Determinants of continued breast self-examination practice in women 40 years and over after personalized instruction

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Abstract

Variables related to continued breast self-examination (BSE) practice were assessed at the conclusion of small group BSE training sessions and again 12 months later, using a sample of 1134 women 40 years and over who had attended a teaching session between February 1985 and September 1987 in Victoria, Australia. The teaching program was successful in increasing the frequency with which the participants practiced BSE, and in reducing the impact of emotional barriers to BSE practice, but it did not achieve the level of regular practice advocated. The frequency of BSE practice was increased, especially among those who reported some BSE practice before attending the training sessions. Although participants recognized the benefits of BSE, failure to practice it regularly was attributed primarily to the practical problem of forgetting and to lack of perceived self-efficacy in relation to BSE practice. The need for further work to develop techniques for reminding women to do BSE was noted and the provision of the opportunity to attend a further training session was recommended.

Introduction

Breast self-examination (BSE) is an effective method of detecting breast cancer in the early stages (Hill et al., 1988). It is particularly effective if women have been personally trained in BSE techniques (Mant et al., 1987) and their examinations are regular and systematic. The aim of this paper is to evaluate the effectiveness of a comprehensive BSE teaching program, called Mammacheck, which is described by Rassaby et al. in the Programme Papers section of this issue of Health Education Research. This evaluation, based on data collected both at the conclusion of the BSE teaching session (Time 1) and again 12 months later (Time 2), will assess the impact of that program on reported frequency of doing BSE and identify the factors which facilitate and inhibit continued BSE practice. As the immediate benefits of BSE are less likely to be found in women under 40 years of age (Baines, 1988), the focus of this study is upon women 40 and over.

The Mammacheck program was based on a model of behaviour change derived from the theory of reasoned action (Ajzen and Fishbein, 1980), the health belief model (HBM) (Becker and Maiman, 1975) and social learning theory (Bandura, 1977). The model proposed that BSE practice depends on one’s intention to practice BSE. These intentions are influenced by six perceptions: self-efficacy in relation to BSE practice, behavioural beliefs about BSE, barriers to doing BSE, personal susceptibility to breast cancer, efficacy of breast cancer treatment, severity of breast cancer and cues to doing BSE (Hirst et al., 1989).

In developing our model, we accepted the postulate derived from Ajzen and Fishbein (1980) that behavioural intention to do BSE would be causally related to subsequent BSE practice, but we did not include the social referent variables as previous research has shown that they add little (Hill et al., 1985; Hill and Shugg, 1989) or nothing (Rutledge,
1986) to the prediction of BSE practice, a fact which has been attributed to the private nature of BSE. We adopted four concepts from the HBM: perceived susceptibility, perceived benefits, perceived costs and perceived severity. After carefully evaluating the relevance of severity, it was retained in the model, but neither directly targetted in the training sessions nor assessed as our previous research has shown its lack of ability to predict BSE behaviour (Hill et al., 1985), a finding which has been attributed to the almost universal acceptance among women that breast cancer is serious. It was considered preferable to focus on the role of early detection of breast cancer in its successful treatment, rather than to focus on its severity which might lead to an unwillingness to carry out BSE or to a denial of the potential danger of any abnormality. Although other modified versions of the HBM have included health motivation (Prentice-Dunn and Rogers, 1986), the impact of this variable on BSE is dubious. Hill et al. (1985) found that it was not a significant predictor of intentions to do BSE, while Champion (1987) reported that it neither added significantly to the prediction of BSE practice nor discriminated between BSE practitioners and non-practitioners. The model adopted the concept of self-efficacy (Bandura, 1977; Strecher et al., 1986), recognizing that a woman was more likely to practice BSE if she felt competent to do so. The central aim of the training program was to draw on social learning principles to enhance self-efficacy both by furthering the participants' knowledge of BSE and breast cancer, and by developing their skills through modelling and reinforced practice.

The program involves a single session of 60–90 min in which 8–12 women meet in a comfortable, relaxed atmosphere with a female facilitator. The session begins with a talk by the facilitator designed to explain the rationale underlying BSE and to increase knowledge of the basic physiology of the breast, the skills participants can develop and knowledge of breast cancer. Emphasis is placed on the success of treatment if diagnosis is early. A short video provides a demonstration of the BSE technique. Then women practice on themselves, over their clothing, and on artificial breast models which contain a number of lumps of different sizes and at different depths. During this practice the facilitator checks for correctness of the technique and offers encouragement and assistance. The session concludes with a discussion of barriers to BSE practice, answers to questions, the development of action plans and the distribution of materials to assist participants at home.

Following our composite model of health behaviour which provided the theoretical basis for the Mammachine program, three hypotheses were tested: first, that there will be an increase in BSE practice between Time 1 and Time 2; second, that the best predictor of BSE practice at Time 2 will be stated intentions to practice BSE as assessed at Time 1 and, third, that BSE practice as assessed 12 months after the training session will be predicted by a combination of previous BSE practice, self-efficacy, barriers, benefits and susceptibility.

Method

Sample

This evaluation is based on the responses of 1134 women over 40 years of age who attended a Mammachine training session between February 1985 and September 1987, and completed a follow-up questionnaire one year later. Of the 6035 women who had attended a session, 37% were 40 years of age or older. Of these 2130 women, 1134 (53%) had completed a second questionnaire when the program was evaluated. Of those women eligible to complete a second questionnaire, 11% of them indicated that they did not wish to do so. Of the remaining women 84% completed and returned the questionnaire. The 16% who did not return the questionnaire included those who had moved and could not be contacted and those who were overseas.

Questionnaires

In formulating the questionnaires, items were developed to assess the attitudes and beliefs which the training program had been designed to influence. The questions had been tested in previous studies (Hill et al., 1985; Hill and Shugg, 1989). The Time 1 questionnaire included pre-coded questions assessing demographic variables, previous
experience with BSE, perceived susceptibility to breast cancer, perceived efficacy of breast cancer treatment, beliefs about BSE (perceived benefits, barriers and self-efficacy) and intentions to practice BSE. The Time 2 questionnaire included pre-coded questions assessing practice of BSE since participating in the program and measuring attitudes to BSE (perceived confidence, competence and barriers to the practice of BSE).

Scales and analyses
Where response categories fell along some continuum in order of intensity, numerical values were assigned to responses so that group results would be condensed for simplicity of presentation and analysis. The Statistical Package for the Social Sciences (SPSSX) was used for all analyses. Alpha was set at 0.001. A high alpha level was selected to reduce the possibility of Type 1 errors when using questionnaire measures that might not be strictly independent.

Results

Entry characteristics of participants
Fifty-four per cent of the sample were 40–49 years of age, 29% were 50–59 and 17% were 60 years or over. Reports of marital status indicated that 5% of the sample had never married, 79% were married or living in a de facto relationship, 8% were divorced or separated and 8% were widowed. In response to a question asking about highest level of education, 17% had completed a tertiary qualification, 9% had some post-secondary education, 29% had completed secondary schooling and only 7% had not reached secondary schooling. Relative to the Australian population, the sample contained more women who were married (79% sample, 64% population), more women with some tertiary education (26% and 12%) and fewer who had not reached secondary schooling (7% and 15%) (ABS, 1989).

Experience of breast cancer
Personal experience of breast cancer was very low. Only 1% of the sample (23 women) had actually had breast cancer, although 17% of them had found a breast lump on one occasion and a further 8% on two or more occasions.

Beliefs and behaviours immediately after BSE training

Intentions to do BSE
Stated intentions to do BSE were assessed using two items, each with seven interval scaled response options. Following Ajzen and Fishbein (1980), the first question was cast as a subjective probability of action and asked ‘‘How likely is it that you will do BSE monthly from now on?’’. In response to this question over one-third of the participants (35%) responded that they were ‘‘certain to do BSE monthly’’, a further 40% were ‘‘very likely to do BSE monthly’’ and another 22% were ‘‘likely to do BSE monthly’’, leaving only 3% whose responses indicated that they were relatively unlikely to do BSE monthly. The second question, somewhat later in the questionnaire, asked participants how often they expected to do BSE within the next 12 months. Responses to this question reflected equally strong intentions to do BSE, with over half the sample indicating that they would do it 11–12 times (61%), a further 21% about 9–10 times and another 9% 5–6 times. The remaining 9% forecast less regular practice.

Self-efficacy
Self-efficacy (Bandura, 1977; Stretcher et al., 1986) was assessed at Time 1 using the summed score of two questions, one assessing confidence in doing BSE properly and one focusing on perceptions of BSE performance. The mean scores of 4.5 and 4.6 on the two seven-point scales (scored 1–7) indicated that the respondents had a moderate level of self-confidence in relation to BSE practice. In fact, only 7% of participants suggested that they were ‘lacking confidence’ in their ability to do BSE.

Behavioural beliefs about BSE
Four beliefs derived from previous work (Hill et al., 1985) were presented as personalized statements: doing BSE would (i) increase the chances of detecting breast cancer early, (ii) mean that any breast cancer found would be curable, (iii) give a sense of
relief to find that nothing was wrong and (iv) stir up worries about breast cancer. Participants responded using a seven-point scale ranging from “extremely unlikely” (scored 1) to “extremely likely” (7). The three positive beliefs were held fairly firmly: that doing BSE increases the chances of detecting cancer in the early stages (mean = 6.1); that doing BSE would give a sense of relief when it is found that nothing is amiss (6.0); and that early detection increases the curability of cancer (5.7). Fortunately, participants tended not to believe that doing BSE would stir up worries about breast cancer (2.8). To obtain a composite score for use in later analyses, the scoring on the negative item was reversed, then the item scores were summed.

Barriers to doing BSE
The list of perceived barriers to action previously developed by Hill et al. (1985) were presented in the Time 1 questionnaire as possible barriers to doing BSE: forgetting, laziness, lack of time, fear of finding a lump, fear of losing a breast and denial of the threat of breast cancer, expressed as “it couldn’t happen to me”. The potential impact of each of these barriers was assessed using a four-point scale ranging from “no obstacle” (scored 0) to “extreme obstacle” (3). The most important single barrier was forgetting (0.9) followed by laziness (0.7), lack of time (0.4), fear of losing a breast (0.5), fear of finding a lump (0.4) and denial of the threat of breast cancer (0.3).

Perceived efficacy of treatment
It was assumed that women who were overly pessimistic about the results of treatment of breast cancer would be unlikely to do BSE, so the program aimed to portray treatment as effective when diagnosis was early. After the program, perceptions of breast cancer treatment results reflected a high level of confidence, in that 62% of participants saw the success of medical treatments as “good” or “extremely good”, 32% as “fair”, 4% as “poor” and only 1% as “very poor”.

Perceived susceptibility
Breast cancer was only seen as a serious threat by 8% of participants who rated their chance of getting breast cancer as “high”, while 52% saw their chances as “moderate”, 36% as a “small chance” and 4% as “no chance”. It should be noted that these estimates were made after receiving information about the risk factors associated with breast cancer, that is, statistics which show that one in 15 Australian women will have breast cancer, with it being more prevalent among older women (Giles, 1987).

Use of cues to BSE
Women were able to purchase cassettes at a nominal cost and were provided with calendars to remind them to do BSE. About a quarter (27%) of the women purchased a cassette.

Representatives of the Time 2 sample
To assess the representatives of the sample of women included at Time 2, the responses of those included in the Time 2 sample and those not included in the Time 2 sample were compared for selected items from the Time 1 questionnaire. There were no significant differences between the two samples on the demographic variables: age, marital status and highest level of formal education. There were no differences between the two samples in their mean scores on the measures of perceived self-efficacy in relation to BSE practice, susceptibility to breast cancer, treatment efficacy of breast cancer, practical barriers or emotional barriers to doing BSE, but the women who completed both the Time 1 and Time 2 questionnaires were slightly more positive in their stated intentions to do BSE, suggesting that those who were included in the Time 2 sample were slightly more motivated to practice BSE. However, this difference may realistically be described as barely significant, but not substantive.

Effect of the program on frequency of doing BSE
There was substantial support for the first hypothesis which predicted that BSE practice would be more frequent at Time 2 than at Time 1 (see Table I). At Time 1 only 15% of the sample could be described as regular BSE practitioners in that they did BSE monthly, although a further 29% could be described as adequate practitioners, in that 14% had done BSE every 2 months and 15% every 3 months. Nearly
half the sample (46%) did very little BSE: 17% had never done BSE; 14% had done it at some time, but not in the last 6 months, and 25% had done it once in the past 6 months.

At Time 2 there was a dramatic increase in the frequency with which most women reported that they had done BSE (see Table 1). Although only 22% of them complied with the recommendations to do BSE monthly, most women (94%) said they had done BSE at least once in the year since attending Mammacheck: 17% had done it 9–10 times, 17% 7–8 times, 22% 5–6 times, 17% 3–4 times and only 6% as little as once or twice. Table 1 also shows that BSE practice at Time 2 was strongly related to reported BSE practice at Time 1 ($\chi^2 = 274.49, 25$ d.f., $P<0.001$). The women who reported some BSE practice before attending Mammacheck were more likely to increase the frequency with which they practiced BSE in the year after attending the training session.

**Barriers to doing BSE**

Additional barriers were included in the Time 2 questionnaire: embarrassing nature of BSE, lack of confidence in doing BSE properly and the complicated nature of BSE. These were included in the follow-up questionnaire as experience with the program suggested that they might be important. Greater experience of doing BSE during the intervening 12 months appeared to influence the perception of the practical barriers. At Time 2 each of the three practical barriers was seen as being a greater obstacle to doing BSE than at Time 1: the rate of forgetting increased from 0.9 to 1.1 ($r=5.39$, 1133 d.f., $P<0.001$); lack of time increased from 0.4 to 0.6 ($r=5.48$, 1132 d.f., $P<0.001$); laziness increased from 0.7 to 1.7 ($r=26.49$, d.f. = 1132, $P<0.001$). However, none of the ratings of the emotional barriers changed significantly. The additional barriers assessed at Time 2 indicated that neither embarrassment (mean = 0.1) nor the complicated nature of BSE (0.2) were major barriers to BSE practice for many women.

It would be anticipated that different techniques would be required to reduce barriers in each of the three areas: practical, emotional and cognitive. Drawing on the work of Folkman and Lazarus (1980), it would be expected that the practical and cognitive barriers would be associated with problem-focused appraisals and would require some type of problem-focused coping strategy, while the emotional barriers would be associated with emotion-focused appraisals and coping strategies. Rather than treat the barriers as a single construct, three scores were derived by summing the scores of the responses of the items loading on each of the two factors assessed at Time 1 and the three factors assessed at Time 2.

**Cues to action**

Recall of having the items and their frequency of use were assessed at Time 2. Of the 298 women (27%) who purchased a cassette, 76% had used it. Sixty-nine per cent of women recalled having been given a calendar, but 43% of these women did not use it at all.

**Factors facilitating and inhibiting BSE practice**

**Predictors of BSE practice**

By following up the women 12 months after they attended training sessions, it was possible to evaluate the factors that predicted actual practice of BSE. A regression analysis was completed using reported BSE practice as assessed at Time 2 as the dependent variable and seven independent variables: previous BSE practice, self-efficacy, benefits, practical barriers, emotional barriers, susceptibility and treat-

<table>
<thead>
<tr>
<th>Time 2</th>
<th>Never</th>
<th>Not in past 6 months</th>
<th>Once in 6 months</th>
<th>Every 3 months</th>
<th>Every 2 months</th>
<th>Monthly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–2 times</td>
<td>8</td>
<td>15</td>
<td>8</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3–4 times</td>
<td>24</td>
<td>28</td>
<td>20</td>
<td>14</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>5–6 times</td>
<td>20</td>
<td>29</td>
<td>22</td>
<td>31</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>7–8 times</td>
<td>17</td>
<td>13</td>
<td>19</td>
<td>19</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>9–10 times</td>
<td>14</td>
<td>8</td>
<td>15</td>
<td>20</td>
<td>28</td>
<td>15</td>
</tr>
<tr>
<td>11–12 times</td>
<td>17</td>
<td>7</td>
<td>14</td>
<td>14</td>
<td>28</td>
<td>60</td>
</tr>
</tbody>
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*P<0.001.
Table II. Summary of regression analyses

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total sample</th>
<th>Non-practiser</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>β</td>
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<tr>
<td>Predictors of BSE practice</td>
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</tr>
<tr>
<td>previous BSE practice</td>
<td>0.38*</td>
<td>0.32*</td>
</tr>
<tr>
<td>intentions</td>
<td>0.31*</td>
<td>0.18*</td>
</tr>
<tr>
<td>practical barriers</td>
<td>–0.23*</td>
<td>–0.15*</td>
</tr>
<tr>
<td>self-efficacy</td>
<td>0.19*</td>
<td>0.11*</td>
</tr>
<tr>
<td>susceptibility</td>
<td>–0.04</td>
<td>–0.05</td>
</tr>
<tr>
<td>treatment efficacy</td>
<td>0.10*</td>
<td>0.03</td>
</tr>
<tr>
<td>emotional barriers</td>
<td>–0.07</td>
<td>–0.03</td>
</tr>
<tr>
<td>benefits</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>( R^2 = 0.23 )</td>
<td></td>
<td>( F(8,1043) = 39.76^* )</td>
</tr>
<tr>
<td>Predictors of BSE practice (omitting intentions)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>previous BSE practice</td>
<td>0.38*</td>
<td>0.35*</td>
</tr>
<tr>
<td>practical barriers</td>
<td>–0.23*</td>
<td>–0.19*</td>
</tr>
<tr>
<td>self-efficacy</td>
<td>0.19*</td>
<td>0.14*</td>
</tr>
<tr>
<td>susceptibility</td>
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<td>–0.02</td>
</tr>
<tr>
<td>treatment efficacy</td>
<td>0.10*</td>
<td>0.04</td>
</tr>
<tr>
<td>emotional barriers</td>
<td>–0.07</td>
<td>0.02</td>
</tr>
<tr>
<td>benefits</td>
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<td>0.01</td>
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<tr>
<td>( R^2 = 0.21 )</td>
<td></td>
<td>( F(7,1044) = 39.28^* )</td>
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<tr>
<td>Correlates of BSE practice</td>
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<td></td>
</tr>
<tr>
<td>practical barriers</td>
<td>–0.41*</td>
<td>–0.38*</td>
</tr>
<tr>
<td>self-efficacy</td>
<td>0.36*</td>
<td>0.31*</td>
</tr>
<tr>
<td>cues to remembering</td>
<td>0.16*</td>
<td>0.09*</td>
</tr>
<tr>
<td>emotional barriers</td>
<td>0.08</td>
<td>0.05</td>
</tr>
<tr>
<td>cognitive barriers</td>
<td>–0.17*</td>
<td>0.04</td>
</tr>
<tr>
<td>( R^2 = 0.27 )</td>
<td></td>
<td>( F(5,818) = 61.06^* )</td>
</tr>
</tbody>
</table>

\( ^* P < 0.001 \).

The analysis was repeated controlling for age and personal experience of breast cancer, both in terms of having had breast cancer and of having a primary relative who had breast cancer. These variables were partialled out in the first step of a regression analysis, and then the remaining variables were entered in the second step. The variables entered at the first step did not yield a significant value \( F = 3.17 \), NS, showing that they did not influence BSE practice. The remaining variables still accounted for the same proportion of the variance.

The initial analysis was repeated again omitting intentions from the predictor set. The remaining variables accounted for 21% of the variance. The significant predictors were similar to those in the
previous analysis: previous BSE practice (beta = 0.35), practical barriers (-0.19) and self-efficacy (0.14).

**Correlates of BSE practice**

Participants' perceptions of their self-efficacy and the roles of practical and emotional barriers might change as they have greater experience of BSE. Hence another regression analysis was completed to identify the correlates of BSE practice as assessed at Time 2. The set of independent variables comprised the scores on the measures of practical barriers, emotional barriers, cognitive barriers, self-efficacy and use of aids to remembering BSE, all as assessed at Time 2. The dependent variable was BSE practice as assessed at Time 2. Twenty-seven per cent of the variance was explained by three of the five variables: practical barriers (beta = -0.38), self-efficacy (0.23) and cues to remembering to do BSE (0.09). Neither the emotional nor cognitive barriers entered into the equation.

Given the major role of the practical barriers in inhibiting BSE practice, a further regression analysis was completed to identify the major barrier. The dependent variable was BSE practice as reported at Time 2 and the independent variables were the scores on the three separate practical barriers as assessed at Time 2: forgetting, laziness and lack of time. Seventeen per cent of the variance was explained: \( R^2 = 0.17, F(1,1071) = 216.76, P < 0.001 \). The only variable to enter the equation was forgetting.

**Non-practisers of BSE**

As many of the women who attended the Mammacheck sessions may have been attending to further their skills and knowledge about BSE rather than to embark on a totally new health behaviour, a further set of analyses was completed using the subset of 358 women who could be described as non-practisers of BSE at Time 1 to identify the factors relating to their BSE practice. The results of these analyses are also presented in Table II. For the non-practicer sub-sample, the predictors accounted for relatively little of the variance (7%), partly due to the absence of the most important single predictor, previous BSE practice.

**Discussion**

**Effectiveness of the program**

Pre-program measures were not included. Participants were selected for inclusion in the sample when they attended a training session and hence could not be assessed prior to the session. A request to complete a questionnaire at the beginning of the session was not appropriate, having the potential to irritate or alienate women who were already feeling self-conscious. It would be unethical to form an equivalent control group by denying them the opportunity to learn BSE for 12 months when they are wishing to learn it. Because there were no pre-program measures, it is not possible to be certain that the program produced the intended changes in health benefits. However, a comparison of the scores on the benefits and barriers items assessed for the sample at the conclusion of the training sessions with those of a comparable control sample reported in a previous study by Hill *et al.* (1985) suggests that the Mammacheck program did have an educational effect in that Mammacheck participants perceived greater benefits and fewer barriers associated with BSE practice than the women not trained in BSE.

Certainly, the program was effective in greatly increasing the frequency with which most women reported that they had done BSE in the preceding 12 months, although only a small proportion of women complied with the recommendation that they should do BSE regularly once a month. However, as most of the participants (94%) had done BSE at least three or four times during the year, this should be sufficiently frequent for them to obtain objective benefit (Feldman *et al.*, 1981). Further, the level of compliance in this study is comparable with that reported for a more labour-intensive program in which hospitalized women were each provided with 30 min of individualized instruction, as well as a video and printed materials (Roche and Gosnell, 1989), indicating the effectiveness of this more economical mode of training. Although it may be preferable to provide individual tuition (Haran *et al.*, 1987), in the absence of the resources required for such intensive training, the Mammacheck program is greatly increasing BSE practice.
Although the intervention was very effective in greatly increasing the frequency with which these women were practicing BSE, it failed to attain the frequency of practice advocated. The failure to achieve monthly BSE practice may be partly attributed to the single session character of the program. Overseas research suggests that frequency of BSE practice increases incrementally after the first, second and third learning opportunities (Baines et al., 1986). Higher levels of BSE practice might be obtained by increasing competence through the participation in further training sessions. This may be particularly true for the women who had not practiced BSE prior to attending the Mammacheck session, women for whom self-efficacy was an important factor in predicting BSE practice. Certainly, the opportunity to attend an additional session is markedly more economical than the provision of individual training.

Intentions as predictors of BSE practice

The major predictors of BSE practice were previous BSE practice, intentions to practice BSE, practical barriers, self-efficacy and perceived treatment efficacy. However, the hypothesized role of stated intentions to do BSE as the major predictor of BSE practice was not substantiated. Although intentions to practice BSE was shown statistically to be a relatively important contributor to the equation predicting BSE practice, the omission of this variable from the predictor set only served to reduce the amount of explained variance from 24 to 21%. The role of the other predictors remained, with the most important predictor being previous BSE practice, supporting the common finding that previous behaviour is an excellent indicator of future behaviour. Practical barriers and self-efficacy continued to be significant factors.

Correlates of BSE practice a year after Mammacheck

The importance of the practical barriers is highlighted by their major role as a correlate of BSE practice a year after attending the Mammacheck session. When assessed at Time 2 concurrently with BSE practice, practical barriers accounted for a large 17% of the variance. This evidence for the major role of perceived practical barriers in inhibiting BSE practice and the relatively minor role of perceived benefits in facilitating such practice is consistent with other recent research findings (Champion, 1984, 1985; Rutledge, 1986; Hill and Shugg, 1989). It is interesting to note the important contribution of perceived practical barriers, despite their absolute rating being relatively low. Although the possibility exists that expressed practical barriers are a cover for more deep-rooted psychological barriers, we found no evidence of this in the present sample of women who were presumably motivated to learn BSE.

The identification of forgetting as the greatest single obstacle to doing BSE highlights the importance of finding techniques to increase the salience of BSE so more women will remember to do it. At a practical level motivational factors need to be supplemented by cues to action. In the present study, women were provided with calendars and stickers to serve as reminders to do BSE. Nearly half the women did not use these materials, and although others claimed to have used them, their use did not contribute to reported BSE practice. Other data casts doubt on the utilization of calendars. In a recent Canadian study assessing their use as reminders to do BSE, Baines et al. (1988) found that calendars did not contribute to an improvement in BSE compliance and consequently they were dropped from usage. In a comparison of the relative utility of BSE calendars (self-management) and postcard reminders (external cues), Grady (1984) found that postcard reminders led to a significant increase in compliance, and calendars did not, but BSE practice declined sharply when the postcards ceased. The absence of a discernible benefit arising from the use of calendars in both this and other research suggests that some more effective means of reminding women is required. Although this might involve a system of personal reminders, it will only be effective if it is able to continue on a long-term basis.

Possibly the most effective reminder is a personal one from each woman's general practitioner when she visits either for a regular check-up or for some other reason. Certainly, there is evidence suggesting
that the frequency of BSE practice can be increased through the integration of regular BSE instruction and evaluation into regular medical examinations (Baines et al., 1986), but this assumes the cooperation of general practitioners. Although it was difficult to obtain their cooperation in distributing the information about Mammacheck (Rassaby et al., 1991), their continuing support in encouraging patients to do BSE should be fostered. An additional, long-term technique may be to engage the services of the announcers on selected popular women's radio programs to offer reminders, to increase the use of conspicuously placed posters, or to conduct extensive mass media advertising campaigns (Hill et al., 1982).

The relatively important association of self-efficacy with both intentions to practice BSE and with subsequent BSE practice is inconsistent with Lauver's (1987) conclusion that there is a lack of empirical support for the construct of self-efficacy in explaining BSE practice. Rather, it supports the view of Haran et al. (1987) that a woman's confidence in her competence to do BSE is an important contributor to continued BSE practice. The fact that this factor was of considerable importance among the women who had not practiced BSE prior to attending Mammacheck indicates the need for careful training in BSE techniques to further develop women's perceived self-efficacy.

Summary and conclusions

In this study we made eclectic use of behaviour theories to structure and evaluate a widely disseminated BSE teaching program. Although we did not set out to formally test specific theories, some support was obtained for those providing the basis of the program. When women left the training session with strong self-efficacy beliefs, positive beliefs in the benefits of BSE and a lack of concern about potential emotional barriers to BSE practice, long-term BSE practice was more likely. However, if the teaching program failed to overcome the practical barriers, long-term BSE practice was unlikely. These findings not only direct attention to those parts of the program that need most emphasis, but illustrate the value of theory in formulating and evaluating the teaching programs.

Notes

1. To evaluate our pre-conceived assumptions that the barriers can be classified into practical, emotional and cognitive barriers, the scores of the items used in the Time 2 questionnaire were submitted to a principal components factor analysis. Three factors accounted for 61% of the variance. The patterns were consistent with our conceptualization of barriers as falling into three categories: practical, emotional and cognitive. Using a cut-off point of 0.6, the first factor loaded on three items representing practical barriers: lack of time (loading 0.80), laziness (0.80) and forgetting (0.72). The second factor loaded cognitive items: lack of confidence in ability to do BSE (0.85) and the complicated nature of BSE (0.81). The remaining two cognitive items: lack of confidence in ability to do BSE (0.85), and the complicated nature of BSE (0.81). The remaining two barriers did not load on any of the factors: fear of finding a lump and the embarrassing nature of BSE. The high loadings of each of the items weighting on each factor and the failure of any item to load on more than one factor can be taken as providing statistical support for the theoretically-based assumptions.

References


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