On-time Mammography Screening with a Focus on Latinas with Low Income: A Proposed Cultural Model

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Abstract. *Background: Initial U.S.A. breast cancer screening rates have risen, but not repeat screening, especially among low-income minority populations. Latinas are particularly at-risk of underscreening. Consequently, late-detection is common, with increased risk of dying after diagnosis. Why women with low-income, particularly Latinas, who had initial mammography, were not regularly screened was examined. Patients and Methods: An expanded model was tested, incorporating the Theory of Planned Behavior (TPB), cultural factors, potential facilitators and barriers. Participants were 112 women, 72 of whom were Latinas, who had contacted an Early-Detection Program and received a mammogram 3-4 years earlier. Results: The TPB did not explain mammography rescreening behavior among Latinas. The cultural factors: high familism and low fatalism showed significant multivariate associations with recent mammogram among Latinas. A major barrier for Latinas was "distorted familism": neglecting own health because family was first priority. Conclusion: A cultural model is proposed, which can guide interventions for improving on-time mammography among Latinas.*

Abbreviations: BCCCP, Breast and Cervical Cancer Control Program; BCEDP, Breast Cancer Early Detection Program; CBE, clinical breast examination; CI, confidence interval; MLOGR, multiple logistic regression; OR, odds ratio; SD, standard deviation; TPB, Theory of Planned Behavior.

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A consistent socioeconomic disparity has been observed in survival from breast cancer. Women with low incomes are at significantly increased risk of dying after breast cancer diagnosis, compared to women from higher socioeconomic strata (1-4). Medically underserved ethnic minority women in the U.S.A. are at increased risk of presenting with late-stage breast cancer compared to non-Hispanic white women (5-8). Breast cancer is the leading cause of malignancy-related death among U.S.A. Latinas, in contrast to non-Hispanic white women for whom lung cancer is the most common. From 1992 to 1999, the average yearly decline in breast cancer deaths among Latinas was smaller than that among non-Hispanic white women in the U.S.A. (9). Of particular concern are recent reports suggesting that Latinas may be at increased risk of presenting with aggressive breast cancer at a relatively young age compared to non-Hispanic white women with breast cancer (10).

The current recommendation for reducing breast cancer mortality is through a clinical breast examination (CBE) and mammogram. Regular screening mammography has been consistently shown in randomized controlled trials to provide long-term reduction in breast cancer mortality (11, 12). While first-time breast cancer screening rates have increased overall in the U.S.A., repeat screening rates have not, especially among low-income minority populations (13). Recent data have indicated a general decline in the use of mammography by women in the U.S.A. (14). In particular, Latinas have repeatedly been found at risk of being underscreened for breast cancer (15-19).

U.S.A. Latinas are disproportionately represented for three of the most consistent predictors for mammography under-use, lack of health insurance, low levels of income and of education (20-21). Low-income and lack of health insurance create a priority among Latinas of addressing urgent health needs rather than seeking preventive services (22). Notwithstanding the fact that lack of access to mammography

and health care are critical barriers, increasing availability and removal of financial obstacles to breast cancer screening services are not, in themselves, sufficient to ensure adherence with screening recommendations among women with low-incomes, including Latinas (13, 23, 24).

There is a need for a comprehensive and integrated approach to better understand why women with low incomes, and particularly Latinas, may engage in initial breast cancer screening, but not subsequent screenings. The cultural, cognitive and psychosocial determinants of low rescreening rates warrant particular attention. Studies in this area could benefit by incorporating a relevant theoretical framework. Components of the Theory of Planned Behavior (TPB) (25) have been found to be helpful in predicting initial participation in mammography screening programs (26-28). The TPB posits that attitudes, subjective norm and perceived behavioral control determine intention, with intention immediately preceding and determining action. The TPB also informs the design of interventions aimed at promoting adherence with screening recommendations (29), and is particularly useful for interventions because it targets behavior-specific beliefs, rather than core beliefs (30). For these reasons, the TPB guided the design of the present study. The TPB is also potentially relevant here because it includes the component, perceived behavioral control, which may empower women with low income to obtain regular mammograms.

In addition, it is hypothesized that culturally-based components could help identify key determinants of rescreening behavior among Latinas. The cultural value of *familism*, which emphasizes the immediate and extended family as a source of support, belonging, identity, and purpose, was positively associated with engaging in initial breast cancer screening among a sample of Mexican American women over the age of forty (31, 32). Persons with high levels of *familism* feel that family members will protect them against external physical and emotional stressors (33). *Familism* may also indicate how much social support a person has. Women who have low social support and cannot discuss their health concerns with members from their social network were found less likely to have favorable attitudes towards mammography (34). Therefore, *familism* appears to be a protective factor which could promote cancer screening behavior of Latinas. In contrast, an impediment to initial breast cancer screening for Latinas is *fatalism*, defined as "the belief that there is little that an individual can do to alter fate" (35). *Fatalism* scores have been associated with lower screening rates among Latinas of Caribbean origin (36). Latinas of other sub-groups, such as Mexican American women have been found often to have fatalistic attitudes toward cancer (37).

When Latinas with low-income have a source of health care, personal barriers appear to take on a greater importance in hampering adherence to breast cancer screening guidelines (23). The most frequently cited of these has been: "*descuido*" translated in this context as neglecting one's health and not making one's health a priority. Other factors included lack of information and fear. These personal barriers also appeared to be critical among Latinas who had ever had a mammogram (23). In earlier studies examining the barriers to breast cancer screening among Latinas, fear of cancer, embarrassment, and pain have been also cited (38, 39). Misconceptions regarding the need for breast cancer screening have also been reported among Latinas (40). Qualitative research among Latinas revealed the perception that breast cancer screening is risky, particularly when one is feeling well (41, 42).

In the light of the overall low rescreening rates among underserved women in LA County and throughout California, the BCEDP sought to increase the number of women with low incomes who receive initial breast cancer screening and rescreening. The rescreening rates from the BCEDP itself were 23% and 22% for the LA Partnership and for the state of California, respectively in 1997 (43). Concern about the continued decline in already low rescreening rates prompted interest in conducting a study on this issue. This study examined why women with low income, in particular, Latinas engage in initial mammography, but do not continue with regular screening. An expanded model was tested, incorporating the TBP and cultural factors. Potential facilitators were also included, such as health provider explanation of the importance of regular mammography. Health professional recommendation has been found in several studies to be a strong predictor of adherence to breast cancer screening guidelines (34, 44-46). Specific barriers were also examined. This expanded model is shown in Figure 1.

The aim of the present study was to test how well the proposed expanded model identified key factors associated with regular mammography screening among a group of women with low incomes, specifically those who had previously, by their own initiative, received a mammogram through contacting a program with a large representation of Latinas.

Patients and Methods

Data source – specific background for the development of this study. A follow-up telephone survey was conducted of women selected from a representative sample of those who, 3 to 4 years previously, had called the Los Angeles (LA) County Breast Cancer Early Detection Program (BCEDP) referral line, were eligible for and received services, including mammography. The BCEDP provides and/or refers annual breast cancer screening services for women

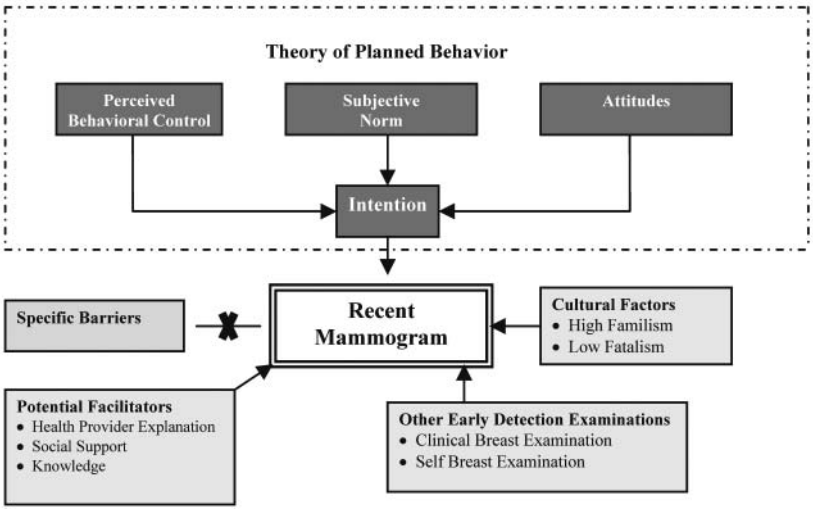

Figure 1. *Expanded model incorporating the Theory of Planned Behavior (TPB) and cultural factors, to identify key associations with recent mammogram for participants in the Breast Cancer Early Detection Program (BCEDP). This figure is adapted from Terán (47). Components of the TPB (25) are framed in dotted lines on the upper half of the figure. Components of the expanded model are shown on the lower half of the figure. Arrows denote a positive relationship; a line crossed with an "x" indicates a negative relationship (specific barriers).*

who have an income 200% below the federal poverty level. The Institutional Review Board of the University of Southern California approved the study. Demographic information about eligible BCEDP referral line callers was released for the purpose of contacting individuals to participate in the study, through the BCEDP from the California Department of Health Services. Women from the LA County Partnership were selected and only personal information such as home telephone number, home address, date of birth, ethnicity, and primary language was used to identify potential participants. The Encore Plus Program, another community organization which provides breast and cervical cancer screening along with information and support to women without other access to health screenings, helped recruit 40 women to test the questionnaire. The group's composition was similar to that of the BCEDP in terms of ethnicity and income. The Encore Plus Program and the LA BCEDP Partnership gave feedback during the questionnaire development.

Study participants and data collection procedure. A total of 1,964 women over the age of 40 called the LA County BCEDP referral line from January, 1997 to December, 1998 and were eligible for services. In January 2001, 640 of those women were randomly selected from the California BCEDP tracking system. Potential participants were contacted *via* telephone and were told that the purpose of this study was to help make breast cancer screening work more smoothly for women like themselves. Telephone interviews were chosen to avoid any literacy-related obstacles. Trained bilingual female interviewers made at least 3 attempts and, in most cases, many more to reach each of the 640 women. All communications were in the woman's language of choice (Spanish or English). "*Personalismo*" was incorporated into all contacts with potential participants, by expressing concern for the participant and her family. "*Personalismo*", defined as a warm, personal way of relating to an individual (48), is particularly appropriate for Latinas, who are reported to be more responsive to people than to impersonal communications (49). Participation among Latinas in health-related studies has been found to be improved by adopting culturally and gender sensitive approaches, characterized by "*personalismo*" (50). Each woman who was contacted was given the opportunity to schedule a convenient time to complete the survey. Verbal informed consent was obtained, with explicit guarantees of confidentiality, freedom to withdraw from the study at any time, as well as to decline answering any specific question(s).

The study was carried out from January to May 2001. Over this period, 172 of the 640 women were reachable. Of those who were unreachable, 215 had telephone numbers which were invalid (either disconnected or wrong). With disconnected or wrong numbers, attempts were made to find the correct number. Figures given here are those for whom no correct number could be found. Despite numerous and persistent efforts to reach them, another 253 women could not be located. For women whose telephone number was verified, a call attempt required that someone answered the phone. Whenever that was not the woman herself, the person answering was asked for the best time to reach her. Of the 172 women who were reached, altogether 112 had received a mammogram and completed the survey (65%). Thirty-five (20%) of the women repeatedly told the interviewer to call back, so that the scheduled interview never took place. Twenty-two (13%) explicitly refused to participate. The participants in this follow-up study were quite similar in age and self-described ethnicity to those served by the BCEDP. Altogether 72 (64.3%) of the women identified themselves as Latina/Hispanic, 9 (8%) as African-American, 23 (20.5%) as white, 2 (1.8%) as Asian/Pacific Islander and 6 (5.4 %) as other or declined to state.

Measures. The questionnaire from which the interviews were performed was developed in English and translated into Spanish; translation back-translation (51) was used to ensure equivalence

between the 2 versions. To avoid scale equivalence problems, the importance of choosing the best answer to each inquiry was emphasized (52). The cultural values measures have demonstrated construct validity and reliability in a study comprised mainly of Mexican Americans (53). For several constructs, shortened versions were used due to the requirements of the participating community-based organizations for concision. The attitudes, subjective norms, and perceived behavioral control measures were newly created for this study.

Demographics. Education and employment status were assessed, but income was not measured due to the 200% below-poverty level requirement of the BCEDP. Age, marital status, number of children and ethnicity with which the participants most identified were documented.

Components of the Theory of Planned Behavior. Intention to be rescreened: Each participant was asked to assess the likelihood that she would obtain a mammogram during the next year, on a 4-point Likert scale. *Determinants of intention according to the TPB: i) Perceived behavioral control:* A proxy measure for perceived behavioral control was created with two items: "if you were to have cancer, would you want to know about it?" and "cancer can be cured if caught early". The logic behind choosing those items was that women who feel that cancer can be cured if caught early would be more likely to feel they have the power to influence the outcome of cancer. The other item, if you were to have cancer, would you want to know about it, indicates that a woman would want to know and through a mammogram she would find out. This in turn would increase her perceived behavioral control. *ii) Attitudes:* Embarrassment about mammography and fear of cancer were assessed. Two queries began with the clause: "Even though it is a good idea," followed respectively by: "having your breasts examined is embarrassing" and "getting an examination for cancer scares you". Each woman was also asked whether she was worried about getting breast cancer (yes, a little and no). *iii) Subjective norm:* The proxy variable was "do you know other women who receive regular mammograms".

Cultural and general psychosocial factors. Four items were used from the *fatalism* scale of Cuellar *et al.* (53), by selecting those items with the highest factor loadings from the *fatalism* scale that did not load highly on any other scale and had a single factor loading, as previously implemented (54). The four items were "people die when it's their time", "live for the present", "it is not wise to plan too far ahead", and "one cannot change the future as it is in G-d's hands". The Cronbach α of the *fatalism* scale was 0.75 for the entire sample, 0.66 for Latinas and 0.74 for the participants who did not identify themselves as Latinas. The two items with the highest loadings from the *familism* scale of Cuellar *et al.* (53) were used. These were: "relatives are more important than friends" and "I expect relatives to help when needed". The Cronbach was 0.53 for the entire sample, 0.54 for Latinas and 0.53 for the participants who did not identify themselves as Latinas.

Four items from the Marín Acculturation Scale (short form) (55) were used to assess language use and preference, the language spoken at home, for reading, for thinking and for talking to friends, (Cronbach α=0.97 for the entire group, 0.93 for Latinas and 0.93 for the other participants). Three items that measured instrumental and emotional aspects of social support were included, as this shortened scale derived from (56) had shown good reliability and validity among Latinas (50). In the present study, the Cronbach for social support was 0.54 for the entire sample, 0.58 for Latinas but only 0.22 for the other participants. One question was asked about spiritual well-being, with possible answers from excellent to poor. A query was also made about religious beliefs affecting medical decisions, explicitly: "To what extent will your religious beliefs influence your decisions about seeing a doctor or having medical tests".

Potential facilitators. i) Knowledge of screening guidelines and breast cancer risk factors: The participants were asked about their knowledge of guidelines concerning how often a woman should have a mammogram. Knowledge of true versus spurious risk factors was measured with the following dichotomous items: "having someone in the family with breast cancer", "not having faith in G-d", and "injury to the area". *ii) Explanation of importance by a health professional:* The query was: "Did a health professional explain the importance of receiving a mammogram regularly?" with options from "very much" to "not at all" on a 4-point Likert scale.

Potential barriers. For those participants who had not received a mammogram within the last two years, a list of 28 possible barriers was read. These women were asked which of the mentioned obstacles applied to them.

Other examinations for early breast cancer detection – clinical (CBE) and self-breast examination. One question assessed most recent CBE with six options from "within 6 months" to "over two years ago" and "never". Recentness of self breast examination was queried with four options ranging from "never" to "every month."

Breast cancer rescreening. The dependent variable was measured by the question "When was the last time you received a mammogram?" with five response options ranging from "within 6 months" to "over two years ago". Two additional questions "How many times have you received a mammogram since you called the BCEDP referral line in 1997 or 1998?" and "How often do you receive a mammogram?" were asked for cross-validation.

Data analysis. Descriptive statistics, frequencies, correlations, t-tests and Pearson chi-square tests were used. Comparisons were made between the Latinas and the other participants with the latter two tests. Statistical tests were 2-sided unless noted otherwise. Multiple logistic regression (MLOGR) analysis was used to identify the most parsimonious set of independent variables (demographics, cultural values, barriers, clinical and self breast examination, physician recommendation) with the highest significance level for having had a mammogram within 1 year and within 2 years as the dependent variables, after adjusting for relevant confounders. Stratified MLOGR analysis was performed among the Latinas and the other participants.

The TPB was tested empirically: the association between the independent variables (perceived behavioral control, subjective norms, and attitudes) and the dependent variables (most recent mammogram within 1 year and within 2 years), was first assessed. Then, the association between intention to have a mammogram (mediator) and the dependent variable was tested. Next, when intention and the independent variables were included in the model, intention would be considered a mediator insofar as its association with the dependent variables remained significant, but the independent variables would lose significance or have a decreased odds ratio (OR).

Results

Univariate analysis. Univariate comparisons between the Latinas and the other participants are presented in Tables I-IV. Latinas differed from the other participants in each of the examined demographic characteristics, except age. Significantly more Latinas had four or fewer years of education, were married, employed and had over three children compared to the other participants (Table I). Cultural and general psychosocial factors shown in Table II revealed significantly higher *fatalism* and influence of religion on medical decisions for Latinas. The mean levels of spiritual well-being, social support and language acculturation were significantly lower among Latinas. Table III shows data on attitudes, subjective norms and knowledge about breast cancer risk screening recommendations. Compared to the other participants a significantly greater percentage of Latinas considered having one's breasts examined embarrassing and worried about getting breast cancer, and a lower percentage of Latinas knew many other women who receive mammograms. There was very little variance in the components of Perceived Behavioral Control. All 112 participants answered that breast cancer can be cured if caught early and 96% said they would want to know if they had cancer. Significantly more Latinas cited the screening recommendations of the BCEDP, that mammograms should be performed yearly. On the other hand, significantly lower percentages of Latinas recognized family history as a true risk factor versus injury to the breast and lack of faith as spurious. As seen in Table IV, Latinas did not differ significantly from the other participants in self breast examination, recentness of CBE or last mammogram. However, a significantly lower percentage of Latinas stated that they were very likely to have a mammogram within one year. No significant differences between the two groups were found in health provider explanation of the importance of mammogram.

Cited barriers to mammography. The most frequently cited barriers among the 10 Latinas who had not had a mammogram within 2 years were "My family is my first priority and I end up not taking care of my own health", financial problems and having lost the information. Each of these barriers was cited by 7 Latinas. Among the other 9 participants who had not had a mammogram within 2 years, the most commonly cited barrier was financial problems noted by 7 women, followed by anxiety while waiting for the results cited by four. Only two of the non-Latina participants cited "My family is my first priority and I end up not taking care of my own health" as a major reason for not having had a mammogram within 2 years.

Multiple logistic regression analysis. Entire Group: For all the participants, the strongest MLOGR model for having had a mammogram within one year included the following independent variables, recent CBE, low *fatalism*, high *familism* and health provider explanation of the importance of mammograms, after adjusting for age, education and acculturation (Table V). For having had a mammogram within two years, CBE also had the highest OR, but this was

Table I. *Demographic characteristics – comparisons between Latinas and the other participants.*

	Entire sample N=112 Number (%)	Latinas N=72 Number (%)	Other participants N=40 Number (%)
Age			
41-49	49 (44.1%)	33 (45.8%)	16 (41.0%)
50-59	48 (43.2%)	29 (40.3%)	19 (48.7%)
60-69	13 (11.7%)	9 (12.5%)	4 (10.3%)
≥70	1 (0.9%)	1 (1.4%)	0
Missing	1		1
Education (years)			
≤4	13 (11.7%)	13 (18.1%)	0
		**	
5-8	27 (24.3%)	25 (34.7%)	2 (5.1%)
9-12	27 (24.3%)	19 (26.4%)	8 (20.5%)
≥13	44 (39.6%)	15 (20.8%)	29 (74.4%)
Missing	1		1
Marital status			
Married	60 (54.1%)	46 (63.9%)	14 (35.9%)
		**	
Divorced, single, widowed or other	51 (45.9%)	26 (36.1%)	25 (64.1%)
Missing	1		1
Number of children			
Up to 3	74 (67.3%)	38 (53.5%)	36 (92.3%)
		***	
4 or more	36 (32.7%)	33 (46.5%)	3 (7.7%)
Missing	2	1	1
Employed outside the home			
Yes	68 (61.3%)	49 (68.1%)	19 (48.7%))
		*	
No	43 (38.7%)	23 (31.9%)	20 (51.3%)
Missing	1	0	1

*, ** and *** denote $p<0.05$, $p<0.01$ and $p<0.001$, respectively, Pearson chi-square test 1 degree of freedom. The 2 categories are indicated by a space between the rows.

Table II. *Cultural and general psychosocial factors-comparisons between Latinas and the other participants.*

Scale and components (Potential Range)	Entire sample N=112 Mean±SD (Range)	Latinas N=72 Mean±SD (Range)		Other participants N=40 Mean±SD (Range)
Familism Relatives more important than friends Expect relatives to help when needed	4.1±1.4 (2-8)	3.9±1.4 (2-7)		4.3±1.5 (2-8)
Reverse coded: Highest score – lowest familism (2-8)				
Missing	6	3		3
Fatalism People die when it's their time Live for the present Not wise to plan too far ahead Can't change the future	7.6±2.6 (4-14)	6.8±2.1 (4-13)	***	9.2±2.8 (4-14)
Reverse coded: Highest score – lowest fatalism (4-16)				
Missing	7	3		4
Language acculturation Language spoken at home Language for reading Language for thinking Language for talking to friends	11.4±6.6 (4-20)	7.7±4.5 (4-20)	***	18.5±3.6 (4-20)
Lowest score – predominance of Spanish (4-20)				
Missing	3	0		3
Social support Has friend with whom to chat Has someone in whom to confide Has someone to help solve problems	4.4±1.5 (3-9)	4.7±1.7 (3-9)	*	3.9±1.0 (3-7)
Reverse coded: highest score – lowest social support (3-9)				
Missing	2	0		2
Spiritual well-being 1=Excellent 2=Good 3=Fair 4=Poor	1.9±0.8 (1-4)	2.0±0.8 (1-4)	**	1.6±0.6 (1-4)
Reverse coded: Highest score – Lowest spiritual well-being				
Missing	4	2		2
Religious influence on medical decisions 1=Very much 2=To a large extent 3=A little 4=Not at all	2.9±1.3 (1-4)	2.7±1.4 (1-4)	**	3.4±1.1 (1-4)
Reverse coded: Highest score – least influence				
Missing	4	2		2

Significant differences between the 2 groups: *, ** and *** denote $p<0.05$, $p<0.01$ and $p<0.001$, respectively, 2-sided *t*-test.

Table III. *Attitudes, subjective norms and knowledge about breast cancer risk and screening recommendations – comparisons between Latinas and the other participants.*

	Entire sample N=112 Number (%)	Latinas N=72 Number (%)		Other participants N=40 Number (%)
Breast cancer examination embarrassing				
Somewhat or very much	42 (37.8%)	33 (45.8%)	*	9 (23.1%)
Very little or not at all	69 (62.2%)	39 (54.2%)		30 (76.9%)
Missing	1			1
Worries about getting breast cancer				
Yes	68 (60.7%)	52 (72.2%)	**	16 (40%)
A little	21 (18.8%)	7 (9.7%)		14 (35%)
No	23 (20.5%)	13 (18.1%)		10 (25%)
Knows other women who receive mammograms				
Yes, many	30 (26.8%)	15 (20.8%)	ξ	15 (37.5%)
Yes, a few	52(46.4%)	34 (47.2%)		18 (45.0%)
No	30(26.8%)	23 (31.9%)		7 (17.5%)
Knowledge of how often a mammogram should be performed				
Yearly	93 (83.0%)	66 (91.7%)	**	27 (67.5%)
Every 2 years	14 (12.5%)	4 (5.6%)		10 (25%)
3 to 5 years	4 (3.6%)	2 (2.8%)		2 (5%)
Once in one's life	1 (0.9%)	0		1 (2.5%)
Knowledge of family history as a breast cancer risk factor				
Yes	89 (79.5%)	51 (70.8%)	**	38 (95%)
No	23 (20.5%)	21 (29.2%)		2 (5%)
States that injury to the breast increases chances of developing breast cancer				
Yes	64 (57.1%)	46 (63.9%)	ξ	18 (45%)
No	48 (42.9%)	26 (36.1%)		22 (55%)
States that lack of faith increases chances of developing breast cancer				
Yes	34 (30.4%)	28 (38.9%)	**	6 (15%)
No	78 (69.6%)	44 (61.1%)		34 (85%)

Significant differences between the 2 groups: ξ, * and ** denote $p=0.05$, $p<0.05$ and $p<0.01$, respectively. Pearson chi-square test, 1 degree of freedom; the 2 categories tested by chi-square analysis are indicated by a space between the rows.

followed by health provider explanation of the importance of mammograms, while high *familism* and low *fatalism* showed approximately the same level of significance. *Latinas:* In stratified analysis among Latinas alone, the best MLOGR model for having had a mammogram within one year was comprised of three significant factors CBE, high *familism* and low *fatalism*, after adjusting for age, education and acculturation. *Familism* had a slightly higher OR, followed by recent CBE and low *fatalism* in the best MLOGR model for having had a mammogram within two years among Latinas. *For participants other than Latinas:* For non-Latinas, having a health professional explain the importance of regular mammograms followed by recent CBE provided the best models for having had a mammogram within one year and within two years after adjusting for age and education.

Table IV. *Breast cancer screening, intention to have a mammogram and health provider explanation of importance – comparisons between Latinas and the other participants.*

	Entire sample N=112 Number (%)	Latinas N=72 Number (%)	Other participants N=40 Number (%)
Self breast examination			
Every month	57 (50.9%)	40 (55.6%)	17 (42.5%)
Every few months	25 (22.3%)	17 (23.6%)	8 (20.0%)
6 months to 1 years	17 (15.2%)	9 (12.5%)	8 (20.0%)
Never	13 (11.6%)	6 (8.3%)	7 (17.5%)
Clinical breast examination			
Within the last year	80 (71.4%)	56 (77.9%)	24 (60%)
Between 1 and 2 years ago	20 (17.9%)	11 (15.2%)	9 (22.5%)
Over 2 years ago	12 (10.7%)	5 (6.9%)	7 (17.5%)
Never	0	0	0
Recentness of last mammogram			
Within the last year	70 (62.5%)	49 (68.1%)	21 (52.5%)
Between 1 and 2 years ago	23 (20.5%)	13 (18.1%)	10 (25.0%)
Over 2 years ago	19 (17.0%)	10 (13.9%)	9 (22.5%)
Intends to have a mammogram w/in 1y			
Very likely	63 (56.3%)	35 (48.6%)	28 (70.0%)
		*	
Likely	39 (34.8%)	29 (40.3%)	10 (25.0%)
Unlikely or very unlikely	10 (8.9%)	8 (11.1%)	2 (5.0%)
Health care provider explained importance of mammogram			
Very much	67 (60.4%)	46 (63.9%)	21 (53.9%)
To some extent	18 (16.2%)	11 (15.3%)	7 (17.9%)
A little	21 (18.9%)	14 (19.4%)	7 (17.9%)
Not at all	5 (4.5%)	1 (1.4%)	4 (10.3%)
Missing	1		1

*denotes $p<0.05$, Pearson chi-square test, 1 degree of freedom; the 2 categories are indicated by a space between the rows.

Salient bivariate findings. Correlations among measures of mammography rescreening: There was a highly significant ($p<0.001$) correlation between recentness of last mammogram and number of mammograms within the last 3-4 years among Latinas (r=0.52) and non-Latinas (r=0.75). Recentness of last mammogram and how often a mammogram was performed were also significantly correlated ($p<0.001$) for Latinas ($\varrho=0.43$), and for non-Latinas ($\varrho=0.62$). Whereas all participants answered the question about when they had their last mammogram, nine Latinas and one of the other participants did not answer how many mammograms they had received in the last 3 to 4 years. Eleven Latinas and four other participants did not answer how often they had a mammogram. Compared to those who responded to these two questions, the women who did not answer had significantly longer time since their most recent mammogram. *TPB – associations with intention to have a mammogram:* No association was found between intention to have a mammogram within 1 year and recentness of last mammogram among Latinas. There were also no significant relations between intention at 1 year and any of the other components of the TPB, nor any of the other variables. Among the non-Latina participants only, intention to have a mammogram was positively correlated with recentness of last mammogram ($\varrho=0.32$, $p=0.047$). *Most recent mammogram:* Although non-significant in the multivariate analysis, among Latinas there was a positive correlation between the answer to how often a woman should have a mammogram and most recent mammogram ($\varrho=0.25$, $p=0.03$). This association was not found among the other participants. *Interrelations among demographic, cultural and general psychosocial factors:* Among Latinas educational level was inversely correlated with *familism* (r=0.45, $p<0.001$) and with *fatalism* (r=0.34, $p<0.01$). Language acculturation was also correlated inversely with *familism* ($\varrho=0.24$, $p<0.05$). *Familism* and *fatalism* were positively correlated (r=0.28, $p<0.05$). There was a direct correlation between *familism* and social support (r=0.26, $p<0.05$). Spiritual well-being was correlated at $p<0.05$ with social support (r=0.45), *familism* (r=0.31), *fatalism* (r=0.27) and with

Table V. *Multiple logistic regression models for recentness of last mammogram.*

Last Mammogram within One Year					
Group	Model Chi-square (p level)	Independent variables	Adjusted OR†	95% CI	p
All participating women (N=103 complete cases)	66.9 Δ (p=0.00000)	Clinical breast examination	5.19	2.52-10.69	0.0000
		Familism	2.15	1.26-3.67	0.004
		Health provider explained importance of mammogram	1.95	1.01-3.77	0.04
		Fatalism	0.62	0.45-0.85	0.003
Only Latinas (N=69 complete cases)	42.2 Δ (p=0.0000002)	Clinical breast examination	4.46	1.94-10.23	0.00
		Familism	2.39	1.16-4.90	0.02
		Fatalism	0.51	0.32-0.81	0.004
Participants other than Latinas (N=39 complete cases)	24.1‡ (p=0.00008)	Health provider explained importance of mammogram	3.61	1.24-10.5	0.015
		Clinical breast examination	3.48	1.36-8.90	0.007
Last Mammogram within Two Years					
Group	Model Chi-square (p level)	Independent variables	Adjusted OR†	95% CI	p
All participating women (N=103 complete cases)	35.2 Δ (p=0.00001)	Clinical breast examination	2.39	1.48-3.87	0.0003
		Health provider explained importance of mammogram	2.31	1.19-4.51	0.01
		Familism	1.77	1.05-2.99	0.03
		Fatalism	0.70	0.50-0.97	0.03
Only Latinas (N=69 complete cases)	21.0 Δ (p=0.002)	Familism	2.30	1.13-4.69	0.02
		Clinical breast examination	2.24	1.15-4.35	0.02
		Fatalism	0.50	0.27-0.94	0.03
Participants other than Latinas (N=39 complete cases)	19.9‡ (p=0.0005)	Health provider explained importance of mammogram	3.85	1.15-12.9	0.02
		Clinical breast examination	2.97	1.23-7.20	0.01

OR denotes odds ratio and CI denotes confidence interval. Δ The models for all cases and for Latinas only are adjusted for age, education and Marin Acculturation Scale. †The odds ratio is given for a unit change in the value of the independent variable. ‡The models for participants other than Latinas are adjusted for age and education.

the degree to which religion influences medical decisions (r=0.27). None of these associations was found among the non-Latina participants. However, spiritual well-being was significantly higher among the non-Latinas who were married ($p=0.03$).

Discussion

The retention of low income, minority women within cancer screening and prevention studies is known to require an extraordinary amount of work (57). This was recently underscored in a study of mammography rescreening among women with low incomes aged 50 and older, where it was found that Latinas were particularly difficult to reach (58). In the present study, which in addition included the important age group between 41 and 49, many of the women were also unreachable on follow-up, despite intensive efforts to contact them. Overall, the participation rate was less than anticipated. Even with all our efforts, there were constraints in time and resources that precluded higher recruitment. Mobility rates among Latin families are known to be very high (47). Moreover, it appears that reaching women with low incomes for follow-up after abnormal mammogram for example, is especially difficult in the Los Angeles area, compared to other areas of the U.S.A. (59).

The present study was unique in being an in-depth exploration of cultural and other factors that promote or hinder on-time mammography among underserved minority women in LA County, and that the participants were followed-up three to four years after having initially contacted the BCEDP for services. Thus, the participants are a special group among women with low income who responded to the BCEDP outreach efforts, and took the initiative to begin and in many instances continue with mammography screening and also were reachable for follow-up. Follow-up studies such as that of Song and Fletcher (18) through a tracking system have provided complete data only on overall rescreening rates, together with some demographic information. More detailed investigations of breast cancer rescreening among women with low-incomes, in particular among Latinas (17, 23) have generally been of a cross-sectional nature. One recent study (13) specifically examined rescreening rates among women who participated in BCEDP and Breast and Cervical Cancer Control Program (BCCCP). In that study just over half of the participants were Latinas, with a 43% rescreening rate, among the lowest of all the racial/ethnic groups included. However, there was no stratified analysis of the specific determinants of rescreening either for Latinas or for other groups who were at particularly high risk of being underscreened.

In this study, marked differences were detected between the Latinas and the non-Latinas with respect to demographic characteristics, cultural and other psychosocial factors, as well as attitudes, subjective norms, knowledge and practices related to breast cancer screening. Some of these factors have been shown to impact adversely upon mammography screening. On the other hand, the Latinas were significantly more aware of the BCEDP recommendations for mammography. In other health-related contexts, high risk and protective factors have also been found to coexist in a complex and specific way among Latinas (50, 60). Therefore, being a Latina appeared to act as an effect modifier in the present study, such that examining all the participants together would mask important differences in the factors associated with adherence to screening guidelines. Indeed, stratified regression analysis reveals a substantially distinct set of associations with recent mammograms among Latinas. While explanation by a health professional of the importance of regular mammography was a highly significant independent variable for non-Latinas, this was not the case for Latinas. On the other hand, cultural factors were significant only for Latinas.

As the pivotal variable within the TPB, it was expected that intention to have a mammogram within 1 year would be associated with a recent mammogram, as well as with attitudes, subjective norms and knowledge about breast cancer. While among the non-Latina participants there was a significant correlation between intention to have a mammogram within 1 year and recentness of mammogram, this was not the case among Latinas. In neither group were there any significant associations between intention and any other variable. Overall, the TPB does not appear to be applicable for Latinas, whereas the cultural components of the proposed expanded model are highly relevant.

A very important cultural factor for Latinas is the family, which has a profound impact upon most aspects of life, including health-related behaviors (61). The most striking finding of the present study was the association between *familism* and breast cancer rescreening. On the one hand, this association was manifested in a positive way, with the likelihood of having had a mammogram within 1 and within 2 years being significantly higher among the Latinas who expected family to help when needed and considered relatives more important than friends. Other studies have found a positive association between *familism* and engaging in initial breast cancer screening among Latinas (31, 32); however, this association was not previously found for rescreening (17). Further insight was provided by bivariate associations among *familism* and other indicators. These interrelationships suggest that *familism* could be a facilitator among Latinas with low education and low levels of acculturation, but with high levels of spiritual well-being and social support.

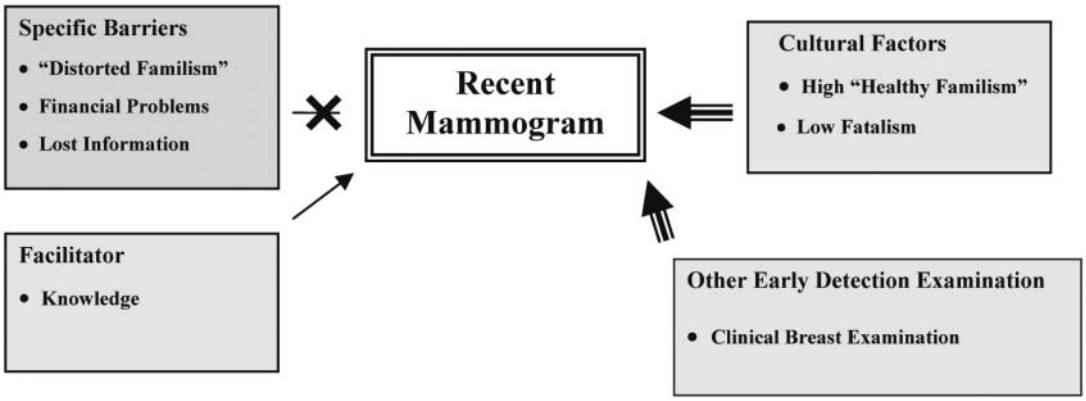

Figure 2. *Summary of empirical findings showing the factors associated with recent mammogram among Latinas. From these findings a Cultural Model is proposed with the key components being familism and fatalism. The dual aspects of familism are "healthy familism" that can help promote on-time mammography, and "distorted familism" which can act as a barrier. Knowledge of screening guidelines and true vs. spurious breast cancer risk factors are also incorporated. Significant multivariate associations are shown with triple lines, univariate associations denoted by single lines. Arrows denote a positive relationship, a line crossed with an "x" indicates a negative relationship (specific barriers).*

On the other hand, there can be a negative side, referred to as "*distorted familism*", when concerns about family overwhelm some Latinas so that they neglect their own health. This negative aspect was seen in the present study, where Latinas cited heavy family obligations as a major reason for not having had a mammogram within two years. This is akin to the personal barrier "*descuido*" reported by Garbers *et al.* (23).

It was also found that the cultural factor, *fatalism*, is associated with less likelihood of having had a mammogram within 1 and within 2 years. This finding replicated those of Otero-Sabogal *et al.* (17). Moreover, both spiritual well-being and *familism* were significantly correlated with *fatalism*. This further indicated how the balance can tip in either direction. Spiritual well-being, recognized to be of great importance to Latinas (61), could be a leverage point, if directed away from *fatalism* and towards the side of social support and *familism*. Given that Latinas show significantly more worry about getting breast cancer, it is vital that contacts are supportive and reassuring.

Overall, a cultural model is proposed for Latinas. This emerges from the empirical results, summarized in Figure 2. The model's key components are *familism* and *fatalism*. The dual aspects of *familism* are incorporated, with a clear distinction between "*healthy familism*" that can help promote on-time mammography, and "*distorted familism*" which can act as a barrier. This proposed cultural model requires further empirical testing which could be done most effectively within the framework of intervention studies geared at increasing rescreening rates among Latinas. Interventions guided by this proposed cultural model would focus on the importance of the family, and how it would be positively affected when Latinas adhere to screening guidelines. Support systems within and outside the family should reinforce this. At the same time, work is needed to provide more knowledge about realistic, as opposed to spurious risk factors among Latinas. Latinas were less often aware that positive family history is a true risk factor for breast cancer. With improved knowledge, *familism* could play a vital role in helping ensure that at-risk relatives participate in breast cancer screening. This, in turn, underscores the need to impact upon the subjective norm. Compared to the other participants, proportionally fewer Latinas knew several other women who receive mammograms. If there were more outreach within extended families, regular mammography screening could indeed become the usual, accepted and even expected behavior.

A brief assessment of *familism* was performed with the two items having the highest loadings from the *familism* scale of Cuellar *et al.* (53). The internal reliability of this short scale was within acceptable limits (62). Notwithstanding the brevity of our assessment, the criterion validity of *familism* with respect to recentness of last mammogram among Latinas is suggested by the significant multivariate findings replicated in two separate models with distinct endpoints. These findings should therefore be viewed in light of their substantive importance, considering that such short scales applied among relatively small numbers of participants would create a tendency toward null results. Since the TPB does not appear to be applicable to Latinas with respect to mammography rescreening, a new model for Latinas is needed, in which the cultural factors are of central importance. In this new model, *familism* in its positive form and in its "distorted" form should be more

fully developed. We are currently working along these lines, piloting a *familism* scale that is focused upon cancer screening behavior among various Latina populations.

The limitations of relying upon self-reported data for mammography should also be mentioned. Although cross-validated, the mammography rates may be higher due to a socially desirable response. It is possible that higher estimates based on self-report data are due to "telescoping" of the time interval between mammograms. Studies comparing self-reported annual mammography rates with radiology records have found self-reported data to be 20% higher (63). It has also been reported that reliability varies with the measure of self-reported mammography (64). The present findings suggest that, particularly among Latinas, assessment of adherence to mammography screening recommendations is better evaluated *via* self-report by a very concrete question about most recent mammogram, rather than querying about general frequency or number of mammograms within a certain time period.

The relevance of this line of research may also extend to underserved women in other settings. Cultural values should be considered when designing intervention programs that aim to increase adherence with breast cancer screening guidelines among minority ethnic groups. A key broader message is that the predictors of compliance cannot be assumed to be the same for minority women as for women in the dominant culture. The extra burdens carried by minority or newly arrived immigrant women should be taken into account, as these can hamper adherence with screening recommendations. These findings may also be of relevance for early breast cancer detection programs in Latin America and in other countries with large Latin populations.

Conclusion

The Theory of Planned Behavior does not appear to be applicable among Latinas with respect to mammography rescreening. The part of the expanded model that was of greatest relevance was comprised of the cultural components incorporating *familism* and *fatalism*.

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