

The relationship of race to women's use of health information resources

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OBJECTIVE: The purpose of this study was to examine, among the general public, the independent effect of race on women's use of health information resources.

STUDY DESIGN: A population-based random-digit dialing survey of adult women, aged 18 to 64 years, was conducted between October 1999 and January 2000. Subjects included 509 women (341 white women, 135 black women, and 33 women of other races). The response rate was 66%. The main outcome variable was the use of health information resources (print health or news media, broadcast media, computer resources [Internet], health organizations, organized health events). Logistic regression was used to determine the independent effect of race/ethnicity on the use of different information resources, with an adjustment for age, income, education, and marital status.

RESULTS: After the adjustment for socioeconomic factors, black women had <50% odds of using print news media (odds ratio, 0.5; 95% CI, 0.4-0.8), <60% odds of using computer-based resources (odds ratio, 0.4; 95% CI, 0.2-0.6), and <70% odds of using health policy organizations (odds ratio, 0.3; 95% CI, 0.2-0.7), compared with white women.

CONCLUSION: There is a large racial disparity in women's use of health information resources. Traditional sources that are used to provide patient information may not be effective in certain populations. (Am J Obstet Gynecol 2003;188:580-5.)

Key words: Women's health, race, health information resources, medical information

Health information resources, which includes print media, broadcast media, computer-based resources, and health organizations, are the primary communication methods used by health care providers and policymakers to disseminate health care information to consumers and to guide health behaviors. Although health information resources have been developed traditionally to educate the general population of consumers, racial differences in consumer use of information resources suggest that health care social marketing campaigns may need to be

tailored to the race/ethnicity of the target population.^{1,2} For example, Guidry et al³ surveyed a group of patients with cancer and found that white patients were more likely to use books and reference materials for information on cancer treatments and black patients relied on pamphlets and television. Brodie et al⁴ found that black patients were less likely than whites to use computers as a source of health information. Another analysis found that immigrant black patients were more likely to use television as a primary source of cancer information, although US-born black patients are more likely to use physicians and other health professionals.⁵

Although these studies provide early, useful data on race and ethnic differences in health information use, the analyses are largely descriptive,⁴ focus on populations with selected disease,^{3,6,7} and do not examine racial differences by gender. Few analyses have examined the impact of race/ethnicity on women's use of health information resources,^{7,8} particularly in the context of other socioeconomic factors. It is important for health care providers and policymakers to know what resources women use for health information. First, women are the primary consumers of health care services, accounting for 60% of all physician visits.⁸ Second, women make most health care decisions for their children and other family members.¹ Finally, women's use of health information can be used to develop gender-based social market-

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ing campaigns,^{9,10} such as those that target women for Papanicolaou test screening and mammography.

We conducted a population-based study to examine women's use of health information resources, in particular to assess the independent effect of race on the use of specific information sources while controlling for sociodemographic and socioeconomic factors.

Methods

Random digit dialing. We conducted a cross-sectional survey of adult women in the Baltimore metropolitan area by using random digit dialing. Women were eligible for the survey if they were between 18 and 64 years old, English speaking, and consented to be interviewed. Verbal consent was obtained by the interviewer and then documented on the survey form. The study was approved by the Institutional Review Board.

Survey instrument. Our survey was developed after a review of published manuscripts on women's health care use and of the data provided in current population-based surveys (eg, the National Ambulatory Medical Care Survey, the Commonwealth Fund Survey). We identified gaps in the current knowledge of women's health use and developed questionnaire items that would address these gaps specifically. The survey was reviewed initially by a focus group of nine, predominately black, women in Baltimore. On the basis of feedback regarding the clarity and appropriateness of the questions, the survey was modified and later presented to a group of public health care providers, administrators, and researchers. Further modifications were made on the basis of suggestions from this second focus group. The final version of the survey consisted of 75 "closed-ended" questions and addressed 6 major content areas: (1) need-based health care use, (2) health care access, (3) physician-patient communication, (4) sources of health care information, (5) health risks and health status, and (6) sociodemographic characteristics.¹¹ For the purpose of this study, we focused our analysis on the sociodemographic data and sources of health care information.

Variables

Health information sources. Information on the resources that are used by the women was obtained from a series of seven questions. First, respondents were read a list of media sources for health information. For each source, the women were asked whether they had used that source of information at any time during the last 12 months. The list of media sources included newspapers, news magazines, health magazines, television news programs, and radio talk shows. In two subsequent questions, respondents were asked whether they had used health books or received health newsletters from local hospitals, universities, or women's organizations. The women were then asked about their use of computer-based health information

sources with the following question: "In the past 12 months, have you used any computer-based health information, such as sites on the Internet or CD-ROM computer programs about health topics?" Respondents were also asked whether they used information from any of the following groups: local women health groups, state-level women's health groups, national women's health groups, or national public policy groups. In addition, the women were asked whether they obtained information from women's health support groups or health fairs.

Sociodemographic variables. We also collected data on patient race (white, black), age, marital status (married, single), insurance (private, Medicaid, Medicare, other sources, self-pay), total household income (\leq \$25,000, \$25,001-\$50,000, \$50,001-\$100,000, $>$ \$100,000), education (\leq 12 years, some college, college/postgraduate), and work status (full-time, part-time, not working).

Analysis of survey responses. Racial differences in the distribution of participant characteristics were compared with the use of the χ^2 statistic. To identify factors that were associated with the use of information sources, we first classified the sources into the following six categories: (1) print health media (health books, health magazines, health newsletters), (2) print news media (newspapers, news magazines), (3) broadcast media (radio talk shows, television news programs), (4) computer resources (CD-ROM, Internet), (5) health organizations (local, state, and national health groups, national public policy groups), and (6) organized health events (health fairs, support groups). We compared the percentage of the black and white women who reported using health information resources, with the use of χ^2 statistics. We then conducted a bivariate analysis, estimating unadjusted odds ratios, to determine the relation between race and information sources. We evaluated potential collinearity between the sociodemographic and socioeconomic variables with the use of a correlation matrix (coefficient = 0.4) and the variance inflation factor.

In the multivariate analysis,¹² multiple logistic regression models were developed to determine the independent association between race and the use of health care information, controlling for other sociodemographic variables. Covariates included in the logistic regression models were household income ($>$ \$50,000 vs \leq \$50,000), marital status (single vs married), and employment (full or part-time vs no employment). Education was recategorized into some college/postgraduate versus \leq 12 years; age was included in the model as a continuous variable. Sociodemographic and socioeconomic characteristics were considered statistically significant in the logistic regression models if the probability value was $<$.05. Data analysis was conducted with STATA software (STATA release 7; StataCorp, College Station, Tex).¹³

Table I. Characteristics of women, compiled from answers to a health care experiences survey

Characteristics	White (n = 336)	Black (n = 132)	P value*
Age (y)†	44 ± 11.3	41 ± 12.5	.002
Median household income (%)			<.0001
≤\$25,000	12	46	
\$25,001-50,000	31	30	
\$50,001-100,000	38	11	
>\$100,000	10	2	
Unknown income	10	11	
Payment source (%)			<.0001
Private, commercial	87	60	
Medicaid	<1	9	
Medicare	3	2	
Other sources	6	5	
Self-pay	4	24	
Educational level (%)			.001
≤12 years	32	45	
Some college	29	37	
College or graduate degree	38	18	
Marital status: single (%)	12	26	<.0001
Full- or part-time employment (%)	76	71	.07

*The probability values compared white women with black women and are based on χ^2 statistic for categorical variables and the *t* test for continuous variables (age).

†Data are mean ± SD.

Results

Response rate and participant characteristics. Of the 4635 telephone numbers that were screened initially, 1828 (39%) were not to households. Another 2031 (44%) were excluded because of age ineligibility (19%), non-English speaking (1%), refused to answer screening questions (13%), and no contact after six attempts (11%). Among the 776 eligible women, 509 women (66%) completed the telephone interview. The racial breakdown was 341 white (66%), 135 black (26%), and 33 (8%) "other race."

Table I shows a comparison of the distribution of characteristics between the white and black women. The average age of the women in the study sample was 42.6 years (± 12 years); the white women were slightly older. There were differences in the median household income and payment source for medical care between racial groups. The median household income for most of the white women was between \$50,000 and \$100,000; the median household income for most of the black women was \leq \$50,000. Most of the black and white women had private insurance coverage. However, almost one fourth of the black women were self-pay, compared with <10% of the white women. Approximately 10% of the black women had Medicaid coverage, compared with <1% of the white women. Almost 40% of the white women had a college or postgraduate degree, compared with 18% of the black women. Forty-five percent of the black women had ≤ 12 years of education, compared with less than one third of the white women. Eighty-eight percent of the white women were married; 74% of the black women were married. There was no significant difference in the percentage of the black and white women who were employed at the time of the survey.

Relationship of socioeconomic factors to use of health information sources.

A variety of socioeconomic factors were not only related to race but also were related to the use of specific information resources. Table II shows the adjusted odds ratios and CIs for the relationship of socioeconomic factors to the use of health information resources. For each 1-year increase in age, there were greater odds of the use of print health media and print news media. Conversely, for each 1-year increase in age, there was a small 2% decrease in the use of computer-based resources.

For participants with a college education, the odds of using print health or news media, broadcast media, health policy organizations, and organized health events were 2.0 to 2.4 greater than for the women with a high school diploma or less. The odds of computer resource use was 3.2 times greater for the women with a college education than for the women with 12 years or less of education.

The women with higher incomes ($>$ \$50,000) had 2.2 times greater odds of using computer-based resources compared with the women with a household income of \leq \$50,000. Although there was a greater use of print and news media, broadcast media, and health organizations among women with higher incomes, these findings did not reach statistical significance. Single status was associated with a lesser odds of the use of most sources of health information, but these findings were not significant.

The women with non-private insurance had 50% less odds of using computer-based resources. Conversely, women respondents who were employed at the time of the survey had greater odds (odds ratio, 1.6; 95% CI, 1.1-2.4) of using computer-based resources for health information, compared with women who were unemployed.

Table II. Association between participant characteristics and use of health information sources*

<i>Sources of information</i>	<i>Age (per y)</i>	<i>College vs high school or less</i>	<i>Household income >\$50,000 vs ≤\$50,000</i>	<i>Single vs married</i>	<i>Nonprivate vs private insurance</i>	<i>Employment vs no employment</i>
Printed health media (health magazines, books, newsletters)	1.02 (1.01-1.03)†	2.4 (1.6-3.7)†	0.8 (0.5-1.3)	0.7 (0.5-1.2)	0.8 (0.5-1.2)	1.2 (0.8-1.9)
Printed news media (newspapers, news magazines)	1.02 (1.01-1.03)†	2.2 (1.5-3.2)†	1.1 (0.7-1.7)	0.8 (0.5-1.2)	0.7 (0.5-1.3)	0.8 (0.5-1.3)
Broadcast media (radio talk shows, television news programs)	1.00 (0.9-1.02)	2.2 (1.4-3.4)†	1.2 (0.7-2.0)	0.7 (0.4-1.1)	0.6 (0.3-1.1)	1.2 (0.8-1.9)
Computer resource (CD-Rom, Web)	0.98 (0.97-0.99)†	3.2 (2.0-5.1)†	2.2 (1.3-2.4)†	1.1 (0.7-1.7)	0.5 (0.3-0.8)†	1.6 (1.1-2.4)†
Organizations (local, state, national health groups, national public policy groups)	1.02 (1.0-1.04)	2.2 (1.3-3.6)†	1.3 (0.8-2.1)	0.8 (0.5-1.4)	0.6 (0.3-1.2)	0.8 (0.5-1.6)
Organized health events (health fairs, support groups)	1.01 (0.99-1.03)	1.9 (1.2-3.1)†	0.9 (0.5-1.5)	1.6 (0.9-2.7)	1.3 (0.8-2.1)	0.9 (0.5-1.6)

Data represent odds of use of information source versus no use of information source for women with a particular characteristic compared with women in reference group. Odds ratio of >1 indicates more use of information source; odds ratio of <1 indicates less use of information source.

*Odds ratios are adjusted for age, education, household income, marital status, insurance, and employment.

†Significant odds ratio because 95% CI does not include 1.

Employment was not associated with other sources of health information.

Independent effect of race on use of health information sources. As shown in Table III, we compared the percentage of black and white women who used different health information with use of the χ^2 statistic. We found that 64% of the white women used newspapers and news magazines, although only 44% of the black women used these information sources. More than 40% of the white women used computer-based resources, compared with only one fifth of the black women. The white women used information from health organizations three times more often than the black women.

There were some racial similarities in the use of health information resources. As shown in Table III, the largest percentage of the black and white women used printed health media. Also, the overall pattern of information use was similar between the two racial groups. Both the black and white women predominately used print health and news media, followed by broadcast media and computer-based resources.

In a bivariate analysis, we estimated unadjusted odds ratios to show the relation of race to the use of different information resources. The bivariate analysis (Table III) suggested that black race was associated with a 60% reduction in the use of printed news media. Bivariate analysis also suggested that the black women had 40% lower odds of using broadcast media and 70% lower odds of using computers or health policy organizations as sources of information, compared with the white women.

In the final step of the analysis, we determined the independent effect of race on the use of information resources. After adjustment for other sociodemographic factors with the use of logistic regression, we found that

the black women still had 50% to 70% less odds of using print news media, computer resources, or health policy organizations as a source of health information, compared with the white women. There was no difference between the black and white women in the use of broadcast media or other sources after an adjustment for other patient factors.

Comment

Although health information resources are an essential tool in providing current medical information and guiding health behaviors, knowledge of the effect of race/ethnicity on the use of health information resources is necessary to guide the development of social marketing campaigns that target the health of adult women. This cross-sectional survey assessed the independent effect of race/ethnicity and other socioeconomic factors on the use of health information, with an adjustment for other patient factors.

We first emphasize that socioeconomic factors affect the use of 4 major sources of health information. The use of print news and health media, computer-based resources, broadcast media, and health organizations was greater among the women with a college degree or with a household income of >\$50,000. These findings may be explained partially by reading comprehension, access, and time. For example, women with a college education probably have a higher reading comprehension level, compared with women with lower levels of education, and may view print health or news media as practical sources of information. Health organizations often communicate through written newsletters or consensus statements, which might appeal to women with a higher education (eg, college).¹⁴ Both education and income

Table III. Association between race and use of health information sources among adult women

<i>Source of information</i>	<i>Black (n = 135) (%)</i>	<i>White (n = 341) (%)</i>	<i>Unadjusted odds ratio black vs white women (95% CI)</i>	<i>Adjusted odds ratio black vs white women (95% CI)*</i>
Printed health media (health books, health magazines, health newsletters)	69	75	0.7 (0.5-1.1)	0.9 (0.5-1.5)
Printed news media (newspapers, news magazines)†	44	64	0.4 (0.2-0.6)†	0.5 (0.4-0.8)†
Broadcast media (radio talk shows, television news shows)	71	81	0.6 (0.3-0.9)†	0.7 (0.5-1.2)
Computer resources (CD-rom, Internet/Web)†	21	45	0.3† (0.2-0.5)	0.4 (0.2-0.6)†
Organizations (local, state, and national health groups, national public policy groups)†	7	21	0.3 (0.2-0.5)†	0.3 (0.2-0.7)†
Organized health events (health fairs, support groups)	17	13	1.4 (0.8-2.3)	1.3 (0.7-2.3)

*Odds ratios are adjusted for age, education, household income, marital status, insurance, and employment.

† $P \leq .05$.

‡A significant odds ratio because the 95% CI does not include 1. An odds ratio of >1 indicates more use of the information resource among black women compared to white women; an odds ratio of <1 indicates less use of an information resource among black women compared to white women.

level can affect access to computer-based resources. Women with higher household incomes may be better able to afford computers and Internet/web access, compared with women with lower incomes. In a recent analysis, adults with incomes of $< \$30,000$ were much less likely to use a computer or to have access to the Internet, compared with other adults with incomes of $> \$50,000$. College-educated adults had greater use of computers, compared with adults with a high school degree.⁵

From the initial analysis, we know that socioeconomic characteristics are related to race and to the use of different types of health information resources. In the final step of our analysis, we determined the independent effect of race on the use of health information resources. We found persistent racial disparities in the use of print news media, health organizations, and computer-based resources after an adjustment for other characteristics. Brodie et al⁴ found an initial disparity in computer use in a survey of male and female adults (34% white adults/19% black adults) that disappeared once they compared black and white adults at higher income levels. In contrast with that analysis, we found that black women remained 60% less likely than white women to use computer-based resources, even after adjustment for income, education, marital status, age, and employment in the logistic regression model. Surprisingly, the combination of these variables only accounted for 11% of the racial variation in computer use.

The persistent racial disparity in the use of print news media is consistent with findings from an earlier study and may be due, in part, to differences in education. Guidry et al³ found that patients with a high school diploma or higher had four to five times greater odds of reporting print media as a useful source of health information, compared with patients without a high school diploma. The black women in our survey were less educated than the white women. In multivariate analysis,

the addition of education to the logistic regression model slightly reduced the racial disparity in the use of print news media.

Despite the addition of education and age to the logistic regression model, the racial disparity in the use of health policy organizations as a source of information remained unchanged. This persistent racial disparity may be due, in part, to a limited exposure of the black women to the venues (eg, print media, Internet) that health policy organizations traditionally use to relay information to consumers. Another possibility is that the black women may prefer nontraditional sources of information, such as family, friends, or the church. In a study of menopausal women, Grisso et al¹⁵ found that black women were more likely than white women to seek advice on menopausal symptoms and treatment from family and friends. Although we did not ask the women if they used these sources of health information, we did ask about the usefulness of family/friends and the church as information resources. The black women were much more likely than the white women (54% vs 32%) to report that family/friends and the church were useful resources. Future surveys should ask about the use of nontraditional and traditional sources of information.

There are additional factors that may explain the racial disparity in the use of health information resources that were not part of our survey analysis. Although time is a possible explanation for the racial disparity in the use of computer-based resources and print news media, we did not ask respondents about their time commitments or whether they perceived time as a barrier to the use of specific resources. Also, our survey only asked whether the respondents used computer-based resources. It would have been helpful in the analysis if we had asked respondents about their access to computers through employment or family and friends. In addition, we were unable to determine whether the racial disparity in use of resources varies

with the type of health information women are seeking. For example, women who need preventive health (Papnicolaou test, mammography) information may prefer print news or health media; women with chronic conditions (hypertension, cancer) may prefer to obtain information from other sources.

The results of this study suggest that the most common sources of health information for women varies with race/ethnicity and education. Although the analysis shows that sociodemographic characteristics that are related to race account for some of the disparity, there are probably other factors that are related to race that further explain the racial differences. Traditional sources of information that health care providers have used to provide patient information may not be effective for certain populations. Race/ethnicity and educational levels may dictate which form of media would be most effective in the dissemination of health information.

Furthermore, racial differences in the use of health information resources indicates that black women who have been traditionally at greater risk of chronic disease may be the primary group that is missed by traditional health marketing campaigns. For example, there have been multiple campaigns to promote breast cancer screening. However, if the sources that were used to disseminate this information are not the principal sources used by black women, there could be a delay in relaying the information to the target population.

Finally, access to information does not always indicate a well-informed consumer. In our analysis, for example, white women were more likely to use computer-based resources for health information, compared to black women. However, access to the Internet does not ensure that white women are receiving the most up-to-date information or that the information that is provided is correct. Several articles have evaluated health information on the Internet for accuracy and completeness with varying results.^{16,17} Future work on health information resources should focus on quality standards for health information and examination for completeness and readability.¹⁸

In summary, our analysis indicates that even after adjustment for other sociodemographic factors, race and education have an independent effect on the use of health information resources. Compared with the white women, the black women were 50% to 70% less likely to use print news media, health policy organizations, or computers as sources of health information. This analysis represents a first step toward the understanding of the information-seeking behavior of adult women and the potential changes necessary to improve the dissemination of health information. Future studies will need to examine the effect of family and friends, the type of information needed, and the perceived quality of information on women's use of health information resources.

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