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Understanding Knowledge and Attitudes About Breast Cancer

A Cultural Analysis

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Objective: To evaluate knowledge and attitudes about breast cancer risk factors among Latinas, Anglo-American women, and physicians.

Design: Ethnographic interviews employing systematic data collection methods.

Participants: Twenty-eight Salvadoran immigrants, 39 Mexican immigrants, 27 Chicanas, and 27 Anglo-American women selected through an organization-based network sampling and a convenience sample of 30 primary care physicians in Orange County, Calif.

Main Outcome Measures and Results: Data analysis using qualitative content analysis and quantitative cultural consensus analysis, a mathematical technique that determines the degree of shared knowledge within groups and estimates "culturally correct" answers (cultural models), was employed. The content analysis revealed different beliefs about breast cancer risk factors, particularly between the Latinas and the physicians. The cultural

consensus analysis found two broad cultural models (defined as groups with ratios between the first and second eigenvalues of ≥ 3 and no negative competency scores). A Latina model (ratio=3.4), formed by the Salvadorans, Mexicans, and Chicanas, emphasized breast trauma and "bad" behaviors, including drinking alcohol and using illegal drugs as risk factors. A biomedical model (ratio=3.0), embraced by physicians and Anglo-American women, emphasized risk factors described in the medical literature, such as family history and age. Within these broad models, each group of respondents also differed enough in their beliefs to form their own, often stronger, cultural models.

Conclusions: Ethnography can provide important insights about culturally based knowledge and attitudes about disease. An understanding of the distinctive cultural models regarding breast cancer risk factors will aid future cancer control interventions.

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BREAST CANCER is the most commonly diagnosed cancer and is second only to lung cancer as the leading cause of cancer deaths among women in the United States.¹ In 1991, health care professionals identified 175 900 new cases, and 44 500 women died of this disease. Fortunately, research indicates that the mortality due to breast cancer can be reduced by 30% to 40% through the use of mammography and clinical breast examinations.² However, certain population groups are less likely than others to obtain these screening procedures. For instance, the National Health Interview Survey found that Latinas were less likely than Anglo-American women ever to have had a mammogram or to have had one in the past year.³ There are many reasons for the underutilization of such cancer control services. Latinas frequently are poor, lack health insurance, and have inadequate finances to

pay for medical care out of pocket.^{4,5} Furthermore, they may have limited knowledge about cancer-related risk factors and cancer screening procedures⁶⁻¹¹ and often delay seeking care for cancer-related symptoms.¹²⁻¹⁴

Current efforts at health care reform may be successful in removing some of the economic barriers to medical care; however, other obstacles will continue to exist. A particular set of problems arises from differences between Latinos and Anglo-Americans in culturally based beliefs about illness and disease. For instance, Perez-Stable et al¹⁵ found that Latino and Anglo-American members of a health maintenance organization, populations that should have similar access to medical

See Methods on next page

METHODS

The findings reported herein are part of a comprehensive study of knowledge, attitudes, and behaviors associated with breast and cervical cancer. Described below is a summary of the entire study, with emphasis on the methodology related to this report on breast cancer risk factors. The University of California, Irvine, Human Subjects Review Committee approved the research protocol.

ETHNOGRAPHY

We conducted ethnographic interviews to obtain our data. Ethnography is a research method that explores cultural beliefs and behaviors, usually through qualitative analysis of in-depth interviews. However, this method may also include systematic data collection techniques, such as rank ordering of interview data, that allow for a quantitative data analytic method called cultural consensus analysis^{16,17} (discussed below). Ethnography focuses on shared cultural knowledge and does not assume that researchers are aware of all the relevant questions and issues. Thus, this approach is useful for exploratory studies, such as this one, that are designed to understand better culturally based beliefs and to generate hypotheses for future research.

INTERVIEW INSTRUMENT AND DATA COLLECTION

We developed a semistructured questionnaire that contained more than 300 closed- and open-ended inquiries regarding cancer in general, breast cancer, cervical cancer, general access to medical care, access to cancer screening and treatment services, and demographic characteristics. The closed-ended questions came from the *National Health Interview Survey Supplement Booklet Cancer Control*.¹⁸ The open-ended questions came from the National Health Interview Survey, focus group encounters, and advice from the study's Advisory Committee on Cancer Among Latinas that included professional and lay Latino community members. We pilot tested the questionnaire using Latinas who did not participate in the study. A group of health services researchers not involved with the project and the study's advisory committee reviewed the questionnaire for content validity. Bilingual investigators translated the questionnaire from English to Spanish and backtranslated it using well-established methods.¹⁹

care, differed greatly in their beliefs about the causes and symptoms of cancer. In particular, Latinas were more likely to have fatalist beliefs about cancer, beliefs that could affect utilization of cancer prevention services. Thus, it is important not only to remove the economic barriers but also to understand the culturally based knowledge, attitudes, and behaviors that may influence the impact of cancer intervention strategies.

Most previous research in this area has contained important limitations. The work has usually employed a "deficit knowledge" approach⁸ in which investigators compared respondents' knowledge with existing biomedical information concerning topics such as risk factors for various cancers or recommended guidelines for cancer screening. This method has been successful in measuring knowledge defi-

Investigators trained in ethnographic methods conducted the interviews between August 1991 and August 1992. Because of the sensitive nature of some questions, women investigators conducted the interviews with the Latinas and Anglo-American women. A male investigator conducted the interviews with the physicians. The interviewers met with the women in their homes and with the physicians in their offices. They conducted and audiotaped the interviews in either Spanish or English, depending on the respondents' preferences. The interviews lasted between 2 and 4 hours with the women and approximately 1 hour with the physicians.

This report presents findings from the questionnaire's section on knowledge and attitudes about risk factors for breast cancer. In that section, we wished first to determine all the beliefs about breast cancer risk factors among the study groups (Salvadoran immigrants, Mexican immigrants, Chicanas, Anglo-American women, and physicians). To do so, we employed a technique called "free listing,"¹⁷ during which the interviewers asked respondents to list everything that could cause or increase the risk of breast cancer and to discuss the reasons for the listings. Second, we wished to determine which beliefs were most common. To accomplish this, we reviewed all listed risk factors by an initial group of respondents (approximately one third of each group), determined the 10 factors mentioned most frequently by each group, and then reviewed these 50 factors (10 per group) to ascertain the number of separate risk factors listed. This last step was necessary because more than one group listed some of the same risk factors. This process yielded 29 different risk factors. Third, we wished to determine beliefs about the relative importance of the risk factors. To do so, we printed each of the separate risk factors on index cards and asked the respondents to rank order them from most important to least important. For the initial group of respondents from whom we established the list of risk factors for ranking, we accomplished the ranking task during a second interview. For the remainder of the respondents, the interviewers included the ranking task during the first and only interview.

RESEARCH SETTING

The setting was Orange County, Calif, a community of 2.5 million residents, of whom approximately 23% are Latinos.²⁰ The majority of Latinos live in the northern

parts compared with the benchmark data; however, it may not have led to a clear understanding of what the respondents actually believed about the topics. Moreover, the research on Latinas has tended to aggregate recent immigrants and long-term residents, ignoring the potentially important differences between these groups. These differences could influence cancer-related knowledge, attitudes, and behaviors and could require varying approaches to cancer control intervention strategies.

This article reports the results of a study that used ethnographic methods to explore knowledge and attitudes about risk factors for breast cancer. In contrast to the deficit knowledge method, we made no a priori assumptions regarding knowledge and attitudes. Instead, we allowed the women

part of the county; therefore, we targeted that area for sampling. Most Latinos are of Mexican heritage; however, an estimated 25 000 immigrants from Central America, particularly El Salvador, also live in the county.

SAMPLING STRATEGY

Organization-based network sampling¹⁹ served as the method to select the nonphysician respondents (see the quantitative analysis section below for the sample size justification). Using this approach, one of the investigators (L.R.C.) made presentations to social, educational, and religious organizations and asked for women volunteers. He assigned a code number to each volunteer and randomly selected subjects from each study site. To improve the comparability of the groups, the study design restricted interviews to women without college degrees.

The physician respondents consisted of a convenience sample of primary care practitioners from the community and from the University of California, Irvine. The physicians received a letter, followed by telephone calls, asking for their participation in the study.

QUALITATIVE ANALYSIS

Trained research assistants transcribed verbatim the open-ended responses regarding the risk factors. Three investigators conducted qualitative content analysis by examining the frequency of citations using a text organizing program (AskSam, Seaside Software Inc, Perry, Fla), evaluating the ranking of the risk factors and establishing themes from each group. They divided the 29 risk factors into three groups according to their rankings: most important (rankings 1 to 10), moderately important (rankings 11 to 20), and least important (rankings 21 to 29). Then they independently evaluated the free-listed risk factors, the rankings, and the open-ended responses and developed themes from them. They later met as a group and discussed the themes until they reached agreement about them. To test the "trustworthiness" of the data, the investigators presented the findings to other groups of Latina immigrants, Anglo-American women, and physicians and asked for their comments. These groups agreed that the identified themes were accurate.

QUANTITATIVE ANALYSIS

We used cultural consensus analysis to test for the existence of a shared cultural model and to determine the respondents rank ordering of the risk factors.^{16,17} Cultural consensus analysis is a mathematical model that determines the degree of shared knowledge within groups and estimates the "culturally correct" answers where an answer was previously unknown. The analysis contains a measure known as competence that assesses the individual's expertise in relation to a set of culturally correct answers (the model) derived from a group of respondents' answers to questions concerning a specific domain of knowledge. Cultural consensus analysis provides estimates of each individual's competency and the average competency level of the group. The analysis initially solves for individual estimates of competency by factoring an agreement (correlation) matrix among raters. The ratio between the first and second eigenvalues determines whether a single factor solution exists, indicating a single, shared cultural belief system. Researchers in this field generally accept a ratio of 3:1 and all competency scores falling between 0 and 1 (no negative competency scores) as a minimum threshold for asserting that there is a single factor (cultural) solution. The higher the ratio, the stronger the amount of agreement among the group. We also provided the correlation matrix of aggregate rankings for breast cancer risk factors and used metric scaling, employing principal components analysis on the agreement matrix, to display the results graphically.²¹

Sample size determination for cultural consensus analysis follows the same principles as those in other types of analyses. For ordinal data, two parameters are necessary: the degree of concordance among respondents (the average Pearson correlation coefficient) and the desired level of validity (estimated by the correlation between the answers obtained from the sample and the "true" answers). If there is a great deal of agreement about a topic, the number of subjects necessary to obtain a high level of validity is small. The lower the average agreement, the larger the number of respondents must be to maintain a specified validity level. Because we had no prior knowledge regarding the amount of agreement about risk factors for breast cancer in our subjects, we chose a low competency score of 0.36 and stringent criteria for proportion of items ordered correctly (95% validity). Using these criteria, a minimum of 17 respondents in each group were necessary.¹⁷

to inform us about these issues in their own terms. Moreover, we studied three subgroups of Latinas—Salvadoran immigrants (the term *immigrant* refers to women born elsewhere who now live in the United States), Mexican immigrants, and Chicanas (women born in the United States who are of Mexican heritage) as well as Anglo-American women and physicians.

RESULTS

CHARACTERISTICS OF THE RESPONDENTS

We interviewed 28 Salvadoran immigrants, 39 Mexican immigrants, 27 Chicanas, 27 Anglo-American women,

and 30 physicians. Of these, 28 Salvadoran immigrants, 31 Mexican immigrants, 26 Chicanas, 26 Anglo-American women, and 30 physicians completed the rank ordering task. The women respondents were similar in age, with the mean age of the Anglo-American women, Chicanas, Mexican immigrants, and Salvadoran immigrants being 38, 39, 40, and 35 years, respectively. The Anglo-American women had the most education, with a mean of 14 years (range, 12 to 19 years), followed by the Chicanas with 12 years (range, 3 to 17 years), the Salvadoran immigrants with 8 years (range, 1 to 16 years), and the Mexican immigrants with 6 years (range, 0 to 13 years). All of the Anglo-American women and Chicanas were born in the United States. The Salvadoran im-

migrants had lived here for an average of 4.5 years, and the Mexican immigrants had lived here for 10.5 years.

Fourteen of the 30 physician respondents worked for the University of California, Irvine, and the other 16 had community-based practices. The physicians practiced internal medicine, family medicine, or obstetrics and gynecology. Twelve were women and 18 were men. Ethnic groups included Anglo-Americans (18), Latinos (3), Asian American (6), African American (1), East Indian (1), and Iranian (1).

QUALITATIVE FINDINGS

The respondents cited a large number of risk factors for breast cancer; the 29 most frequently cited by all groups and their relative rankings appear in **Table 1**. The risk factors ranged from those generally accepted by the medical community, such as family history and age, to those generally not accepted, such as blows to the breast and chemicals in food. The discussion below provides an analysis of the themes illustrated by the open-ended responses regarding the risk factors and their rankings, including quotations that epitomize these themes.

PHYSICIANS

The physicians expressed only one major theme, that biomedically recognized risk factors increased the chance of getting breast cancer. Indeed, nine of the 10 most im-

portant risk factors (smoking was the exception) were well established in the medical literature.²² The physicians gave little credence to the risk factors ranked highly by the immigrants, such as blows to the breast. The physicians indicated that they obtained their knowledge from medical training, textbooks, journals, and professional experience. This comment was typical of the physicians' responses:

Family history, nulliparity, children after age 30; a woman who carries her fat or heaviness above the belt. Family history is probably the overriding factor.

ANGLO-AMERICAN WOMEN

Anglo-American women were closest to the physicians in their rankings; however, they did not replicate them. They expressed two major themes. They believed that biomedically recognized risk factors and pollution of food and the environment increased the risk of breast cancer. They also ranked highly two other risk factors that did not fit these themes, highly stressful lives and breast implants.

Biomedically Recognized Risk Factors

Anglo-American women accepted some of the biomedically recognized risk factors such as family history, hormone supplements, and exposure to radiation. Indeed,

Table 1. Risk Factors for Breast Cancer and Their Ranking by Group*

Risk Factor	Rankings by Group				
	Physicians	Anglo-Americans	Chicanas	Mexicans	Salvadorans
Family history	1	1	1	7	20
Age	2	13	15	25	19
First child after age 30 years	3	19	20	21	18
No children	4	22	29	23	26
Obesity	5	15	19	17	22
Hormone supplements	6	2	7	16	11
Radiation	7	7	2	10	12
Early menses	8	21	27	29	25
High-fat diet	9	10	14	20	23
Smoking	10	5	6	3	7
Lack of medical care	11	12	8	2	5
Never breast-fed	12	18	25	19	16
Birth control pills	13	4	5	4	6
Chemicals in food	14	3	9	9	9
Breast implants	15	9	4	5	3
Excessive alcohol intake	16	16	12	13	15
Large breasts	17	23	18	27	24
Poverty	18	27	26	14	29
Medications	19	11	17	24	21
Polluted environment	20	6	10	18	14
Stressful life	21	8	23	26	28
Problems producing milk	22	17	13	15	13
Illegal drug use	23	14	11	8	4
Breast-feeding	24	25	28	28	27
Dirty work environment	25	24	21	22	17
Blows to the breast	26	20	3	1	2
Lack of hygiene	27	29	24	11	10
"Wild" lifestyle	28	26	22	12	8
Excessive breast fondling	29	28	16	6	1

*The 10 top-ranked risk factors by each group appear in boldface.

like the physicians, they ranked family history of breast cancer as the most important risk factor. A typical quote was

I understand that it kind of runs in families. I really can't tell you if this is true, but I would suspect that sometimes a drug that we take may affect breast cancer, but I can't really tell you which ones. I'm kind of hesitant about x-rays, even on my teeth.

Interestingly, some Anglo-American women listed biomedical risk factors but then questioned their veracity:

I think it just happens to some people. They say birth control pills and smoking, but that doesn't necessarily mean that I believe that.

Pollution

Anglo-American women also emphasized pollution as a risk factor for breast cancer. They ranked chemicals in foods and environmental pollution Nos. 3 and 6 in importance, respectively. Environmental pollution included a wide array of risks as indicated by this quote:

Maybe depending on where she works, you know, there might be like, might be exposed to nuclear radiation. Not radiation but, a, just like waves, and like if she works on televisions or something. You know, it depends. Or maybe sitting at, like, at a computer. Maybe the computer gives off something.

CHICANAS

Chicanas ranked highly breast cancer risk factors that were similar in some respects to those submitted by the Anglo-American women and in other respects similar to those submitted by immigrants (described below). Thus, the Chicanas were bicultural in their perceptions of breast cancer risks. The themes included biomedically recognized risk factors, physical trauma, and pollution of food and the environment. In addition, they often mentioned the lack of medical care as a risk factor and ranked it relatively highly. While the medical community views medical care in this context as a secondary preventive measure rather than a risk factor, the Chicanas and immigrants did not make this distinction when asked to list risk factors.

Biomedically Recognized Risk Factors

Like the physicians and Anglo-American women, Chicanas ranked as most important risk factors such as family history, exposure to radiation, and hormonal supplements. One woman said:

If it's hereditary, then I think you are more likely to get it. I've heard that if someone within your family, your mother, your grandmother or sister that has it, there is an increased chance that you may get it, not that you will get it. So they recommend that you get checked.

Physical Trauma

However, they ranked blows to the breast as the third most important risk factor, much like the rankings of the immigrants.

Pollution

Chicanas shared with the Anglo-American women and the immigrants the concern that chemicals in food and a polluted environment could increase the risk for breast cancer.

Lack of Medical Care

Chicanas shared with Mexican women a belief that a lack of medical care posed a cancer risk, as suggested by this quote:

If you're not getting any medical attention or yearly checkups, then you're never gonna really know if you start [cancer]. I think it is going to be bad if your symptoms are at a late stage.

MEXICAN AND SALVADORAN IMMIGRANTS

Mexican and Salvadoran immigrants ranked highly a different list of breast cancer risk factors that we grouped under the following four themes: physical trauma, behavior/lifestyle, lack of medical care, and chemicals in food. We combined the discussion of their rankings because of the similarity in themes.

Physical Trauma

The first theme pertained to the risk posed by excessive physical use and abuse of the breasts, including blows to the breasts (ranked No. 1 by Mexican immigrants and No. 2 by Salvadoran immigrants), and excessive fondling of the breasts (ranked Nos. 1 and 6, respectively). This theme consisted of three main aspects. The immigrants believed that accidental blows to the breast, especially during childhood, could lead to breast cancer later in life. In addition, they noted that breasts were subject to bruising and rough handling during breast-feeding, especially from older children who had teeth and strong fingers. Finally, the immigrants cited excessive fondling of the breasts, which can occur during normal sexual relations, as a breast cancer risk factor. This Mexican woman's comment captured all three aspects of bruising and hitting:

Bruises to the breast are bad. The breasts are very delicate. So when a child sucks on the breast and leaves a bruise, it's bad. Hits to the breast can also cause cancer. And when the husband massages or squeezes the breast or sucks on it, that, too, can cause cancer.

Behavior/Lifestyle

A second theme pertained to a number of behaviors and lifestyle choices. Mexican and Salvadoran women ranked highly risk factors such as drinking alcohol, the lack of appropriate hygiene, and taking illegal drugs. As this Mexican woman said:

If the person drinks, or the person who eats a lot of spicy food. Women who drink, right, tequila or rum. Women should get a checkup when they can. They should go to the clinics. There are clinics that give mammograms for free, for women over 40.

Lack of Medical Care

As the last quote suggests, Latina immigrants often realized that women should seek preventive care for breast cancer. Mexican and Salvadoran immigrants ranked lack of medical attention second and fifth, respectively. As one Mexican woman said:

I don't have insurance. In my opinion if one doesn't have insurance, it's bad because, well, here cures are expensive and, well you know, sometimes for many people, what we earn is not enough even to eat and live. So when we have these types of illnesses we don't go to the doctor because of a lack of money.

Chemicals in Foods

Like the Anglo-American women, the immigrants worried that the chemicals in processed food in the United States posed a cancer risk (ranked No. 9 by both Mexican and Salvadoran immigrants). They contrasted this with life in Mexico and El Salvador, where they ate mostly fresh food. They also spoke of the greater purity of the water and land in their countries compared with what they perceived as the too many chemicals in the United States. A Salvadoran woman said:

Contamination is a cause of cancer. Here in this environment we live in there is a lot of contamination from the factories, car exhaust, and cigarettes. All this can cause cancer, I say, including the food. This food is bad. I think that canned food is especially bad because it is canned so long. When you buy it, it doesn't have any nutrition left for the body. They are not healthy foods. I think that in our environment fewer people die of cancer than here. Perhaps it's because life is different there. The food is more healthy, more natural. Maybe here they use more dangerous fertilizers.

QUANTITATIVE FINDINGS

The qualitative content analysis above indicated that the study groups had varying beliefs about the risk factors for breast cancer. Through cultural consensus analysis, we evaluated the level of consensus within the groups about the importance of the risk factors. The analysis searched for a single factor solution, or cultural model, that would explain the risk factor rankings. We evaluated all groups in every possible combination (ie, physicians and Anglo-American women; physicians, Anglo-American women, and Chicanas; and so forth) as well as separately.

Table 2 displays the results for all groups of respondents combined and for groups in which the analysis demonstrated cultural models (ie, the ratios of eigenvalues were ≥ 3 and there were no negative competency scores) for beliefs about breast cancer risk factors. There was no single cultural model of all groups combined. Indeed, the eigenvalues ratio was only 1.2, indicating little consensus about the risk factors. However, other combinations revealed definite cultural models. The Anglo-American women were close enough to physicians in their beliefs to share a cultural model with them (ratio=3.0). Chicanas shared a cultural model with Anglo-American women and with the Mexican (ratio=3.4) and Salvadoran (ratio=3.0) immigrants (but not with physi-

Table 2. Summary Statistics for the Cultural Consensus Analysis*

Group	Mean (SD) Competency	Ratio of Eigenvalues†
All	0.40 (.23)	1.2
Physicians/Anglo-Americans	0.61 (.18)	3.0
Anglo-Americans/Chicanas	0.58 (.17)	3.4
Chicanas/Mexicans	0.50 (.20)	3.3
Chicanas/Salvadorans	0.47 (.20)	3.0
Mexicans/Salvadorans	0.48 (.20)	3.0
Chicanas/Mexicans and Salvadorans	0.48 (.20)	3.4
Physicians	0.73 (.16)	8.8
Anglo-Americans	0.64 (.16)	4.1
Chicanas	0.58 (.18)	4.2
Mexicans	0.51 (.20)	3.0
Salvadorans	0.47 (.21)	3.0

*The data represent results from all groups combined and from those groups whose scores signified a cultural model.

†A ratio between the first and second eigenvalues of 3.0 or greater indicates a cultural model.

cians), indicating their bicultural heritage. Moreover, all Latinas (Chicanas and Mexican and Salvadoran immigrants) shared a cultural model that did not include the Anglo-American women or physicians (ratio=3.4). Other group combinations revealed eigenvalue ratios of less than 3 and often contained multiple negative competency scores, demonstrating that no cultural models existed for them.

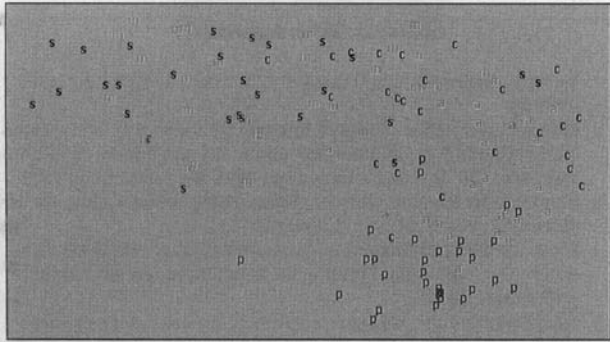
When evaluated separately, all the groups demonstrated their own cultural models that often were stronger than the general models described above. By far, the physicians expressed the highest level of consensus. Their mean competency score was 0.73, and the ratio between first and second eigenvalues was 8.8. Likewise, the Anglo-American women and the Chicanas demonstrated separate cultural models with ratios of 4.1 and 4.2, respectively. The Salvadoran and Mexican immigrant women also formed cultural models, although the eigenvalue ratios of 3.0 in each case indicated less consensus about breast cancer risk factors than the other groups.

Table 3 displays the correlations of the aggregate rankings of breast cancer risk factors among the groups. There were relative high correlations between the Anglo-American women and Chicanas, Chicanas and Mexican immigrants, and Mexican immigrants and Salvadoran immigrants. On the other hand, the rankings of the physicians and Mexican and Salvadoran immigrants were actually negatively correlated.

The **Figure** provides a visual representation of the consensus analysis data described above. Metric scaling displays in three-dimensional space interrelations among variables.²¹ The closer the letters are to each other on the Figure, the greater the agreement about the rank ordering of breast cancer risk factors among the respondents represented by the letters. For instance, the tight clustering of p's, representing physicians, in the right lower portion of the Figure, indicates the high level of agreement about the risk factors within that group. Likewise, the cultural models for each of the other groups are rep-

Table 3. Correlation Matrix of Aggregate Rankings for Breast Cancer Risk Factors by Group

	Physicians	Anglo-Americans	Chicanas	Mexicans	Salvadorans
Physicians	1.00				
Anglo-Americans	0.56	1.00			
Chicanas	0.24	0.76	1.00		
Mexicans	-0.13	0.26	0.72	1.00	
Salvadorans	-0.35	0.12	0.61	0.84	1.00



The spatial configuration of the risk factor rankings obtained by plotting the first against the second principal components. The figure displays the relationship of the points to each other, not to the x- and y-axes. Each letter represents the rankings of one respondent. The closer together the letters appear, the more the respondents agreed about the risk factor rankings. Respondents are represented by letters: a, Anglo-Americans; m, Mexican immigrants; s, Salvadoran immigrants; c, Chicanas; and p, physicians.

resented by the clustering of letters representing the groups. The Figure also displays the interrelationships among the groups regarding beliefs about breast cancer risk factors. Physicians and Latina immigrants (Mexican and Salvadoran) are at opposite ends of the Figure with almost no overlap, indicating very little agreement. Indeed, if the physicians believed the risk factors were important, the immigrants believed that they were unimportant and vice versa. However, between these extremes, there is much overlap among the groups of respondents. As we move from the left to the right of the Figure, we find overlap between the Salvadoran and Mexican immigrants, between the immigrants and the Chicanas, between the Chicanas and the Anglo-American women, and between the Anglo-American women and the physicians. The bicultural nature of the Chicanas is particularly evident in this visual representation. Likewise, the relatively close, but not completely overlapping, rankings of the Anglo-American women and the physicians becomes clear through the Figure.

COMMENT

This is the first study, to our knowledge, that has employed both qualitative and quantitative ethnographic methods to explore knowledge and attitudes about any type of cancer. The qualitative portion allowed the Latina immigrants, Chicanas, Anglo-American women, and physicians to express their beliefs about breast cancer risk factors from their own frames of reference and in their own languages. The quantitative portion allowed the in-

vestigators to determine systematically the major beliefs about risk factors and the level of consensus about them within the groups.

The groups formed two broad-based cultural models regarding beliefs about breast cancer risk factors—a Latina model and a biomedical model. The Salvadoran and Mexican immigrants and the Chicanas shared beliefs that characterized the Latina model: beliefs that stressed physical trauma to the breast and “bad” behaviors such as drinking alcohol and using illegal drugs. Physicians and Anglo-American women shared a biomedical model that differed considerably from the Latina model. This model emphasized epidemiologically determined risk factors such as age and family history. Within these two broad cultural models, each group differed enough in its beliefs to form separate, often stronger, cultural models. For instance, while both groups of immigrants reached consensus about many beliefs, the Mexicans’ beliefs were somewhat closer to those of the Chicanas than were the Salvadorans. Interestingly, the Chicanas shared many beliefs with the immigrants and with the Anglo-American women, indicating the bicultural nature of this group. The physicians reached the highest levels of consensus, embracing risk factors found in the medical literature and giving little credence to others. Anglo-American women shared enough of the physicians’ beliefs to be included in a general biomedical model, but they also indicated that other issues were important, such as environmental pollution and chemicals in food—risk factors not proven by scientific studies.

These findings augment previous research on knowledge, attitudes, and behaviors regarding cancer. Others have found that Latinos had less information about cancer, including its causes, than Anglo-American populations.^{6-11,15} However, we found that knowledge and attitudes about breast cancer risk factors were parts of comprehensive and coherent cultural models rather than nonintegrated bits and pieces of beliefs. The models elucidated the risk factors that the women perceived as meaningful, the relative importance of the factors, and the logical explanations for their beliefs. Moreover, the findings pointed out the schism between the beliefs of the medical care providers and those of potential medical care consumers. It is important for physicians to recognize these differences to provide more culturally sensitive medical care.²³

Two limitations of the study should be mentioned. First, the generalizability of the findings may be questioned because the number of subjects was small and the sample was not random. We chose the sample sizes using the methods of cultural consensus analysis. While

small, the samples were large enough to determine the level of consensus among the respondents, a major purpose of the study, with 95% validity. Indeed, the small sample sizes required for this type of research should encourage its use in future exploratory studies. We interviewed volunteers recruited through schools, churches, and other organizations, rather than obtaining a true random sample, because of the exploratory nature of the study and because of the extensive questioning involved in the ethnographic interviews. We attempted to improve the generalizability by selecting the subjects randomly from the volunteers. Nevertheless, additional larger studies by telephone or face-to-face interviews will be necessary to determine if these findings apply to other groups of Latinas, Anglo-American women, and physicians.

Second, the reliability and validity of the qualitative data may be questioned. These concepts, derived from quantitative research, cannot be applied directly to qualitative inquiries. More often, qualitative investigators refer to the trustworthiness of the research.^{24,25} We dealt with this issue by having researchers not involved with the study and a Latino advisory committee evaluate the questionnaire content prior to its use. We also required three investigators to review independently the open-ended responses about risk factors, to formulate themes about them and to discuss the themes as a group until they reached consensus. Finally, we presented the results to other groups of Latinas, Anglo-American women, and physicians who indicated that the themes were accurate reflections of their beliefs.

The methods and findings of this study have important implications for future cancer control research and interventions. First of all, ethnographic studies, using the qualitative and quantitative analytical methods that we described, can lead to a better understanding of cancer-related knowledge, attitudes, and behaviors. Investigators should consider the use of ethnography in future studies. Second, the ethnographic findings suggest that cancer control educational materials could be improved by addressing culturally based beliefs that conflict with those of the medical profession, not only among Latinas but also among Anglo-American women. Third, the findings imply that cancer control interventions should address varying knowledge and attitudes among ethnic subgroups such as Latina immigrants and Chicanas. Finally, we believe that physicians should be educated about the diversity of beliefs among ethnic groups for whom they provide care. This knowledge may help them to understand why patients with dissimilar cultural backgrounds respond differently to their medical recommendations and may lead to better patient-provider communication. Addressing these issues will help to move us toward the goals of increasing the use of cancer preventive services and of lowering breast cancer mortality rates among women in the United States.

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