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Racial/Ethnic Variation in Perceptions of Medical Information Sources in Durham County, North Carolina

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Abstract

Background: *Concerns about health and health care disparities have led some groups to promote better communication of medical information as a potential means of empowering patients to overcome barriers to health care and to practice healthy behaviors. We examined the independent effect of race/ethnicity on perceptions of the usefulness of different sources of health information.*

Methods: *We analyzed data from a cross-sectional telephone survey of black, Latino, and white adults (n = 515) in Durham County, North Carolina, in 2002. Respondents rated the usefulness of medical information sources, nonmedical information sources, and media. We used logistic regression to determine the effect of race/ethnicity on ratings of information sources, adjusting for demographic, socioeconomic, and health status factors.*

Results: *Compared to white respondents, Latinos and black respondents were more likely to perceive as useful the local health department, ministers/churches, community centers, television, and radio. Latinos were less likely than white and black respondents to report the pharmacy as a useful source of medical information.*

Limitations: *Some findings may be particular to Durham County, especially those based on the Latino subgroup. Also, the response rate (43%) suggests that nonresponse bias may have affected our results. Finally, perceived usefulness may affect one's intent to act on information but may not correlate with the benefit gained from a particular source.*

Conclusions: *There are substantial racial/ethnic differences in perceptions of certain medical information sources. Medical information designed for minority populations may be more effective if disseminated through particular sources.*

Key Words: *Attitude to health; ethnic groups; health services accessibility; mass media; North Carolina; public opinion; social perception; social support*

Racial/ethnic minorities experience a greater burden of preventable morbidity and mortality and poorer quality of care than white patients in the United States even after controlling for access-related factors.[1-4] Concerns about health and health care disparities have led some groups to promote better communication of medical information as a potential means of empowering patients to overcome barriers to health care and to practice healthy behaviors.[1,3,5] Improved dissemination of medical information may lead to greater demand for and receipt of preventive care and other services; greater awareness and understanding of risk factors, screening tools, and treatments; greater patient and provider satisfaction; and better health outcomes.[3,5-9] Several studies have focused on patient-provider communication, but less is known about patients' attitudes and beliefs about other sources of medical information.[10-13] Because the amount of information, the number of channels employed to disseminate information, and the skills necessary to access information are increasing, enhanced understanding of

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patients' perceptions of information sources is critical.[14-16]

The source of a message and the medium used to deliver the message are key elements of effective communication.[17-19] Furthermore, previous work has suggested there may be race/ethnicity-specific preferences for sources of medical information.[20-26] These studies have suggested that higher proportions of racial/ethnic minorities use medical personnel and electronic media (ie, television and radio) as information sources whereas higher proportions of white persons use print media (ie, newspapers, magazines, and books). Previous studies, however, have some limitations. First, previous studies have investigated the frequency of use of medical information sources but not the usefulness of those sources. Although frequency of use may reflect usefulness, frequency may also be influenced heavily by exposure to information sources. Second, previous studies have evaluated a narrow set of traditional sources of medical information. Given the rapidly increasing use of the Internet as a source of medical information as well as the variety of other information sources such as churches, family, and friends, it is important to analyze responses to these sources. Third, previous studies typically focused on persons with specific medical conditions (usually acquired immunodeficiency syndrome or cancer) and compared only 2 racial/ethnic groups.

If efforts to educate and empower patients are to succeed in helping to eliminate disparities, providers and public health practitioners must consider patients' use and perceptions of various sources of medical information. Minorities' perceptions of information sources are important because they are related to trust. Previous studies have shown connections between race/ethnicity, trust, and interactions in medicine and medical research.[22,27-28] Given new sources of information and recent demographic and health care trends in North Carolina, health practitioners would benefit from studies of medical and nonmedical information sources in a wider spectrum of racial/ethnic groups and asymptomatic individuals. The objective of this study was to investigate independent associations between race/ethnicity and perceptions of the usefulness of various sources of medical information.

Methods

Data for this study are from a cross-sectional, community-based survey designed to assess attitudes, perceptions, and beliefs about access to and quality of health care among black, Latino, and white persons residing in Durham County, North Carolina. The survey contained 40 items addressing a range of issues including personal health, perceptions of various sources of medical information, personal experiences in the health care system, knowledge of racial/ethnic differences in health and health care, and demographic characteristics. Many of the items were adapted from a national survey by the Kaiser Family Foundation.[29] Additional survey items were drawn from the California Health Interview Survey, El Centro Hispano Survey–Proyecto Life, and a literature review.[30-31] We made further modifications after conducting a provider survey (administered through a local independent practice association) and interviewing community leaders. Finally, we conducted interviews with Latino and black community members to assess content validity and to ensure that an exhaustive list of precoded responses was included in the survey. The survey was translated into Spanish and back-translated into English to ensure that the English and Spanish versions were consistent. Due to the survey's length, we split the survey into 3 components (a core survey, a set of questions for split-half sample 1, and a set of questions for split-half sample 2) and asked all participants to complete the core survey and 1 of the split-half set of questions.

Sample

Eligible participants were adults aged 18 years and older residing in Durham County, North Carolina, in households with telephones. The sample was designed to generalize to the Durham County adult population and to allow for analyses stratified by race/ethnicity. Two separate samples were used for all interviews. The first sample was obtained using a standard, list-assisted, random-digit dialing procedure. Active blocks of telephone numbers (area code + exchange + 2-digit block number) that contained 3 or more residential directory listings were selected with probabilities in proportion to the number of listed phone numbers. After selection, 2 more digits were added randomly to complete the number. The resulting numbers were compared with business directories, and matching numbers were removed. Telephone exchanges with greater than average density of black households were oversampled to increase the overall sample of black respondents. For the second sample, to achieve an oversampling of Latino respondents, participants were recruited by random-digit dialing from a list of households with Latino surnames. We selected this approach because Durham has few Latino households.

We used survey weights to adjust for the sample design (ie, oversampling of black and Latino populations) and for any nonresponse bias. Specifically, the survey weights helped to ensure that the study sample resembled the population of Durham County with respect to age, sex, and education level. Additional details of the survey weighting process are available from the authors upon request.

Survey Administration

The telephone interviews were conducted between October 14 and December 16, 2002, in either English or Spanish based on participant preference. A minimum of 15 attempts were made to contact a potential respondent at each sampled telephone number. The interviewers used a standard screening technique used by major policy research organizations and designed to obtain the best distribution of male and female respondents. Interviewers asked to speak to the youngest male at home. If a male was not available, interviewers asked to speak with the oldest female at home. Interviewers contacted 2615 people by phone, and 1415 (54%) agreed to participate. Of the 1415 consenting households, 1175 (83%) met eligibility criteria. Ninety-six percent (1131/1175) of consenting and eligible households completed the survey, either split-half sample 1 or split-half sample 2. The analysis presented here focuses on the

515 participants who responded to split-half sample 1 and identified themselves as black, Latino, or white. The institutional review board of the Duke University Health System approved the study.

Dependent and Independent Measures

The primary outcome of interest was the perception of the usefulness of 12 sources of medical information. Participants were asked, "How useful do you think the following sources are for medical information for yourself?" Possible responses were "very useful," "somewhat useful," "not too useful," "not useful at all." If participants did not use a particular source, they could also choose the responses "don't know" or "refuse to respond." The sources of medical information were medical personnel sources (ie, doctors, nurses, pharmacists, health department personnel), nonmedical sources (ie, ministers and churches, community centers, friends and relatives, libraries), and media (ie, Internet, newspapers and magazines, radio, television).

Self-reported race/ethnicity was the primary independent variable. Participants were asked if they were of Latino descent and then asked to indicate their race (Asian, black, white, or other). Because of small cell sizes, we excluded participants who indicated that their race was Asian or other. In the remaining sample, we coded participants of Latino descent as Latino, and we coded all others as black or white. In addition to race/ethnicity, we collected data on demographic characteristics, socioeconomic characteristics, health status, and health care experience.

Demographic and socioeconomic variables included sex, age, education level, marital status, employment status, financial status, facility with English, and country of origin. Financial status was assessed by asking about participants' current financial situation. Possible responses included "having difficulty paying the bills, no matter what," "enough money to pay the bills, but have to cut back," "enough money to pay bills, but little to spare for extras," "bills are paid and still have enough for extras," and "don't know" or "refused to answer." All participants who were interviewed in Spanish were asked, "If you have to speak in English on the telephone, would you say you can speak in English very well, somewhat well, or not too well?" Country of origin was coded as United States or other.

Health status and health care experiences were assessed by self-reported health (excellent, very good, good, fair, poor), diagnosis of 5 chronic diseases (diabetes mellitus, hypertension, lung disease, heart disease, cancer), type of health insurance, possession of a usual source of care, and time since last physician visit (within the past year, more than 1 year and up to 2 years, more than 2 years and up to 5 years, and more than 5 years).

Statistical Analysis

Weighting was used to adjust for features of the sample design (oversampling of black and Latino populations) and for bias that may have resulted from nonresponse. To determine whether an information source was perceived as useful, the outcome variable was dichotomized. Responses of "very useful" and "somewhat useful" were collapsed into "useful," and responses of "not too useful" and "not useful at all" were collapsed into "not useful." Responses of "don't know" and "refused" were excluded from further analysis due to small cell sizes. We dichotomized age (less than 40 years, 40 years or older), education level (less than high school degree, high school degree or more), marital status (married, other), and employment status (employed, unemployed). We dichotomized financial status as less wealthy (participants reporting difficulty paying bills or those able to pay the bills with cutbacks) and more wealthy (those with "enough for extras" or "little to spare for extras"). We dichotomized health status as more healthy (excellent or very good) and less healthy (good, fair, poor), insurance status as insured (private and Medicare/Medicaid) and uninsured, and time since last physician visit as more recent (within 1 year) and less recent (all responses greater than 1 year).

We then performed univariate analyses to assess differences by race/ethnicity in perceptions of medical information sources. Chi-square tests were used to compare the groups. Next, we performed bivariate analyses to test associations between respondents' race/ethnicity and the perceived usefulness of information sources, calculating unadjusted odds ratios. We also tested for associations between covariates and perceptions of medical information sources.

We then developed multiple logistic regression models to assess the independent association between race/ethnicity and the perceived usefulness of medical information sources. Before conducting multivariate analyses, we assessed collinearity of variables and developed groups of meaningful predictors. We used a sequential modeling approach and arrived at 2 models. The first model included the variables for age, sex, education, marital status, employment status, and financial situation. The second model included the factors above along with perceived health status, insurance status, possession of a usual source of care, and time since last physician visit. Data analysis was performed in STATA (StataCorp, College Station, TX).

Results

Table 1 gives the demographic, socioeconomic, and health characteristics of the survey respondents by race/ethnicity. The sample included roughly equal proportions of black, Latino, and white respondents. The Latino subgroup was younger, had a higher proportion of men, and had less formal education than the black and white subgroups. Most respondents were employed at the time of the interview. The proportion of respondents who reported excellent or very good health was highest for white respondents. The prevalence of chronic conditions was similar among the subgroups. Black and white respondents were more likely than Latinos to have health insurance and a usual source of care.

As shown in Table 2, all subgroups perceived doctors and nurses as useful sources of information. Perceptions of other sources of information varied. For example, black and Latino respondents more often perceived ministers and churches, community centers, and television as useful sources of medical

Table 1.
Characteristics of Survey Respondents by Race/Ethnicity*

Characteristic	Race/Ethnicity			*P*
	White (n = 197)	Black (n = 155)	Latino (n = 163)	
Age, mean (SD), year	45.7 (1.4)	43.3 (1.7)	34.9 (1.4)	< .001
Female	54.2	59.7	42.4	.16
Education				< .001
Less than high school diploma	6.0	25.0	68.9	
High school diploma	19.1	26.4	17.1	
Some college	23.2	27.9	5.9	
College degree	51.7	20.8	7.6	
Married	52.1	29.9	49.0	< .001
Employed	62.8	62.5	71.2	.56
Financial status				< .001
Bills paid, extras	50.0	34.7	9.4	
Bills paid, little extras	34.5	33.8	39.3	
Bills paid, cutbacks	10.2	10.1	24.7	
Difficulty paying bills	3.5	19.3	20.3	
No answer	1.8	2.1	6.3	
Facility with English language‡				
Very well			4.3	
Somewhat well			16.4	
Not too well			79.3	
Born in United States	94.9	97.0	4.8	< .001
Self-reported health				< .001
Excellent	26.7	14.8	11.7	
Very good	41.7	30.4	13.5	
Good	22.8	30.4	37.6	
Fair	4.1	21.5	34.1	
Poor	4.7	2.9	3.2	
Diagnosis				
Diabetes mellitus	4.8	13.2	9.0	.03
Hypertension	24.6	30.7	20.7	.31
Lung disease	13.0	16.6	3.3	.10
Heart disease	6.9	6.7	3.5	.59
Cancer	5.7	5.6	0.6	.38
Health insurance status				< .001
Private	75.7	53.6	28.3	
Medicare/Medicaid	15.8	21.0	1.7	
Uninsured	7.7	22.2	69.8	
Uncertain/no answer	0.7	3.2	0.2	
Has usual source of care	90.5	90.9	73.3	.01
Time since last doctor visit				.09
Less than 1 year	82.0	86.1	62.0	
1 to 2 years	8.7	7.8	17.2	
2 to 5 years	4.2	3.5	10.7	
More than 5 years	5.1	2.6	10.1	

* Values are expressed as weighted percentages unless otherwise indicated.
† For some variables, sample size varies due to nonresponse. Total sample size ranged from 511 to 515.
‡ Facility with English was assessed in the 138 respondents who chose to complete the interview in Spanish.

Table 2.
Proportion of Respondents Perceiving Medical Information Sources as "Very Useful" or "Somewhat Useful" by Race/Ethnicity*

Information Source	Race/Ethnicity			*P*
	White (n = 197)	Black (n = 155)	Latino (n = 162)	
Medical Source				
Doctors	95.9	98.8	96.7	.25
Nurses	87.9	95.5	84.9	.04
Pharmacy	88.5	94.8	73.9	.002
Health department	43.6	68.0	88.8	< .001
Nonmedical source				
Minister or church	23.2	63.4	70.1	< .001
Community center	26.8	60.5	86.4	< .001
Friends or relatives	69.9	74.7	77.9	.43
Library	65.8	72.5	76.4	.23
Media				
Internet	66.1	63.8	59.5	.68
Newspapers/magazines	69.1	80.4	68.1	.05
Radio	34.9	62.7	74.8	< .001
Television	52.3	81.4	81.5	< .001

* Values are expressed as weighted percentage unless otherwise indicated.

information, compared to white respondents. Perceptions of print media and the Internet did not vary substantially.

Unadjusted associations between respondent characteristics and perceived usefulness of information sources were also examined. The pharmacy was perceived as useful by respondents who had more education, and the health department was cited as useful by respondents who were younger, less educated, less healthy, and uninsured. The odds of perceiving a minister, church, or community center as a useful source of information were higher for respondents without a high school diploma and those who were less wealthy, less healthy, and uninsured. Radio and television were seen as more useful by respondents who had less education and poorer health and those who were uninsured. Interestingly, respondents with less education and wealth, poorer health, and without insurance found most of these sources (excluding the pharmacy) to be useful as compared to their better educated, wealthier, healthier, and insured counterparts.

As shown in Table 3, controlling for demographic and socioeconomic characteristics and health status, significant differences persisted in the ways Latinos and black respondents perceived the health department, the pharmacy (for Latinos only), ministers and churches, community centers, television, and radio, as compared to white respondents. In most cases, the model controlling for demographic and socioeconomic variables accounted for part of the racial/ethnic difference (data not shown). The model controlling for both demographic and socioeconomic characteristics and health status also did not fully explain the racial/ethnic differences observed in univariate analyses.

Discussion

Although there have been suggestions that we can reduce health disparities by educating and empowering persons from racial/ethnic minority groups, there is little information on the effect of perceptions of the tools used to educate and empower. This study found persistent racial/ethnic variation in perceptions of several sources of medical information. Compared to white respondents, Latinos and black respondents were more likely to rate health departments, ministers, churches, community centers, television, and radio as useful sources. In addition, Latinos were less likely to report pharmacies as useful sources. These differences remained after controlling for demographic, socioeconomic, and health-related factors.

In the literature on race/ethnicity and sources of medical information, most studies have surveyed respondents with specific health conditions and have examined the actual use of information sources rather than perceptions of those sources. Still, these reports have been somewhat consistent with our findings in that they also detected racial/ethnic variations for certain sources of information. Cunningham et al[24] found that black respondents were more likely than white respondents to

Table 3.
Proportion of Respondents Perceiving Medical Information Sources as "Very Useful" or "Somewhat Useful" by Race/Ethnicity*

Information Source	Black Respondents			Latino Respondents		
	Unadjusted OR (95% CI)	Model 1†	Model 2‡	Unadjusted OR (95% CI)	Model 1†	Model 2‡
Medical source						
Doctors	3.4 (0.5-23.3)	2.3 (0.2-23.3)	2.1 (0.2-23.7)	1.2 (0.4-4.3)	0.7 (0.2-2.5)	0.4 (0.0-5.4)
Nurses	2.9 (1.0-8.7)	2.6 (0.8-8.7)	2.4 (0.6-8.8)	0.8 (0.4-1.7)	0.5 (0.1-1.5)	0.3 (0.1-1.1)
Pharmacy	2.4 (0.9-6.4)	2.2 (0.8-6.4)	1.9 (0.6-5.6)	0.4 (0.2-0.8)§	0.2 (0.1-0.4)§	0.1 (0.0-0.3)§
Health department	2.8 (1.6-4.7)§	2.3 (1.3-4.0)§	2.0 (1.1-3.5)§	10.3 (5.7-18.4)§	5.9 (2.6-13.3)§	3.7 (1.4-9.4)§
Nonmedical source						
Ministers/churches	5.7 (3.3-9.9)§	5.4 (3.0-9.6)§	5.0 (2.8-9.1)§	7.8 (4.3-14.0)§	6.6 (2.8-15.6)§	4.7 (1.7-12.6)§
Community center	4.2 (2.5-7.1)§	3.6 (2.1-6.3)§	3.2 (1.8-5.6)§	17.4 (9.0-33.3)§	9.3 (4.0-21.8)§	6.4 (2.4-16.9)§
Friends/relatives	1.3 (0.7-2.2)	1.4 (0.8-2.4)	1.3 (0.7-2.3)	1.5 (0.8-3.0)	2.4 (0.8-6.8)	1.7 (0.6-4.8)
Library	1.4 (0.8-2.4)	1.6 (0.9-2.9)	1.4 (0.8-2.8)	1.7 (1.0-3.0)	1.5 (0.7-3.3)	1.1 (0.4-2.7)
Media						
Internet	0.9 (0.5-1.5)	1.1 (0.6-1.9)	1.1 (0.6-2.1)	0.8 (0.4-1.3)	0.7 (0.3-1.7)	0.9 (0.3-2.4)
Newspaper/ magazines	1.8 (1.0-3.3)§	2.0 (1.0-4.0)§	1.7 (0.9-3.4)	1.0 (0.5-1.7)	1.2 (0.5-2.9)	0.8 (0.3-2.1)
Radio	3.1 (1.9-5.2)§	3.4 (2.0-5.9)§	3.2 (1.8-5.5)§	5.5 (3.2-9.6)§	6.4 (3.0-13.7)§	4.6 (2.0-10.5)§
TV	4.0 (2.3-7.0)§	4.1 (2.3-7.3)§	3.9 (2.1-7.2)§	4.0 (2.3-7.1)§	4.7 (2.0-11.1)§	4.0 (1.6-10.7)§

* Values are expressed as odds ratio (95% confidence interval). White respondents served as the reference group for both sets of comparisons.

† Model 1 included the variables for age, sex, education, marital status, employment status, and financial situation.

‡ Model 2 included the variables for age, sex, education, marital status, employment status, financial situation, perceived health status, insurance status, possession of a usual source of care, and time since last physician visit.

§ $P < .05$.

OR indicates odds ratio; and CI, confidence interval.

report using religious organizations, public health agencies, government sources, family, and friends for information about acquired immunodeficiency syndrome. Surveying black and Hispanic respondents, O'Malley et al[21] found variation in the use of health providers and radio as sources of information. Nicholson et al[25] found differences between white and black women in the use of print news media, computer-based resources, and health policy organizations. Other studies dealing with individuals' perceptions of sources of medication information for human immunodeficiency virus, cigarette smoking messages, and cancer treatment have also found racial/ethnic differences.[20,22,26]

Although some of our findings are similar to those of previous studies, the present study offers a number of contributions in this area. First, instead of using frequency of use as a measure of usefulness, we asked about the usefulness of the information sources directly. This allowed us to measure individuals' attitudes toward the sources. Second, we were able to measure an independent effect of race/ethnicity by controlling for demographic, socioeconomic, and health-related factors. Third, our study examined a broader spectrum of individuals and types of information than have other studies. We compared individuals from 3 racial/ethnic groups with different health status and asked about medical information in general rather than about information on one particular disease or health issue. Fourth, we included a wide range of information sources including some newer sources of medical information.

This study has some limitations that may affect the generalizability of the results. First, the study design sought to create a sample that was representative of one county's population rather than of the United States. Thus, some response patterns may be particular to Durham County. Conclusions based on the Latino subgroup are particularly vulnerable to this limitation. The arrival of large numbers of Latinos to Durham County is a relatively recent trend.[32] Ninety-five percent of Latinos in this study were born outside of the United States, compared to 49% in the national study by the Kaiser Family Foundation.[29] Due to recent "hypergrowth" in the Latino population in Durham County, there may not be an adequate supply of culturally and linguistically appropriate resources. In addition, Durham's

Latinos may be less acculturated than Latinos in other areas. Second, we tried to reduce confounding by controlling for demographic, socioeconomic, and health-related factors, but these factors are complex and some residual confounding certainly remained. For example, previous research has suggested that the correlation between self-reported health status and health indicators is less valid in Latino populations.[33] Third, although the response rate in this study was within the range of similar surveys of this type, the response rate increases the likelihood of some degree of bias in the results.[34] We attempted to correct for nonresponse bias by assigning weights to key demographic variables to arrive at a sample that more closely resembled Durham County's population. Finally, perceived usefulness may affect one's intention to act on information but may not always be correlated with the actual benefit gained from a particular source.

Using cross-sectional survey data, we found racial/ethnic differences in perceptions of the usefulness of various sources of medical information. Health professionals have struggled to construct high-quality informational messages that reach minorities, augment their health knowledge base, and alter their behaviors. When constructing messages designed for minorities, health professionals have begun to realize they should consider race/ethnicity when creating the format and content of the message. The present study suggests that race/ethnicity should also be considered when selecting the source that will be used to disseminate the message. Sources deemed useful by minorities should be used to spread messages that are particularly relevant to these groups. As an example, health practitioners seeking to reach minorities might consider forming new or stronger partnerships with churches and ministers because both black and Latino respondents seem receptive to health messages from these nontraditional sources of medical information. Health practitioners might also consider increasing the use of media to deliver health messages because these also seem to be trusted sources in some minority communities.

The subject of race/ethnicity and the transmission of medical information is a fertile area for further investigation that has received little previous attention. In our study we found racial/ethnic differences in perceptions of sources of medical information. Future studies should investigate the types of messages received and how these messages are integrated into health behaviors and beliefs about health care services. **NCMJ**

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REFERENCES

1 Smedley BD, Stith AY, Nelson AR. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Washington, DC: National Academies Press; 2002.
2 Keppel KG, Pearcy JN, Wagener D. Trends in Racial and Ethnic-Specific Rates for the Health Status Indicators: United States, 1990-1998. *Healthy People 2000 Statistical Notes*. Atlanta, GA: Centers for Disease Control and Prevention, US Department of Health and Human Services; 2002.
3 *Healthy People 2010: Understanding and Improving Health*. 2nd ed. Washington, DC: US Department of Health and Human Services; 2002.
4 Mayberry RM, Mili F, Vaid IGM, et al. *Racial and Ethnic Differences in Access to Medical Care: A Synthesis of the Literature*. Menlo Park, CA: The Henry J. Kaiser Family Foundation; 1999.
5 American College of Physicians. Racial and ethnic disparities in health care: a position paper of the American College of Physicians. *Ann Intern Med*. 2004;141(3):226-232.
6 National Cancer Institute. *Making Health Communications Work*. Washington, DC: US Department of Health and Human Services; 1989. NIH Publication 89-1493.
7 Atkin C, Wallack L, eds. *Mass Communication and Public Health*. Newbury Park, CA: Sage Publications; 1990.
8 Backer TE, Rogers EM, Sopory P. *Designing Health Communication Campaigns: What Works?* Newbury Park, CA: Sage Publications; 1992.
9 US Government Accounting Office. *Consumer Health Informatics: Emerging Issues*. Washington, DC: US Government Accounting Office; 1996. Publication GAO/AIMD-96-86.
10 Jepson C, Kessler LG, Portnoy B, Gibbs T. Black-white differences in cancer prevention knowledge and behavior. *Am J Public Health*. 1991;81(4):501-504.
11 Johnson RL, Saha S, Arbelaez JJ, Beach MC, Cooper LA. Racial and ethnic differences in patient perceptions of bias and cultural competence in health care. *J Gen Intern Med*. 2004;19(2):101-110.
12 O'Malley MS, Earp JA, Hawley ST, Schell MJ, Mathews HF, Mitchell J. The association of race/ethnicity, socioeconomic status, and physician recommendation for mammography: who gets the message about breast cancer screening? *Am J Public Health*. 2001;91(1):49-54.
13 Ashton CM, Haidet P, Paterniti DA, et al. Racial and ethnic disparities in the use of health services: bias, preferences, or poor communication? *J Gen Intern Med*. 2003;18(2):146-152.
14 Eng TR, Maxfield A, Patrick K, et al. Access to health information and support. *JAMA*. 1998;280(15):1371-1375.

15 Robinson TN, Patrick K, Eng TR. An evidence-based approach to interactive health communication: a challenge to medicine in the information age. *JAMA*. 1998;280(14):1264-1269.
16 Brodie M, Flournoy RE, Altman DE, et al. Health information, the Internet, and the digital divide. *Health Aff (Millwood)*. 2000;19(6):255-265.
17 McGuire WJ. Attitudes and attitude change. In: Lindzey G, Aronson E, eds. *Handbook of Social Psychology*. 3rd ed. New York, NY: Random House; 1985: 233-346.
18 Bettinghaus EP. *Persuasive Communication*. New York, NY: Holt, Rinehart and Winston; 1980.
19 Kosicki GM, McLeod JM. Learning from political news: effects of media images and information processing strategies. In: Kraus S, ed. *Mass Communication and Political Information Processing*. Hillsdale, NJ: Lawrence Erlbaum Associates; 1990: 69-83.
20 Guidry JJ, Aday LA, Zhang D, Winn RJ. Information sources and barriers to cancer treatment by racial/ethnic minority status of patients. *J Cancer Educ*. 1998;13(1):43-48.
21 O'Malley AS, Kerner JF, Johnson L. Are we getting the message out to all? Health information sources and ethnicity. *Am J Prev Med*. 1999;17(3):198-202.
22 Marin G. Perceptions of Hispanics of channels and sources of health messages regarding cigarette smoking. *Tob Control*. 1996;5(1):30-36.
23 Benjamin-Garner R, Oakes JM, Meischke H, et al. Sociodemographic differences in exposure to health information. *Ethn Dis*. 2002:12(1):124-134.
24 Cunningham WE, Davidson PL, Nakazono TT, Andersen RM. Do black and white adults use the same sources of information about AIDS prevention? *Health Educ Behav*. 1999:26(5):703-713.
25 Nicholson WK, Grason HA, Powe NR. The relationship of race to women's use of health information resources. *Am J Obstet Gynecol*. 2003;188(2):580-585.
26 Meredith KL, Jeffe DB, Mundy LM, Fraser VJ. Sources influencing patients in their HIV medication decisions. *Health Educ Behav*. 2001;28(1):40-50.
27 Corbie-Smith G, Thomas SB, St George DM. Distrust, race, and research. *Arch Intern Med*. 2002;162(21):2458-2463.
28 Van Houtven CH, Voils CI, Oddone EZ, et al. Perceived discrimination and reported delay of pharmacy prescriptions and medical tests. *J Gen Intern Med*. 2005;20(7):578-583.
29 Kaiser Family Foundation. Race, Ethnicity & Medical Care: A Survey of Public Perceptions and Experiences. Menlo Park, CA: The Henry J. Kaiser Family Foundation; 1999.
30 California Health Interview Survey. *CHIS 2001 Adult Public Use File, Release 2* [computer file]. Los Angeles, CA: UCLA Center for Health Policy Research; 2002.
31 deRosset L. *Access and Barriers to Healthcare*. Durham, NC: El Centro Hispano/Project LIFE; 2001.
32 Seils DM, Schulman KA. Perceptions of racial and ethnic differences in access to healthcare. *N C Med J*. 2004;65(6):350-352.
33 Shetterly SM, Baxter J, Mason LD, Hamman RF. Self-rated health among Hispanic vs non-Hispanic white adults: the San Luis Valley Health and Aging Study. *Am J Public Health*. 1996;86(12):1798-1801.
34 Curtin R, Presser S, Singer E. Changes in telephone survey nonresponse over the past quarter century. *Public Opinion Q*. 2005;69(1):87-98.