

## **Breast Self-Examination Education Among Dominican Women: A Pilot Study**

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### **Abstract**

**Purpose:** Dominican women have limited exposure to breast health/breast self-examination (BSE) techniques. With increased incidence of breast cancer internationally and the burden of breast cancer deaths in low-income countries, it is challenging to develop effective strategies to decrease mortality. The purpose of the pilot study was to assess and educate Dominican women on breast health/BSE. Study objectives included collect data on current breast cancer knowledge and BSE practices; provide education and demonstrate proper BSE; have participants return-demonstrate proper BSE on a model; and determine the need for larger scale breast health programs. **Methods:** In this descriptive feasibility study, we surveyed rural Dominican women ( $N = 73$ ) to determine BSE knowledge and provided education/demonstration during medical mission clinics. **Results:** All women reported limited previous knowledge of breast health/BSE, with 6% reporting monthly BSE. After instruction, 100% of women reported knowledge, with 90% reporting intentions of monthly BSE. **Conclusion:** Despite limitations, this project increased BSE knowledge in rural Dominican communities.

### **Keywords**

*breast; breast self-examination (BSE); breast health; breast cancer; health promotion; Dominican*

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## Introduction/Purpose

With an increased incidence of breast cancer internationally over the last several decades and an even greater burden of breast cancer deaths in low-income countries, a challenge exists to develop effective strategies to reverse this trend of increasing mortality (Porter, 2009). The global incidence of breast cancer increased from 641,000 in 1980 to 1.64 million in 2010, making it the leading type of cancer and also the leading type of cancer mortality (Shetty, 2013). Furthermore, approximately 60% of the breast cancer deaths occurred in less developed countries with 5-year survival rates ranging from 12% to 60% (Sankaranarayanan & Ferlay, 2013).

Early detection of breast cancer through diagnostic imaging may be a promising long-term intervention requiring less extensive treatment to prevent cancer deaths, although the economic investment required to provide screening programs may not be feasible for lower income countries (Porter, 2009; Shetty, 2013). Inexpensive screening methods are more practical for developing countries and must be used to overcome financial barriers. Effective methods to improve early diagnosis include breast cancer screening through breast self-examination (BSE) and clinical breast examination (CBE), followed up with ultrasound if a breast lump is detected (Porter, 2009; Shetty, 2013). Studies have shown that the survival of women with early breast cancer diagnosis is 90% (Moodi, Mood, Sharifirad, Shahnazi, & Sharifzadeh, 2011). Sorensen, Hertz, and Gudex (2005) reported that about 95% of breast cancers can be diagnosed in primary stages if BSE is used regularly. Porter (2009) suggested addressing the breast cancer burden through partnerships between the government, public health system, health care professionals, and community advocates and organizations.

In low-resource countries, such as the Dominican Republic, women present at medical clinics with breast masses that are in the advanced stages, leading to high mortality rates (Porter, 2008, 2009). For example, breast cancer mortality to incidence is less than 0.20 in North America, whereas it is 0.35 in Latin America and the Caribbean (Porter, 2008). Public health systems in many Caribbean regions are focused on the health challenges of infectious diseases and infant mortality, ignoring chronic disease, including cancer. Global mortality rates from breast cancer total 465,000, whereas approximately 35,000 women die each year from breast cancer in the Caribbean region alone (Knaul, Lozano, Arreola-Ornelas, & Dantes, 2008; Moodi et al., 2011). When performed, regular screening for breast cancer has been found to be one of the most effective methods to promote timely treatment and improve survival (Flórez et al., 2008; Petro-Nustas, Tsangari, Phellas, & Constantinou, 2013). Early diagnosis of breast cancer requires the education of women on disease signs and symptoms as well as the importance of seeking care early, especially in rural settings (Shetty, 2013). In fact, the Breast Health Global Initiative

Guidelines support breast health awareness education, BSE, and CBE when health care resources are scarce (Shetty, 2013).

The purpose of this pilot study was to assess and educate Dominican women on BSE and breast health. The specific aims of this project were to (a) collect data on the Dominican women's baseline knowledge of breast cancer and BSE techniques; (b) provide education and demonstrate proper BSE self-examination to Dominican women; (c) encourage Dominican women to return-demonstrate breast examination on a breast model; and (d) determine the need to produce a breast cancer screening program on a larger scale. We hypothesized that the Dominican women (a) would have little or no previous knowledge of BSE and (b) would not know what to do if they found a suspicious lump in their breasts.

This pilot study was initiated in the Dominican Republic in May 2013 to determine inhabitants' knowledge of breast cancer and their responses to breast cancer screening education. The theoretical framework for this project was the Health Belief Model (HBM; Becker, 1976), which asserts that people's health-related behavior depends on their perception of (a) the severity of the potential illness, (b) their susceptibility to that illness, (c) the benefit of taking preventive action, and (d) barriers to taking that action.

## Literature Review

The HBM has frequently been applied to breast cancer screening because health behaviors are often influenced by people's perception of threat to their health as well as the value of their actions to decrease that health threat (Dundar et al., 2006). Women may decide to practice BSE on contextual and personal factors including (a) their knowledge of breast health, (b) their attitudes toward breast cancer, and (c) their health beliefs (Petro-Nustas et al., 2013).

The HBM supposes that each woman's perception of a perceived threat to her health due to breast cancer affects her health-related behavior, such as performing a monthly BSE. According to the HBM, if a woman perceives that she is susceptible to breast cancer, she will start practicing BSE at an early age (Petro-Nustas et al., 2013). If a woman believes that performing a BSE is beneficial to breast health (perceived benefit), and if she is proficient at performing the BSE (confidence), fear (barrier) will be overcome, and she will routinely practice BSE (Dündar et al., 2006; Petro-Nustas et al., 2013). The HBM accounts for personal health behaviors by identifying factors associated with individuals' beliefs. Moodi et al. (2011) found that breast health education had a positive effect on increasing knowledge and attitude about BSE.

Although research shows that breast cancer incidence is highest in more developed regions, overall breast cancer mortality rates are greater in developing countries as a result of late detection, diagnosis, and treatment (Akpo, Akpo, & Akhator, 2010; Porter, 2009). With over 1 million new breast cancer

diagnoses worldwide in 2009, lower resource countries were burdened with 45% of these breast cancer cases and 55% of the breast cancer deaths (Porter, 2009). Knaul, Bustreo, Ha, and Langer (2009) cited that in low- and middle-income regions approximately 317,000 women died from breast cancer, as compared with high-income countries where 155,000 women died. The elevated breast cancer mortality rates in developing countries are often due to late-stage diagnosis and inadequate health care systems. In addition, the incidence of breast cancer widely varies across regions because of differences in culture, health resources, and lifestyles (Porter, 2009). Furthermore, there is a lack of health statistics in developing countries as well as the need for cancer registries to better realize the extent of cancer incidence and mortality rates in these regions (Knaul et al., 2009; Shetty, 2013).

Regardless of culture or socioeconomic status, improved cancer screening participation can result in early breast cancer discovery, decreased incidence of Stage 3 and 4 cancer diagnoses, and improved health outcomes, thereby improving cancer survival rates (Gany, Trinh-Shevrin, & Aragones, 2008). Some common Hispanic cultural values that must be included in breast health education include (a) family, (b) respect, (c) folk illnesses, and (d) spirituality (Siatkowski, 2007). Decisions about health care are often made as a family in a collaborative fashion. Respect for self and others, especially elders in the community, is of high value. Folk illnesses may even be considered a “curse” caused by another individual. Finally, spirituality and prayer are often an integral part of daily life and the healing process (Siatkowski, 2007).

The global incidence of breast cancer varies widely and is most likely due to differences in ethnicity, culture, health resources, and lifestyle patterns, requiring diverse strategies (Porter, 2009). In developing countries, resources and health care services are lacking, although the need for effective strategies has increased. In rural areas of developing countries, breast health awareness is even more challenging than in urban areas (Shetty, 2013). Some methods for early detection of breast cancer are expensive, but the most cost-effective strategy is the monthly BSE to detect individual tumors, prompting clinical examination, diagnosis, and treatment. Furthermore, BSE is a patient-centered, noninvasive, cost-effective method of monitoring for breast abnormalities, especially in rural, low-resource areas (Shetty, 2013). This is often an accepted starting point to increase awareness and acceptance of breast health in developing countries, especially as it is unrealistic for developing countries to perform mammograms for all women over age 40 years (Knaul et al., 2009; Porter, 2009).

The fundamental purpose of developing breast health strategies is to promote diagnosis of breast cancer in early stages to improve mortality (Shetty, 2013). BSE is a viable option in rural areas of low-resource, developing countries and may still detect breast cancers early enough for effective treatment, whereas access to CBE and mammography is often limited (Dündar et al.,

2006). The American Cancer Society (ACS, 2013) recommends that women know how their breasts normally feel and report any changes to their health care professionals. Fancher et al. (2011) reported that women who regularly practiced BSE monthly presented with smaller tumors that less often involved axillary lymph nodes. Developing countries must, therefore, place a greater emphasis on early detection through BSE to reduce the proportion of breast cancers diagnosed in Stages 3 and 4 (Knaul et al., 2009).

Current international breast cancer incidence has increased by 3.1% annually, and the prevalence is even greater in young women in developing countries (Kelly & Shetty, 2013). Furthermore, in low-resource countries, approximately 63.5% of the new cases of breast cancer occur in women under age 50, with 72.1% of the deaths from breast cancer occurring in this age group. A recent report on global breast cancer showed that 23% of breast cancer cases occurred in the 15–49 year age group in developing countries, as compared with 10% in developed countries, suggesting breast screening should begin at earlier ages (Shetty, 2013).

Cultural beliefs may be a barrier to effective BSE education. For women in some cultures, the perceived inability to cope with a potential breast cancer diagnosis can result in the circumvention of breast cancer screening (Kudadjie-Gyamfi, Magai, & Consedine, 2010). Although there is research supporting the concept of fatalism as a deterrent to breast cancer screening, a recent qualitative study by Flórez et al. (2008) showed that Latino and Dominican women supported breast cancer screening and held positive attitudes and proactive behaviors toward breast cancer prevention and cancer survival ( $N = 25$ ). Fatalism refers to the belief that events are predetermined by external forces and that little can be done to change their course; breast cancer may be seen as a predetermined condition that is unavoidable (Chavez, Hubbell, Mishra, & Valdez, 1997). Flórez et al. emphasized the importance of understanding cultural factors that may determine either barriers or incentives to breast cancer screening. In addition, Flórez et al. found that Dominican women were more motivated to participate in cancer screening if they believed late diagnosis or no treatment would lead to death. Dominican women in the United States cited a lack of health care access as the most significant barrier to cancer screening (Flórez et al., 2008).

Roth et al. (2010) conducted a retrospective, quantitative study using secondary, self-reported National Health Interview Survey answers from 361 female breast cancer survivors between 1980 and 2003. They sought to determine why so many women in their clinics reported breast cancers that were detected by methods other than screening mammograms, as 70% of women in the United States reported having a screening mammogram in the previous 2 years (Roth et al., 2010). Roth et al. reported that 56% of breast cancers since the 1980s had been discovered either through CBE or a patient-reported

abnormality. These findings support the importance of teaching women BSE techniques to expedite women seeking clinical diagnosis and treatment of breast malignancies in earlier stages (Roth et al., 2010).

Funke, Krause-Bergman, and Nave (2008) conducted a longitudinal, quantitative study to examine the long-term effects of teaching BSE and breast health awareness. They used self-reported data from women who had attended in-depth breast health seminars in Germany to learn about the effectiveness of a campaign promoting BSE and breast health awareness. Individual and group seminars were taught by female gynecologists, including discussions about the importance of BSE (Funke et al., 2008). Questionnaires were distributed before and after the event as well as 1 year later. They examined the percentage of women who reported performing a monthly BSE before the teaching sessions (21.4%) and at the 1-year follow-up (61.9%; Funke et al., 2008). A significant clinical effect of educating women on BSE was seen; 5.4% of the women had palpated a lump in their breasts poststudy, all had consulted a gynecologist, and one was diagnosed with breast cancer (Funke et al., 2008).

Duda and Bhushan (2011) assessed the baseline knowledge, attitudes, BSE practices, and CBE practices among rural Nicaraguan women. Their research validated the benefits through an informal breast health campaign in an area where breast cancer is the second most common malignancy among female Nicaraguans (Duda & Bhushan, 2011). A community project was designed to increase breast health awareness using a BSE teaching model specifically developed for instructing rural Nicaraguan women (Duda & Bhushan, 2011). The study involved 198 Nicaraguan women initially, with 60 available for the 2-week follow-up assessment. Comparisons made between the pre- and postinstruction survey questions showed substantial improvement in all areas. Duda and Bhushan noted that the surveys demonstrated positive outcomes even with a relatively informal breast health campaign.

In a recent study with Latinas residing in the United States, volunteer lay health advisors ( $N = 74$ ) performed an interactive training program on breast and cervical cancer screening (Saad-Harfouche et al., 2010). Results showed that health education programs led by lay health advisors that are focused on breast health and other health promotion topics may be an effective strategy in improving health in underserved populations, as they often share similar socioeconomic and cultural characteristics (Saad-Harfouche et al., 2010).

Although each study was focused on various minority populations, the underlying theme of the data collected was consistent: Regardless of community location, community education level, or community availability of resources, health education on BSE is an inexpensive yet effective technique for helping to identify breast cancers in earlier stages. This may allow for earlier treatment initiatives, thus improving the long-term chances of survival (Gany et al., 2008). Because research supports the need for early detection of breast cancer, spe-

cific cost-effective strategies need to be developed for the promotion of breast health, including BSE for women in developing countries (Knaul et al., 2009).

## Method

### Design and Sample

After obtaining approval through the institutional review board at Ohio Northern University, we discussed the feasibility study details with medical mission team members, including the director (physician) and clinical coordinator (nurse). This pilot project was created in response to the need for basic BSE teaching in the rural areas of the Dominican Republic as expressed by physicians working with medical teams in this region. Preliminary research shows a pervasive lack of knowledge regarding BSE for cancer screening throughout the Latin America/Caribbean region. In this feasibility study, we used a descriptive research design with a convenience sample of 73 rural Dominican women. The project was implemented in mobile medical clinics in the rural areas of the western Dominican Republic

### Measures

While Dominican women were waiting to receive medical care at mobile medical clinics offered by U.S. volunteers in four barrios, they were individually approached and asked if they would like to participate in a brief survey and breast health education session. Each barrio was notified several weeks prior by the community leader about the mobile clinic with health promotion education. They were surveyed in Spanish pre- and posteducation through the use of a female interpreter and were asked questions regarding their current knowledge of (a) breast cancer, (b) BSE technique, (c) BSE frequency, and (d) medical treatment options for breast health. The questions were asked through the interpreter because many of the women stated they were more comfortable being asked the questions verbally. The researchers also provided (a) a pamphlet with written breast health information in Spanish, (b) simple line drawings of BSE technique, (c) discussion of cancer warning signs and risk factors, and (d) verbal instructions and demonstration of a breast exam on a breast model. The HBM served as a conceptual framework throughout the study.

Three registered nurses provided instruction, with the assistance of a female Dominican interpreter. In an attempt to encourage enthusiastic participation in the study, as well as to start to promote breast cancer awareness in general, we and the female interpreter wore pink uniforms or pink breast cancer awareness T-shirts and handed out pink parachute rope bracelets. We employed a 20-year-old female Dominican interpreter, who worked closely and enthusiastically with the project. She actively engaged the women by discussing and demonstrating the BSE techniques and by coaching the participants

during their practice sessions on the plastic breast model. At the conclusion of the study, this interpreter continued BSE education among the local women while accompanying subsequent medical mission groups visiting the region.

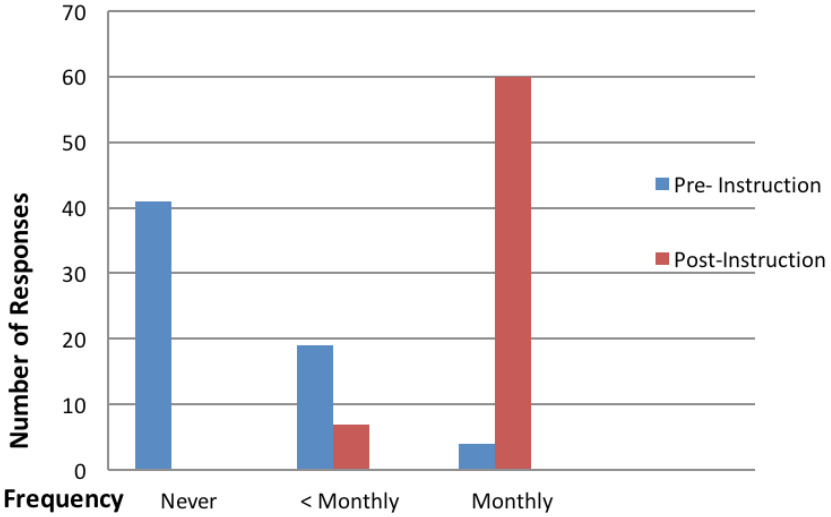
The survey was developed for this pilot, with validity testing performed by having several Spanish-speaking women complete the survey prior to the study. After a baseline 3-point Likert scale survey (*none, some, or a lot*), women were shown a poster with drawings of BSE performed while standing in front of a mirror, lying on a flat surface, and in the shower. Second, the women were shown three breast palpation patterns and instructed to use three fingers flat on the breast to perform their examinations. Finally, the women were given the opportunity to palpate lumps in a plastic breast model, demonstrating BSE techniques. Women were surveyed on breast health pre- and post-breast health education/demonstration to determine teaching effectiveness as well as their intentions to begin monthly BSE. In addition, the women were encouraged to disseminate their new knowledge of breast cancer awareness and BSE techniques to female friends and family members.

### **Findings and Analysis**

The short-term effect of the project incorporated into a medical mission trip was evaluated by comparing Dominican women's survey responses before the individual teaching session to their survey responses after the breast health education. The HBM was used as a conceptual framework throughout the study to look at personal decisions to perform routine BSE. Seventy-three women aged 18 years and over from four rural communities in the Dominican Republic received basic breast cancer education and instructions on two methods of BSE. Many of the women attempted to find lumps by poking the breast model lightly in random locations. They were then retaught a three-finger palpation technique. Study participants ranged in age from 18 to 78 years. The average age of the participants was 35.8, and the most frequently surveyed participants were 20 to 22 years old.

Surveys were analyzed using basic descriptive statistics (means, mode). Analysis of this breast health project demonstrated a significant increase in BSE knowledge. Of the women, 37% indicated BSE knowledge prior to breast health education, whereas 91% indicated BSE knowledge after education, demonstrating a 54% increase. Most significantly, the BSE education provided in this study resulted in a dramatic increase in the number of women who indicated their intention to perform monthly BSE. Before the study, 94% of the participants performed BSE less than monthly or never. After instruction, 90% stated that they would perform a monthly BSE (Figure 1). In addition, 100% of the women surveyed agreed to share the information with female family and friends (Table 1).





**Figure 1.** Frequency of Breast Self-Examinations in Rural Dominican Republic Women

**Table 1**

*Dominican Women Pre- and Post-Breast Health Education Questions and Responses*

Pre-breast health questions	Pre-breast health results	%
Have you ever heard of a disease called breast cancer or such things as breast lumps or breast tumors?	None = 13	18
	Some = 59	82
	A lot = 0	
Do you know anything about examining your own breasts for lumps or abnormalities?	None = 40	63
	Some = 24	37
	A lot = 0	
How often do you perform an examination of your breasts to check for problems?	Never = 41	64
	Less than monthly = 19	30
	Monthly = 4	6
Are you aware of what you should do or who you should talk to if you have a lump or abnormality in your breast?	No = 12	18
	Some = 53	78
	Definitely = 3	4
Post-breast health questions	Post-breast health results	%
Do you feel that you now have some knowledge of breast cancer?	None = 0	
	Some = 63	93
	A lot = 5	7

Do you feel that you now have some knowledge about BSE?	None = 0 Some = 62 A lot = 6	91 9
How often do you feel that you will examine your breasts from now on?	Never = 0 Less than monthly = 7 Monthly = 60	10 90
Do you feel that you now know what you should do or who you should talk to if you find a lump or abnormality in your breast?	No = 0 Some = 60 Definitely = 8	88 12
Do you think you will share this information with other women so they will know what problems to look for in their own breasts?	Yes = 73 No = 0	100

Prior to breast health education, 91% stated they had little or no previous knowledge of BSE and 88% answered that they did not know what to do if they found a suspicious breast lump. After BSE education, 100% stated that they had some or much knowledge of how to examine their breasts for lumps and who to contact if they detected a breast lump. The women who participated expressed their intent to perform routine BSE as well as share the BSE information with friends and family.

Examination of the results by age indicated that women in the youngest and oldest age brackets were the most likely to change their BSE practices after receiving education. In the 18 to 30 age group, none of the women performed monthly BSE before instruction, and 92% indicated an intention to perform monthly BSE after the teaching project. In the 51–60 age bracket, none of the women performed monthly BSE before instruction, and 100% indicated an intention to perform monthly BSE after the project. Similarly, in the over-60 age group, only 14% of the women performed monthly BSE before education, and 100% said they intended to perform monthly BSE after the instruction (Table 2).

**Table 2***Dominican Women Pre- and Post-Breast Health Education BSE Frequency by Age Group*

<b>Age range</b>	<b>Frequency of BSE prior to instruction</b>	<b>%</b>
18–30 years	Never = 20	80
	Less than monthly = 5	20
	Monthly = 0	0
31–40 years	Never = 7	41
	Less than monthly = 7	41
	Monthly = 3	18
41–50 years	Never = 14	74
	Less than monthly = 5	26
	Monthly = 0	0
51–60 years	Never = 4	80
	Less than monthly = 1	20
	Monthly = 0	0
61+ years	Never = 5	72
	Less than monthly = 1	14
	Monthly = 1	14
<b>Age range</b>	<b>Frequency of BSE (intended) after instruction</b>	<b>%</b>
18–30 years	Never = 0	0
	Less than monthly = 2	8
	Monthly = 23	92
31–40 years	Never = 0	0
	Less than monthly = 3	18
	Monthly = 14	82
41–50 years	Never = 0	0
	Less than monthly = 3	21
	Monthly = 11	79
51–60 years	Never = 0	0
	Less than monthly = 0	0
	Monthly = 5	100

## Discussion

The two study hypotheses were supported by survey results. First, we hypothesized that the Dominican women would have little or no previous knowledge of BSE (37% preeducation). With breast health and BSE education, post-education survey results demonstrated a 54% increase. Next, we hypothesized that women would not know what to do if they found a suspicious lump in their breasts (88% preeducation). Health care follow-up if a breast lump is discovered improved significantly with breast health education (100%).

The youngest and oldest women demonstrated their intent to practice a routine BSE after breast health and BSE education. These results are monumental as Fancher et al. (2011) found that young women are more likely to present with advanced stage breast cancer. In addition, Fancher et al. found that 69% of younger women (under 41 years) and 39% of older women (over 40 years) discovered their breast lumps through BSE. Although the ACS (2015) recently recommended that monthly BSE be optional, it also recommends that women be educated on the benefits and limitations of BSE. The ACS (2015) also suggests that women start using the BSE technique in their 20s, get to know how their breasts normally feel, and report any changes to their health care provider.

Although the intent of the pilot study was to survey and educate Dominican women on breast health/BSE, several of the communities had multiple immigrant Haitian families residing there and attending the medical clinics. During the 4 days of this feasibility study, we met and taught primarily Dominican women and a small number of Haitian women. Haitian immigrants are affected by barriers shared by other underserved populations, such as language, undocumented status, and limited health care benefits, and often exhibit limited knowledge of cancer screening and treatment (Gany, Herrera, & Avallone, 2006). Furthermore, Haitians living in the Dominican Republic have even greater limitations on health care because of their immigration status as well as language barrier as their primary language is Creole. Conversation and instruction took place in three languages: (a) English, (b) Spanish, and (c) Creole.

Regardless of culture or socioeconomic status, improved cancer screening participation can result in early breast cancer discovery and more favorable outcomes (Gany et al., 2008). Many studies have shown that women who routinely practice BSE present with smaller tumors and less frequently have axillary node involvement (Fancher et al., 2011; Porter, 2009). Furthermore, cultural values must be included in breast health education, including (a) family, (b) respect, (c) folk illnesses, and (d) spirituality (Siatkowski, 2007).

It should be noted that this project was implemented in areas of the Dominican Republic where women often become pregnant at an early age. One study limitation was the exclusion of pregnant women and girls under age 18. This trend was especially true in the Elias Piña community, an area located within 15 miles of the Haitian border where primarily young, Haitian women, many of whom were pregnant, lived.

Additional limitations of this study include (a) the language barrier (including the need for translation in Spanish and Creole), (b) illiteracy, (c) a significant gap in baseline research to assess attitudes and beliefs of Dominican women on breast cancer screening, (d) limited number of personal contacts at each of the four locations, (e) a large number of pregnant women and girls under age 18 that may have benefited from BSE education, and (f) limited com-

parison data between Dominican and Haitian women on their breast health education and beliefs.

### **Suggestions for Applying Research Findings**

It is possible for cancer screening rates to be improved by (a) targeting health promoters in rural communities to assist with breast health programs, (b) improving Dominican women and health promoter understanding of BSE guidelines, (c) determining Dominican women's attitudes toward breast cancer screening, and (d) continuing BSE education programs with health promoters and community members. In addition, the use of health promoters to educate Dominican women on BSE and other health education programs may be an effective sustainable strategy in improving health in underserved populations, often sharing similar socioeconomic and cultural characteristics (Saad-Harfouche et al., 2010).

As a result of this pilot study based on educating rural women in the Dominican Republic on breast health awareness and BSE practices, and to improve the sustainability of the project, a breast model was purchased for the mobile medical clinic, and future medical mission volunteers will have the opportunity to continue this project.

### **Conclusions**

In contrast to developed countries where the main source of breast health information may be the media (radio/television/newspaper/magazines), health care professionals and rural health promoters are the major information sources in developing countries. An increase in breast health awareness and BSE practices may reduce barriers even in low-resource, developing countries. Proper breast health education on BSE can be an important step in shaping women's breast health behaviors and promoting earlier detection of breast cancer in an effort to improve mortality rates.

### **References**

- Akpo, E., Akpo, M., & Akhator, A. (2010). Breast cancer knowledge and screening practices among Nigerian medical students. *The Internet Journal of Health, 11*(2). Retrieved from <http://ispub.com/IJH/11/2/5445>
- American Cancer Society. (2013). *The cancer burden in Latin America*. Retrieved from <http://www.cancer.org/aboutus/globalhealth/globalinitiatives-byregion/latin-america>
- American Cancer Society. (2015). Breast cancer screening reminder. Retrieved from [http://www.cancer.org/healthy/toolsandcalculators/remind-me?\\_ga=1.267017486.123767255.1433708369](http://www.cancer.org/healthy/toolsandcalculators/remind-me?_ga=1.267017486.123767255.1433708369)
- Becker, M. (1976). *Health Belief Model and personal health behavior*. Thorofare, NJ: Slack.

- Brown, C. G., Patrician, P. A., & Brosch, L. R. (2012). Increasing testicular self-examination in active duty soldiers: An intervention study. *Med-Surg Nursing, 21*, 97–102.
- Chavez, L. R., Hubbell, F. A., Mishra, S. I., & Valdez, R. B. (1997). The influence of fatalism on self-reported use of Papanicolaou smears. *American Journal of Preventive Medicine, 13*, 418–424.
- Duda, R. B., & Bhushan, D. (2011). Teaching rural women in Nicaragua the principles of breast health. *Journal of Cancer Education, 26*, 560–565. doi:10.1007/s13187-011-0244-9
- Dündar, P. E., Özmen, D., Öztürk, B., Haspolat, G., Akyildiz, F., Çoban, S., & Çakıroğlu, G. (2006). The knowledge and attitudes of breast self-examination and mammography in a group of women in a rural area in western Turkey. *Biomed Central Cancer, 6*(43). <https://doi.org/10.1186/1471-2407-6-43>
- Fancher, T. T., Palesty, J. A., Paszkowiak, J. J., Kiran, R. P., Malkan, A. D., & Dudrick, S. J. (2011). Can breast self-examination continue to be touted justifiably as an optional practice? *International Journal of Surgical Oncology*. <https://doi.org/10.1155/2011/965464>
- Flórez, K. R., Aguirre, A. N., Viladrich, A., Céspedes, A., DeLaCruz, A. A., & Abraído-Lanza, A. F. (2008). Fatalism or destiny? A qualitative study and interpretative framework on Dominican women's breast cancer beliefs. *Journal of Immigrant and Minority Health, 11*, 291–301. doi:10.1007/s10903-008-9118-6
- Funke, L., Krause-Bergman, B., Pabst, R., & Nave, H. (2008). Prospective analysis of the long-term effect of teaching breast self-examination and breast awareness. *European Journal of Cancer Care, 17*, 477–482. doi:10.1111/j.1365-2354.2007.00889.x
- Gany, F. M., Herrera, A. P., & Avallone, M. (2006). Attitudes, knowledge, and health-seeking behaviors of five immigrant minority communities in the prevention and screening of cancer: A focus group approach. *Ethnicity and Health, 11*(1), 19–39. doi:10.1007/s10903-007-9076-4
- Gany, F., Trinh-Shevrin, C., & Aragonés, A. (2008). Cancer screening and Haitian immigrants: The primary care provider factor. *Journal of Immigrant Minority Health, 10*, 255–261. doi:10.1007/s10903-007-9076-4
- Kelly, K. M., & Shetty, M. K. (2013). Future strategies for breast cancer screening in developing countries. In M. K. Shetty (Ed.), *Breast and gynecological cancers: An integrated approach for screening and early diagnosis in developing countries* (pp. 302–319). New York, NY: Springer. doi:10.1007/978-1-4614-1876-4\_16
- Knaul, F., Bustreo, F., Ha, E., & Langer, A. (2009). Breast cancer: Why link early detection to reproductive health interventions in developing countries? *Salud Publica Mexicana, 51*, S220–S227. doi:10.1590/S0036-36342009000800012

- Knaul, F. M., Lozano, R., Arreola-Ornelas, H., & Dantes, G. G. (2008). Breast cancer: Take it to heart. Mexico: Breast cancer in numbers. Retrieved from <http://www.funsalud.org.mx/competitividad/>
- Kudadjie-Gyamfi, E. K., Magai, C., & Consedine, N. S. (2010). The obscuring object of race: Clinical breast exams and coping styles in ethnic subpopulations of women. *British Journal of Health Psychology, 15*, 289–305. doi:10.1348/135910709X463723
- Moodi, M., Mood, M. B., Sharifirad, G. R., Shahnazi, H., & Sharifzadeh, G. (2011). Evaluation of breast self-examination program using Health Belief Model in female students. *Journal of Research in Medical Sciences, 16*, 316–322.
- Petro-Nustas, W., Tsangari, H., Phellas, C., & Constantinou, C. (2013). Health beliefs and practice of breast self-examination among young Cypriot women. *Journal of Transcultural Nursing, 24*, 180–188. doi:10.1177/1043659612472201
- Porter, P. L. (2008). Westernizing women's risk? Breast cancer in lower-income countries. *New England Journal of Medicine, 358*, 213–216. doi:10.1056/NEJMp0708307
- Porter, P. L. (2009). Global trends in breast cancer incidence and mortality. *Salud Publica Mexicana, 51*, S141–S146. doi:10.1590/S0036-36342009000800003
- Roth, M. Y., Elmore, J. G., Yi-Frazier, J. P., Reisch, L. R., Oster, N. V., & Miglioretti, D. L. (2011). Self-detection remains a key method of breast cancer detection for U.S. women. *Journal of Women's Health, 20*, 1135–1139. doi:10.1089/jwh.2010.2493
- Saad-Harfouche, F. G., Jandorf, L., Gage, E., Thelemaque, L. D., Colon, J., Castillo, A. G., & Erwin, D. O. (2010). Esperanza y vida: Lay health advisors and cancer survivors to promote breast and cervical cancer screening in Latinas. *Journal of Community Health, 36*, 219–227. doi:10.1007/s10900-010-9300-3
- Sankaranarayanan, R., & Ferlay, J. (2013). Burden of breast and gynecological cancers in low-resource countries. In M. K. Shetty (Ed.), *Breast and gynecological cancers: An integrated approach for screening and early diagnosis in developing countries* (pp. 1–4). New York, NY: Springer. doi:10.1007/978-1-4614-1876-4\_1
- Shetty, M. K. (2013). Screening and early diagnosis to breast cancer. In M. K. Shetty (Ed.), *Breast and gynecological cancers: An integrated approach for screening and early diagnosis in developing countries* (pp. 58–68). New York, NY: Springer. doi:10.1007/978-1-4614-1876-4\_4
- Siatkowski, A. A. (2007). Hispanic acculturation: A concept analysis. *Journal of Transcultural Nursing, 18*, 316–323. doi:10.1177/1043659607305193
- Sorensen, J., Hertz, A., & Gudex, C. (2005). Evaluation of a Danish teaching program in breast self-examination. *Cancer Nursing, 28*, 141–147.