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## **An evaluation of comparative strategies for teaching breast self-examination**

Julia Agars  
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**AN EVALUATION OF COMPARATIVE STRATEGIES  
FOR TEACHING BREAST SELF-EXAMINATION**

**BY**

**Julia Agars Dip.H.Sci(Nurs), B.H.Sci(Nurs)Hons.**

**A Thesis Submitted in Total Fulfilment of the Requirements for the Award of  
Master of Health Science (Nursing)  
at the School of Nursing, Edith Cowan University  
Western Australia**

**Date of Submission 18.11.91**

## ABSTRACT

This study addresses the issue of breast self-examination (BSE) in female nurses, as nurses who perform BSE are more likely to promote BSE to their clients. The purpose of the study is twofold: first, to assess the effects of three alternative methods of BSE instruction on nurses' BSE practice; and second, to determine the influence of nurses' health beliefs on their practice of BSE. Previous studies have indicated that various teaching strategies have improved BSE practice. However, the three methods of BSE instruction to be assessed in this study which includes booklet with written instruction, film and group discussion, and one-to-one discussion, modeling and rehearsal have not been previously researched collectively in a single study.

The study is guided by the Health Belief Model (HBM) which attempts to explain preventative health behaviour in terms of attitudes, values and beliefs. The following hypotheses have been formulated for investigation: (a) there will be a significant difference in the effectiveness of BSE practice in the experimental groups at follow-up twelve weeks post intervention; and (b) the health belief scores of nurses who do practise BSE will be higher than the health belief scores of nurses who do not practise BSE.

Using a quasi-experimental design the study drew a non-random convenience sample of 166 nurses from four hospitals in W.A. The effect of alternative methods of BSE instruction were evaluated to identify the optimum method for increasing the effectiveness of BSE practice in the study sample. A self-administered pretest and follow-up questionnaire was employed to measure the practice of BSE, the nurses' health beliefs and other modifying variables. To

determine if any of the methods of instruction increase nurses' health beliefs, a posttest subset of questions was administered one week following each of the designated interventions.

The findings of the research lend support to both hypotheses. Although the results demonstrated that each method of BSE instruction produced a significant improvement in the technique of BSE ( $p < .0001$ ), the nurses involved in the film and discussion had the greatest improvement in proficiency. At follow-up, the health belief scores of nurses who practised BSE were significantly higher than the nurses who did not practise BSE ( $p < .0001$ ). Significant predictors for the practice of BSE were the HBM variables 'perceived barriers' ( $p < .0005$ ) at pretest and 'perceived susceptibility' ( $p < .05$ ) at follow-up. The incidence of BSE practice was found to be significantly higher in the older nurses ( $p < .05$ ). Using a reminder to practise BSE was significantly associated with effective BSE practice ( $p < .0001$ ).

The implications for nursing practice are that nurses may be successfully encouraged to practise effective BSE through implementation of a film and group discussion, a strategy which has potential for reaching a large number of women. The study findings also suggest that nurses may be able to develop a variety of effective strategies to promote and reinforce breast health in their clients.

**DECLARATION**

"I certify that this thesis does not incorporate, without acknowledgement, any material previously submitted for a degree or diploma in any institution of higher education and that, to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where due reference is made in the text".

## **ACKNOWLEDGEMENTS**

**The author wishes to gratefully acknowledge the following people who assisted in the completion of this thesis:**

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## CHAPTER ONE

### INTRODUCTION

This study is concerned with Breast Self - Examination (BSE) practices in nurses. Specifically, the study evaluates three alternative methods of BSE instruction. The question for research is: Which method of BSE instruction is most effective for promoting change and increasing effectiveness in nurses' personal BSE practice?

The study is concerned with the health promoting behaviour of breast self-examination. Its theoretical basis is the Health Belief Model (HBM), which was initially developed in the 1950's (Becker, 1974), and Bandura's (1977) Social Learning Theory. The HBM was developed in an attempt to understand the widespread failure of people to accept disease preventatives or screening tests for the early detection of asymptomatic disease (Janz & Becker, 1984). The model suggests that motivation to perform health promoting behaviours is influenced by an individual's own perceptions. The health beliefs in the present study, related to the likelihood of BSE practice, are determined by the subjects' perceived susceptibility to breast cancer, perceived benefits of BSE, perceived barriers to BSE, perceived seriousness of breast cancer and other modifying variables such as cues to action and demographic variables. Bandura's (1977) emphasis on modeling as a powerful learning strategy is of significance in the present study in that it guides the choice of BSE instructional strategies. The three instructional strategies employed were (a) booklet with written instruction, (b) film and discussion, and (c) one-to-one modeling and rehearsal using silicone breast models. The most effective methods for promoting and maintaining BSE and

breast health in nurses are deduced from the subjects' BSE related behaviours following the three types of instruction.

### 1.1 Background

Western Australian morbidity statistics reveal that cancer of the breast is the most frequently occurring cancer in females and, in Australia, mortality rates have not declined in recent years (Australian Bureau of Statistics, 1988). According to studies, the size of the primary breast tumour is directly correlated with the prognosis; therefore, early detection methods, such as BSE, need to be promoted (Australian Health Ministers' Advisory Council [AHMAC], 1990).

Nurses are in the optimal position to perform BSE health teaching as they practise in more settings than other health care workers and constitute the largest group of health professionals. The sample for this study is therefore comprised of currently practising nurses. Evidence from international studies on nurses' personal and professional BSE practice (Agars, 1989; Bayley, Cockram, Fatin & Wilson, 1980; Clarke & Sandler, 1989; Cole & Gorman, 1984; Edgar, Shamian & Patterson, 1984; Elkind, 1980; Ellis, Slavin & Pinch, 1990; Hirst, 1986), have revealed that nurses generally are ineffective practitioners of BSE and that their frequency of BSE teaching is low. These results have been disappointing, as health teaching is stated as a major component of a nurse's professional role (Caffarella, 1984). This present study assesses BSE practice and various methods of BSE instruction. It may lead to the development of effective strategies for influencing nurses to better promote breast health.

### 1.2 Purpose of the study

The purpose of this study is to assess the effects of three alternative methods of BSE instruction on nurses' personal BSE practice and to determine the influence of nurses' health beliefs on their practice of BSE. The methods of BSE instruction are; (a) booklet with written instruction, (b) film and group discussion, and (c) one-to-one discussion, modeling and rehearsal. The following hypotheses have been formulated:

### 1.3 Hypotheses

1. There will be a significant difference in the effectiveness of BSE practice between the control and experimental groups at follow-up 12 weeks after BSE instruction.
2. The health belief scores of nurses who practise BSE will be higher (i.e. reflect higher perceived susceptibility, higher perceived benefits, fewer perceived barriers to BSE practice, and higher perceived seriousness) than the health belief scores of nurses who do not practise BSE.

### 1.4 Research Questions

The study asks the following research questions:

- 1) How frequently does a sample of nurses practise BSE?
- 2) How effective is the nurse's BSE practice?

3) Which method of BSE instruction (booklet with written instruction; film and discussion; or one-to-one modeling and rehearsal) encourages nurses to commence practising BSE?

4) Which method of BSE instruction produces improvements in BSE technique?

### 1.5 Definitions of major variables

The conceptual and operational definitions of major variables measured in this study are as follows:

Nurse - female person registered with the Nurses Board of W.A. as a Registered Nurse, Enrolled Nurse, Registered Midwife or Mothercraft Nurse.

Breast Self-Examination - the examination of both breasts by the nurse in a systematic manner for the purpose of detecting an abnormality, as determined by her self reported practice.

Effective BSE Practice - dependent on four factors:

- (1) Palpation - with pads of fingers
- (2) Time - immediately following menstruation
- (3) Position - in a supine position
- (4) Regularity - at least once every month

Partially effective BSE Practice - BSE at least every two months and two of the first three factors above.

**Ineffective BSE Practice** - absence of BSE at least every two months and/or two of the first three factors above for effective BSE.

**Breast health** - physical well-being of the breast; absence of disease.

**Health beliefs** - a set of perceptions an individual holds about her susceptibility to a disease (breast cancer), the seriousness of that disease on her life, and the benefits of taking an action (BSE) to reduce the threat of the disease (Stillman, 1977).

**Perceived susceptibility** - the nurse's belief that she is at risk of developing breast cancer.

**Perceived benefits** - the nurse's subjective belief that there is benefit from BSE in detecting or minimising the consequences of breast cancer.

**Perceived seriousness** - the nurse's belief that breast cancer is of serious consequence.

**Perceived barriers** - factors which inhibit the nurse's BSE practice, such as pain or worry of finding a cancer.

**Modifying variables** - age, knowledge about breast cancer, previous experiences relating to breast disease (family and personal, information gained through previous education or experience).

**Modeling** - "refers to a process of observational learning in which the behaviour of an individual or group - the model- acts as a stimulus for similar thoughts,

attitudes, or behaviours on the part of another individual who observes the model's performance" (Perry & Furukawa in Kanfer & Goldstein, 1986, p. 66).

Rehearsal - "actual performance of the modeled behaviour by the observer .....this helps in both coding and developing the necessary motor skills required to perform the behaviour smoothly" (Perry & Furukawa in Kanfer & Goldstein, 1986, p. 76).

1.6 Organisation of the Thesis

Chapter One provides an introduction and purpose of the study with related hypotheses, research questions and definitions of major variables. A review of the literature concerning breast cancer, screening techniques, clinical breast examinations, and the use of BSE as an early detection method is contained in Chapter Two. In the same chapter, the importance of patient education and nurses' personal and professional BSE practice is also discussed. The theoretical framework for this study is described with associated literature in Chapter Three. Chapter Four is concerned with methodology and includes the study's design, questionnaire description, data collection procedure and sample details. Analysis of data and reporting of results is presented in Chapter Five. A summary of findings and their comparison to other studies is incorporated in Chapter Six. The thesis concludes with a discussion of the implications for nursing practice and recommendations for future research.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

The following literature review outlines the development of this study. Initially it discusses breast cancer including aetiology, pathology, epidemiology, risk factors and prognostic factors. The need for early detection of breast cancer is established and available screening techniques outlined. Screening by mammography is emphasised as the present most effective method for early detection. International mammographic trials are discussed. Further to this, annual clinical breast examinations and breast self-examination as adjuvant methods are outlined in relation to current research. The various strategies for teaching BSE are then discussed and applied in context to the present study. Nurses' personal and professional BSE practice and their role in BSE education is encompassed in the final section of the chapter.

#### **2.2 Breast Cancer**

##### **2.2.1 Epidemiology**

In Australia, breast cancer is the most frequent cancer in females, comprising twenty percent of all female deaths from cancer. However, despite advances in medical science, the death rate from breast cancer is not decreasing. McMichael and Armstrong (1988) predict that approximately 1 in 16 women will develop breast cancer during their lifetime, and 1 in 24 will die of it. In 1988 a total of 2348 Australian women died of breast cancer, 209 of them residing in W.A.

In the 25 to 39 female age group, there were 99 female deaths from breast cancer in Australia. This represented 9 percent of the total mortality rate from breast cancer in that year (Australian Bureau of Statistics, 1988). In W.A. 419 new cases of breast cancer are reported every year. It has been observed that the incidence of breast cancer rises rapidly from the age of 25 years to old age, with a brief plateau being observed in the age group 45 to 49 (Health Department of W.A., 1987).

### 2.2.2 Aetiology and Risk Factors

The exact aetiology of breast cancer is not known but many risk factors for the development of this disease have been identified. These factors include genetic, hormonal, nutritional, morphologic and breast irradiation (Berg, 1984). Rohan (1982) identified women at high risk of developing breast cancer as follows:

1. Family history of breast cancer
  - especially mother or sister
  - especially if bilateral
  - especially if premenopausal
2. Personal history of breast cancer
3. Nulliparity or first birth after age 30
4. History of fibrocystic breast disease
5. Early menarche



6. Late menopause (> 50 years)
7. Obesity, especially post-menopausal
8. Increasing age, especially over the age of 40 years
9. Developed country as place of residence
10. Upper socioeconomic status

These risk factors have been commonly identified in numerous studies (Braunwald et al., 1987; Cole, 1980; de Waard & Trichopoulos, 1988; Kalache, 1981; Littlefield, 1986; McMichael & Armstrong, 1988; Nash, 1985; Health Department of W.A., 1987; Studva & Nash, 1984). However, Sinclair (1988) questions that women with fibrocystic breast disease do not have an increased risk for developing breast cancer. Cole (1980) also recognised ionising radiation as a causative factor for breast cancer development, especially if exposure occurs during adolescence when the breast tissue is actively developing.

Long term use of oral contraception and replacement oestrogens have been suggested to increase risk of breast cancer (Cole, 1980; McMichael & Armstrong, 1988; Rohan, 1982; Health Department of W.A., 1987; Smigel, 1989). A case control study analysed data from the Cancer and Steroid Hormone (CASH) research conducted in the United States of America (U.S.). Women with newly diagnosed breast cancer (n = 4,711) and a control group (n = 4,676) were compared and findings indicated that oral contraceptive use does not increase the risk of breast cancer in women (The CASH Study of the Centers for Disease Control and the National Institute of Child Health and Human Development

1986). A follow-up of the CASH study to examine if a long term latent effect of oral contraceptives on breast cancer exists was undertaken and no evidence of this effect was found (Schlesselman, Stadel, Murray & Lai, 1988).

A further case control study conducted in New York, Philadelphia, Baltimore and Boston from 1983 to 1986 was undertaken by Miller et al. (1989) to examine the relationship between the risk of breast cancer before 45 years of age and oral contraceptive use. The sample included 407 women with breast cancer and 424 females in a control group. Results suggested that oral contraceptive users may have an increased risk of developing breast cancer. Therefore, at present, the evidence concerning the use of oral contraceptives and increased risk of breast cancer remains inconclusive.

A profile of breast cancer in W.A. was reported by Chleboun and Gray (1987) in a study of 435 women who presented with primary breast cancer during 1984. The highest incidence occurred in women who were nulliparous, those who lived in a 'better' socioeconomic area and those of professional occupation status.

Although many risk factors for the development of breast cancer have been identified, there is limited understanding of specific causes. The only factors that could reasonably be altered are age at first childbirth and body weight. Miller (in McMichael & Armstrong, 1988) suggests that if Australians decreased their intake of fat and maintained a healthy body weight we could expect a 26 percent reduction in breast cancer mortality over the next 60 to 70 years.

### 2.2.3 Pathology

Each breast consists of 15 to 20 lobes separated by adipose tissue. In each of these lobes are several lobules which are smaller compartments composed of connective tissue. Alveoli, the milk secreting cells, are embedded in the lobules and a series of mammary ducts link the lobes to the nipple. Support for the breast is provided by ligaments between each lobule (Braunwald et al., 1987). Breast tissue is influenced by a number of stimuli throughout a female's life-span. At the time of menarche breast tissue grows rapidly and is influenced and fluctuates with the menstrual cycle during reproductive life. Further changes occur during pregnancy, lactation, and at post-menopause the breast tissue atrophies. As Gallager (1980) emphasises "in such an active cell population, opportunities for the genetic mutation that produces cells capable of neoplastic proliferation must be abundant" (p. 905).

Tumours can arise from any of the breast structures but most commonly occur in a large duct (70 to 75%). These cancers frequently metastasise and therefore women with ductal carcinomas are given the worst prognosis (Braunwald et al., 1987). Ductal carcinoma is more frequently seen in post-menopausal women and is commonly identified through mammographic screening (Sinclair, 1988), or may present as a palpable lesion (Hartmann, 1984).

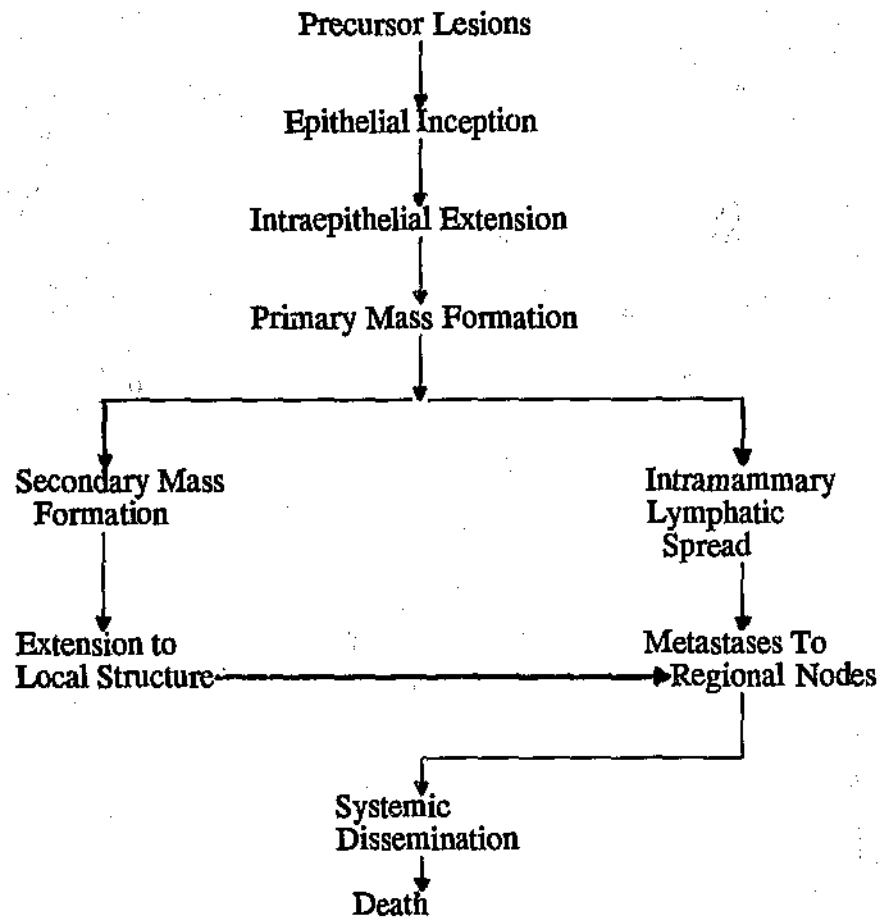
Invasive or non-invasive lobular carcinoma is usually diagnosed in pre-menopausal women and accounts for approximately five percent of all breast cancers. Other less common tumours of the breast that have favourable outcomes include medullary, colloid, tubular, adenocystic and secretory types. The upper

outer quadrant of the breast is the most frequent site of cancer and the lower inner quadrant the least frequent site (Braunwald et al., 1987; Pool & Judkins, 1990).

The majority of breast cancers are slow growing (McLellan, 1988). Evidence suggests that invasive cancer is preceded by pre-malignant changes that are 'in-situ' and pre-invasive (de Waard & Trichopoulos, 1988; Gallager, 1980). A diagrammatic representation of the sequence of events in the natural history of breast cancer is proposed by Gallager (1980) and presents a fairly uniform process prior to the invasive stage of breast cancer (see Figure 2.1). His proposal is an inferential conceptualisation derived from clinical experience and from a variety of investigations. According to Gallager (1980) local treatment methods occurring prior to the initial invasive stage have a greater likelihood of being highly effective. He, therefore, suggests that early detection is of utmost priority.

#### 2.2.4 Prognostic Factors

Once a woman has been diagnosed as having breast cancer, clinical predictors of outcome include the size of the primary mass (tumour) and axillary nodal involvement. Tumours less than two centimetres in size are generally associated with the most favourable outcome, with survival at five years after diagnosis being 90 percent. Tumours of this size are also less likely to have axillary nodal metastases (Braunwald et al., 1987; Duncan & Kerr, 1976; Fleming, 1985; McLellan, 1988; McMichael & Armstrong, 1988; O'Malley & Fletcher, 1987; Tabar & Dean, 1987).



(Gallager 1980, p. 906)

**Figure 2.1 - Diagrammatic Representation of the Sequence of Events in the Natural History of Breast Cancer**

Age as a prognostic factor has been the focus of studies internationally. A Swedish study of 57,068 women, who were diagnosed with breast cancer in the years 1960 through to 1978, was conducted by Adami, Malker, Holmberg, Persson and Stone (1986) to analyse the relation between age at diagnosis and relative survival. Women who were 45 to 49 had the best prognosis with relative survival declining markedly after this age. A similar study of 31,594 females diagnosed with breast cancer in Norway between 1955 and 1980 was reported by Host and Lund (1986). The best prognosis was given to women aged 35 to 49 and the

poorest prognosis to women under 35 years and those over 75 years. Noyes, Spanos and Montague (1982) report on a comparative study of women below and over 30 years diagnosed with breast cancer between 1945 and 1977 in Houston, Texas. Results indicated that the younger women (below 30 years) with no axillary node metastases and those with tumours less than 5 centimetres in size had significantly poorer survival than women over the age of 30 with the same presenting findings.

A further important prognostic factor is the presence or absence of the oestrogen receptor. Breast cancer cells contain receptors that can bind to the circulating oestrogen in the body. The levels of the oestrogen receptors aid the prediction of the hormonal treatment response. A positive oestrogen receptor level is usually associated with a more favourable prognosis as the cancer is more likely to respond favourably to hormonal treatment. Post-menopausal women present more frequently with this receptor status (Braunwald et al., 1987).

#### 2.2.5 Staging

Following the diagnosis of breast cancer, clinical staging is conducted to determine the prognosis and the type of treatment required, i.e. radiotherapy or chemotherapy. The clinical staging involves assessment of the tumour size, presence of palpable lymph nodes and evidence of distant metastases. Table 2.1 presents the staging of the American Joint Committee on Cancer (1987). The table includes a description and frequency of each stage at presentation and indicates that the five year survival rate is dependant on the size of the tumour.

### 2.2.6 Diagnosis

A painless mass or thickening in the breast is the most common presenting symptom of breast cancer. Other clinical manifestations (indicative of advanced breast carcinoma) may include skin puckering or dimpling; nipple discharge or retraction; change in size, shape or contour of the breast; skin oedema; discolouration; dilated superficial blood vessels; frank skin ulcerations; and hard palpable axillary lymph nodes (Nash, 1985; Porth, 1986).

**Table 2.1 - Breast Cancer Clinical Stage and Prognosis**

Stage	American Joint Committee staging	Approx. frequency of stage at presentation, %	Approx. 5-year survival %
I	Primary tumour < 2cm; nodes, if palpable, not felt to contain metastases; no distant metastases	55 - 70	80
II	Primary tumour > 2cm and < 5cm; nodes, if palpable, not fixed no distant metastases evident	20 - 25	65
III	Tumour > 5cm or fixed to chest wall or skin invasion present; supraclavicular nodes palpable; no distant metastases evident	10	40
IV	Distant metastases	10	10

(Braunwald et al., 1987, p. 1568)

A study of 501 women with newly diagnosed breast cancer, seen in a consulting surgical practice, was presented by Devitt (1983). The findings stated that two-thirds of the cancers had an associated visible clinical sign. Braunwald et al. (1987) maintain that 70 to 80 percent of women present with a hard mass. Almost all breast cancers (90 to 98%) are found by women themselves either accidentally or through BSE (Braunwald et al., 1987; Ludwick, 1988; Nash, 1985; Porth, 1986; Senie, Rosen, Lesser & Kinne, 1981; Studva & Nash, 1984). The remaining two to ten percent of cancers are discovered during examination by health professionals or by mass screening techniques, such as mammography (Braunwald et al., 1987).

#### 2.2.7 Summary of Breast Cancer Literature

Breast cancer is the leading cause of death from cancer in Australian women. Many risk factors for the development of this disease have been identified but the aetiology remains uncertain and, therefore, total primary prevention of breast cancer is not possible. The size of the primary tumour is directly correlated with the staging and presence of lymph node involvement. These three factors (size, stage and lymph node involvement) are the predictors of outcome for women diagnosed with breast cancer. Efforts to control the mortality rate from this disease must be directed toward early detection through the use of secondary preventative measures, such as breast self-examination. Secondary prevention of breast cancer could reduce mortality rates if the tumour is detected when it is localised (Butler, Furnival & Hart, 1990), prior to dissemination (McLellan, 1988), and when immunocompetence is intact (Strax, 1984). The practice of BSE is,



therefore, important for all women to adopt in an effort to decrease the mortality rates.

### 2.3 Breast Cancer Screening

In recent years the major emphasis for the promotion and maintenance of breast health, has been on the implementation of screening programmes for the early detection of breast cancer. Screening is the "performance of tests on apparently well people in order to detect a medical condition at an earlier stage than would otherwise be the case" (AHMAC, 1990, p. 15). The ultimate goal of breast cancer screening is a reduction in mortality from this disease.

### 2.4 Types of screening available

Various screening methods have been considered and employed for the early detection of breast cancer. These include ultrasound, thermography, transillumination light scanning, immunological technique (magnetic resonance imaging), computerised tomography and mammary serum antigen test. Screening by mammography is also employed and section 2.5 discusses this method.

#### 2.4.1 Ultrasound

Preliminary development and investigation of ultrasound began in the 1950's and continued through to the early 1970's (Kopans, 1987). Ultrasonography introduces high frequency sound waves into the breast tissue and the waves produced are then reflected and converted to create cross-sectional images of the breast (Isard, 1984; Nash, 1985). The reflected sound waves vary in strength

according to the density of the tissue (Nurses Reference Library, 1984) and the images produced are used to determine a diagnosis.

The benefits of breast tissue ultrasonography include reliability for differentiating cystic from solid masses (AHMAC, 1990; Nash, 1985; Read, 1990). Ultrasound can also produce views of the chest wall posterior to the breast, which is not adequately seen with radiographic techniques (Nurses Reference Library, 1984). Ultrasound is non-ionising, noninvasive and considered appropriate for use in younger women with radiographically dense breasts that are not suited for screening by mammography (Nash, 1985).

There is a lack of evidence to suggest that ultrasound is effective in detecting non-palpable cancers, which casts some doubt on its value as a screening technique (Kopans, 1987). However, Lapayowker and Revesz (1980) predict that, "in the future, ultrasound could replace the use of ionising radiation for the diagnosis of early breast cancer" (p. 935). Further technological development of this technique will determine its role in breast cancer screening.

#### 2.4.2 Thermography

Thermography uses passive heat detection devices to record slight differences in tissue temperatures (McLellan, 1988, p. 565). In breast disease the tissue temperature is higher than in normal breast tissue. Therefore, breast abnormalities are displayed as 'hot spots' on the film rather than a symmetry of blood vessels. Opposing the use of thermography as a screening technique is the lack of specificity as thermogram abnormalities can also be observed in nonmalignant processes (Isard, 1984).

The National Breast Cancer Detection Programme in the U.S. included screening by thermography with disappointing results. Lapayowker and Revesz (1980) compared nine studies conducted between 1969 and 1976. They concluded that the thermogram has an accuracy rate of approximately 75 percent, particularly in symptomatic patients and that "its accuracy was barely better on the average than that due to guessing" (p. 933). Considering these results thermography has no real value at present in the screening for breast cancer.

#### 2.4.3 Transillumination Light Scanning

Transillumination (also known as diaphanography) is the passage of far red and near infrared light through the breast. This concept is not new, as usage 50 years ago has been reported (Isard, 1984). Cancer tissue absorbs more of these wavelengths due to increased amounts of blood and, therefore, appear darker on the film (Kopans, 1987). Transillumination light scanning for breast cancer screening is generally considered to be of little value as it cannot distinguish between cancer and benign disorders although it may be useful for younger women who have radiographically dense breasts that are difficult to x-ray effectively (AHMAC, 1990; Nurses Reference Library, 1984; Isard, 1984; Kopans, 1987; Sickles, 1987).

#### 2.4.4 Magnetic Resonance Imaging

Magnetic Resonance Imaging (MRI) produces a cross-sectional image of the breast which is due to the interaction between magnetism and radiowaves (Nash, 1985). As a screening technique for the early detection of breast cancer MRI is deemed unsuitable and expensive, although, it may have some value in the staging

of breast cancer and with treatment decisions (AHMAC, 1990; Kopans, 1987; Nash, 1985). When compared with mammography, MRI is not as accurate for diagnosing breast cancers (Sickles, 1987).

#### 2.4.5 Computerised Tomography

Computerised tomography (CT) scans provide a cross-sectional, three-dimensional image of the breast. Minimal information is available on the value of CT scans in screening for breast cancer. Major disadvantages that will prevent widespread application of this technique is the high cost, and in comparison to mammography, exposure of the breast to higher radiation doses (AHMAC, 1990; Sickles, 1987).

#### 2.4.6 Immunological Technique

The Mammary Serum Antigen (MSA) test is an immunological technique that is based on the use of monoclonal antibodies. The level of MSA indicates the presence of a breast cancer (Hare, Tjandra, Russell, Collins & McKenzie, 1988). An Australian Study conducted by Hare et al. (1988) compared MSA levels and two-view xero-mammography in a study of 97 symptomatic patients. Results indicated that for the detection of breast cancer the MSA test was superior to mammography providing a sensitivity of 76 percent compared to 54 percent xero-mammography sensitivity. The Australian Health Ministers' Advisory Council (1990) proposed that the sensitivity of xero-mammography, as used in the study by Hare et al. (1988), is well below that of modern screen-film techniques, and subsequently may not be a true reflection of the results' implications. Hare et al. (1988) however, identified that their sample was small, non-randomised and

employed only symptomatic women. They specified the need for a properly conducted population-based study to conclusively identify the role of MSA in screening for breast cancer.

### 2.5 Mammography

A mammogram is a radiographic image of a breast. It is widely recognised and accepted that screening mammography for the early detection of breast cancer is the most useful and noninvasive technique currently available (Braunwald et al., 1987; McDermott & Sacharias, 1988; Melville & Burch, 1987).

Haus (1987) emphasises that the goal of promoting and conducting mass screening by mammography is to "consistently produce high-contrast, high-resolution images at the lowest radiation dose possible" (p. 913). Screen-film mammography and xeromammography are the two types of transmission radiography available.

In screen-film mammography the "x-rays are beamed onto a fluorescent screen which exposes a film in contact with it. It can be adjusted to emphasise different kinds of tissue within the breast" (Tortora & Anagnostakos, 1984, p. 726). Xeromammography is produced by an "electrostatically charged plate that records the x-ray image and transfers it to a special paper" (Nurses Reference Library, 1984, p. 756). In comparison with screen-film mammography, xeromammography delivers a larger dose of radiation to the breast.

### 2.5.1 Mammographic research trials

Numerous mammographic research trials are presently being conducted in many countries. The following discussion briefly summarises major mammography studies.

The Health Insurance Plan (HIP) of Greater New York began a study in late 1963 which was the first prospective randomised controlled trial that provided evidence that screening by mammography can reduce the mortality rate from breast cancer. Approximately 31,000 women between the ages of 40 and 65 were randomly selected for the study from a total population of 62,000. The selected women were offered four annual screens that included mammography and physical breast examinations (Shapiro, Venet, Strax, Venet & Roeser, 1982). Ten years after commencement a 29 percent reduction in mortality from breast cancer was reported in the study group. This significant mortality reduction has persisted through 18 years of follow-up (Tabar & Dean, 1987). Habbema, van Oortmarsen, van Putten, Lubbe and van der Maas (1986) report that this reduction equates to the prevention of 1.3 deaths per 1,000 women, and the saving of 31 life-years per 1,000 women.

In 1976 the second randomised controlled trial, the Swedish Two County, began as reported by Tabar, Fagerberg, Duffy and Day (1989). All women over the age of 40 were included. Of the sample, 77,092 women were invited for screening by single view mammography alone, while 56,000 women were not invited and thus comprised the control group. Women under 50 years of age were screened every 24 months, while those over the age of 50 were screened every 30 to 36 months. At eight years follow-up, women in the study group aged 50 years

and over had a 32 percent reduction in breast cancer mortality compared to the control group, a statistically significant result. No reduction in mortality was found in the age groups 40 to 49 years and 70 to 74 years.

The UK randomised controlled trial enrolled women aged 45 to 64 living in eight locations in the United Kingdom (UK Trial of Early Detection of Breast Cancer Group, 1988). Breast cancer screening comprised physical examination and mammography in years one, three, five and seven; and physical examination only in years two, four and six. The comparison population consisted of 127,117 women. Results indicated a fourteen percent mortality reduction in the study group. This was not statistically significant, projecting some doubt on the efficacy of mammographic screening.

The Edinburgh trial results (which is one of the centres of the UK trial) were also examined separately. Findings, after seven years follow-up, found that women aged 50 and over achieved a twenty percent mortality reduction (Roberts et al., 1990), however, this result was not statistically significant.

A further study which did not achieve a significant reduction in mortality rates was the randomised controlled trial conducted in the Swedish city of Malmo (Andersson et al., 1988). The Malmo study invited 21,088 women over the age of 45 for mammography screening at an interval of 18 to 24 months. The control group consisted of 21,195 women. Five rounds of screening have been completed. Follow-up, nine years later, revealed only a four percent reduction in breast cancer mortality in the study group. This result was not statistically significant, although women over the age of 55 exhibited a 20 percent reduction in mortality.

The Australian Health Ministers' Advisory Council (1990) cautions that the statistically insignificant results of the Malmo and UK trial are caused by delayed mortality reductions as observed in the HIP and Swedish Two County studies. They suggest that a significant mortality reduction may be observed at follow-up in later years.

The United States Breast Cancer Detection Demonstration Project (BDCCP) consisted of five annual screens between 1973 and 1981 using a combination of mammography and physical examination. More than 280,000 women between the ages of 35 and 74 were screened in the expectation of reducing the mortality rate (Morrison, Brisson & Khalid, 1988). An interpretation of the BCDPP results was undertaken by Eddy, Hasselblad, McGivney & Hendee (1988) who concluded that "at face value the study implies approximately a 50 percent reduction in mortality" (p. 1512). Whilst the results must be viewed with caution as random sampling was not employed, the preliminary results are favourable.

Similar results were suggested by Verbeek et al. (1984) in the Netherlands. In 1975 a screening programme was introduced in Nijmegen which included a single-view mammogram every two years for women over the age of 35. The authors concluded from their results of the first four rounds of screening that "breast cancer mortality in women 35 years of age and over can be reduced by roughly 50 percent by regular mammographic screening of all eligible women" (p. 1224).

A similar case control study also began in 1975 in Florence, Italy, and included a two-view mammogram offered every 2.5 years for women between 40



and 70. Palli et al. (1986) reported a statistically significant reduction (not reported in terms of percentages) in breast cancer mortality for the women over the age of 50 years.

The DOM project commenced in 1975 in the city of Utrecht. It was a population-based, non-randomised study of women aged 50 to 64. A total of four screens were conducted on each of 14,796 women with findings demonstrating that only the women in the 55 to 64 age group had a statistically significant reduction in mortality from breast cancer (Collette, Day, Rombach, & De Waard, 1984).

The Central Sydney Area Health Service (CSAHS) Breast X-ray Programme, Australia's first population-based pilot mammography screening project, commenced in March 1988 (Rickard et al., 1991). Free screening by two-view mammography was performed in a mobile van that was placed for periods of two to six weeks at highly visible locations in the inner western suburbs of Sydney. A total of 7,193 women were screened in the first 18 months. Fifty three cancers were detected, 60 percent of which were impalpable to the examining surgeon. The statistical significance of these results was not reported, though, Rickard et al., (1991) claim that their results compare well with the Swedish Two County and Nijmegen Trials. However, because the women attended voluntarily in the Australian study the results may have been biased by the possible attendance of self-motivated women.

The W.A. Women's Cancer Prevention Unit commenced a pilot mammography screening project in 1989. This project targets two areas, a mobile unit in the south-west of W.A. and a unit at Cannington that invites women in the surrounding area to attend for screening free of charge. The first round of

screening has been completed with a total of 19,232 women. The second round of screening is not yet complete. Results to the end of 1990 included a cancer detection rate of 6.6 per 1,000, however, the significance of these results were not reported. Due to the early stage of this project, reductions in mortality rates from breast cancer will not be able to be calculated for a few years. (R. Kaufmann, Acting Senior Research Officer, Women's Cancer Prevention Unit, personal communication, September 24th, 1991).

### 2.5.2 Benefits of mammography

The overall results of the preceding trials provide support for screening by mammography in the early detection of breast cancer for the reduction of mortality rates from this disease. Glaziou (in AHMAC, 1990) conducted a meta-analysis of the randomised controlled trials (HIP, Swedish Two County, Malmö and UK) and found a 22 percent reduction in deaths from breast cancer. A 1988 symposium of the Nordic Cancer Union concluded that "screening by mammography alone or mammography plus physical examination can reduce mortality from breast cancer" (Anonymous in AHMAC, 1990, p. 21).

Considering the available techniques for breast cancer screening, it is widely acknowledged that mammography is the only method that has repeatedly demonstrated the ability to detect breast cancer at an early stage (AHMAC, 1990; Kopans, 1987; McLellan, 1988; Health Department of W.A., 1987; Rickard et al., 1991; Strax, 1984; Tabar & Dean, 1987).

### 2.5.3 Disadvantages of mammography

Many factors can affect the quality of the mammogram. These include "inadequate positioning, poor compression, suboptimal image contrast, incomplete or inappropriate work-up, and reader inexperience" (Read, 1990, p. 429). The most commonly discussed problem of the mammogram is the incidence of the 'false negative' result. They have been reported as; 11 percent (Cregan, Parer & Power, 1988; Dodd, 1977), 28 percent (Acheson, Smith, Stubbs, Ingram & Armstrong, 1988), 43 percent (Walker & Langlands, 1986), and 10 to 30 percent but possibly as high as 73 percent (Skrabanek, 1985). The incidence of false negative rates in these studies may indicate that mammography screening may not be relied upon as the definitive method for detecting breast cancer.

Low compliance with attendance has been cited as being a major problem that will impair the effectiveness of self-referral mammography screening (Gold, Bassett & Fox, 1987; Hall, 1987; Lane & Fine, 1983; Tabar, Faberberg, Day & Holmberg, 1987). In Australia, experience with low compliance of women self-referring for cancer screening has already been encountered with attendance for cervical cancer screening (Joseph, Hamilton, Denham, Ackland & Stewart, 1990).

Compliance rates reported from an American study of 1,822 women differed dramatically depending on a number of factors. Women who were asymptomatic, had normal breast examination findings and those who had to pay for their mammogram had a low compliance rate for attending mammography screening of 7.6 percent. This compared to 92.5 percent compliance rate for women who had breast disease symptoms, an abnormal examination and for who the mammogram

was provided free of charge (Lane & Fine, 1983). Clearly, education for secondary prevention of breast cancer must begin at the presymptomatic stage.

#### 2.5.4 Mammography costs and recommended intervals of screening

An important consideration for the implementation of a mammography screening programme is the financial cost. The cost of the screening programme must be determined against the cost of providing treatment for breast cancer (Butler, Furnival & Hart, 1990; Eddy et al., 1988; Knox, 1988; Strax, 1984). Analysis of screening costs should also include personal costs (Hurley & Livingston, 1991; Love & Camilli, 1981; Mooney, 1982; Moskowitz, 1987), assessment of quantity and quality of life (Gerard, Salkeld & Hall, 1990), cost per year of life saved (Tabar, Faberberg, Duffy & Day, 1989), and risks, benefits and acceptability (Gerard, Salkeld & Hall, 1990). A further personal 'cost' could be an increase in women's anxiety regarding breast cancer following screening for this disease.

Screening costs within the British National Health Service were evaluated by Mooney (1982). Mammography with single person reporting and one clinical examination was found to be the best screening programme in regard to screening costs, health service costs per cancer detected, and personal costs incurred by the woman herself.

Gerard, Salkeld and Hall (1990) estimate that it would cost between 60 and 100 million dollars every year to provide a national screening programme for Australian women. This estimate is based on 70 percent of all women over the age of 45 years having a mammogram every two years. Preliminary costings of the

Sydney Breast X-ray Programme was \$118.93 to screen a woman and \$13,817 to detect a cancer, not including tumour staging. However, Joseph et al. (1990) point out that "extrapolation of Gerard et al.'s (1990) costing to the national setting should be done with extreme caution as the optimal methodology for breast cancer screening has not yet been established" (p. 545).

A random survey of 150 Australian women who had undergone screening by mammography was undertaken by Hurley and Livingston (1991) to determine the personal costs incurred by the woman herself. Their findings included "mean travel costs, out of pocket expenses, and opportunity costs per attendance were \$6.45, \$8.14 and \$13.75 respectively" (p. 132). The promotion of 'free' screening would thus appear to be a misnomer and may prevent women from screening.

The greatest factor influencing the cost of mammography programmes is the screening interval. No trial has directly addressed this issue (Joseph et al., 1990). Different countries have adopted varying recommendations for screening intervals from annually in Sweden (Fox, Baum, Klos & Tsou, 1985) to every three years in the United Kingdom (Whitehead & Cooper, 1989). In Australia it is recommended that screening of all women over the age of 40 should be every two years, but a continual review of this interval is necessary (AHMAC, 1990). Presently, the mammogram remains the most effective modality for reducing the mortality from breast cancer.

#### 2.5.5 Side effects

It is generally acknowledged that missing early cancers of the breast by not utilising mammography screening is much more serious than the incalculable risk

of radiation induced breast cancers (Dodd, 1984; Eddy et al., 1988; Feig & Ehrlich, 1990; Melville & Burch, 1987; Strax, 1984). However, radiation induced breast cancer through mammography screening has been a major concern (Bailar, 1977; Dodd, 1984; Feig & Ehrlich, 1990; Schwartz, 1978). Bailar in 1976 concluded that there seems to be a "possibility that the routine use of mammography may eventually take as many lives as it saves due to radiation hazards" (p. 82). Mammography technology has improved since Bailar's comments, and the radiation dose exposed to the breast is now only minimal.

No evidence of breast cancer developing due to mammography has ever been shown (Feig & Ehrlich, 1990; Howe, Sherman, Semenciw & Miller, 1981; Strax, 1984). However, as Feig and Ehrlich (1990) point out "radiation-induced and spontaneously occurring breast cancers cannot be distinguished histologically" (p. 638). The risk of inducing breast cancer through radiation exposure through mammograms can only be implied and not proven.

#### 2.5.6 Availability of mammograms

The Breast Cancer Screening Evaluation Committee (AHMAC, 1990) has identified various recommendations to assist in ensuring success of a national breast cancer screening programme. It is recommended that screening should be available to all women over the age of 40, by self-referral, and be free of charge. A policy of self-referral is also advocated by Monsees, Destouet and Evens (1988). Provision of these recommendations would increase compliance with screening attendance.

## 2.6 Summary of Breast Cancer Screening Literature

Breast cancer remains the leading cause of death in Australian women. International studies have indicated that mortality from breast cancer can be reduced through early detection. Screening programmes for early detection have been implemented in numerous countries and the long term effectiveness of early programmes are now reporting positive results, particularly for women over the age of 50. The modalities available for breast cancer screening are ultrasound, thermography, transillumination light scanning, magnetic resonance imaging, computerised tomography, mammary serum antigen, and mammography. Studies have indicated that screening mammography for women over the age of 40 is the most effective modality that can detect breast cancer before it is palpable and when it is most curable (AHMAC, 1990). The risk of radiation induced breast cancer through the use of mammography is believed to be negligible. The cost of a screening programme is initially high but this must be offset against the cost of treating a woman with advanced breast cancer. Essential components of a screening programme to ensure success and compliance are, easy access for all women, with minimal personal cost incurred. Women need to understand the benefits and importance of breast cancer screening. This education could be achieved through contact with general practitioners, other health professionals and the mass media.

## 2.7 Clinical Breast Examinations

Clinical breast examinations are recommended by the Cancer Foundation of W.A., to be performed annually, for all women over the age of 20. Also recommended is that these examinations be conducted by physicians. It is interesting to note in a study of physicians' abilities to detect lumps in silicone models of breasts, the mean number of lumps detected was only 8 (44 percent) out of a total of 18 lumps, with a range of 3 (17 percent) to 15 (83 percent) (Fletcher, O'Malley & Bunce, 1985). Thomas, Spitzer and MacFarlane (1981) found that surgeons were generally better than nurses in detecting breast lesions, but the findings were not statistically significant. Breast examinations by nurses have also been studied. Moskowitz (1979) reported on a study of 10,556 women who were examined by nurse clinicians in the community of Cincinnati. Findings concluded that nurses are as effective in the detection of breast lesions as surgeons in the general community. Barckley (1980) also supported nurses' knowledge in the area of breast lump detection and education of patients. Barckley (1980) reports that;

nurses performed physical assessments on 3,883 patients. When the nurses' examinations were checked by a physician, the rate of agreement was found to be 97.1 percent. In the area of disagreement, the nurses erred in being too scrupulous; in not one instance did they miss a serious lesion (p. 35).

Venet (1980) maintains that teaching women how to examine their breasts is more important than teaching physicians, "as at least 98 percent of women who develop breast carcinoma discover the tumour themselves" (p. 931). An opposing view is presented by Baines (1983) who supports a need for campaigns to increase the skills of physicians in breast examinations rather than teaching women.



However, education to physicians and women are equally important for the early detection of breast cancer.

## 2.8 Breast Self-Examination

The third component of the Cancer foundation of W.A. recommendations for maintenance of breast health is the practice of monthly BSE from the age of 20. The efficacy of BSE as a primary screening method for breast cancer has been questioned. It is commonly identified that BSE used in conjunction with annual clinical examinations and mammography is the most acceptable method for detecting breast cancer (Del Greco & Spitzer, 1984; Mahoney, Bird & Cooke, 1979; Tabar & Dean, 1987). The present study does not aim to refute the obvious benefits of mammograms but supports the practice of BSE as an adjuvant therapy, particularly for women under the age of 40 who do not yet qualify for screening by mammography.

BSE is the examination of both breasts in a systematic manner for the purpose of early detection of abnormalities. It should be performed immediately following menstruation, or in amenorrhoeic women, at any time of the month on a monthly basis. The Cancer Foundation of W.A. produces booklets that describe the correct technique of BSE and also discuss breast anatomy, breast pathology and treatments for breast cancer.

### 2.8.1 Advantages of BSE

There are many advantages of BSE. It is simple, inexpensive, noninvasive, convenient, performed in private, nonradiative (Baines, 1984; Cole & Austin, 1981; Nettles-Carlson, Field, Friedman & Smith, 1988; O'Malley & Fletcher, 1987), and

can be practised in remote regions where other screening programmes are unlikely to be established (Del Greco & Spitzer, 1984; Miller, Chamberlain & Tsechkovski, 1985). Gastrin (1987) reports that women who practise BSE monthly discover symptoms of breast tumours that are 0.5 to 1.0 centimetre in diameter. Also Pool and Judkins (1990) state that women who practise BSE are eleven times more familiar with their breasts than their physician who only performs a breast examination annually.

### 2.8.2 Disadvantages of BSE

Considering its disadvantages Baines (1984) maintains that "BSE arouses fear and anxiety in some women for numerous complex reasons including; dislike of touching oneself, fear of discovering cancer and uncertainty of what to look for" (p. 120). Further, Jakobsen, Beckmann, Beckmann & Brunner (1987) report that women who refuse to participate in BSE also tend to be "fearful that finding breast cancer will destroy their life and feel that they should not go looking for more problems than they already have" (p. 75).

Despite the fact that false positive results of BSE may generate financial costs (i.e. additional physicians visits and diagnostic costs), some authors advocate strongly for BSE practice, suggesting that the costs of failing to detect breast cancers could generate additional costs from delayed diagnosis and treatment (Baines, 1983; O'Malley & Fletcher, 1987).

Considering BSE practice in younger women Frank and Mai (1985) argue that 88 percent of abnormalities in young women found by BSE are benign and that BSE "does more harm than good" (p. 657). Frank and Mai (1985) appear to

dismiss the remaining 12 percent of malignant cancers discovered by BSE in young women as being insignificant.

### 2.8.3 The value of BSE as a screening method

Numerous retrospective studies have been concerned with the practice of BSE in the detection of breast cancer. Many of these indicate that women who practise BSE monthly are more likely to find their breast tumours than BSE non-practitioners (Philip, Harris, Flaherty & Joslin, 1986). However, some studies have failed to corroborate the benefits of BSE practice in relation to lymph node involvement, pathologic staging and size of the breast tumour.

Foster and Costanza (1984) conducted a study over a seven year period with 1,004 newly diagnosed breast cancer patients and found that more frequent BSE was related to earlier detection and improved survival. The relationship between BSE and breast cancer stage at diagnosis was examined by Mant, Vessey, Neil, McPherson and Jones (1987) in 616 women in England aged between 15 and 59 years. Women who practised BSE were found to have tumours less advanced in terms of size and lymphatic involvement. This relationship between breast cancer stage and BSE practice was also studied by Caseldine et al. (1988), Feldman, Carter, Nicastrri and Hosat (1981), Foster et al. (1978), Huguley and Brown (1981), and Mamon and Zapka (1985), who all found that BSE for the early detection of breast cancer can be positively supported.

Survival rates for women five years after being diagnosed with breast cancer was examined by Huguley, Brown, Greenberg and Clark (1988). Findings indicated that 76.7 percent of women who practised monthly BSE were still alive at

five years after diagnosis compared to 60.9 percent of women who did not practise BSE. Greenwald et al. (1978) estimated that breast cancer mortality would be reduced by 18.8 percent through BSE.

Senie, Rosen, Lesser and Kinne (1981) studied 1,216 women in New York with primary breast cancer and found BSE frequency and nodule detection were not significantly related to pathological stage of disease at diagnosis. A retrospective Canadian study of 416 women with breast cancer was undertaken by Hislop, Coldman and Skippen (1984) who found that the practice of BSE was not significantly associated with tumour size or lymph node involvement, although 86 percent of their sample had detected their own breast tumour. These findings were also supported by Haughey et al. (1988), Philip et al. (1986), Smith and Burns (1985), and Smith, Francis and Polissar (1980).

The above international studies show that the benefits of BSE for the early detection of breast cancer remain inconclusive. However, a recent meta-analysis of twelve studies by Hill, White, Jolley and Mapperson (1988) found that 39 percent of the women who performed BSE had lymph node metastases compared to 50 percent in those women who did not perform BSE. This indicates a favoured prognosis for the women who had practised BSE.

The number of women practising BSE every month varies in the literature from 19 percent (Roberts, French and Duffy, 1984) to 59 percent (Dickson et al., 1986). Two American telephone surveys (Celentano & Holtzman, 1983; Sheley, 1983) discovered that 35 and 39 percent of women practised monthly BSE respectively. Foster et al. (1978) and Magarey, Todd and Blizard (1977) conducted studies with newly diagnosed breast cancer female patients and found that 50

percent of their samples had never performed BSE. Baines (1983) offered a realistic opinion for why many women choose not to practise BSE, in that it is ironical that 'success' with BSE means that you have found disease, and that there is lack of short term satisfaction.

An extensive literature review revealed only three Australian studies concerning BSE practice in the general community. Hill, Rassaby and Gray (1982) reported 25 percent of their sample practised monthly BSE. In a further study by Hill, Gardner and Rassaby (1985) only 17 percent of their sample reported monthly BSE. A random sample of 1,454 women in New South Wales was surveyed by Redman, Reid, Campbell and Sanson-Fisher (1990), with results indicating that 39 percent of these women practised BSE on a monthly basis.

#### 2.8.4 Summary of BSE Literature

BSE is the examination of both breasts for the early detection of breast cancer, and overall, retrospective studies have indicated support of BSE for this purpose. The actual value of BSE could only be ascertained by a prospective randomised study that indicated a reduction in the mortality rates from breast cancer. However, no intervention of potential value, such as BSE, should be ignored (Baines, 1984). In Australia, the National Health and Medical Research Council has endorsed the value of BSE in the prevention of breast cancer (Redman et al., 1990). BSE is an important detection method for women under the age of 40 who do not yet qualify for screening by mammography. The number of women practising monthly BSE is disappointing. BSE can result in earlier detection with subsequent earlier treatment and improved survival. The need for education in the correct methods of BSE is crucial.

## 2.9 Evaluation of BSE Modeling and Teaching Methods

It has been identified that properly targeted educational programmes can significantly improve BSE behaviours (Baines, 1983; Mamon & Zapka, 1985). Dickson et al. (1986), in a study of 483 women found that 62 percent indicated that they would practise BSE regularly if they were shown how. According to Bandura's (1977) Social Learning Theory most human behaviour is learned observationally through modeling, that is, when one individual observes another. Symbolic modeling also occurs which involves behaviours which are modeled in the form of films, cartoons, videotapes, audiotapes, and written scripts (Perry & Furukawa in Kanfer & Goldstein, 1986). Various educational strategies that employ human and symbolic models to promote BSE practice have been studied in an effort to determine which method of instruction is the most effective. These strategies include pamphlets, lectures, films, mass media, prompting, and one-to-one guided practice and rehearsal using breast models.

### 2.9.1 BSE Pamphlet / Booklet

A major study in Ireland by Turner et al. (1984) included approximately 30,000 women aged 40 to 74. Using random sampling, half of this group were chosen to receive a booklet on BSE from their general practitioner (G.P.). The other half of the sample served as the control group. Findings showed that early malignant cancers were detected significantly more frequent in the group that received the booklet. This group also had a smaller average tumour size. A pamphlet was employed in the Dutch study by Siero, Kok and Pruyn (1984). Four experimental groups and one control group were used. The study was conducted to determine whether health messages with varying levels of beliefs had an effect

on knowledge, attitudes and behaviour related to BSE. No statistically significant differences were found between experimental groups but after reading the pamphlet all groups indicated a greater intention to practise BSE regularly.

McDermott and Marty (1984) compared a group that were given a BSE pamphlet and a group that were exposed to individual modeling and rehearsal using breast models. A posttest three months following the programmes revealed no difference in knowledge, but, statistically significant, more women in the modeling and rehearsal group indicated that they had practised BSE at least once since the programme.

### 2.9.2 Breast Models

Teaching lump detection using silicone breast models has been evaluated in numerous studies. In a study of 219 female college students Marty, McDermott and Gold (1983) assessed the effects of three formats of promoting BSE; (a) pamphlet, (b) BSE modeling on silicone breast models, and (c) BSE modeling and individualised guided practice. Findings indicated that the group exposed to modeling and guided practice demonstrated significantly higher BSE frequency and had more positive attitudes about the benefits of BSE. Young and Marty (1985) also employed college students and assigned each student to one of four groups according to present units of study and past education. The students in the experimental group were exposed to a BSE programme that consisted of a short lecture, BSE film, BSE pamphlet, modeling of BSE using a silicone breast model and guided practice. The other groups consisted of (a) students who had previously taken a health course, (b) normal unit syllabus that included BSE information and, (c) control group with no BSE education. Results from a

questionnaire survey of respondents administered 14 weeks post programme revealed that the experimental group performed BSE more frequently and indicated greater confidence in their ability to perform BSE.

A two-tier educational programme implemented by Boyle et al. (1981) initially targeted nursing personnel. The second component, that focussed mainly on BSE practice and risk factors of breast cancer, included lay women and nurses. The format included lecture, small group discussion, demonstration of BSE using silicone breast models, and rehearsal of technique either on the subject's clothed body or a breast model. At follow-up regular BSE was reported by 82 percent of the lay women. A statistically significant increase in knowledge was also found. A similar BSE programme that included lecture, film and rehearsal using silicone breast models was reported by Michalek, Walsh, Burns and Mettlin (1981). A follow-up telephone survey of the 305 women three months later also revealed that 82 percent reported monthly BSE practice; a statistically significant finding.

A statistically significant increase in knowledge levels of BSE was found in an American study of 25 women by McNeal (1987). The programme included one-to-one BSE instruction using a silicone breast model with a return demonstration. Edwards (1980), in a study of 130 women, found that modeling alone was equally as effective as employing a combination of modeling with guided practice, self-monitoring or peer support.

The effectiveness of teaching BSE using silicone breast models for the detection of human breast lesions has been questioned. A New York study by Haughey et al. (1988) included 130 female patients who had been diagnosed with breast cancer in the past five years. This investigation employed silicone breast



models that contained five simulated tumours for detection. Forty one percent of the breast cancer patients were unable to find any abnormalities in the breast model. The women that had discovered their own breast lesions through BSE were not significantly more competent in detecting the simulated tumours. Hall et al. (1980) also compared the teaching for detection of tumours in silicone models and human breasts. Findings indicated that detection of breast lesions increased significantly in both formats.

### 2.9.3 Film and Discussion

Various published reports have evaluated BSE programmes that adopted a combination of film and discussion in an effort to promote BSE practice (Calnan, Chamberlain & Moss, 1983; Caseldine et al., 1988; Philip et al., 1984) with a majority of these studies indicating that women can be motivated to practise BSE.

As part of the 'UK Trial of Early Detection of Breast Cancer' a total of 49,573 women residing in several districts in England were invited to attend a 40 minute session consisting of a BSE film and discussion. The programme was conducted over a seven year period and 14,905 women attended. Follow-up after eight years has revealed that of the 43 women who developed breast cancer, 13 found their own breast tumour as a result of deliberate BSE (Holliday et al., 1983). A follow-up of these results was reported by Dowle et al. (1987) who compared the findings of tumour characteristics and survival rates with a control population. The results indicated a significant reduction in the size of tumours at presentation, a reduction in lymph node involvement, but no survival difference between the two groups at time of report. These results would appear to indicate that the significant reduction in the size of the tumours at presentation may have been a

result of the women's greater awareness of BSE through attending the film and discussion session. The results of Dowle et al. (1987) were also supported in two other major studies in England by Caseldine et al. (1988) and Philip et al. (1984).

A randomised sample was employed for a study in England by Calnan, Chamberlain and Moss (1983). The control group included 895 women and the experimental group, who attended a BSE film and discussion, consisted of 825 women. The experimental group demonstrated a statistically significant improvement in BSE technique at one year posttest. Styrd's (1982) results of a Canadian study also supports the use of a film and discussion to significantly increase monthly BSE practice.

Carstenson and O'Grady (1980) advocate commencement of BSE education in high school curricula. To highlight this need they conducted a BSE programme that included a film and discussion with 7,037 females aged 15 to 18 years. Twelve months later a questionnaire was completed by administered to 224 participants. Regular BSE practice was reported by 27 percent of these women, 23 percent of whom stated they had taught the technique of BSE to other women. These results need to be interpreted selectively as only basic descriptive statistics were reported by the authors. A review of the literature was unable to reveal any other study that included BSE education for women only under the age of 20 years, therefore, a comparison was not possible.

#### 2.9.4 Group and One-to-one Education / Instruction

Brailey (1986) examined the effects of group and individual teaching by nurses using a convenience sample of 140 Canadian women. Findings indicated a

significant increase in BSE technique, confidence and frequency with both formats. In a similar study, of 124 female university employees by Golden (1981), women who had individual BSE instruction exhibited a significantly higher rate of compliance with BSE practice.

In a randomised trial in America by Nettles-Carlson, Field, Friedman and Smith (1988) individual and routine instruction were compared. Results of a posttest three months later revealed that both formats were equally effective for increasing confidence in BSE technique and practice. However, previously non-practising women remained significantly less likely to practise monthly BSE.

McLendon, Fulk and Starnes (1982) support the use of individualised BSE instruction. Their experimental study of 189 women concluded that this method of instruction resulted in significantly greater BSE knowledge and accuracy as compared to a control group. Individual instruction for increasing BSE could not be supported in a population based study by Flaherty, Philip, Harris and Joslin (1986). Their findings indicated a higher level of anxiety and a lower standard of practice by the women who had received this form of education, as compared to the women who were educated in small groups. Individual and small group modeling using breast models were studied by Duer (1984) in an effort to determine which format is most effective. This study included a convenience sample of 36 female university employees. Although not statistically significant, the self-reported practice of BSE indicated that small groups were as effective as individual teaching in BSE education. These results indicate that both one-to-one teaching and small group format have been successful for increasing BSE knowledge and practice in various studies.

### 2.9.5 Prompting Strategies

A major reason given by women for not practising BSE regularly is that they forget. In an American study, of 83 female volunteers by Mayer and Frederiksen (1986), two prompting strategies were initiated, following a one hour BSE workshop, to assess their effects on the long term compliance of BSE. These strategies included phone prompting, mail prompting or no external prompting (control group). Both prompting strategies were effective in encouraging initial performance of BSE however, this practice declined over the seven month course of the study. Grady (1984) also noted that women need 'cues' or 'reminders' for maintaining BSE practice. This study included 189 female volunteers, who were randomly assigned to receive either calendars with stickers or monthly reminder postcards, to assess their compliance with BSE practice over a six month period. Both methods were found to be effective in obtaining high rates of BSE in the study period, however the rate of BSE practice declined in the six month post-experimental period indicating the need for ongoing reminders for practice. Monthly prompts were also effective for increasing BSE in a study of 250 female psychology students by Craun and Deffenbacher (1987).

A well designed reward / reminder system was implemented by Grady, Goodenow and Borkin (1988) in a study that included 153 American women. The women were initially involved in a teaching session that included an interview, demonstration of BSE and then a guided rehearsal. Each woman was then randomly assigned to either a (a) stimulus control group that included a calendar with reminder stickers and a monthly postcard, (b) external reward group that received a monthly instant lottery ticket on receipt of their BSE practice record or,

(c) self-reward group who were given a list of suggested rewards i.e. to read a book, after practising BSE. The results of the initial six months indicated that the external reward was most effective, however in the six month post-experimental period all rates of BSE record return decreased especially in the external reward group. These study results suggest that there is a need for prompting mechanisms to be incorporated into all BSE educational programmes.

#### 2.9.6 Mass Education Campaigns

A health education campaign was conducted in Britain to encourage early reporting of breast symptoms. The campaign included posters, pamphlets, meetings, tape-slide projection, television and radio. Findings indicated a trend towards women consulting doctors early, but this was not statistically significant (Nichols, Wheeler, Fraser & Hayes, 1983). Two years following a mass campaign in Finland 70 percent of women reported to be practising regular BSE compared to only five percent prior to the campaign (Gastrin, 1976), and at a four year follow-up, 67 percent of women continued to practise BSE (Gastrin, 1980). No increase in BSE practice was found at twelve months following a campaign in Edinburgh, however an increase in breast cancer knowledge was reported (Roberts et al., 1986). In Australia, a twelve month television campaign was conducted to encourage BSE practice. Following the campaign thirteen percent more women in the general population reported monthly BSE compared to the numbers of women practising BSE prior to this education (Hill, Rassaby & Gray, 1982).

### 2.9.7 Combination of Teaching Strategies

Shamian and Edgar (1987) included several methods of instruction in their Canadian study in an effort to determine the role of nurses as agents for change in teaching BSE to healthy women in the community. Posters, group discussion, film and one-to-one teaching were provided for all women. Posttest findings indicated a significant increase in regular BSE practice and knowledge levels.

BSE was integrated into annual medical examinations for 8,214 Canadian women. BSE evaluation was undertaken at this screen and further at the second and third screens. Monthly BSE increased from 18 percent to 51 percent to 55 percent respectively at these screens. These results lend support to the suggestion that BSE instruction should be included in routine medical examinations (Baines, Wall, Risch, Kuin & Fan, 1986).

### 2.9.8 Limitations of Studies

Methodological limitations can be assigned to the majority of the reported studies in section 2.9 including non-randomised sampling, retrospective designs, small samples, self-reporting of practice and short follow-up intervals. A further suggested limitation was studied by Grady, Kegeles, Lund, Wolk and Farber (1983) who identified the characteristics of women who volunteer for BSE programmes. They suggested that volunteers had more previous experience with BSE, more family history of cancer and stated more confidence in the effectiveness of breast cancer detection and treatment. These results may provide important considerations for the planning of further BSE programmes.

A reduction in breast cancer mortality through the regular practice of BSE is required to conclusively promote the effectiveness of BSE as a secondary preventative measure. Alcoe, Wallace and Beck (1990) examined the results of multiple studies to determine the effectiveness of BSE education. They concluded that "as self-discovery is still the prevalent method of detection, it would seem reasonable to continue to promote the behaviour in women" (p. 448).

Studies reviewed in the foregoing analysis of the literature reveal that previous research has not included all the common methods for teaching BSE in one study. The three teaching strategies included in the present study were chosen because; (a) each strategy incorporates a different method of communication (individual, group and pamphlet), (b) each strategy contains a component that encourages a reminder system, and (c) to provide an evaluation of the three most common methods of BSE education. This provides a rationale for the instructional methods selected for the present study.

#### 2.10 Nurses' Personal and Professional BSE Practice

Considering nurses' personal BSE practice, Cole and Gorman (1984) found that nurses who performed BSE regularly tended to be younger, more highly educated and with less bedside experience of breast cancer. Elkind (1980) however, in a non-randomised study of 785 female hospital nurses, discovered that the greater the nurse's professional experience of cancer the more likely she was to value BSE.

In an attempt to understand the factors which influence why nurses do not teach or practise BSE more significantly, Edgar, Shamian and Patterson (1984)

compared BSE practices of 380 hospital-employed nurses and non-nurses. Their findings showed that the knowledge and confidence of BSE in nurses was significantly higher than the non-nurse group. However, the differences between the two groups in frequency of practise was extremely small, as only 24 percent of nurses and 21 percent of non-nurses practised regularly. It was inferred that as a majority of nurses do not practise BSE regularly, the frequency of their teaching would also be low.

In an earlier study, that included a non-random convenience sample of 49 Western Australian registered nurses, the present author (Agars, 1989) found that only 39 percent practised effective BSE and only 7 percent of these nurses had taught BSE to a client. No significant correlation was found between effective BSE practitioners and the incidence of teaching BSE to clients. In addition, the occurrence of BSE was found to be significantly less in nurses over 40 years of age. A further Western Australian study of 60 registered nurses conducted by Ellis, Slavin and Pinch (1990) revealed that 38 percent practised BSE monthly with 22 percent of these nurses having an effective technique. Of this sample, 16.3 percent stated that they had taught BSE. An Australian study by Bayley et al. (1980) of 47 registered nurses, discovered that 76.6 percent practised BSE and 31.9 percent said that they had taught the procedure, but only 11.1 percent were deemed effective practitioners. Hirst (1986) in a further Australian study found that while only 18.5 percent of nurses employed in oncology, gynaecology and breast cancer wards were effective BSE practitioners, 64 percent of these nurses had taught BSE, a non-significant finding. Findings by Clarke and Sandler (1989) are more encouraging. In their sample of 105 Canadian nurses it was discovered that 41 percent practised monthly BSE and that 40 percent had undertaken BSE teaching to clients.



However, only basic descriptive statistics were used in the studies by Bayley et al. (1980), Clarke and Sandler (1989), and Ellis et al. (1990). Therefore, no correlations of any statistical significance between the incidence of BSE and the teaching of BSE were able to be reported.

A replication of the study by Agars (1989) was undertaken in a Western Australian non-randomised study of 67 student nurses by Lancaster (1990). Of the sample, 90 percent reported that they practised BSE, but only 12 percent of these student nurses were deemed effective in their technique.

These previous studies indicate that although a large number of nurses report BSE practice they are deemed to have an ineffective technique. Effectiveness in personal technique may have serious implications for the teaching of BSE to patients as well as for their own health.

### 2.11 Nurses Role in BSE Education

The importance and need for patient education has increased in recent years and this has subsequently led to an increase in the professional nurse's opportunities to adopt a health teaching role (Caffarella, 1984). Through teaching, it is possible to prevent, promote, maintain or to modify a number of health-related behaviours. It is a common belief that nurses are in the optimal and unique position to perform BSE health teaching as they practise in more settings than other health care workers and constitute the largest group of health professionals (Clark, Kendall & Haverty, 1987; Close, 1987; Crooks & Jones, 1989; Gianella, 1985; Ludwick, 1988; Rowlands, 1987; Williams, 1988; Winslow, 1976). These settings include the hospital, clinic, school, G.P.'s room (Kochanczyk, 1982),

community, industry, extended care department (Boyle et al., 1981), summer camp, family planning clinic, military service, health fair and nursing home (Frank-Stromborg, 1988).

Nurses are not always utilising the opportunity to teach BSE as many assign low priority to patient education (Cohen, 1981; Syred, 1981; Wienzierl, 1983). This may be attributed to lack of time, lack of preparation for the role, and confusion about their formal teaching role (Wienzierl, 1983).

In an attempt to prepare nurses to teach, Kochanczyk (1982) implemented an educational programme consisting of a day long workshop which included a lecture, film, discussion and demonstration of BSE. Participating nurses were then required to role play a BSE teaching session with a surrogate client. A similar workshop was conducted for a quasi-experimental study by Heyman, Tyner, Phipps, Cave and Owen (1991). One month following their workshop, nurses in the experimental group had taught BSE to significantly more patients. This group of nurses also reported greater confidence in their ability to teach BSE. Edgar and Shamian (1987) reported on a BSE programme, conducted by nurses, that was open to the public to attend. Follow-up questionnaires by 223 participants revealed a significant increase in knowledge and monthly BSE practice. Evaluation of further programmes conducted by nurses have shown an improvement of BSE practices, including technique, confidence and knowledge (Champion, 1985; Michalek, Walsh, Burns & Mettlin, 1981; Nettles-Carlson et al., 1988; Shamian & Edgar, 1987; Styrd, 1982). Clarke and Sandler (1989) and Rose (1978) maintain that women instructed in BSE by a nurse display high proficiency in their practice.

Along with the transfer of nurse education into tertiary institutions has come an increased commitment to preventative health care. A part of that commitment involves the importance and credibility of the educative role of nurse practitioners. Hopefully, with both the skills and knowledge, BSE education will become a focal point of nursing care in all health settings.

### 2.12 Chapter Summary

This chapter has identified the need for nurses to learn and to teach BSE, especially as an important method of breast cancer screening for women under the age of 40 who do not yet qualify for screening by mammography. Various BSE strategies have all been shown to be effective for promoting the practice of BSE, especially in the short term following BSE instruction. However, there is no empirical evidence that conclusively identifies one particular teaching strategy as being the most effective for positively influencing BSE behaviour. Reminders have been shown to be successful for retaining BSE practice over longer periods of time. Previous studies have indicated that nurses themselves are not practising BSE effectively and that the frequency of teaching BSE to clients is also low. The literature has indicated that nurses knowledge of BSE does not necessarily mean that they increase their patient BSE education. The rationale of this study is to examine the three common methods of BSE instruction as these methods have not been researched collectively in any previous studies. The chapter to follow provides a conceptual foundation for the study.

## **CHAPTER THREE**

### **THEORETICAL FRAMEWORK**

#### **3.1 Introduction**

This chapter discusses the conceptual basis of the research. The theoretical framework for guiding this study is based on Bandura's (1977) Social Learning Theory (SLT) and on Becker's (1974) Health Belief Model (HBM). The HBM and its key concepts will be discussed followed by an account of previous studies that have employed this model as a theoretical framework. Social Learning Theory is then discussed in terms of its significance for the modeling of BSE behaviour. A comparison of the HBM and SLT is then drawn to highlight the similarities of the two models and to provide a foundation for the study.

#### **3.2 Health Belief Model**

The HBM was formulated by Hochbaum, Leventhal, Kegeles and Rosenstock during the 1950's (Champion, 1984) and modified by Becker and Maiman in 1975 (Hallal, 1982). The Health Belief Model attempts to explain preventative behaviour in terms of the combination and interaction of differing attitudes, values and beliefs. The model suggests that an individual's perceptions are highly influential in his or her decision to undertake preventative and health promoting behaviours. Perceptions are modified by perceived susceptibility, perceived seriousness, perceived benefits, and perceived barriers. These concepts have been specified by Champion (1985) as follows:

i) **perceived susceptibility** : perceived subjective risks of contracting a specific condition within a specified time period;

ii) **perceived seriousness** : perceived degree of personal threat that an individual relates to a specific condition. Threat is defined as perceived harmful consequences of the condition in relation to altering the individual's physical health, role and social status, and ability to complete desired tasks;

iii) **perceived benefit** : a person's belief regarding the effectiveness of a specific new behaviour or alternate behaviour in preventing or detecting disease, maintaining health, and curing or lessening undesirable consequences of a diseased state;

iv) **perceived barriers** : the negative component of an anticipated behaviour which would be undertaken for the purpose of preventing or detecting disease, maintaining health, and curing or lessening undesirable consequences of a diseased state. The negative aspects might involve problems such as monetary consequences, pain, changing habits, inconvenience, embarrassment, side effects, or need for new patterns of behaviour (p. 374).

Modifying variables and cues to action are also said to be necessary for triggering preventative behaviour and include such variables as knowledge, previous history of the disease and media influences.

The HBM has provided a framework for numerous previous studies investigating aspects of BSE (Agars, 1989; Champion, 1985, 1987, 1988; Lauver & Angerame, 1988; Worden, Costanza, Foster, Lang & Tidd, 1983). Since the late 1970's all variables included in the HBM have been studied in relation to the

likelihood of a woman practising BSE. A combination of all these variables were found to be highly significant predictors of BSE behaviour in the studies by Champion (1985, 1988), Hill, Gardner and Rassaby (1985), and Williams (1988). A study by Dickson et al. (1986) employed a random sample of 486 women and reported that health beliefs were correlated with BSE behaviour. Unfortunately, only basic statistics were utilised by Dickson et al. (1986) and the credibility of the results from this study have been questioned (Lauver, 1987).

Studies by Hallal (1982), Kelly (1979) and Massey (1986) all reported significant correlations with frequency of BSE and the variable 'perceived susceptibility'. Calnan, Chamberlain and Moss (1983) found that perceived benefits were significant indicators for BSE practice. The combined concepts of perceived barriers and perceived benefits were found to be significantly correlated with BSE compliance in the study by Rutledge (1987) and these results were later supported in a study by Rutledge and Davis (1988).

Lashley (1987) studied BSE practice among a group of 123 elderly women and found that lower perceived barriers were significantly related to an increase in BSE technique however, the variables of perceived susceptibility and perceived benefits were not significant predictors of BSE practice. Janz and Becker (1984) evaluated 29 studies that had employed the HBM as a theoretical framework and found that the variable of perceived barriers was consistently significant in predicting preventative behaviours.

The HBM also specifies that a cue-to-action or stimulus must occur and "serve as a catalyst for health behaviour" (Davidhizar 1983, p. 469). The concept of cues have not been as thoroughly researched as the other variables of the HBM

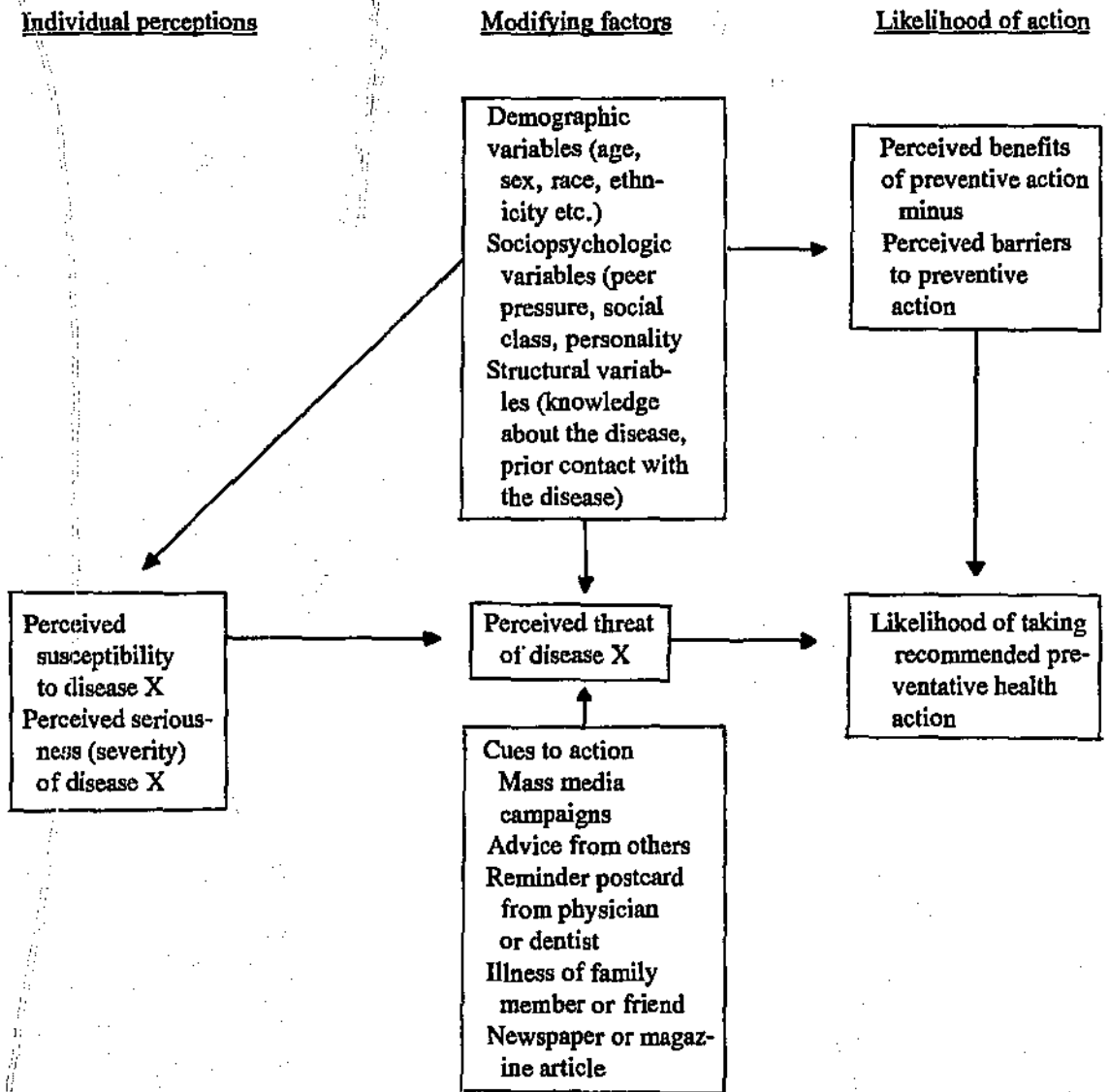
however, in a study by Craun and Deffenbacher (1987), cues-to-action were consistent predictors of BSE practice.

Some studies found that the HBM was not able to provide an explanatory basis for BSE health behaviours (Bennett, Lawrence, Fleischmann, Gifford & Slack, 1983, Calnan & Rutter, 1986; Magarey et al., 1977, Schlueter, 1982; Stillman, 1977). The results of these studies need to be viewed with caution as only basic descriptive statistics were used for data analysis. In support of the HBM as a conceptual framework, Janz and Becker (1984), who conducted a critical review of 29 HBM related investigations published during the period 1974 to 1984, concluded that their "summary results provide substantial empirical support for the HBM" (p. 1).

The HBM has been deemed appropriate as a paradigm for health-protecting or preventative behaviour (Pender, 1987), and for explaining and predicting acceptance of health and medical care recommendations (Janz & Becker, 1984; Rutledge & Kinman, 1986). This model is suitable to explain a nurse's own preventative behaviour of BSE. A diagrammatic explanation of the HBM is illustrated in Figure 3.1.

### 3.3 Social Learning Theory

The purpose of BSE health education is to increase women's breast health awareness and to encourage them to learn and acquire a new behaviour (BSE). In traditional behaviourist psychology an individual's current behaviour is believed to be a result of past conditioning (Berger, 1983). In later years, learning theorists



(Rosenstock in Becker 1974, p. 7)

**Figure 3.1 - The Health Belief Model**



recognised that most human behaviours are learned observationally through the modeling of others (Coleman, Butcher & Carson, 1984).

This view led to social learning theory (SLT), particularly Bandura's (1977) modeling theory which has been widely accepted in the psychology literature (Berger, 1983; Coleman et al., 1984; Perry & Furukawa in Kanfer & Goldstein, 1986; Lieberman, 1990; Thelen, Fry, Fehrenbach & Frautschi, 1979). Bandura's theory (1977) states that;

"observational learning is governed by four component processes; attentional (acquisition and interpretation of behaviour), retentional (ability to remember behaviour), motor reproduction (performance / rehearsal of behaviour) and motivational (reinforcement of behaviour)" (p. 23).

According to social learning theory, modeling of behaviours usually occurs by one human observing another. *Symbolic* models also exist which represent modeling behaviour in the form of films, videotapes, audiotapes, cartoons, and written scripts (Perry & Furukawa in Kanfer & Goldstein, 1986).

Thelen et al. (1979) reviewed 55 studies involving the use of videotape and film as symbolic models. These studies all successfully utilised modeling in the issues of phobias, dental and medical stress, interpersonal skills, and a variety of clinical problems. The age range of subjects in these studies were from pre-school to adulthood, indicating that the effects of symbolic modeling can be favourably adopted throughout the life-span.

A further study using a film for symbolic modeling was undertaken by Melamed and Siegel (1975) and included 60 children who were to undergo elective surgery. On admission to hospital they were shown either a peer modeling film of

a child being hospitalised and receiving surgery, or an unrelated control film. The results indicated a significant reduction in pre-operative and post-operative anxiety in the children who had viewed the peer modeling film.

There are many advantages of symbolic modeling including greater control over events and composition, repeated use, self-administering ability, use with large groups of people, and reduced costs due to less demand on professional time (Perry & Furukawa in Kanfer & Goldstein, 1986; Thelen et al., 1979).

Reinforcement is an important issue in the modeling of behaviours. Bandura (1977) asserts that reinforcement is necessary for the behaviour to continue and may be of three types: external, vicarious or self-reinforcement. Lieberman (1990) believes that people should control their own behaviour rather than rely on reinforcement from external sources. Coleman et al. (1984) also state that "observational learning does not seem to require extrinsic reinforcement" (p. 645). In relation to BSE practices, self-reinforcement should be encouraged as it is a behaviour performed in private. General practitioners and all health care professionals should also encourage BSE practices at every contact with women, providing external reinforcement. The value of physician encouragement as an effective reinforcer for both frequency and practice of BSE was supported in a study of 482 women by Amsel, Grover and Balslem (1985).

Rosenstock, Strecher and Becker (1988) report that Bandura recently relabelled his social learning theory as social cognitive theory (SCT). In terms of Bandura's concepts, behaviour is said to be determined by 'expectancies' and 'incentives'. 'Expectancies' include environmental cues, consequences of one's own actions (outcome expectation) and one's own competence to perform the

behaviour as needed to influence outcomes (self-efficacy). The 'incentive' is the value of a particular outcome with behaviour regulated by its' consequences (reinforcements). Strecher, De Vellis, Becker and Rosenstock (1988) emphasise that the concept of self-efficacy should be considered particularly important if the change of behaviour is difficult to make, but the health practice is believed to lead to desired consequences. By utilising an example by Rosenstock, Strecher and Becker (1988, p. 176) as an outline, Bandura's concepts can be applied to BSE practice as follows:

A woman who values the perceived benefits of practising BSE (incentive) will commence practising BSE if she believes that, (a) her current lifestyle (i.e. family history of breast cancer, age, weight) poses threats to any personally valued outcomes, such as health or appearance (environmental cues), (b) that BSE practice will reduce the threat of breast cancer (outcome expectation), and (c) that she is personally capable of adopting BSE as a new behaviour (efficacy expectations).

#### 3.4 Comparison of the Health Belief Model and the Social Learning Theory

Rosenstock et al. (1988) argue that the HBM is closely related to Bandura's (1977) Social Learning Theory. The similarity of concepts is illustrated in Figure 3.2.

As identified in Figure 3.2, the concept of self-efficacy is not explicitly included in the HBM. Rosenstock et al. (1988) claim that this may be a major reason why results from studies employing the HBM as a framework have not been as significant as anticipated. They also suggest that future research should incorporate the self-efficacy concept to allow for further adaptation of the HBM.

The present study evaluates the concept of self-efficacy by surveying subjects' perceived confidence in their BSE technique. However, this comparison needs to be viewed with caution until more studies examine a possible relationship between the HBM and the SLT.

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### CONCEPTS

<u>Social Learning Theory</u>	<u>Health Belief Model</u>
Expectancies about environmental cues	Perceived susceptibility to and severity of illness or its sequelae (threat)
Expectations about outcomes (Social Cognitive Theory does not explicitly include costs or barriers)	Perceived benefits of taking a particular action minus perceived costs of barriers to action
Expectancies about self-efficacy	(Not explicitly included in Health Belief Model though implied in "perceived barriers")
Incentive	Health motive : value of reduction of perceived threats

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(Rosenstock et al., 1988, p. 177)

### Figure 3.2 - Comparison of the Social Learning Theory and Health Belief Model

#### 3.5 Chapter Summary

The conceptual basis for this research is derived from Bandura's (1977) Social Learning Theory and the Health Belief Model (Becker, 1974). In accordance with the HBM, the likelihood of nurses practising BSE is dictated by their health beliefs. Perceived susceptibility refers to the nurse's belief in her

chance of developing breast cancer. Perceived benefit refers to what the nurse believes she can gain from practising BSE, that is, earlier detection of breast cancer with an improved survival rate. Perceived barriers prevent her from performing BSE. Perceived seriousness is concerned with how threatening breast cancer is to the nurse. Critical review of the HBM has provided support for the use of this model as a framework to determine the influence of the nurses' health beliefs on their practice of BSE. Bandura's (1977) emphasis on modeling as a powerful learning strategy is highly significant to the study design in that it guides the choice of instructional strategies. As mentioned previously, modeling encompasses all three instructional strategies included in the present study (booklet, film and 1:1). Details of the study methods and procedures are discussed in the following chapter.

## CHAPTER FOUR

### METHODS AND PROCEDURES

#### 4.1 Design

The design of this research study was quasi-experimental. It included a knowledge pretest, a posttest and a three month follow-up test administered to a control group and three experimental groups (see Table 4.1). A pretest was administered to each group to gather information on the health beliefs and BSE practice of the nurses. The nurse's health beliefs were then evaluated through the use of section B (only) of the questionnaire at one week following implementation of each intervention. This part of the questionnaire survey was included to reveal any immediate effects of the various instructional methods on nurses' health beliefs. Twelve weeks following the designated interventions the effect of different methods of BSE instruction on BSE practice and health beliefs were evaluated through the nurses' completion of a questionnaire that was identical to the pretest.

#### 4.2 Subjects

In this study nurses employed at the four study hospitals, and who met the selection criteria, were asked to participate ( $N = 402$ ). Study participants were, therefore, a non-random convenience sample. Criteria for sample selection included nurses who were:

1. female
2. at least 18 years of age
3. not presently on annual leave

4. employed for various shifts (day, evening, night)
5. not presently on extended sick leave
6. not presently on workers compensation

**Table 4.1 - Pretest/posttest quasi-experimental design utilised in this study**

Group	Scores of BSE practice and effectiveness	BSE teaching sessions	Score of BSE practice & effectiveness
Group A	Pretest**		Posttest* Follow-up**
Group B	Pretest**	BSE booklet	Posttest* Follow-up**
Group C	Pretest**	Attendance at film & discussion	Posttest* Follow-up**
Group D	Pretest**	1:1 instruction	Posttest* Follow-up**

\* - Section B of the questionnaire only

\*\* - Total questionnaire

Only those nurses who completed both pre-test and follow-up questionnaires and who participated in the interventions, if in the experimental groups, were included in the final analysis. A total of 166 nurses comprised the study sample, and this provided a final overall response rate of 41.3 percent. The number of participants and response rate (percent) for the individual groups were as follows:

Group A - 64 (46.4%); Group B - 40 (34.5%); Group C - 31 (41.9%); and Group D - 31 (41.9%). The participants were aged between 21 and 60 (Mean = 39.4, SD = 8.57).

#### 4.3 Setting

The study was conducted at four Western Australian State Government, community-based, acute care hospitals. The hospitals included medical, surgical, paediatric, maternity and accident and emergency care. The study was conducted for all nursing areas including clinical, staff development and management.

#### 4.4 Ethical considerations

Consent for this study was sought and obtained from the Ethics Committee of the Edith Cowan University and from the Director of Nursing and the Ethics Committee at each study hospital (see Appendix A). Once approval was given each hospital provided a list identifying nurses who met the criteria for selection. Their names were entered into a personal computer and each was allocated an identification number. The lists of names provided from each hospital were then destroyed. Only the researcher had access to the file of names through use of a password. The cover page of each questionnaire informed the subjects of the following: the basic purpose of the study; the fact that confidentiality would be maintained through identity coding; the approximate time to complete the questionnaire; assurance that they would have the right to refuse, the right to withdraw at any time, and that their participation was completely voluntary. The cover page of each questionnaire for each data collection is reproduced in Appendix B. Consent from subjects was implicit in their voluntary placement of questionnaires into the sealed boxes.



Pamphlets were provided for all nurses in Group B and all nurses in the respective groups were invited to attend the sessions in Groups C and D, even if they had not completed the pretest.

#### 4.5 Instrumentation

A self-administered questionnaire was utilised to measure the subjects' health beliefs and practice of BSE at pretest and at follow-up three months later. The questionnaire is reproduced in Appendix C and consists of four sections. The first section deals with the personal practice of BSE. Practice is measured by frequency, its timing in relation to the menstrual cycle, correct palpation and the bodily position when performing BSE. Effective BSE (BSE score = 2) is seen as monthly performance immediately following menstruation in a supine position using the flat parts of the fingers. Partially effective practice (BSE score = 1) is BSE at least every two months and two more of the above factors included in effective BSE (as above). Ineffective BSE (and this also included the nurses who reported no BSE practice) is given a score of 0.

This initial section also includes reasons for practising BSE and how confident the subject is of her practice. The subject is also requested to state any method she utilises for a reminder to perform BSE. These will be considered as modifying variables. This section was adapted from Rutledge and Davis (1988).

The second section of the questionnaire is intended to measure the respondent's health beliefs. Scores for this variable were obtained using a twenty-item measure. Questions one to ten adapted from Champion (1984) are concerned with the variables of 'perceived barriers' and 'perceived seriousness'. The latter ten items utilising Stillman's (1977) HBM instrument include the

variables of 'perceived susceptibility' and 'perceived benefits'. Stillman (1977) only included two of the HBM variables, therefore, to enable the present study to investigate all of the HBM variables both instruments were included. This section consists of a Likert-type scale in which the subjects respond to nineteen statements on an agree-disagree continuum, and to one statement in terms of a comparison with other women. Items 1, 3, 5, 7, and 10 reflect perceived seriousness of breast cancer. The nurses' perceived barriers to practising BSE will be gained from items 2, 4, 6, 8 and 9. Perceived susceptibility to breast cancer from items 12, 14, 16, 18 and 20. Items 11, 13, 15, 17 and 19 are concerned with perceived benefits of BSE in reducing the threat of breast cancer. For items one to nineteen, the lowest belief is allotted a score of one and the highest belief, a score of four. The final item, number twenty, is a three point scale with a response of 'above average' allotted a score of three. A total range of 5 to 19 is possible for perceived susceptibility, and a range of 5 to 20 is possible for perceived benefits, perceived barriers and perceived seriousness. In all instances, a score of 16 or more represents a high degree of belief; score 9 to 15 a moderate belief; and below 9, a low belief. The scores were combined to obtain the nurses' overall health beliefs in relation to breast cancer and BSE.

Further modifying variables including knowledge and cues to action comprise the third section of the questionnaire. The multiple choice format seeks to identify when the subject first became aware of BSE, if their general practitioner examines their breasts and any reasons for non-practise of BSE. Section four examines whether a family or personal history of breast disease is present. A history of breast disease in association with a high health belief score

was expected to provide further support for the chosen theoretical framework as these have been previously considered modifying factors of the HBM.

#### 4.6 Validity and Reliability

BSE health educators employed in an acute general hospital were asked to review the questionnaire to ascertain face and content validity. No changes to the questionnaire were required after this review. A pilot study was undertaken utilising 10 registered nurses from another hospital setting to assess face validity of the questionnaire. The nurses were approached individually following completion of the questionnaire and asked if they had experienced any difficulty interpreting the questions. Four of the ten nurses reported no difficulty and the remaining six identified a grammatical error which was subsequently corrected. Stillmans' (1977) HBM instrument which includes only the variables of 'perceived benefits' and 'perceived susceptibility' was included in this study's questionnaire (see Appendix C, Section B, questions 11 to 20). Stillman's (1977) HBM instrument has been utilised for numerous previous studies (Agars, 1989; Brailey, 1986; Calnan, Chamberlain & Moss, 1983; Calnan & Rutter, 1986; Edgar & Shamian, 1987; Hallal, 1982; Hirst, 1986; Lancaster, 1990; Massey, 1986; Nettles-Carlson et al., 1988; Rutledge & Davis, 1988; Schlueter, 1982; Shamian & Edgar, 1987). Agars (1989) obtained a Cronbach alpha coefficient of 0.87 for Stillman's (1977) instrument with a sample size of 49 nurses whilst Massey (1986) obtained a 0.70 alpha coefficient for the same instrument using a sample of 20 women.

This study also adapted Champion's (1984) instrument to enable the variables of 'perceived seriousness' and 'perceived barriers' to be considered, as Stillman's (1977) instrument does not include these HBM variables. Champion

(1984) conducted research to develop valid and reliable scales to test the HBM. Internal consistency reliability coefficients ( $> 0.7$ ) were obtained for Champion's scales of perceived seriousness, perceived barriers and perceived susceptibility. Perceived benefits only had a coefficient of 0.61, but at a later test-retest this scale was reported to be reliable. All variables were found to be mutually exclusive in Champion's (1984) instrument. Multiple regression analysis revealed that a combination of the HBM concepts is related to the frequency of BSE. As mentioned previously, only Champions' (1984) scales for 'perceived barriers' and 'perceived seriousness' were employed for the present study and, subsequently, only ten items from Champions' (1984) instrument were included in this study's questionnaire (see Appendix C, Section B, questions 1 to 10). Champion (1984) further utilised her instrument in later studies (1985, 1987, 1988). Lashley (1987) used Champion's (1984) questions for perceived susceptibility, perceived benefits and perceived barriers. Internal consistency and test-retest reliability of these variables using alpha coefficients were 0.82, 0.80 and 0.92 respectively. A study of 93 women by Rutledge (1987) utilised Champion's (1984) complete instrument and internal consistency ranged from 0.83 to 0.86.

Considering the present study, test-retest reliability was undertaken using the control groups' results of the pretest and posttest two weeks later for the variables perceived susceptibility, perceived benefits, perceived barriers and perceived seriousness. Statistically significant ( $p < .0001$ ) Pearson correlation coefficients for these variables were 0.59, 0.56, 0.84, and 0.73 respectively. Assessing test-retest reliability, only using the control groups results, for the pretest and follow-up, 15 weeks later, the following statistically significant ( $p < .0001$ ) coefficients were

found for each of the variables; 0.79, 0.67, 0.64, and 0.78 respectively. Overall, a coefficient of 0.77 was obtained for the health belief instrument.

The author was the facilitator for all teaching sessions. Prior to commencement of the study the facilitator employed a principal BSE health educator to ensure the validity of BSE technique. The facilitator demonstrated BSE using the silicone breast model that was later employed for teaching the nurses in Group D.

#### 4.7 Data Collection

In order to minimise the threat of intra-group contamination, the four groups were sought from four different hospitals. Selection of the method of BSE instruction for each hospital was randomly chosen. Each hospital had a different method of BSE instruction. Data was gathered over a five month time period. Pretests were distributed two weeks prior to the delegated BSE instruction for Groups B, C and D. For the control group, where no intervention was implemented, the questionnaires were distributed at the same time as for the other groups. The nurse was required to complete the pretest questionnaire and place it into a box provided, subject to her individual consent for participation. Submission dates were posted around the hospital areas for each data collection period. The three methods of BSE instruction for the study were as follows:

1. Group A - the control group. No intervention was implemented.
2. Group B - subjects were given a Cancer Foundation of W.A. booklet titled "Breast Cancer And You, Some Facts About Breasts, Breast Cancer, Its Early Detection And Treatment". A letter of introduction and instruction was attached

to this booklet (see Appendix D). The booklet with instruction was distributed seven days following collection of the pretest questionnaires.

3. Group C - all nurses working all shifts were invited to attend a session that included a film and discussion. A brief overview including risk factors of breast cancer was initially provided (see Appendix E) followed by a 13 minute film titled "Breast Self-Examination : Taking Care of Yourself" (produced by the Victorian Anti-Cancer Council). Time was allowed for questions and subsequent discussion. The total time of this session was approximately 30 minutes. This session was repeated several times to gain access to all nurses working various shift times. Invitation to these sessions was in the form of posters that were displayed in the nursing stations of the selected hospital (see Appendix F). Nurses working night duty were approached individually in their respective areas and participated in the session when time permitted.

4. Group D - all nurses working all shifts were invited to attend a one-to-one session. Posters explaining the sessions and inviting the nurses to attend were displayed in the relevant wards and nursing areas (see Appendix G). Sessions were conducted in a small seminar room. Nurses working night duty were approached individually in their respective areas and participated in the session when time permitted. The content of this session included a brief discussion of breast structure, hormonal influences, risk factors for breast cancer, and early detection methods (see Appendix H). Actual modeling of BSE was conducted on a silicone breast model that contained various lumps for detection. This teaching tool is used by the Edith Cowan University School of Nursing in their BSE instruction to undergraduate nursing students. Following modeling of BSE each subject was required to give a return demonstration (rehearsal). If the subject was

unable to satisfactorily perform BSE on the breast model, information and modeling was repeated until both the subject and facilitator were confident of the subjects psychomotor skills.

One week following each teaching method Section B (only) of the study questionnaire was distributed to all nurses of each group to assess the nurses' health beliefs at this time. Twelve weeks following the designated intervention, a follow-up complete questionnaire identical to the pretest was administered. For the posttest and follow-up all the study groups were requested to complete the questionnaires and place it into a sealed box provided on their wards.

#### 4.8 Assumptions

In this study it was assumed that nurses would provide an accurate recall of their BSE practice and report this on the questionnaire.

#### 4.9 Limitations

An important possible limitation that needs to be considered is that the nurses involved may feel that a lack of personal BSE practice reflects their own professionalism. They may have responded, therefore, as they felt they should. Actual observed technique of BSE practice was not assessed to maintain privacy. Because an individual's regularity of practise cannot be observed, the study relied on self-reporting.

Methodological limitations include the following:

- i) selection - maturation; the study could not control for the possibility that subjects may have been exposed to prior or additional BSE programmes, or

other factors that may influence their questionnaire completion i.e. personal experience, family factors. No additional BSE education was conducted in any of the hospitals during this study.

ii) sample selection; random sampling was not applied, therefore the results need to be selectively interpreted.

iii) utilisation of a pretest may have served as a reminder for the nurses to practise BSE and influenced the effect of the treatment in the experimental groups, increasing the probability of obtaining confounding results.

After the data collection further limitations were identified and these are addressed in Section 6.3.



## CHAPTER FIVE

### RESULTS

#### 5.1 Introduction

This study measured the differences between four groups to determine which method of BSE instruction was the most effective for promoting change and increasing effectiveness in nurses' personal BSE practice. Each group had a different method of BSE instruction that included: (a) control, no intervention, (b) booklet with instruction, (c) film and group discussion and, (d) one-to-one discussion, modeling and rehearsal. The health belief scores of nurses who practised BSE and nurses who did not practise BSE were also measured to test the chosen theoretical framework as a predictor for BSE practice. To test the two hypotheses, regarding differences between mean scores of BSE effectiveness and health belief scores, analyses of co-variance (ANCOVA), comparing scores at posttest with the pretest as covariate, were used. Descriptive statistics were used to summarise general characteristics of the groups. The statistical analysis was undertaken using SAS package. The level of statistical significance was set at .05 or below.

#### 5.2 Hypothesis 1 - The effect of type of BSE instruction on BSE practice.

It was hypothesised that there would be a significant difference in the effectiveness of BSE practice (technique) between the control and experimental groups at follow-up 12 weeks after BSE instruction.

Of the total sample of 166 nurses, at pretest 143 (86%) indicated that they had practised BSE in the last 6 months. When considering the effectiveness of

their BSE practice, 31 (18%) were deemed fully effective, 36 (22%) partially effective, and 99 (60%) ineffective. At follow-up, regardless of group, 140 (84%) nurses indicated that they had practised BSE in the last 3 months. T-test analysis revealed no increase in the number of nurses who reported commencing BSE practice in any of the study groups,  $t(166) = 1.43, p > .05$ .

The combined mean pretest score (possible range 0 - 2) for BSE effectiveness of the control and experimental groups was 0.57. An analysis of variance did not indicate a significant difference between the four groups at pretest,  $F(3,165) = 1.29, p > .05$ .

Table 5.1 displays the pretest and follow-up mean BSE effectiveness scores of the control and three experimental groups. These results indicate that mean scores of all groups increased at follow-up. As shown in Table 5.1 the mean score of the control group only increased minimally.

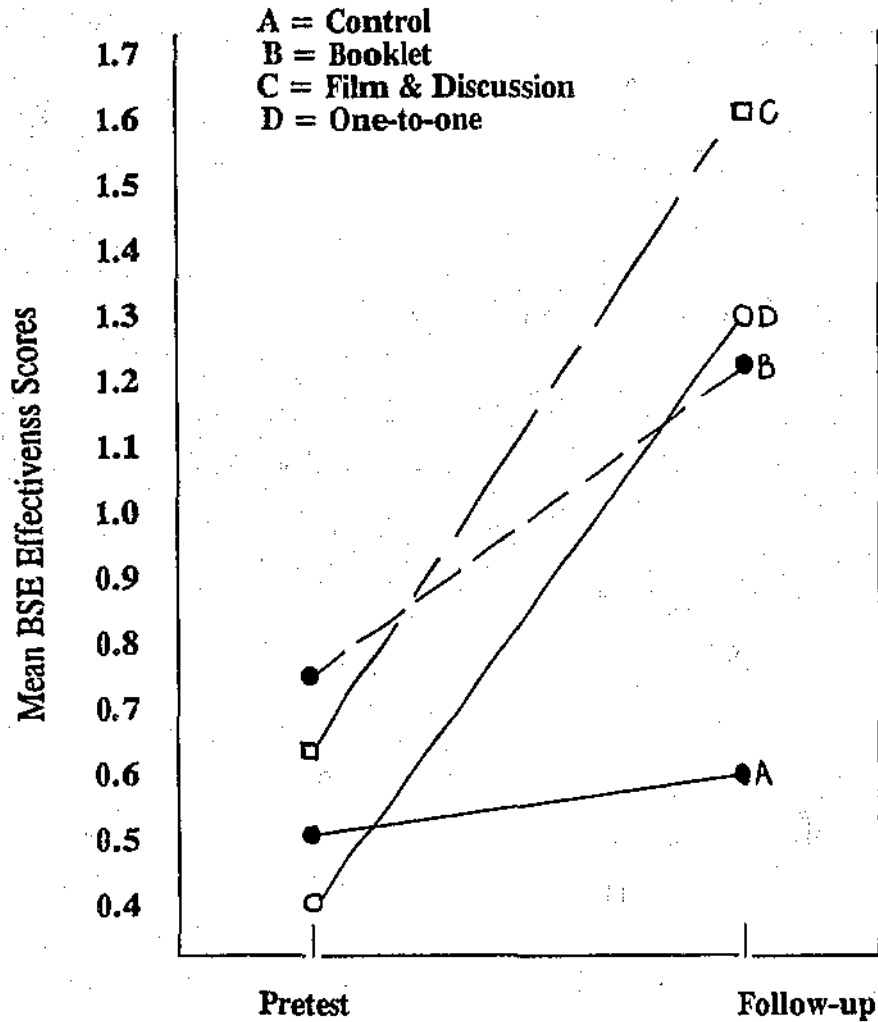
**Table 5.1 - Pretest and Follow-up Mean Scores for BSE Effectiveness**

Group	n	Pretest		Follow-up	
		Mean	SD	Mean	SD
Control	64	0.51	0.75	0.60	0.8
Booklet	40	0.75	0.86	1.22	0.8
Film/discussion	31	0.64	0.79	1.61	0.61
1:1 modeling	31	0.41	0.67	1.29	0.78

As random sampling was not employed for this study, ANCOVA was used to control for group differences at pretest while assessing for a difference in BSE

effectiveness scores at follow-up (i.e. performance on the pretest was the covariate in all the ANCOVA's reported below). Analysis of covariance indicated a significant difference between the four groups,  $F(3,161) = 16.19, p < .0001$ . All possible comparisons between the groups using ANCOVA revealed a significant difference between the control group and the booklet group ( $p < .001$ ); between the control group and film and discussion group ( $p < .0001$ ); and between the control group and one-to-one modeling and rehearsal group ( $p < .0001$ ). This indicated that there was a significant increase in the mean BSE effectiveness scores in the experimental groups compared with the control group, therefore supporting the first hypothesis. A comparison of the experimental groups with each other using ANCOVA revealed no significant difference between the booklet group and one-to-one modeling group ( $p > .05$ ), or between the film and discussion group and the one-to-one modeling group ( $p > .05$ ). A significant difference was found between the group that had participated in a film and discussion and the group that had received the BSE booklet with letter of instruction ( $p < .01$ ). The film and discussion group had a significantly higher mean BSE effectiveness score than the booklet group. Figure 5.1 illustrates the pretest and follow-up mean BSE effectiveness scores.

In summary the number of nurses practising BSE did not increase at follow-up. However the nurses in the experimental groups were all practising BSE more effectively than the control group 12 weeks after BSE instruction. The subjects in the film and discussion group were practising BSE more effectively than subjects in the booklet group.



**Figure 5.1 - Group BSE Effectiveness Mean Scores - Pretest and Follow-up**

### 5.3 Hypothesis 2 - Health Belief Scores and BSE

#### 5.3.1 The incidence of BSE practice and level of health beliefs

It was hypothesised that the health belief scores (HBS) which measure perceived susceptibility, perceived benefits, perceived barriers and perceived

seriousness, would be higher for nurses who practised BSE than for nurses who did not practise BSE.

At pretest the range of HBS was 49 to 75 for BSE practitioners ( $n = 143$ ,  $M = 62.75$ ,  $SD = 5.33$ ) and 47 to 70 for non-practitioners ( $n = 23$ ,  $M = 60.73$ ,  $SD = 6.6$ ). Analysis by t-test revealed that the difference of HBS between the two groups was not significant ( $t[164] = 1.62$ ,  $p > .05$ ). At follow-up 12 weeks after BSE instruction the HBS's were 50 to 75 ( $n = 140$ ,  $M = 62.75$ ,  $SD = 5.15$ ) for BSE practitioners and 48 to 68 ( $n = 26$ ,  $M = 57.42$ ,  $SD = 5.33$ ) for non-practitioners of BSE. As hypothesised, the HBS of the nurses who practised BSE were significantly greater than the nurses who did not practise BSE,  $t(164) = 4.82$ ,  $p < .0001$ , but only at follow-up. As previously indicated in the 'Effectiveness of BSE Practice' analysis (5.1), there was no increase in BSE practice in any of the experimental groups, as the nurses who reported practising BSE at pretest also did so at follow-up. Examination of the mean HBS's pretest and follow-up indicate that the practitioners' scores remained stable and the non-practitioners decreased at follow-up.

Further analysis was undertaken to determine if a particular concept of the Health Belief Model: perceived susceptibility, perceived benefits, perceived barriers or perceived seriousness, had an influence on the practice of BSE at pretest. Table 5.2 displays the pretest mean health belief scores, divided into the individual HBM variables, for BSE practitioners and BSE non-practitioners. As shown in Table 5.2 the BSE practitioners had a higher mean score for all variables except perceived seriousness. Evaluating these differences further, T-test analysis of each variable of the Health Belief Model between BSE practitioners' and non-practitioners' demonstrated that only perceived barriers by practitioners'

significantly influenced BSE practice at pretest,  $t(164) = 3.55, p < .001$ . The effects for perceived susceptibility  $t(164) = 0.8, p > .05$ , perceived benefits  $t(164) = 1.4, p > .05$ , and perceived seriousness  $t(164) = 1.01, p > .05$ . between BSE practitioners' and non-practitioners' were not significant.

**Table 5.2 - Pretest Mean Health Belief Scores for BSE Practitioners and Non-Practitioners**

Health Beliefs	BSE Practitioners			BSE Non-practitioners		
	n	Mean	SD	n	Mean	SD
Barriers	143	18.2	1.8	23	16.7	2.2
Susceptibility	143	14.9	2.3	23	14.4	2.5
Benefits	143	17.3	2.0	23	16.6	2.2
Seriousness	143	12.4	2.6	23	12.9	2.8

### 5.3.2 The effect of type of BSE instruction on nurses' health beliefs

The effect of the various BSE teaching strategies was also assessed to determine if one method of instruction significantly influenced nurses' health beliefs. At posttest, one week following the interventions, the health beliefs (only) were measured. Utilising the pretest health belief scores as the covariate, ANCOVA did not indicate a significant difference between the four groups  $F(3,122) = 2.51, p > .05$ . At follow-up ANCOVA again indicated no significant difference between the four groups,  $F(3,161) = 1.79, p > .05$ .

### 5.3.3 The effect of type of BSE instruction on individual Health Belief Model variables

The effects of the various BSE teaching strategies were also assessed to determine if one method of instruction significantly influenced a particular variable of the Health Belief Model. Table 5.3 displays the mean scores for each of the HBM variables divided into the study groups.

**Table 5.3 - Follow-up Mean Scores for Health Belief Model Variables**

Health Beliefs	Control n=64		Booklet n=40		Film/ discussion n=31		1:1 modeling n=31	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Barriers	17.4	2.4	17.4	2.2	18.6	1.4	17.9	2.1
Susceptibility	14.4	2.4	15.2	1.9	15.1	2.2	15.1	1.9
Benefits	16.9	2.4	17.3	2.1	17.6	1.9	17.5	2.1
Seriousness	12.3	2.7	11.9	2.4	11.7	2.3	12.2	2.3

As shown in Table 5.3 the scores do not display a large difference between groups, therefore, analysis of covariance was employed to compare the individual health belief variable scores at posttest using the pretest scores as the covariate. The first variable to be assessed was perceived susceptibility which is the nurse's belief that she is at risk of developing breast cancer. An analysis of covariance for perceived susceptibility at follow-up indicated a significant difference between the four groups,  $F(3,161) = 3.22, p < .05$ . All possible comparisons between the control group and the experimental groups using ANCOVA revealed a significant difference between the control group and the booklet group ( $p < .01$ ), and

between the control group and the one-to-one modeling group ( $p < .05$ ). No significant difference was found between the control group and the film and discussion group ( $p > .05$ ).

Perceived benefits measure how valuable the practice of BSE is to the nurse. At follow-up ANCOVA revealed no significant difference for perceived benefits between the four groups,  $F(3,161) = 1.39, p > .05$ . The third variable to be assessed was perceived seriousness which measures the nurses belief of the severity for developing breast cancer. No significant difference was found using ANCOVA between the four groups,  $F(3,161) = 1.08, p > .05$ . Perceived barriers, the final variable to be assessed indicated no significant difference at follow-up,  $F(3,161) = 1.39, p > .05$ .

A summary of findings related to health belief scores indicates that: (a) the health belief scores of nurses who practised BSE were significantly greater than the nurses who did not practise BSE, but only at follow-up, (b) at pretest the only significant predictor for BSE practice was perceived barriers, (c) there were no significant differences between the effects of the interventions on the nurses' health beliefs, and (d) only the variable - perceived susceptibility - of the Health Belief Model indicated a significant difference at follow-up. Perceived susceptibility, which measures the nurses' belief of the likelihood of their developing breast cancer, was significantly higher in the booklet group and the one-to-one modeling group as compared to the control group.

#### 5.4 Cues for BSE Practice

Included in the Health Belief Model are cues to action, which include reminders to practise. The study questionnaire asked the nurses whether they had



any method of reminding themselves to perform breast self-examination. Of the total number of nurses 29 (20%) indicated a method for reminding themselves to practise BSE. These nurses had a mean BSE effectiveness score of 1.17 (SD = 0.88) compared to a mean score of 0.54 (SD = 0.73) for the 112 (79%) nurses who reported no reminder to practice. Analysis by t-test found that nurses who had a reminder to practise BSE were significantly more likely to practise BSE effectively ( $t[139] = 3.92, p < .0001$ ). These results may indicate support for the use of a reminder for effective BSE.

A further cue to action is the role of the general practitioner (G.P.) in asking and reminding women to practise monthly BSE. The questionnaire included a question concerning whether the nurses' G.P.s asked them if they practised monthly BSE. A total of 96 (58.5%) nurses answered that their G.P. did ask them this question. The relationship between the nurse's G.P. asking about BSE practice and the effectiveness of the nurse's personal BSE practice did not prove significant using chi-square analysis  $\chi^2(2, N = 164) = 2.45, p > .05$ .

A further important role of the G.P. is regular physical breast examinations. The questionnaire requested that the nurse indicate how often her G.P. performs these examinations. Of the 164 nurses who responded to this question, 85 (52%) reported never, 57 (35%) sometimes, 11 (6.5%) most of the time, and 11 (6.5%) always. Analysis by chi-square indicated a significant relationship between the incidence of breast examination by the G.P. and effectiveness of the nurses BSE practice  $\chi^2(6, N = 164) = 13.456, p < .05$ . This result may indicate that the nurses are learning the technique of BSE by observing their G.P. performing their breast examination. However, the relationship between the breast examinations by the

G.P. and incidence of BSE practice was not significant

$$\chi^2 (3, N = 164) = 1.38, p > .05.$$

### 5.5 Confidence and Effectiveness of BSE

According to the Social Learning Theory if a woman feels capable and confident to practise BSE she is more likely to adopt the desired behaviour. A correlation analysis was performed on the respondents' answers concerning their self-perceived confidence in BSE practice and the effectiveness of their BSE practice. Contrary to the prediction, the pretest results revealed that nurses who answered that they were confident in their practise of BSE displayed a weak negative correlation for BSE effectiveness ( $r = -.21, p < .01$ ). At follow-up 12 weeks after BSE instruction the nurses who still reported confidence in their practice continued to have an ineffective BSE practice ( $r = -.26, p < .001$ ).

### 5.6 Age and BSE Practice

The age range of the total sample ( $N = 166$ ) was 21 to 60 ( $M = 39.4, SD = 8.57$ ). The nurses who indicated that they practised BSE had an age range of 21 to 60 ( $M = 39.95, SD = 8.67$ ) and the nurses who did not practise BSE had an age range of 23 to 48 ( $M = 36, SD = 7.15$ ). Analysis by t-test indicated a significantly higher incidence of BSE practice in the older nurses,  $t(161) = 2.06, p < .05$ . A major risk factor for developing breast cancer is that the risk increases as age increases, especially over the age of 40 years. However, the age of the nurses did not indicate a noteworthy association with perceived susceptibility using Pearson's correlation coefficient ( $r = -.09; p > .05$ ).

### 5.7 History of Breast Disease and BSE Practice

The modifying factors of the Health Belief Model maintain that the presence of a family or personal history of breast disease increases the perceived threat of that disease. This threat then directly influences the likelihood of a woman taking the recommended preventative action of BSE. Thirty-six (22%) of the sample indicated a family history of breast disease and of these nurses, 33 (92%) practised BSE. Of the nurses who indicated no family history of breast disease ( $n = 128$ ), 108 (84%) reported practising BSE. The relationship between the presence of a family history and BSE practice did not prove significant using chi-square analysis  $\chi^2(1, N = 166) = 1.23, p > .05$ .

Individual history of breast disease was also examined. Fifty-four (33%) of the nurses indicated a personal history of breast disease and 49 (91%) of these nurses practised BSE. No personal history of breast disease was reported by 112 (67%) nurses in the study and 94 (84%) of these nurses reported BSE practice. The relationship between the presence of a personal history of breast disease and BSE practice also did not prove significant using chi-square analysis  $\chi^2(1, N = 166) = 1.41, p > .23$ .

### 5.8 BSE and Nursing Designation

Of the total sample there were 57 (34%) registered midwives, 72 (44%) registered nurses, and 36 (22%) enrolled nurses. (One respondent did not indicate her nursing designation). No significant relationship between nursing designation and BSE practice was obtained using chi-square analysis,  $\chi^2(2, N = 165) = 0.34, p > .84$ . A further evaluation was undertaken to determine whether a nurses designation displayed any influence on their health beliefs.

Analysis of variance (ANOVA) indicated no significant relationship,  $F(2,162) = 0.76, p > .47$ .

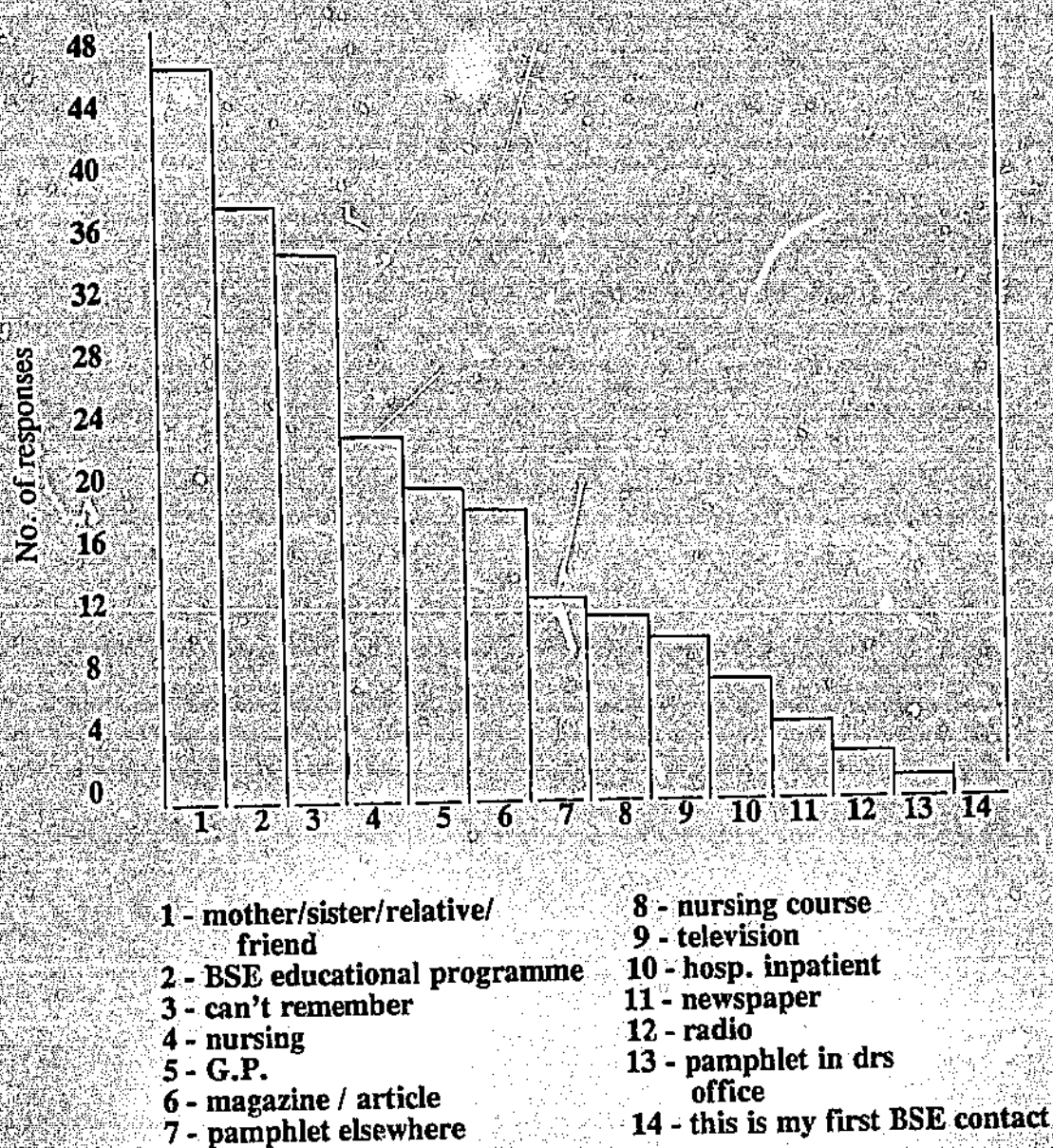
### 5.9 First Awareness of BSE

The nurses were asked to indicate where they had first become aware of BSE, with a total of 14 responses available for choice.

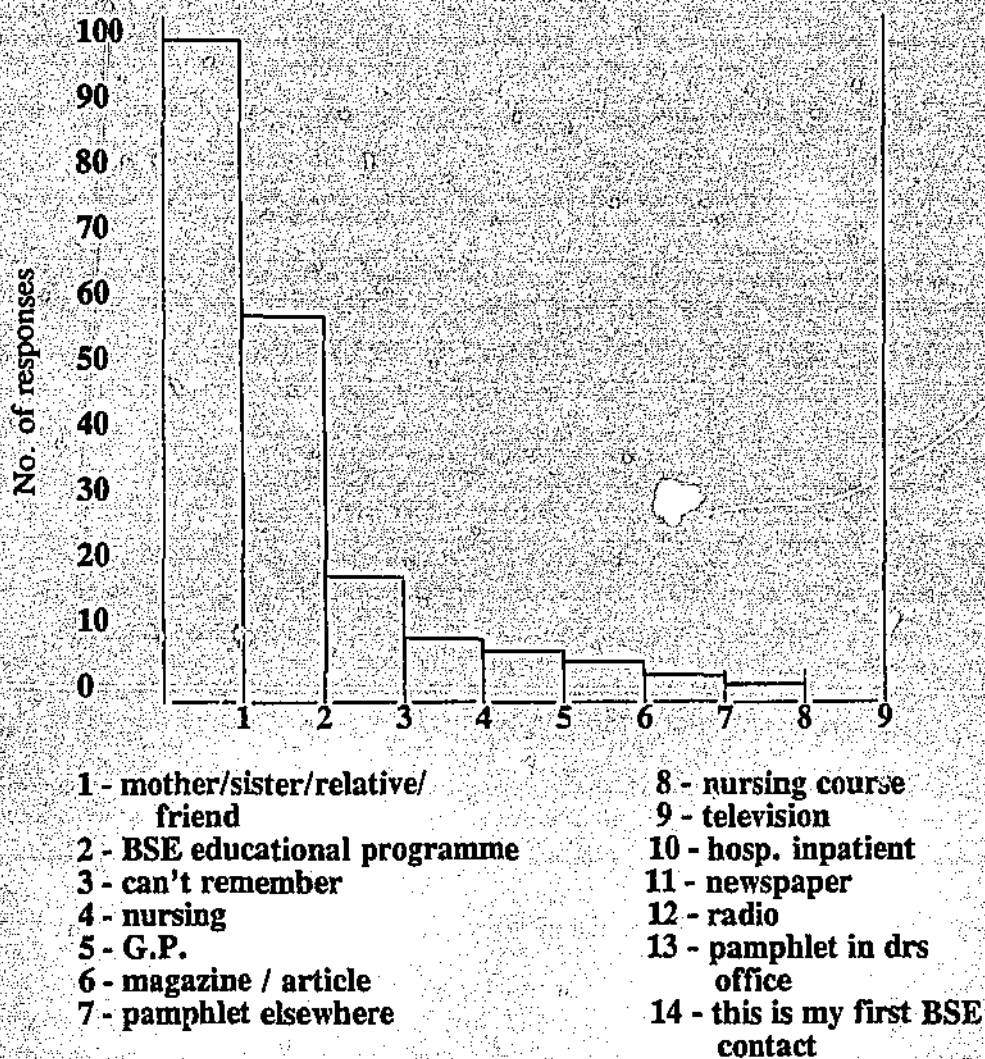
Mother/sister/relative/friend was the most popular response, 46 (28%). The next most frequent response was a BSE educational programme, 37 (22%). Figure 5.2 displays the frequency of all the responses for the nurses' first awareness of BSE.

### 5.10 Reasons for Non-Practice of BSE

A question regarding reasons for non-practice of BSE was included in the questionnaire. Nine responses were available for choice. A total of 97 nurses (59%) selected the response of 'not applicable - I practise BSE monthly'. 'I forget' was the second most frequent response ( $n = 53, 32\%$ ). Figure 5.3 displays the frequency of responses to reasons for non-practice of BSE. It is evident from the graph that the two main reasons for non-practice of BSE were 'forgetting' and 'not taking the time'.



**Figure 5.2 - First Awareness of Breast Self-Examination**



**Figure 5.3 - Reasons for Non-practise of BSE**

The following chapter summarises the major findings and their comparison to other studies. Implications for nursing practice and recommendations for future research conclude the chapter.

## CHAPTER SIX

### DISCUSSION

#### 6.1 Summary of Study

The aim of this study was to assess the effects of three alternative methods of BSE instruction on nurses' BSE practice. The Health Belief Model and Social Learning Theory were utilised as the theoretical framework. A sample of 166 nurses included 64 from Group A, 40 from Group B, and 31 each from Groups C and D. In summary, the findings suggest that each method of BSE instruction significantly increased the nurses' mean BSE effectiveness (technique) scores ( $p < .0001$ ), therefore, supporting the first hypothesis. However, the group of nurses involved in the film and discussion group displayed the greatest improvement in BSE technique. At follow-up, the health belief scores of nurses who practised BSE were significantly higher than the health belief scores of nurses who did not practise BSE ( $p < .0001$ ), supporting Hypothesis 2 and lending support to the usefulness of the theoretical framework. No particular teaching strategy was found to have a significant effect on the nurses' health beliefs. The Health Belief Model variable of perceived barriers was a significant predictor of BSE practice ( $p < .001$ ) at pretest, but at follow-up only the variable of perceived susceptibility was significantly different in the booklet and one-to-one modeling group as compared to the control group ( $p < .05$ ). The incidence of BSE practice was found to be significantly higher in the older nurses ( $p < .05$ ), although nursing designation was found to have no significant effect on the practise of BSE or health beliefs. No statistically positive relationships were found to exist between family or personal history of breast disease and BSE practice. Using a reminder

strategy to practise BSE was significantly associated with effective BSE technique ( $p < .0001$ ). The nurses who reported confidence in their BSE practice actually displayed a significant weak negative correlation between confidence and BSE proficiency at pretest ( $p < .01$ ) and at follow-up ( $p < .001$ ).

## 6.2 Major Findings

### 6.2.1 BSE Practice

Results at pretest indicated that 86% of the nurses reported practising BSE in the last 6 months, but only 18% of these nurses were deemed competent in this routine, that is, practised an effective technique. These results are consistent with the findings of other investigations concerning nurses' personal BSE practice (Agars, 1989; Bayley et al., 1980; Ellis, Slavin & Pinch, 1990; Heyman et al., 1991; Hirst, 1986; Lancaster, 1990). In a recent study by Heyman et al. (1991) it was found that 26% of the nurses in their sample used effective techniques although 99% of the nurses felt capable of performing BSE. The results of an earlier study by the present author (Agars, 1989) were more favourable as 39% of the nurses were deemed to practice BSE using an effective technique.

The nurses who reported BSE practice at pretest (86%) also reported practising BSE at follow-up, with the exception of three nurses in the control group (84%). Therefore even after instruction, the non-practitioners could not be influenced to practise BSE even once. It is not possible to compare this research with previous studies on nurses' BSE practice as no reports are available of teaching programmes which have attempted to change nurses' BSE practice.



BSE practice was found to be significantly higher in older nurses. This result is pleasing as increasing age, especially over the age of 40 years, is a major risk factor for the development of breast cancer. This result is congruent with findings by Clarke and Sandler (1989). In their study all the nurses over 40 years of age said they practised BSE. Edgar et al. (1984) reported that younger nurses were more likely to practise BSE, but this finding may need to be interpreted selectively as "more than half of their sample was aged between 20 and 30 years" (p. 258). Additionally, mean ages for BSE practitioners and non-practitioners were not reported by Edgar et al. (1984).

#### 6.2.2 The influence of teaching strategies on BSE practice

The results of this study demonstrated that all three teaching strategies produced a significant improvement in BSE technique in comparison to the control group. However, the nurses involved in the film and discussion group demonstrated the most significant increase in effectiveness of BSE technique. This type of learning may, therefore, be most acceptable to the nurses. Such a learning environment may have been more readily acceptable to the nurses in that they attended the film and discussion session in groups. This seemed to be the preferred option for at least some of the nurses, as several requests were made by the nurses involved in the one-to-one modeling group to attend the session in pairs or small groups.

It is difficult to compare this study with previous research as the review of literature revealed that previous research had not included a comparison of all three teaching methods used in this study. The effectiveness of the film and discussion in improving BSE technique was unexpected, particularly as an

extensive analysis of BSE studies by Nettles-Carlson and Smith (1988) reported considerable support for one-to-one teaching as the ideal method for the effective learning of BSE.

Significant support for using a film and discussion for effective BSE practice was established in a population-based programme in the United Kingdom (Flaherty et al., 1986). This study compared individualised teaching with a film and discussion group and found women in the latter group had a higher standard of practise and lower anxiety in a postal survey six months following education. A follow-up of this study was reported by Dowle et al. (1987). Comparison with a control population found a significant reduction in size of breast tumours at presentation. No survival difference between the experimental groups and the control group has yet been observed.

A further major national study in England included 14,905 women who attended a BSE teaching programme that was comprised of a film and discussion (Holliday et al., 1983). Their findings were concerned with breast cancers detected and not BSE technique. However, this study supports this form of instruction as 11 of the 13 cancers detected in the study group were detected as a the direct result of deliberate BSE. This indicates that this learning strategy is effective for improving BSE technique and, therefore, enabling the woman to detect any breast tumours herself. Further follow-up of the major studies in England may provide further support for this implication.

### 6.2.3 Health beliefs

The mean health belief scores for BSE practitioners and non-practitioners were only significantly different at follow-up. However, the mean health belief

scores of the nurses who practised BSE remained the same at pretest and at follow-up. This significant difference was found to be the result of the non-practitioners mean health belief scores decreasing at follow-up. However, these results of practitioners health beliefs remaining significantly higher still suggest that nurses' health beliefs do predict BSE behaviour as, in accordance with the HBM, the likelihood of practise is correlated with higher levels of health beliefs. Therefore, it was indicated that even following the interventions the beliefs remained stable for the nurses who practised BSE and decreased even further for those nurses who did not practise BSE. This result is surprising as all the teaching interventions emphasised the mortality and prevalence of breast cancer, therefore possibly increasing the nurses' perceived seriousness and perceived susceptibility to breast cancer. The interventions also highlighted the importance of early detection (a perceived benefit), and the interventions also promoted the use of a reminder for practise, attempting to reduce a common perceived barrier. A possible explanation to account for this finding may be that the nurses practising BSE already perceive this health promoting behaviour as valuable and, therefore, their beliefs remain stable.

#### 6.2.4 The influence of various health belief model variables

For the present study the variable of perceived barriers (embarrassment, time consumption) was a significant predictor for BSE practice ( $p < .001$ ) at pretest. This finding supports several other studies that identified perceived barriers as accounting for the greatest amount of variance for BSE practice (Champion, 1985, 1987; Hill, Gardner & Rassaby, 1985; Lashley, 1987; Rutledge, 1987; Strauss, Solomon, Costanza, Worden & Foster, 1987). A critical review of all studies that utilised the HBM 1974 to 1984 was undertaken by Janz and Becker

(1984). It was identified that the most significant variable in all of the studies in accounting for preventative behaviours was the presence of perceived barriers.

At follow-up the individual HBM variables were compared with the teaching strategies. Only perceived susceptibility, and only for the booklet group and the one-to-one modeling group, was found to be significantly different in comparison to the control group. Studies by Schlueter (1982) and Rutledge and Davis (1988) supported perceived susceptibility for predicting BSE behaviour. Champion (1984, 1985, 1987, 1988), who has identified herself as a leader in analysing the usefulness of the HBM for the prediction of BSE practice, maintains that perceived susceptibility is consistently predictive for the routine of BSE.

#### 6.2.5 The usefulness of a reminder for BSE practise

The results of this study indicated that having a reminder to practise was significantly associated with an effective BSE technique, which includes practising every month. Even though the nurses were asked to state what their method for reminding was, only 8 of the 29 nurses who reported a reminder completed this question. All responded that their menstrual period was their reminder. This form of reminder is obviously appropriate as menstruation normally occurs approximately once a month. This has further implications for the nurses who are post-menopausal and cannot have this method for reminding themselves to practise, however this was not determined in the present study.

Previous studies significantly support the use of some type of prompting strategy for compliance with monthly BSE (Grady, Goodenow & Borkin, 1988). Successful strategies have included telephone prompts (Mayer & Frederiksen, 1986), self-managed use of calendars with reminder stickers (Grady, 1984), and

monthly postcards (Craun & Deffenbacher, 1987). Rutledge and Davis (1988) reported that a reminder method was the most significant predictor of compliance with BSE practice. This finding is especially relevant when considering the greatest reason reported for non-practise of BSE in the present study was forgetfulness, also established by Craun and Deffenbacher (1987), Heyman et al. (1991) and Nettles-Carlson et al. (1988).

#### 6.2.6 Perceived confidence and BSE practice

The results at pretest and follow-up indicated a significant negative correlation between effective BSE technique and confidence. Although the nurses were confident in their BSE practice they were not always practising effectively. The variable of confidence is included in the self-efficacy concept of the Social Learning Theory. According to this theory, if a woman is confident that she is capable of BSE she is more likely to adopt this practice. Clarke and Sandler (1989) support the concept of confidence in relation to BSE practice. Their study reported that the most frequent reason for not practising BSE was lack of confidence in technique.

The false confidence observed in the present study was also found by Norman and Tudiver (1986) and Celentano and Holtzman (1983). However, findings from the majority of studies support perceived confidence for practising effective BSE (Amsel, Grover & Balshem, 1985; Craun & Deffenbacher, 1987; Michalek et al., 1984; Rutledge & Davis, 1988; Young & Marty, 1985).

In comparison to the majority of previous research this study's results are surprising. The negative correlation between perceived confidence and effective BSE technique may have been due to a lack of knowledge on the part of the nurse.

A nurse may think she is performing BSE correctly yet be unaware that her technique is ineffective. A further explanation for this finding is that the nurses may have been portraying a false confidence in their technique related to having never questioned its effectiveness. These results unfortunately persisted at follow-up even after nurses were instructed through the various teaching strategies of the correct technique of BSE, however the negative correlation was weak (-.21 to -.26). It is difficult to actually determine why this result occurred.

#### 6.2.7 The role of the general practitioner in BSE education

The role of the general practitioner (G.P.) in promoting BSE was found to be as important as the nurse's role because the results of studies have indicated that women seek BSE knowledge from either their G.P. or a nurse (Amsel et al., 1985; Baines, 1984; Hirst, 1986). The only significant relationship found in the present study was between a G.P. performing a breast examination and the nurses having an effective personal BSE technique. It could possibly be assumed that the nurses learnt the technique of BSE through direct observation of their G.P. performing their breast examination. However, the use of BSE and G.P. breast examinations were not significantly related. This may indicate that the nurses not practising BSE themselves may rely on their G.P. to maintain their breast health or possibly they just cannot be influenced to practise BSE for whatever reason. As found in this study no teaching strategy had any effect on influencing the non-practitioners to commence BSE.

Unlike the present study Rutledge and Davis (1988) found that a woman's increased compliance with BSE practice was significantly associated with her doctor asking if she practised BSE monthly. Amsel et al. (1985) focused on the

function of physician reinforcement on the frequency of BSE. Results supported the physician as having a key role in the promotion and retention of BSE practice.

### 6.3 Limitations

Further limitations to those identified in Chapter Four are noteworthy as follows:

1. The relatively short time period of 3 months from the teaching interventions to the follow-up questionnaire may not be a true indication of whether the nurses will continue with an effective BSE practice.
2. The study relied on self-reporting of BSE practice. Judging competence of a psychomotor skill through use of a questionnaire may not be reliable. However, an important component of effective BSE is the regularity of practice which is unable to be observed.
3. The response rate of 41.3% was disappointing. As in any study, the characteristics of the nurses who participated may not be representative of all nurses invited to attend. Those who did participate may have been more highly motivated to learn, or more health-oriented, however, the study did not include a mechanism for ascertaining this. Attempts to increase compliance rates were made through the delivery of individual invitations to the nurses who were involved in the film and discussion and the modeling group. Displaying numerous posters in all areas of the hospitals was also designed to attract participation. A variety of reasons could have influenced the nurses attendance at the teaching sessions. For example, there may have been staff shortages in the ward area or a workload that did not allow time for attendance at the sessions. The participants'

reasons for attending were not determined, however a study by Grady et al. (1983) evaluated the characteristics of women who volunteered for a BSE programme. Their findings concluded that "participants differed from refusers most notably in terms of less experience with BSE" (p. 79). For the present study the final overall number of 166 participants was deemed adequate for statistical analysis.

#### 6.4 Conclusions

The results from this study support the proposal that increasing the nurse's knowledge of breast cancer and BSE through teaching programmes, most notably a film and discussion, has a beneficial effect in increasing the proficiency of BSE practice. This is the first known study that has evaluated the influence of various teaching strategies on nurses' practice of BSE. The findings of this study have implications for nursing practice and for future research.

#### 6.5 Implications for Nursing Practice

The findings of this study indicate that the nurses in the experimental groups were receptive to learning the correct technique of BSE. The most significant improvement in BSE proficiency was found by the nurses who had attended a film and discussion. Based on these results it would be beneficial for all nurses to participate in a film and discussion session that highlighted the technique, benefits and purpose of BSE. This would be especially worthwhile for nurses who report practising BSE as the present study, and other studies concerning nurses' BSE practice, has found that a majority of their BSE practice is ineffective. The film and discussion session should also emphasise that at present the only means of reducing mortality and morbidity due to breast cancer is through early detection methods such as BSE.



Nurses need to become competent BSE practitioners to maintain their own personal breast health and to teach proficient BSE to female clients. The successful use of a film and discussion in this study has implications for wider use because if nurses can be successfully influenced to practise effective BSE this may indicate that lay women's BSE practice can also be modified successfully. For example: (a) the use of a film and discussion to encourage BSE practice may be ideal in the community where women could be invited to attend such sessions and (b) hospital inpatients could be informed of the availability of an 'in-house' BSE video through the use of bedside televisions for women who prefer passive learning or if lack of time for instruction remains a problem.

As highlighted, film and discussion was the most effective teaching strategy. However, if this type of learning is inappropriate or unavailable, evidence from this study suggests that one-to-one modeling or a booklet may also be valuable for improving the technique of BSE. Booklets may also be of assistance in providing information to women in remote country areas where lack of viewing facilities may be a problem.

Educational programmes should encourage family and friends to discuss BSE as this was supported in the present study and also by Gravell, Zapka and Mamon (1985) for the promotion and practice of BSE. Considering the significant influence of perceived barriers and perceived susceptibility in the present and previous studies, future educational programmes could incorporate specific actions that women might take to minimise barriers and to continue the emphasis on perceived susceptibility to breast cancer. For example, BSE educational programmes could include the risk factors of breast cancer to increase women's'

perceived susceptibility and promote that BSE is simple to perform and is not time consuming, therefore, addressing common perceived barriers to BSE practice.

The positive association observed between the use of a reminder and effective BSE practice should be considered in planning future programmes. To maintain BSE practice over time, monthly reminders could be sent or women could be encouraged to use a calendar that could be marked to identify a 'BSE Day' every month. Additionally, G.P.s should incorporate BSE reinforcement in their routine practice. Nurses should also encourage women to request breast examinations from their G.P. as in this study the incidence of breast examination by the G.P. was significantly associated with effective BSE practice, a finding also supported by Norman and Tudiver (1986).

As the purpose of BSE is for the early detection of breast cancer, the increase of women practising effective BSE may ultimately result in the decline of mortality rates from this disease. Widespread practice of BSE has not yet been achieved. Therefore, this effect has yet to be realised.

#### 6.6 Recommendations for Further Research

Based on the findings of this study it is recommended that future research be directed toward the following areas:

1. As this was the first study to evaluate the three common methods of BSE instruction collectively, this research should be replicated in an effort to provide further support for the findings.
2. A longer interval follow-up after intervention would be useful to determine which method of BSE instruction sustains practice over time.

3. In future, it could be investigated whether lay women can also be encouraged to practise effective BSE through a film and discussion session.
4. The value of self-reporting of BSE practice has been frequently challenged, as judging competence of a psychomotor skill by use of a questionnaire may not be reliable. Research which evaluates BSE through direct observation and then compares the results with self-reporting may establish the validity of self-reports.
5. Numerous studies have utilised the Health Belief Model as a conceptual framework. The modifying variable of cues to action, which includes the use of a reminder, needs to be investigated further to determine its influence on encouraging women to practise BSE.
6. The HBM variable of perceived barriers was found to be a significant predictor for the use of BSE, supporting the results of previous studies. Considering this, the effects of various teaching methods on lowering specific barriers to BSE compliance needs to be undertaken.
7. Bandura's (1977) emphasis on modeling is a powerful learning strategy and was highly significant to this study's design. Further use of the Social Learning (Cognitive) Theory to evaluate its potential is advised to determine which of its aspects have the greatest influence in increasing the use of BSE as a preventative behaviour.
8. In this study perceived confidence was correlated with an ineffective BSE practice even following BSE instruction. The effect of confidence could be evaluated to determine its actual influence on BSE technique and compliance.

9. The BSE practice and health beliefs of the non-practitioners could not be successfully changed by the interventions chosen for this study. Future research should attempt to identify if this is a common problem and if so, possible reasons for not adopting BSE once it has been encouraged through educational presentations.

10. The question remains: Will a widespread competent practice of BSE lead to a decrease in mortality rates? The majority of retrospective studies have speculated in the affirmative, however, no prospective randomised clinical trials have been reported. Ideally this type of study needs to be undertaken to show whether women who perform regular BSE will have a lower mortality rate from breast cancer than those women who do not practise BSE.

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**Appendix A**  
**Letter to Directors of Nursing Requesting Permission**  
**to Conduct Research at Hospital**

Name  
Director of Nursing  
Name of Hospital  
Address

Dear (Director of Nursing)

I refer to our recent telephone discussion regarding my application to conduct research concerning teaching strategies of breast self-examination at the (name) Hospital. Pursuant to our discussion, I now enclose a copy of my research proposal for your perusal. I trust the proposal will gain your approval and hope to receive confirmation from you in the near future to proceed with my data collection.

Should you wish to contact me regarding this application, please telephone me on 306 2867 or address correspondence to 28 Pioneer Drive, Edgewater.

Yours faithfully

Julia Agars

## **Appendix B**

### **Questionnaire Introduction (I)**

Dear colleague,

Please find attached a questionnaire which is one of a series of three that you will be receiving over the next 5 months. I am conducting this study, which concerns breast self-examination practices, for a Master of Health Science (Nursing) degree at Edith Cowan University. It would be very helpful for us as nurses if you could participate in my study.

The number in the top right hand corner of this page is a coded personal number and only I have access to this data. All information you provide will be held in the strictest confidence as the details will be used for statistical purposes only. Also, the information gathered from all nurses will be grouped further protecting your individuality.

Your participation is completely voluntary and you have the right to withdraw from this study at any time.

Completion of the questionnaire will take approximately 10 minutes. Please place the completed questionnaire in the box provided on your ward.

Should you have any queries please do not hesitate to contact Julia Agars on 306 2867.

Yours sincerely,

**Julia Agars**

**Please do not put your name on this questionnaire**

**Thank you for your participation**

## **Questionnaire Introduction (II)**

**Dear colleague,**

**Thank you for completing the last questionnaire. Please find attached a short questionnaire which is the second in a series of three concerning breast self-examination practices. It would be a great help to the nursing profession if you could participate further in my study.**

**The number in the top right hand corner of this page is a coded personal number and only I have access to this data. All information you provide will be held in the strictest confidence as the details will be used for statistical purposes only. Also, the information gathered from all nurses will be grouped further protecting your individuality.**

**Your participation is completely voluntary and you have the right to withdraw from this study at any time.**

**Completion of this questionnaire will take approximately 3 - 5 minutes. Please place the completed questionnaire in the box provided on your ward.**

**Should you have any queries please do not hesitate to contact Julia Agars on 306 2867.**

**You will receive the final questionnaire in approximately 3 months.**

**Yours sincerely,**

**Julia Agars**

**Please do not put your name on this questionnaire**

**Thank you for your participation**

### **Questionnaire Introduction (III)**

Dear colleague,

Please accept my sincere thanks for your completion of the last two questionnaires concerning breast self-examination practices. You will find the final questionnaire in the series of three attached. It would be of great benefit to this study if you could complete this final questionnaire.

The number in the top right hand corner of this page is a coded personal number and only I have access to this data. All information you provide will be held in the strictest confidence as the details will be used for statistical purposes only. Also, the information gathered from all nurses will be grouped further protecting your individuality.

Your participation is completely voluntary and you have the right to withdraw from this study at any time.

Completion of the questionnaire will take approximately 10 minutes. Please place the completed questionnaire in the box provided on your ward.

Should you have any queries please do not hesitate to contact Julia Agars on 306 2867.

Yours sincerely,

**Julia Agars**

**Please do not put your name on this questionnaire**

**Thank you again for your participation throughout this study**



**Appendix C****Study Questionnaire**

**Please read the following questions carefully and clearly circle the letter of the statement which is most applicable to you.**

**1. Have you practiced breast self-examination in the past 6 months?**

- a) yes
- b) no

**IF NO please go to Section B**

**SECTION A**

**1. How often have you practiced breast self-examination in the past 6 months?**

- a) more than once per month
- b) monthly
- c) every other month
- d) every three to four months
- e) less than every six months

**2. When do you practice breast self-examination in relation to your menstrual cycle?**

- a) no relation - any time during the month
- b) immediately before menstruation
- c) immediately after menstruation
- d) midcycle
- e) do not menstruate, practice any time during the month

**3. How do you practice breast self-examination?**

**i) When performing hand palpation do you use;**

- a) the tips of your fingers?
- b) the palms of your hands?
- c) the flat parts (pads) of your fingers?

**ii) Do you practice breast self-examination;**

- a) standing up?
- b) lying down?

4. What are your reasons for practising breast self-examination?  
(Please circle as many as you choose)

- a) not applicable
- b) most breast lumps are found by the woman herself
- c) my doctor said I should
- d) value of early detection
- e) I'm at high risk
- f) contact with breast cancer patient
- g) a personal experience
- h) might save my life
- i) peace of mind / reassurance
- j) nurse guidance
- k) fear of breast cancer
- l) fear of mastectomy
- m) other (please state) \_\_\_\_\_

5. How confident are you in your ability to perform breast self-examination accurately?

- a) very confident - I'm sure I know the method used
- b) somewhat confident - I'm uncertain of my technique
- c) not confident at all - I don't think I'm doing it right

6. Do you have a method any method of reminding yourself to do breast self-examination?

- a) no
- b) yes - please state \_\_\_\_\_

## SECTION B

Please circle appropriate response beside each question

SA = strongly agree

A = agree a little

D = disagree a little

SD = strongly disagree

1. If I got breast cancer, it would be more serious than other diseases.

SA A D SD

2. Doing breast self-examination is/would be time consuming.

SA A D SD

3. The thought of breast cancer scares me.

SA A D SD

4. The practice of breast self-examination can be painful. SA A D SD
5. If I had breast cancer, my whole life would change. SA A D SD
6. I would not be so anxious about breast cancer if I did monthly breast examinations. SA A D SD
7. I believe that breast cancer is a hopeless disease. SA A D SD
8. If I do monthly breast self-examinations I may find a lump before it is discovered by regular health examinations. SA A D SD
9. The practice of breast self-examination interferes with my activities. SA A D SD
10. I am afraid to even think about breast cancer. SA A D SD
11. If more women examined their breasts regularly, there would be fewer deaths from breast cancer. SA A D SD
12. My health is too good at present to even consider thinking that I might get breast cancer. SA A D SD
13. Whether I find a lump in my breast myself doesn't really matter because by then it's too late anyway. SA A D SD
14. Whenever I hear of a friend or relative getting breast cancer, it makes me realise that I could get it, too. SA A D SD

15. If I examined my own breasts regularly, I might find a lump sooner than if I just went to the doctor for a check-up.

SA A D SD

16. There are so many things that could happen to me that it's pointless to think about any one thing like breast cancer.

SA A D SD

17. Even though it's a good idea, I find examining / having to examine my breasts an embarrassing thing to do.

SA A D SD

18. The older I get, the more I think about the possibility of getting breast cancer someday.

SA A D SD

19. Examining my breasts often makes / would make me worry unnecessarily about breast cancer.

SA A D SD

20. If I had to think about the possibility that I might someday get breast cancer, I would rate my chances as compared with other women as:

(Please circle appropriate response)

a) average

b) above average (more likely I would get it)

c) below average (less likely I would get it)

### SECTION C

1. When you go to your doctor (G.P.) for examination, about how often does the doctor examine your breasts?

a) never

b) sometimes

c) most of the time

d) always

2. Does your doctor ask you if you are doing monthly breast self-examination?

a) yes

b) no

3. Where did you first become aware of breast self-examination?

- a) can't remember
- b) doctor / G.P.
- c) pamphlet in doctors office
- d) pamphlet elsewhere
- e) breast self-examination educational programme
- f) this is my first contact with breast self-examination
- g) magazine article
- h) TV
- i) newspaper
- j) radio
- k) in hospital as a patient
- l) mother / sister / relative / friend
- m) nurse
- n) other (please state) \_\_\_\_\_

4. What are the reasons you don't practice breast self-examination?  
(Please circle as many as you choose)

- a) not applicable - I practice breast self-examination every month
- b) I forget
- c) I don't take the time
- d) I'm afraid I'll find something
- e) I'm too young
- f) I don't know how to do it
- g) I don't think it has any value
- h) I'd rather not think about cancer
- i) I'm not concerned about breast cancer
- j) other (please state) \_\_\_\_\_

#### SECTION D

1. Please indicate your age in the space provided

\_\_\_\_\_

2. Please indicate your nursing designation at your hospital

- a) registered nurse
- b) registered midwife
- c) enrolled nurse
- d) mothercraft nurse
- e) mental health nurse
- f) other (please state) \_\_\_\_\_

3. Have you had any personal history of breast lumps?

- a) yes
- b) no

4. Have you any family history of breast disease / cancer?

- a) yes
- b) no
- c) unsure

**THANK YOU FOR YOUR PARTICIPATION  
PLEASE PLACE QUESTIONNAIRE IN BOX**

**Appendix D****BSE Booklet - Letter of Introduction and Instruction**

**Dear Colleague**

Please find attached a booklet titled "Breast Cancer and You" which has been compiled by the Cancer Foundation of Western Australia. The booklet contains information that every woman should know about her breasts and why she should care for them.

Furthermore, the booklet is intended to promote self-awareness and a better understanding of breast cancer. It may help some women towards the earlier recognition of a serious disease and it may give many more the courage to seek an early diagnosis.

Breast self-examination, as outlined on pages 3 and 4 of the booklet, is very important as this examination, if carried out regularly and correctly, will enable women to detect any early changes in their breasts.

**Yours faithfully**

**Julia Agars**

## **BSE Booklet**

### **Breast Cancer and You**

#### **Some Facts About Breasts, Breast Cancer,**

#### **Its Early Detection and Treatment**

Compiled by the Cancer Foundation of W.A. (Inc)

#### The Purpose Of This Booklet

Over the last 15 years there have been many developments in the ways that breast cancer can be detected as well as in the methods of treatment.

Some of these developments are still new enough to be the subject of debate among doctors. Breast cancer also receives a significant amount of space and time in our media which reflects the community's concern about this cancer. The answers cannot be clear cut until research provides more data and direction. This booklet gives basic information on breast cancer and describes the issues where problems exist and opinions differ. A booklet is no substitute for professional medical advice. Ask your doctor or medical specialist for their advice.

A woman experiences many changes in her breasts. These include cyclical changes with the menstrual cycle and changes when she is pregnant and breast feeding. Other changes occur in mid-life when her periods stop. New lumps can grow within the breast tissue, and although most of these lumps are harmless, one in ten may turn out to be a breast cancer. Understandably women often worry about harmless lumps but are reluctant to seek medical advice for fear that the lump could be cancer.

This booklet is intended to promote self-awareness and a better understanding of breast cancer. It may help some women towards the earlier recognition of a serious disease; it may give many more the courage to seek an early diagnosis and subsequent relief from intolerable anxiety.



## **WHAT IS BREAST TISSUE**

Basically the breast is a collection of potential milk sacs which are cells capable of producing milk packed around with fat and fibrous support bands linked to the muscle on the chest wall. Each milk sac joins up with others and finally into some dozen or so small tubes (ducts) which open onto the surface of the nipple.

In addition to the many blood vessels supplying the breast, there is an intricate network of lymph vessels draining tissue fluid from the breast into the lymph glands. These filter systems are found in the armpit, just above the collarbone and beneath the ribs where they join the breast bone.

Since the breast is made up of different tissues, some fibrous, some fatty, it is easy to understand why some breasts can feel very lumpy.

## **HOW BREASTS CHANGE**

Each month the breast glands - the milk producing sacs - go through an orderly series of changes. In the first half of the menstrual cycle, very little appears to happen, but once the egg has been shed from the ovary, the cells of the milk glands swell and become very active in response to increases in hormone levels.

A woman is aware of swelling of her breasts which is occasionally associated with tenderness. If the woman does not become pregnant, the lining of the womb will shed - menstruation - the hormone levels will fall and the breasts return to their resting state. If the egg is fertilised and a woman becomes pregnant, this activity continues.

One of the first signs of pregnancy may be swelling and tenderness of the breasts. Once the ovaries have stopped working, either at the menopause or because they have been removed by surgery, the milk glands get smaller and are no longer stimulated unless the woman takes hormone supplements.

## **RISK FACTORS FOR BREAST CANCER**

1. Women who have already had breast cancer have an increased risk of developing another breast cancer.
2. Women with a mother and/or sister with breast cancer have an increased risk.

Regular screening mammography is very important for these groups of women.

3. Having your first child after 30 years of age or having no children contribute to an increased risk of breast cancer.
4. Women who are carrying excess weight have a slightly increased risk for breast cancer. Ideal body weight for height should be the aim.
5. As women get older their risk increases.
6. Women in western countries who have a high intake of fat in their diet are known to have an increased risk of breast cancer.

## **SOME OTHER FACTS ABOUT BREAST CANCER**

- a) Cancer of the breast is the commonest cancer in Australian women. It affects 1 in 15 women, and is more common in women over 40 years of age.
- b) A balanced low fat diet which includes a daily intake of a wide variety of fresh fruit and vegetables is recommended to contribute to lowering the risk of breast cancer.
- c) Recent international research has raised some uncertainties about long term use of the contraceptive pill starting in early teenage years. More research is now being conducted the results of which will enable doctors to provide more specific advice. Whatever the circumstances, use of the pill should be very carefully considered and other contraceptive methods may be preferable, especially for girls and young women. Nowadays, low dose contraceptives are usually prescribed for women and some doctors advise using these for short periods to reduce any possible risk.

## **SCREENING MAMMOGRAPHY**

Overseas screening mammography programmes have proved that regular mammograms (i.e. breast xrays) are valuable for all women over 40 years of age and are essential for women in a high risk category.

Screening mammography is a programme of regular breast xrays commenced at about 40 years of age. Screening mammography is valuable in that it can detect very tiny, even microscopic breast cancers. Detection of these very tiny cancers can result in breasts and lives, being saved.

Screening mammography is most valuable in women over 40 years of age. Some women under 40 have firm breasts. The density of this firm breast tissue may prevent a tiny breast cancer from showing up on x-ray. This makes mammography less reliable in younger women. Women under 40 years of age who may be classified as high risk, i.e. family history of breast cancer at an early age, should seek the advice of their doctor about screening. (See Diagnostic Mammography in this booklet.)

## **WHAT CAN GO WRONG IN THE BREAST**

### **1. Infections**

True infections of the breasts occur mainly in new mothers. Antibiotics are the usual form of treatment.

### **2. Benign, non cancerous lumps**

(i) Cystic disease or mammary dysplasia is characterised by a painful area of the breast which is sore and lumpy and often develops a few days before a period. The soreness usually disappears once the period starts. It is related to changing hormone levels. This type of lumpy breasts is benign.

ii) Another common benign abnormality is a lump that is very mobile and is easily pushed within the breast tissue, thus it is often called a "breast mouse"; medical advice should be sought.

Breast lumps that are cancer are not easily distinguished from benign lumps by a woman herself and she should consult her doctor. Any persistent change in the breasts needs to be discussed with your doctor.

### **3. Pre-cancerous conditions**

A few women will have lumps in their breasts which, though not cancers, are at high risk of developing into cancers at some future time; simple removal of some breast tissue will greatly diminish this risk.

If an abnormality is noted in the breast there are a variety of diagnostic tests which may be performed, including:

#### **1. Diagnostic mammography**

This is a breast x-ray done for women with a breast change, i.e. lump, thickening. It is used to help differentiate between cysts, benign lumps and cancer.

#### **2. Ultrasound**

This is an additional test which can add to the information the doctor already has. This test helps differentiate between cysts which are filled with fluid and solid lumps which may be benign or malignant.

#### **3. Fine needle aspiration**

Fine needle aspiration can be undertaken in the hospital outpatients department or doctor's surgery. It involves passing a needle into the breast lump and withdrawing a few cells for examination under a microscope. In the event the lump is a cyst i.e. filled with fluid, this can be emptied completely. In this case the lump will immediately disappear. If the lump is a solid no further treatment is necessary. Fluid or tissue taken from the breast can be examined under the microscope. It is sometimes possible to be given an estimation of the seriousness of the condition simply on a needle biopsy specimen.

#### **4. Surgical biopsy**

This involves a patient having a general or local anaesthetic, and an incision being made in the breast so that a whole lump can be removed and examined under the microscope.

At the time of the biopsy, the woman may be asked to give permission for removal of the breast or for lumpectomy, if the tissue proves to contain cancer cells. Many women would prefer to know the results of the biopsy before making a decision about further treatment.

There is no evidence that cancer is more likely to spread, or that the patient is harmed by waiting between biopsy and further treatment. This allows the patient and her doctor to discuss treatment options.

#### **HOW TO EXAMINE YOUR BREASTS**

The aim of breast self-examination is to identify any change in the breast. The most common change is the development of a lump or thickening of the breast tissue. Should a change occur it is most important to consult a doctor.

Breast self-examination (BSE) should be carried out towards the end of the menstrual period. If a woman no longer has regular periods, it should be performed on a regular date, i.e. the 1st of every month.

Staff at doctor's surgeries and the Cancer Foundation will be able to help you perform BSE correctly. Since you need to learn properly, your doctor or the Cancer Foundation will help you understand what your normal breast tissue feels like and teach you a reliable technique to help you detect any changes in the breast.

**BSE must be done lying down to avoid mistakes while examining the under surface of the breast.**

1. Lie down in a relaxed and comfortable position. Examination of the breast should be in circles from the outer edge of the breasts towards the centre.

2. **First examine your left breast. The left arm should be raised with the left hand behind the head. The left breast is then examined with the right hand. You should use the front part of the flat of your hand keeping your fingers straight and close together. It is important to learn how hard to press when examining your breasts. Never pinch up the breast. If you do, you may feel lumps even in a perfectly normal breast. Never dig into the breast with the fingertips.**
3. **Slide your hand over the breast, starting at the armpit and moving across the breast on the outer edge of the breast pressing to feel for lumps. Continue examining the outer edge of the breast.**
4. **Now repeat the action moving in a circle closer to the centre of the breast.**
5. **Finally slide your hand across the nipple making sure you have felt all parts of the breast.**
6. **Now carry out the same examination on your right breast using your left hand.**

**Remember ask your doctor to show you how to examine your breasts, or make an appointment at the Cancer Foundation. The teaching of breast self-examination is a free service at the Cancer Foundation or via one of the Cancer Foundation's Country Nurses.**

**In carrying out a self-examination of the breast it is important to carry out conscientiously all the steps which we have described and in right order. Otherwise you are likely to omit part of the examination and your chances of detecting an abnormality will be correspondingly reduced.**

**It is also important to realise that while the primary objective of the examination is to detect breast cancer you are not in a position to make a diagnosis. Your role is only to detect any of the changes which we have described.**

**If you have found anything abnormal or if there is any noticeable change since the last examination, you must consult your doctor without delay.**

The chances that it is due to cancer are small, but only a doctor sometimes using special tests, will be able to decide whether it is cancer or not, or if indeed there is anything wrong at all.

Remember that unnecessary delay in consulting your doctor will lose the time you have gained by your programme of self-examination.

Use a calendar to remind you to examine your breasts immediately after each period or on the first day of the month.

Tick the calendar when you have completed your examination.

## **I INTRODUCTION -**

### **BREAST CANCER TREATMENT**

There is growing concern that women, if they wish, should be able to take a greater part in decisions about the treatment of their breast cancer. In order to do this they must have clear and adequate information about their treatment options.

There is no single ideal treatment for breast cancer. Choices about treatment should be made by the patient with her doctor's help in the light of existing knowledge. It is more likely that a woman who has taken an active part in decisions about her treatment will feel more comfortable and confident when undergoing such treatment.

The following information is offered as an introduction to these complex questions. Women are strongly advised to discuss the details of treatment and management of their breast cancers with their doctors, perhaps seeking second opinions if they feel that their questions can be better answered in this way.

### **Staging of Breast Cancer**

Treatment of breast cancer is usually decided after a number of investigations which result in staging of the cancer. Stages are defined according to the size of the breast cancer and its spread within the breast, the presence and number of axillary lymph nodes containing cancer cells and the presence or absence of spread of the cancer beyond the breast and axilla. Axillary nodes

containing cancer cells are called positive nodes; those which do not contain cancer cells are negative nodes.

Simply described, the system of staging is:

**Stage I** cancers are those 2cms or less in diameter with no axillary nodes containing cancer cells and no evidence of distant spread.

**Stage II** cancers are those up to 5cms in diameter with axillary nodes containing cancer cells and no evidence of distant spread; cancers 2 to 5 cm without lymph node involvement are also classified as stage II.

**Stage III** contains cancers which are of any size, with either axillary nodes involved and fixed to one another, or with extension to the chest wall or skin but with no evidence of distant spread.

**Stage IV** cancers are those of any size with any number of axillary nodes involved and evidence of distant spread.

### **Receptor status**

Another measurement used in decisions about cancer treatment is that of receptor status.

Breast cancer cells contain protein substances or "receptors" which can bind to the circulating hormones in the body - oestrogen and progesterone. The levels of oestrogen (ER) and progesterone (PGR) receptors help to predict the responses of patients to hormonal treatments and may give an indication of the general outlook for the patient, e.g. a high ER status score will indicate that the cancer is likely to respond favourably to hormonal treatment; whereas low ER scores may indicate the need for more therapy particularly in younger women.

### **Other tests**

Other recently developed tests on breast cancer cells measure small differences in the behaviour and appearance of the cells and the results can be used to make decisions about the need for adjuvant therapy after surgery.



## **II BREAST CANCER TREATMENT**

### **Treatment of early breast cancer**

#### **Surgery and radiotherapy**

Modified radical mastectomy involves removal of the breast and axillary lymph nodes with or without division of the smaller muscle on the front of the chest. Until the 1980s this was the standard treatment for early or operable breast cancer.

The trend towards breast-preserving operations for breast cancer - lumpectomy - is increasing in Western Australia though some surgeons still prefer to offer mastectomy. Sometimes mastectomy is an appropriate form of treatment. Lumpectomy can be safely offered to women with breast cancers up to 4 centimetres in diameter and where the breast does not contain, nor is likely to contain, other areas of cancer. It is generally agreed that both mastectomy and lumpectomy should be accompanied by an examination of the lymph nodes in the corresponding axilla and that lumpectomy should be followed by a course of radiotherapy to the breast with small daily treatments over a period of 4 to 7 weeks.

The axillary lymph nodes examination is necessary to find whether there has been any spread of the cancer to the nodes so that good decisions about further treatment can be made.

Radiotherapy is advisable to the breast following lumpectomy because of the possibility of recurrence of cancer in the same breast. Radiotherapy is a means of destroying cells which may otherwise eventually develop into cancer.

The decision on whether to have a lumpectomy and radiotherapy or a mastectomy is very individual and may be based on the possibility of achieving a pleasing cosmetic result. However, sometimes, even with small cancers, mastectomy may be a safer option because of changes in the rest of the breast tissue.

### **Breast reconstruction**

Women who choose, or need to have mastectomy, may want to know about breast reconstruction and it is useful to discuss this with the surgeon before the mastectomy is undertaken as the surgeon can leave adequate skin to cover new breast. Women may like to contact the Cancer Foundation for more information on breast reconstruction.

### **Radiotherapy**

Radiotherapy following lumpectomy is not often accompanied by troublesome side effects. There may be mild nausea and tiredness which will disappear when the treatment finishes. Breast changes due to radiation, tightening of the breast, discolouration of the skin and loss of skin texture, may persist.

For women who will not accept breast surgery, radiotherapy alone may be a useful treatment option for very small breast cancers.

### **Adjuvant systemic therapy**

Adjuvant systemic therapy is cytotoxic chemotherapy or hormonal therapy given after surgery in order to kill any remaining cancer cells in the body.

It is the standard treatment advised for premenopausal women whose cancer has been found to have spread to the axillary lymph nodes. It is an option for premenopausal women with larger breast cancers even when no lymph node spread is found and for premenopausal women whose cancer cells show an ER negative status.

Adjuvant chemotherapy with or without added Tamoxifen is also sometimes advised for younger post menopausal women.

The usual adjuvant chemotherapy used in Australia is a combination of the drugs Cyclophosphamide, Methotrexate and 5-Fluorouracil given in monthly cycles for six months; this is called CMF. Sometimes the drug Prednisolone is added and the treatment is then called CMFP.

For older post menopausal women with cancer in the axillary nodes adjuvant hormonal therapy with the anti oestrogen drug Tamoxifen should be considered standard therapy. Some doctors advise its use over a period of two years whilst others advise longer use. As Tamoxifen has also been shown to significantly decrease the possibility of the cancer returning in post menopausal node negative women, some doctors now recommend its routine use for these patients.

It has now been quite clearly shown that the use of these treatments after the initial surgery (be it mastectomy or lumpectomy and radiotherapy) significantly improves the chances of a woman surviving breast cancer. Even in those women in whom the cancer ultimately returns, adjuvant therapy may significantly delay this.

Relapse is usually due to the presence of microscopic clinically undetectable traces of cancer growing in sites of the body distant from the breast and axilla. These are called metastases. Adjuvant systemic therapy can kill these cells before they cause problems.

#### **Intraduct carcinoma in situ**

With screening mammography programmes more women with early breast cancers will be diagnosed. Among this group will be a number with intraduct carcinoma in situ where the cancer cells are contained within a breast duct. This is considered by some doctors to be a precancerous condition rather than an actual cancer. However, though some of these cancers will never spread or invade surrounding tissues or metastasise, others are very likely to do so.

Treatment has usually been mastectomy which offers a 100% likelihood of cure; more recently lesser surgical options have sometimes been offered. These include subcutaneous mastectomy, in which breast tissue is scooped out leaving the skin and nipple, and lumpectomy or quadrantectomy, possibly followed by radiotherapy. As in all breast cancers treatment should include careful and regular review of the remaining breast using clinical and mammographic examinations. Adjuvant therapy is not necessary in this condition and lymph nodes are not usually removed from the axilla.

### **Side Effects of Adjuvant Therapy**

Adjuvant Tamoxifen had few side effects but may cause some nausea, hot flushes, vaginal dryness and feelings of depression in some patients.

The side effects of adjuvant cytotoxic chemotherapy vary in different women. Most women experience only mild upsets on the day of treatment or for a few days following and can carry on with their usual daily occupations. Some may have persistent unpleasant symptoms and will need additional treatment to help them. Nausea and vomiting, hair loss, mouth ulcers and general tiredness are the major problems. Chemotherapy also acts on the blood-forming and infection fighting cells that are made in the bone marrow. Regular blood tests are taken during the treatment and treatment may be modified so that side effects are less severe. Short delays or changes in dose do not affect the success of the treatment. Nausea and vomiting can often be successfully relieved by giving anti-nausea medications and psychological techniques are also useful, particularly if the symptoms occur when treatment is anticipated. Some women experience temporary hair loss or thinning, but the hair usually begins to grow again before the treatment is finished. The new growth of hair is often more luxuriant than before.

In younger women cessation of the periods may occur and this may only be temporary. In women close to the menopause periods usually cease and generally do not return; symptoms of menopause, such as hot flushes, vaginal dryness and weight gain may appear. Prednisolone may cause some weight gain. A few women experience loss of desire.

### **Treatment of advanced breast cancer**

Women who are diagnosed at the stage when breast cancer has spread (metastasised) to tissues beyond the breast and the axillary nodes or whose disease metastasises after primary therapy are considered to have advanced cancer.

With good management, women with advanced cancer may live for years after this diagnosis and it is essential to make sure that the best quality of life is maintained.

The mainstay of management in these patients is treatment with either hormonal drugs or chemotherapy. Hormonal drugs are usually used in older patients, those with slow growing disease and those with positive oestrogen receptor status. Chemotherapy is usually used in younger patients, those with rapidly advancing disease, tumours with negative oestrogen receptor status, those known to be resistant to hormone therapy and those whose cancer involves organs such as lungs or liver.

It is important that the overall management of patients with advanced disease is carefully planned with a view to determining the best sequence and/or combination of therapies in each individual patient.

In addition to systemic treatment local therapy with surgery and radiotherapy may occasionally be required.

General supportive, physical and psychological care are also of great importance.

#### **Tamoxifen in advanced breast cancer**

Tamoxifen, though also used in adjuvant therapy of early breast cancer, is the commonest hormonal therapy in advanced disease. It is the treatment of choice in some women with breast cancer, mainly those with slower growing ER positive cancers, and in those with predominantly bony metastases.

If patients respond to Tamoxifen and then subsequently relapse, other hormones may be used and further responses may be obtained. Some patients will become resistant to hormonal therapy and will then need chemotherapy.

#### **Chemotherapy in advanced breast cancer**

The most commonly used chemotherapy is a combination of drugs called CMFP. This is the same combination as used in the adjuvant chemotherapy of early breast cancer but with the addition of Prednisolone.

In advanced disease, chemotherapy is given in much the same way as for the adjuvant therapy programme but it is continued for longer. Treatment trials have

shown that the best results are obtained in controlling the cancer and in maintaining the patient's quality of life, when chemotherapy is given continuously rather than in short intermittent courses.

If CMFP chemotherapy fails in advanced breast cancer, other combinations of drugs or single drugs may be successful in controlling growth and alleviating symptoms. Ongoing treatment trials are assessing the usefulness of other forms of chemotherapy.

### **Follow up**

Women who have had breast cancer treated need careful regular follow up for the rest of their lives. After lumpectomy and radiotherapy or mastectomy there is a need for regular follow up visits although the intervals between these visits will increase with time.

Women who have had breast cancer should continue to be seen by their doctor at least annually for clinical examination and screening mammography should be undertaken at regular intervals.

Women who have had treatment for breast cancer are at risk of developing another cancer in their remaining breast tissue. If a new primary breast cancer is detected and treated early, the outlook for that woman is not necessarily any worse. The need for regular careful follow up is very important for this reason.

### **Recent clinical trials information**

Many women with breast cancer will live out normal life spans; however a proportion of those diagnosed at what appears to be an early stage of the cancer, will relapse with metastases. As yet doctors have no means of identifying the women who will relapse. The question of whether all or most women with breast cancer, even including those at an early stage of disease, should be offered adjuvant therapy in order to delay or prevent relapse, is being discussed by doctors and investigated in treatment trials. Some doctors believe that adjuvant therapy should be offered to nearly all women; others contend that this would mean the unnecessary treatment of about two thirds of the women with early cancer who will never relapse.

Recent treatment trials have shown that fewer women with early breast cancer will relapse if they are given adjuvant therapy after surgical treatment. These results suggest that, contrary to earlier opinions, adjuvant therapy should be an option for most women with breast cancer excepting those with minimal or "in situ" cancers which have an inherently excellent prognosis without additional treatment.

We hope that this book has given you information and understanding of breast cancer which will enable you and your doctor to make good decisions on the right treatment for you.

## **GLOSSARY OF TERMS**

### **ADJUVANT**

A treatment which is added to another treatment to make it more effective. e.g. Radiotherapy used after surgery or chemotherapy used after surgery to "mop up" any microscopic cancer which may be present.

### **AXILLA**

The armpit.

### **AXILLARY LYMPH NODES**

These are lymph nodes located deep in the armpit in the hollow beneath the shoulder.

### **CLINICAL TRIALS**

A scientific method for finding out the effectiveness of a proposed new treatment. The usual approach is that one group of patients is selected at random to receive the new treatment, whilst another randomly chosen group receives the currently used treatment. The results of treatments are then compared. Clinical trials are only carried out after tests have shown that the new treatment is not detrimental to the patient.

**CYTOTOXIC**

Destructive to living cells including cancer cells.

**LUMPECTOMY**

The surgical removal of a lump; the cancer and a margin of surrounding normal breast tissue is removed.

**PRIMARY THERAPY**

The treatment which is used first to treat the cancer, e.g. mastectomy may be the primary therapy for breast cancer. Another example of primary therapy is lumpectomy followed by radiotherapy to the breast.

**QUADRANTECTOMY**

A surgical treatment which removes the quarter of the breast which contains the cancer.

**RELAPSE**

The return of the cancer after a period of improvement or remission.

**REMISSION**

The decrease or disappearance of signs and symptoms of cancer. A patient is said to be in remission when there is no evidence of active disease.

Services for breast cancer patients offered by the Cancer Foundation of Western Australia are listed below.

**The Breast Cancer Support Service - BCSS**

This service is offered by the Cancer Foundation of Western Australia. Selected and trained volunteer visitors make hospital or home visits as requested and provide practical advice to help the patient during recovery.



### **Support Group for Breast Cancer Patients - SGM**

This service, offered by the Cancer Foundation of Western Australia, is for women who have had breast cancer. The group's aim is to help in the adjustment process and teach women coping skills to manage everyday stress. Each group consists of 6 - 10 women who meet for a 2 hour period each week for 6 - 8 weeks. Groups are led by a health professional.

### **Cancer Support Groups**

The Cancer Foundation provides structured and professionally led Support Groups for patients / families and friends with different types of cancer who meet on a regular basis at 42 Ord Street, West Perth.

### **Breast Prostheses**

Patients requiring prostheses can view a wide range of prostheses in a relaxed setting. Advice is provided by members of the Breast Cancer Support Service.

Location: 32 St Georges Terrace, Perth

Opening times: Monday to Friday 11 am to 1 pm

### **Fitting service appointments**

A qualified female fitter provides a specialised service from Maxine's Body Fashions, Piccadilly Arcade, Perth, between the hours of 11 - 1 on Tuesday, Wednesday and Friday. Details of country fitting services are available from the Cancer Foundation or BCSS.

### **Reconstruction**

Breast reconstruction or plastic surgery can offer good cosmetic results. The possibility of reconstruction can be discussed by the patient with her doctor. Slides illustrating what can be achieved by breast reconstruction can be viewed at the Cancer Foundation and discussed with the Medical Counsellor. An illustrated leaflet is also available.

### **Medical Counselling**

The Cancer Foundation provides the services of a Medical Counsellor who can be contacted by telephone or by appointment.

### **Cancer Foundation Country Nursing Service**

This service offers support for cancer patients and their families and friends in country areas. These nurses provide emotional support and information.

### **Accommodation for country patients**

Special Accommodation for country patients is available for short and long term stays at Anstey House in the grounds of the Queen Elizabeth II Medical Centre, Nedlands.

### **Outreach**

The Cancer Foundation offers a home visiting service by selected and trained nurses to assist patients cope better at home. This is not a "nursing service" but provides counselling, support and practical help where possible. The Outreach service can be contacted via the Cancer Foundation.

### **Financial assistance etc**

Financial grants are made to assist disadvantaged patients. Funds are also made available for temporary housekeeping services, travel assistance, telephone connections and limited home nursing for terminally ill patients only in country areas. Applications via Social Work Departments, GP's or direct to the Cancer Foundation.

This information has been compiled by the Cancer Foundation of Western Australia. The Cancer Foundation of Western Australia Inc. is a non-government funded organisation that raises all its own funds. All donations to the Cancer Foundation are tax deductible.

## **Appendix E**

### **BSE Video and Discussion Outline**

#### **1. Introduction of self**

Request those attending to write name and area of employment in exercise book provided.

#### **2. The aim of this session**

To promote the practice of breast self-examination for the early detection of breast cancer.

#### **3. Included in session**

- risk factors for breast cancer
- a video demonstrating the technique of breast self-examination
- the video is 11 minutes in duration
- time will be available after the video for questions

#### **4. Risk factors for breast cancer**

- i) Personal history of breast cancer
- ii) Family history of breast cancer
  - especially mother or sister
- iii) First birth after 30 years of age or no children
- iv) Excess weight
- v) Increasing age, especially over 40 years
- vi) High intake of fat in the diet

### 5. Fact of breast cancer

Cancer of the breast is the commonest cancer in Australian women.

It affects 1 in 15 women.

### 6. Important points

- i) Nine out of ten lumps are not cancer.
- ii) Annual clinical breast examinations by health professional.
- iii) Mammograms every 1 to 2 years over the age of 40 years.
- iv) Breast self-examination commencing at 20 years of age
  - every month
  - immediately following menstruation, or if amenorrhoeic one day every month.
  - lying down
  - flat parts (pads) of fingers.
- v) If you detect any changes in your breasts seek medical advice without delay.
- vi) Most common change in the breast is the development of a lump or thickening of the breast tissue.

### 7. Video introduction

Breast self-examination : Taking care of yourself (1985)

Produced by Westmead Hospital and the NSW Cancer Council.

### 8. Cancer Foundation of Western Australia

1. Visual inspection not promoted as this does not indicate early detection.

**2. BSE must be performed lying down to avoid mistakes while examining the under surface of the breast.**

**9. Video (11 minutes)**

**10. Reiterate important points (as per number 6)**

**11. Any questions?**

**12. Thank you for your attendance**

## Appendix F

### Poster for Film and Discussion

# WHAT EVERY WOMAN SHOULD KNOW



## B.S.E.

ALL NURSES ARE INVITED  
TO ATTEND A FILM AND  
DISCUSSION CONCERNING  
BREAST SELF-EXAMINATION.

THE AIM OF THIS INFORMAL  
SESSION IS TO PROMOTE YOUR  
UNDERSTANDING OF BREAST  
SELF-EXAMINATION PRACTICE.

WHAT - BREAST SELF-EXAMINATION  
WHERE - SEMINAR ROOM  
WHEN - MONDAY 22ND APRIL - 1330 & 1415 (TWO SESSIONS)  
.. - NIGHT DUTY (TIME TO BE ARRANGED)  
- WEDNESDAY 24TH APRIL - 1330 & 1415 (TWO SESSIONS)  
- NIGHT DUTY (TIME TO BE ARRANGED)  
- SATURDAY 27TH APRIL - 1330 & 1415 (TWO SESSIONS)  
- NIGHT DUTY (TIME TO BE ARRANGED)  
HOW LONG - 30 MINUTES  
HOW - JUST COME ALONG!

IF YOU HAVE ANY QUERIES PLEASE DO NOT HESITATE TO CONTACT ME,  
JULIA AGARS, ON 306 2867.

P.S. EVEN IF YOU PRESENTLY PRACTICE BREAST SELF-EXAMINATION  
PLEASE COME ALONG. YOUR ATTENDANCE AND PARTICIPATION  
WILL BE MOST WELCOME.

## Appendix G

### Poster for One-to-one Modeling and Rehearsal

# WHAT EVERY WOMAN SHOULD KNOW



## B.S.E.

ALL NURSES ARE INVITED TO LEARN ABOUT BREAST SELF-EXAMINATION ON AN INDIVIDUAL BASIS IN AN INFORMAL, RELAXED SETTING.

THE BREAST SELF-EXAMINATION PROGRAMME IS DESIGNED FOR YOU TO LEARN ABOUT HOW BREAST CANCER CAN AFFECT YOU, HOW TO DETECT IT EARLY, AND FOR YOU TO HAVE THE OPPORTUNITY TO PRACTICE BREAST EXAMINATION USING A SILICONE BREAST MODEL.

WHAT - BREAST SELF-EXAMINATION

WHERE - SEMINAR ROOM

HOW LONG - 15 MINUTES

HOW - PLEASE PLACE YOUR NAME IN THE TIME MOST SUITABLE FOR YOU BELOW, AND JUST COME ALONG TO THE SEMINAR ROOM AT YOUR CHOSEN TIME.

IF YOU HAVE ANY QUERIES PLEASE DO NOT HESITATE TO CONTACT ME, JULIA AGARS, ON 306 2867.

P.S. EVEN IF YOU PRESENTLY PRACTICE BREAST SELF-EXAMINATION PLEASE COME ALONG AND UPDATE YOUR SKILL. YOUR ATTENDANCE IS MOST WELCOME.

## Appendix H

### One to One Discussion, Modeling and Rehearsal Outline

#### 1. Introduction of self

2. Request person attending to write name and area of employment in exercise book provided.

#### 3. Aim of session

- promote your awareness of breast cancer and breast self-examination
- observe then practice technique of breast examination using a silicone breast model.

#### 4. What is breast tissue?

- Diagram of breast used for illustration of structures

#### Discussion points

- basically breast is collection of milk sacs that join up with ducts that open onto the surface of the nipple.
- fat and fibrous bands are packed around the milk sacs and these are linked to muscle on the chest wall.
- there is a network of lymph vessels draining tissue fluid from the breast into the lymph glands. These are located in the armpit and above the collarbone.
- the breast is made up of different tissues (fibrous and fatty) and these can make the breast feel lumpy.

#### 5. How breasts change

- each month the breast glands go through changes under the influence of hormones.



- after ovulation the cells of the milk glands swell and women may be aware that their breasts feel swollen.

- if a woman doesn't become pregnant the hormone levels fall and breasts return to their resting state.

- after menopause, and if no hormone supplements are taken, the milk glands get smaller as they are no longer stimulated by hormones.

#### 6. Risk factors for breast cancer

i) personal history of breast cancer.

ii) family history of breast cancer

- especially mother or sister.

iii) first childbirth after the 30 years of age or no children.

iv) excess weight.

v) increasing age, especially over 40 years.

vi) high intake of fat in diet.

Cancer of the breast is the most common cancer in Australian women.

1 in 15 women will be affected.

#### 7. Three essential components for breast health

1. Breast self-examination.

2. Annual breast examinations by health professional.

3. Screening mammograms from the age of 40 years.

### 8. Breast self-examination

- Aim of breast self-examination is to identify any change in your breasts.
- practised monthly.
- immediately following menstruation because breasts are in a resting state (hormonal influence) or if menstruation does not occur one day every month (i.e. first Sunday in the month)..
- position is lying down to avoid mistakes while examining under surface of breast.
- flat parts (pads) of fingers used for palpation of breasts.

### 9. Modeling of BSE

Including;

- demonstration of breast examination using silicone breast model.
- diagrams of female in supine position with arm behind head.
- diagram of direction of circles from outer to inner beginning with armpit and ending with areola and nipple area.
- perform BSE in same order so that no step is missed.
- BSE is for you to know what is normal for you and to detect any deviations from this norm early.
- if anything abnormal is found consult your doctor without delay.
- use a method to remind you to practise BSE each month i.e. calendar or use your menstrual period as a reminder.

### 10. Rehearsal of BSE by nurse

Including repeat modeling and rehearsal if required to master technique.

### **11. Important points**

- i) Nine out of ten lumps are not cancer.**
- ii) Annual clinical breast examination.**
- iii) Screening mammography commenced at 40 years of age.**
- iv) Breast self-examination commencing at 20 years of age:**
  - monthly**
  - immediately following menstruation or if amenorrhoeic one day every month.**
  - lying down.**
  - flat parts (pads) of fingers.**
- v) If you detect any changes in your breasts consult your doctor without delay.**
- vi) Most common change is the development of a lump or thickening of the breast tissue.**

### **12. Any questions?**

### **13. Thank you for your participation**