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The Impact of Family History of Breast Cancer on Knowledge, Attitudes, and Early Detection Practices of Mexican Women Along the Mexico-US Border

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Abstract

Rates of breast cancer (BC) have increased in Mexico, with the highest incidence and mortality rates observed in the northern Mexican states. This study aimed to describe the BC knowledge, attitudes and screening practices among Mexican women with and without a family history of BC residing along the Mexico-US border, and identify factors associated with screening behaviors. One hundred and twenty eight Mexican women aged 40 and older completed an interviewer-administered questionnaire on sociodemographic characteristics, knowledge, family history, and screening practices. There were no significant differences between Mexican women with and without a family history. Over 60% of women in both groups had never had a mammogram/breast ultrasound, and more than 50% had never obtained a clinical breast exam. Age, marital status, insurance, and breast cancer knowledge significantly influenced BC screening behaviors among Mexican women. Further research is needed to examine other key factors associated with screening utilization, in effort of improving BC rates.

Keywords

Breast cancer; Family history; Screening; Knowledge; Mexican

Background

The burden of breast cancer in Mexico has steadily increased over the past few decades [1]. It is estimated that nearly 30 new cases of breast cancer are diagnosed every day in Mexico [2–4], with many of these diagnoses occurring among younger women, for whom evidence suggests breast cancer presents a decade earlier compared to women in the United States (US) or Europe [3, 5]. Consequently, as in several developed nations, breast cancer has become a significant threat to the health of women in Mexico.

Even though breast cancer is becoming a substantial public health issue in all of Mexico, the highest rates of breast cancer are observed in the northern Mexico-US border states [6]. Research indicates the incidence and mortality rates of breast cancer among Mexican women living in the northern border states are significantly higher compared to the rest of the country [1, 3, 7].

Several well-established risk factors have been shown to be associated with screening practices among Mexican women and women of Mexican descent residing in the US, including socioeconomic status, demographic factors, health behaviors, as well as cultural and psychosocial factors [8–12]. However, relatively little, if any, research has examined the association between family history (FH) of breast cancer and screening practices in Mexican women. Women with a family history of breast (FH⁺) have a significantly increased risk for developing breast cancer and, thus, represent a high-risk group [13–17].

Family history has been shown to be associated with health beliefs, such as perceived susceptibility, perceived barriers, and cancer worries [18], some of which were found to impact the level of participation in preventive screening programs among FH⁺ women [19–21]. Although researchers have examined the association between family history of breast cancer and screening practices, existing data on the breast cancer screening practices among women with a family history of breast cancer is largely inconsistent. Many studies have found a positive association between FH⁺ women and breast cancer screening rates [4, 22–29], while other investigations have found no association or non-statistically significant associations between family history and ever having received breast cancer screening or screening compliance [19, 30–33]. Nevertheless, to the best of our knowledge, the role of family history in relation to early detection practices (EDPs) has not been extensively examined among Mexican women; especially those residing along the Mexico-US border.

Further, there is an overall lack of access to mammography and clinical breast examinations in Mexico; for instance, clinical examinations often fail to include a breast examination [34]. Accordingly, non-governmental health organizations and the Mexican Ministry of Health emphasize the importance of BSE, recommending women practice monthly BSE starting at the age of 18 [35]. It is not surprising then that data indicate approximately 90% of breast cancers in Mexico are identified by the woman herself, with only 10% of those tumors

diagnosed in stage I [36, 37]. Nonetheless, data on access and utilization of health care for breast cancer in Mexico is scarce [34].

In light of the evidence showing low breast cancer screening levels among Mexican overall [37–40], we endeavored to determine whether women at increased risk of developing breast cancer, women with a family history, understand the importance of preventive screening, possess certain attitudes towards breast cancer prevention, and participate in preventive screening. The purpose of this study was twofold: (1) to determine if there is an association between family history of breast cancer and breast cancer knowledge and attitudes, and (2) to ascertain the history of preventive screening among Mexican women with and without a family history of breast cancer.

Methods

Population and Study Procedures

This cross-sectional analysis was conducted in Ciudad Juárez, Chihuahua, Mexico. The study population consisted of 128 Mexican women who self-referred to Hospital de la Familia/Santa Maria (HF) for routine medical care. Staff members at HF initially identified approximately 900 women who made appointments to receive routine medical care between August 2006 and March 2007, and who met the basic study eligibility requirements, including: (1) age 40 years or older; (2) not presently receiving radiation or chemotherapy treatment for cancer; (3) no history of previous malignancies; (4) not pregnant; and (5) able to provide written informed consent. From eligible women identified, 300 were randomly selected for inclusion in the study.

Thereafter, a trained interviewer approached potential participants, explained the nature of the study, and invited women to participate. If the client agreed to participate, the interviewer provided a written document (in Spanish) describing the purpose of the study, the eligibility requirements, and an informed consent. Of the 300 randomly selected women, 210 agreed to participate; a response rate of 70%. For this analysis, we excluded 82 women who were unaware of their family history of breast cancer status. Consequently, this analysis included 128 Mexican women.

Participants were verbally assured that they were free to refuse or terminate their participation in the study at any point during the interview process and that their refusal would in no way compromise the standard of care they were entitled to receive. Women who participated in the study received a \$25 shopping card for use at a local supermarket (with alcohol and tobacco restrictions).

Interviewers were staff members at HF. Prior to initiation of the study, research investigators provided a single, 3-hour in-service training for all personnel who were participating in the administration of the study. The purpose of the training was to outline the objectives of the study, in addition to formalize the data collection protocol. The Institutional Review Boards at New Mexico State University and HF approved all study procedures.

Instrument and Data Collection

Instrument Development—The instrument used in the present study was adapted from an instrument used by Estape et al. in their study of cancer knowledge, self-efficacy, causes and attitudes towards cancer among 541 Spanish women [41]. Efforts to geographically and culturally adapt the questionnaire for use in our study were carried out in three phases. In Phase I, a panel of Mexican experts was selected to adapt the Spanish version (Spain) of the instrument to northern Mexico. The panel was composed of three, full-time faculty members of the Universidad Autonoma de Ciudad Juárez. The panel members were experts in women's health, public health, medicine, education, and molecular biology. The experts reviewed the instrument and made appropriate linguistic and cultural changes so as to be easily understood by participant Mexican women.

During Phase II, after all materials had been adapted, we conducted six focus groups comprised of 6–9 Mexican women patients selected from HF, for a total sample size of 43 women. The focus groups were held at HF, conducted and moderated by trained promotoras and social workers who were HF staff. All focus groups took approximately 4 h, with food and refreshments provided. During the sessions, each item/question on the questionnaire was reviewed, assessing the comparability of concept meaning (concept equivalence) and terminology. All sessions were taped, and a research assistant was present to take notes.

Lastly, in Phase III, all comments and suggestions from the focus groups were compiled and distributed to both the panel of experts and study investigators. Upon incorporating the relevant changes, a second edition of the instrument was developed. Thereafter, the panel of experts and research investigators convened to review the second edition and ensure the instrument was appropriate for the study location, language, population and need. Discrepancies in the instrument were resolved by reaching a consensus majority of the group. Following this, the final version was created. This qualitative method has been used successfully in several studies that have adapted instruments for use in a culture/population other than that for which it was initially developed [42–44]. The stability-reliability of the survey instrument was assessed by administering the survey to a purposive sample of 54 women patients from HF that had not been selected for inclusion in the main study. The stability-reliability of the instrument was $r = 0.78$. The internal reliability of the instrument, calculated on the responses to the survey, was $\alpha = 0.82$.

Instrument Administration—Study participants completed an interviewer-administered questionnaire that contained questions on sociodemographic information, attitudes and knowledge about breast cancer and breast cancer screening, family history of breast cancer, and early detection practices. Breast ultrasound was included with mammography since breast ultrasounds are often more widely used than mammography in countries with limited resources, such as Mexico, as both a screening and diagnostic test [45].

Women were categorized into two groups: women with a family history of breast cancer and women without a family history of breast cancer. For the current analyses, women who responded as having a positive family history were designated (FH⁺), whereas women who responded as not having a family history were designated (FH⁻).

The sociodemographic, knowledge and attitude variables used in the current analyses are shown in Table 1. To gain a better understanding of the impact that knowledge may have on a participant's early detection practices, we calculated a composite Knowledge Score to evaluate the overall levels of knowledge of each participant. To calculate the Knowledge Score, answers to each knowledge question were given a value based on whether the answer was correct (value of 1) or incorrect (value of 0). For each participant, the sum of values to all knowledge questions was totaled and divided by the number of knowledge variables. Overall Knowledge Scores ranged from 0 to 1 (with a higher score suggesting greater knowledge) and were used to determine the accuracy of respondents' breast cancer knowledge.

Data Analysis—All statistical analyses were conducted using Stata/SE 10.1 [46]. Descriptive statistics including means, frequencies, percentages, and confidence intervals were used to describe sociodemographic characteristics, breast cancer knowledge and attitudes, and preventive screening practices. *T* tests, Pearson's chi-square test, and Fischer's exact test were employed to investigate the relationships between breast cancer knowledge and attitudes, and preventive screening practices among women with and without a family history of breast cancer, using a significance level of $P < 0.05$.

Multivariate logistic regression was conducted to control for potential confounding and/or modifying effects of sociodemographic variables on the association between family history of breast cancer and screening behaviors, as well as to explore the effect of participant variables on early detection practices. Bivariate and multivariate analyses were performed to examine the indirect and direct association between participants' level of breast cancer knowledge (Knowledge Score) and early detection practices.

Results

Sociodemographic Characteristics

Participant characteristics are summarized in Table 2. Of the 128 Mexican women, 31 women (24.2%) reported having a family history of breast cancer (FH⁺), while 97 women (75.8%) did not (FH⁻). There were no significant differences in sociodemographic characteristics between FH⁺ and FH⁻ women. Participants' mean age was 48.2 years (SD = 6.67), with mean educational attainment of 8.01 years (SD = 3.01) and mean weekly income of 1,067.64 pesos (SD = 438.05; results not shown).

Breast Cancer Knowledge, Attitudes, and Early Detection Practices

Knowledge of breast cancer and breast cancer screening among FH⁺ and FH⁻ women did not differ significantly (Table 3). All participants felt that breast cancer can be cured if found early. Overall, study participants' had a mean breast cancer Knowledge Score of 0.84 [95% CI: 0.82]. Women's attitudes about breast cancer were also similar (Table 4). The majority of participants in both FH⁺ (65.4%) and FH⁻ (68.1%) groups agreed that they had a good chance of developing breast cancer in the next 5 years.

Mammography/ultrasound, CBE, and BSE use did not differ significantly between FH⁺ and FH⁻ groups (Table 5). However, it is important to note that the majority of study participants

reported that they had never obtained a mammogram/ultrasound or clinical breast exam, although more than half of the women in both the FH⁺ and FH⁻ groups had ever performed a breast self-exam.

Multivariate Analysis

The results of multivariate regression analyses are shown in Table 6. After adjusting for all sociodemographic variables, family history of breast cancer was not associated with screening behaviors. Age was related to BSE only, indicating younger aged women had higher odds of performing BSE (OR = 0.89, 95% CI = 0.82–0.96). Participants who were married or living with an intimate partner had significantly lower odds of having ever received a CBE (OR = 0.18, 95% CI = 0.03–0.82) compared to participants who were single or never married. Similarly, women who were divorced, widowed, or separated had significantly lower odds of CBE (OR = 0.15, 95% CI = 0.03–0.82) and BSE (OR = 0.14, 95% CI = 0.02–0.91) in comparison with women who were single or never married.

Health insurance was associated with increased odds of CBE (OR = 2.65, 95% CI = 1.07–6.59) and BSE (OR = 8.35, 95% CI = 2.16–32.25), but was not associated with mammography/breast ultrasound use. Education and income were not related to screening behaviors. Additional analyses examining whether women's breast cancer knowledge was associated with early detection practices found that women with higher Knowledge Scores had significantly greater odds of ever receiving a mammogram/breast ultrasound (OR = 3.93, 95% CI = 1.30–11.90) and performing BSE (OR = 5.08, 95% CI = 1.84–14.03).

Discussion

This study assessed the levels of knowledge, attitudes and screening practices among Mexican women with and without a family history of breast cancer. The main findings show that there were no statistically significant differences between FH⁺ and FH⁻ Mexican women. Our findings are consistent with other studies that have found no statistically significant differences in breast cancer screening behaviors between women with and without a positive family history of breast cancer [29–33].

However, it is worth mentioning that over 60% of women in both groups had never had a mammogram/breast ultrasound, and more than 50% had never obtained a clinical breast exam. These results suggest that Mexican women residing along the Mexico-US border are not receiving health care services in accordance with recommended breast cancer screening procedures. Evidence pointing to an overall lack of access to mammography and CBE in Mexico [34] may partly explain the large proportion of participants who have never obtained a mammogram or CBE. This is alarming considering that women with a family history of breast cancer have an elevated risk of developing breast cancer over their lifetime, and comprise a population for whom participation in preventive screening could significantly reduce breast cancer mortality.

Results of the multivariate analyses suggest factors such as age, marital status, insurance, and breast cancer knowledge may influence breast cancer screening behaviors among Mexican women. These findings support the results of previous research on the use of breast

cancer screening among Mexican women [34, 47, 48], as well as those derived from several studies conducted in other women populations [10, 19, 49–53].

Foster and Costanza [53] found that younger women performed BSE more frequently, a finding that is similar to ours. Evidence suggesting a strong emphasis on BSE starting at the age of 18, in response to the lack of access to preventive screening [35], may be one potential explanation for this finding. Younger women may be more likely to have ever performed BSE and continue practicing BSE, since access to mammography/breast ultrasound and/or CBE is limited, and not recommended, until an older age is reached.

Our finding that marital status was significantly associated with women not engaging in early detection breast cancer practices may be explained by the sociocultural beliefs among Latina women. Research by Salazar [54] showed that Latinas' perceived responsibility to their family was a reason for not obtaining mammograms; participants expressed that taking care of the family was their top priority, and women often ignored sickness to carry out this responsibility. Similarly, Luquis and Cruz [55] suggested that Latinas may be more concerned with the wellbeing of their children and family, paying less attention to their own health. Consequently, this cultural tradition among Latinas may be an important factor in women's decision to obtain and carry out breast cancer screening procedures.

The results showing insurance as a significant factor in breast cancer early detection practices are consistent with several previous reports that suggest having insurance was associated with an increased likelihood of having ever had a mammogram, CBE, or BSE [49–51, 56–59]. Insurance may serve as the means through which women gain access to screening services such as mammography and CBE, as well as health education on BSE. Furthermore, this may help explain why we observed such low levels of breast cancer screening in the study population, as over 70% of women in both the FH⁺ and FH⁻ groups were uninsured.

Lastly, participants' knowledge of breast cancer and breast cancer screening procedures was shown to be significantly associated with mammography/breast ultrasound and BSE use. Our findings support previous research by Wall and colleagues [48] who found that, among women workers in urban Mexico, accurate knowledge of early detection practices was associated with use of breast cancer screening services. Likewise, higher levels of knowledge about screening guidelines among Latina women have been shown to be associated with recent mammography history [60]. Indeed, these studies document the importance of access to breast cancer screening services and concomitant increased knowledge that may facilitate use of breast cancer early detection practices among Latinas.

The current study has certain limitations that need to be considered. First, this analysis focused on Mexican women with and without a family history of breast cancer who presented at HF in Ciudad Juarez, Mexico; therefore, these results are most generalizable to clinic-based populations of women or those that have access to a similar health care setting. Second, this study has a limited total sample size ($n = 128$) and a relatively small number of women with a positive family history ($n = 31$), which limits the generalizability of the findings.

Third, the data are based on self-reports, which are subject to recall bias and may, therefore, not be fully accurate if study participants had difficulty remembering their history of breast cancer screening procedures. While the accuracy of self-report of family history of breast cancer is considered to be reasonably sound [61, 62], studies examining the accuracy of self-report data on history of mammography use among low income women have shown accuracy between self-report and medical charts to be around 73–77% [63, 64]. Consequently, while our results may overestimate the true percentage of women who have ever had breast cancer screening procedures, it does not undermine the overall message of underutilization among study participants.

Finally, the inclusion of breast ultrasound with mammogram on several variables may have affected the responses of some participants. However, use of breast ultrasound with mammogram was intended to allow us to accurately and comprehensively measure breast cancer screening behaviors in Mexican female populations, as breast ultrasounds may be widely used in Mexico, as both a screening and diagnostic test [45].

Despite these limitations, this study also has numerous strengths. While several studies have examined breast cancer utilization among Mexico-US border Latinas, few have focused on Mexican women. Hunter et al. found that less than 3% of Mexican participants residing in the Mexico-US border state of Sonora, Mexico had received a mammogram in the previous year [65]. Contributing to this literature, Wall and colleagues reported that among Mexican women who had not had a mammogram in the previous 2 years, only 30% had received a mammogram in their lifetime; however, this study was carried out in Monterrey, Mexico which is not a border state [48]. Given these troubling findings, our goal was to better understand the overall scope of use and lifetime use of breast cancer early detection practices among border Mexican women. Our findings support these other studies and reiterate the need for increased screening among this border population.

Furthermore, there is a scarcity of research in the area of breast cancer that accurately addresses the health needs of the women in the Paso del Norte region, where the states of Texas, New Mexico in the US intersect the state of Chihuahua, Mexico. There may very well be variation in the early detection practices of border Mexican women, depending on geographic locale, sociocultural beliefs, and resource allocation. After all, the Mexico-US border encompasses four US states and six Mexican states, with the Paso del Norte region being one of the largest and busiest border sectors and comprising one of the largest binational metropolitan areas in the world—a combined population of 2.4 million people [1]. Accordingly, our findings provide valuable information regarding breast cancer preventive screening practices among women in the border city of Juárez, Mexico; one of the largest cities in Mexico, with an estimated population of nearly 1.5 million people, as well as one of the largest cities along the Mexico-US border [1].

Healthy Border 2010 objectives include reducing the rates of female breast cancer. For these reasons, reducing mortality from breast cancer through early detection has become a high priority. The potential of the findings in this study to identify key factors that influence early detection practices among women residing in the Mexico-US border region, may prove instrumental in helping reduce breast cancer morbidity and mortality rates.

Conclusion

Our findings suggest that Mexican women, regardless of family history, residing along the Mexico-US border are not receiving health care services in accordance with the recommended breast cancer screening procedures. This is particularly alarming, considering evidence suggests women with a family history of breast cancer are at increased risk of developing breast cancer, and that breast cancer may present a decade earlier in Mexican women when compared to their US or European counterparts [3, 5]. Moreover, breast cancer is becoming an increasingly significant public health threat to women in Mexico. Our research emphasizes the lack of access to breast cancer prevention services, and emphasizes the need to accurately identify other factors that may be associated with early detection practices among Mexican women in order to develop culturally appropriate strategies for improving access to and increasing participation in breast cancer screening programs.

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Table 1**Variables of interest***Socioeconomic variables*

Age

Marital status

Educational attainment

Household weekly income

Insurance status

Family history

Have any of your female relatives (such as mother, sister, grandmother, aunt, cousin, or other relative) ever been diagnosed with breast cancer?

Knowledge

Do you think a woman could have breast cancer without having symptoms or without feeling ill?

At what age do you think a woman is more likely to develop breast cancer?

If breast cancer is found early, it can be cured

A woman only needs a breast ultrasound/mammogram when you experience breast pain or feel a lump or have discharge

A breast ultrasound/mammogram will help you find breast cancer early

How often do you think a woman should have a mammogram?

If you have a clinical breast exam there is no need to have a breast ultrasound/mammogram

After receiving two breast ultrasounds/mammograms where the results were normal, you don't need to have other exams done for at least 5 years

Attitudes

You would prefer to not know if you had breast cancer

At your age you don't need to worry about breast cancer

You are more likely to get breast cancer than Hispanic women who live in United States

You would be afraid to tell your husband or partner that you have breast cancer because it would affect your relationship

Screening behavior

Have you ever had a breast ultrasound/mammogram?

Have you ever had a clinical-breast exam?

Have you ever done a self-breast exam?

Table 2

Selected sociodemographic characteristics of study participants

Characteristic	FH ⁺ (<i>n</i> = 31) Mean (SD)	FH ⁻ (<i>n</i> = 97) Mean (SD)	<i>P</i> value
Age, years	47.6 (5.7)	48.4 (7.0)	0.538
Educational attainment, years	8.2 (2.8)	8.0 (3.1)	0.735
Household weekly income, pesos	1,043.3 (326.1)	1,075.5 (469.8)	0.677
	<i>n</i> (%)	<i>n</i> (%)	
Marital status			
Married/living with intimate partner	21 (67.7)	75 (78.2)	0.294
Divorced/widowed/separated	5 (16.1)	14 (14.6)	
Single/never married	5 (16.1)	7 (7.3)	
Insurance status			
Uninsured	27 (87.1)	71 (73.2)	0.146
Insured	4 (12.9)	26 (26.8)	

Values based on those who had valid responses to each individual question

Table 3

Knowledge of breast cancer and preventive screening procedures

Characteristic	% Answered correct		P value
	FH ⁺ (n = 31)	FH ⁻ (n = 97)	
Can a woman have breast cancer without having symptoms or feeling ill	87.1	95.7	0.104
At what age do you think a woman is more likely to develop breast cancer	83.9	62.1	0.027
If breast cancer is found early it can be cured	100	100	1.000
A woman only needs a breast ultrasound/mammogram when they feel pain/feel a lump/have discharge	90.3	89.7	1.000
A mammogram/breast ultrasound will help you find breast cancer early	90.3	97.9	0.091
How often do you think a woman should have a mammogram/breast ultrasound	71.0	84.9	0.109
If you have a breast exam from a doctor there is no need to have a mammogram/breast ultrasound	96.2	93.0	1.000
After receiving two breast ultrasounds/mammograms where the results were normal, you don't need to have other exams done for at least 5 years	76.9	88.2	0.200
	Mean [95% CI]	Mean [95% CI]	
Knowledge score	0.83 [0.76, 0.90]	0.84 [0.82, 0.87]	0.789

Percentages based on those who had valid responses to each individual question

Table 4

Participants' attitudes about breast cancer

Characteristic	% Agreeing		<i>P</i> value
	FH ⁺ (<i>n</i> = 31)	FH ⁻ (<i>n</i> = 97)	
You would prefer not to know if you had breast cancer	3.2	8.4	0.451
At your age you do not need to worry about breast cancer	16.7	35.1	0.070
In the next five years, you believe you have a good chance to get breast cancer	76.5	69.5	0.764
You are more likely to get breast cancer than Hispanic women who live in US	12.5	2.8	0.098
You would be afraid to tell your partner/spouse that you have breast cancer because it would affect your relationship	13.3	10.8	0.744

Percentages based on those who had positive responses to each individual question

Table 5

History of early detection practices by family history

Characteristic	FH ⁺ (n = 31) n (%)	FH ⁻ (n = 97) n (%)	P value
Ever had a mammogram/ultrasound	12 (38.7)	30 (30.9)	0.422
Ever had a clinical breast exam	11 (35.5)	46 (47.4)	0.244
Ever performed a breast self-exam	17 (54.8)	56 (58.3)	0.732

Percentages based on those who had valid responses to each individual question

Table 6

Multivariate results for early detection practices

Variable ^a	Mammography/breast ultrasound OR (95% CI)	Clinical breast exam OR (95% CI)	Breast self-exam OR (95% CI)
Family history of breast cancer	1.65 (0.67–4.05)	0.55 (0.22–1.39)	0.94 (0.36–2.47)
Age	1.02 (0.96–1.09)	0.99 (0.93–1.05)	0.89 (0.82–0.96) ^c
Education	1.08 (0.94–1.24)	1.06 (0.92–1.25)	1.15 (0.97–1.36)
Income	1.00 (0.99–1.00)	1.00 (0.99–1.00)	1.00 (0.99–1.00)
Marital status			
Single/never married	Ref	Ref	Ref
Married/living with intimate partner	1.09 (0.31–3.80)	0.18 (0.04–0.73) ^b	0.78 (0.18–3.42)
Divorced/widowed/separated	1.01 (0.22–4.70)	0.15 (0.03–0.82) ^b	0.14 (0.02–0.91) ^b
Insurance	1.59 (0.66–3.80)	2.65 (1.07–6.59) ^b	8.35 (2.16–32.25) ^c
Knowledge score	3.93 (1.30–11.90) ^b	1.75 (0.67–4.58)	5.08 (1.84–14.03) ^b

Results are adjusted odds ratios

OR odds ratio, 95% CI 95% confidence interval

^a The multivariate models were adjusted for all variables^b $P < 0.05$ ^c $P < 0.01$