Predictors of breast self-examination practice among elderly women

The purpose of the study presented in this article was to examine predictors of breast self-examination (BSE) practice among elderly female subjects in selected senior citizen centers. The health belief model served as the theoretical framework for the research study. Both the frequency of BSE performance and the technique subjects used to examine their breasts were measured by a questionnaire. Subjects who perceived few barriers to BSE had higher BSE technique scores. The findings also indicated that receiving instruction through a class on BSE was related to improved BSE technique. Perceived susceptibility to breast cancer and perceived benefits of BSE were not found to be significantly predictive of BSE practice.

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CURRENTLY, THERE ARE 16 million women aged 65 years or over in the United States. It is projected that by the year 2000, this figure will rise to 20 to 22 million women.[1] Approximately 49% of breast cancer deaths occur in women 65 or over.[2]

Breast self-examination (BSE) is a method of early breast cancer detection that has been associated with the discovery of smaller tumors in an earlier disease stage[3-5] and improvement in survival.[3,6] BSE, then, can improve the health status of elderly women by fostering detection of breast cancer in earlier disease stages when it is more amenable to treatment. Despite the literature documenting breast cancer as an important health care problem in women 65 or over and research supporting BSE as an efficacious method of early breast cancer detection, few research efforts have examined BSE practices among elderly women. The purpose of the study on which this article is based was to

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identify predictors of BSE practice in elderly women.[7]

THEORETICAL FRAMEWORK

The health belief model was selected as the theoretical framework for the present research study. Created and revised by Rosenstock et al, the health belief model is based on assumptions regarding human motivation in health behaviors.[8,9] It addresses four major health belief constructs: perceived susceptibility to an illness, perceived severity of a disease, perceived benefits to engaging in a health behavior, and perceived barriers to taking a health action. General health motivation was introduced by Becker as a fifth concept to measure different degrees of readiness to engage in general health behaviors.[10] Though some researchers measure health motivation as a separate and distinct variable,[11] others measure it indirectly through the four major constructs.[12]

Rosenstock also defines "cues" as factors that serve to precipitate behavior. A cue can arise from an internal perception of an alteration in body functioning (eg, detecting a breast lump) or persuasion from external sources (eg, advice from significant others or exposure to a media campaign).[9]

The present study drew on the health belief model to measure the relationship between perceived susceptibility to breast cancer, perceived benefits of BSE, and perceived barriers to BSE and BSE practice among elderly women. For the purpose of this study, it was assumed that persons perceive breast cancer as a serious condition.[13]

LITERATURE REVIEW

Studies utilizing components of the health belief model to explain BSE practice have yielded conflicting results. These differences have been attributed to the diversity in study populations, the lack of uniformity in operationally defining model variables, and the lack of information on the reliability and validity of the study instruments.[11] Finally, in examining the BSE practice variable, operational definitions range from simply measuring the frequency of BSE to assessing the actual steps taken in examining the breasts.

Schlueter, in a descriptive, comparative study of 263 women contacted through sorority alumnae and YMCA groups in a Midwestern metropolitan community, divided her sample into athletic and nonathletic women based on self-reported levels of physical exercise. The author found no significant difference in the frequency of BSE practice among exercisers and nonexercisers and no relationship between knowledge of breast cancer or health beliefs and the frequency of BSE practice.[14] Conversely, Hallal concluded from her descriptive, correlational study of 207 women that health beliefs were significant correlates of BSE practice ($P < .05$).[15]

Hirschfield-Bartek, in a study of 25 women aged 29 to 76 years with a history of breast cancer who were receiving radiation treatments, found a significant relationship between perceived susceptibility to the recurrence of breast cancer and frequency of BSE ($P < .05$). However, perceived barriers to BSE practice were not significantly related to frequency of BSE.[16]

Champion developed an instrument to

measure the constructs of the health belief model in relation to BSE practice. Using a convenience sample of 301 women, she tested her instrument for content and construct validity, internal consistency, and test-retest reliability. Champion documented preliminary evidence for the reliability and validity of her tool and suggested it be refined on different study populations.[11]

Trotta, in a study of 446 female employees of an insurance company in Connecticut, aged 18 to 64 years, investigated predictors of BSE performance. Frequency and thoroughness of BSE practice were operationalized using an investigator-designed questionnaire. With multiple regression analysis, perceived barriers were found to be the single best predictor of BSE practice, with high barrier scores being predictive of low reported BSE frequency and thoroughness. Another significant predictor of thoroughness of practice was knowledge of BSE and perceived benefits of engaging in BSE. Additional predictors of thoroughness of practice included receiving printed information, person-to-person instruction, and instruction within a group. Trotta concluded that receiving personal instruction and identifying and overcoming barriers are important aspects of successful BSE performance.[17]

Celentano and Holtzman conducted a telephone survey of 236 women under 65 years of age and 72 women 65 years of age or older to determine their competence in performing BSE. The authors found that, although many of the women reported that they practiced BSE, few could describe the proper method for performing the procedure.[18] Since the technique of performing BSE can profoundly impact the ability of subjects to detect irregularities in their breasts, it is essential that this aspect be adequately measured.[18,19]

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METHODOLOGY

The following research questions were addressed in the present study:

- How frequently does a sample of elderly women perform BSE?
- Which source of BSE instruction relates to greater BSE frequency?
- Which demographic and health belief variables under investigation predict BSE frequency?
- Which technique do elderly women use to examine their breasts?
- Which source of BSE instruction relates to improved BSE technique?
- Which demographic and health belief variables under investigation predict BSE technique?

Sample

One hundred sixty-nine questionnaires were distributed to elderly female subjects at two senior citizen centers in a metropolitan community. One hundred twenty-three were returned, yielding a 73% response rate. Of the 123 questionnaires returned, 105 (or

62% of those distributed) were usable for data analysis. Questionnaires were considered unusable and were excluded from analysis if subjects reported being under 65 years of age or if no age was reported. Sixty percent of respondents were widows. Forty-eight percent were black and 51% were white. Fifty-five percent reported a high school education or more, while 27% reported an eighth grade education or less. The sample, then, was heterogeneous on the demographic variables under investigation.

Instrument

The research tool designed for the present study consisted of a 53-item, three-part questionnaire. The first section consisted of three Likert-type subscales of an instrument designed by Champion[11] to measure the health belief model constructs: perceived susceptibility, perceived benefits, and perceived barriers. Examples of possible barriers to performing BSE include embarrassment, pain from performing the procedure, lack of time, ridicule from family, fear of not being able to perform BSE, and difficulty establishing BSE as a new habit.[11]

The health belief subscales were evaluated for internal consistency and test-retest reliability. The internal consistency of the subjects' responses were computed, yielding alpha coefficients of 0.82, 0.80, and 0.92 for the susceptibility, benefits, and barrier scales, respectively. These findings are more favorable than Champion's findings, in which reliabilities for these subscales yielded coefficients of 0.77, 0.61, and 0.76, respectively.[11]

When the number of elderly subjects agreeing to participate in a test-retest reliability study was too small for analysis, a convenience sample of 24 female graduate students in nursing, aged 24 to 47 years, completed two administrations of the questionnaire within a three-week interval. Subscales for susceptibility, benefits, and barriers yielded test-retest reliability coefficients of 0.68, 0.63, and 0.81, respectively. These findings can be compared with Champion's findings, in which subscales for susceptibility and barriers yielded significant correlations of 0.86 and 0.83, respectively, and perceived benefits yielded a test-retest correlation of 0.47.[11]

The second section of the instrument included a question addressing the frequency of BSE and an investigator-designed checklist assessing the technique subjects employ each time they examine their breasts. The 14-item BSE checklist was based on American Cancer Society and National Cancer Institute recommendations.[20,21] Scores on the BSE technique scale range from 0 to 14, with 14 indicating complete performance of all the recommended BSE steps.

The content validity of the scale was addressed by submitting the tool to a panel of three registered nurses currently enrolled in a master's level nurse practitioner program. Of these judges, one was currently practicing in a geriatric outpatient clinic located in one of the senior centers in which the study was conducted and was therefore familiar with part of the accessible population utilized in this study. Another judge had been certified in BSE instruction through the American Cancer Society and was therefore familiar with the American Cancer Society guidelines for BSE performance. All of the judges

reported teaching BSE to their female patients.

The test-retest reliability of the instrument was conducted on a convenience sample of 18 female graduate students in nursing, aged 24 to 47 years. A reliability coefficient of 0.85 was obtained for the BSE technique scale. To measure internal consistency on this interval-level scale, an alpha coefficient was computed on the original study sample. The alpha reliability of the total scale was 0.77.

Finally, given that 27% of the study sample reported an eighth grade education or less, the reading level of the tool was assessed. The SMOG Readability Formula was designed by the Office of Cancer Communications to evaluate the reading level of health education materials.[22] The formula uses word and sentence length as an index of the difficulty level of the statements.[23] The SMOG formula has been cited for its ease in calculation and its accuracy in estimating the grade level of reading materials. It is also viewed as a conservative estimate of reading grade level.[22] Applying the SMOG formula, the BSE technique tool was found to be at an eighth grade reading level.

The third section of the tool consisted of demographic information, including age, marital status, race, religion, education level, personal and family history of breast disease, and source of any previous BSE instruction (including television, radio, physician, nurse, nurse practitioner, brochure or pamphlet, newspaper or magazine, and BSE class).

Procedure

Data were gathered over approximately two months. Subjects were approached individually and in groups during regularly scheduled activities, blood pressure screening clinics, and informal socialization periods. Questionnaires were distributed to elderly female subjects wishing to participate. To protect the rights of subjects participating in the study and to obtain informed consent, subjects were given a questionnaire and a consent form outlining the purpose, procedure, confidentiality, and freedom to withdraw from the study. Return of a completed questionnaire and an optional signed written consent form indicated the subject's desire to participate. In some instances, subjects were assisted in completing the questionnaire by having the statements read to them and their responses marked. Data were collected by the investigator, female volunteers (at one of the centers), or female graduate students trained in questionnaire distribution. Following participation in the study, subjects were offered an American Cancer Society brochure on BSE. The questionnaires took approximately 10 to 15 minutes to complete.

Data were analyzed using Pearson's *r* correlation coefficients and stepwise multiple regression. Missing data were handled using a similar deletion of subjects, an option in the Pearson's *r* and multiple regression programs of the *Statistical Package for the Social Sciences* manual.[24,25] An alpha level of 0.05 was set for determining the significance level for all data analysis.

RESULTS

BSE frequency

The findings indicated that 62 (61%) of the 101 respondents answering this item reported performing BSE monthly, and 15

(15%) reported performing BSE at least once every other month. Conversely, 19 (19%) reported not performing BSE. (Four reported performing BSE at least once a year and one reported performing BSE less than once a year.) Television was found to be the only source of BSE instruction associated with greater BSE frequency ($P < .03$) (Table 1). Finally, perceived barriers to BSE were the best predictor of BSE frequency ($P < .02$). This variable explained 6% of the total variance in BSE frequency (Table 2). However, this finding was in the opposite direction from that predicted by the health belief model, with greater perceived barriers predicting greater BSE frequency. Perceived susceptibility and perceived benefits were not found to significantly predict BSE frequency. In addition, none of the demographic variables was found to significantly predict frequency of BSE performance.

BSE technique

Five of the 14 recommended steps for BSE were reportedly practiced by less than 50% of the respondents. The step most often performed was feeling the breasts for lumps, hard knots, or thickening. The step least reported was placing a towel or pillow under the shoulder of the breast being examined (Table 3). Subjects who reported receiving instruction in a class on BSE had significantly higher BSE technique scores ($P < .02$), while those who reported receiving no BSE instruction had significantly lower BSE technique scores ($P < .05$). Finally, subjects who reported fewer barriers to BSE had higher BSE technique scores ($P < .05$) (Table 1). Race was the single best predictor of BSE technique ($P < .03$). Race, age, and perceived barriers were found to be the best set of predictors of BSE technique ($P < .004$), with Caucasian subjects, younger subjects, and subjects reporting fewer barriers to BSE having higher BSE technique scores. Race, age, and perceived barriers to BSE together accounted for 19% of the variance in total BSE technique scores (Table 2). Perceived susceptibility and perceived benefits were not found to significantly predict BSE technique.

Table 1. Significant correlates of BSE frequency and BSE technique among study respondents (n = 65)*

Variable	BSE frequency, *r*	BSE technique, *r*
Television	0.29	
Class on BSE		0.30
No instruction		−0.25
Perceived barriers to BSE		−0.31

*$P < .05$ or better.

DISCUSSION

The results of this study demonstrate that selected demographic and health belief variables only weakly predict BSE behavior in the 105 elderly women under investigation. This is evident from the finding that 94% of the variance in BSE frequency and 81% of the variance in BSE technique remain unexplained by the variables under investigation. Given that the health beliefs studied accounted for only a small portion of the variance in BSE practice, future studies should examine other psychological and sociocultural variables

Table 2. Stepwise multiple regression of selected demographic and health belief variables with BSE frequency (n = 94) and technique (n = 71)

Variable	Final step				Cumulative values			
	Beta	*T*	Sig *T*	*r*	r^2	*F*	*P*	Change in r^2
				Frequency				
Perceived barriers to BSE	0.25	2.5	0.015	0.25	0.06	6.2	0.015	0.06
				Technique				
Race	0.40	3.4	0.001	0.27	0.07	5.6	0.020	0.07
Age	−0.26	−2.3	0.026	0.36	0.13	5.2	0.008	0.06
Perceived barriers to BSE	−0.23	−2.1	0.040	0.43	0.19	5.1	0.003	0.05

Table 3. Frequency and percent distribution of study respondents' reported performance of selected BSE steps

BSE step	No. respondents*	No. (%) yes responses
1. I examine my breasts during my bath or shower.	80	48 (60)
2. I look at my breasts in the mirror with my arms at my sides.	79	40 (51)
3. I look at my breasts in the mirror with my arms raised over my head.	78	32 (41)
4. I look at my breasts in the mirror with my hands on my hips.	77	16 (21)
5. When I look at my breasts in the mirror, I am looking for swelling, dimpling of the skin, or changes in the nipple.	80	49 (61)
6. I examine my breasts while lying down.	82	48 (58)
7. When lying down, I place a towel or pillow under my shoulders before examining my breast on that side.	79	14 (18)
8. When lying down, I place my hand above my head before examining my breast on that side.	80	30 (38)
9. I use my right hand to examine my left breast and my left hand to examine my right breast.	82	58 (71)
10. I examine one breast at a time.	84	75 (89)
11. I examine my breasts in a circular or clockwise motion moving from the outside in.	82	62 (76)
12. When examining my breasts, I feel for lumps, hard knots, or thickening.	84	79 (94)
13. When examining my breasts, I also feel my armpit area.	82	56 (68)
14. I squeeze the nipple of each breast to look for discharge.	79	31 (39)

*The number of respondents for each step may be higher than that for the total BSE technique scale (n = 74) since, if subjects neglected to answer one or more items on the scale, the total score could not be computed.

to more adequately explain BSE behavior in elderly women.

Weisenberg et al found that some relationships between the health belief variables and health behaviors were in the opposite direction from those predicted by the health belief model.[26] Likewise, contrary to the theoretical framework, this study found that the more barriers to BSE, the greater the BSE frequency. Weisenberg et al hypothesize that differences in study results may have been secondary to the research design employed or the nature of the population under investigation.[26] It is possible that women who perform BSE, when reading the possible barriers listed in a questionnaire, are able to recall more barriers that they did need to overcome in order to practice BSE with greater frequency. It is also possible that despite greater perceived barriers, women may quickly palpate their breasts, which does not require the motivation needed to perform BSE with the appropriate technique.

The present study demonstrated that 61% of the respondents perform monthly BSE. In contrast, Galleto et al found that 19.5% of women 61 years and older perform monthly BSE, and a 1974 Gallop Survey found that 18% of women 18 years and older perform monthly BSE.[27,28] The relatively high percentage of women performing monthly BSE in this study may be secondary to their participation in senior centers offering medical and health education services or their exposure to BSE classes that emphasize the importance of screening and early detection of breast cancer. As such, the selection of the sample from an essentially healthy, ambulatory population limits the generalizability of these findings. Indeed, it can be argued that persons who participate in medical and health education services are more concerned over their health status and therefore seek preventive health services and adopt improved preventive health behaviors. This point needs to be investigated empirically in future studies.

The finding that race was a significant predictor of BSE technique may be a function of educational level or age. Indeed, a significant relationship existed between race and educational level, with white subjects reporting a higher educational level than black subjects ($P < .005$). In addition, black subjects tended to be significantly older than white subjects ($P < .009$). Finally, socioeconomic, cultural, and other attitudinal factors that were not investigated in the present study could account for this significant finding.

Missing data may have been due to a difficulty in comprehension and readability of the questionnaire and may have affected the study results. Given that 27% of the study sample reported an eighth grade education or less, subjects may have had difficulty interpreting and responding to items. For example, several of the research participants appeared to have difficulty comprehending the Likert scale format. Questions arose regarding differences in shades of meaning, eg, between strongly agree and agree, and strongly disagree and

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disagree. In addition, the extent to which fear, modesty, or embarrassment led to nonresponsiveness remains uncertain.

The present study suggests that many unexplained issues remain in BSE research that are amenable to nursing investigation. The use of convenience samples from ambulatory settings limits the generalizability of the present findings and may have affected the research results. Therefore, replication of the study using a random sampling method and a larger sample size is advised to strengthen the generalizability of the results to other study populations. Moreover, BSE behavior should be studied in diverse elderly female populations, including institutionalized, homebound, and dependent elderly women, and in elderly women with a history of breast disease. It would also be interesting to study other barriers, including fear of surgery or other treatments for breast cancer, and the impact of altered sensation, mobility, or illness on BSE practice in elderly women with physical restrictions.

Given that five of the recommended steps for BSE were reportedly practiced by fewer than 50% of the respondents, nurses should exert a concerted effort to instruct elderly women in this preventive health behavior and to perform professional breast examinations on them. Any health education endeavor should emphasize the aspects of BSE technique that are most often neglected.

Using a questionnaire approach, nurses can identify the unique health beliefs of patients prior to implementing an educational program designed to address their concerns. In addition, prospective, experimental studies should be conducted to examine the effect of different health education techniques and other modes of instruction on changes in BSE practice in elderly women over time. In future studies, BSE practice should be evaluated through direct observation and compared with self-reported measures using the BSE technique tool to establish criterion validity for the tool and document the validity of self-reports of BSE technique.[29] Finally, test-retest reliability studies should be conducted on a sample of elderly women. By strengthening their research methods and exploring factors known to motivate health behaviors, future nurse-researchers will continue to shed light on BSE practice in elderly women.

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