responses from focus groups of older African American women in North Carolina that indicated women turn to other women they know with their health concerns.[32] This has implications for the development and implementation of education/intervention programs. More use should be made of peer groups, with which the women identify, such as natural helpers in The Save our Sisters Project,[32] to develop and provide more culturally appropriate and understandable education materials. The finding that relatives influenced target women also indicates that public health education in this population needs to target the family.

Future educational efforts should be directed specifically at low-literature women, and nonprint methods of patient education such as videos, stories, and verbal education by peers should be explored. Patient education and physician-patient communication need to be emphasized and simplified. If patients cannot read commonly available brochures, their only health education will be through visual aids and/or oral communication. A current debate in patient education is who is the most effective patient educator: the physician, nurse, health educator, pharmacist, or peer educator? In the authors study on improving screening mammography,[33] a combination of a nurse and a peer educator was used in a small group setting.

A notable concern about mammography for all the women in the current study was cost. Previous studies have found that increased knowledge regarding the importance of mammograms can not overcome cost as a barrier.[34,35] The study focus groups and anecdotal reports from the current study population and physicians show that many patients and many physicians do not know the actual cost of a screening mammogram or the amount covered by Medicare/Medicaid. Among the current study population, nearly half of the patients (45%) stated they would like to receive more information to help make a decision about getting a mammogram. Health providers must take the time to discuss with educate women about mammography and specifically help low-income women determine what screening will cost them.

In summary, the current study evaluated knowledge and attitudes regarding screening mammography in low-income, low-literate women and identified some of their misconceptions. This information, as well as insight into perceived barriers and facilitators to regular screening, is essential in designing effective interventions aimed at increasing the use of screening mammography in the most disadvantaged segment of the population. This study showed that reading level is correlated with knowledge regarding mammography. Screening for reading ability identifies a subset of women who need more tailor-made health care education.

APPENDIX

Hello! I'm _____.
I'm a research assistant at LSU Medical Center.
We're doing a women's health survey, and we'd like to ask you a few questions. Afterwards, we're offering information about mammography while you wait in the clinic.
It's important for the survey that as many women as possible agree to participate, so we'd very much like your help. This will not slow you down to see the doctor. If you're called while I'm asking you questions, you may get up and leave.
Would you help?
If agrees to help.
Thank you for agreeing to help.
Administer consent form.
First, I'm going to ask you about your health.

1. How would you describe your health now? Please point to the best answer. (*use Scale A*)
   # _____
2. What clinics at LSU Medical Center have you been to in the past year—since _____ (*e.g., June 1 of last year*)?
   _____
   _____

   Now, I'm going to ask you some questions about breast examination.
3. Have you ever heard of a mammogram?
   1. yes 2. no DK
   If yes: Where did you hear about it? (*Enter respondent's words. Prompt with "TV, newspaper, health fair, doctor, nurse, friend," etc.*)
   _____

   Do you know what a mammogram is?
   1. yes 2. no
4. Why are women given mammograms?
   _____
   _____
   _____
5. Have you ever had a mammogram?
   1. yes 2. no DK
   If yes: Was it
   1. As part of a check-up?
      or
   2. Because of a breast problem?
6. When did you have your last mammogram? (*Write response verbatim and circle ONE of the following.*)
   _____
   1. Within 1 year—since _____ (*e.g., June 1 of last year*)?
   2. >1 and ≤2 years
   3. >2 and ≤3 years
   4. >3 and ≤5 years
   5. >5 years
   6. DK
7. How were you told the results of the mammogram? (*Write response verbatim and circle ONE of the following.*)
   _____
   1. In person
   2. By telephone
   3. Through the mail
   4. Combination of methods
   5. Never told, which means results were normal
   6. Never told; if problem
   7. Other _____
8. *If patient has not had a mammogram or has not had a mammogram in the last year, what is the most important reason why? Write response verbatim and check ONE of the following. If necessary, probe: "and what was the one most important reason?" and read list.*
   1. Put it off
   2. Didn't know I should
   3. Not needed/Not necessary
   4. Costs too much
   5. No insurance coverage
   6. Don't go to doctors
   7. Don't have a doctor
   8. Not recommended by doctor
   9. Doctor said it wasn't needed
   10. Too embarrassing
   11. Haven't had any problems
   12. Fear
   13. Fear of radiation
   14. Painful procedure
   15. Unpredictable results
   16. Other _____
   17. DK
9. Did anyone ever say you should have a mammogram?
   1. *If yes:* Who?
      1. doctor
      2. husband
      3. family
      4. friend
      5. other: _____
   2. no _____ self-referral?
   DK
10. How old do you think a woman should be before she begins having mammograms? *Write response verbatim and check ONE of the following.*
    1. <40
    2. 40–49
    3. 50–59
    4. 60+
    5. DK
11. How often do you think a woman should have a mammogram after she reaches that age? *Write response verbatim and check ONE of the following.*
    1. <1 year
    2. 1 year
    3. 2 years
    4. 3 years
    5. ≥5 years
    6. DK
12. Do you check your breasts for lumps?
    1. yes 2.no DK
    If yes: About how often? *Write response verbatim, and check ONE of the following.*
    1. once a week
    2. once a month
    3. 2 to 4 times a year
    4. 5 to 8 times a year
    5. not at all
    6. DK
13. If a woman finds cancer by feeling a lump in her

breast, how well do you think treatment works? Please point to the best answer. (*use Scale A*)
_____

14. If a woman finds out she has cancer after having a mammogram, how well do you think treatment works? Please point to the best answer. (*use Scale A*)
_____
15. If a doctor recommended a mammogram as a routine check-up, how likely would you be to get one? Please point to the best answer. (*use Scale C*)
_____
16. If a doctor told you that you might have cancer, how likely would you be to get a mammogram? Please point to the best answer. (*use Scale C*)
_____
17. If a friend recommended a mammogram, how likely would you be to get one? Please point to the best answer. (*use Scale C*)
_____
18. If a relative recommended a mammogram, how likely would you be to get one? Please point to the best answer. (*use Scale C*)
_____
19. How concerned are you that a mammogram will be embarrassing? Please point to the best answer. (*use Scale B*)
_____
20. How concerned are you about a mammogram being harmful? Please point to the best answer. (*use Scale B*)
_____
21. How concerned are you about a mammogram being painful? Please point to the best answer. (*use Scale B*)
_____
22. How concerned are you about the cost of a mammogram? Please point to the best answer. (*use Scale B*)
23. Have you even been told by a doctor that you had cancer?
    1. yes 2. no DK
    If yes: Do you know what kind of cancer?
    _____
24. Has anyone in your family had cancer?
    1. yes 2. no DK
    If yes: Who?
25. What do you think your chances of getting breast cancer are? Please point to the best answer. (*use Scale A*)
_____
26. Do you know anyone who had breast cancer?
    1. yes 2. no DK
    If yes:
    Who? _____
27. How concerned are you that you will find out you have cancer if you have a mammogram? Please point to the best answer. (*use Scale B*)
_____

Interviewer's overall impression of interviewee's reliability and validity:

1. *Excellent reliability and validity*
2. *Good reliability and validity*
3. *Fair reliability and validity*
4. *Questionable reliability and validity*
5. *Totally inconsistent answers*
6. *DK*

28. How much trouble do you think it will be for you to get a mammogram? Please point to the best answer. (*use Scale B*)
_____
29. Have you wanted information to help you make a decision about mammography?
    1. yes 2. no DK
30. If you have cancer, do you want to know it?
    1. yes 2. no DK

Knowing income helps us know whether people in one income group use or need health services more or less than those in another group. How much was your household income this past year?

1. <$10,000
2. $10,001–$20,000
3. $20,001–$30,000
4. >30,000

Are others dependent on this income?
1. yes 2. no DK
If yes: How many?
_____

Thank you for helping with this study. Your information will help us improve programs for women's health.

Explanation of interviewer's impression:
_____
_____
_____
_____

Selected Mammography Questions

Knowledge

1. Do you know what a mammogram is?
2. Why are women given mammograms?
3. How old do you think a woman should be before she begins having mammograms?
4. How often do you think a woman should have a mammogram after she reaches that age?

Attitude

1. How concerned are you that a mammogram will be embarrassing?
2. How concerned are you about a mammogram being harmful?

3. How concerned are you about a mammogram being painful?
4. How concerned are you about the cost of a mammogram?
5. How concerned are you that you will find out you have cancer if you have a mammogram?
6. How much trouble do you think it will be for you to get a mammogram?

Influences

1. If a doctor recommended a mammogram as a routine check-up, how likely would you be to get one?
2. If a doctor told you that you might have cancer, how likely would you be to get a mammogram?
3. If a friend recommended a mammogram, how likely would you be to get one?
4. If a relative recommended a mammogram, how likely would you be to get one?

REFERENCES

1. Miles S, Davis T. Patients who can't read: implication for the health care system [Invited editorial]. *JAMA* 1995; 274(21):1719–20.
2. Kirsch I, Jungeblut A, Jenkins L, Kolstad A. Adult literacy in america: a first look at the result of the national adult literacy survey. Washington DC: National Center for Education Statistics, U.S. Dept. Of Education, 1993.
3. U.S. Department of Health and Human Services. Healthy People 2000: National Health Promotion and Disease Prevention Objectives. Washington DC: U.S. Printing Office, DHHS Publication No. (PHS) 91-50213, 1991:72, 115.
4. American Cancer Society. Cancer and the socioeconomically disadvantaged. *CA Cancer J Clin* 1989;39:263–95.
5. Cella DF, Orav EJ, Kornblith AB, Holland JC, Silberfarb PM, Lee KW, et al. Socioeconomic status and cancer survival. *J Clin Oncol* 1991;9(8):1500–9.
6. Freeman H. Race, poverty and cancer. *J Natl Cancer Inst* 1991;83(8):526–7.
7. Li A, Burton G, Glass J. Breast cancer socioeconomic and racial comparison between hospital populations [abstract]. *Clin Res* 1993;41:235A.
8. Rimer BK, Trock B, Engstrom PF, Lerman C, King E. Why do some women get regular mammograms? *Am J Prev Med* 1991;7(2):69–74.
9. U.S. Department of Health and Human Services. Breast cancer risk factors and screening: United States, 1987 Washington DC: Vital and Health Statistics, National Center for Health Statistics, 1987:13–26.
10. Zapka JG, Stoddard AM, Costanze JE, Greene HL. Breast cancer screening by mammography: utilization and associated factors. *Am J Public Health* 1989;79(11):1499–502.
11. National Center for Educational Statistics, Educational Testing Services, Office of Education, Research, and Improvement, U.S. Department of Education. Adult Literacy in America. 1993.
12. Brazius JA, Foster SE. Enhancing adult literacy: A policy guide. Washington, DC: Council of State Policy and Planning Agencies, 1987.
13. Dowling W. Reading level analysis of written materials distributed by the Ohio Cancer Information Service. Columbus, Ohio: Adult Literacy Center for Individual and Organizational Development, 1990.
14. Weiss BD, Hart G, McGee DL, D'Estelle S. Health status of illiterate adults: relationship between literacy and health status among persons with low literacy skills. *J Am Board Fam Pract* 1992;5:257–65.
15. Breen MJ. Partners in practice: the Literacy and Health Project Phase Two. August 1990-October 1992. Summary Report. Toronto, Ontario, Ontario Public Health Association, 1993.
16. Centers for Disease Control. Health beliefs and compliance. *JAMA* 1990;264:2864.
17. Davis TC, Crouch MA, Wills G, Miller S, Abdehou DM. The gap between patient reading comprehension and the readability of patient education materials. *Pediatrics* 1994; 93(3):460–8.
18. Doak CC, Doak LG. Teaching patients with low-literacy skills. 2nd edition. Philadelphia: J.B. Lippincott, 1996.
19. Doak CC, Doak LG. The challenge in diabetes education: So that the client may understand. *Diabetes Care Educ* 1993; 14(2):9–11.
20. Somora J, Saunders L, Larson RF. Medical vocabulary and knowledge among hospital patients. *J Health Hum Behav* 1961;2(2):83–92.
21. Weiss BD, Hart G, Pust RE. The relationship between literacy and health. *J Health Care Underserved* 1991;1(4):351–63.
22. National Cancer Institute, National Work Group on Cancer and Literacy, Bethesda, MD, May 7, 1992.
23. Davis TC, Long SW, Jackson RH, Mayeaux EJ, George RB, Murphy PW, et al. Rapid estimate of adult literacy in medicine: a shortened screening instrument. *Fam Med* 1993; 25(6):256–60.
24. Kaestle CF, Damon-Moore HD, Stedman LC, Tinsley K, Tollinger WV Jr. Literacy in the United States: readers and reading since 1880. New Haven: Yale University Press, 1991.
25. Parker R, Baker D, Williams M, Nurss J. The test of functional health literacy in adults (TOFHLA): a new instrument for measuring patients' literacy skills. *J Gen Intern Med* 1995;10:537–45.
26. SAS (R) Release 6.11 edition. Cary NC: SAS Institute Inc., 1994.
27. Jackson RH, Davis TC. Results of a novel screening mammography program. *Clin Res* 1992;40:868A.
28. Parikh NS, Parker RM, Nurss JR, Baker DW, Williams MV. Shame and health literacy. the unspoken connection. *Patient Educ Couns* 1996;27:33–9.
29. Williams MV, Parker RM, Baker DW, Parikh NS, Pitkin K, Coates WC, et al. Inadequate functional health literacy among patients at two public hospitals. *JAMA* 1995;274(21):1677–82.
30. Michielutte R, Bahnson J, Beal P. Readability of the public education literature on cancer prevention and decision. *J Cancer Educ* 1990;5(1):55–61.
31. Meade CD, Diekmann J, Thornhill DG. Readability of American Cancer Society patient education literature. *Oncolo Nurs Forum* 1992;19(1):51–5.
32. Eng E. The Save our Sisters Project: a social network strategy for reaching rural black women. *Cancer* 1993;72(3):1071–7.
33. Arnold C, Davis T. Improving mammography screening use in low-income, low-literate women. *J Invest Med* 1996; 44(1):57A.
34. Kiefe CI, McKay SV, Halevry A, Brody BA. Is cost a barrier to screening mammography for low-income women receiving Medicare benefits? A randomized trial. *Arch Intern Med* 1994;154(111):1217–24.
35. Fox S, Siu RL, Stein JA. The effects of physician communication in breast cancer screening of older women. *Arch Intern Med* 1994;154:2058–68.