

Mammography messages in popular media: implications for patient expectations and shared clinical decision-making

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Abstract

Objective To examine the relationship between the quantity and content of information about mammography in popular magazines and the educational level of their target audience.

Design Articles published in popular magazines from January 1988 through April 1994 in which $\geq 25\%$ of all readers were females ≥ 35 years of age were identified ($n = 65$). We used the proportion of readers who were college graduates to stratify the magazines into three education levels. We used a content analysis to assess the relationship between media messages about mammography and readers' education levels.

Results Seventy-eight percent of lowest education level articles were categorized as persuasive or prescriptive compared with 28% of articles in the highest education level ($P < 0.01$). Only 26% of the lowest education level articles that discussed screening guidelines for women under 50 years of age considered the issue controversial, while 59% of the high education level articles considered it controversial ($P < 0.01$).

Conclusion Women with lower education levels received a clearly persuasive or prescriptive message urging mammography screening, while higher educated women received more balanced and informative messages. Such differences suggest that women may be entering their physicians' offices with very different sets of information from which to draw when faced with clinical decisions. Physicians and other health-care providers should be aware of these potential differences, and further research should be done to explore the relationship between women's preferences for participation in shared decision-making and the types of messages they are receiving from popular media.

Introduction

Many patient characteristics, such as educational level, cultural background, presence of a significant other, and age, have been associated with patient interest in participating in health-care decisions.¹ This variation may be important if health-care providers are to structure care in ways that allow patient participation in the decision-making process. Patients' interest in, and expectations for, participating in medical-care decisions may depend on the amount and type of information available to patients, as well as the ability of patients to integrate this information into their health-care decision-making process.

Although there are many sources of health-related information, the general public most often turns to the popular press.²⁻⁶ Television, newspapers and magazines reinforce specific messages about medical interventions, simplifying and framing complex biomedical issues for the lay public.⁷ Women's magazines, in particular, serve as an important source of health-related information for many women.^{8,9} Understanding the content and manner in which preventive health topics are discussed in women's magazines and other popular media may help inform providers about what patients 'bring to the exam room' when a discussion takes place about the complex issues surrounding preventive health practices. The structure of print media discussions about health topics reflects a likely interaction between the magazine writers and editors and what they know or assume about their readership. The content may reflect reader preferences for the particular style of reporting, or it may reflect assumptions made by the editorial staff. Regardless, a better understanding of how health-care issues are explicated in the popular media may help providers improve communication about these complex health-care issues. Similarly, a better understanding of what patients 'bring to the exam room' could have implications for developing programmes intended to increase patient's participation in health care decision-making.

In this paper we examined whether there were differences in how popular women's magazines addressed the issues surrounding screening mammography to readerships with different levels of education. We looked at the relationship between the quantity and content of information about mammography as it related to the educational level of the target audience. We hypothesized that the quantity of information about breast cancer screening would be lower in magazines whose readership consists of predominantly women with less education; and that the type of information about mammography screening and screening guidelines might differ across socioeconomic strata. Potential content differences might be in depth and breadth of information, with emphasis on risk factors for breast cancer, or the uncertainty regarding the benefits and risks of screening. Further differences might include the degree to which political aspects of breast cancer are covered.

Methods

Data sources

The Mediamark Research, Inc. Database contains detailed demographic and socioeconomic information about the readerships of 165 of the most popular magazines published in the US.¹⁰ The database includes information about gender, age, marital status, race, educational level, employment status, and household income. The database information we used was compiled in the spring of 1990.

Sampling

We identified all magazines in which one quarter or more of all readers were females aged 35 or older ($N = 65$). We eliminated 28 of those magazines because they were issue-specific and unrelated to health (e.g. *Country Home* and *Bon Appetite*) ($N = 26$), or information about the content of previous issues was not available through either the Readers Guide to Periodical Literature, the magazine's publisher, or local libraries ($N = 2$).

From the remaining 37 magazines, we obtained all articles pertaining to mammography published from January 1988 through April 1994 by searching the Readers Guide to Periodical Literature using the headings Mammography or Breast Cancer (321 articles in 37 magazines). Of these articles, 90 were selected for content analysis either because the entire article was devoted to the topic of mammography, or, despite the article's focus on another topic, a substantial portion was devoted to mammography.

Data analysis

To examine the quantity of information we counted the number of pages devoted to mammography-related topics in each magazine and divided the amount by the average number of pages of text per year. The denominator was calculated by counting the number of issues per year and the average number of pages of text for four random issues in 1993.

To examine differences in the content of articles, we abstracted information using content analysis.¹¹ From a 15% random sample of articles, we derived three dominant dimensions of content based on a qualitative process involving theme identification, independent coding, and group discussions. We then developed an abstraction form comprised of 120 items that classified articles within these three dimensions and collected additional information including: mentions regarding barriers to mammography (e.g. economic costs, fear of radiation); mentions regarding conference findings (NCI, Canadian, Swedish); mentions regarding incidence or prevalence of breast cancer, morbidity, or mortality rates; advantages and disadvantages of screening; issues regarding the quality of providers and facilities of mammography. Additional information was collected about how messages were presented in these 90 articles.

Under the first dimension (Intent) articles were classified as persuasive or prescriptive if they dictated a particular course of action (e.g. to screen or not to screen). These articles

presented opinions in a persuasive, argumentative way: mammograms save lives, or why your next mammogram might kill you. Articles were classified as balanced or informative if their predominant purpose was to neutrally impart knowledge such that contrasting elements were in equilibrium. Such articles provided readers with both the position for and the position against mammography screening, avoiding advocacy positions and specific recommendations.²

Under the second dimension (Uncertainty) articles were classified as reinforcing uncertainty if they included discussions about both the risks and benefits of mammography, the juxtaposition of which may create doubts about mammography in the minds of the readers. The risks of mammography include the possibility of false positives and false negatives. Articles that emphasized only the benefits of mammography, such as morbidity and mortality reduction(s), were classified as not uncertain.

Under the third dimension (Controversy) articles were classified as controversial if they addressed the medical debate over screening guidelines for women under age 50. Some of the arguments in favour of screening women under 50 were that mammography for women in this group will save some lives; studies on which suggestions for guideline changes are based were questionable; and while mammography may not help, it cannot hurt. Some arguments against screening women under age 50 were as follows: the disease is rare in younger women; the dense breast tissue of younger women obscures the accuracy of mammograms; cumulative doses of radiation may prove harmful; and widespread screening for women under 50 is not cost-effective.

We also examined the content of case descriptions within each article. Case descriptions are emotionally laden stories or celebrity accounts, in this case about women with breast cancer, that can elicit strong public reaction.^{2,12,13} From each vignette we recorded the subject's age, occupation, marital status and parity, if described, as well as the story's central theme.

One person read all 90 articles, recording the answers to all 120 abstract items for each article. To test inter-reader reliability a second reader read a random sample of 26 articles. Both readers were blinded to all information about the readership of these articles. A kappa-statistic measure of inter-reader agreement demonstrated adequate agreement for all three dimensions. Our results on the selected variables were as follows: persuasive or prescriptive vs. balanced or informative = 0.75; whether the article mentioned false negatives = 0.91; and whether the article considered screening women under 50 controversial = 0.72.

We constructed two databases. The first database contained a record for each magazine. Each record contained variables describing the number of articles pertaining to mammography, the average number of pages per article, the average number of pages per issue, the number of issues per year, and the socioeconomic and demographic variables. Previous research has shown education level to be highly predictive of health knowledge, therefore, we used one measure of socioeconomic status, the proportion of female readers who were college graduates, to stratify the magazines into education levels.^{14,15} A second database contained a data record for each article and variables indicating the magazine's educational ranking and the content of the article. We then compared the quantity of information and content of information of the articles by tertile. Hypotheses for proportions were tested using chi square tests. A *P*-value < 0.05 was considered statistically significant.

Results

We arranged 90 articles in 37 magazines into three educational levels. The lowest level contained 11 magazines with 27 articles (Table 1). The average percentage of female readers in this level who were college graduates was 11.8%. All three magazines targeted at African-American audiences fell into this level. The middle educational level was comprised of 12 magazines with 34 articles. The average percentage of female college graduates was

16.6%. Most magazines targeted specifically at women (e.g. *Cosmopolitan*, *Ladies Home Journal*, and *Glamour*) fell into the middle level. The highest educational level contained 12 magazines with 29 articles. The average female readership who were college graduates was 35.3%. This level is comprised mainly of magazines targeted at general audiences, neither ethnic nor gender specific (e.g. *Time*, *Newsweek*, *The New Yorker*, and *U.S. News & World Report*). While the number of articles published during the study did not differ significantly by educational level, the length of the articles did differ. Articles in low and middle education level magazines were on average shorter than articles in the high education level magazines, 1.6 and 1.4 pages vs. 2 pages, respectively (Table 2).

There was a strong association between intent and educational level. Whereas 78% of the low education level articles fell into the persuasive or prescriptive category, only 28% of the high education level articles were, thus, classified (Fig. 1). The middle education category contained 56% persuasive or prescriptive articles ($X^2(2) = 14.3$, $P < 0.01$).

There were also associations between uncertainty and educational level. One third of the articles in all of the combined levels mentioned false negatives as a drawback of mammography. The problem of false negatives was mentioned less frequently in the low education level magazines than in the middle and high education level magazines. Similarly, one third of all the articles mentioned the problem of false positives, elaborating on the concurrent pain and anxiety associated with them. Low education level magazines mention false positives only 22% of the time while middle and high education level magazines mentioned false positives 35% and 48% of the time, respectively ($X^2(2) = 4.1$, $P = 0.13$).

Morbidity and mortality reduction(s) were also considered under the uncertainty dimension. A strong association existed between education level and the mentioning of morbidity and mortality reduction. Morbidity reduction, or mammography's potential to increase the possibility of breast conserving therapy through

Table 1 Magazine Characteristics

Magazine Title	# Articles on Mammography	% Female Readership	% Female Readership ≥ 35	% Female College Graduates	% Female Caucasian
High Education Level					
Ms.	2	91.0	66.0	88.9	87.4
The New Yorker	1	52.0	70.8	56.6	86.7
NY Times Magazine	0	54.0	69.5	48.8	88.1
New York Magazine	1	51.8	67.4	48.3	91.1
Vanity Fair	0	76.3	45.3	30.2	88.1
Newsweek	4	46.1	64.9	28.5	85.9
US News & World Report	4	41.1	67.4	26.4	87.5
Self	4	89.7	37.5	25.7	90.5
Time	3	46.9	64.4	25.7	84.0
Working Woman	0	89.9	52.1	23.9	90.1
Vogue	2	87.5	43.2	23.3	78.1
American Health	5	69.5	65.4	23.2	90.1
Harper's Bazaar	2	88.2	56.0	23.1	92.8
Mademoiselle	1	88.0	31.8	22.2	87.8
Totals and Means	29	69.4	57.3	35.3	87.7
Middle Education Level					
Yankee	0	59.0	83.1	21.3	99.0
Glamour	7	91.5	35.8	20.0	85.4
People	0	63.1	57.2	17.5	87.5
Life	0	54.4	56.4	17.4	86.7
Working Mother	0	90.2	39.6	17.3	88.2
Parent's Magazine	0	77.4	30.8	17.0	88.7
Cosmopolitan	3	84.2	37.5	16.3	86.2
Good Housekeeping	3	85.1	68.5	14.7	90.3
Family Circle	9	86.8	69.2	14.6	91.3
Sat. Evening Post	2	54.8	80.2	14.6	90.0
Ladies' Home Journal	2	90.5	67.6	14.4	91.2
Woman's Day	8	91.6	68.1	14.1	89.8
Totals and Means	34	77.4	57.8	16.6	89.5
Low Education Level					
Prevention	6	75.7	77.5	13.9	87.1
Readers Digest	2	58.1	71.4	13.8	90.0
Redbook	3	89.3	62.8	13.6	92.1
Ebony	0	56.7	64.1	13.5	7.4
Modern Maturity	1	59.9	88.9	13.3	93.6
Essence	2	71.6	49.8	12.9	11.1
Parenting	3	77.2	25.5	12.4	90.1
McCalls	5	89.2	66.3	12.1	89.0
Health	3	73.7	68.0	12.0	80.1
Jet	0	56.7	49.7	7.1	6.7
National Enquirer	2	65.1	53.6	5.7	82.5
Totals and Means	27	70.3	61.6	11.8	66.3

early detection, was only mentioned in 23% of the articles, while mortality reduction was mentioned in 62% of the articles. While 48% of

the low education level articles mentioned the usefulness of mammography in leading to breast conserving therapy, the middle and high

Table 2 Quantity of Information by Education Level

	Low	Middle	High
Number of Articles	27	34	29
Average Article Length (pages)	1.6	1.4	2
Mammography articles as a percentage of all articles in 1993	2.5%	2.3%	2.2%

education level articles were not nearly so well represented, with 12% and 14%, respectively (Fig. 1, $X^2 (2) = 13.3, P < 0.01$). Similarly, 80% of the articles in the low education level mentioned the benefits of mortality reduction vs. approximately 50% of the articles in the middle and high education levels ($X^2 (2) = 5.1, P < 0.05$). Both benefits of mammography were mentioned more frequently in the lowest educational level magazines than the highest, the number of mentions being inversely proportional to the increase in education.

Sixty-nine out of 90 articles mentioned breast cancer screening guidelines. Though education level was not associated with the proportion of articles mentioning screening guidelines, it was associated with the message about screening guidelines. Among articles mentioning screening guidelines, 92% of low education level articles recommend screening for women under 50 compared with 41% of the high education level

articles ($X^2 (4) = 17.6, P < 0.01$). Conversely, only 26% of the low education level articles that discussed screening guidelines for women under 50 considered the issue controversial, while 59% of the high education level articles considered it controversial ($X^2 (4) = 19.2, P < 0.01$). The three articles that recommend against screening for women under 50 were in the high education level magazines.

Approximately one third of the articles contained case histories, including 47 individual cases. Of the 42 case histories that included the subject's age, 79% were based on women under 50, and 42% were based on women under the age of 40. Only two of the 42 case histories were based on women older than age 55. The age of the case history subject was positively associated with readership education level. Indeed, only one article in the lowest level contained a case history based on a subject older than 50. The case histories reinforced both the lifesaving capabilities of mammograms and their imperfections, illustrating some fear and doubt inspiring aspects of the technology.

Discussion

In our review, the articles targeted toward women with low education downplayed the

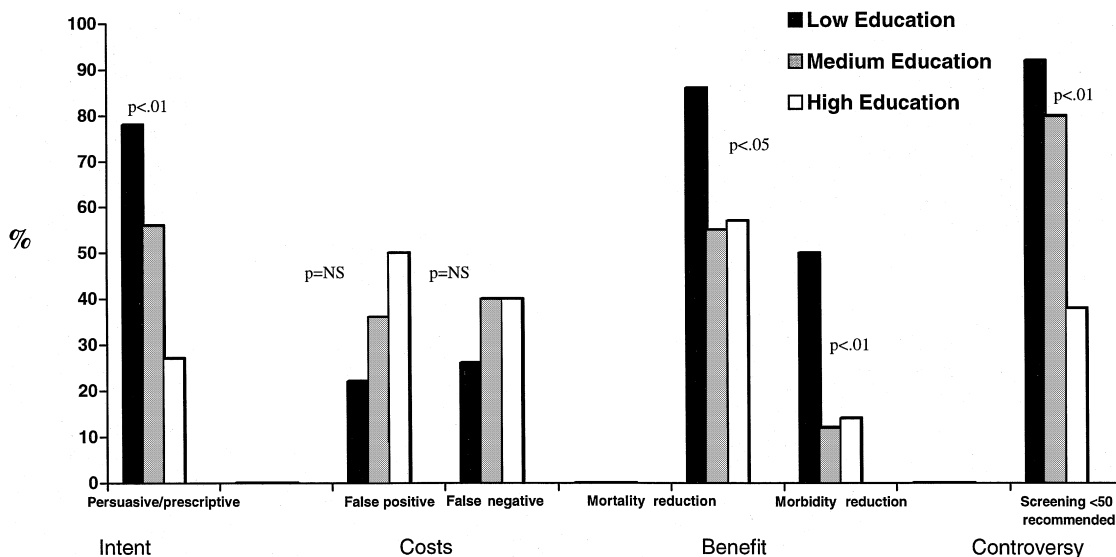


Figure 1 Content analysis of articles by education levels: dimensions of uncertainty.

uncertainty surrounding mammography, while campaigning strongly for the lifesaving power of the technology. Many of the articles stressed the risks of a breast cancer diagnosis and the negative consequences of foregoing screening. Alarming statistics, such as the familiar 'one-in-nine women will be diagnosed with breast cancer in her lifetime', were more frequently cited in these articles than in articles directed at higher educational levels. Less emphasis was placed on the prevalence and consequences of false positives and false negative tests, and they rarely addressed the controversy about whether to screen women younger than 50. These articles, stripped of the controversy regarding the appropriate use of this technology, sent a clear prescriptive message: 'just do it'.

A more ambivalent message was seen in the articles aimed at women with higher education levels. Mammography was described as a blunt, crude and fallible procedure, subject to error by machine, operator, and interpreter. These articles made more explicit the issues that form the debate about mammography, the most frequent being that since studies do not show a significant reduction in mortality when women under 50 are screened, the enormous costs clearly outweigh the benefits to providing uniform screening for women of 40–49 years. They identified the inherent conflict between a public health policy perspective, which emphasizes these high costs and uncertain benefits, and an individual perspective, which minimizes uncertainty and discounts social costs of screening. These articles offered more balanced, objective information concerning mammography than the articles seen in the magazines with a predominant readership of lower educated women.

Across educational levels, magazines used case histories to illustrate women's experiences with breast cancer, and thus, the need for mammography. However, fewer than 5% of case histories were based on women older than age 55, even though age is known to be one of the most important risk factors for breast cancer. Publishing case histories in which 79% of the subjects are under 50 and 42% are under 40 may give women an inaccurate perception of

their age-related risk of breast cancer. Although this finding was apparent across educational levels, it was strongest at the lowest educational levels.

Several limitations in this study merit comment. Although the inter-reader reliability for the major content variables was adequate, for two of the measures the reliability was on the lower end of adequacy. Lower reliability could favour a null finding in this study. However, we found strong associations between educational level and all three of the content dimensions. Magazines and articles were categorized into roughly three equal tertiles. We found that a sensitivity analysis varying the magazine groups at the margin between each education level did not substantially change our findings.

Overall, our findings may reflect general differences in the way the media communicates information about health and science across education groups. In an examination of the content of print and broadcast media coverage to discern attitudes reflected in the presentation of managed care topics, it was found that attitudes varied markedly depending on the media source.¹⁶ The majority of the articles in general newspapers and business press were neutral with respect to managed care, while special series and broadcast media portrayed managed care in a negative light. Although socioeconomic status (SES) was not specifically measured, it is known that the audiences of select media differ by SES. Topics in various media are covered concurrently, but with distinct differences, based on knowledge of the characteristics of target audiences.

The literature suggests that communication about preventive care between patients and providers varies across SES as well. Several studies suggest that this may be due to differences in patient preferences for level of information or control of decisions.^{17,18} Others raise concerns that providers may not have sufficient information about these preferences to act in the patients' best interests. Our study results suggest that patients of varying SES may be entering the clinical encounter having received very different messages about medical care from the popular media.

Our findings that there are variations in mammography information by educational level may reflect readership preference, editorial assumptions, or some combination of both. Regardless, providers need to know about the nature and source of knowledge and attitudes about important health topics that women bring to the clinical encounter. Our study suggests that women with lower SES received a more simplified message about mammography use that was stripped of the clinical controversies. Furthermore, the mammography messages explicated through women's magazines were distorted in their presentation of risk of breast cancer across age groups. Thus, providers may face a special challenge when trying to elucidate these complex issues in the clinical setting because the information discussed may conflict with the media message. Our results suggest that women with lower SES may be particularly less engaged in the nuances of these issues. Providers need to be aware of these differences in sources of knowledge and attitudes toward screening when communicating with patients.

Quality improvement initiatives are emphasizing the positive role of shared decision-making in clinical encounters. Studies have shown that greater patient participation in decision-making about health-related concerns may lead to increased patient satisfaction. Patients are more satisfied when treated in a 'partnerlike manner', or as social equals by the physician.¹⁹ In addition, research suggests that satisfaction can be predicted by the amount of information a patient is given. The more information offered to the patient, the more satisfied (s)he is with the health-care.²⁰ Consequently, when patients are satisfied with the care they are receiving, they are more likely to comply with the suggested treatment option or procedure. Since studies have shown that women distinguish their physicians as the most important facilitators of mammography screening,^{21–25} it is essential for physicians to communicate thoroughly, emphasizing the importance of the agreed upon course of action and how it can be carried out.

Of course it is likely that there is enormous variation in patient preferences for the type of

information given and level of participation in decision-making in clinical encounters. Our study suggests that the health-related information that may form the basis of knowledge and communication preferences may partly explain these differences. A better understanding of these sources of information may help guide more effective interventions to improve clinical communication.

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