

Research Article

The Effect of Physicians' Bias and Beliefs about Recommending Breast Cancer Screening to their Patients

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Abstract

Receiving physicians' recommendations to undergo screening was found to be given less often to patients from low income or ethnic minority groups. One of the factors accounting for discriminatory healthcare is *physician's bias*.

This study examined physicians' beliefs regarding cancer, barriers to screening among women, and physicians' bias in relation to recommending and discussing breast cancer screening with their patients.

A random sample (cluster sampling) of 146 Arab physicians who serve the Arab population was drawn. Pathways among the study variables were examined by Structural equation modeling (SEM).

The results show that the majority of physicians recommend regular examinations to average-risk women. However, recommending CBE to young women was relatively low. The models for predicting recommending mammography and CBE, and discussing screening with patients demonstrated good fit indices. Physicians' bias mediated the associations of years of seniority as a physician and gender with recommending mammography, recommending CBE, and discussing screening. Traditional beliefs served as a mediator between years of seniority as a physician and discussing screening.

Because of their significant role in breast cancer screening, *physicians' bias* and *traditional beliefs about cancer* need to be addressed and eliminated. Efforts to debunk physicians' bias should particularly target less experienced physicians and male physicians.

Keywords: Screening for breast cancer; Recommending and discussing screening; Traditional beliefs; Barriers to screening; Physicians' bias

Introduction

Breast cancer is the second leading cause of death, due to cancer incidence among women in Western countries [1]. Surviving breast cancer greatly depends on its detection at an early stage [2]. Although regular mammography screening has recently been questioned - due to high over-diagnosis and false-positive rates [3] - systematic screening programs, especially for average-risk women aged fifty and over, have been shown to significantly increase early detection and reduce mortality [2]. However, young women are often diagnosed at a more advanced stage than older women, due to a lack of efficient screening procedures for young women; as a result, they have worse survival rates [4].

Current Israeli guidelines for average-risk women aged 50-74 and above for early detection practice, stipulate regular mammography testing once every two years [5]. In addition, women from the age of 20 are advised to undergo a yearly clinical breast examination (CBE) and increase breast awareness (BA) to become more familiar with their breasts and learn to notice when changes occur in them [5], although these examinations have not proven efficient [6]. However, attending CBE may create awareness about the importance of screening, and creates an opportunity for physicians to discuss screening importance.

The Arab population in Israel is an ethnic minority, constituting about 20% of the Israeli population. This population consists of several religious groups: 83% Muslims, 8% Christians, 8% Druze, and 1% other [7]. Although this population is currently experiencing modernization processes, it is still, to a large extent, a traditional and religious society [8,9]. The incidence of breast cancer is considerably lower among Arab women than among Jewish women in Israel and women in Western countries, but Arab women are more likely to be diagnosed at a more advanced stage of the disease [10]. In addition, research shows that young Arab women are at a higher risk to develop breast cancer at an early age than Jewish women in Israel or women in Western countries [11]. This tendency towards a later diagnosis was suggested to be attributed to the significantly lower incidence of screening for the early detection of breast cancer [12], and is related to social and cultural screening barriers [8,13-15]. Due to the provision and promotion of the free-of-charge screening system and major efforts on the part of the Israeli health services and the Israel Cancer Society, since 2014 the majority of Arab women aged 50 and over has undergone a mammography screening at least once, thus decreasing the gap in screening rates with the Jewish population [16]. However, the adherence rate to the mammography schedule (undergoing mammography every two years), and of CBE for younger women, is still low among Arab women [15,17]. Thus, further research is necessary to identify factors that impede regular screening.

Lower attendance of mammography, as well as other screening behaviors, was also found among women from ethnic or traditional groups in Western countries [18-20]. Studies have identified several factors that affect disparities in screening tests for breast cancer among different ethnic or traditional groups in Western countries [18,21,22], and among Arab women in Israel [9,13-15,23-25]. Patient-related factors include low socio-economic status; high perceived barriers to screening, such as the fear of radiation or pain; and low perceived benefits of screening (reviewed in [9]). Healthcare system-related factors consisted of language barriers and geographic distance [13,23,26]. Recent studies have identified additional barriers to screening in women from traditional societies such as the Latinas in the USA [21], and Jewish ultra-Orthodox [27] and Arab women in Israel [24,28,29]. These findings reflect cultural and religious perceptions about cancer, health, and fate [9].

Provider-level factors were found to play a significant role in ethnic and racial healthcare disparities [30]. Considerable research suggests that physicians play an important role in their patients' screening attendance [31,32], particularly patients from ethnic minority groups [13,33,34]. Imparting information, recommending screening or reminding patients about specific screenings, and most importantly, discussing the advantages as well as women's barriers to screening have all proved to be the main predictors for mammography completion in studies conducted in both the US and Israel [13,35].

However, it was also found that physicians' recommendations tend to be given less often to patients from low income or ethnic minority groups [13,34,36]. Moreover, studies on women from different backgrounds in Israel, including Muslim and Christian Arab women, showed that, according to the women's self-reports, physicians recommend mammography less to Arab women than to Jewish ones. When controlling for demographic factors, recommendation receipt was a strong predictor of mammography and CBE adherence [13-15,23].

Studies have identified several factors related to whether or not physicians recommend or discuss breast cancer screening with their patients. These factors are related to physicians' personal characteristics, such as gender, age, and seniority [37,38], and the socio-demographic characteristics of their patients, such as education, language, ethnicity, and co-morbidities [34,39,40]. Nevertheless, only a few studies examined the effect of physicians' own beliefs on their recommendation patterns. A few studies suggested that physicians seem to be influenced, regarding their decision to recommend or not recommend mammography, by their own beliefs and attitudes regarding breast cancer and screening [40,41]. These attitudes stem from the general perception of cancer as a stigmatized illness [42,43].

Physicians were also found to be less likely to recommend screening examinations to women who the physicians believe would not be receptive to the advice or would not be able to appear for mammography because of costs, accessibility barriers or considerations related to modesty [44,45]. This phenomenon, coined "physician bias," was defined as a case whereby "a personal characteristic of a patient seeking medical advice or treatment appears to have influenced a physician's clinical treatment of the patient" [46, p. 195]. Research has shown that physicians' bias promotes discriminatory healthcare [47]. Moreover, bias among

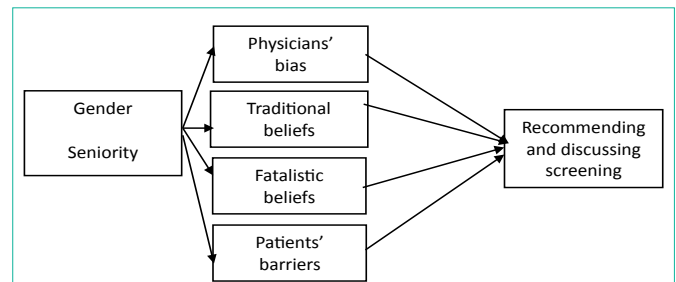


Figure 1: The study model combining the effects of perceptions about patients' barriers, physicians' beliefs, and social distance on recommending and discussing screening for the early detection of breast cancer.

healthcare personnel was also found to have an independent effect on health disparities [30,48]. It is important to mention that biases are not always conscious; nonetheless, both explicit and implicit biases produce discrimination [49].

In light of the lacuna in both theory and research regarding the factors that affect physicians' recommending or discussing screening advantages and barriers for the early detection of breast cancer, the present study will first assess the frequency of recommending mammography to women aged 50 and older, recommending CBE to patients aged 20-50, and discussing screening with patients who do not undergo screening. Next, the study will assess the role of physicians' gender, seniority, and personal beliefs regarding cancer; physicians' perceptions of their female patients' barriers to screening; and the role of physicians' bias on recommending mammography and CBE, and on discussing screening advantages and barriers with their patients (Figure 1).

Methods

Participants

The participants were 146 Arab physicians who treat the Arab population, recruited from 14 communities in the northern, central and southern regions of Israel, including Arab cities and villages and mixed Jewish-Arab cities, sampled by the cluster sampling method. According to the size of each community, 5 to 20 participants were recruited from each, using a random sampling method. A total of 320 physicians were approached, out of which 146 agreed to participate (47% participation rate).

Personal and professional characteristics of the sample are described in Table 1.

The sample consisted of mainly male physicians with a mean age of about 44 years. The physicians were mostly Muslim; the rest were Christian (the ratio was proportional to the distribution of the Arab population in Israel [7], married, and mildly or moderately religious. All were employed in the community health services. About 70% specialized in family medicine; the rest specialized in gynecology and internal medicine. The mean years of seniority were about 15, ranging from 1 to 42 years.

Questionnaires

Socio-Demographic characteristics included gender, age, family status, education, years of seniority as a physician, and specialty.

Patterns of recommending and discussing screening advantages

Table 1: Participants' background characteristics.

Age, years (M, SD, range)	43.9	12.1	26-68
Gender, male (N, %)	126	88.1	
Family status (N, %)			
Married or intimate relations	121	84.6	
Single	19	13.3	
Divorced	3	2.1	
Religion (N, %)			
Muslim	119	83.2	
Christian	11	7.7	
Religiosity (N, %)			
Secular	26	18.2	
Mildly religious	48	33.6	
Moderately religious	47	32.9	
Very religious	6	4.2	
Specialty (N, %)			
Family	101	70.6	
Obstetrics/Gynecology	11	7.7	
Internal	26	18.2	
Other	5	3.5	
Seniority in profession (M, SD, range)	14.8	11.2	1-42

In the case of missing data, the valid percent is presented.

and barriers with patients consisted of five separate items asking for the rate of recommending mammography to women aged 50-74, recommending CBE to women aged 20-40 and 40-50, and discussing the barriers to screening and screening advantages with women who refused to attend the exams. Responses ranged from 1=never to 4=always.

Measures of physicians' barriers

The *physicians' bias scale* consisted of a list of seven patient characteristics that may affect recommending screening to patients. The physicians were asked to rate the degree to which each characteristic may influence them, causing them to not recommend or discuss screening (including a high level of religiosity, advanced age, being single, having a low education level, women with mental illness, women with chronic diseases, and women who neglect their health). Responses ranged from 1=definitely not discuss to 4=definitely discuss. Internal consistency was 0.86.

The *physicians' perceptions about the patients' barriers to screening questionnaire* consisted of 8 items, including environmental barriers (distance, communication barriers, financial expenses), exposure barriers (being examined by a male physician, religious barriers related to not wanting to expose the body (modesty issues), the fear of being seen in a breast clinic), and the fear of mammography (the fear of pain and/or radiation). The questionnaire was adapted from the Cultural Barriers to Screening for Arab Women Scale [29]. However, in the present study, it was used to assess the physicians' perceptions about their patients' barriers to screening. Responses ranged from 1=not at all to 5=very much. Internal consistency was 0.81.

Physicians' traditional beliefs regarding cancer was measured by

eight items of the Cultural Barriers to Screening for Arab Women Scale [29], related to religious beliefs (for example, prayers help the healing process, traditional medicine helps, cancer is a punishment for one's personal sins, cancer is one of God's tests). Responses ranged from 1=not at all to 5=very much. The internal consistency of this subscale was 0.85.

The *fatalistic beliefs scale* [14,15] consisted of two items that referred to fatalistic beliefs about cancer (e.g., cancer is a death sentence, despite the treatment); two items related to avoidance of cancer (i.e., it's better not to do the screening; "what you don't know can't hurt you"). Responses ranged from 1=not at all to 5=very much.

Procedure

The study received the approval of the University of Haifa's Ethical Board. Physicians were approached by phone; once they had agreed to participate, they were interviewed in person by one of five trained interviewers. All participants signed an informed consent form.

Statistical analyses

The analysis was conducted using SPSS 21 and AMOS 21 software. Frequencies, percentages, and means (SDs) were computed. Multivariate regression analysis to identify factors related to the patterns of recommending and discussing screening for the early detection of breast cancer. Structural equation modeling (SEM) was conducted in order to evaluate the direct and indirect pathways among the study variables [50]. Goodness of fit was measured by χ^2 test, and χ^2/df ; confirmatory fit index (CFI), normed fit index (NFI), Tucker-Lewis index [TLI], and root mean square error of approximation (RMSEA) were also assessed. For overall model fit indices, $\chi^2/df < 2$, CFI, NFI and TLI values ≥ 0.95 are preferred and ≥ 0.90 is deemed acceptable; a RMSEA of ≤ 0.05 indicates a close fit [51].

Results

The mean frequency score of recommending mammography to patients aged 50+ was close to the scale range's upper value ($M=3.72$, $SD=0.55$, ranges 2-4, out of 1-5 possible ranges), indicating a very high frequency for recommending mammography to female patients aged 50 and older. In addition, the participants reported a very high frequency of discussing advantages of and barriers to mammography screening with the women who refused to undergo it ($M=3.57$, $SD=0.65$, ranges 2-4). The frequency of recommending CBE to patients aged 40-50 was above the mid-scale range ($M=2.66$, $SD=0.91$, ranges 1-4), indicating a high frequency of recommending CBE, while recommending CBE to women aged 20-40 was just mid-scale ($M=2.66$, $SD=1.02$, ranges 1-4), indicating a lower tendency to recommend CBE to young women. No differences were found between male and female physicians.

Physicians' bias was assessed by probing factors that may affect their decision to discuss screening examinations with their patients: 6.9% reported that they might not discuss the examinations with very religious women. Some also reported that they tended not to discuss screening examinations with older women (5.7%), single women (8.3%), women with a low education level (3.4%), women with high fatalistic beliefs (3.4%), those with chronic diseases (2.8%), and women who neglect their health (1.4%).

Table 2: Physicians' beliefs towards cancer and perceptions about their patients' barriers to mammography.

	M	SD	Range
Fatalistic beliefs	1.49	0.79	1-5
Traditional beliefs	3.75	0.42	2.14-4
Being examined by a male physician	2.92	1.05	1-5
Distance and transportation barriers	2.47	0.99	1-5
Language and communication barriers	2.30	0.93	1-5
Religious barriers related to modesty issues	2.36	1.07	1-5
Fear of being seen in a breast clinic	2.44	1.01	1-5
Financial expenses	2.08	0.94	1-4
Fear of pain	2.49	1.01	1-5
Fear of radiation effects caused by mammography	2.71	1.07	1-5
Total score of perceived patients' barriers	2.47	0.68	1-4.13

Table 2 shows the means (SDs) of the physicians' traditional beliefs toward cancer and perceptions about their patients' barriers to screening for the early detection of breast cancer. The physicians expressed a relatively high level of traditional beliefs (i.e., perceiving cancer as a test or punishment from God, believing in the healing power of prayers and reading verses from religious writings), and low levels of fatalistic beliefs (regarding cancer as a fatal disease). They perceived their patients to have moderate levels of each of the assessed barriers to screening (mean scores were about mid-scale for each of the barriers and for the total score). Being examined by a male physician was perceived as a particularly common barrier for the patients.

Multiple regression analyses were conducted (Table 3) to assess the associations of the rate of recommending and discussing mammography and CBE with gender, seniority, physicians' traditional and fatalistic beliefs, the perceived patients' barriers, and physicians' bias (the other background variables were not significantly correlated with the dependent variables, and hence were not entered into the analyses). The models explained 25%, 23% and 20% of the patterns of recommending mammography, recommending CBE to women aged

20-40, and recommending CBE to women aged 40-50, respectively, and 56% of discussing advantages of and barriers to screening with reluctant patients. Higher seniority was associated with a higher tendency to recommend and discuss screenings, while gender was not significantly associated with recommending or discussing patterns. In addition, physicians who held higher traditional and fatalistic beliefs and biases had a lower tendency to recommend and discuss screening; however, perceiving more patients' barriers was associated with a higher frequency of screening-related recommendations and discussion.

In the next step, SEM was applied to assess the direct and indirect relations among the study variables. The resulting models are depicted in Figure 2 (a-c). As can be seen in Figure 2a, seniority, seniority was associated with a higher tendency to recommend mammography, while fatalistic beliefs and physicians' bias were associated with a lower frequency to recommend mammography. In addition, physicians' bias mediated the associations of seniority and gender with recommending mammography. Therefore, seniority and female gender were associated with lower bias, while bias by itself reduced the chance of recommending mammography. Model 2a shows an acceptable fit: $\chi^2(7)=12.64$, $p=.480$; $\chi^2/df=0.97$, NFI=.85, CFI=.93, TLI=.78, RMSEA=.06.

Figure 2b shows that the pathways of recommending CBE (for patients aged 20-40 years) were identical to the former model and the fit values were similar: $\chi^2(7)=13.58$, $p=.14$; $\chi^2/df=1.94$, NFI=.94, CFI=.98, TLI=.90, RMSEA=.04. Figure 2c depicts the pathways for discussing advantages and barriers to screening examinations with reluctant patients. In this model, in contrast to the former ones, fatalistic beliefs were not related to the discussion about screening, but the traditional beliefs variable was an additional mediator between seniority and discussing screening. The model's fit indices were good: $\chi^2(7)=13.22$, $p=.43$; $\chi^2/df=1.88$, NFI=.92; CFI=.99; and TLI=.99, RMSEA=.01.

Discussion

The present study is the first to show that physicians' beliefs about cancer, their perceptions of patients' barriers, and their bias toward

Table 3: Regression analysis for recommending and discussing screening for the early detection of breast cancer.

	Recommending mammography to patients aged 50-74	Recommending CBE to patients aged 40-50	Recommending CBE to patients aged 20-30	Discussing screening advantages and barriers
Gender	.08	.09	.06	.14
Seniority	.30**	.27**	.23*	.36***
R ²	.08	.07	.04	.12
F (2,141)	3.49**	3.88*	2.71*	8.71***
Gender	-.02	.02	.01	.02
Seniority	.21*	.18*	.15	.15*
Traditional beliefs	.04	-.03	-.11	-.16*
Fatalistic beliefs	-.20*	-.21**	-.20*	-.05
Perceived patients' barriers	.03	.21**	.20*	.04
Physicians' bias	-.36***	-.18*	-.22*	-.64***
R ²	.25 (.22)	.23(.19)	.20(.16)	.56(.54)
F (7,141)	6.59***	4.61***	4.64***	24.67***

Gender: male=0, female=1; *p<.05, **p<.01, ***p<.001.

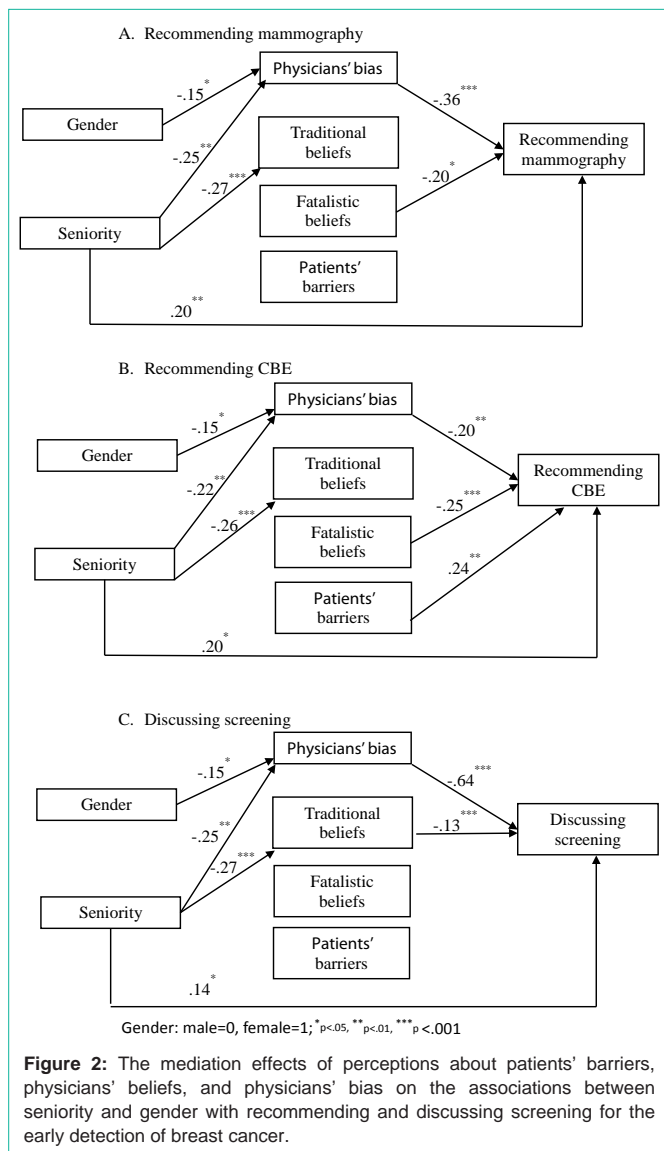


Figure 2: The mediation effects of perceptions about patients' barriers, physicians' beliefs, and physicians' bias on the associations between seniority and gender with recommending and discussing screening for the early detection of breast cancer.

specific groups of patients are related to patterns of recommending mammography and CBE, and discussing screening advantages and barriers.

There were several main findings. First, the results indicate that most physicians are aware of the importance of mammography and do recommend regular examinations to most women aged 50 and older. This is in spite of the current debate regarding the effectiveness of mammography in increasing survival [3], but in accordance with the ample evidence about the positive effects of regular mammography in reducing mortality rates due to breast cancer [2], and in agreement with the screening policies in Israel [5]. However, the situation is less clear for CBE. The rate of recommending CBE for young women was relatively low. This finding requires attention, as considerable cases of the more aggressive types of breast cancer are detected in young Arab women [11]. The low rate of recommending CBE is in line with reports on its low efficiency in reducing mortality. However, due to the fact that mammography is a less efficient examination for younger women [4], attending the CBE should be recommended and discussed

with much higher frequency. In addition, attending CBE may create awareness about the importance of screening, and especially of doing mammography examinations as one gets older. Moreover, CBE attendance creates an opportunity to discuss screening-related matters with physicians. Another related finding was that the younger and less experienced the physicians are, the lower their tendency to recommend and discuss screening. Therefore, this group should be a target for raising awareness about the significance of recommending or discussing screening with patients.

Second, physicians were aware of the possible barriers experienced by their patients, which might make it difficult for them to adhere to screening guidelines. These results cannot be compared to other studies, as we could not locate previous studies assessing physicians' perceptions of their patients' barriers. However, the extent of their patients' barriers, as they perceived it, was similar to the extent of the barriers reported by Arab women in Israel in previous studies [14,15,23]. It should be noted that the participants in these previous studies consisted of a population-based sample of Arab women. Therefore, it may be assumed that they hold similar attitudes and perceptions toward screening as the actual patients of the physicians in the present study. Having an accurate picture of patients' barriers indicates that physicians are aware of the possible barriers of their patients, which was found to be positively associated with a higher rate of recommending CBE, but not mammography or discussing screening with reluctant patients.

Third, although the physicians in the present study all had a Western medical education, they expressed relatively high levels of traditional beliefs, such as perceiving cancer as a punishment or test from God, belief in the power of prayer or traditional medications, and fatalistic beliefs about cancer as a fatal disease. The extent of their beliefs was similar to the extent of traditional and fatalistic beliefs among Arab women in previous studies [13-15,23,29]. It was previously reported that people from traditional societies continue to hold traditional beliefs, in spite of Western ways of life or varying levels of religiosity [52].

Fourth, the present findings support previous studies' findings that physicians tend not to recommend examinations to women who are believed to be less inclined to undergo them [34,45] or to women whom the physicians perceive are different from themselves [53], a phenomenon termed *physicians' bias* [46]. However, only a small number of the physicians reported being less inclined to discuss examinations with patients with distinct characteristics such as old age or a high level of religiosity. It may be that the actual impact of patients' characteristics is even higher, but not evident in this study, due to a possible unwillingness to report behaviors that may deviate from professional norms.

Fifth, it is important to note that years of seniority as a physician was found to be directly linked to all recommending and discussing screening. This finding contradicts ample research which shows that up-to-date clinical knowledge is negatively associated with years of practicing medicine (see, for example, [54-56]). For example, Choudhry *et al.*'s [54] literature review shows that 63% of the studies on physicians' adherence to standards of practice for diagnosis, screening, and prevention reported that years of practicing medicine was negatively linked to adherence to the aforementioned standards.

Perhaps our finding is linked to the structure of the Israeli health system. Since 1994, when the *National Health Insurance Law* was enacted, Israeli citizens have been entitled to public health services. The physicians in our sample were employed by the public health system, which provides ongoing training to practicing physicians in order to keep them up-to-date regarding state-of-the-art clinical knowledge, medical standards, and guidelines. In addition, it may be that the more senior physicians are less stressed at work, and experience less family and career stressors, in general. Therefore, they are more open to their patients' needs and make more time to discuss screening.

As was mentioned previously, diminished bias and accounted for the positive association between years of seniority and the outcome variables. Furthermore, fewer traditional beliefs accounted for the association between years of seniority as a physician and the tendency to discuss screening. These findings could be explained by the *contact hypothesis* [57], which generally argues that interpersonal contact serves to reduce prejudice between majority and minority group members. The more years of experience (meaning contact) a physician has with a variety of patients and diseases, the less bias he/she has concerning both patients and cancer as a disease, thus the more inclined he/she is to recommend screening. These findings emphasize the central role that physicians' bias plays in explaining the association between years of seniority as a physician and women physicians (gender), and all of the outcome variables. This is especially troubling since studies show that the uptake of breast cancer screening among patients is positively related to physicians' recommendations (cf. [13,35,58]).

Diminished bias also accounted for the positive association between women physicians and the outcome variables. This finding is in accord with some of the literature on stigma, which shows that women are less inclined than men to stigmatize, for example, persons with HIV/AIDS [59-62].

The study results have several practical implications. Increasing awareness among physicians about the need to recommend and discuss screening for early detection, and especially the need to recommend CBE, is underscored from the present results. CBE is an opportunity to recommend mammography, if needed. Even more important is the need to increase CBE for younger women. Family physicians may play a central role in promoting CBE and early detection in young women. Due to the present finding, which shows that physicians with less years of seniority have a lower tendency to recommend and discuss the examinations, it is recommended to strengthen messages regarding the importance of doing so for this group of physicians. Low adherence was reported for additional types of cancer screening for which early detection may save lives, such as colorectal cancer, melanoma or cervical cancer. The results call attention to the salient role of physicians' traditional beliefs regarding cancer and their bias toward specific groups of women who they perceive as being less inclined to attend screening, which impact their recommending and discussing behaviors. Education, related to increasing physicians' self-awareness about the impact of their perceptions and reducing their bias toward specific groups of patients, is imperative.

The strengths and limitations of the study should be underscored.

The study is based on a random and large sample of physicians, who belong to a unified cultural group, and treat patients from the same cultural group. In addition, this study is the first to assess the effect of physicians' personal beliefs and biases, and their perceptions of patients' barriers on their behaviors regarding recommending and discussing breast cancer screening. A main limitation of the study is the relatively low response rate (47%); therefore, generalization to other groups of physicians should be made with caution. However, similar and even lower response rates were reported in other studies assessing physicians' screening attitudes (for example, 55% [63], 40% [64], and 5.7% [65]). Another limitation is that patients' perceptions and beliefs were not assessed in relation to those of their physicians. Therefore, further studies are suggested that will assess physician-patient dyads, and specifically elaborate on groups of patients that are subjected to stronger physicians' bias regarding their reluctance or inability to adhere to screening recommendations. In addition, controlled intervention studies, focused on changing traditional beliefs toward cancer and reducing bias toward specific groups of patients, are recommended.

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