Health Beliefs, Health Locus of Control, and the Frequency of Practice of Breast Self-Examination in Women

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The relationship of health beliefs, health locus of control, and the frequency of practice of breast self-examination in women was explored through use of a survey. Health beliefs alone and health beliefs combined with internal health locus of control were found to predict the frequency of practice of breast self-examination in a sample of 48 women. The combined variables of health beliefs, internal health locus of control, religion, and occupation explained 80% of the variance in nonpractice and 73.3% of the variance for high practice. Moderate frequency practice was not a significant predictor of breast self-examination. Discriminant function analysis, canonical correlation, and analysis of variance were used in the data analysis.

Breast cancer is the second leading cause of cancer death in women in the United States. Breast self-examination has been widely recommended as an inexpensive method of detecting breast lesions at an early stage. Despite the simplicity and widely documented benefits of breast self-examination, studies indicate that women do not practice breast self-examination regularly and seldom at the recommended monthly frequency. Although numerous correlates of breast self-examination have been hypothesized, research has not conclusively identified significant correlates of this behavior.

The purpose of this study was to further develop this body of knowledge by examining the relationships among health beliefs, health locus of control, and the frequency with which breast self-examination is performed. The theoretical framework for this study was based on the health belief model and the multidimensional health locus of control concept developed by Wallston, Wallston, and DeVellis from Rotter's locus of control concept.

The health belief model posits that an individual must have a psychological state of readiness for action in reference to a health behavior. Readiness for action is influenced by health beliefs concerning the threat posed by a disease (perceived susceptibility to and severity of the disease), the perceived benefits of and barriers to recommended health actions, modifying factors, and cues to action. The health belief model assumes that motivation determines an individual's perception of the environment.

The multidimensional health locus of control concept seeks to explain the individual's interpretation of the causality of health-related behavioral outcomes. Persons learn to expect that health-related outcomes are the result of their own actions (internal health locus of control) or the result of the actions of others (external health locus of control). External locus of control consists of two or-
thogonal components: the perception that health-related outcomes result from chance and the perception that health-related outcomes result from the influence of a powerful other.5

Because of the apparent multidimensional nature of motivation to engage in preventive health behavior, Wallston et al. and others have suggested that to investigate health-related behavior health locus of control be used in combination with other variables such as perceived severity of and susceptibility to disease, health motivation, and perceived costs and benefits of recommended health actions.5

REVIEW OF LITERATURE

In support of the health belief model, Fink, Shapiro, and Roester report that "a perception of personal vulnerability to cancer and a concern with the severity of cancer distinguished participants from nonparticipants in a breast cancer screening program."9 Other researchers have found health beliefs to correlate with the practice of breast self-examination. Stillman and Zapka and Mamon found that the majority of women who held high beliefs in the perceived benefits of breast self-examination and/or a perceived susceptibility to breast cancer practiced breast self-examination to some degree.2,10 Breast self-examination also was found to be positively correlated with perceived benefits by McCusker and Morrow.11

Locus of control, among ten personality factors, effectively discriminated among levels of practice of breast self-examination in a study of "psychological correlates of breast self-examination behavior."12 In another study, no relationship was found between health locus of control alone, or in combination with health value, and breast self-examination.11 Relationships were found between health locus of control and health beliefs concerning vulnerability to cancer, efficacy of preventive actions, and overall anxiety about cancer. Kin found that participants in breast self-examination screening programs demonstrated higher perceived susceptibility than did nonparticipants.13 Health locus of control was found to be unrelated to participation in screening.

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In contrast, Gramse found that perceived benefits of action and health beliefs explained 9.3% of the variance in breast self-examination practice.14 Women with an external locus of control tended not to practice breast self-examination. Hallal found significant relationships between breast self-examination and health beliefs.3 Breast self-examination was negatively correlated with higher scores on powerful others health locus of control, but no relationship was found between internal health locus of control and breast self-examination. Similarly, another study found a negative correlation between chance health locus of control and health promotion activities, including preventive health behaviors.15

Definitions

- Breast self-examination: "Self-reported examination of both breasts in a systematic manner by a woman for the purpose of detecting an abnormality."12
- Frequency of breast self-examination: Self-reported number of times per year that breast self-examination is performed.
- Health beliefs: A set of perceptions an individual holds about susceptibility to breast cancer and the perceived benefits of breast self-examination, as measured by the Stillman health beliefs instrument.
- Health locus of control: The individual's interpretation of the causality of behavioral outcomes related to health, as measured by the multidimensional health locus of control scale. Subscales include internal health locus of control, the generalized expectancy that health-related reinforcements result from one's own actions; chance health locus of control, the generalized expectancy that health-related reinforcements result from chance; and powerful others health locus of control, the expectancy that health-related reinforcements result from the actions of powerful others.

Assumptions

This study was based on three major assumptions: cancer is perceived by most individuals to be an extremely serious illness; health is valued highly by most individuals; and health locus of control and health beliefs are relatively stable over time.
METHODS

Sample

The sample was delimited to English-speaking women 18 years of age and older. Questionnaires and letters were distributed to all mothers (N = 137) of children attending three private, nonsectarian preschools offering similar services within a suburban community. Forty-nine subjects responded by returning the questionnaires and consent forms in a box provided at the school. One subject was omitted from the study because she had omitted several pages of the questionnaire.

Fourty-eight mothers of preschool children were surveyed, using the Stillman health beliefs instrument and the multidimensional health locus of control scale.

Subjects ranged in age from 26 to 44 years. Twenty-seven subjects were between the ages of 26 and 31 years, 19 were between 32 and 37 years, and two were between the ages of 38 and 44. Twenty-six of the women, eight of whom described themselves as health professionals, worked outside the home. All subjects had completed high school; 18 had completed some college, 11 had graduated from college, four had completed college and additional education, and three had completed graduate school. The sample comprised 44 white, two Black, and two Asian women. Thirty women were Catholic, 14 women were Protestant, and four women were Jewish.

Instruments

The following instruments were incorporated into a four-part survey: the Stillman health beliefs instrument (part II), the multidimensional health locus of control scale (form A), a breast self-examination performance instrument, and a demographic background data form. An informed consent form was completed by the subjects and returned along with the completed survey.

Nine items from the Stillman health beliefs instrument concerning perceived susceptibility to breast cancer and perceived benefits of breast self-examination were used in the survey. For example, two questions were, "Whether I find a lump in my breast myself doesn't matter, because by then it's too late anyway" and "My health is too good at present to even consider thinking that I might get breast cancer."

A Likert-type agree-disagree continuum was used for this study. The original four-point Likert scale was modified to a six-point scale to be consistent with the multidimensional health locus of control scale. The potential range of scores was 9-54 points. Stillman reported pretesting this instrument on a sample of 20 women. Content validity for the health beliefs scale was established by a panel of experts.2

The data from the current study yielded an alpha coefficient of 0.637 for health beliefs. (The alpha coefficient, the preferred method of estimating internal consistency, measures the extent to which all of the items are homogeneous or measure the same characteristics. Alpha coefficients range from 0.00 to 1.00. Higher coefficients signify a more homogeneous measure.)14 Because no evidence of internal consistency was provided by Stillman or in subsequent use of the health beliefs scale, comparing the reliability of this scale in this sample to previous samples studied was not possible.3,17 Only part II of the scale was used because the other portions of the scale did not specifically measure health belief concepts but pertained to knowledge and breast self-examination behavior.

The multidimensional health locus of control consists of 18 statements to which the subject responds on a six-point Likert-type continuum (strongly agree to strongly disagree). Each of three subscales (internal, powerful others, and chance) contains six statements, and each subscale yields an independent score. Thus, potential scores for each multidimensional health locus of control subscale range from 6 to 36. Questions are mixed within the schedule. Examples of items are as follows: internal health locus of control—"If I get sick, it is my own behavior which determines how soon I get well again"; chance health locus of control—"Most things that affect my health happen to me by accident"; and powerful others health locus of control—"Having regular contact with my physician is the best way for me to avoid illness."

Alpha coefficients for the multidimensional health locus of control subscales were 0.667 (internal health locus of control), 0.165 (powerful others health locus of control), and 0.685 (chance health locus of control) in this sample. Wallston found alpha coefficients of 0.767, 0.673, and 0.685, respectively.5 Powerful others health locus of control was omitted from the analysis because of low internal consistency for this sample. Internal health locus of control has been found to be correlated with health status (r = 0.403, p < 0.001), and chance health locus of control has been found to be negatively correlated with health status (r = -0.275, p < 0.01) as an indication of predictive validity.5 The multidimensional health locus of control subscales correlated positively with the subscales of the Le-
The breast self-examination performance instrument elicited frequency of breast self-examination performance and included open-ended questions concerning history of breast lumps and cancer, sources of breast self-examination education, and the rationale for practicing or not practicing breast self-examination. The demographic background form elicited age, education, income, occupation, and religious affiliation. The entire questionnaire was pretested on a sample of five women to ensure clarity of instructions and readability.

Procedure

Permission was obtained from the directors of three local preschools to approach the women about participation in the study. Packets containing the questionnaire, consent form, and a cover letter were delivered to potential subjects through mailboxes used to deliver notices to the parents. Completed forms were deposited to a box placed in a visible location in each school. After three weeks of survey collection, a follow-up letter was sent as a reminder to complete and return the surveys. Data collection occurred over a five-week period in the spring.

Measures of central tendency were calculated for all subscales of the breast self-examination instrument. Frequency of practice of breast self-examination was grouped into three categories according to the frequency distribution of the scores. Subjects who practiced breast self-examination from not at all to twice per year ($n = 15$) were classified as nonpractitioners. Moderate practitioners ($n = 18$) were subjects who reported breast self-examination three to eight times per year, and high practitioners ($n = 15$) were those subjects who performed breast self-examination from nine to twelve times per year.

Health beliefs alone and health beliefs combined with internal health locus of control predicted frequency of practice of breast self-examination.

Stepwise discriminant function analysis and canonical correlation were used to predict classifications of level of practice and to compare predicted to actual classifications using the independent variables of health beliefs, internal health locus of control, chance health locus of control, educational level, history of breast lumps, occupation, and religion.

RESULTS

Ten subjects reported not practicing breast self-examination, and 38 subjects reported practicing breast self-examination. Health belief and internal health locus of control scores were normally distributed. Mean scores for survey subscales were calculated according to level of practice (Table 1). Health belief mean scores increased for each level of practice.

Scores on internal health locus of control increased between non-practice and moderate frequency practice, decreasing slightly between moderate and high frequency practice. However, high frequency practitioners scored higher than nonpractitioners on internal health locus of control. No consistent trend for chance health locus of control scores was identified.

The first step of the stepwise discriminant function analysis demonstrated that health beliefs alone explained 12.5% of the variance in breast self-examination frequency, $(F(2, 45) = 3.189, p = 0.05)$. A significant difference was found between nonpractitioners and high practitioners $(F(1, 45) = 6.062, p = 0.01)$. The difference in health beliefs between moderate and high practitioners did not achieve statistical significance.

Step two of the discriminant function analysis included internal health locus of control with health beliefs. A significant difference was found between nonpractitioners and high practitioners $(F(1, 45) = 6.062, p = 0.01)$. The difference in health beliefs between moderate and high practitioners did not achieve statistical significance.

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Table 2. Summary Table of Stepwise Discriminant Function

<table>
<thead>
<tr>
<th>Steps</th>
<th>Variable Entered</th>
<th>Wilks's Lambda</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Health beliefs</td>
<td>0.87</td>
<td>0.02</td>
</tr>
<tr>
<td>2</td>
<td>Internal health locus of control</td>
<td>0.82</td>
<td>0.07</td>
</tr>
<tr>
<td>3-7</td>
<td>Occupation</td>
<td>0.65</td>
<td>0.20</td>
</tr>
<tr>
<td>8-10</td>
<td>Religion</td>
<td>0.53</td>
<td>0.16</td>
</tr>
</tbody>
</table>

The remaining steps of the discriminant function included occupation and religious affiliation. Chance health locus of control, educational level, and history of breast lumps did not enter the discriminant analysis due to low F ratios. Health beliefs, internal health locus of control, occupation, and religion explained 47.5% of the variance. The difference between nonpractice and high frequency practice resulted in an F ratio of 2.0253 (df = 10, 36, p = 0.05), following the final step of the discriminant function analysis, although Wilks’s lambda did not achieve significance (Table 2).

Frequency of breast self-examination practice was correctly classified by the resulting discriminant function 64.58% of the time. Canonical correlations demonstrated an 80% accuracy rate in predicting nonpractice and a 70% accuracy rate in predicting high practice (Table 3). These percentages demonstrate the strong predictive ability of the combination of health beliefs, internal health locus of control, occupation, and religion.

Cross tabulations and analyses of variance revealed no patterns or significant differences in group membership, which could explain the effects of the categorical variables of occupation and religion. Analysis of variance for the effect of religion revealed that the main effect of religion was not statistically significant.

**DISCUSSION**

Support for the relationship between health beliefs and frequency of practice of breast self-examination compares favorably with the findings of Hallal and Stillman. Lack of support for the role of internal health locus of control alone also concurs with Hallal’s findings. Chance health locus of control was not found to be a significant predictor.

Internal health locus of control and health beliefs discriminated well between nonpractitioners and high practitioners of breast self-examination, together accounting for 18% of the variance. Although the combination of variables did not achieve significance (p = 0.07), the strong predictive ability of the discriminant function suggests that with a larger sample size, significance would improve.

The canonical functions predicted only the extremes in breast self-examination frequency, perhaps because members of the moderate frequency group did not have beliefs that were as consistently intense as the two extremes (not practicing and high frequency of practice). A larger, more random sample would enhance the discriminative abilities of the independent variables.

The high proportion of subjects who reported practicing breast self-examination (38 of 48 subjects) is consistent with Stillman’s findings. However, only 15 of the 48 subjects reported high-frequency practice (nine to twelve times per year). This finding compares unfavorably with Stillman’s finding of 40% high frequency practice. Given the time span between the publication of Stillman’s work (1977) and the publication of this study, as well as the widespread dissemination of information about breast self-examination, this finding suggests that...
motivational factors unrelated to possession of information alone play a role in breast self-examination behavior.

Limitations

Because only frequency of breast self-examination performance was elicited from the subjects of this study, no generalizations can be made from this data concerning the effectiveness of the practice of breast self-examination or the timing of practice in relation to the menstrual cycle. In addition, the small nonrandom sample and multiple variables examined limit the general application of these findings. A potential nonresponse bias, given the low response rate, is another limitation. The possibility for the participants to have given socially desirable responses and to have been subject to the effects of memory in reporting breast self-examination behavior are other potential limitations. The strength of the discriminant function, however, lends support to the role of health beliefs and health locus of control as predictors of the frequency of practice of breast self-examination in women.

NURSING IMPLICATIONS

Nurses play an important role in educating the public to the efficacy of breast self-examination. Subjects in this study learned about breast self-examination from various sources, including nurses, physicians, family members, friends, and the media. Although five of the breast self-examination subjects were taught by nurses, none of the subjects who did not practice breast self-examination were taught by nurses, suggesting the effectiveness of nursing intervention in motivating health behavior. Breast self-examination can be taught to women in a variety of settings, including teenagers in high school, women in both in-patient and out-patient health-care settings, and women in community group settings. Although providing information is important, information alone generally has not been shown to lead to increased frequency or quality of breast self-examination performance. Reading about the procedure or hearing about breast self-examination from a health-care professional or through the media usually is not a sufficient cue to motivate behavior.

Nursing interventions should be designed to modify women's health beliefs, such as perceived susceptibility to cancer, perceived benefits or efficacy of breast self-examination, and perceived barriers to practice of breast self-examination. Within the context of the health belief model, cues provided through personal contact, encouragement, and reinforcement of learned behavior can be provided. Visual reminders such as posters and stickers also have been found to be useful as reminders after breast self-examination has been thoroughly learned and practiced.

Perceived susceptibility can be strengthened by providing information concerning the risk of developing breast cancer. Women should be made aware of the numerous risk factors for developing breast cancer, including advanced age, bearing a first child after the age of 30, having a first degree relative with breast cancer, history of benign breast disease, and previous diagnosis of breast cancer. In addition, teaching in a group situation has been shown to increase perceived susceptibility to breast cancer, perhaps because the group setting fosters shared beliefs and does not allow women to deny or rationalize susceptibility to breast cancer.

A frequently cited barrier to breast self-examination is lack of confidence in the ability to detect breast lumps. Personal instruction with provision for practice and return demonstration is more effective in developing proficiency, frequency and confidence in the efficacy of breast self-examination than more passive methods such as pamphlets and videotapes. Breast models, which are fairly widely available, also are effective teaching aids that foster the development of effective breast self-examination.

Internal health locus of control generally is thought to be a fairly stable personality trait. Thus, educational strategies might be developed in accord with the client's level of internal health locus of control. Strategies that provide opportunities for self-directed learning and independence are appropriate for persons with high internal health locus of control. Although breast self-examination is not a means of controlling whether one develops breast cancer, self-examination can be presented as a means of exerting some control through prompt assessment and early intervention.

CONCLUSIONS

In summary, numerous nursing interventions, consistent with the theoretical framework developed in this study, can be used to foster the effective practice of breast self-examination. This study investigated the breast self-examination behavior of 48 young, suburban mothers. Other groups should be studied to enhance the general application of these findings, and nursing interventions should be further developed and tested within the theoretical framework described. The variables studied provide a fertile area for investigation of breast self-examination behavior. With in-
Increased insight into the relationships among these variables will come increased ability to assist women to effectively practice preventive health behaviors such as breast self-examination.

REFERENCES


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