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To examine the association between religiosity and breast cancer screening methods, 6,541 women aged 60 and older from the Health, Well-Being and Aging in Latin America and the Caribbean Study (SABE) were studied. The outcomes were reporting a mammogram, a clinical breast examination (CBE) or breast self-examination (BSE) within the last 2 years. Women who reported religion being very important were more likely to have a mammogram (OR=1.90, 95% CI 1.53-2.35), a CBE (OR= 1.70, 95% CI 1.44-2.00) and a BSE (OR= 1.44, 95% CI 1.23-1.68) compared with women who reported no religious affiliation. This suggests that religiosity may facilitate breast cancer screening behaviors among older women.

ASSOCIATION OF RELIGIOSITY AND USE OF BREAST CANCER SCREENING AMONG OLDER WOMEN IN LATIN AMERICA AND THE CARIBBEAN

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CHAPTER 1

INTRODUCTION

In the Americas cancer is the second leading cause of death (Pan American Health Organization). In 2005, at least 101,000 individuals died of cancer in Central America and the Caribbean. For women in these populations, breast and cervical cancer are the primary causes of cancer-related mortality (Pan American Health Organization). Latin American countries are among those with the highest breast and cervical incidence rates in the world (Arossi, Sankaranarayanan, & Parkin, 2003). Breast cancer is the second leading cause of cancer and the most common in women worldwide. Each year, breast cancer is newly diagnosed in more than 1.1 million women, representing more than 10% of all new cancer cases and over 1.6% of all female death worldwide (Anderson & Caleffi, 2006). According to the American Cancer Society, about 1.3 million will be diagnosed with breast cancer annually worldwide and about 465,000 will die from it. Breast cancer in the US is also the primary cause of cancer death in Latin women (Haynes & Smedley, 1999). In comparison to white women, Latina women have a lower 5-year survival rate for breast cancer at 76% versus 85% (Haynes & Smedley, 1999). Despite the common notion that breast cancer is a disease of affluent countries, the predominant amount of breast cancer deaths take place in developing countries. Within South American, breast cancer incidence is highest in Argentina and Uruguay, but lower in breast cancer mortality in both countries (Anderson & Caleffi, 2006). In contrary, Central America has the lowest breast cancer incidence rates when compared to North and South America, but have some of the highest breast cancer mortality rates, including Mexico (Anderson & Caleffi, 2006).

The use of preventative cancer screening methods has been widely implemented for early detection and therefore reduces the rates of breast cancer and cervical cancer death. Methods such as clinical breast exams (CBE), mammograms, breast self-examinations and Papanicolaou (pap) test have been utilized as a main approach for cancer control. According to the Behavioral Risk Factor Surveillance System, 76.5% of women older than 40 years of age and 80%of women older than 50 years of age in the US and Puerto Rico obtained a mammogram within the past two years in 2006. Among these women, studies show that Hispanics in the US are found to be less likely to have ever had a mammogram compared to non-Hispanic women (Central for Disease Control). Since 2005, the use of mammograms in the US has dropped slightly from 2003. Specifically, among Hispanic women over the age of 40 having obtained a mammogram within a 2 year time frame dropped from 65% to 59% (National Cancer Institute). Cultural explanations involving social and cultural norms among Latin communities have been hypothesized to deter women from obtaining preventative measures such as breast and cervical screening (Abraido-Lanza, Chao, & Gates, 2005). In Latin and Caribbean countries where an increase in urbanization and higher education is occurring, there is a greater demand for quality health services (Robles & Galanis, 2002). However in Mexico, breast cancer has been the second leading cause of cancer death in women at 13.3% in 2004 (Brandan & Navarro, 2006). Breast cancer is also the second leading cause of death in Mexico related to neoplasia in women, mainly due in part by the increased incidence of smaller nodules detected too late (Sanchez R, et al., 2007).

Religiosity is a social and cultural factor that has been broadly studied among numerous populations. Both spirituality and religiosity have been used interchangeably as constructs with multidimensional concepts to ascertain the aspect of spiritual-religious dimensions of human beliefs, behaviors and practices (Gullatte, 2006).

The study of religiosity in relation to cancer screening methods, particularly mammograms and pap smears, has been diversely investigated among women in the United States. Health models relating to spirituality and religiosity have been proposed to study the relationship of certain beliefs and seeking preventive screening tests for breast and cervical cancer among specific populations. A two dimensional study on spirituality, which included both beliefs and behavior dimensions, found that the belief dimension of African American women played a more important role in adoptive breast cancer beliefs and mammogram utilization than the behavioral dimension (Gullatte, 2006). Little research has been conducted on the influence of religiosity and spirituality as a predictor of breast and cervical cancer screening usage among women of Latin American countries. Moreover, there have been limited studies specifically looking at religiosity among older aged Latin women.

Purpose of the Study

The purpose of this study is to examine the association between religiosity and the use of breast and cervical cancer screening methods among women older than 60 years of age in Latin America and the Caribbean using cross-sectional analysis of secondary data collected from the Health, Well-being and aging in Latin America and the Caribbean Study (SABE). Furthermore, this study aims to study the social impact of religiosity in relation to health promotion and cancer screening for Latin women.

Research Questions

1. What are the characteristics of the Latin America and Caribbean women aged 60 years and older that participated in the study?

2. What are the prevalence rates differences of breast self-examinations, clinical breast examinations and mammography use among women aged 60 years and older?

3. Is there a relationship between religious importance and the use of breast self-examinations, clinical breast examinations and mammography among women aged 60 years and older?

De-limitations

The sample population will include women aged 60 years and older from seven Latin American and Caribbean cities (Mexico City, Bridgetown, Havana, Sao Paulo, Santiago, Buenos Aires, and Montevideo). These cities are urban or metropolitan areas of the following countries: Mexico, Barbados, Cuba, Brazil, Chile, Argentina, and Uruguay. With the exception of women living in Barbados and Sao Paulo, participants' women were Spanish speaking.

Limitations and Assumptions

Although, findings did reveal a positive association between religiosity and breast cancer screening use, certain limitations were noted in the investigation. a. All the information used for the analysis was self reported; therefore the data collected and results may not accurately portray the association between religiosity and the use of cancer screenings in individual cities. b. Since the data was collected only from large cities, the SABE survey used does not give a completely accurate representation of the diversity of the elderly population that exists in each of the selected countries. Hence, this study may not be generalized to the entire population of each country. c. Since the topic of religion is mostly subjective, the accuracy of quantifying such a topic is difficult. Due to the fact that there is no direct question assessing church attendance, only an assumption could be made that religiosity, measured by the participant's responses on the importance of religion, is an accurate proxy of contact to church organizations as a means of potential sources for information in preventive health screening. d. Given that this study is cross-sectional, a causal relationship cannot be associated between religiosity and breast cancer screening use.

Definition of Terms

Religiosity- a degree of religious activity among those who are religious. These include church attendance, religious group participation, faith in God, prayer, reading of scriptures, and religious attitudes.

Importance of religion- a qualitative self-reported religiosity.

Religious person- is a believer in existence of God and his related religious doctrine or based in Scripture or Bible.

Latin women or Latina- a woman of Hispanic origin. In this study it refers to women residing in countries from Central America, Caribbean and South America.

Breast cancer screening- Surveillance method used for an early detection of breast cancer among women.

Breast cancer screening methods- include breast self-examinations, clinical breast examinations and mammography use

Importance of Study

This study is of great importance due to the fact that there is no information on the relationship between religiosity and cancer screening behaviors among older Latin American women. Also, if an association is found, it will have many potential applications in the Hispanic community. For example, a positive association will support community interventions using existing religious organizations in order to promote breast and other types of cancer screening behaviors not only in these seven Latin American countries, but in Latin women in the U.S. The topic is important to public health because religious practices are highly prevalent among Latina women. Therefore these practices may be potential sources for cancer screening information and education. Positive findings will assist healthcare providers in disseminating information through religious organizations. This information can be utilized when implementing early detection programs, allowing healthcare professionals to form partnerships with certain religious organizations.

Summary

With breast cancer rates in Latin America being of the highest in the world, investigators have begun conducting more studies in these countries. Although no studies have yet investigated religious factors in relation to cancer and screening in this population, studies in the United States have found such a relationship. This study's purpose was to find an association between religiosity and the use of the breast cancer screening methods among older women in seven Latin American countries. Since there is little information on this topic among these populations, this study will make headway for further investigations and will also have potential applications to local Hispanic communities.

CHAPTER 2

REVIEW OF LITERATURE

Religiosity and Health Outcomes

The role of religion in health outcomes and practices has been widely investigated among numerous populations. Aspects of religiosity including religious involvement, social activities, specific denominations and religious beliefs have been continuously investigated in relation to health outcomes among populations. A recent study using a longitudinal survey of older Taiwanese examined the relationship between religious involvement and self-reported measures of overall health status (Yeager, 2006). Results revealed religious attendance to have the strongest association with health outcomes, but only prior to controlling for social networks, health behaviors and prior health status. Involvement in social activities, however, was found to have a stronger association even after controlling for prior health status. Such results suggest that people who attend religious congregations exhibit better health behaviors and greater social participation, which results in positive effects on health. Therefore, health-related behaviors and social activity are potential mediators of religion benefiting health (Yeager, 2006). Other studies have also concluded similar findings in regards to social support and religious coping through the membership of a religious organization (Thune-Boyle, 2006). When estimating the effects of religious salience and denomination on six different types of preventative health care including mammograms, breast self exams, flu shots, cholesterol screening, pap smears and prostate screenings, a study reported both elderly women and men who stated high level of religiosity were more likely to use the preventative service (Benjamins, 2004). As health care shifts the focus from diagnostic measures to preventive measures in the intention of reducing health disparities, the role of religious involvement and social support becomes highly important.

Religiosity among older populations

Older populations are an important group source in investigating the relationship of religiosity and preventive health outcomes. This is primarily due to the fact that age affects both religious involvement and health care use (Benjamins, 2004). Older individuals are commonly found to be both more religious and use health care services more frequently. Among elderly women, religious importance is more highly associated with the use of preventive screenings than men (Benjamins, 2004). Overall, women appear to have stronger religious effects on their health both in the United States as well as internationally (Koenig, 2001). In a study done in Latin American countries, 80% of the elderly population considered religion to be important in their lives. Women were four times more likely to have a religious affiliation and more than twice as likely to report religion being important. In addition, elderly adults reporting a strong importance of religion were less likely to report fair or poor health in comparison to those who were less religious (Reyes-Ortiz, 2007).

Breast Cancer screenings in Latin America and the Caribbean

For the last forty years, mortality rates related to breast cancer have been increasing within Latin American countries and the Caribbean (LAC) (Robles, 2002). Risk factors of breast cancer are thought to be related to socioeconomic development in most of these countries as well as changes in reproductive behaviors due to this development. Industrialized countries are widely implementing screening and treatment protocols as ways to minimize breast cancer mortality. Studies have shown that out of three available screening methods including mammograms, clinical breast examinations and self-breast examinations, only mammograms have been effective in reducing mortality rates by 23% for women 50-69 years of age (Kerlikowske, 1997). In Mexico, where the majority of breast cancer tumors are commonly diagnosed at early stages, mammograms have been used in most of these cases (Brandan & Navarro, 2006). A recent retrospective study in Chile found that mammography use detected about 61% of small cancerous nodules in their participants, therefore concluding the need for more mammogram use as a primary, early screening method among women (Sanchez R, et al., 2007). A secondary method of screening used, which physicians conduct periodically is the Clinical Breast Examination. There is no direct evidence investigating the effect of Clinical Breast Examinations in comparison to no screening or to mammography within Latin American and Caribbean populations (Robles & Galanis, 2002).The use of Breast-Self Exams is based on the idea that 90% of all breast cancers are detected by women themselves (Giuliano, Tierney, McPhee, & Papadakis, 1996). Women in Mexico have been found to detect lesions less than 1 cm in size and superficial lesions as small as 0.5

cm using self breast exams, once they have learned the proper technique (Brandan & Navarro, 2006). In Cuba, despite the universal access to healthcare and technological screening methods like mammograms, 97% of malignant neoplasia in the breast is detected by women conducting self-breast exams (Betancourt, Carmona, Herrera, & Viamontes, 2003). Despite the lack of evidence showing its effectiveness, the use and teaching of breast self examination in developing countries in the Latin American and Caribbean region primarily focuses on the awareness of breast cancer at a low cost (Robles & Galanis, 2002).

Religiosity and breast cancer screenings

As breast cancer incidence increases to become the second leading cancer in women worldwide, social and behavioral risk factors such as religiosity are being studied in relation to screening usage. Studies examining the use of preventive screening methods such as mammograms and Clinical breast exams among various religions have shown substantial differences among religious groups such as Christians, Muslims and Druze in Arab women (Azaiza & Cohen, 2006). Qualitative studies focusing on certain ethnicities in underserved areas such as Polynesian women native to Hawaii suggest older, religious women are the primary focus of family-oriented education related to breast cancer prevention (Ka'opu, 2008). Limited qualitative studies targeting African American populations also revealed religion and spirituality to be significantly influence several important health behaviors and health care practices when asked in a survey (Underwood & Powell, 2006). A quantitative study done in Utah investigated the association between

Mormon women and breast cancer survival. The study found that age-adjusted cancer incidence was less in those who were religiously affiliated with the Mormon Church (LDS) in comparison to those who were not throughout the entire age span. In addition, both LDS and non-LDS women displayed lower breast cancer incidence rates than in Surveillance Epidemiology and End Results (SEER) for the entire United States (Merill & Folsom, 2005).

Few studies investigating religiosity and breast cancer screening have focused on older women in Latin America. The purpose of this investigation is to study religious importance and affiliation in relation to breast cancer screening among older women of Latin descent in seven cities of Latin America and the Caribbean. Findings within this investigation will assist to better understand possible cultural and social implications leading to better screening use.

CHAPTER 3

METHODOLOGY

Study Population

The study population for this study consists of 6,550 women aged 60 and older from the Health, Well-being and Aging in Latin America and Caribbean Study (SABE). The women from this study were interviewed in seven cities: Buenos Aires (Argentina, n=656), Bridgetown (Barbados, n=914), Havana (Cuba, n=1197), Mexico D.F. (Mexico, n=735), Montevideo (Uruguay, n=936), Santiago (Chile, n=852) and Sao Paulo (Brazil, n=1260).

Protection of Human Participants

This study was approved by the Institutional Review Board at the University of North Texas Health Center for exempt status. Research involving the study of the existing data, documents, and records are publicly available or recorded by the investigator in such a manner that subjects cannot be identified.

Study design and data source

Data obtained from the SABE study consist of a cross-sectional survey carried out in seven cities of Latin America and Caribbean countries from 1999-2000 (Albala, 2005).The SABE study was mainly coordinated and designed by the Pan American Health Organization in collaboration with the Center for Demography and Ecology from the University of Wisconsin-Madison. Local teams in each country along with a principal investigator trained the interviewers in each city. The study sample population is comprised by urban populations of individuals aged 60 or older living in each of the cities chosen. Sampling was based on classical multistage clustering with stratification of units at the highest levels of aggregation used. The main sampling unit consisted of independent households within the predetermined geographic areas grouped based on socioeconomic status. Groups were then divided into secondary sampling units entailing a smaller number of households. From these households, target individuals 60 years and older were then randomly selected. Participants were contacted and interviewed in their homes.

Dependent variables

The dependent variables are breast self-examination, clinical breast examination and mammography use. Breast self-examination is assessed by the question: “In the last two years, have you regularly examined your breasts for lumps?” Responses are yes or no. Clinical breast examination was assessed by the question: “In the last two years, were your breasts examined by a health professional to see if you have lumps in your breasts?” Responses are yes or no. Mammography use was assessed by the question: “In the last 2 years have you had a mammogram that is a test to determine whether you have breast cancer?” Mammography use was dichotomized as user (response=yes) and nonuser (response=no).

Independent variables

Main independent variable is importance of religion, and was assessed in each city by this question: “How important would you say religion is in your life?” Subjects in all cities had these response options: 1- Very important, 2-Somewhat important, 3-Not important, and 4-No response or missing (because of no religious affiliation or refusal to answer). The three first categories correspond to any religious affiliation and the last category corresponds to having no religious affiliation.

Control variables that are usually associated in the literature with the dependent variables include age, marital status, education, medical conditions, and functional status. Socio-demographic correlates examined are age (years), marital status (currently married, yes or no), and education (years). Number of children was assessed by asking a woman how many children has she had, from 0 to 27 (not including step-children, adopted children, abortions or stillbirths).

Additional control variables that will be examined include preexisting medical conditions assessed asking the respondent if she had been ever told by a doctor or other health care provider that she had diabetes mellitus, arthritis, hypertension, heart disease, stroke or cancer (yes or no). A summary score for medical conditions was constructed, from 0 to 6, and used as a continuous variable. Functional status was assessed by eight Instrumental Activities of Daily Living items (IADL) (Fillenbaum, 1985), score 0-8. Women were asked if they had difficulty performing any of these eight activities at the time of the interview: using the telephone, traveling alone, going shopping for groceries, preparing own meals, taking own medicine, handling own money, doing light house work, or doing heavy house work.

Data Analysis

The outcomes of this study were defined as reporting a mammography, clinical breast examination or self breast examination within the last two years. The independent variables in this study were religiosity, other socio demographics, medical conditions, and functional status. Religiosity will be the main variable which will be examined based on religious affiliation and its level of importance (religion being very important, somewhat or not important).

Descriptive analysis (frequencies, percentages) was used to report the prevalence of breast cancer screening methods including mammograms, clinical breast exams and self breast examinations. Bivariate analysis between the dependent variables (cancer screening) and religiosity categories were tested using Chi-square. Multivariate logistic regression analysis will be used to report the association between religiosity categories and breast cancer screening methods adjusting for the control variables. For all analysis, SAS systems for Windows, version 9.1 and SPSS, version 15 for Windows will be used.

CHAPTER 4

RESULTS

Table1a and 1b show the sociodemographic and health characteristics of Latin American and Caribbean women aged 60 years and older from the SABE study. About a third of the population is older than 75 years, with Sao Paulo having the highest percentage (44.4%) and Mexico City having the lowest (26.9%). Approximately one third (30%) of the population are married with Mexico City having the highest percentage (38.8%) and Havana having the lowest (21.0%). Women widowed and divorced were considered unmarried. About 76% of the population has 0-6 years of education or less. Sao Paulo has the highest percentage (92%) and Havana the lowest (21.0%). An estimated two thirds (76%) of the population has any type of insurance with Bridgetown having the lowest percentage (13.1%) and Sao Paulo the highest (97.4%). Attainment of insurance did not apply to Havana since there is a universal healthcare system, therefore all women had insurance. Approximately 13% of women are not religious: Havana having the highest percentage (35%) and Mexico City the lowest (17%). The average mean for pre-existing medical conditions for all seven cities is 1.5±1.1. Havana has the highest mean of pre-existing medical conditions (1.8±1.2) and Mexico City the lowest (1.2±1.0). The overall mean number of IADL difficulties within this population was 0.9+1.6 within this population have IADL difficulties with Sao Paulo and Santiago having the highest mean (1.2 ±1.9) and Montevideo having the lowest mean (0.4±1.0).

Table 1a. Study Population, Women aged 60 years and older

	Buenos Aires	Bridgetown	Sao Paulo	Santiago
	N=656	N=914	N=1260	N=852
Age				
60-74	449 (68.5)	550 (59.5)	701 (55.6)	536 (62.7)
75+	207 (31.5)	374 (40.5)	561 (44.4)	319 (37.3)
Marital status				
Married	197 (30.0)	217 (23.7)	460 (36.5)	249 (29.2)
Unmarried	459 (70.0)	697 (76.3)	800 (63.5)	603 (70.8)
Education				
0-6	502 (76.5)	735 (79.6)	1161 (92.0)	586 (68.5)
7+	154 (23.5)	189 (20.4)	101 (8.0)	269 (31.5)
Number of children (0-27)	2.5 ± 2.4	3.6 ± 2.9	3.9 ± 3.3	4.1 ± 2.9
Insurance				
Any	557 (85.3)	121 (13.1)	1227 (97.4)	768 (89.9)
None	96 (14.7)	800 (6.9)	33 (2.6)	86 (10.1)
Religiosity				
Very important	511 (77.9)	830 (89.8)	1025 (81.2)	738 (86.3)
Somewhat/ not at all	105 (16.0)	47 (5.1)	67 (5.3)	86 (10.1)
No-religious	40 (6.1)	47 (5.1)	170 (13.5)	31 (3.6)
Medical conditions (0-6)	1.5 ± 1.0	1.6 ± 1.1	1.5 ± 1.1	1.6 ± 1.1
IADL difficulties (0-8)	0.7 ± 1.2	0.6 ± 1.3	1.2 ± 1.9	1.2 ± 1.9

Data are presented as percentages (%) or means ± SD. Medical conditions include arthritis, hypertension, diabetes, heart attack, stroke, and cancer. N/A indicates that insurance does not apply to Havana.

Table 1b. Study Population, Women aged 60 years and older

	Havana	Mexico City	Montevideo	Total sample
	N=1197	N=735	N=936	N=6550
Age				
60-74	731 (61.1)	541 (73.1)	633 (69.1)	4141 (63.2)
75+	466 (38.9)	199 (26.9)	283 (30.9)	2409 (36.8)
Marital status				
Married	251 (21.0)	285 (38.8)	322 (35.2)	1981 (30.3)
Unmarried	946 (79.0)	450 (61.2)	593 (64.8)	4548 (69.7)
Education				
0-6	751 (62.7)	602 (81.4)	623 (68.0)	4960 (75.7)
7+	446 (38.9)	199 (26.9)	283 (30.9)	1590 (24.3)
Number of children (0-27)	2.8 ± 2.5	5.6 ± 3.5	2.8 ± 2.4	3.6 ± 3.0
Insurance				
Any	N/A	531 (72.0)	827 (96.7)	4050 (76.4)
None	N/A	206 (28.0)	28 (3.3)	1249 (23.6)
Religiosity				
Very important	568 (47.5)	651 (87.9)	565 (61.7)	4888 (74.6)
Somewhat/ not at all	208 (17.4)	72 (9.7)	244 (26.6)	829 (12.7)
No-religious	421 (35.2)	17 (2.3)	107 (11.7)	833 (12.7)
Medical conditions (0-6)	1.8 ± 1.2	1.2 ± 1.0	1.5 ± 1.1	1.5 ± 1.1
IADL difficulties (0-8)	0.9 ± 1.8	0.9 ± 1.7	0.4 ± 1.0	0.9 ± 1.6

Data are presented as percentages (%) or means ± SD. Medical conditions include arthritis, hypertension, diabetes, heart attack, stroke, and cancer. N/A indicates that insurance does not apply to Havana.

Tables 2a and 2b show the bivariate analysis of screening use including mammograms, clinical breast exam and self-breast exams by religious categories. The highest mammogram rate among the seven cities is Sao Paulo at 34.6 % and the lowest in Havana at 10%. The highest Clinical breast exam rate is in Bridgetown at 58.6% and the lowest in Havana at 28.7%. Among the seven cities self breast exam rates are highest in Bridgetown at 58.4% and lowest in Santiago at 44.8%. Screening method rates significantly associated with religiosity included the following cities: Buenos Aires (SBE), Sao Paulo (mammogram, CBE, and SBE), Havana (SBE), and Mexico City (mammogram, CBE, SBE).

Table 2a. Prevalence of screening use (mammogram, clinical breast exam, self-breast exam) by religiosity categories.

	Buenos Aires	Bridgetown	Sao Paulo	Santiago
Variables	N=656	N=914	N=1260	N=852
Mammogram				
% per city	29.4	18.8	34.6	20.8
Religiosity				
Very important	29.9	19.0	37.9 *	21.0
Somewhat/ not at all	28.6	23.4	37.3	23.3
No-religious	25.0	10.9	13.5	9.7
CBE				
% per city	44.6	58.6	45.1	41.0
Religiosity				
Very important	43.3	58.7	48.0 *	41.7
Somewhat/ not at all	54.3	63.0	49.2	41.9
No-religious	35.0	51.1	25.9	22.6
Self-breast exam				
% per city	53.3	58.4	56.5	44.8
Religiosity				
Very important	56.1 *	58.8	62.8 *	45.3
Somewhat/ not at all	48.6	51.1	50.7	40.7
No-religious	30.0	57.4	20.2	45.2

Table 2b. Prevalence of screening use (mammogram, clinical breast exam, self-breast exam) by religiosity categories.

	Havana	Mexico City	Montevideo
Variables	N=1197	N=735	N=936
Mammogram			
% per city	10.0	14.1	28.6
Religiosity			
Very important	10.6	15.4 *	28.5
Somewhat/ not at all	8.2	4.2	29.9
No-religious	10.2	6.2	26.2
CBE			
% per city	28.7	43.4 *	45.8
Religiosity			
Very important	28.3	45.3	45.7
Somewhat/ not at all	30.8	27.8	46.3
No-religious	28.3	37.5	45.8
Self-breast exam			
% per city	56.5	57.1	57.6
Religiosity			
Very important	58.1 *	58.7 *	58.3
Somewhat/ not at all	63.5	46.5	54.5
No-religious	50.9	37.5	60.7

Data are presented as percentages (%). p-value * <.05 across religiosity categories, obtained by Chi-square

Table 3a and 3b display the results for the multivariate logistic regression analysis for religiosity predicting the odds of screening methods use in the past two years by city from the SABE survey. Among the total population, all three screening methods were significantly associated with religiosity: Mammogram 1.9 (1.5-2.4), CBE 1.7 (1.4-2.0), and SBE 1.4 (1.2-1.7) for religion being very important compared to women who are not religious. In analysis by city, the following showed significant odds ratio: Sao Paulo (Mammograms, CBE, and SBE), Buenos Aires (SBE), Santiago (CBE), and Havana (SBE).

Table 3a. Multivariate logistic regression analyses by each city

	Buenos Aires N=656	Bridgetown N=914	Sao Paulo N=1260	Santiago N=852
Variables	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Mammogram				
Religiosity (ref. not religious)	1.00	1.00	1.00	1.00
Very Important	0.9 (0.4-2.1)	1.9 (0.7-5.1)	2.0* (1.2-3.4)	2.4 (0.7-8.1)
Somewhat/ not at all	0.8 (0.3-2.1)	2.4 (0.7-7.9)	1.6 (0.8-11.6)	3.1 (0.8-11.6)
Clinical Breast Exam (CBE)				
Religiosity (ref. not religious)	1.00	1.00	1.00	1.00
Very Important	1.1 (0.5-2.3)	1.2 (0.7-2.3)	1.8* (1.2-2.8)	2.4* (1.01-5.9)
Somewhat/ not at all	1.6 (0.7-3.8)	1.4 (0.6-3.3)	1.7 (0.9-3.3)	2.6* (1.0-7.0)
Self-breast exam (SBE)				
Religiosity (ref. not religious)	1.00	1.00	1.00	1.00
Very Important	2.3* (1.1-4.8)	1.0 (0.5-1.9)	4.5* (2.8-7.1)	0.9 (0.4-1.9)
Somewhat/ not at all	1.7 (0.7-3.8)	0.8 (0.3-1.8)	2.3* (1.2-4.6)	0.8 (0.3-1.9)

*<0.05 † <0.01 ‡ < 0.001 § <0.0001

Table 3b. Multivariate logistic regression analyses by each city

	Havana N=1197	Mexico City N=735	Montevideo N=936
Variables	OR (95% CI)	OR (95% CI)	OR (95% CI)
Mammogram			
Religiosity (ref. not religious)	1.00	1.00	1.00
Very Important	1.1 (0.7-1.6)	3.4 (0.4-26.6)	1.3 (0.8-2.0)
Somewhat/ not at all	0.7 (0.4-1.4)	0.8 (0.1-8.0)	1.2 (0.7-2.1)
Clinical Breast Exam (CBE)			
Religiosity (ref. not religious)	1.00	1.00	1.00
Very Important	1.0 (0.8-1.3)	1.5 (0.5-4.3)	1.0 (0.7-1.6)
Somewhat/ not at all	1.1 (0.7-1.6)	0.7 (0.2-2.1)	1.2 (0.6-1.6)
Self-breast exam (SBE)			
Religiosity (ref. not religious)	1.00	1.00	1.00
Very Important	1.3 (0.9-1.7)	2.7 (0.9-8.2)	1.0 (0.7-1.6)
Somewhat/ not at all	1.6* (1.1-2.2)	1.5 (0.5-4.8)	1.2 (0.6-1.6)

*<0.05 † <0.01 ‡ < 0.001 § <0.0001

Table 4 shows the results for the multivariate logistic regression analysis for all predicting factors on the screening method use. Women that are more religious show to have greater odds (mammograms 1.92, CBE 1.7, SBE 1.44) of screening method use compared to women who are not religious. Other variables that were associated with screening method use were age, marital status, education, previous medical conditions and IADL difficulties. Parity also revealed an association with mammogram use and self-breast exams, but showed no association with clinical breast exams. For mammogram use and self-breast exams, parity showed lesser odds of screening use than women with no children. Women older than 75 years of age also have reduced odds of obtaining mammograms, CBE and SBE.

Table 4. Multivariate logistic regression analyses for religiosity predicting use of screening methods in women aged 60 years and older, SABE study (1999-2000), combined sample of seven cities (n=6,550)

	Mammogram	**Clinical Breast Exam (CBE)**	**Self-breast exam (SBE)**
Variables	Odds ratio (95% confidence intervals)	Odds ratio (95% confidence intervals)	Odds ratio (95% confidence intervals)
Religiosity			
Very important	1.92 (1.55-2.38)	1.7 0 (1.44-2.00)	1.44 (1.23-1.69)
Somewhat/ not at all	1.48 (1.14-1.93)	1.40 (1.14-1.73)	1.12 (0.92-1.37)
No-religious	1.00	1.00	1.00
Age			
60-74	1.00	1.00	1.00
75+	0.58 (0.50-0.67)	0.68 (0.61-0.77)	0.61 (0.54-0.68)
Marital status			
Married	1.74 (1.53-1.97)	1.44 (1.29-1.61)	1.26 (1.13-1.42)
Unmarried	1.00	1.00	1.00
Education			
0-6	1.00	1.00	1.00
7+	1.53 (1.33-1.75)	1.45 (1.29-1.64)	1.31 (1.16-1.48)
Number of children (0-27)	0.97 (0.95-0.99)	1.00 (0.98-1.02)	0.98 (0.96-0.99)
Medical conditions (0-6)	1.11 (1.05-1.17)	1.14 (1.09-1.19)	1.17 (1.12-1.23)
IADL difficulties (0-8)	0.92 (0.88-0.96)	0.93 (0.90-0.97)	0.86 (0.83-0.89)

Figure 1 shows the percentage of screening use by method (mammogram, CBE, SBE) for the total sample of seven cities. Self breast exams are the highest used screening method among all seven cities (55%) while mammogram use had the lowest percentage of use at 22.4%

Figure 1. Percentage of screening method use for total sample.

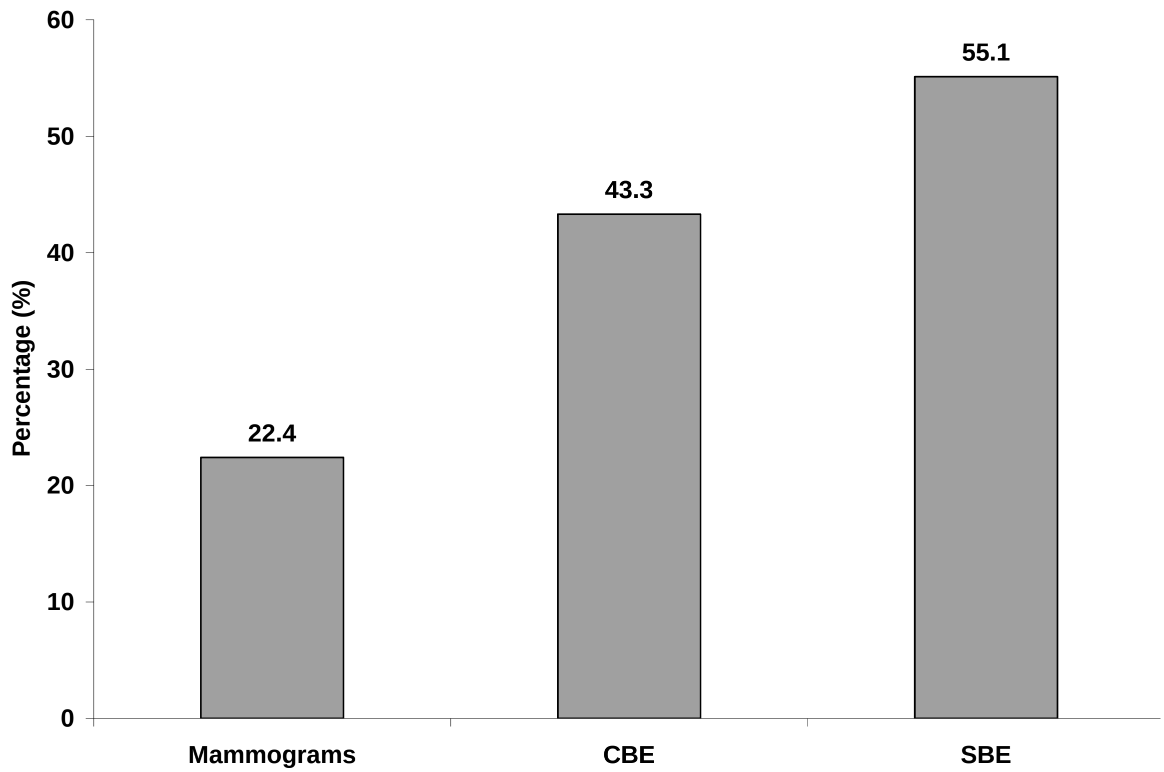

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Figure 2 shows the percentage of screening method use by religious categories in each of the seven cities. In all seven cities, SBE has the highest screening method use ranging from 44% in Santiago to 58% in Bridgetown. Mammogram use has the lowest percentage rate ranging from as low as 10% in Havana to 29% in Buenos Aries. Bridgetown had the same percentage rates for both CBE and SBE (58.5% and 58.4%).

Figure 2. Percentage rates of screening method use by each city.

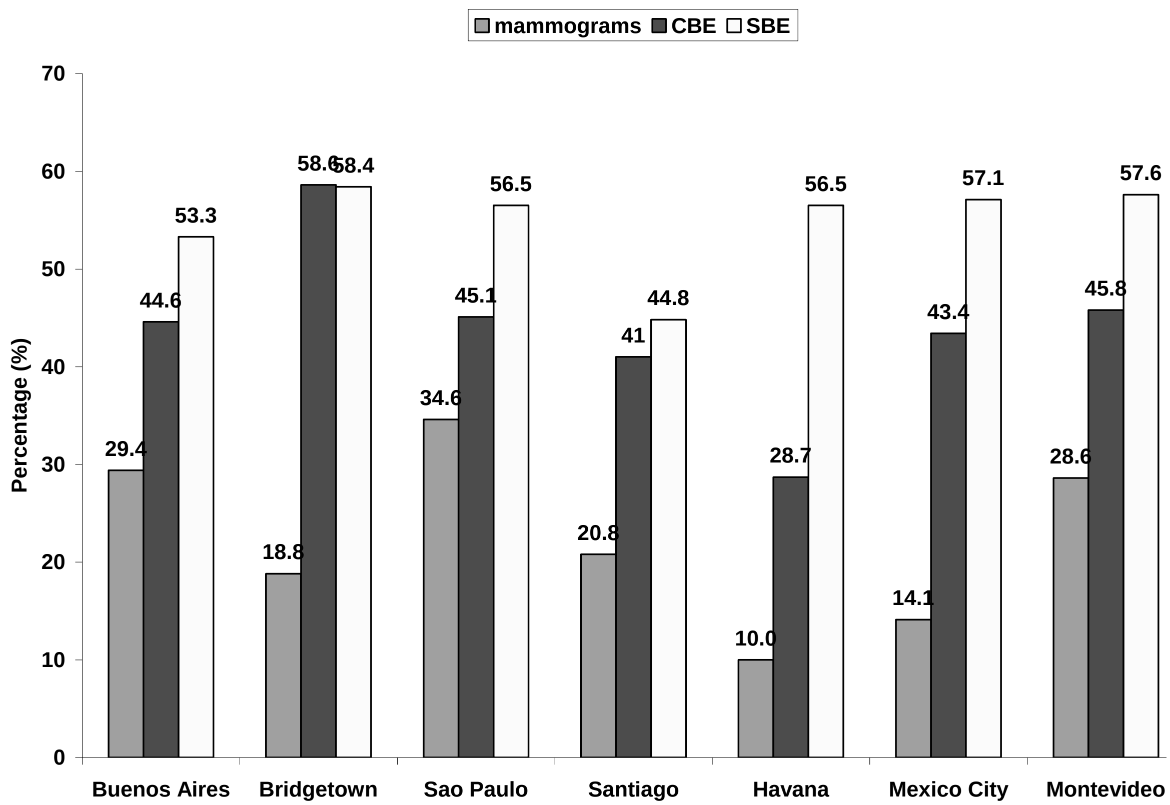
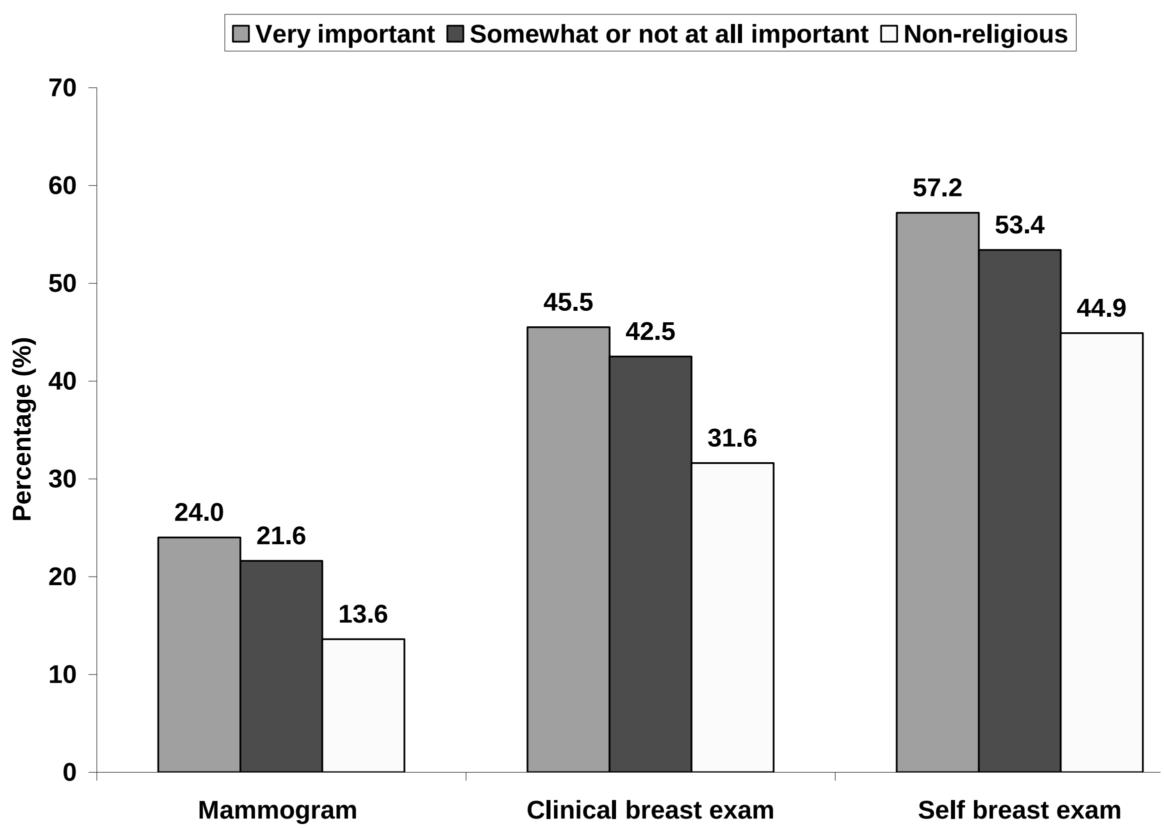


Figure 3 displays the percentage of screening method use by religious categories in the total sample of cities. The figure shows that women who state religion to be very important have a higher percentage rate of seeking breast cancer screening methods when compared to women who are not religious. Self breast exams have the highest percentage rate compared to clinical breast exams and mammograms in all three religious categories. Of the three screening methods tested, women who stated religion to be very important had the highest percentage rate (57%) in self breast exams

Figure 3. Percentage of screening method use by religious categories in total sample.



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CHAPTER 5

DISCUSSION/CONCLUSION

The purpose of this study was to analyze and compare the association between religiosity and screening method use among older women in seven Latin American and Caribbean cities. Overall, a positive association between religiosity and the use of mammograms, clinical breast exams and self breast exams was found.

This study supports findings from other investigations of older adults showing that religion plays an important role in health. Other studies have shown that frequent religious activities are associated with reduction in cardiovascular risk factors, psychological wellbeing, life satisfaction, and longer life expectancy (Ayele et al., 1999; Campbell et al., 1999; Ho et al., 1995; Hummer et al., 1999; Koenig et al., 2001; Levin et al., 1995; Oexmann et al., 2000; Resnicow et al., 2001; Strawbridge et al., 2001; Reyes-Ortiz et al, 2007). The positive association between religiosity and screening use found in this study may be an indicator of frequent church attendance, and church attendees engaging in healthier lifestyles (Strawbridge et al. 2001), such as having recent medical checkups. Numerous studies among U.S. African American communities have suggested that significant improvements can occur in their health status if health education and outreach efforts are presented and promoted through religious, spiritual and faith-based venues (Underwood et al., 2006). Religiosity as form of social support, especially through church attendance or participation in social religious activities, has been associated with increased breast cancer screening among African American women

(Farmer et al., 2007). In addition, women of older age believing that religions can be combined with standard medical treatments in curing breast cancer had a small positive effect on self-reported mammography (Mitchell, 2000). The effect of socioeconomic characteristics on this dimension of religious belief suggests that women who are older, such as the sample of my study, are more likely to believe in religious interventions combined with medical treatment to prevent and cure breast cancer (Mitchell, 2002).Studies among African American women of older age and diverse socioeconomic status have also found that that women for whom strong religious beliefs had a great influence in their lives and also had a greater reliance on church ministry advice, supported mammography screening as well (Fowler, 2006). One mechanism mentioned in previous studies that may explain why religious women tend to have higher screening rates than non-religious women, is the perception of self-efficacy. These studies have used the health belief model (Russell et al., 2006), which has been useful in predicting health beliefs in mammography screening use in African Americans, to find that perceptions of self efficacy are associated with higher number of repeated mammograms (Champion & Miller, 1996; Champion & Scott, 1997; Champion & Menon, 1997; Skinner, Arfken & Sykes, 1998; Champion & Springston, 1999). Other findings, however, have found a different association among religious faith and cancer screening. A marginal amount of African American women believed religious faith to be more important than medical approaches in treating and curing cancer, resulting in a positive effect on women’s intention to delay presentation of a self-discovered breast lump (Mitchell, 2002).

When analyzing the seven cities individually, only Sao Paolo (Brazil) showed a significant association for all three screening methods. Santiago (Chile) showed a significant association for clinical breast exams, whereas Buenos Aires and Havana showed a significant association for only self-breast exams. Such associations may suggest that religion importance in association with attendance may have potential benefits for higher screening use. In Brazil, although no studies have shown religious organizations to take part specifically in cancer screening, there is evidence of local church organizations being used to facilitate and educate youth on HIV prevention and condom use (Da Silva, 2000). This suggests that there may be a connection between religious organizations and the facilitation of health education and possibly cancer screening among Brazilians.

In cities showing no significant association between religiosity and breast cancer screening methods, religious churches or congregations may be isolated and not have a direct alliance with local health services. Therefore, although women are extremely religious and take part in their congregation, they may not be receiving any health education or information, specifically in cancer screening. Factors such as inaccessibility to mammogram services or cost may be deterring religious groups from facilitating the aid of breast cancer screening methods. Physician consultation and regular medical care is also an important precursor to mammography and clinical breast examinations (Mitchell, 2002) (O'Malley et al. 2001).

When analyzing and comparing the use of each screening method separately, mammogram use had the lowest percentage rate for the combined study sample as well as for individual cities. Factors such as lack of access or regulation for breast cancer screening, low education levels, and insufficient or unequal healthcare may have influence in lower prevalence rates among mammography use in comparison to clinical breast examinations and self breast examinations (Reyes-Ortiz, 2007). In Brazilian populations, lack of mammography use and clinical breast examinations have been found to be associated with factors including older age (>70), mixed race (black/Latin), low income, and marital status (Amorim VMSL et al., 2008). Although the World Health Organization along with its regional office, the Pan American Health Organization, have provided guidelines for organizing national cancer control programs in these cities, these guidelines are focused only on breast cancer screening for those countries of high resources (World Health Organization, 2002). Also, in many of these countries public health officials have little or no regulatory role in standard clinical screening (Organización Panamericana de la Salud, 1998). Other factors including the lack of referral by physicians in local health centers have also found to be related to low mammography use among countries such as Brazil (Marinho, 2008).

An inclination of rates from mammogram use to self-breast examinations was observed in all cities except Barbados, where rates for clinical breast examinations and self breast examinations were fairly similar. This finding may be partly due to healthcare being free for all Barbadians and older populations in Barbados having unlimited access to primary healthcare through government-ran polyclinics (Health in the Americas, 1998;

Hambleton, 2005). Higher rates of self breast examinations compared to mammography show that women are comfortable and consistent with personal screening for breast cancer, but may be more resistant to clinical examinations. In Cuba, for example, where breast cancer mortality rates have shown no significant increase in the past decade (Bosetti, 2005), the self breast examination rate in this study is more than twice as high as mammography rates. This may infer that self- breast examinations may be a form of effective screening for countries that lack the resources or access for mammography use. In Mexico, despite the controversial publications of its effectiveness, self breast examinations have assisted in detecting more than 90% of breast cancer cases through women's own detection of nodules (Brandan & Navarro, 2006).

This study and its findings have potential implications for outreach and education programs aimed at increasing breast cancer screening rates among Hispanic and Latin women. The positive association found among the overall sample as well as with Sao Paulo will help support community interventions using existing religious organizations in order to promote breast and other types of cancer screening behaviors.

Recommendations

Further investigations examining the role of religious affiliation and importance in breast cancer prevention should be explored among Hispanic and Latin communities. Future studies using questionnaires like SABE should include more in depth questions asking about church attendance and more information on participation in other church-related activities such as praying groups, health promotion education, or providing transportation to health care facilities. Since Brazil had the most prominent findings in this investigation, additional studies should be considered in this population perhaps with a greater age range of women from 35 to 75 years of age. Also, a more diverse population as far as socioeconomic and rural versus urban populations should be considered.

Conclusion

Overall, this study revealed an association between religiosity and the use of breast cancer screening methods among older women in all seven cities in Latin America and the Caribbean combined. This finding suggests that religious congregations and church affiliation with local health services to promote and educate older women will benefit them. These findings provide new possible ways for outreach and education in programs aimed at improving breast cancer screening use.

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