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A national survey of older (65+) women in Puerto Rico was conducted to assess their knowledge and beliefs of breast cancer, compliance with early detection practices, and perception of barriers associated to non-compliance. The sample was stratified by area of residence and socioeconomic level.

No relationship was found between knowledge and detection practices. Beliefs, on the other hand, had an impact on preventive behavior. Area of residence was not a determining factor for breast-cancer knowledge and beliefs and compliance with early detection practices. A higher socioeconomic status, more years of schooling, and younger age increased the likelihood of early-detection practices. CBE was the most often used early detection practice, followed by the mammogram, with BSE a distant third. The women mainly cited personal factors as most important obstacles for non-compliance with established guidelines. However, statistical analysis demonstrated that external factors were more significant than personal ones in terms of compliance with breast cancer early-detection behavior.

A pilot health promotion program was designed based on the findings. It combines education to the aged women, training for health-care providers, and coordination of appointments and transportation to CBE and mammograms. An evaluation plan was also formulated.

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TABLE OF CONTENTS

Table of Contents (cont.)

TABLES

Table of Contents (Cont.)

TABLES

FIGURES

KNOWLEDGE AND BELIEFS OF BREAST CANCER AMONG
ELDERLY PUERTO RICAN WOMEN

INTRODUCTION

Overview

The risk of a woman developing breast cancer increases with age. Age is a main risk factor for breast cancer. Older women are at higher risk of developing breast cancer and dying from the disease than their younger counterparts. Women 65 years of age or older face a 6 times higher risk of developing breast cancer than women under the age of 65 and a 7 times higher risk of dying from this disease than women under the age of 65 (Haynes & Ory 1992; Constanza 1992). Approximately 40 to 45% of invasive breast cancers occur in women who are 65 or older (Mor, Pacala & Rakowski 1992; Kopans 1992).

With a growing proportion of the population 65 years of age and older, and the expected increase of this segment of the population as baby-boomers age, it is expected that breast cancer will become a more significant health issue for older women. However, studies indicate that breast cancer screening rates decrease with increasing age (Constanza 1992, Fletcher et al. 1993, Haynes & Ory 1992). Despite studies that indicate that a mammography is the best method for early detection of breast cancer and that there is a need for a periodic clinical breast examination (CBE) and mammography, women 50 years of age and older have been slow to adopt these practices (Constanza 1992, Fletcher et al. 1993, Haynes & Ory 1992, Rimer 1993, 1990 Forum for Breast Cancer Screening in Older Women 1992).

Information about barriers to breast cancer screening in older women in the United States is limited, particularly the effect of physician referral and knowledge of early detection practices (Haynes & Ory 1992, Saint-Germain & Longman 1993) as well as the women's knowledge and attitudes about the disease and risk factors. The lack of a physician recommendation to undergo screening has been found to be the most important barrier for older women, particularly those over 70 (Rimer & King 1992). The lack of information about breast-cancer knowledge and use of recommended screening tests is even scarcer for cultural and ethnic subpopulations (Saint-Germain & Longman 1993, US DHHS 1991). Thus, it is important to recognize minority women's knowledge and concerns about breast cancer, whether they follow the recommended screening guidelines, and what are the barriers for compliance with suggested screening intervals.

Purpose of the Report

The results that are discussed in this report are part of a larger Project to address some unanswered research questions in breast cancer early-detection practices among Puerto Rican women 65+ residing in Puerto Rico. The report explains the outcome of an investigation to gain insight of some personal and external barriers affecting breast cancer early-detection practices of

elderly Puerto Rican women. It assesses older Puerto Rican women's knowledge and beliefs of breast cancer, early detection practices, and barriers associated to non-compliance with breast self-examination (BSE), CBE, and mammograms. The Project also contemplates the design of a pilot breast-cancer health promotion program for Puerto Rican elderly women based on the research findings. The design of the specific health promotion program is also discussed in this report. The program will be implemented and evaluated on the fourth and last year of the Project.

The last available official report on vital statistics of Puerto Rico indicate that cancer was the second cause of death for older women in Puerto Rico for 1990 (Sánchez-Ayéndez & Dávila-Román 1993). Heart ailments was first and diabetes, third. In terms of breast cancer morbidity, when age specific breast cancer incidence rates are calculated for 1990, there is an increase from 88.7 per 100,000 females 40 to 44 to 202.7 per 100,00 females 75 or older (Department of Health of Puerto Rico 1991).

During the first year of the Project, focus groups were conducted to gain insight among women 65 years of age and older in Puerto Rico of breast cancer and screening issues ranging from breast cancer knowledge and beliefs to perception of barriers for early detection practices. The results of the focus groups were used to construct a cohort and culturally-sensitive questionnaire. The measurements were validated during the second year of the study. The validated questionnaire was used in a national survey of 500 Puerto Rican women 65 and older. The sampling design was stratified by area of residence (type of city as described by the US census definitions) and socioeconomic status (as measured by median house price). The survey questionnaire focused on the following areas: (a) sociodemographic information, (b) family and personal history of breast cancer, (c) early detection practices, (d) breast-cancer knowledge and beliefs, and (e) health status.

This Report pertains to the third year of the Project and focuses on the discussion of the principal findings of the national survey and the design of the health promotion program. It centers on a demographic description of the population and the significant variables that explain reasons to follow recommended intervals of early detection practices as well as barriers for not following the established guidelines. Measures of central location and spread were calculated to summarize the results. Contingency tables were prepared to describe and determine statistical association. Logistic regression models were used to determine the relationship among mammograms and external and personal barriers as well as specific demographic and health variables. Based on to the survey results, a health promotion program was designed to serve as a pilot to increase older Puerto Rican women's compliance with breast cancer early-detection practices. This pilot program could also serve as a model for programs geared to other Latino women in the United States.

NATIONAL SURVEY

Methodology

Data analysis focused on the most important barriers to breast cancer early detection practices. Internal barriers were defined as knowledge, beliefs and self-perception of health. Gender preference for physician was considered only for CBE. External barriers were defined as those related to health insurance, transportation, referrals to mammograms, and information provided by health-care providers about breast cancer and early detection practices. The detection practices considered were: BSE once or twice a month, CBE during the last year, mammogram sometime in life, and mammogram during the last two years. The effect that social and demographic variables, family and personal history of breast cancer, and visit to a gynecologist had on detection practices was also considered.

A univariate description of the data was the first step of analysis. Data on marital status and education was compared with the information provided by 1990 Census Bureau. The prevalence rates were computed for the early-detection practices of the study group.

A bivariate analysis was performed using contingency tables to describe the relationship between breast cancer early-detection practices and internal or external barriers. Also, social and demographic characteristics, family and personal breast cancer history and visit to a gynecologist were considered. Independence tests were performed for each table and the odds ratio (OR) was computed to determine the strength of association between screening practices and the other variables. Only significant ($p<0.05$) or marginal ($.05<p<.10$) associations are presented in the bivariate analysis for purposes of this report.

Logistic regression was used to determine the effect of barriers and other predicting variables on mammograms. Mammograms are the most efficient screening practice for breast cancer detection. Potential predictors for the initial model were defined by the significant variables ($p < 0.10$) found in the bivariate analysis. The Wald test ($ß/se(ß)$ (t-Student distribution) was performed to determine significant predictors (Hosmer and Lemeshow, 1989). Once this was accomplished, variables that were significant in the initial model were used to build a reduced model. Both models were subjected to analysis of deviance in order to determine a final model.

Results

Participants

A. Demographic and Social Characteristics

A stratified sampling design was defined with equal size for each strata in order to balance the number of participants by socioeconomic status and place of residence. However, when the data was collected slight differences were observed in this stratification. The number of interviews for those in the lower status was greater in the metropolitan areas, specially in the

largest cities (See Table 1). Some factors, such as higher rejection among women from the non-low socioeconomic status (middle and upper) living in inside-central metropolitan areas, could explain the difference. Fifty per cent of the total sample was classified as low socioeconomic status and 46% as non-low.

Table 1. Interviewees by Area of Residence and Socioeconomic Status
(n=500)

Area of Residence	Socioeconomic Status[a]					
	Low		Non-low		Total	
	n	%	n	%	n	%
Inside-central, Metropolitan (largest city in the metropolitan area)	104	(60.8)	67	(39.2)	171	(100.0)
Outside-central, Metropolitan (surrounding inside-central cities)	87	(51.5)	82	(48.5)	169	(100.0)
Non-metropolitan	80	(50.0)	80	(50.0)	160	(100.0)

[a] Low = Median household price < 40,000 Non-low = Median household price ≥ 40,000

Women's ages ranged from 65 to 99 years. The average age was 73.95 ± 6.51 years. A considerable proportion (44.6%) of women were over 74 years old. The average years of formal schooling was 5.60 ± 4.53 years. Forty per cent of the participants had less than 4 years of academic education, 28.6% had four to seven years, and 30.8% had at least eight years of education (See Table 2). Thirteen per cent of the sample had never attended school.. The maximum level of education was 18 years of completed academic preparation.

Widowhood (49.2%) was the most frequently reported marital status, followed by those reported legal or common law marriage (35.0%). Twelve per cent of the women were separated or divorced, and less than 4.0% had never been married. Three-fourths of the interviewees (75.4%) mentioned Catholicism as their religious preference. Only 2.2% of the women did not state religious preference (See Table 2).

Table 2. Interviewees by Sociodemographic Characteristics

Sociodemographic Characteristics	Number	Per Cent (%)
Age		
65-69	149	29.8
70-74	128	25.6
75+	223	44.6
Education level		
0-3	203	40.6
4-7	143	28.6
8+	154	30.8
Marital status		
Single	19	3.8
Widowed	246	49.2
Married/Common law marriage	175	35.0
Separated/Divorced	60	2.0
Religion		
Catholic	376	75.4
Non-Catholic	112	22.4
No religious preference	11	2.2

Approximately 88% of the interviewees reported Social Security as their principal source of income. Welfare Programs (27.5%) and private pensions or retirement funds (16.2%) were also cited as sources of income (See Table 3). Economic assistance from sons, daughters and husband was also mentioned but to a much lesser degree.

Table 3. Interviewees by Principal Sources of Income

Source of Income	Number	(%)
Social Security*		
Yes	438	87.8
No	61	12.2
Welfare Programs*		
Yes	137	27.5
No	362	72.5
Pension*		
Yes	81	16.2
No	418	83.8

* One missing value.

One of the variables considered for evaluating family composition was living alone at the moment of the interview. Two-thirds (65.8%) of the women were living with other persons. Fifty two per cent of those who did not live alone lived with their spouses, 27.4% with their daughters, 24.9% with their sons, and 27.1% with another relative. Only four of the 500 elderly

women reported living with a person who was not a relative (See Table 4). The average number of sons and daughters alive at the moment of the interview was 2.0 ± 1.7 and 2.2 ± 1.9, respectively. Only 7.4% of the interviewees reported not having an offspring alive at the time of the interview.

Table 4. Interviewees by Living Arrangements

Arrangement		Number	(%)
Living alone	**(n = 500)**		
	Yes	171	34.2
	No	329	65.8
Living with*	**(n = 329)**		
	Husband	171	52.0
	Daughter(s)	90	27.4
	Son(s)	82	24.9
	Sister(s)/Brother(s)	14	4.3
	Another relative	75	22.8
	Another person	4	1.2

* The percentages among categories are not mutually exclusive.

Different aspects were considered to explore the support networks of the participants. These were: economic assistance, help during sickness, and escort to medical appointments. Daughters were the persons most frequently mentioned as providers of assistance in all categories. Husbands ranked second in terms of assistance during sickness and escort to medical appointments. Sons were mentioned more frequently than husbands only in terms of economic assistance but second to daughters.

Thirty nine per cent of the interviewees reported that they do not receive economic assistance either from family or any other persons. Fifty-three per cent of the women indicated that they receive economic support from either their daughters, sons or husband. Only 7.5% reported receiving financial assistance from persons other than sons, daughters or husband. (See Table 5).

Almost 50% of the interviewees identified their daughters as the persons who help the most during health crisis. Husbands and sons were also mentioned but to a lesser extent. Only 10.2% of the women reported that nobody helps them when faced with adverse health conditions, while 18.4% stated depending on persons outside the immediate family of procreation during a health crisis (See Table 5). Daughters are the most frequent companions to medical appointments, yet almost one-third of respondents (29.4%) stated going alone to medical appointments.

Table 5. Interviewees by Type of Support

Type of Support	Number	(%)
Economic support		
No one	195	39.3
Husband	49	9.9
Daughter(s)	133	26.8
Son(s)	82	16.5
Others[1]	37	7.5
Support during sickness		
No one	51	10.2
Husband	71	14.2
Daughter(s)	244	48.8
Son(s)	42	8.4
Others[1]	92	18.4
Escort to medical appointments		
No one	147	29.4
Husband	64	12.8
Daughter(s)	186	37.3
Son(s)	38	7.6
Others[1]	65	13.0

[1] Others includes sisters, brothers, other relatives, neighbors and friends.

B. Family and Personal History of Breast Cancer

Only 13.8% of the 500 women reported to have felt pain or any discomfort in the breast during the five years prior to the interview. More than three-fourths (76.8%) of these 69 women reported to have felt pain or discomfort during the last twelve months. A relatively small proportion of the interviewees (11.8%) reported to ever having felt a nodule in the breasts. Thirty per cent of these 59 women reported to have felt a nodule during the last twelve months previous to the interview. Only 3.4% of the 500 women (17 women) stated having had secretions from the nipples. Approximately 8% of the interviewees had undergone a breast biopsy. Thirty two women (6.4%) reported to had been diagnosed cancer of any type. Only nine of these 32 women had been diagnosed with breast cancer; therefore 1.8% of the women who participated in the study had been diagnosed breast cancer (See Table 6). Twenty per cent of the interviewees reported to have or have had relatives who had been diagnosed with breast cancer. Thirty-four percent of these women mentioned a sister as having suffered or suffering from the disease; 10.8% mentioned a daughter, and 2.9%, a mother (Table 6). Fifty-three per cent mentioned other female relatives such as cousins, nieces, grandmothers, aunts and grand-daughter. Risk factors were not the objective of the investigation. Participants were asked if a female relative had been diagnosed breast cancer as a way to look into breast cancer issues and factors that could promote awareness to the disease but not genetic predisposition. On a similar vein, they were also asked if they knew or had known someone who had been diagnosed the disease. Two-thirds of the respondents (67.6%) knew someone that had been diagnosed with breast cancer.

Table 6. Interviewees by Family and Personal History of Breast Cancer

History	Number	(%)
Breast pain and/or discomfort (n = 500)		
No	431	86.2
Yes (>12 months to 5 years)	16	3.2
Yes (≤12 months)	53	10.6
Nodule (n = 498)		
No	440	88.2
Yes (>12 months)	41	8.2
Yes (≤12 months)	18	3.6
Secretions (n = 500)		
No	483	96.6
Yes (>12 months)	16	3.2
Yes (≤12 months)	1	0.2
Breast biopsy (n = 500)		
No	461	92.2
Yes (>12 months)	34	6.8
Yes (≤12 months)	5	1.0
Personal history of cancer (n = 500)		
No	468	93.6
Yes, breast cancer	9	1.8
Yes, other type of cancer	23	4.6
Family history of breast cancer (n = 498)		
No	396	79.2
Yes	102	20.4
Relative with breast cancer* (n = 102)		
Mother	3	2.9
Sister	35	34.3
Daughter	11	10.8
Others[1]	54	53.0

* The percentages among categories are not mutually exclusive.

[1] Others includes aunt, grandmother, cousins, niece and grand-daughter.

C. Gynecologist-Patient Relationship

Some questions revolved around the gynecologist-patient relationship in the year previous to the interview. One-third of the study group had visited a gynecologist during this period of time. Half (51.5%) of these 169 women received an explanation of how to detect breast cancer during this visit, and the same proportion received a referral for mammogram (See Table 7). Fifty per cent of the women who visited the gynecologist received an explanation on how to perform BSE. Likewise, 78.7% of the women who visited the gynecologist the year

previous to the interview underwent a CBE. More male gynecologists than females were visited (74.3%).

Table 7. Interviewees by Variables Related to Visit to Gynecologist in the Last Twelve Months (n = 169)

Variables	Number	(%)
Gender of gynecologist*		
Female	43	25.4
Male	124	/3.4
Information on methods to detect breast cancer		
Yes	87	51.5
No	80	47.3
Do not remember	2	1.2
Mammogram referral		
Yes	87	51.5
No	82	48.5
Instruction on how to perform BSE		
Yes	85	50.3
No	82	48.5
Do not remember	2	1.2
CBE		
Yes	133	78.7
No	35	20.7
Do not remember	1	0.6

* Two missing values

D. Internal Barriers

Knowledge and beliefs

Twenty statements were used to construct two scales to determine level of knowledge and beliefs about breast cancer. Twelve statements were used to measure knowledge and eight for beliefs. The responses for these statements were: true, false and do not know. The following codes were assigned to the knowledge statements: 1-true, 0-false/do not know. The responses to the beliefs were assigned the following: 0-false, 1-true/do not know. The scales were computed using the unweighted sum of codes. The values for the knowledge scale indicate the number of correct answers. High values in the knowledge scale indicate high level of breast cancer knowledge. The beliefs-scale values indicate number of false answers. Low values in the beliefs-scale indicate low level of beliefs on breast cancer issues. Beliefs were defined as incorrect knowledge or notions not based on scientific facts.

The distribution of the answers for statements on knowledge related to breast cancer showed that items 68, 73, 76, 78, and 86 reported a "true" response as the most frequent

alternative (> 90%). Therefore, they were not useful to discriminate between subgroups. These statements were related to relevance of and compliance with breast cancer early-detection practices (See Table 8). Around 60% of the respondents answered incorrectly (false or do not know) two statements pertaining to risk factors: 67 and 71. More than one-third (38%) of the elderly women did not know that the possibility of developing breast cancer increases with age.

Table 8. Responses for statements on knowledge

Item	Statements	True %	False %	Do not know (%)
62	Women who have had breast cancer have more possibilities of developing it a second time.	84.2	8.2	7.6
64	A possible symptom of breast cancer is fluid coming out of nipples.	71.8	8.6	19.6
65	A swelling of the arm can be a consequence of breast cancer treatment.	70.2	8.2	21.6
66	A breast nodule is a symptom of breast cancer.	81.4	13.2	5.4
67	Women who give birth to their first child before 30 years of age have a less possibilities of developing breast cancer.	38.6	26.6	34.8
68	Women who are 50 years of age or older must have a mammogram (breast plate or X-rays) every year.	98.0	0.4	1.6
71	Women who had their menarche before 12 years age have more possibilities of developing breast cancer.	27.4	29.6	43.0
72	Women whose mothers or sisters have suffered from breast cancer have more possibilities of developing this type of cancer.	81.8	11.2	7.0
73	An annual clinical breast examination is a way of early detecting breast cancer.	96.8	1.0	2.2
75	Pain, stinging sensation or discomfort in the breast are possible symptoms of breast cancer.	83.9	8.0	8.0
76	The mammography detects breast cancer in its early stages.	90.6	3.6	5.8
77	The possibility of developing breast cancer increases with age.	62.0	29.0	9.0
78	The breast self-examination must be performed once every month.	92.8	4.2	3.0

Table 8 (continuation). Responses for statements on knowledge

Item	Statements	True %	False %	Do not know (%)
80	Women who have suffered from breast cancer must wait five (5) years without diseases to be considered cured.	44.6	31.4	24.0
81	Women with high fat diet have more possibilities of developing breast cancer.	77.2	7.0	15.8
85	A swelling or increase in size of the breasts is a possible symptom of breast cancer.	86.2	7.4	6.4
86	The mammogram is the most adequate or efficient test to detect breast cancer.	97.0	1.0	2.0

Forty-eight per cent of the participants answered correctly 10 or more of the items on the knowledge scale. Almost 17% (16.5%) of the women obtained a score of five or less in this scale (See Table 9).

Table 9. Distribution of Score on Knowledge Scale
(n = 496)

Score	Number	%
0 -2	16	3.2
3-5	66	13.3
6-8	176	35.5
10-12	238	48.0
Median 8	**Media 8.1 ± 2.6**	

The distribution of the responses for the statements on beliefs related to breast cancer showed that 88% of the interviewees believe that hitting or bruising the breasts can cause breast cancer; 59% acknowledged that women who have breast cancer must always undergo a mastectomy ; and 55.7% indicated that breast cancer always leads to death (See Table 10). The majority of the elderly women (61.3%) either upheld the belief that never having had sexual intercourse decreases the possibility of developing breast cancer (29%) or could not assume a position as to it (32.2% do not know). Only 38.7% knew the correct answer.

Table 10. Responses for Statements on Beliefs

Item	Statements	True %	False %	Do not know (%)
63	Women with large breast have more possibilities of developing cancer than women with small breasts.	48.2	32.6	19.2
69	Thin women have a higher possibility of developing breast cancer.	17.6	63.8	18.6
70	To hit, bruise or hurt the breast can cause breast cancer.	88.0	5.2	6.8
74	Women who have breast cancer must always undergo a mastectomy or amputation of the breast.	59.0	35.0	6.0
79	The mammogram (breast plate or X-rays) is necessary only when a woman feels discomfort in her breast.	47.8	49.6	2.6
82	Breast cancer always causes death.	55.7	33.5	10.8
83	Women who have never had sexual intercourse have less possibilities of developing breast cancer.	29.0	38.7	32.3
84	Breast cancer always leads to death.	51.3	44.7	4.0

The distribution of the beliefs-scale showed that around 75% of the interviewees had a high level of beliefs. That is, almost three-fourths of the participants answered affirmatively to four or more of the eight beliefs-statements. An affirmative answer to a belief statement implied misconception or ignorance about a breast cancer issue. The median for the belief-scale was five (See Table 11). Further analysis indicated that the young older women (65-69) and those with more years of schooling scored lower on the beliefs-scale: that is, expressed less beliefs.

Table 11. Interviewees by Scores on Belief-scale
(n = 491)

Score	Number	%
0-1	26	5.3
2-3	98	19.9
4-5	153	31.2
6-8	214	43.6
Median 5	**Media 5.0 ± 2.0**	

Self- perception of health

The majority of the participants had a positive self-perception of health (See Table 12). Seventy one per cent of the elderly females evaluated their health as better or much better than that of their peers; 20% perceived their health as equal to that of others in their age group, and only 8% evaluated their health as worse or much worst than other persons their age.

Table 12. Self -Perception of Health (n = 500)

Self -Perception of Health	Number	(%)
Much better/ better	356	71.2
Same	102	20.4
Worse/ much worst	42	8.4

Gender preference of physician conducting a CBE

Attitudes toward gender preference of health-care provider were examined. The survey instrument included a question pertaining to gender preference of the physician who performs the CBE. The study group was almost equally divided in terms of preference as to female physician (46.5%) and no preference at all (45.8%). Only 7.7% stated that they prefer a male physician to conduct the CBE over a female (See Table 13).

Table 13. Gender Preference of Physician Conducting a Clinical Breast Examination

Gender Preference	Number	(%)
Male	35	7.7
Female	212	46.5
No preference	209	45.8

E. External Barriers

Almost 83% per cent of the women have Medicare Part A, which covers hospitalization services. The overwhelming majority (90.8%) also has Medicare Part B, which covers ambulatory services; including mammograms. Many of the interviewees (57.9%) reported to have Medicaid. Over one third (36.6%) of the women reported also having a private health plan (See Table 14). The stratification of the sample by socioeconomic status could explain these results.

Table 14. Type of Health Insurance

Health Insurance		Number	(%)
Medicare A*	**Yes**	413	82.8
	No	86	17.2
Medicare B**	**(n = 413)**		
	Yes	375	90.8
	No	36	8.7
Medicaid***	**Yes**	289	57.8
	No	207	41.4
Other health plans*	**Yes**	183	36.6
	No	316	63.2

* One missing value ** Two person answered "do not know" *** Four person answered "do not know"

The majority of the women (54.9%) reported that they depend on relatives for transportation to medical appointments (See Table 15). Only 12.2% of the aged women indicated that they own a car and transport themselves to medical appointments.

Table 15. Transportation to Medical Appointments

Means of Transportation	Number	(%)
Relative's car	274	54.9
Public transportation	89	17.8
Own car	61	12.2
Walking	31	6.2
Others	44	8.8

* Others includes friend's or neighbor's car, public transportation and private transportation.

A large majority of the interviewees (71%) had never received an explanation of how to detect breast cancer. Half of the women in the study group had not received a physician referral for a mammogram during the last five years (See Table 16).

Table 16. Information Received after Menopause

Information	Number	(%)
Ways to detect breast cancer		
Yes	130	26.0
No	355	71.0
Do not remember	14	2.8
Do not know	1	0.2
How to perform a BSE		
Yes	137	27.4
No	349	69.8
Do not remember	14	2.8
Referral for mammogram <5 years		
Yes	248	49.6
No	250	50.0
Do not remember	2	0.4

The two main sources of information related to breast cancer early detection practices were health professionals (43.8%) and television (29.2%) (See Table 17). Printed materials (newspapers, magazines, books or pamphlets distributed at health centers) did not rank high as a principal source of information on breast cancer. However, newspapers, magazines and books ranked second as secondary sources of information. Television was the secondary source most often cited which points to this media as an important primary and secondary source of information.

Table 17. Sources of Information about Breast Cancer
(n = 482)

Source	Principal Source	Secondary Source
	Number (%)	Number (%)
Health professionals	211 (43.8)	116 (24.1)
Radio	7 (1.5)	147 (30.5)
Television	141 (29.2)	288 (59.8)
Printed materials (general)	56 (11.6)	176 (36.5)
Relatives	13 (2.7)	143 (29.7)
Friend(s)/Neighbor(s)	30 (6.2)	174 (36.1)
Printed materials at health centers	8 (1.6)	119 (24.7)
Other sources	16 (3.3)	23 (4.8)

F. Early Detection Practices

Only 9.2% of the interviewees expressed not performing a BSE. One-fourth of the national sample (25.6%) reported that no physician had ever performed a CBE. Thirty-nine per cent of the women stated that they had never had a mammogram.

Ninety per cent (89.8%) of the women reported to practice BSE as a method to detect breast cancer. Ninety-four per cent of them (423) self-examined their breasts during the last year. Only 8.8% of the study group reported to follow the recommended BSE interval (once a month) and 4.2% twice a month (See Table 18). Almost forty per cent (39.4%) of the women had never had a mammogram. Forty-two per cent of the total sample had the last mammogram two years prior to the study and 15.8%, three years or more. Fifty-six per cent of the women who have had at least one mammogram during their life did not follow a specific time interval; 38.5% had an annual mammogram and only 2.4% reported having one every two years. Seventy two per cent of the women (361/500) reported to have had a CBE performed by a physician or nurse at least once in their life. Almost two-thirds of these 361 women (61.8%) had a CBE performed one year or less prior to the interview (See Table 18).

Table 18. Early Detection Practices

Practices	Number	(%)
Breast self-examination (n = 495)		
Never	46	9.2
No during the last twelve months	26	5.2
One time per month	44	8.8
Two time per month	21	4.2
Others[1]	358	71.6
Last Mammogram (n = 488)		
Never	197	39.4
One year ago	166	33.2
Two years ago	46	9.2
Three years ago or more	79	15.8
Interval (n = 299)		
No specific interval	169	56.5
Every year	115	38.5
Every two years	12	2.4
Clinical Breast Examination (n = 489)		
Never	128	25.6
One year or less	223	44.6
Two years ago or more	138	27.6

[1] Others includes daily, weekly, more than two time per month and annually.

The elderly women were asked what was the main reason for not performing the BSE. The most frequently offered response was feeling fine or not feeling any symptoms or discomfort (41.3%). Other main reasons were: physician does breast examination (17.4%), not knowing how to perform BSE (6.5%), feeling uncomfortable to touch one's body (6.5%), and fear of finding something (6.5%). Reasons subsumed under other personal reasons (21.7%) include: self perception of old age, carelessness, not being able to detect changes in the breast, religious reasons, lack of interest, and not seeing its importance. To sum up, 82.6% of the interviewees indicated personal reasons for not performing the BSE (See Table 19).

Table 19. Main Reason for not Performing Breast Self-Examination
(n = 46)

Reason	Number	(%)
Feels fine/does not feel any discomfort or symptoms	19	41.3
The physician does it	8	17.4
Does not know how to perform BSE	3	6.5
Feels uncomfortable/does not like to touch my body	3	6.5
Fear to find something that could be breast cancer	3	6.5
Other personal reasons	10	21.7

As previously mentioned, almost 40% of the elderly women indicated that they had never had a mammogram. The principal reason for never having a mammogram at any time in their life was lack of symptoms (55.8%). Other main reasons were: not recommended by physician (12.7%), negligence (9.6%), and not perceiving it as necessary (8.6%) (See Table 20). Approximately, 85% of these 197 women cited personal reasons as the primary reason for not ever having a mammogram.

Table 20. Main Reason for Never Having a Mammogram
(n = 197)

Reason	Number	(%)
Lack of symptoms	110	55.8
No referral from physician	25	12.7
Negligence/Forgetfulness/Carelessness	19	9.6
Not necessary	17	8.6
Other personal reasons	25	12.7

Twenty-five per cent of the women (125) had not had a mammogram during the year previous to the interview. The main reason cited among these 125 women was lack of symptoms (44.4%). Negligence (22.4%) and no referral from physician (10.4%) were also cited as main reasons but to a lesser extent (See Table 21). Once again, personal reasons were emphasized.

Table 21. Main Reason for not Having a Mammogram During the Last Twelve Months
(n = 125)

Reason	Number	(%)
Lack of symptoms	53	42.4
Negligence/Forgetfulness/Carelessness	28	22.4
No referral from physician	13	10.4
Other personal reasons	24	19.2
Other external reasons	7	5.6

One-third of the total sample had a mammogram during the year previous to the interview. Of these 166 women, 62% cited referral from a physician (62.5%) as the main reason for having a mammogram during the last twelve months. Other less-cited reasons were: knowledge of the need to have practice performed (19.3%) and signs and symptoms related to breast cancer (14.5%) (See Table 22).

Table 22. Main Reasons for Having a Mammogram During the Last Twelve Months
(n = 166)

Reason	Number	(%)
Referral from physician	103	62.5
Knowledge of need to have the practice performed	32	19.3
Signs/symptoms related to breast cancer	24	14.5
Other reasons	7	4.2

Breast Self-Examination

For further analysis of BSE, a comparison between women who comply once or twice a month and those who have not performed BSE during the last twelve months was carried out. Those who had never performed BSE were included in the latter group. Women who stated to practice BSE on other intervals (weekly, daily) were excluded on the basis that they could be providing information to impress the interviewer or did not know the correct interval.

Demographic characteristics affect BSE practices. The young-old women (65-69) have a higher possibility of practicing BSE as defined when compared to older women ($p_{trend<}$ 0.05). For those 65-69, the odds of performing BSE was 2.66 higher than the odds of women 75 or older (See Table 23).

Table 23. Sociodemographic Characteristics and Self Examination

Characteristics	Self-examination			
	1-2 times per month n (%)	No n (%)	OR	95%CI
Socioeconomic status				
Non-low	29 (44.6)	43 (59.7)	1.00	----------
Low	36 (55.4)	29 (40.2)	1.80*	0.88-3.84
Age				
65-69	26 (40.0)	16 (22.2)	2.66*	1.09-6.56
70-74	17 (26.2)	20 (27.8)	1.39	0.55-3.49
75+	22 (33.9)	36 (50.0)	1.00	----------

* $p < 0.10$ ** $p_{trend} < 0.05$

Internal barriers were not significant for BSE. The only external barrier that affected variations in BSE practice was main source of information about the disease and detection practices. Those women who stated that health-care professionals were their main source of information were twice as likely to perform BSE (OR = 2.49, 95%CI: 1.11-5.60) than those who mentioned other sources of information (See Table 24).

Table 24. Main Source of Information and Self Examination

External Barrier	Self-examination			
	1-2 times per month n (%)	No n (%)	OR	95%CI
Main Source				
Health Professionals	27 (41.5)	16 (22.2)	2.49*	1.11-5.60
Others	38 (58.5)	56 (77.8)		

* $p < 0.05$

Clinical Breast Examination

A visit to the gynecologist in the 12 months prior to the interview increased the possibilities of having a CBE. These women were six times as likely to have a CBE than others who have not had this health care intervention (OR = 6.04, 95%:CI 3.53-10.39) (See Table 25).

Table 25. Visit to Gynecologist and Clinical Breast Examination
(n = 361)

	Clinical-Breast Examination			
Visit	≤ 1 year n (%)	> 1 year n (%)	OR	95%CI
Yes	127 (57.2)	25 (18.1)	6.04	3.53-10.39
No	95 (42.8)	113 (81.9)		

The beliefs-scale was associated with CBE. A low level of beliefs doubled the odds of having a CBE in the last twelve months prior to the interview (OR = 2.17, 95%CI = 1.35-3.48) (See Table 26).

Table 26. Beliefs and Clinical Breast Examination
(n = 361)

	Clinical-breast examination			
Beliefs	≤ 1 year n (%)	> 1 year n (%)	OR	95% CI
< 5	108 (49.8)	43 (28.5)	2.17	1.35-3.48
≥ 5	109 (50.2)	94 (68.6)	1.00	----------

Transportation, having Medicare Part B, and having received information about early detection practices were associated to CBE among elderly Puerto Rican women. Women who own a car had higher opportunity of undergoing a CBE in the year prior to the interview than those who depended on relatives for transportation to medical appointments (OR = 2.16,

95%CI:1.04-4.54). No differences were found between among those who depended on relatives or other means (including walking) for transportation (OR=0.78, 95%CI:0.47-1.28). Women who had Medicare Part B showed a 76% higher opportunity of reporting a CBE in the last year when compared to those who did not have the plan (OR=1.76, 95%CI:1.03-3.01). Receiving information from health-care providers on the methods to detect breast cancer after menopause increased by 68% the odds of having had a CBE in the last year by 1.68 times (95%CI: 1.02-2.77).

Table 27. External Barriers and Clinical Breast Examination

External Barriers	Clinical-Breast Examination			
	≤ 1 year n (%)	> 1 year n (%)	OR	95%CI
Transportation				
Own a Car	44 (19.8)	13 (9.4)	2.16	1.04-4.54
Relative Car	116 (52.3)	74 (53.6)	1.00	----------
Others	62 (27.9)	51 (37.0)	0.78	0.47-1.28
Medicare B				
Yes	183 (82.1)	99 (72.3)	1.76	1.03-3.01
No	40 (17.9)	38 (27.7)	1.00	----------
Information from health - care providers on early detection practices after menopause				
Yes	83 (38.4)	36 (27.1)	1.68	1.02-2.77
No	133 (61.6)	97 (72.9)	1.00	----------

Mammogram Sometime in Life

Elderly women from middle and upper socioeconomic status had a 70% (95%CI: 1.16-2.5) higher possibility of having had a mammogram sometime in their life. Age also affected this early detection practice. Women 65 to 69 years old had a 63% higher odds (OR=1.63, CI: 1.03-2.58) of ever having had a mammography than those 75 and older. Participants with eight or more years of formal schooling were twice as likely to ever have had a mammogram (OR = 2.19, 95%CI: 1.37-3.51) than those with a third grade or less (See Table 28).

Table 28. Sociodemographic Characteristics and Mammogram Sometime in Life

Characteristics	Mammogram			
	Yes n (%)	No n (%)	OR	95%CI
Socioeconomic status				
Non-low	153 (51.2)	75 (38.1)	1.70	1.16-2.50
Low	146 (48.8)	122 (61.9)	1.00	----------
Age				
65-69	101 (33.8)	48 (24.4)	1.63	1.03-2.58
70-74	74 (24.8)	53 (26.9)	1.08	0.68-1.72
75+	124 (41.5)	96 (48.7)	1.00	----------
Education level				
0-3	105 (35.1)	95 (48.2)	1.00	----------
4-7	85 (28.4)	57 (28.9)	1.35	0.85-2.14
8+	109 (36.5)	45 (22.8)	2.19	1.37-3.51

Two variables pertaining to personal history of breast cancer were significantly related ($p< 0.05$) to ever having had a mammogram: having had a breast biopsy (OR = 6.4, 95%CI: 2.23-25.12) and having at least one symptom related to breast cancer (OR = 3.5, 95%CI: 2.02-6.17). Having or having had a female relative with breast cancer showed a marginal association with this practice ($0.05<p<0.10$). That is, being faced by the possibility of having breast cancer and undergoing a breast biopsy, having had at least one symptom or having a relative who suffered from the disease augment the odds of these women ever having had a mammogram (See Table 29). These factors could be enabling the elderly women to be more aware of the disease and of a mammography as a screening practice.

Table 29. Interviewees by Variables Related to Personal History of Breast Cancer and Mammogram Sometime in Life

	Mammogram			
	Yes n (%)	No n (%)	OR	95%CI
At least one symptom				
Yes	85 (28.4)	20 (10.2)	3.52	2.02-6.17
No	214 (71.6)	177 (89.8)	1.00	----------
Breast Biopsy				
Yes	35 (11.7)	4 (2.0)	6.40	2.23-25.12
No	264 (88.3)	193 (42.2)	1.00	----------
Familial history of breast cancer				
Yes	69 (23.2)	32 (16.3)	1.54	0.95-2.52
No	229 (76.8)	164 (83.7)	1.00	----------

Visiting a gynecologist during the last year increased the possibilities of ever having a mammogram 3.64 (95%CI: 231-5.73) times as much than for those who did not (See Table 30). This could be related to positive impact from this health care specialist with regards to information about the disease. Knowing someone (not a relative) who had been diagnosed with breast cancer also increased the odds of having had at least one mammography; 51% (OR =1.51, 95%CI: 1.01-2.26) (See Table 31).

Table 30. Visit to Gynecologist and Mammogram Sometime in Life

	Mammogram			
Visit	**Yes n (%)**	**No n (%)**	**OR**	**95%CI**
Yes	132 (44.2)	35 (17.9)	3.64	2.31-5.73
No	167 (55.8)	161 (82.1)	1.00	----------

Table 31. Knowing someone with Breast Cancer and Mammogram Sometime in Life

	Mammogram			
Knows someone diagnosed with breast cancer	**Yes n (%)**	**No n (%)**	**OR**	**95%CI**
Yes	214 (71.6)	123 (62.4)	1.51	1.01-2.26
No	85 (28.4)	74 (37.6)	1.00	----------

Beliefs were the only internal barrier that was significantly associated to ever having had a mammogram. Those who upheld less beliefs were more likely to ever having had a mammogram. A score of four beliefs or less in the belief-scale increased the possibility 80% in comparison to women who scored five or more (See Table 32).

Table 32. Beliefs and Mammogram Sometime in Life

	Mammogram			
Beliefs	**Yes n (%)**	**No n (%)**	**OR**	**95% CI**
< 5	131 (44.7)	60 (30.9)	1.81	1.21-2.69
≥ 5	162 (55.3)	134 (69.1)	1.00	----------

The external barriers were determining factors for ever having had a mammogram. Those that were significant ($p<0.05$) were: not having Medicare Part B and/or a private health plan, not having received information about early detection practices, other main source of information than health provider, and not receiving a referral for a mammogram. Transportation was marginally significant ($0.05 < p < 0.10$). Women who have health insurance that covers mammograms are more likely to have had this screening practice than those who do not. The odds was 2.07 times as likely (95%CI:1.34-3.20) for those with Medicare part B and it triples (OR = 3.00, 95%CI: 1.96-4.60) for those who also have a private health insurance. Referral from

a physician was what most affected ever having had a mammogram. Women who had received a referral in the last five years are 34.1 times (95%CI: 18.9-62.0) more likely to ever have had a mammogram than those who had not. Only 7.3% (18 of 248 elderly women) of the women who received a referral for a mammogram did not attend screening. This provides evidence that once the physician recommends a mammogram the elderly women tend to follow the doctor's orders. Receiving information about early detection increased the likelihood of ever having had a mammography to almost four times as much (OR=3.73, 95%CI: 2.24-6.23). When a health-care provider was the principal source of information on early detection practices after menopause, the odds of ever having had a mammogram almost tripled (OR = 2.90, 95%CI: 1.94-3.20) when compared to those women who received the information from other sources (See Table 33).

Table 33. External Barriers and Mammogram Sometime in Life

External Barriers	Mammogram			
	Yes n (%)	No n (%)	OR	95%CI
Transportation				
Own car	44 (14.8)	17 (8.6)	1.88	0.98-3.62
Relative's car	157 (52.7)	114 (57.9)	1.00	----------
Others	97 (32.6)	66 (33.5)	1.07	0.71-1.62
Medicare B				
Yes	241 (80.9)	131 (67.2)	2.07	1.34-3.20
No	57 (19.1)	64 (32.8)	1.00	----------
Other plan				
Yes	139 (46.5)	44 (22.5)	3.00	1.96-4.60
No	160 (53.5)	152 (77.6)	1.00	----------
Information from health-care providers on early detection practices after menopause				
Yes	105 (36.1)	25 (13.1)	3.73	2.24-6.23
No	186 (63.9)	165 (86.8)	1.00	----------
Principal source of information				
Health Professional	162 (45.8)	57 (28.9)	2.90	1.95-4.34
Others	137 (54.2)	140 (71.2)	1.00	----------
Referral for mammogram < 5 years				
Yes	230 (77.4)	18 (9.1)	34.14	18.99-62.04
No	67 (22.6)	179 (90.9)	1.00	----------

A logistic regression model was constructed to explain ever having had a mammogram by different predictors. The predictors variables were determined by the significant association ($p<0.10$) found in the bivariate analysis. In addition, area of residence and socioeconomic status were included in the logistic model. Analysis of deviance was used to determine the best model

to fit the breast cancer early detection practices (See Table 34). Internal barriers were excluded from the model because they were not significant. Information provided by health-care professional on early detection measures after menopause (p=0.0298), referral for a mammogram (p<0.001), and health-care provider as main source of information were significant (p=0.03).(See Table 35). Physician referral was the most important factor ($OR_{adjusted}$= 34.12, 95%CI:18.23-63.9) even when confounding variables were considered. Having undergone a breast biopsy was also a significant factor for ever having had a mammogram even when other variables were considered ($OR_{adjusted}$ = 4.48, 95%CI:1.15-17.3). The confounding variables found in this model were: socioeconomic status (p=0.0224) and age (p=0.0513).

Table 34. Analysis of Deviance in the Logistic Regression Model Explaining Mammogram Sometime in Life

(n = 496)

Model	Deviance	d f [a]	Difference in deviance (df)	p-value
MODEL I:				
Significant variables in bivariate analysis + area of residence + socioeconomic status	350.6163	442		
MODEL II*:				
Significant variables in model I + areas of residence + socioeconomic status	362.6321	466	12.0158 (24)	0.9796
MODEL III*:				
Model II + interactions with area of residence + interactions with socioeconomic status	335.4667	448	27.1654 (18)	0.0760
MODEL IV:**				
Model II - area of residence	362.6390	467	0.0069 (1)	0.9203

* Compared with previous model **Compared with Model II

[a] Degrees of freedom

Table 35. Mammogram Sometime in Life : Logistic Regression Model

Variable	β	SE (β)	p -value	OR
Intercept	-4.1426	1.6937	0.0145	----------
Socioeconomic status	0.6223	0.2726	0.0224	1.86
Age	0.0411	0.0211	0.0513	1.04
At least one symptom	0.6808	0.3877	0.0791	1.98
Breast biopsy	1.5032	0.6896	0.0293	4.50
Medicare part B	0.5563	0.3149	0.0773	1.66
Information from health-care providers on early detection practices after menopause	0.7395	0.3403	0.0298	2.09
Referral for mammogram ≤ 5	3.5303	0.3189	<0.0001	34.13
Main source of information	0.5861	0.2839	0.0390	1.80

Mammogram within the Last Two Years

Age was related to having a mammogram in the last two years prior to the interview. Women 65 to 69 were twice as likely (OR = 2.24, 95%CI: 1.15-4.40) to have had their last mammogram during this time interval than those 75 or older. Education level was marginally significant ($0.05<p<0.10$) for having had a mammogram in the last two years. It was observed that those with more formal years of schooling (8th grade or more) had a 73% higher possibility of having had a mammogram in the last two years than those with less schooling (OR = 1.73. CI: 0.87-3.45).

Table 36. Sociodemographic Characteristics and Last Mammogram

	Last Mammogram			
	≤ two years n (%)	> two years n (%)	OR	95%CI
Age				
65-69	81 (38.2)	19 (24.1)	2.24	1.15-4.40
70-74	53 (25.0)	19 (24.1)	1.47	0.73-2.95
75+	78 (36.8)	41 (51.9)	1.00	----------
Education level				
0-3	71 (33.5)	30 (39.0)	1.00	----------
4-7	55 (25.9)	28 (35.4)	0.83	0.42-1.62
8+	86 (40.6)	21 (26.6)	1.73	0.87-3.45

Visiting a gynecologist during the last year showed a high correlation with having had a mammogram in the last two years. The odds were 8.06 times (95%CI: 3.87-17.17) as much than for those who have not (See Table 37).

Table 37. Visit to Gynecologist and Last Mammogram.

Visit	Last Mammogram			
	≤ two years n (%)	> two years n (%)	OR	95%CI
Yes	120 (56.6)	11 (13.9)	8.06	3.87-17.17
No	92 (43.4)	68 (86.1)	1.00	----------

Two external barriers were significant ($p<0.05$) for having had a mammogram in the last two years: receiving information about early detection practices and having had a referral for a mammogram during the last five years. Women who received information about early detection practices from a health-care provider were twice as predisposed to have had this screening practice in the last two years (OR = 2.06, 95%CI: 1.10-3.88) than those who had not (See Table 38). A referral for a mammogram was the most important determinant for having a mammography during this specific period of time. The odds increased 7.62 times (95%CI: 3.93-14.84) when a physician recommended the screening practice than when not (See Table 38).

Table 38. External Barriers and Last Mammogram

External Barriers	Last Mammogram			
	≤ two years n (%)	> two years n (%)	OR	95%CI
Transportation				
Own car	36 (17.1)	7 (8.9)	2.35	0.94-6.69
Relative's car	105 (49.8)	48 (10.8)	1.00	----------
Others	70 (33.2)	24 (30.4)	1.33	0.72-2.47
Information from health-care providers on early detection practices after menopause				
Yes	83 (40.3)	19 (24.7)	2.06	1.10-3.88
No	123 (59.7)	58 (75.3)		
Referral for mammogram < 5 years				
Yes	189 (89.2)	41 (51.9)	7.62	3.93-14.84
No	23 (10.8)	38 (48.1)		

Transportation was barely significant ($0.05<p< 0.10$) as an external barrier. However, going to medical appointments in one's own car increases the possibility of having a mammogram 2.35 times (95%CI: 0.94-6.69) when compared to those who depend on a relative for transportation. Beliefs were the only internal barrier marginally associated to having or not a mammogram during the last two years ($0.05<p<0.10$). Women who manifested less beliefs (Scale score <5) had 68% higher possibility of having had a mammography during the last two years (OR = 1.68, CI: 0.95-2.99) than those who upheld more beliefs. (See Table 39) .

Table 39. Beliefs and Last Mammogram

Beliefs	Last Mammogram ≤ two years n (%)	Last Mammogram > two years n (%)	OR	95% CI
< 5	102 (49.0)	28 (36.4)	1.00	----------
≥ 5	106 (51.0)	49 (63.6)	1.68	0.95-2.99

The different factors that affect the practice of mammogram in the last two years were evaluated simultaneously in a logistic regression model. The significant ($p<.0001$) predictors found were: physician referral and visit to the gynecologist. Referral for a mammogram increased the odds of having had a mammography in the last two years by 6.36 times (95% CI:3.6 - 12.4) when adjusted by visit to a gynecologist (See Table 41). Other variables were not considered because they were not significant.

Table 40. Analysis of Deviance in the Logistic Regression Models for Mammogram in Last Two Years

Model	Deviance	d f	Difference in Deviance (d f)	p-value
MODEL I: Significant variables in bivariate analysis + area of residence + socioeconomic status	230.82	262		
MODEL II *: Significant variables in Model I + area of residence + socioeconomic status	257.40	286	26.57 (24)	0.32
MODEL III* : Model II + interactions with area of residence + interactions with socioeconomic status	254.64	282	2.75 (4)	0.59
MODEL IV:** Model II - area of residence -socioeconomic status	264.05	288	6.65 (2)	

* Compared with previous model **Compared with Model II

[a] Degrees of freedom

Table 41. Mammogram in the Last Two Years: Logistic Regression Model

VARIABLE	β	SE (β)	p -value	OR
Intercept	-1.0594	0.4436	0.0169	-----
Referral for mammogram ≤ 5	1.8507	0.3583	<0.0001	6.63
Visit to gynecologist ≤ 12 months	1.9318	0.3712	<0.0001	6.89

HEALTH PROMOTION PROGRAM

Introduction

The analysis of the data gathered in the qualitative and quantitative phases of the research was used to design a model for a health-promotion program that would be culturally appropriate for women 65 years of age or older in Puerto Rico. The terms, beliefs, knowledge, and attitudes related to breast cancer expressed by the women who participated in the focus groups (See Annual Reports I and II), and the personal and external barriers identified in the national survey served as the basis for the development of this model. The model is intended to minimize the barriers for breast cancer early detection screening and increase the elderly women's compliance with the recommended guidelines. It consists of the following components: (1) a cohort and culturally appropriate health education program for women 65 years and older about breast cancer and early detection practices, (2) a training for primary-care health professionals in breast cancer screening and current guidelines for early detection of this disease in women 65 years of age or older as well as in barriers that affect compliance of early detection practices among elderly women in Puerto Rico; and (3) coordination of the minimum necessary support services in order to facilitate access to the CBEs and mammograms and minimize barriers for early detection of breast cancer.

Theoretical/Conceptual Framework of the Model

Conceptual framework

Health promotion efforts focus on the actions that an individual may take in order to achieve a positive well-being balance. They involve the combination of educational and environmental supports for actions and conditions of living conducing to health (Green & Kreuter, 1991). In 1985, the National Council on Aging and the American Hospital Association formulated a broad definition of health promotion specifically for the elderly. This statement defines health promotion as any health-education intervention or related organizational, political, and economic intervention which is designed to facilitate behavioral and environmental changes that promote the independence and well-being of elderly adults and which result in the prevention or delay in onset of illness and disability and the decrease in their impact (McKenzie & Jurs, 1993). Health-promotion is visualized as the process of promoting awareness,

influencing attitudes, and identifying alternatives so that individuals make informed health decisions and adopt behavioral changes aimed to achieve an optimal level of physical and mental health that improves her/his physical and social environment (Walker, 1990).

The elderly population is a heterogeneous group characterized by differences in lifestyle, educational level, historical experiences and socio-economic status, among others. The investigation and analysis of the factors that enable or prevent desirable health practices among aging adults is the first step of a health promotion program. A knowledge of these factors will provide effective direction for the development of appropriate interventions for the promotion of health in elderly populations.

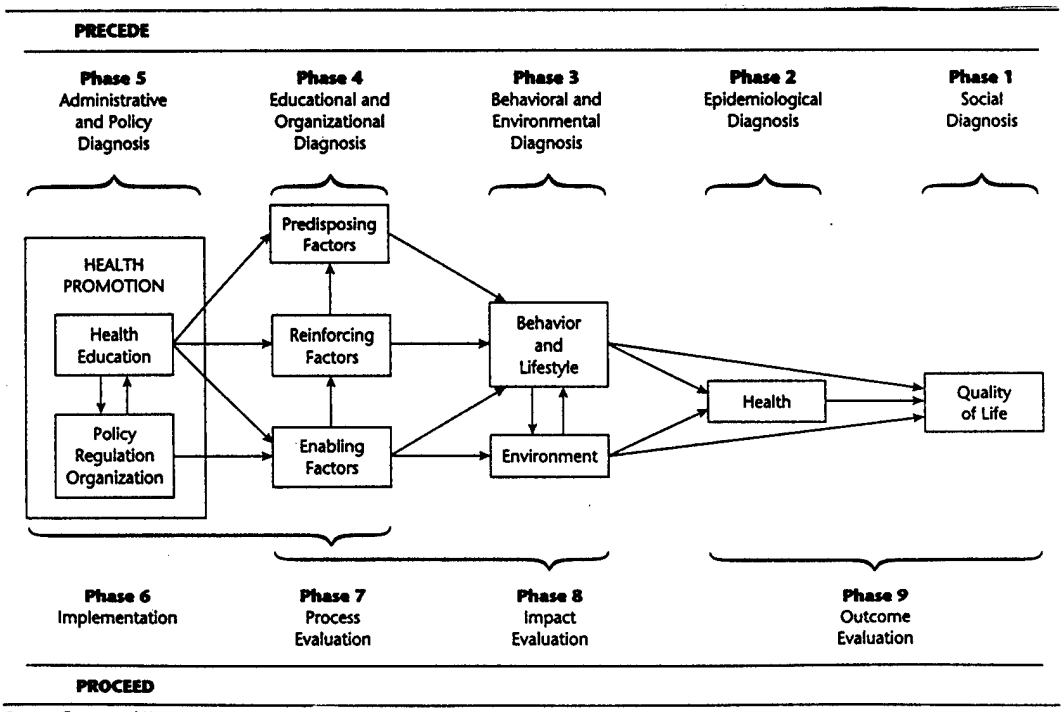
PRECEDE-PROCEED Theoretical Model

Health-promotion models represent a conceptual and analytical framework that provides structure and organization to program planning. The PRECEDE-PROCEED model, formulated by Green and Kreuter in 1991, integrates concepts from Rosenstock's Health Belief Model (1974 in Green & Kreuter, 1991) and Bandura's Social Learning Theory (1962 in Green & Kreuter, 1991).

The Health Belief Model is a psycho-social theory which attempts to explain human behavior with respect to preventive health care. It postulates that health behavior depends on the value placed by an individual on a given goal and in the individual's estimate about the possibility of achieving that goal through a change in health behavior. The theory assumes that actions related to health maintenance depend on the simultaneous interaction of three cognitive factors occurring in the individual: the perceived susceptibility (vulnerability) or risk of disease; the perceived barriers to and benefits of undertaking a particular health behavior; and the perceived severity of the disease. Bandura's Social Learning Theory assumes that the performance of positive health behaviors depends on the reciprocal interaction between cognitive, environmental, and behavioral factors. The adoption of the behavior is influenced by self-generated factors such as the individual's confidence or the perceived ability for carrying out the health action and the self-regulation or monitoring that the individual exercises in the performance of the behavior.

The PRECEDE-PROCEED model (see Figure 1) proposes a diagnostic approach for planning health promotion programs. Planning is conceived as a deductive analytical process, which begins with the identification of the primary goal for improving the quality of life of the target group in a particular area and ends with the program designed. A broad spectrum of factors predispose, enable, and reinforce individuals' health behavior and determine whether the target group will adopt the proposed changes. An analysis of these factors will serve as a diagnostic scheme for developing appropriate educational interventions. In order to achieve the proposed health results, the health-promotion program should focus on producing specific changes in the factors that predispose, enable, and reinforce the target health-behavior.

FIGURE 1. PRECEDE-PROCEED Planning Model



Source: Green and Kreuter, 1991, p. 24.

PRECEDE is an acronym for the Predisposing, Reinforcing, and Enabling factors that influence the health behavior that one wishes to promote in individuals. These factors constitute the basis for the educational and organizational diagnosis of a program aimed at promoting health. The schema is based on concepts and principles derived from four disciplines related to public health: epidemiology, social sciences, health administration, and education. It consists of the following phases:

1. **Social diagnosis:** a needs assessment to determine quality-of-life goals defined with respect to the health problems that prevail in the target population. One might consider the health goals and priorities already identified by the organizations responsible for a country's public health.

2. **Epidemiological diagnosis:** an analysis of epidemiological data in order to identify the specific health problems of the target population and establish the priorities to be addressed in the health-promotion program. One might consider health-related variables such as mortality, morbidity, and the distribution of mortality and morbidity in various sub-groups within the population.

3. **Behavioral diagnosis:** a determination of the specific health behaviors associated with the prioritized health problems selected in the epidemiological diagnosis. Priorities are established for the specific behaviors that will be promoted by the program, according to their importance and potential for change. In addition to the behavioral factors, one might recognize other non-behavioral factors (genetic, economic, environmental) that may have an influence on the health behaviors that will be promoted.

4. **Educational diagnosis:** an analysis of the causes of the specific health behaviors identified in the behavioral diagnosis. The focus of the health-education intervention centers on three types of factors which have a potential for influencing the individual's motivation to change her/his health behavior. These are:

   a. Predisposing factors: associated with the knowledge, beliefs, perceptions, values, and attitudes related to the motivation needed to carry out a specific health action and to the demographic variables that describe individuals.

   b. Enabling factors: associated with the skills, abilities, resources, and health care services that are necessary to perform the action. Among these are the availability of and access to services and the self-healthcare skills possessed by the individual.

   c. Reinforcing factors: associated with the variables that reward or support the positive health behaviors exhibited by individuals. Among these are the family, peers, and other significant persons such as health-care providers.

5. **Administrative diagnosis:** decision-making related to those factors which will be the focus of the health-promotion intervention and to the strategies and methods that will be implemented, taking into consideration the factors that influence the behavior that one wishes to change and available resources.

6. **Implementation of the health-promotion program according to available resources.**

7. **Process evaluation:** refers to the monitoring and assessment of the operational dynamics of the program; how the execution of the plan is going and the gains that are gradually being achieved vis-a-vis the proposed objectives. Activities are performed to determine the extent to which the program is implemented according to the plan. This allows to make decisions as to adjustments and modifications that may be needed, to identify strengths and weaknesses, and to determine parameters for interpreting the degree of success of the plan.

8. **Impact evaluation:** refers to the external, long-term gains which result in positive consequences for the society. Results and changes in those characteristics and

behaviors that the program set out to influence are observed over a period of time. The results are analyzed to determine the effectiveness and efficiency of the program, to define the critical aspects that require improvement, and to make decisions with regard to the revision of the program in order to achieve excellence.

9. **Outcome evaluation:** will depend on the prior phases of the model and on the scope of the program's proposed objectives and requirements. It determines the program's effect on health and quality of life indicators.

Justification for Using the PRECEDE-PROCEED Model

A health-promotion program aimed to increase elderly women's breast cancer knowledge and early detection practices should be grounded in the analysis of all those factors that predispose, enable and reinforce these women's compliance with the recommended guidelines. The emphasis should be on the particular and specific health needs of this population. The PRECEDE-PROCEED model offers a conceptual framework for a holistic analysis of these factors and their incorporation into the design and implementation of a program adequate to this population's needs. It is grounded on the principles that behavior subject to change must be compatible with the values, attitudes, expectations, and social reality of those who will participate in the educational programs and that the reasons or motivations for the recipient's change in behavior must be fully understood by those who question that behavior.

Implementation Plan for the Health-Promotion Model

Operational Concepts

The Model for a Health Promotion Program for Breast Cancer Early Detection Among Elderly Puerto Rican Women has been designed taking into consideration the results of the national survey discussed in the foregoing section and the focus groups that were conducted during the first year of the Project. This model proposes multi-dimensional strategies which can contribute to the achievement of the established Objectives for the Year 2000 (US DHHS 1990) related to the prevention and early detection of conditions that affect the **quality of life** of the elderly population.

The **health problem** identified is the increase in the incidence and mortality rate of breast cancer as the woman's age increases. Epidemiological data for Puerto Rico indicate that breast cancer is the most frequent type of cancer among Puerto Rican women (Department of Health of Puerto Rico, 1993). Elderly women have a higher probability of developing and dying from the disease than younger women. Studies show that despite the existence of effective screening tests for early detection of breast cancer, elderly women are the least likely to comply with them (Haynes and Ory, 1992). The **health behavior** to be promoted is the elderly women's compliance with the recommended guidelines for breast cancer screening. Health promotion efforts are aimed at:

1. Increase awareness of breast cancer as a major health threat for older women and of the importance of breast cancer screening for early detection of the disease;

2. Change attitudes and fears that might be preventing older women from undergoing breast cancer screening, specifically CBEs and mammograms;

3. Teach skills related to BSE;

4. Motivate older women to communicate with their physicians about breast cancer and breast cancer screening.

It is expected that the program will help women to minimize personal barriers and adhere to the practices recommended for breast cancer early detection in women 65 years of age or older (i.e., secondary prevention: monthly self-examination of the breast, clinical examination of the breast once a year, and a mammogram every two years) and to practice assertive communication in the patient-doctor relationship.

To achieve the proposed goals and objectives, emphasis will be placed on the determining factors that predispose, enable, and reinforce behaviors related to the health of the group of women 65 years of age or older. These factors were evidenced in the results of this Project's national survey.

Predisposing factors will be addressed in the health education sessions designed for the elderly women. These factors include demographic variables, beliefs and knowledge about the disease, attitudes related to early-detection practices, and the woman's perception of her vulnerability to the disease. According to the findings of the national survey, no significant differences were found when area of residence was considered. Age, educational level, and socioeconomic status were significant demographic variables affecting the elderly women's early detection practices. As old age increases, there is a decrease in compliance with breast cancer screening practices. Women with a greater number of beliefs, according to the "scale of beliefs" designed by the investigators, had a lower probability of having a clinical examination or a mammogram. As a group, women with the highest level of education exhibited a lower number of beliefs. The results of the study also indicate that the lower percentages in the knowledge scale (< 70%) correspond to assertions related to risk factors for breast cancer. A low socioeconomic status was associated to non-compliance with BSE and mammogram. Neglect or forgetfulness, fear of the disease or of screening practices, modesty or shame at touching themselves or being touched, were reasons mentioned by women for not practicing the early detection techniques and are representative of attitudes which act as personal or internal barriers to follow the early-detection guidelines for breast cancer. Another related attitude was to rely on the physician's judgment or decision to perform the early-detection practices. A considerable proportion of the surveyed women reported that feeling well, having no symptoms or their physician not recommending the practices were principal reasons for non-compliance. Feeling well, not having symptoms, and the fact that their physicians did not recommend specific screening practices were the reasons perceived as most important by the elderly women for not doing the BSE or having a mammogram.

This might be an indicator that these women do not feel susceptible to contracting breast cancer.

The second category are the **enabling factors.** The results indicate that only 8.8% of the women said that they did a monthly BSE while 50.2% indicated doing it daily. This may imply a lack of knowledge as to the correct practice of this method. Having Medicare Part B or a private plan, having visited the gynecologist during the twelve months prior to the interview, the physician's explanation as to early-detection measures, and information provided by health professionals are factors which affect the practice of clinical examination and mammogram. Medical referral was a significant enabling factor for women to have a mammogram.

Based on the definitions of the PRECEDE model, the research findings indicate that having or having had a relative with breast cancer, knowing someone who has or has had the disease, and the presence of symptoms are reinforcing factors for breast cancer early detection practices for the women who participated in the national survey. The findings also indicate that transportation, information on breast cancer offered by health-care professionals, and medical referral for a mammogram are **reinforcing factors** which stimulate compliance with early-detection practices.

Design of the Health-Promotion Model

The health-promotion program has been designed to address those factors which the survey found to be most likely to influence health behaviors. Selection of factors was based on those that can be achieved according to available resources and the objectives of the original proposal. A municipality in the metropolitan area of Puerto Rico will be selected for implementation of this model at the beginning of the fourth year of the Project. A single location will be selected since the results of the survey did not indicate significant differences by area of residence. Since low level of education and low socioeconomic status is a factor that affects non-compliance among the participants, the design and implementation of the program will also consider these factors.

The model will consist of a health education program aimed at elderly women and a training program for primary-care health professionals. In addition, collaborative agreements will be promoted between agencies and community organizations for providing screening services for early detection of breast cancer in these women. The objectives of this health-promotion program are:

1. To educate women 65 years of age or older who attend senior day-care centers in a metropolitan area in Puerto Rico in order to increase both their knowledge about breast cancer and early detection practices and their compliance with the recommended guidelines.

2. To train primary-care health professionals at the selected site in order to increase their knowledge about breast cancer and early-detection guidelines recommended for women 65 years of age or older as well as of the barriers to early detection practices that elderly women in Puerto Rico confront.

3. To provide coordination and assistance for screening appointments to a group of women who took part in the health education program in order to increase their compliance with clinical examinations and mammograms.

Description of the components of the health-promotion program

The health education program for elderly women addresses the objective of educating women in this age group and aims to increase their knowledge of breast cancer and early-detection practices for the disease. The main activities which will be pursued in order to achieve this objective are:

1. Design a culturally and cohort appropriate curriculum to educate elderly women about breast cancer and early detection of the disease.

2. Coordinate the implementation of the health education program with agencies, community organizations, health centers, and senior centers.

3. Evaluate and select or prepare appropriate educational materials for the participants in the health education program.

4. Recruit and train an elderly health educator or nurse to act as a peer for teaching BSE skills.

5. Select the elderly women who will take part in the education program.

6. Carry out the education sessions.

7. Evaluate the knowledge and skills acquired by the participants.

The topics that will be covered in the education sessions are:

1. Barriers faced by elderly women in Puerto Rico for compliance with adequate early detection practices for breast cancer

    a. Personal barriers: beliefs and attitudes
    b. External barriers: access to CBE and mammograms, health care providers

2. Risk factors associated with breast cancer

3. Early-detection practices for breast cancer

    a. Recommended guidelines
    b. Skills for the BSE

4. Medical insurance coverage: Medicare and Medicaid

5. Community resources for breast cancer screening

6. Assertiveness skills in the patient-doctor relationship

The objective of the training for the health-care professionals is to increase their knowledge of breast cancer and the early-detection practices recommended for women 65 years of age or older as well as of the barriers they face for compliance with recommended guidelines. The activities that have been designed to achieve this objective are:

1. Design a curriculum appropriate for professionals concerning breast cancer and its early detection in women 65 years of age or older.

2. Coordinate the training with health services organizations.

3. Identify, evaluate, and select appropriate educational materials for participants in the training program and the lecturers who will participate in the training sessions.

4. Identify and recruit participants.

5. Carry out the training.

6. Evaluation of the training by the participants.

The topics that will be covered in the training sessions are:

1. Summary of the findings from the national survey of the Project "Knowledge and Beliefs of Breast Cancer among Elderly Puerto Rican Women"

2. Epidemiological and clinical aspects of breast cancer in Puerto Rico

3. Screening tests for early detection of breast cancer and recommended guidelines for women 65 years old and older

    a. Screening tests for early detection of breast cancer
    b. Recommended guidelines for elderly women
    c. Appropriate techniques or skills for self-examination and clinical examination in elderly women
    d. Quality-control standards in mammography
    e. Actions to take for follow-up and referral if the tests show suspicious lessions

4. Personal and external barriers that keep elderly women in Puerto Rico from complying with correct practices for early breast-cancer detection

5. Community resources

   a. Medical insurance coverage: Medicare, Medicaid, and others
   b. Organizations and agencies: services, education
   c. Community groups
   d. Early-screening services

The coordination of certain minimum necessary support services is the third component of the program that has been designed. Its objective is to facilitate access to health services offering CBEs and mammograms. The elderly women who attend at least two of the health education sessions and state non-compliance with at least one of the early detection procedures will be divided into two groups. One group will be provided with coordination and transportation to medical appointments for screening purposes. The others will be left to make the appointments by themselves and will not be provided with transportation. The groups will be compared to see if coordination has an impact or not or if education alone is enough to motivate the women to attend screening. The activities designed for the coordination of services are:

1. Coordination of appointments with health centers and the city hospital for CBEs and mammograms

2. Coordination of transportation with the senior citizens community-centers to bring the women to CBEs and mammograms appointments

3. Identification of the candidates who will receive external assistance with regard to support services

4. Scheduling appointments for the CBEs and mammograms

5. Remind participants about appointments and transportation arrangements

6. Provision of transportation for the appointments

7. Coordination of dates for mammograms for those women to whom the physician has given a referral during the CBE visit

9. Follow-up interviews of the participants

Evaluation Plan

Evaluation Model

The evaluation plan for the health promotion model is based on Stufflebean's CIPP (Context, Input, Process, Product) model (1983). It is a systemic approach in which all aspects affecting the achievement of the proposed goals are analyzed. These aspects include: the context or external environment in which the program will operate, the inputs and resources available for the development of the program, the processes or operational dynamics of the program, the achievements over the short, medium, and long term, and the consequences for society (Batista, 1994). Each of these aspects provides information to evaluate decision-making regarding the implementation, modification, termination or continuation of proposed activities aimed at improving the program and achieving the proposed goals.

The evaluation plan intends to investigate the degree of short- and long-term achievements of the proposed goals and objectives. The effectiveness of the program will be measured through activities designed to monitor progress on the plan implementation and to assess the immediate product of the planned efforts as well as the long-term impact of the results of these efforts. The plan will consist of two kinds of evaluation: process/product and impact/results. The process/product evaluation will measure short-term changes while the impact/results evaluation will measure long-term changes (See Figure 2).

FIGURE 2. Types and Methods of Evaluation

Type of Evaluation	Evaluation Methods	Content of Evaluation
IMPACT — PROCESS	First Interview	Practices before health promotion program Knowledge and beliefs before education sessions Assertiveness skills
IMPACT — PROCESS	Post test	Knowledge and beliefs after education sessions
IMPACT	Follow- up interview	Practices after health promotion program Assertiveness skills

Process/Product Evaluation

A. Introduction

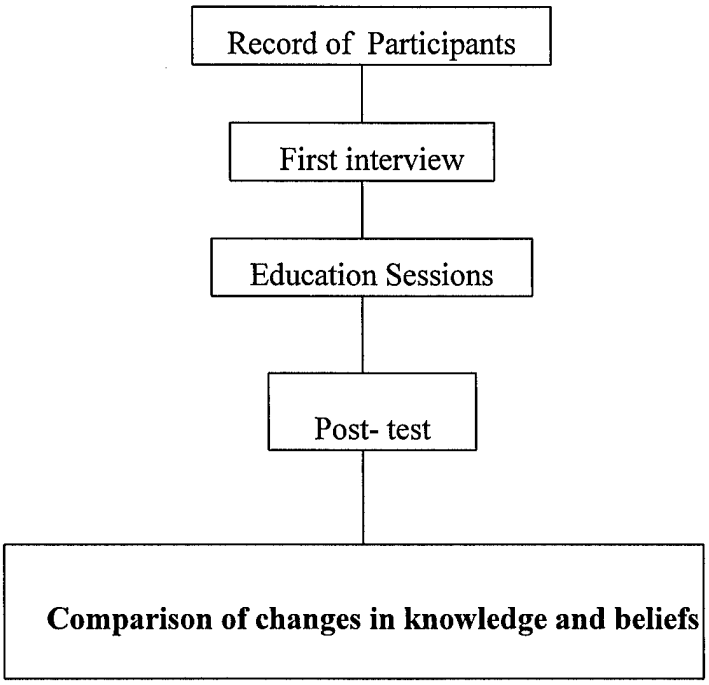
The process/product evaluation analyzes the progress of all the planned activities required for implementing the health education sessions for the elderly women, the training of the primary health-care professionals, and the coordination of the external support services for CBEs and mammograms. Quality in the implementation is monitored by various means in order to make appropriate modifications and measure the immediate product of the efforts. Process/product evaluation will be assessed using the following criteria: number of elderly women who participate in the health education sessions, percentage of women who attend all sessions, changes in knowledge and beliefs as measured by pre and post-tests, and the participant's opinion related to quality of the sessions. The short-term scope will be measured by the change in knowledge and beliefs and the acquisition of BSE skills. The criteria for the process/product evaluation of the training sessions geared to the health-care professionals are: number of professionals who attend the training sessions and the opinion of the professionals as to the quality of the process.

B. Methodology

The attendance sheet will be used to measure the participation in the educational sessions. It is expected that 70% of the women who attend the centers and meet the age-requirement will participate in the sessions. Fifty percent of the participants should attend all the educational sessions. Each session will be evaluated on the basis of content, methodology, organization, instructional resources, and satisfaction with the education sessions. This information will be used to decide any adjustments and modifications that might be necessary to improve the execution of the plan.

The participants will undergo an interview before the beginning of the health education sessions. The interview will focus on the following areas: socio-demographic characteristics (age, educational level, and health insurance coverage), breast cancer early detection practices that they perform, and knowledge and beliefs about breast cancer (scales used in the national survey). The scales on knowledge and beliefs will be repeated after completion of the health education program in order to assess the immediate product of the health education program. The average change between the initial and final interviews will be determined using a general and specific scoring scale. The significance of the change will be evaluated by a t-test for matching samples. In addition, a prosthesis will be used to observe correct performance skills for BSE and the proportion of women who execute the procedure correctly will be determined (See Figure 3).

FIGURE 3. Process/Product Evaluation of Health Education Sessions: Changes in Breast Cancer Knowledge and Beliefs



The attendance sheets for the training sessions for professionals will be used to obtain the number of participants and the type of professional that attended. The quality of the training will be measured by the opinion of the participants of the content, methodology, instructional resources, organization, and satisfaction with the activity. This Project does not contemplate measuring change in the health-care professionals' knowledge about breast cancer and practices of early detection recommended for elderly women. Nevertheless, the results of the national survey indicated that health-care professionals are an important source of information on breast cancer. Therefore, it was agreed that it was necessary to include in the health promotion model a component directed to primary-care providers. It is expected that the health-care providers will benefit from the training and indirectly contribute to the achievement of the health promotion program's goal.

Impact/Result Evaluation

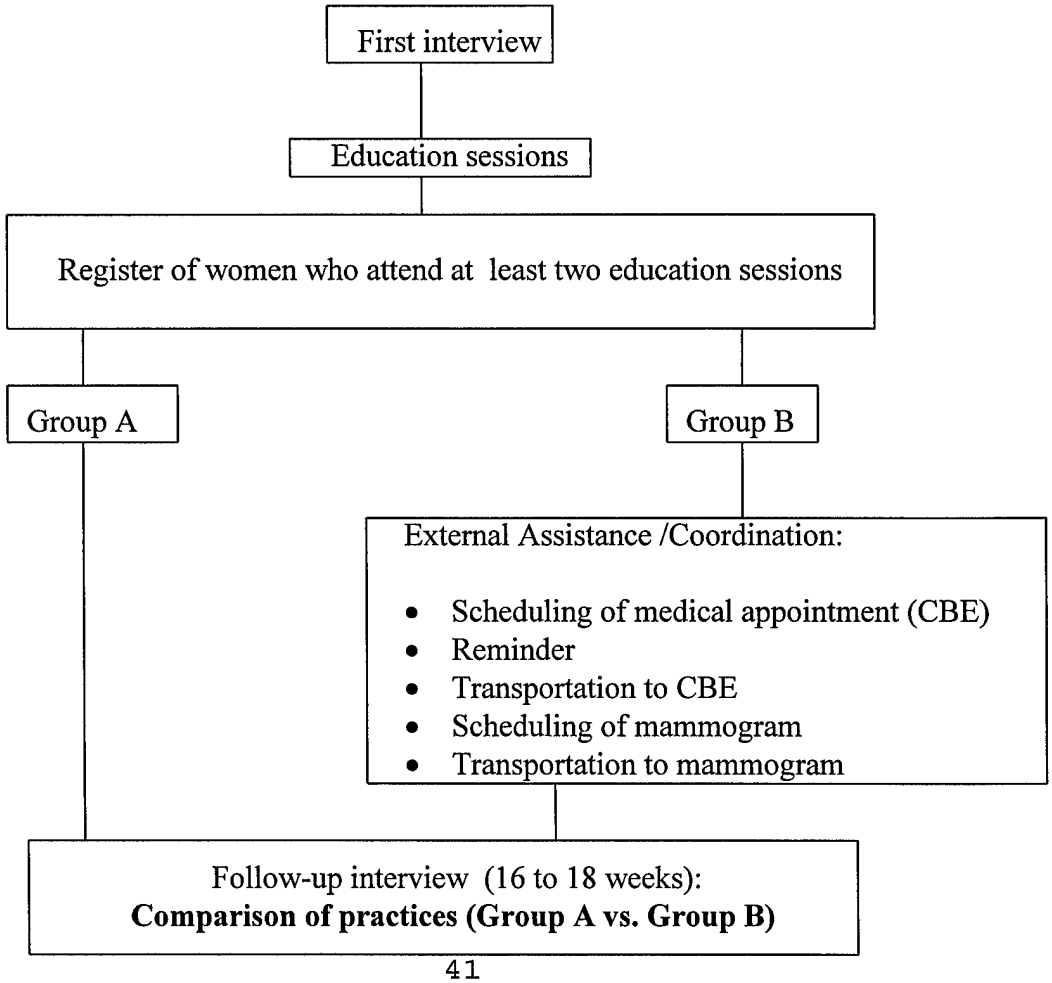
A. Introduction

The evaluation of the impact/results or long-term results of the health promotion program will be measured between 16 and 18 weeks after the health education sessions are completed. The criterion to be used in this type of evaluation will be the change in the practices of early detection of breast cancer during this period of time as reported by the elderly participants.

B. Methodology

An experimental design for evaluating the impact and long-term results of the program is proposed. Women who meet the following criteria will take part in the proposed experimental design : attendance to at least two educational sessions and non-compliance with at least one early-detection practice. The women who meet these criteria will be divided into two groups. The first group (Group A) will only participate in the health education sessions while the second (Group B) will take part in the education sessions and will also receive the external assistance necessary for complying with the CBEs and mammograms. The assistance that will be offered to Group B will consist of making an appointment for the CBE, a reminder prior to the appointment, transportation to the medical appointment for CBE, and reminder and coordination of transportation for the mammography, if the physician so recommends. Sixteen to eighteen weeks after the health education sessions are completed, the participants in the two groups will be interviewed as to the early-detection practices they have complied with since the educational sessions. This information will be compared with that obtained from the first interview in order to determine changes in practices as a result of the program (See Figure 4).

FIGURE 4. Impact/Result Evaluation of the Health Promotion Program: Changes in Breast Cancer Early Detection Practices



DISCUSSION

This study is the first report of results of breast-cancer knowledge, beliefs, and early detection practices among elderly women in Puerto Rico. The national survey was conducted among 500 elderly women stratifying by socioeconomic status and area of residence. Whether results can be generalized to the older female population in Puerto Rico remains to be determined. The sample design was stratified with equal size per strata for selecting households and then using snow-balling technique for selecting subjects. Stratification of the sample affected that 54% of the participants were classified as having a low socioeconomic status when census data indicate that nearly two-thirds of older women in Puerto Rico live below the poverty level (Dávila and Sánchez-Ayéndez, 1996). This difference in proportion could be a limitation in terms of extrapolating results to the elderly population of Puerto Rico. Notwithstanding, the survey population shares certain demographic characteristics with the total female elderly population in Puerto Rico. The sample exhibits a similar average educational level to that of the elderly female population of Puerto Rico; fifth grade (Dávila and Sánchez-Ayéndez, 1996). Education was an important variable in terms of the detection practices of the elderly women who participated in the national survey. Also, the proportion of widowed women in the survey sample (49%) is almost the same as that of the general population (47%) (Dávila and Sánchez-Ayéndez, 1996).

No relationship was found between knowledge and detection practices. The majority of the elderly women knew that the possibility of breast cancer increases with age, that CBE and mammogram are early detection practices, and that the BSE must be performed once a month. Beliefs, on the other hand, had an impact on preventive behavior. Those who adhered to more beliefs tended to practice less cancer early-detection behavior. In terms of risk-behavior, many respondents believed that hitting, bruising or hurting the breast can cause breast cancer. Also, a majority was uncertain if or believed that women who had never had intercourse have a lower risk for developing the disease.

The findings indicate that area of residence is not a determining factor for breast-cancer knowledge and beliefs and compliance with early detection practices. Education and age were determining factors for beliefs. Those with more education and in the younger age category (65-69) adhere to more beliefs about the disease and early detection practices. More years of schooling as well as being a young-older woman (65-69) increase the likelihood of early-detection practices. Age was associated to BSE, ever having a mammogram, and having a mammogram in the last two years. A higher socioeconomic status was associated to performing BSE and having a mammogram. Education was positively correlated to ever having a mammogram or having a mammogram in the two years previous to the interview.

Unlike other studies of Hispanic older women, the results indicate that the older women who participated in the study tend to seek early detection screening of breast cancer. This result could be affected by the fact that almost half the sample (46%) was stratified into non low-income and most of the studies of older Hispanic women focus on those in the lower socioeconomic strata.

CBE was the most often used early detection practice, followed by the mammogram, with BSE a distant third. Almost 45% of the sampled women reported undergoing a CBE during the year previous to the interview. The average number of visits to a physician among older women in Puerto Rico is 55 per every 100 females and the average total of visits per year to a physician is eight (Dávila & Sánchez-Ayéndez, 1996) which points to a high utilization of medical services. Forty per cent of the elderly women in the sample reported never having a mammogram. Forty two per cent of the total sample reported having a mammogram within the two years previous to the interview. The primary reasons most often cited for compliance with a mammogram were: physician referral, knowledge of recommended guideline, and having symptoms. The study did not differentiate between screening mammography and mammography done for symptoms. Many women stated doing a BSE more than once or twice a month. Although a high proportion of women in the sample (71%) reported that they perform a BSE, doubts arise as to whether or not they were stating responses that would be acceptable to the interviewer as the interval cited did not match the recommended interval. A more serious doubt is whether these women are performing the practice correctly. This, however, was not contemplated in the interview schedule. Saint-Germain and Longman (1993) also found that although many older Hispanic women reported doing BSE, they were complying with the practice more than once or twice monthly; up to once daily. Only 8.8% of the total sample indicated that they perform a monthly BSE and 4.2% reported performing a BSE twice a month.

This study also indicates that the two primary sources of breast-cancer health information of the elderly women were formal health care providers and television. Radio and printed materials distributed at health scenarios were mentioned the least. These results could indicate where efforts for dissemination of health information and preventive behavior should be directed.

Results indicate that personal factors were perceived by the elderly women as important barriers for compliance with recommended screening practices. The women mainly cited personal factors as most important barriers for non-compliance with BSE and mammogram. They cited not having symptoms and preference for a physician to conduct a breast examination as the most important factors for not performing a BSE. The primary reasons most often cited for not having a mammogram related to both personal and external factors: not having symptoms, negligence or forgetfulness, and not having a physician's referral. Even though the women mainly cited personal factors as most important barriers for non-compliance with established guidelines, statistical analysis demonstrated that external factors were more significant than personal ones in terms of compliance with cancer early-detection behavior.

Statistical analysis proved that having a CBE was related to visiting a gynecologist. The likelihood of having a CBE increased when the women owned a car and did not depend on others for transportation, had Medicare Part B, or had received information from a health-care provider about breast cancer and early detection methods after menopause. The first two could be related to income. However, the investigation did not ask about specific income.

Statistical analysis also indicated that visiting a gynecologist, having a car, having received information from a health-care provider about breast cancer and early detection methods after

menopause, and upholding less beliefs about the disease increased the odds of having had a mammography sometime in life. The most significant factors that affected ever having had a mammogram were: having a referral from a physician, a health provider as the main source of information about the disease, and having received information from a health-care provider about breast cancer and early detection methods after menopause. When all significant factors were considered, the most significant one turned out to be a referral from a physician.

Similar results were obtained when having a mammogram performed during the two years previous to the interview was considered. The most significant factors for undergoing a mammogram in the last two years were: having a referral from a physician, having received information from a health-care provider about breast cancer and early detection methods after menopause, and having visited a gynecologist. Once again, a referral from a physician was the most important factor when all other were considered. This investigation, like others (Burnett et al., 1995; Danigelis et al. 1995; Rimer, 1993; Rimer & King, 1992; Ross et al., 1994), indicated that physician referral and relationship with health-care professionals influence elderly women's performance of screening behavior for mammograms and CBE. It also evidenced that older women who visit a gynecologist are most likely to have a mammogram. Burg and others found that older women are least likely to visit gynecologists who are the physicians most likely to recommend mammograms (1990, 1992).

The study of client-specific, physician-specific, and health-care-specific barriers and ways to overcome these obstacles has the capability of pointing to specific health promotion actions that can lead to the improvement of rates of personal health-care (BSE), preventive counseling, and office screening (CBE and mammograms) that could decrease breast-cancer morbidity and mortality rates among elderly women. There is a need for health promotion programs to bring early breast cancer detection to underserved women, particularly elderly and minority women. Health promotion programs should detect and recognize personal factors that hinder following recommended early detection intervals or make early detection practices unacceptable. They should also identify social barriers and barriers in the health system so that early detection services could be made more accessible and, also, available. Programs should foster not only knowledge of risk factors but necessary skills pertaining to specific practices (i.e., BSE) and assertive communication with physicians. They must be geared also to increase awareness among health professionals of specific needs of elderly women related to breast cancer early-detection. To provide a listing of screening recommendations to health practitioners and elderly women, as well as women of all ages, is not enough to affect screening rates. Knowledge does not necessarily lead to compliance (Fletcher et al., 1993). Different strategies must be combined to warn elderly women that age 50 years and older is a risk factor for breast cancer and to instruct them about recommended guidelines; specifically about the effectiveness of a mammography. In addition, obstacles to preventive care due to beliefs, attitudes, other personal characteristics, health-system infrastructure, failure of physicians to perform to practice preventively, and lack of access to available health care must also be addressed.

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