Plans to obtain a mammogram among Chilean women: the roles of recommendations and self-efficacy

Yamile Molina[1,2]*, Javiera Martínez-Gutiérrez[1,3], Klaus Püschel[3] and Beti Thompson[1,4]

[1]Cancer Prevention Program, Fred Hutchinson Cancer Research Center, Seattle, WA, USA, [2]Division of Epidemiology and Biostatistics, School of Public Health, University of Illinois-Chicago, Chicago, IL, USA, [3]Department of Family and Community Medicine, School of Medicine, Pontificia Universidad Católica de Chile, Santiago, Chile and [4]Department of Health Services, School of Public Health, University of Washington, Seattle, WA, USA.

*Correspondence to: Y. Molina. E-mail: ymolina@fhcrc.org

Abstract

Social factors may heavily influence cancer screening decisions and practices among Latinas, given the importance their culture places on close, interpersonal relationships. Recommendations by healthcare providers, family and friends have been associated with early detection strategies among US-based Latina populations, but little is known about other Latin American populations. Furthermore, less is known about mechanisms underlying this relationship. In this study, we sought to (i) understand if different types of recommendations were associated with subsequent plans to obtain a mammogram and (ii) assess the potential mediating roles of perceived importance of these recommendations and self-efficacy. Our sample included 250 women residing in a low-income, urban area of Santiago, Chile, and who had participated in a 6-month intervention to increase mammography screening, but remained noncompliant. Women who received family recommendations were more likely to indicate they planned to receive a mammogram in the next 6 months. Perceived self-efficacy mediated this relationship, such that women who received a family recommendation appeared to be more likely to plan to get a mammogram because of increased perceived capabilities to do so. Future research should consider the cultural context of family and self-efficacy in the development of screening interventions for Latinas.

Introduction

Breast cancer is an important public health concern in Latin America. It is the leading cause of malignancy-related death among Latin American women [1, 2]. Despite lower incidence rates, Latin America's mortality-to-incidence ratios (MIRs) are 32.8% relative to 18.8% in the United States and 25.0% in Canada [3]. Furthermore, Chile is an important country with regard to breast cancer: it has one of the highest incidence rates of breast cancer in the region [1, 4], mortality rates that have slightly increased over the past two decades [5–7] and a MIR of 29.8%. Late-stage detection in Chile may partially contribute to these alarming rates: in 2006, only 8% of Chilean breast cancer cases were identified at the in situ stage and ∼75% were diagnosed in Stages II, III or IV [7]. To improve breast health outcomes, the National Breast Cancer Screening Program in Chile was implemented in 2005 and provided free mammography screening every 2 years for women aged 50 and older. Even though this policy increased mammography screening in the public sector from 2% in 2006 to 30% in 2008, the majority of age-eligible Chilean women did not obtain a mammogram [7, 8].

To help improve mammography screening, in 2010, we conducted a randomized controlled trial to evaluate potential strategies hypothesized to promote mammogram screening among 50- to 70-year-old Chilean women in an area of Santiago [9]. This study provided findings useful to decision makers in Latin American countries, in that relatively simple interventions, such as mailing information and mailing information along with telephone/in-person contact, improved mammography screening among disadvantaged communities like the study sample in Santiago, Chile. Indeed, mailing and mailing along with telephone/in-person contact strategies were associated with greater rates of mammography utilization relative to current standard care guidelines (51.8% and 70.1% versus 6%). Of the 500 study participants, ∼50% of this sample did not obtain a mammogram during the intervention period. The majority of these 250 women had received standard care during the intervention, but 27.2% had received mailed information and 16.8% had received both mailed information and brief telephone/in-person contact. Approximately 74% stated that they planned to obtain a mammogram within the next 6 months. In this study, we sought to understand what factors were associated with plans to obtain a mammogram among these non-compliant women.

Specifically, we were interested in the influence of recommendations to obtain a mammogram. For example, service provider recommendations have been described as a major factor in the literature for all women [10–12] and specifically for US-based Latinas [13–16]. The roles of family and friends in decisions to have a mammogram have received less attention; however, they do appear to influence such decisions among Latinas [17–20]. For example, Suarez [18] found Mexican American women with greater traditional *familismo* attitudes to be more likely to have obtained a mammography. Garbers and Chiasson [20] reported US-based Mexican and Dominican women who discussed breast cancer screening with family members to be more likely to have performed breast self-examinations (84.9% versus 58.3%). A qualitative study noted that family and friend recommendations were perceived to be a reminder to obtain a mammogram among Latinas who were adherent to screening recommendations [21]. Also, with regard to friend recommendations, Luquis and Cruz [22] found that close friends represented a source of information with regard to breast cancer among Latinas.

A growing body of work has indicated the importance of recommendations from multiple sources with regard to mammography screening, but certain gaps in the extant literature exist. Few studies have simultaneously assessed different types of recommendations in relation to screening practices. Second, the majority of this research has focused on US-based samples. Finally, few studies have addressed mechanisms (i.e. mediators) that may underlie this relationship. Below we describe two potential mechanisms: perceived importance of recommendations and self-efficacy to obtain a mammogram. Identification of mediators may inform future mammography screening interventions developed for Latinas to include providers, family and friends. For example, if recommendations influence screening practices because the person in question is perceived to be important, future interventions should focus on inclusion of these recommendations and highlight the importance of screening for the benefit of providers, family and friends to women. If, alternatively, recommendations relate to self-efficacy, intervention strategies should influence recommendations such that providers, family and friends' discussions increase confidence and perceived ability to obtain a mammogram among Latinas.

Several cultural values existing in Latino/a culture [23–26] may result in specific recommendations being perceived to be very important for Latinas. Recommendations by providers may be particularly motivating for Latinas, as individuals are raised to understand their place in hierarchical relationships and to respect authority figures (*respeto*). *Familismo* describes the importance and emphasis Latino culture places on family ties: Latinos/as are socialized to sacrifice and work for the benefit of the family as well as exhibit altruism, generosity and strong loyalty to family members.

Familismo results in Latinas placing a high level of importance on the recommendations and suggestions of family members to obtain a mammogram. Friend recommendations may be perceived to be important on account of values such as *personalismo*, which denotes the importance of warm, strong relationships and wherein friends are considered a source of strength as well as a source of information. Finally, Latino culture exhibits *colectivismo*, wherein people are socialized to experience life in a social, cooperative context and are taught to value social interdependence. Altogether, these cultural values may increase the perceived importance given to these recommendations for Latina women; consequently, recommendations may be related to screening practices because of their increased perceived importance. There may be a mediating effect of perceived importance of recommendations, wherein recommendations may influence plans to obtain a mammogram through increasing the perceived importance of the recommendations.

Alternatively, cultural values may influence effects on screening practices in that recommendations and support from these social ties may increase women's perceptions of self-efficacy or confidence in terms of ability to get a mammogram, which is a consistent predictor of health practices such as mammography screening [27]. For collectivistic cultures such as those in Latin America, self-efficacy could potentially be understood in terms of a social context enabling individual capabilities [28]. For example, familial recommendations and discussions may be associated with a reduction of barriers to obtaining mammograms (e.g. childcare, transportation) for Latinas. Social support may also reduce psychological barriers, such as embarrassment (*vergüenza*). Women who perceive high levels of support from their social networks with regard to mammography screening (e.g. recommendations) may thus believe themselves more capable or able to obtain mammograms, either because of instrumental or emotional support. In this way, recommendations may influence plans to obtain a mammogram through increasing women's perceived self-efficacy (mediation).

This study seeks to provide contributions to the extant literature and inform future interventions by simultaneously testing different types of recommendations and testing potential mechanisms underlying their relationships to plans to obtain a mammogram. Addressing these gaps may influence the design and implementation of interventions used to increase screening among populations of Latin American descent (e.g. family inclusion). The research questions addressed in this study include the below:

(1) Are provider, family and friend recommendations to obtain a mammogram associated with plans to acquire a mammogram in the next 6 months?
(2) Do perceived importance of recommendations and self-efficacy mediate relationships between recommendations and plans to obtain a mammogram?

Methods

Procedures

Recruitment

This study was a part of a randomized clinical trial to test an intervention to increase mammography screening among Chilean women conducted by the Fred Hutchinson Cancer Research Center and a Pontificia Universidad Católica de Chile-sponsored clinic located in El Castillo Oriente, a low socioeconomic status area within the Municipality of La Pintana in the southeast area of Santiago, Chile. Electronic medical records were used to identify potential participants being served by the university clinic who met the following eligibility criteria: age 50–70 years old; had not received a mammogram within the past 2 years and had no personal history of breast cancer. A computerized random number generator program was used to select 500 eligible women to contact and invite into the study. Enrolled women then participated in one of three types of interventions (standard care, low intensity and high intensity) and completed a follow-up questionnaire at the end of a 6-month period. Information

regarding the larger study and intervention procedures have been reported elsewhere [8, 9]. In brief, of standard care women, 6% received a mammogram, compared with 51.8% of women randomized to low intensity and 70.1% of those randomized to high intensity.

Measures

Sociodemographics

Standard demographic questions assessed age, education and household income. Lifetime and 6-month history of mammography screening history was also assessed.

Recommendations

Women were asked if they had received recommendations to obtain a mammogram within the past 12 months by their family, friends or providers (0 = no, 1 = yes).

Perceived importance of recommendations of mammograms

Women were asked the degree of importance/motivation they gave to providers, family and friends, when telling them to get or not to get a mammogram with the following response categories ('Always in relation to mammograms, please tell me what degree of importance or motivation you give to the following persons or institutions when telling you to get or not to get a mammogram'). Scores were coded as 1 = very important, 2 = important, 3 = kind of important, 4 = of little importance and 5 = of very little importance. Scores were recalculated such that greater scores indicated a woman placed greater importance on a recommendation (e.g. 5 = very important).

Perceived ability to obtain a mammogram

Women were asked how sure they were of being able to get a mammogram ('How sure are you of being able to get a mammogram?'). Response categories included were 1 = very sure, 2 = sure enough, 3 = not sure or 4 = very unsure. We recalculated scores such that greater scores indicated

greater perceived ability to obtain a mammogram: for example, scores of 4 would indicate the greatest amount of sureness or self-efficacy.

Plans to obtain a mammogram

Women were asked if they are thinking of getting a mammogram done in the next 6 months (0 = no, 1 = yes).

Analysis plan

We report descriptive statistics concerning participants' baseline sociodemographic characteristics and mammography history. With regard to our first research question, we assessed relationships between types of recommendations (family, friends, doctors/providers) through univariate chi-square tests. We subsequently calculated a logistic regression including all three types of recommendations to determine which types were associated with plans to obtain a mammogram. We considered the use of intervention arm as a covariate for analyses; however, data suggested few to no differences for family ($\chi^2(2) = 0.02$, $P = 0.99$), friend ($\chi^2(2) = 2.79$, $P = 0.25$) and provider recommendations ($\chi^2(2) = 2.79$, $P = 0.25$). Similarly, there were no differences with regard to plans to obtain a mammogram ($\chi^2(2) = 4.11$, $P = 0.13$). Given this, we did not include intervention arm in further analyses. For recommendations that were significant predictors of plans to obtain a mammogram, we conducted multiple mediation tests via the Preachers and Hayes method [29, 30]. This method is considered superior relative to others (e.g. Baron–Kenny) for testing mediation among small to moderate sample sizes [31, 32]. This bootstrap method is a nonparametric resampling procedure that involves sampling from the data set multiple times (5000 for this study) and generating a sampling distribution. We calculated standard errors and 95% confidence intervals of the effect of a type of recommendation on plans to obtain a mammogram through perceived importance of that recommendation and perceived ability to obtain a mammogram (self-efficacy). For comparison, we also used the traditional and

Table I. *Sociodemographic and mammography-based characteristics* (n = 250)

Variable	Mean (SD)
Age	57.94 (5.32)
Perceived ability to obtain a mammogram[a]	2.08 (1.17)
	***n* (%)**
Income	
<100 000 pesos	146 (58.4)
≥100 000 pesos	104 (41.6)
Education	
No schooling	22 (8.8)
1–8	61.2 (153)
≥9	30.0 (75)
Ever had a mammogram	107 (37.2)
Type of intervention	
Standard care	140 (56.0)
Low intensity	68 (27.2)
High intensity	42 (16.8)
Plans to obtain a mammogram in 6 months	184 (74.2)

[a]Anchors are as follows = 1 = very unsure, 2 = unsure, 3 = sure, 4 = very sure.

Table II. *Frequency and perceived importance of recommendations to obtain a mammogram* (n = 250)

Variable	*n* (%)
Received family recommendation	99 (39.6)
Received friend recommendation	59 (23.6)
Received provider recommendation	34 (13.6)
	Mean (SD)
Perceived importance of recommendations by[a]	
Family	4.11 (1.17)
Friends	3.56 (1.45)
Doctors/matrons	4.50 (0.79)

[a]Anchors are as follows: 5 = very important, 4 = important, 3 = kind of important, 2 = of little importance, 1 = of very little importance.

common test of mediation, Sobel's test, to assess the full mediated pathway [33, 34].

Results

Of the 500 women enrolled in the larger study, 38 women were lost to follow-up and 212 reported a mammogram within the intervention period. Our analytic sample includes the remaining 250 women who completed the follow-up questionnaire and did not obtain a mammogram within the intervention period. Table I provides sociodemographic characteristics of these women. As there were very few missing cases (<1%), we used case deletions to accommodate them. This is considered a simplistic and adequate method for datasets with a limited amount of missing data [35].

Recommendations and plans to obtain a mammogram

Approximately half of our sample reported not having received any type of recommendation (51.2%), 25.2% reported experiencing one type, 19.2% two types and 4.4% of our sample received recommendations from family, friends and providers. Table II portrays the frequency and perceived importance of recommendations. Women who received family recommendations were also more likely to receive friend, $\chi^2(1) = 56.29$, $P < .0001$, and doctor recommendations, $\chi^2(1) = 10.37$, $P = 0.001$. Friend and provider recommendations were not related to one another, $\chi^2(1) = 1.67$, $P = .20$.

We conducted a logistic regression to address the relationship of family, friend and provider recommendations to plans to obtain a mammogram, $\chi^2(3) = 27.32$, $P < 0.0001$. Subsequent analysis suggested that women who received family recommendations were more than four times as likely to be planning to obtain a mammogram within the next 6 months, adjusted odds ratio (AOR) = 4.60, 95% confidence interval (CI) (2.0–10.6), $P < 0.0001$. Plans to obtain a mammogram were not associated with friend, AOR = 1.77, 95% CI (0.7–4.8), $P = 0.26$, or provider recommendations, AOR = 1.14, 95% CI (0.4–3.0), $P = 0.80$.

Mediation models

Given these findings, we conducted a multiple mediation analysis via the Preacher and Hayes method [29, 30] to test if family recommendations were associated with plans to obtain a mammogram

through perceived importance of recommendations by family and perceived ability to obtain a mammogram. When tested separately, both pathways, through perceived ability to obtain a mammogram (Sobel $z = 3.74$, $P = .0002$) and perceived family recommendation (Sobel $z = 2.28$, $P = .02$), were significant. However, when both mediators were included simultaneously, the combined mediation effect of all the mediators was significant, but appeared to be driven by perceived ability to obtain a mammogram, which remained significant, whereas perceived ability did not as a mediator (Table III; Figure 1). Results suggest that family recommendations are associated with plans to obtain a mammogram partially through increasing women's perceived abilities to obtain a mammogram.

Table III. *Mediation of the effect of family recommendation on plans to obtain a mammogram through perceived ability and perceived importance of recommendation*[a]

Model	Bootstrap results for medication effects		
		95% CI	
	Mediation effect (SE)	Lower	Upper
Indirect effects			
Perceived ability	**0.82 (0.23)**	**0.40**	**1.27**
Perceived importance	0.16 (0.10)	−0.01	0.41
Total indirect	**0.99 (0.25)**	**0.51**	**1.49**
Contrasts			
Perceived ability versus importance	**0.66 (0.25)**	**0.19**	**1.15**

SE = standard error; $N = 248$. Entries in bold represent a significant effect as determined by the 95% bias corrected and accelerated CI. [a]5000 resamples.

Discussion

This study provides significant contributions to the existing literature. To our knowledge, this is the first study to (i) simultaneously assess the role of provider, family and friend recommendations in terms of mammography, (ii) address these factors in an international sample of Latin American women and (iii) identify mediators underlying associations between recommendations and decision-making in screening practices. In line with previous research addressing cultural values among Latina/o
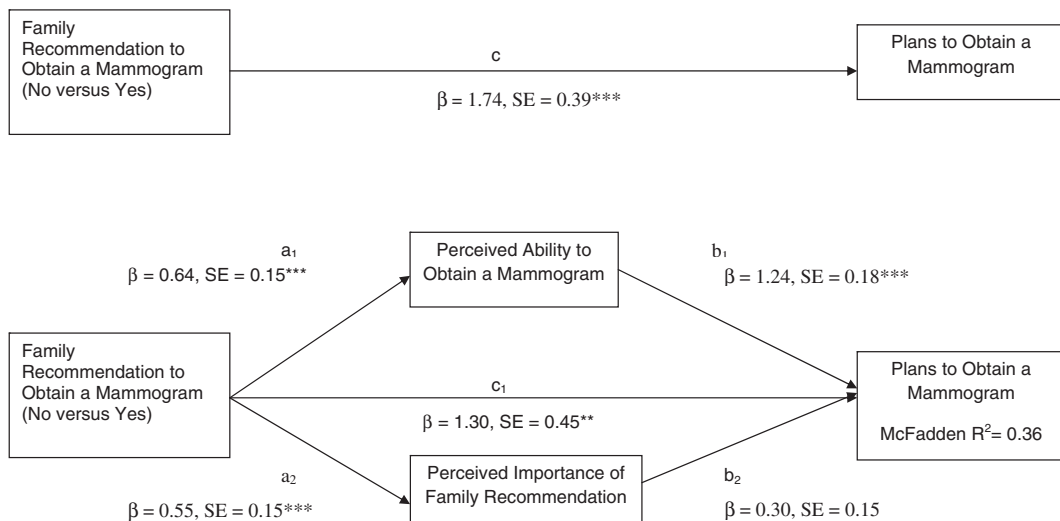

Fig. 1. Multiple mediation model of the relationship of family recommendation and plans to obtain a mammogram. All coefficients represent unstandardized regression coefficients. $*p < .05$, $**p < .01$, $***p < .001$.

populations [22–26, 28], our findings highlight the importance of family in terms of health for Latinas and suggest that family may impact health practices through providing a social context in which women feel confident in their ability to adhere to medical guidelines.

Previous work has shown that attitudes toward and strong connections with family are associated with adherence to mammography guidelines among Latinas [17, 18]. Recommendations by and discussions with family have been associated with early detection strategies, including breast self-examinations [20] and mammography use [17, 21]. Our evidence contributes to this existing body of literature. Additionally, this study is among the first to assess the mediating roles of self-efficacy and perceived importance in this relationship and highlights the importance of considering self-efficacy in a sociocultural context. Indeed, family recommendations were associated with plans to obtain a mammogram through increased self-efficacy or perceived ability to obtain a mammogram.

Our work serves to add a new perspective in understanding the role of cultural values; namely, *familismo* may, in part, impact health practices through bolstering Latinas' confidence and abilities. Our work is in line with active participation of Latina/o family members in interventions concerning breast health [e.g. 36]. Future work may assess if this relationship regards higher perceived ability due to psychosocial resources versus practical familial support, such as facilitation of transport to and child-care during appointments. An important consideration with regard to future lines of research is to consider the source of family recommendations and their position in the family hierarchy. In Latin America, older kin (e.g. grandmothers, parents) command respect and their recommendations may thus be important with regard to *familismo* and *respeto* [37]. Conversely, the importance of mammography is a recent development in Latin American countries [38]; given this, younger family members (e.g. siblings, nieces) may be more likely to understand and promote these practices than older family members. They may also be considered more knowledgeable with regard to such

technological advances. Future work should assess different family recommendations and their relationship to self-efficacy and plans to obtain a mammogram.

In contrast to previous literature [10–16], provider recommendations were not significantly associated with plans to obtain a mammogram in this study. Several possibilities may explain these conflicting results. First, a relatively few number of women received a recommendation, which may have influenced results. Second, approximately half of the women in this study received standard care, whereas the other half participated in low- and high-intensity interventions dedicated to promoting mammography use. Women who did not obtain a mammogram and were included in this study may comprise a special subgroup demographically that may be less likely to adhere to provider recommendations or may perceive provider recommendations to be less important. Compared with women who did obtain a mammogram during the intervention, our sample did not differ in terms of age, education or income, but were more likely to report having received a provider recommendation within the past year and did perceive provider recommendations to be less important. Interestingly, frequency and perceived importance of family recommendations did not vary among women who did and did not obtain a mammogram (data not shown). Future interventions involving provider recommendations may additionally consider inclusion of family members, as this social factor may capture women who perceived providers to be less important when deciding to obtain a mammogram.

Strengths and limitations

There were several limitations to our work which can be addressed in future studies. Our study was composed of Chilean women who resided in a low-income, urban area and were 50–70 years old. Our results may be most generalizable to low-income, urban populations residing in Latin America. The non-compliant women in this study were involved in a randomized clinical trial and may thus have a greater motivation to obtain a

mammogram than other Latinas. This may be an underlying reason for the relatively high perceived importance participants placed on all three types of recommendations. Furthermore, their involvement in mammography research certainly influenced the likelihood that they would receive any, multiple or all types of recommendations, as family, friends and providers might be aware of their involvement in the study. Future observational studies should assess the relative frequency in which Latinas receive recommendations to obtain a mammogram and the importance they place on these recommendations. Our outcome for this study was intention to obtain a mammogram, but plans do not necessarily reflect actual future behavior. Future research should address plans and subsequent screening practices. With regard to operational definitions, we used single-item measures in a cross-sectional design; future research should incorporate validated and reliable instruments to confirm our findings. Finally, as this is a cross-sectional study, we are not able to draw any causal inference on the relationships between family recommendations and plans to obtain a mammogram.

Our study also had multiple strengths. To our knowledge, this is the first study to address the role of recommendations to obtain a mammogram in a Latin American sample. Our work suggests that the importance of family for breast health practices found in US-based Latinas may be generalizable to other Latin American populations. Future research addressing such a relationship would allow for further testing of generalizability. Second, we used rigorous statistical techniques to assess our mediation model, which allowed us to understand the relative contributions of each potential mechanism underlying the influence of recommendations to plans to obtain a mammogram. Our work posits important implications for understanding how and why family and *familismo* are important factors to consider in health promotion for Latina/o populations. Future research should address the cultural context of self-efficacy and further pursue the way in which family may increase individuals' perceived capabilities and subsequent actions relative to health practices.

Conflict of interest statement

None declared.

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