BREAST CANCER PREVENTION: THE KNOWLEDGE AND SKILLS OF FINAL-YEAR UNDERGRADUATE NURSING STUDENTS

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Breast cancer is the most frequently occurring cancer among women, and is the second leading cause of death in women between the ages of 40 and 46 (Ziegfield, Lubejko & Shelton, 1998). Worldwide, there are 57 000 new cases of breast cancer per year. In the UK, the age-standardised incidence and mortality are the highest in the world (Leinster, Gibbs & Downey, 2000). Breast cancer accounts for 18% of all female cancer deaths in the UK and is still the most common cause of death from any cancer.

At present, breast cancer is the leading cause of death in South African women (Pantanowitz & Benn, 2002). South African women have a one in nine lifetime risk of developing breast cancer. The biggest breast cancer risk factor is increasing age. A higher mortality rate is found among women of lower education and income levels, who fail to treat the disease at an early stage (Ziegfield et al., 1998).

Early diagnosis is essential to breast cancer survival, as early intervention can prevent metastasis. Metastasis is the ability for cancer cells to relocate and survive beyond a primary tumour. Metastatic growth is often the cause of death in breast cancer patients (Ziegfield et al., 1998). Early detection of the disease has resulted in the mortality rate of women treated for breast cancer decreasing in Western society

(Pantanowitz & Benn, 2002). The treatment of breast cancer varies according to the breast cancer type, stage and hormone sensitivity (Ziegfield et al., 1998).
For breast cancer, primary prevention includes educating women on breast cancer risk factors and influencing behavioural changes, such as healthy eating and exercise. Secondary prevention in the form of breast screening has been introduced in an attempt to decrease the mortality from the disease (Leinster et al., 2000). The only method proved to result in a decrease in mortality is regular mammography, a test that is fairly expensive in monetary terms. For this reason, it is still not easily accessible to women in developing countries. The introduction of a programme of breast self-examination in these countries may result in the presentation of breast cancer at an earlier stage with consequent improvement in survival.

Nurses have a professional and ethical responsibility to educate peers, clients and society in general about changes needed to improve the quality of health care in a cost-effective manner. With regard to breast cancer, this can be achieved through the nurse's role as educator, advocate and enforcer (Edelman & Mandle, 1994). In the UK, a more general 'breast awareness' is being encouraged, based on knowing what is normal, what changes to look out for and, above all, encouraging the reporting of such changes (McPherson & Waller, 1997). This raised awareness of breast cancer has led to Cancer Research UK announcing that in the last ten years, Britain has seen the sharpest fall in breast cancer rates in the world, it has decreased by 22% (Wilson, 2003). This is something for the developing world, including South Africa, to aspire to. It is thus essential that South African nurses play an active role in facilitating the raising awareness of breast cancer.

1.2 Rationale for the study

Women's health has evolved in the last three decades from simply concentrating on childbirth issues to include issues concerning the health and well-being of women. This evolution has contributed to an increase in breast cancer awareness as a leading issue in women's health. Due to the fact that contemporary nursing curricula have a large women's health component, it has become essential for nursing students to become well-acquainted with the theory and practice surrounding breast cancer. Nursing students who become familiar with the prevention of breast cancer and the treatment options available are better able to provide relevant education and support to the many patients with whom they have contact (McGinn & Moore, 2001). For high-risk women, understanding their risk, appropriate screening recommendations and prevention strategies is paramount.

The Baccalaureate education programme for nurses encompasses four years of study at a university. The programme focuses on the integration of theory and practice. The baccalaureate-prepared nurse should therefore possess the scientific knowledge base and appropriate skills regarding breast cancer prevention. As the final year of study comprises mostly practical application of knowledge and skills, undergraduate students should ideally be familiar with these issues prior to their final year of study. These students spend a substantial amount of time in a range of workplace settings, several of which they may never be exposed to after graduation. Due to the nursing students' extensive contact with large numbers of diverse patients in a variety of settings, their role in promoting breast cancer awareness must be emphasised.

Nursing students should be considered a valuable asset to medical and nursing centres, not only as future professionals, but also as a means to improving quality of care (Zisberg, Bar-Tal & Krulik, 2003).

Breast cancer prevention needs to be viewed as a health priority and nurses' health promotion activities in the area of breast cancer awareness can have a substantial impact on the uptake of breast screening initiatives among women in South Africa. Health promotion is the process of enabling people to increase control over, and to improve their health (Edelman & Mandle, 1994). In 1994, the African National Congress (ANC) developed an overall National Health Plan based on a Primary Health Care (PHC) approach. The ANC is committed to the promotion of health, using the PHC approach as an underlying philosophy for restructuring the health system. Health workers at all levels must be able to promote general health and encourage healthy lifestyles. Promoting good health and preventing disease, such as breast cancer, is central to the success of PHC.

Patient education is a professional requirement and a legal duty of a professional nurse (Edelman & Mandle, 1994). It is a critical factor in promoting breast cancer awareness. However, it is 'time and resource intensive, both of which are in limited quantities in today's healthcare environment' (Monsivais & Reynolds, 2003:172). Final-year undergraduate nursing students may be in an ideal position to assist in providing the appropriate education to patients as they often practice as part of the workforce in a particular setting. However, this remains dependent on the fact that they have adequate knowledge and skills to do so.

1.3 Problem Statement

Breast cancer is the leading cause of death in South African women. Worldwide, it accounts for over 30% of all new cancer cases in women (Pantanowitz & Benn, 2002). South African nurses are in an ideal position to play an active role in promoting breast cancer awareness, thereby reducing the incidence of the disease in this country. This is largely due to the fact that nurses are often the health care providers who detect early breast changes in patients. The detection of early-stage breast cancer requires knowledge, skill, dedication, and commitment. This early detection can prompt effective treatment of breast cancer before its progression.

Breast cancer is not only one of the most frequently occurring cancers among women, but the incidence of breast cancer is rising by one to two per cent per year (Pantanowitz & Benn, 2002). Despite this fact, the mortality from breast cancer is decreasing. One of the main reasons for this apparently paradoxical situation is that the use of routine screening strategies has led to the early diagnosis of the disease, which in turn has led to a much higher cure rate. South African nurses are able to significantly contribute to the decrease in mortality from breast cancer. However, in order to accomplish this, it is essential for them to possess the necessary knowledge and psychomotor skills to perform breast examinations, and to educate the community on breast cancer preventative issues.

Since 1994, the Primary Health Care approach has been the underlying philosophy for the restructuring of the health system in South Africa. This approach has led to

changes in the nursing curriculum, with a greater emphasis on promotive and preventive health care activities; related knowledge and skills are thus important outcomes of the curriculum that leads to registration as a nurse. Breast cancer prevention and the skills required in this area therefore need to be comprehensively covered in the women's health curriculum. This study questioned whether or not the knowledge and skills of final-year undergraduate nursing students, with regard to breast cancer prevention, is optimum.

Educators have a responsibility to know what kinds of materials, strategies and activities best help students learn. This information could best be obtained with the aid of scientific research methodology, aimed to assist in developing relevant, practical recommendations with regard to breast cancer education for undergraduate nursing students. To accomplish this, it is necessary to first determine the students' level of knowledge and skills relating to breast cancer prevention.

1.4 Aim of the study

The aim of this study was to determine the level of knowledge and skills of final-year undergraduate nursing students relating to breast cancer prevention. Knowledge areas included human behaviour, basic pathophysiology, economic patterns, family and social organizations and cultural beliefs. Skills encompassed the psychomotor ability in clinical breast examinations, which examined the students' application of theory to practice.

1.5 Research objectives

The objectives of the study were to:

- Determine the awareness of, and orientation toward breast cancer preventative measures of final-year undergraduate nursing students.
- Determine the level of knowledge regarding breast cancer prevention of final-year undergraduate nursing students.
- Assess their psychomotor skills in performing a clinical breast examination.
- To identify critical knowledge and skill deficits, with regard to breast cancer prevention, of final-year undergraduate nursing students.

1.6 Operational and theoretical definitions

Breast: a breast is a modified sweat gland positioned over ribs two through six, mainly overlying the pectoralis major and pectoralis minor muscles.

Breast cancer: refers to a malignant tumour originating in the breast.

Prevention: warding off or hindering the occurrence of a disease.

Prevention of breast cancer: screening activities aimed at early detection of a malignant tumour originating in the breast. In this study it refers to knowledge of breast cancer risk factors and screening guidelines, and skill in carrying out a breast examination.

Knowledge: theoretical understanding; person's range of information. In this study, it refers to the understanding of breast cancer preventative issues, particularly screening guidelines and breast cancer risk factors. The student's theoretical knowledge will be deemed adequate if he/she scores over 60% in the questionnaire.

Psychomotor skills: practiced ability in doing something. In this study, it refers to the practiced ability to adequately perform a complete clinical breast examination. The student will be deemed competent if he/she scores over 60% in the practical component of the research.

Undergraduate nursing student: a student within a four-year Bachelor of Nursing degree at a university.
(Dox, Melloni & Eisner, 1993; Sykes (ed.), 1978).

1.7 Significance of the study

Nursing represents a significant professional resource that can help facilitate positive changes in breast cancer prevention strategies. Nurses are often the health care providers who teach women how to perform breast self-examinations and who carry out clinical breast examinations. This research aimed to provide evidence of the nursing actions that are effective in promoting positive patient outcomes with regard to breast cancer prevention. It enabled the identification of knowledge deficits, which in turn enabled recommendations to be made to optimize nursing education in the field of breast cancer prevention.

1.8 Structure of the research report

This report will follow a systematic structure comprising six chapters. Chapter two covers a review of the literature relevant to this study. Chapter three explains the methodology of the research. Chapter four describes and illustrates the findings of the research. A discussion of the findings and implications thereof follows in chapter five. The report concludes with chapter six, which includes the major conclusions and recommendations arising from the study. The annexures and references for the study are included at the end of the research report.

1.9 Summary

The frequency of breast cancer makes it an important health issue. Breast screening is a form of secondary prevention aimed at reducing mortality from the disease, as early detection is essential to breast cancer survival. Nurses must play an active role in creating breast cancer awareness through education and empowerment. They therefore need to have a sound knowledge base and adequate practical skills in the field of breast cancer prevention. The purpose of this study was to determine the current knowledge, skills and awareness of breast cancer prevention, of final-year undergraduate nursing students. Major deficits in these areas could then be identified with a view to developing relevant recommendations aimed at optimizing nursing education in this field.

This chapter serves as an introduction to the study and includes the study's rationale, aim, objectives and significance. A review of the relevant literature follows in the next chapter.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Breast cancer management is a rapidly evolving field. New technologies are being incorporated to better understand the progression of this disease and to help identify the genes involved in its prognosis and responsiveness to therapy. These findings, added to improved risk assessment and prevention strategies, as well as screening, diagnosis and supportive care, create optimism for the future. Education and clinical trials are the key to success (Pantanowitz & Benn, 2002).

Nursing represents a significant professional resource for facilitating positive changes in breast cancer prevention strategies in South Africa.

This chapter is a review of the relevant literature concerning breast cancer prevention from a nursing perspective. The outline of this chapter is as follows:

- Overview of breast cancer prevention
- Anatomy of the breast
- Pathophysiology of the breast
- Risk factors for breast cancer
- Clinical manifestations of breast cancer
- Treatment of breast cancer
- Prognosis of breast cancer
- Complications of breast cancer

- The prevention of breast cancer
- The nurse's role with regard to breast cancer prevention
- Cancer care resources

2.2 Overview of breast cancer prevention

Over 80% of women will experience some concern regarding breast symptoms during their life. Breast cancer accounts for over 30% of new cancer cases in women and is the leading cause of death in South African women (Pantanowitz & Benn, 2002). It is for this reason that breast cancer has been labeled 'women's number one health concern', and is a rapidly developing field (Wilson, 2003:23). It is diagnosed most often in women over fifty years of age, but can affect younger women and, more rarely, men. Breast cancer is also the most common malignancy in pregnancy. It occurs at a rate of about one in 4 000 pregnancies. A higher mortality rate is found among women of lower education and income levels, who fail to treat the disease at an early stage (Ziegfield et al., 1998). This is important in a South African context, as many women in rural areas lack the education, awareness, resources and finances to practice strategies for breast cancer prevention, or to seek effective treatment for breast cancer itself.

In the past, the only issues in women's health that received direct attention, were those related to childbearing. More recently, after women began being included in research studies, the knowledge base regarding disease prevention and treatment of women has grown dramatically (Beatty, 2000). However, the incorporation of this

knowledge into clinical practice has been much slower. Although our understanding of breast cancer has increased enormously in the last two decades, progress is slow (McPherson & Waller, 1997).

When a malignant tumour originates in the breast, it is classified as breast cancer. If it spreads to other parts of the body, it remains a breast cancer (Judkins & Akins, 2001). Since the prognosis of breast cancer is much better if it is detected at an early stage, screening is essential. 'It is critical that breast disorders be detected early, diagnosed accurately and treated promptly' (Lewis, Collier & Heitkemper, 1996:1542). The essential factors in the early detection of breast disorders are regular breast self-examinations, regular clinical breast examinations (those performed by health professionals), and routine mammography.

2.3 Anatomy of the breast

Breast cancers are potentially life-threatening malignancies that develop in one or both breasts. The structure of the female breast is important in understanding this disease. The breast, a modified sweat gland, is positioned over ribs two through six and mainly overlies the pectoralis major and pectoralis minor muscles. The axillary process of the breast (also known as the axillary tail of Spence) extends upward and laterally toward the axilla. It is breast tissue that lies between the breast proper and the axilla. This region of the breast is clinically significant because of the high incidence of breast cancer within the lymphatic drainage of the axillary process (Van De Graaff, 1998).

Each mammary gland is composed of fifteen to twenty lobes. Each lobe is subdivided into lobules that give rise to ducts and contain the glandular mammary alveoli. The ducts from all the lobules in a lobe converge into a single lactiferous duct. These ducts open individually on the surface of the nipple through a lactiferous sinus (Leinster et al., 2000). The nipple is a cylindrical projection from the breast that contains some erectile tissue. A circular pigmented areolar surrounds the nipple.

Each lobe or lobule is embedded in fat. It is this fat that gives the female breast its shape, contour and size. Ligaments running from the pectoralis muscle to the skin of the breast separate the lobules within their respective fatty coats. These are called ligaments of Cooper. They give support to the breast fat, preventing it from deforming. Thus they are essential in maintaining the shape of the breast (Pantanowitz & Benn, 2002).

Blood and lymph vessels form a network throughout each breast. Breast tissue is drained by lymphatic vessels that lead to axillary nodes (which lie in the axilla) and internal mammary nodes (which lie along each side of the sternum). When breast cancer spreads, it is frequently to these nodes.

Figures 2.1 and 2.2 are diagrams of the anatomy of the breast. Figure 2.2 includes the relation of the breast to the lymphatic drainage system.

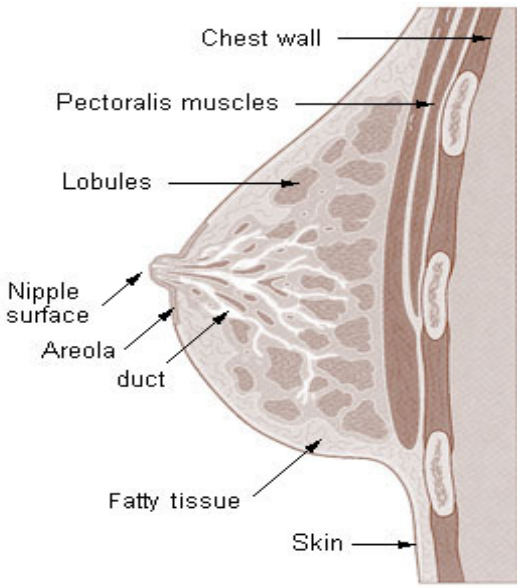

Figure 2.1: Anatomy of the breast (cross-section)
(From www.breasthealth.co.za)

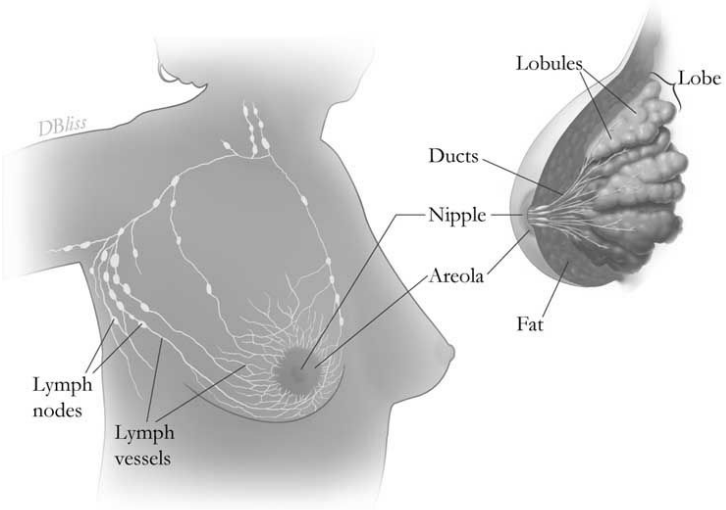

Figure 2.2: Anatomy of the breast and its position in relation to the lymphatic drainage system
(From www.breasthealth.co.za)

2.4 Pathophysiology of breast cancer

Breast cancer develops from the epithelial cells of the terminal ducts of the breast. Breast cancer is either non-invasive (generally known as in situ, that is, confined to the site of origin) or invasive (spreading).

The development of breast cancer is generally thought to occur as a sequence of gradual changes, governed by a series of mutations in the genes. The exact sequence of genetic events has not been clearly worked out for breast cancer (Leinster et al., 2000). Most patients presenting with breast cancer have disease localised to the breast or to the breast and lymph nodes; however, 40% to 50% may eventually develop metastatic disease (Mincey & Perez, 2004). Metastases are little 'islands' of cancer cells that have spread from the primary cancer and have taken root in distant tissues and organs. It is these metastases that eventually cause death (Pantanowitz & Benn, 2002).

The majority of breast cancers (70% – 80%) arise from lobular or ductal epithelium. Intraductal tumours rarely metastasize and have a high cure rate. Carcinomas invading adjacent tissues, called infiltrating carcinomas, often metastasize early and have a poor prognosis (Lewis et al., 1996).

There are basically two staging systems that may be used to classify a breast cancer, the Manchester and TNM systems (Pantanowitz & Benn, 2002). Staging allows for the logical treatment and prognostication (prediction of outcome) for the patient.

According to both staging systems, there are four stages of breast cancer. Table 2.3 presents the staging of breast cancer according to the Manchester system

Table 2.3: Manchester system of breast cancer staging

Stage I: mass confined to the breast (mass is not fixed)
Stage II: mass in breast that has spread to axilla, but nodes are still mobile and there is no apical nodal involvement
Stage III: LOCAL in breast: a large lump (>5cm in diameter) or adverse local signs; or REGIONAL in axilla: fixed large breast mass or fixed axillary nodes or apical nodes involvement
Stage IV: remote spread of the cancer far beyond the breast (distant metastases); either via the lymph or more usually the bloodstream

The TNM (tumour, node, metastasis) classification is a variant of the Manchester system of classification. It is so called because the stages are determined by the tumour size (T), the involvement of the tumour in regional lymph nodes (N), and the presence of distant metastatic disease (M). The TNM malignant classification of breast cancers is as follows:

Tumour:

Tx: Cannot be assessed

TO: No evidence of primary tumour

Tis: Carcinoma in situ, intraductal carcinoma, lobular carcinoma in situ, Paget's disease of the nipple

T1: Tumour ≤ 2cm in greatest dimension

a ≤ 0,5cm

b > 0,5cm ≤ 1cm

c > 1cm ≤ 2cm

T2: Tumour > 2cm ≤ in greatest dimension

T3: Tumour > 5cm in greatest dimension

T4: Tumour any size with direct extension to chest wall or skin

a extension to chest wall

b oedema, including peau d'orange or ulceration of skin of breast or satellite skin nodules on same breast

c 4a and 4b

d inflammatory carcinoma

Nodes:

Nx: Regional lymph nodes cannot be assessed

NO: No regional lymph nodes metastasis

N1: Metastasis with movable ipsilateral axillary nodes

N2: Metastases with ipsilateral axillary nodes fixed to one another or to other structures

N3: Metastases to ipsilateral internal mammary nodes

Metastases:

Mx: Presence of distant metastases cannot be assessed

MO: No distant metastases

M1: Distant metastases including supraclavicular nodes

Table 2.4 presents the staging of breast cancer according to the TNM classification described above:

Table 2.4: Staging of breast cancer according to the TNM classification

Stage 0:	Tis	NO	MO
Stage I:	T1	NO	MO
Stage IIA:	TO	N1	MO
	TI	N1	MO
	T2	NO	MO
Stage IIB:	T2	N1	MO
	T3	NO	MO
Stage IIIA:	TO	N2	MO
	T1	N2	MO
	T2	N2	MO
	T3	N1	MO
	T3	N2	MO
Stage IIIB:	T4	Any N	MO
	Any T	N3	MO
Stage IV:	Any T	Any N	M1

Breast cancer differs among patients; it can range from slowly progressive to rapidly growing. It is most frequently located in the upper, outer quadrant of the breast. The preclinical phase of breast cancer may be up to eight years long. Metastases can occur before the tumour is clinically palpable.

2.5 Risk factors for breast cancer

The cause of breast cancer is not known, but is thought to be multifactorial (Ziegfield et al., 1998). All women are at risk for developing breast cancer. The biggest breast cancer risk factor is increasing age. More than 80% of breast cancer cases occur in women over 50 years (Pantanowitz & Benn, 2002).

Other risk factors include the following:

- Previous breast cancer
- Family history of the disease in first-degree relatives
- Exposure to carcinogens, such as radiation
- Nulliparity or late child bearing (first child after the age of thirty)
- Long menstrual life: early menarche or late menopause
- Obesity and high fat diets
- Use of oestrogen-containing drugs
- Excessive alcohol consumption

An additional risk factor is mammographic density. Breast tissue that appears dense on mammogram, due to large amounts of epithelial and connective tissue, is one of

the strongest established risk factors for breast cancer. Mammographic density also decreases the sensitivity of mammography. The relative importance of breast tissue density as a risk factor and the underlying mechanisms responsible for the increased risk in women with dense breast tissue are topics of ongoing research (Mincey & Perez, 2004).

An estimated 10% of all women with breast cancer have a very strong family history of the disease, as certain inherited genetic mutations predispose women to this cancer. An American clinical trial is currently investigating genetic and environmental causes of breast cancer by enrolling 50,000 sisters of women diagnosed with breast cancer. This trial is the largest of its kind and may enable researchers to learn what causes the disease (Armstrong, 2004).

There was a time when it was thought that all benign breast changes were risk factors for breast cancer. It is now clear that they are not (Leinster et al., 2000). The increased risk is related to certain specific changes, particularly atypical epithelial hyperplasia.

Current methods for defining risk include the use of the modified Gail Model, a statistical linear regression model that was developed to calculate breast cancer risk in the general population of women. The model is available as a computer disc, a slide rule, or a handheld computer (Lin, 2001). It combines relative risks associated with age, race, age at menarche, number of previous breast biopsies, history of atypical ductal hyperplasia, and family history of breast cancer in first-degree relatives. From these factors, it estimates 5-year and lifetime risks of breast cancer

development in an individual woman, using a system of scoring (Mincey & Perez, 2004). The modified Gail Model is reasonable for estimating risk in most women, but may seriously underestimate risk in women with strong family histories of breast cancer. For such women, the Claus Model, which considers only family history, can be used to estimate risk.

For high-risk women, understanding their risk, appropriate screening recommendations and prevention strategies is paramount (Gross, 2000). A risk factor does not cause breast cancer. It only intensifies the relative risk for developing the disease. However, about 75% of women who develop breast cancer have no identifiable risk factors (Lewis et al., 1996).

2.6 Clinical manifestations of breast cancer

Breast cancer is usually first detected as a lump in or near the breast. It occurs most often in the upper, outer quadrant of the breast (Lewis et al., 1998). The lump is most commonly small, firm and immobile. It is not necessarily painful, but may be tender on palpation.

Other common warning signs of an underlying breast disorder include the following:

- Satellite lesions (surrounding lumps)
- Dimpling (invasion of the breast ligaments)
- Tethering (tumour stuck to the skin)
- Puckering (tumour pulling the skin inwards)

- Lymphoedema of the breast (looks like an orange peel)
- Inversion or retraction of the nipple
- Eczema of the nipple (clinically known as Paget's disease)
- Enlargement of the nodes in the axilla or in the neck region
- Enlargement of one breast
- Enlargement of one arm
- Nipple discharge (which may be blood-stained)
- Ulceration (breaking through the skin)

Breast cancer rarely presents with mastalgia (breast pain). Paget's disease is an important lesion to recognize as 90% of women who have it, have an underlying breast cancer (Pantanowitz & Benn, 2002). It is a lesion that looks like a scaling, oozing, crusting lesion of the skin of the nipple and the areola complex. It is sometimes associated with a purulent nipple discharge.

Benign breast lumps commonly include breast cysts and fibroadenomas and do not usually require removal, unless multiplying or enlarging (Leinster et al., 2000). One of the most important objectives in the management of patients with benign breast disease is reassurance.

A definitive diagnosis of breast cancer is often based on a triple assessment. This includes a clinical examination, imaging and tissue diagnosis. Imaging modalities routinely used are mainly mammography and ultrasonography (Leinster et al., 2000).

2.7 Treatment of breast cancer

Advances in screening, diagnosis, and treatment of breast cancer continue to influence the approach to patients with breast cancer. In general, the earlier a breast cancer is detected the better the prognosis. However, early detection is only as good as the treatments that follow. The treatment of breast cancer varies according to the breast cancer type, stage and hormone sensitivity (Ziegfield et al., 1998). Early breast cancer is a curable disease. Treatments are often combined to eliminate all evidence of the disease, to prevent tumour recurrence, or to provide symptomatic relief of metastatic lesions.

Two principle goals of treatment of breast cancer are the long-term control of local disease and the prevention of distant disease. Surgery remains the mainstay of local control, and includes partial or total removal of breast tissue. An operation to remove the cancer but not the breast is called breast-conserving surgery, and includes lumpectomies and partial mastectomies. Surgical removal of all or most of the breast, is a mastectomy. Radiation therapy is another form of local treatment, often used in conjunction with surgery (Ziegfield et al., 1998).

The introduction of adjuvant therapy has been one of the most important advantages in the management of breast cancer. Adjuvant therapy is given to eliminate or control micro-metastases (which may be present, yet undetectable, at the time of treatment). It is also given to reduce the chances of distant recurrence. Two categories of adjuvant therapy are anti-oestrogen hormonal therapy and chemotherapy (Leinster et al., 2000). These systemic treatments are given after the primary treatment and are

aimed at destroying any remaining cancer cells and preventing the cancer from recurring, in the breast or elsewhere. If both chemotherapy and hormonal therapy are recommended, the chemotherapy is given first to minimize toxicity and improve efficacy (Mincey & Perez, 2004).

2.8 Prognosis of breast cancer

Prediction of prognosis of breast cancer depends on the size of the tumour, the extent of lymph node involvement, and the biological characteristics of the tumour (whether it is aggressive or not). A number of genetic abnormalities seen in breast tumours can be used to estimate the prognosis for a given tumour. If breast cancer is detected early enough, and before it has metastasised, the woman has a survival rate of more than 90% (Pantanowitz & Benn, 2002). Combination therapy, which includes surgery and adjuvant therapy, in the general population is believed to decrease the mortality rate by as much as 20%. In South Africa, the five-year survival rate is 64% among black women and 80% among white women (Smith & Maurer, 1995). Figure 2.4 is a graphic representation of the prognosis of breast cancer.

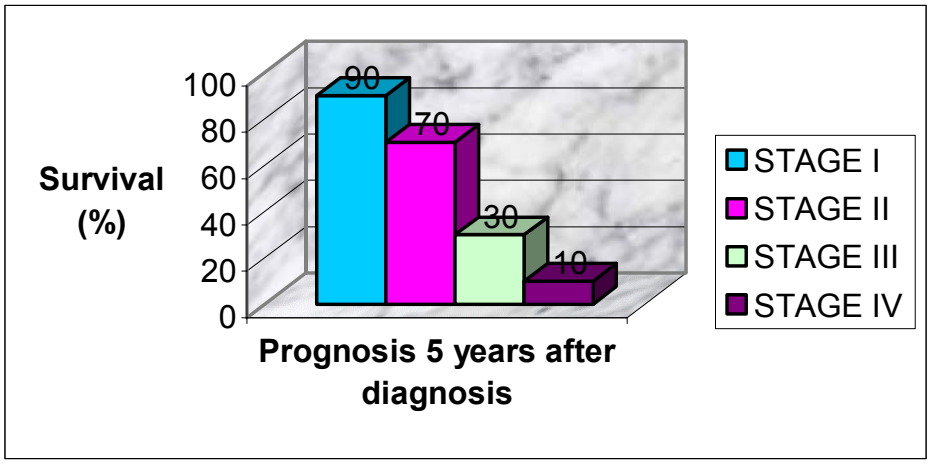

Figure 2.5: Prognosis of breast cancer (by stage and with appropriate treatment)

2.9 Complications of breast cancer

The main complication of breast cancer is recurrence, which may be local or distant. About half of all women with breast cancer will suffer some form of recurrence, and one half of all patients will eventually present with distant metastases and die from their illness (McPherson & Waller, 1997). Two-thirds of all recurrences occur during the first five years of the initial diagnosis.

Patients with breast cancer continue to be at risk for metastatic disease for twenty or more years after diagnosis. Therefore, clinical vigilance and prompt diagnostic evaluation of abnormal signs and symptoms are recommended (Mincey & Perez, 2004). The most common sites of metastatic disease are bone, liver, lungs, skin, and brain.

There is also an extensive psychological impact, which needs to be addressed by health care professionals. Most women who present with breast symptoms are emotionally distressed, some to the point of clinical depression (Leinster et al., 2000). As many as 30% of patients newly diagnosed with breast cancer develop an anxiety or depressive illness within a year of diagnosis (Tessaro & Herman, 2000).

2.10 The prevention of breast cancer

Prevention of breast cancer is the key to decreasing the mortality from the disease. There are several options aimed at preventing breast cancer, although none have been proven to guarantee complete freedom from the risk of the disease occurring. For breast cancer, primary prevention includes educating women of breast cancer risk factors, and influencing behavioural changes. Secondary prevention includes screening. Screening strategies are aimed at early detection with a view to early intervention (Madanat & Merrill, 2002).

Although there is no medication proven to prevent breast cancer, tests are presently underway (Warren, 2002). The drug Tamoxifen, a selective oestrogen receptor, seems to reduce the incidence of new cancer in women who are at increased risk for the disease. It was demonstrated to reduce the incidence of breast cancer by 47% and was approved by the Food and Drug Administration for breast cancer reduction. Raloxifene, a newer selective oestrogen modulator, may also decrease the risk by 50%, and has fewer side effects. The Study of Tamoxifen and Raloxifene (STAR) trial is comparing five years of Tamoxifen use versus Raloxifene use.

Currently, 22 000 high-risk post-menopausal women (as determined by the modified Gail Model) are being tested (Mincey & Perez, 2004). In addition, researchers at the City of Hope Cancer Centre in the United States of America, are experimenting with a nasal spray called Desilorelin, which could prevent breast cancer in younger women (Warren, 2002).

Individual women who have a substantially elevated risk of breast cancer development may consider surgical options for the prevention of breast cancer. These women need appropriate counseling in this regard. Although not an option chosen by many, available data regarding risk reduction with surgical prophylaxis indicate that bilateral mastectomy reduces the risk of breast cancer development by approximately 90%. Oophorectomy reduces this risk by approximately 50% if performed after menopause. These risk reductions are based on retrospective, observational studies and on more recent prospective observational studies of women at high risk (Mincey & Perez, 2004).

At present, the only feasible means of prevention of breast cancer is screening. Screening is a form of secondary prevention. Screening is the periodic evaluation of a population to detect previously unrecognised disease. The primary objective of screening is the detection of breast cancer in its early stages in order to treat it and thus deter its progression. The secondary objective of screening is to reduce the costs of treating the disease by avoiding the more vigourous interventions required during its later stages (Edelman & Mandle, 1994). Screening takes advantage of the early pathogenic state of breast cancer. With early detection, the cancer is often localized

and responds better to treatment. The only screening method proved to result in decreased mortality is regular mammography.

Early mammography screening in the general population is believed to reduce mortality rates by 20% (Pantanowitz & Benn, 2002). This test is fairly expensive in monetary terms and requires highly skilled medical and technical staff (Leinster et al., 2000). A screening test should be relatively inexpensive, easily reproducible and feasible (Whitman, 1999). In an attempt to overcome these obstacles to mammography screening in the developing world, the introduction of a programme of regular breast self-examinations may result in presentation of the disease at an earlier stage, with a consequent improvement in survival. There needs to be ongoing screening in low-income and culturally diverse communities such as those in South Africa. Ongoing screening and prevention services should be provided to populations that have not been successfully reached through usual means such as media and referrals. This is because prevention programmes can positively affect both cost control and mortality rates.

Health promotion and maintenance practices apply to all women, regardless of their age and menstrual status. Early detection is vital. It is important for all women to be 'breast aware' and to report any changes to a health professional. Current guidelines regarding breast surveillance practices are:

- Monthly breast self-examinations from the age of twenty.
- Clinical breast examinations every three years between the ages of twenty and forty years, and annually thereafter.

- Screening mammography for asymptomatic women over the age of forty, annually (Lewis et al., 1996).

2.10.1 Breast self-examination (BSE)

The breasts are an integral part of a women's femininity and identity, yet many still choose not to examine them regularly (Wilson, 2003). It should be mandatory for every woman to examine her breasts on a monthly basis. Most breast cancers (over 90%) are found by women themselves, and there is a need to optimize their chances of doing so (McPherson & Waller, 1997).

The breasts should be examined at the same time of the month. For premenopausal women, the ideal time is ten days after the menstrual period as breasts are least tender at that time. Post-menopausally, a woman should examine her breasts at the same time of the month, every month. Breast self-examination must be incorporated as a routine monthly occurrence and should take at least fifteen to twenty minutes. Woman must be educated to examine breasts in front of a mirror, lying down, and in the shower. Women need to become familiar with what their breasts normally feel and look like in order to be able to detect any abnormalities.

Upon inspection, standing in front of the mirror, one should look for any changes in the normal look of the breasts, such as dimpling, rash, discolouration, size difference or nipple discharge. To make changes in breast appearance more easily noticeable, the woman must inspect her breast with her arms at her sides, arms overhead, firmly pressing hands on hips, and bending forward at the waist.

Next, the woman needs to lie down and palpate the breasts. She should lie on her back with a pillow placed under the right shoulder. The right hand must be placed behind the head. The flat surfaces of the three middle fingers of the left hand (medically known as the volar surface of the hand) must be used to palpate the right breast. The breast should arbitrarily be divided into four quadrants and a sub-areolar (beneath the nipple and areola) region to ensure a complete, systematic approach to examination. All five regions of the breast must be palpated using small, circular motions and pressing firmly. The nipple should be squeezed gently to assess if there is any discharge, especially in non-lactating women. The woman needs to be educated on the necessity of palpating the axillary tail (of Spence) and the axilla itself as part of a complete breast examination. This entire process must be repeated using the right hand on the left breast.

The shower is an ideal place to examine one's breasts as water and soap aid in decreasing friction, thereby making it easier to palpate the breasts systematically. The right arm should be raised when examining the right breast, and vice versa. The complete process carried out when lying down must be repeated in the shower.

The entire process of breast self-examination must be demonstrated and explained to all women by health care professionals who are proficient in teaching and demonstrating it. To increase understanding, graphic representations may enhance verbal explanations and should therefore be available in pamphlet or poster form. Annexure 1 is an example of a section of a pamphlet that is distributed freely by the Cancer Association of South Africa. It must be noted, however, that these types of

visual aids should serve to augment the teaching of breast self-examination, and not to replace it.

Women also need to be made aware of what abnormalities to look out for on breast self-examination. The following list explains the signs and symptoms of breast cancer, which must be understood by the health care provider, and subsequently explained to every woman.

Signs and symptoms of breast cancer:

1. A lump (varying in size from a marble to a tennis-ball), may be seen in the mirror or palpated

2. Puckering, tethering or dimpling of the skin of the breast

- Puckering is where a cancer may invade the overlying skin, pulling it inwards
- Tethering is where a cancer may be attached to the overlying skin
- Dimpling is where a cancer invades the breast ligaments (ligaments of Cooper), causing a malignant fibrosis and contraction of the ligament; this also pulls the skin finely inwards

3. Peau d'orange or orange peel appearance of the skin of the breast

- This is due to the cancer blocking the breast lymphatic channels, causing a lymphoedema or fluid retention and swelling of the breast (the hair follicles or skin pores give the orange skin appearance)

4. Inversion or retraction of the nipple

- If this is recent, it may mean that a cancer under the areola may be pulling the nipple inwards

- If nipple inversion has been present since birth, it is called congenital inverted nipple and has no special significance except for cosmetic appearance
- The benign problem of duct ecstasia may also cause nipple retraction

5. Eczema of the nipple (Paget's disease)

- If this is recent, if the patient has no history of eczema, and if there is no other area of eczema, then the eczema may be the first sign of an underlying cancer that is spreading to the nipple via the milk ducts

6. Enlargement of the nodes in the axilla or the neck above the collar-bone (supraclavicular nodes)

7. Enlargement of one breast

- Normally one breast may be slightly larger than the other, but this will always have been so since puberty or after breast-feeding; if it is recent, there may be an underlying cancer

8. Enlargement of one arm

- Lymphoedema of the arm may be due to extensive metastatic involvement of the ipsilateral (same side) axilla with breast cancer, thus blocking the normal lymph drainage of the arm

9. Discharge from the nipple

- Gently squeeze the breast in all four quadrants and the nipple/ areola region
- A clear or greenish discharge is almost always innocent
- A red, black or brown discharge means it probably contains blood and it may be due to breast cancer

10. Skin ulcer

It is essential that all women know to seek professional advice upon detection of any abnormalities during a breast self-examination. Women also need to be made aware of the fact that most palpable lumps are benign and need not warrant fear or panic. However, emphasis must be placed on the fact that early detection of breast cancer can mean complete cure from the disease (Pantanowitz & Benn, 2002).

2.10.2 Clinical breast examination

There is clear evidence from the literature that nurses are effective in detecting breast cancer by clinical examination (Leinster et al., 2000). The clinical breast examination is a vital part of breast cancer screening and surveillance because up to ten percent of breast cancers may be clinically evident while mammographically occult (Pantanowitz & Benn, 2002).

Several different approaches may be made to clinical breast examination. It is of no consequence which approach is used, as long as the examination is carried out systematically (Leinster et al., 1998). If there is any doubt on examination, the woman must be referred, if only to put her own mind at ease. Clinical breast examinations entail the systematic inspection and palpation of both breasts. The routine is much the same as for self-examination.

Inspection:

Some signs of breast cancer may be visible on inspection. To inspect the breasts thoroughly, the entire upper torso must be exposed. Inspection of the woman's breasts should be carried out from the front, with the woman's arms at her sides, on

her hips and above her head, and then with the upper body leaning forward. These positions will accentuate retraction of the nipples and skin changes as they cause contraction of the pectoral muscles. Skin dimpling and retraction may result from tumour infiltration. Recent nipple inversion may also be indicative of tumour growth (Ziegfield et al., 1998). Skin changes, which may appear thickened with prominent pores, result from obstructed lymph drainage. An important element in inspection is a comparison between the two sides; the breasts must be inspected for symmetry and size changes.

Palpation:

Palpation allows the nurse to determine the condition of underlying breast tissue and lymph nodes. It should be carried out with the flat of the middle three fingers in a systematic fashion. The patient should be positioned so that the areolar complex is central in the breast. For most women, this is achieved by raising their arms above their head. The larger the breast, the more horizontal the woman may need to be to achieve this (McPherson & Waller, 1997).

If differences between the two breasts were noted on inspection, the normal side should be palpated first. Each quadrant of the breast as well as the axilla must be assessed carefully using a circular hand movement. The supraclavicular and infraclavicular nodes must also be palpated, as should the neck for cervical nodes. A palpable node is a small mass that is often hard, tender and immobile (Potter & Perry, 1993). Palpable lymph nodes are frequently an indication of metastasis.

Breast masses develop most frequently in the upper, outer quadrant of the breast. Tumours are more often found in the left breast than the right (Ziegfield et al., 1998). Cancerous lesions are hard, fixed, non-tender and irregular in shape.

Nipple discharge may result from a local lesion. Palpating each quadrant with one finger and observing when the discharge occurs from the duct can identify the involved quadrant of the breast (Pantanowitz & Benn, 2002).

2.10.3 Mammography

A mammogram is a special type of x-ray of the breasts, which remains the cornerstone of screening. It has three main indications:

- To show the features of a breast lump
- To show if there is an impalpable lesion
- To screen for breast cancer

(Ziegfield et al., 1998).

Mammography is therefore useful in screening asymptomatic women, evaluating palpable masses and monitoring women who are at high risk for breast cancer. In 1998, several studies were published, reinforcing the value of screening mammography in women aged 40 years and older (Whitman, 1999). Young women at increased risk of breast cancer development should be advised to undergo regular mammograms before the age of 40 (Mincey & Perez, 2004). Mammograms find more tumours at earlier stages of development than any other screening test currently

available. However, even the best mammograms miss about ten per cent of breast cancers (Gorman, 2002).

About the smallest tumour a mammogram can pick up is 0,5cm to 1cm in diameter. By contrast, the average cancers that are felt by either women or health professionals are around 2,5cm. Screening mammography has thus been shown to reduce breast cancer mortality by detecting small, non-palpable, early-stage breast cancers. Mammography screening can reduce breast cancer deaths by 20% to 39% (Wee, McCarthy, Davis & Phillips, 2004). In randomized clinical trials, mammography screening of women aged 40 years and older has resulted in reduced cancer deaths by 29% to 45% (Whitman, 1999).

Research indicates that low-income women undergo mammography screening less frequently than the general population (Ziegfield et al., 1998). They are therefore more likely to be diagnosed at a later stage of the disease. A study in Seattle in 1999 revealed a number of factors that differentiated the regularly screened women from those who had not undergone screening. These include misconceptions about mammograms; expense; lack of discussion with health care providers; scheduling considerations; transportation problems and lack of social support (Whitman, 1999). It is a fair assumption that these factors apply to South African women of low-income groups, and therefore presents a challenge for the nurses in this country.

2.11 The nurse's role with regard to breast cancer prevention

The role of the nurse in reducing breast cancer mortality focuses largely on educating and empowering women. Nurses are also needed as advocates for patients to encourage physicians to recommend mammograms (Ellerhost-Ryan and Goeldner, 1992). The role of the nurse in health promotion focuses on educating women about their risk factors and the importance of participating in early detection practices. The detection of early stage breast cancer requires knowledge, skill, dedication, and commitment on the part of the nurse (Roberts & Birch, 2001). Nurses therefore have a professional obligation to be knowledgeable in the area of breast cancer prevention.

Nursing is predominantly a women's profession. Nurses are in an optimal position to assume roles in diverse settings as advocates, decision-makers and policy-planners. Female nurses can focus on the importance of primary care, prevention and health promotion for women by women. Teaching women the importance of caring for themselves is the first step (Ellerhorst-Ryan and Goeldner, 1992).

Nurses have a commitment to empower women with knowledge and safe care. Contemporary nursing requires that nurses possess knowledge and skills in a variety of areas to enable them to meet this commitment. Nurses have a vital role to play in encouraging women to become more 'breast aware'. Their health promotion activities in the area of breast awareness can have a substantial impact on the uptake of breast screening initiatives (Bailey, 2000). In addition, nurses who become familiar with newer treatment options for metastatic breast cancer are better able to provide

information and support for their patients, and can therefore assist in decision-making.

Women have a need both for adequate information and for social and emotional support. Nurses and nursing students have extensive contact with patients and therefore play an important role in meeting the needs of these women. In 1996, a programme of cancer screening services was planned, implemented and evaluated by nursing students as part of the comprehensive care provided in a district nursing community health clinic in Texas, USA (Bailey, Bennett, Hicks, Kemp & Warren, 1996). The activities formed part of the students' community health clinical experience in the last semester of a Baccalaureate nursing program. These efforts towards early detection and prevention of breast cancer in an underserved population can and should be replicated by other schools of nursing, such as those in South Africa. According to researchers, the single most important factor leading to increased breast cancer morbidity and mortality, and to resistance to screening, is possibly socioeconomic disadvantage (Ziegfield et al., 1998). The role of the nurse, with regard to decreasing the mortality from breast cancer, in these disadvantaged communities in South Africa cannot be adequately emphasised.

The screening role of the nurse should be part of accepted nursing practice as screening is a valuable preventative tool. The nurse is often the health care provider who teaches women how to do breast self-examinations, and who performs clinical breast examinations. Competence in these skills is therefore critical. Competence is essentially a state of having the knowledge, judgement, skills, energy, experience and motivation required to respond adequately to the demands of one's profession. Caring

demands competence and is the basis and precondition of all cure (Tschudin, 1992). Therefore, the caring role of the nurse with regard to breast cancer prevention is a significant one.

Nursing represents a significant professional resource that can help facilitate positive changes through health education strategies. Health education is aimed at the promotion of health and prevention of disease. There are compelling reasons for nurses to become leading patient educators. Nurses should be experts on the process of a common illness such as breast cancer, from their own experience and from their knowledge of what is in the literature (Monsivais & Reynolds, 2003). The combined health educator-screener role of the nurse means also that the nurse should evaluate clients for additional risk factors and teach them means of altering or improving these risks. It is important too to plan and develop an efficient referral system to enhance continuity of care and to ensure compliance with the recommended referral. Thus, a team approach is essential in breast cancer prevention strategies.

South African nurses and nursing students are exposed to a variety of cultures, and challenges within the belief systems of diverse cultures. Improved practice calls for an understanding of these cultures and requires considerable self-education and a subsequent refinement of delivery of care (Facione & Katapodi, 2000). Studies have revealed that cancer is generally not perceived as a serious health problem in developing countries where the threat of infectious disease is significant. This is despite the fact that cancer deaths in developing countries exceed those in developed countries (Ali & Khalil, 1996; Boffet & Parkin, 1994; cited in Rajaram & Rashidi, 1999). Some women in developing countries are less likely to perceive breast cancer

as a serious illness that can be prevented. Cultural belief systems relating to cancer and cancer prevention need to be addressed in health educational efforts by nurses. For health education to be assimilated by diverse populations, it must be presented within the socio-religious and cultural context of the target population. This is due to the fact that some socio-cultural beliefs about cancer and cancer screening create barriers to practicing breast cancer screening (Facione & Katapodi, 2000).

Community nursing encompasses community assessment, primary care, home health care, and health promotion and disease prevention; and is driven by individual, family and community needs. For the role of the nurse to be successful, it must be based on a balance between the population's health needs and the nursing professions effective contributions (Edelman & Mandle, 1994).

In South Africa, the ANC has developed a National Health Plan based on a Primary Health Care (PHC) approach. This change will inevitably bring about some transformations, not only of the health services and of the training and research institutions, but also of the attitudes of both health providers and those demanding health services. PHC offers the only viable alternative for sustainable and equitable health development. The prevention of breast cancer is an example of a PHC approach as it focuses on preventive and promotive, rather than curative, activities. From an economic perspective, breast cancer is ranked as the number one health care cost in several countries. The high economic and social costs of breast cancer mean that reducing deaths, and increasing the numbers of women, who receive early intervention and treatment, have become important goals at national level. Because nurses and nursing students play an important role in breast cancer prevention and

education, these topics need to be comprehensively covered within the educational programs of nursing schools in South Africa. Educational efforts are vital avenues through which nurses can learn more about the primary and secondary prevention of breast cancer (Wilson, 2003).

2.12 Cancer care resources

Nurses and nursing students need to be aware of available resources of information and support for breast cancer patients, to be able to refer patients and families appropriately. Three such resources are:

- Reach for Recovery: (011) 646-5628
- Netcare Breast-Care Centre of Excellence: 0860-233-233
- CANSA (The Cancer Association of South Africa): 0800-226-622
- www.breasthealth.co.za
- www.breastcancer.org

These organizations provide, amongst other services, information, education, support groups and equipment.

2.13 Summary

The literature reviewed for this study provided insight into breast cancer, and the management and prevention thereof. It also clarified the role of the nurse in the rapidly developing field of breast cancer prevention, and thereby supported the belief

that nurses need to have a sound knowledge base and adequate practical skills to fulfil their role.

The literature review provided the researcher with a framework for developing the research methodology, which is described in the next chapter.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the methodology for the study. It includes the design, setting population and sample, and explains how data were collected and analysed. The validity and reliability of the data collection instrument are discussed and ethical considerations of the study are outlined.

3.2 Research design

A descriptive survey was used to gather data relevant for this research. This method enabled the researcher to effectively assess the awareness, knowledge and skills of final-year undergraduate nursing students with regard to breast cancer prevention.

Descriptive studies involve collecting accurate data on the domain to be studied. By 'survey' is meant the empirical and logical investigation that involves the systematic and impartial collection of data from a sample of cases, as well as statistical analysis of the findings (Burns & Grove, 2001). In this study, it involved the collection of data from a sample of final-year undergraduate nursing students. The data collected were statistically analysed to provide objective information about their knowledge and skills relating to breast cancer prevention.

3.3 Research setting

The research setting was the nursing education departments of three universities in the Gauteng province. The subject information letter and questionnaire were distributed by the researcher in a lecture theatre or classroom, with time allocated for completion. The practical assessment took place in a separate area of the classroom or lecture theatre with adequate space for a table and two chairs.

3.4 Population and sample

The study population consisted of all the final-year undergraduate nursing students at three universities in the Gauteng province (N=73). The entire population was invited to participate. All the participants were used as the study sample. The students could exercise their right not to participate in the study, or to withdraw prior to completion of the study. The sample size was therefore adjusted accordingly. The final number of students who agreed to participate was determined at the onset of the study (n=62).

3.5 Data collection

3.5.1 Data collection technique

Data were collected from final-year undergraduate nursing students at three universities in Gauteng between June and September 2004. Data were collected in two ways. Firstly, data relating to the theoretical knowledge of breast cancer

prevention was collected by means of an appropriate self-compiled written questionnaire (Annexure 2). The second method of data collection was by means of direct, structured observation, with a self-compiled checklist (Annexure 3) as the instrument for recording data.

3.5.2 Data collection instruments

The questionnaire consisted of open-ended, close-ended and Likert scale-type questions, which were goal-directed and specific to breast cancer prevention. The first part of the questionnaire was designed to assess the students' orientation towards the issue of breast cancer prevention. It also aimed to gauge the students' perceptions relating to their preparedness in carrying out clinical breast examinations, and educating clients about breast cancer issues and breast self-examinations. Thus, the first part of the questionnaire aimed to meet the first objective of the study.

The second and third parts of the questionnaire focused on the students' theoretical knowledge relating to breast cancer risk factors and breast cancer screening and surveillance practices respectively. These parts aimed to meet the second research objective, namely to assess the theoretical knowledge of the nursing students with regard to breast cancer prevention. The final part of the questionnaire was to gather demographic data for the study, and required the age and gender of the participants.

Using a written questionnaire ensured that questions were presented in a consistent manner. The completed questionnaires were analysed according to the model responses developed by the researcher. These were extracted from recent literature,

current standards of practice and recent research findings. The researcher carried out content analysis in order to extract meaning from the responses to the open-ended questions.

Direct, structured observation was the second method of data collection for this study. The researcher observed and recorded certain aspects of an individual nursing students' skill in examining a breast. The participants were asked to examine a breast model that has five strategically placed lumps in situ (Annexure 4). The model is one that is used in the training of health professionals to correctly examine a breast. The lumps are made to feel as close to a real breast lump as possible. The instrument for data collection was a checklist. A checklist is a technique used to indicate whether or not a behaviour has occurred. In this study, the behaviour comprised critical points on a breast examination carried out by the student. Observations were made directly by the researcher, recorded on the checklist, and then coded. This ensured uniformity in statistical calculations. By using a breast model and checklist to collect data, the researcher was able to meet the third research objective, namely to assess the nursing students' psychomotor skill in performing a clinical breast examination.

Both the instruments for data collection for this study were constructed in English to accommodate all the participants in the study sample, as well as to allow the researcher to process the information effectively.

3.5.3 Data collection procedure

Permission to invite the students to participate in the study was first requested in writing (Annexure 5), and was verbally granted, from the Heads of the Nursing Departments of the three universities. Dates and times for data collection were then arranged at the mutual convenience of the students, relevant lecturers and the researcher.

The researcher visited each university twice to ensure contact with the majority of the final-year nursing students. The process of data collection therefore took six days in total. After distributing the subject information letters (Annexure 6) to the students, the questionnaires were given to potential participants. The completed questionnaires were collected individually at the time of the individual observations of the breast examinations, which followed thereafter. This was done to ensure correct numerical correspondence of the participant's questionnaire and checklist, with a view to enabling accurate data collection and valuable comparisons.

The researcher alone collected the data for this study, thereby ruling out the possibility of bias and non-equivalence.

3.6 Validity and reliability of the data collection instruments

Since no instruments existed that could gather and record the information required for this study, new tools had to be developed by the researcher. The issues of validity and reliability refer to characteristics of the instruments that make them usable and are an

indication of whether or not the instruments truly reflect the variables that the study wishes to measure.

3.6.1. Validity

Validity is the main criterion by which the quality of an instrument is evaluated. It refers to the degree to which an instrument measures what it is supposed to be measuring (Burns & Grove, 2001). Validity information thus gives some indication of how well an instrument measures a given area, under certain circumstances, and with a given group (Burns, 2000). In this study, that refers to the knowledge and skills of final-year undergraduate nursing students regarding breast cancer prevention.

Validity has a number of different assessment approaches, including face and content validity. Face validity was ensured by using recent literature to compile the items in the questionnaire (Annexure 2) and the checklist (Annexure 3) according to their relatedness, specifically and exclusively to the subject of breast cancer prevention. A group of experienced nurse educators adjudged the instruments to possess face validity.

Content validity focuses on the degree of balance and representativeness or sampling adequacy of the content of the data collection instruments. The content of the constructed data collection instruments includes all the essential aspects of breast cancer prevention from the nurse's point of view. This information was established by the researcher from a thorough literature study, as well as from the standards for

breast self-examination from the Cancer Association of South Africa and the Netcare Breast- Care Centre of Excellence. These aspects appear in a balanced and representative manner on both the questionnaire and the checklist, and thus ensure the content validity of the instruments. The design of the questionnaire also reflects the relative degree of importance of each essential aspect of breast cancer prevention.

Predictive validity involves the wish to predict performance on some other criterion (Burns, 2000). It is a fair assumption that the instruments fulfilled the criteria of predictive validity as they objectively assessed the nursing students' knowledge and made use of a life-like breast model to assess the students' psychomotor skills. The instruments were thus able to predict the students' responses and behaviours in a clinical context.

The research was contextualised in that only final-year undergraduate nursing students were included in the research. No person other than the researcher collected data.

3.6.2 Reliability

By reliability is meant the degree of consistency or accuracy with which an instrument measures the attribute it is designed to measure (Burns, 2000). The reliability of the instruments was pre-tested in the form of a pilot-study to measure their reliability. Reliability testing examines the amount of random error in the measurement technique (Burns & Grove, 2001). It is concerned with characteristics such as dependability, stability, consistency, accuracy and comparability.

Stability is concerned with the consistency of repeated measures of the same attribute with the use of the same instrument. It is usually referred to as test-retest reliability (Burns & Grove, 2001). The test-retest reliability of a data collection instrument is expressed as the correlations between the scores from two administrations of the same instrument to the same students (Burns, 2000). The knowledge and skills being measured in this study were tested and then retested using a pilot group of four students. A period of eight days was allowed to lapse between the two testing times. After retesting, correlation analysis was performed on the scores from the two measures. High correlation coefficients (r=0,92 for the questionnaire and r=0,87 for the checklist) were obtained, which indicated a high stability of measurement by both the instruments.

Use of this technique required the assumption that the factor to be measured, namely the knowledge and skills of breast cancer prevention of final-year undergraduate nursing students, remained the same at the two testing times. The rationale of the test-retest method implies that the same level of cognitive, intellectual, motivational and personality variables are demonstrated on each occasion (Burns, 2000).

3.7 Pilot study

A pilot study was conducted utilizing a convenience sample of four final-year undergraduate nursing students, approximately one month prior to the actual study. This study provided a miniature trial run of the planned methodology and an opportunity to adjust or refine the instruments for data collection if necessary. It also allowed the researcher to determine if the information elicited would lend itself to

statistical analysis. The instruments used to collect data were found to elicit the information required to meet the objectives of the study.

The pilot study allowed the researcher to test the reliability of the instruments by means of a test-retest method and correlation analysis. The coefficient of stability (r) was 0,92 for the questionnaire and 0,87 for the checklist. Both these values reflect a high stability of the items of the instruments.

3.8 Data analysis

The collected data were analysed using descriptive statistics and bivariable analyses. Content analysis had to first be carried out by the researcher in order to extract meaning from responses to open-ended questions. Data analysis was done utilizing two computer software packages, Moonstats and Microsoft Excel. A statistician was consulted for this purpose. The researcher employed frequency distributions to summarise and describe the data. All tests of significance were based on the 5% level and correlation analyses were based on Pearson's product-moment correlation. The results of the study are presented by means of charts and graphs in Chapter Four.

3.9 Ethical considerations

This research proposal was submitted to the University of the Witwatersrand's Committee for Research on Human Subjects, and ethical approval was obtained (Annexure 7). The University of the Witwatersrand's Postgraduate Committee also

granted approval of the protocol (Annexure 8). Permission to conduct the research was requested in writing (Annexure 5) from the Heads of Nursing Departments of the three universities invited to participate in this study. Permission was granted telephonically and via e-mail. Each participant received an information letter (Annexure 6), which explained the purpose of the study and guaranteed his or her anonymity. The information letter also requested voluntary participation in the study, and allowed permission for withdrawal from the study with no consequence to the student or to their university.

The identities of the universities and the participants were protected at all times by the researcher and will not be publicly disclosed at any stage. The questionnaires did not require the disclosure of the participant's name or student number. Number only identified each questionnaire and corresponding checklist. The raw data were kept safe and confidential by the researcher alone.

As part of the researcher's ethical responsibility to educate those students who were found to have knowledge and/or skill deficits in relation to breast cancer prevention, an educational package was given to all students who participated in the study. This supplementary learning package consisted of standard, graphic guidelines for breast self-examination, basic theory surrounding the issue of breast cancer, and breast cancer awareness paraphernalia. These packages were given to all participants on the assumption that the participants' knowledge and skills were generally not of optimum standard, and that if they are, then the package will serve as a reinforcement of it. The participants received the package upon completion of the data collection, so as not to have presented it as a form of coercion or bribery. Giving the identical package to all

participants ensured that students with different levels of knowledge did not feel discriminated against.

3.10 Summary

The methodology chosen for this study proved to be satisfactory as it enabled the researcher to gather and analyse the data necessary for meeting the research objectives. This chapter described the methodology in detail. The next chapter provides descriptions and graphic presentations of the findings of this study.

CHAPTER FOUR

RESULTS

4.1 Introduction

The data collected for the study were organised, collated and then statistically analysed by the researcher. A statistician was consulted to ensure accuracy of the findings. This chapter describes and presents the findings graphically.

4.2 Approach to data analysis

The data collected for the study were analysed with the aid of two computer software packages, namely MoonStats and Microsoft Excel. MoonStats is a stand-alone statistical software program that provides the statistical tools for data exploration and data description. Microsoft Excel enabled the researcher to collate the collected data, and to create customised graphs to present the statistical findings of the study.

4.3 Results of the study

The results of the study will be discussed, and graphically presented in the following order:

- Demographics of the sample
- Student nurses' orientation towards breast cancer prevention
- Theoretical knowledge of breast cancer prevention

- Psychomotor skill competence in breast examination

4.3.1 Demographics of the sample

The population of this study consisted of all the final-year undergraduate nursing students at three universities, who were present on the occasions during which the researcher invited them to participate (N=73). Seven students completed part of the study before choosing to withdraw; two students chose to not participate at all. The study sample therefore consisted of sixty-two students (n=62), who participated fully in the research.

The ages of the sample (n=62) ranged from 20 to 35 years of age. Twenty-seven percent (n=17) of the students were 22 years old. Twenty-six percent (n=16) were 21 years of age, and eighteen percent (n=11) were 23 years of age. The remaining thirty-nine percent (n=44) of the students occurred in smaller percentages across the range of ages. The mean age of the sample was 23 years. There is a unimodal distribution of age; the mode of ages of the sample was 22 years; the median is also 22 years. The specific distribution of ages across the sample is represented in Figure 4.1.

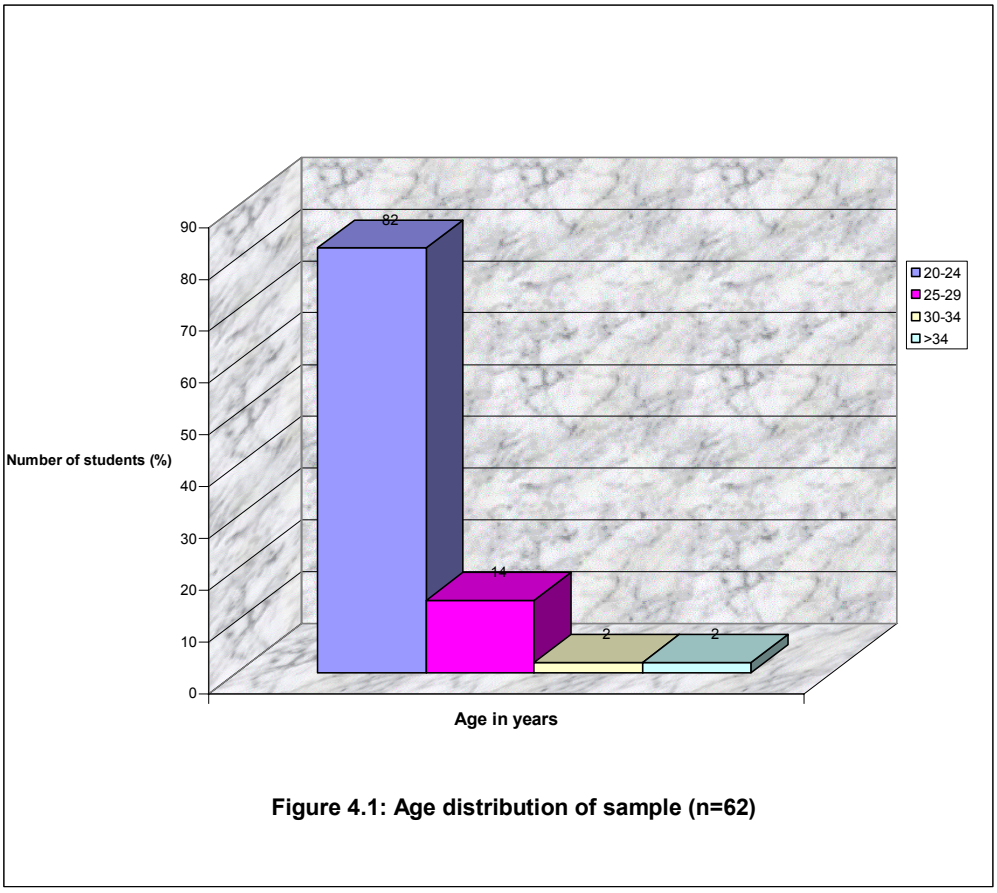

Figure 4.1: Age distribution of sample (n=62)

Ninety-two percent (n=57) of the participants in the study were female and eight percent (n=5) were male. See Figure 4.2.

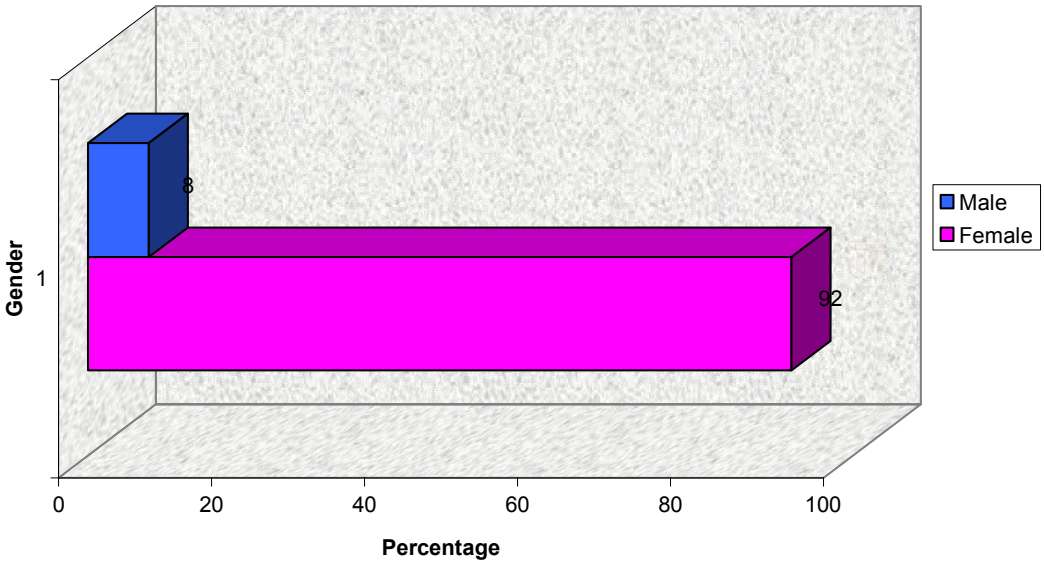

Figure 4.2: Gender of sample (n=62)

4.3.2 Student nurses'orientation towards breast cancer prevention

The first part of the questionnaire was designed to elicit information necessary to meet the first objective of the study, namely to determine the orientation of the student nurses towards breast cancer preventative issues. Most of the students proved to have a very positive orientation towards breast cancer prevention. Overall, 63% (n=39) of the students felt strongly about the importance of breast cancer prevention to themselves and to the nursing profession. Thirty-four percent (n=21) of the students agreed that breast cancer prevention was important and were positively orientated to the issue. Three percent (n=2) remained uncertain in their views about breast cancer prevention. These students were neither positively nor negatively orientated towards breast cancer prevention. None of the students revealed a negative

orientation towards the issue of breast cancer prevention. The orientation of the students towards breast cancer prevention is graphically represented in Figure 4.3.

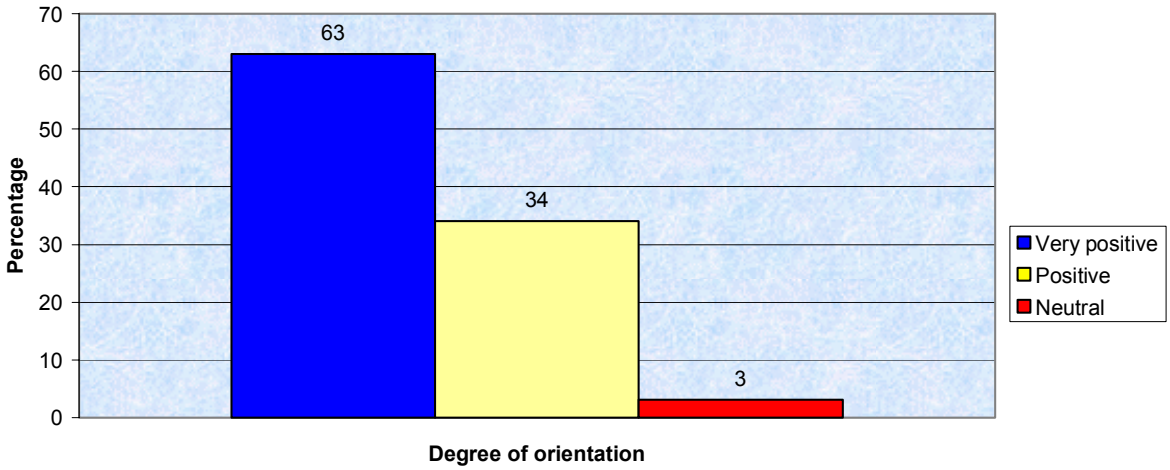

Figure 4.3: Orientation towards breast cancer prevention (n=62)

4.3.3 Student perceptions regarding preparedness with regard to breast cancer preventative issues

Nineteen percent (n=12) of the students strongly agreed that breast cancer education had been comprehensively covered in their curricula. Forty-four percent (n=27) of the students agreed with this statement. Nineteen percent (n=12) of the students were unsure as to whether breast cancer education had been adequately covered in their curricula. The remaining 18% (n=11) of the students did not think that the topic had been comprehensively covered.

Of the 62 students, 80% (n=50) indicated that they felt adequately prepared to perform a clinical breast examination. Fifteen percent (n=9) were uncertain about

their adequacy in performing a clinical breast examination and 5% (n=3) expressed the view that they felt inadequately prepared to perform the examination.

Eighty-three percent (n=52) of the students expressed that their education had prepared them adequately to educate clients on breast self-examinations. Thirteen percent (n=8) were uncertain about the issue. Four percent (n=2) expressed that they felt inadequately prepared to educate clients on breast self-examinations.

4.3.4 Theoretical knowledge

The second and third parts of the questionnaire aimed to assess the nursing students' awareness and theoretical knowledge of breast cancer prevention. The mean score for the theoretical component of the questionnaire was 56%. The standard deviation was 11. The lowest score for theory was 31% and the highest score was 79%. The median was 55%. There was a bimodal distribution in the students' scores for theory, as the modes were 55% and 62%. The distribution of scores was negatively skewed, as the skewness was calculated to be –0,18. Figure 4.4 graphically presents the relative scores for the theoretical component of data collection. A discussion of specific knowledge areas and their presentations follow thereafter.

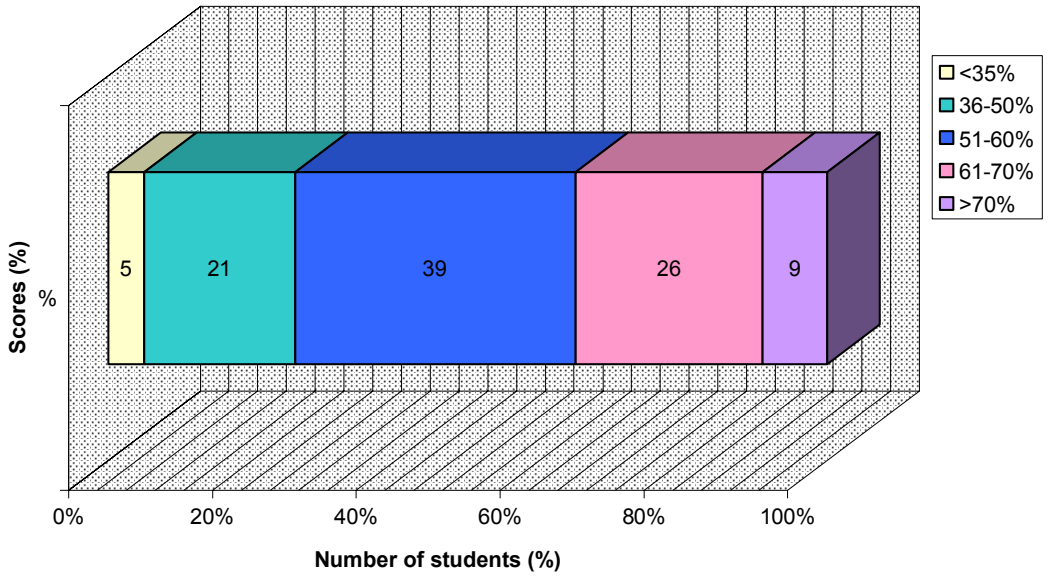

Figure 4.4: Distribution of scores for theoretical knowledge (n=62)

4.3.4.1 Knowledge regarding risk factors for breast cancer

The second part of the questionnaire aimed to assess the nursing students' theoretical knowledge regarding risk factors for breast cancer. Forty- five percent (n=28) of the students scored between 36% and 50% for this part. Sixteen percent (n=10) of the students scored below 35%, and five percent (n=3) scored above 70%. The mean score for students' knowledge regarding breast cancer risk factors was 45%. The median was 44% and there was a bimodal distribution of scores, as the modes were 44% and 56%. The range of scores was 78%, with the minimum score being 11% and the maximum score being 89%. The standard deviation for the scores in this section was 18,08. The distribution was negatively skewed, as the skewness value was –0,07. The scores for this component were distributed as indicated by Figure 4.5.

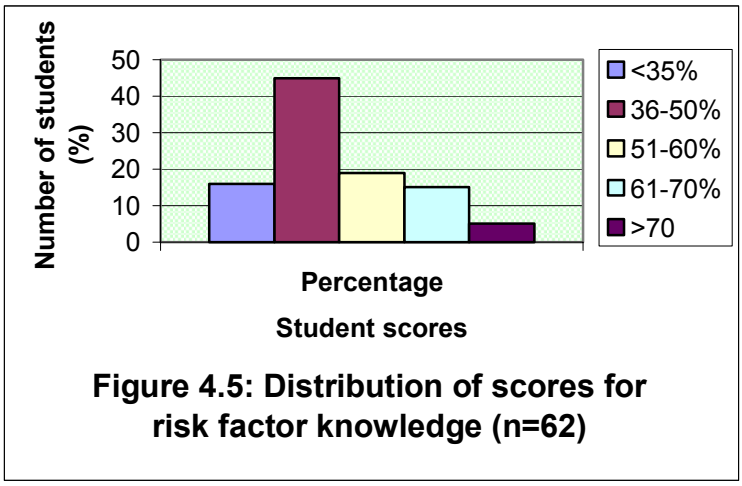

Figure 4.5: Distribution of scores for risk factor knowledge (n=62)

A South African woman's lifetime risk for developing breast cancer is one in nine. Thirty-five percent (n=22) of the students chose the correct option for this question, which is that a South African woman has a one in nine lifetime risk of developing breast cancer. Of the 65% (n=40) who answered incorrectly, 31% (n=19) largely underestimated this risk.

Within the section of the questionnaire designed to assess the students' knowledge of breast cancer risk factors, was a question asking the student to list of five risk factors for breast cancer. Only two percent (n=1) listed five correct risk factors. This, together with the majority of the students' responses, is represented by Figure 4.6.

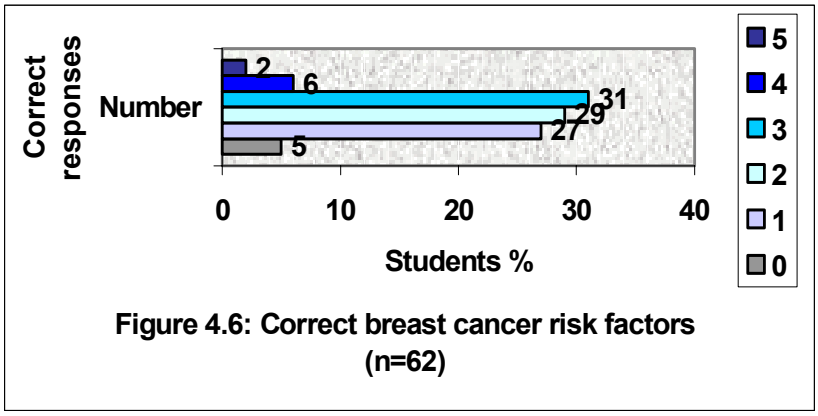

Figure 4.6: Correct breast cancer risk factors (n=62)

4.3.4.2 Knowledge regarding breast cancer screening practices

The third part of the questionnaire assessed the students' theoretical knowledge of breast cancer screening practices. Thirty-two percent (n=20) of the students scored between 61% and 70% in this section. Thirty-one percent (n=19) scored between 51% and 60%. The mean score for this section of the questionnaire was 61%. The standard deviation was 13,22. The median was 63% and the mode was 65%. There was a unimodal distribution of scores. The minimum score for knowledge regarding breast cancer screening practices was 22%, and the highest score was 90%. The range of scores was therefore 68%. There was a negatively skewed distribution of scores; the skewness was -0,34.

The distribution of scores for students' knowledge regarding breast cancer screening practices is graphically represented in Figure 4.7.

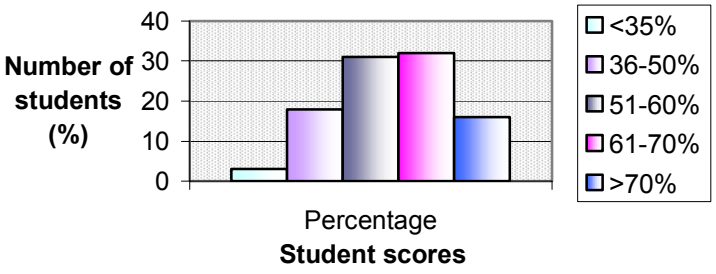

Figure 4.7: Student scores for knowledge of breast cancer screening practices (n=62)

Women who detect any abnormality in their breasts need to be referred to a physician for further investigations. Ninety-two percent (n=57) of the nursing students were correct in their response regarding the advice they would give to such women.

4.3.4.3 Awareness of available community resources

There are several different community resources that a person with breast cancer may be referred to for further information, support and education. The nursing students were asked to identify two. The majority of the students, 69% (n=43) were unable to identify any. Thirty-one percent (n=19) were able to correctly identify one community resource. No students were able to identify two correct resources. This is illustrated in Figure 4.8.

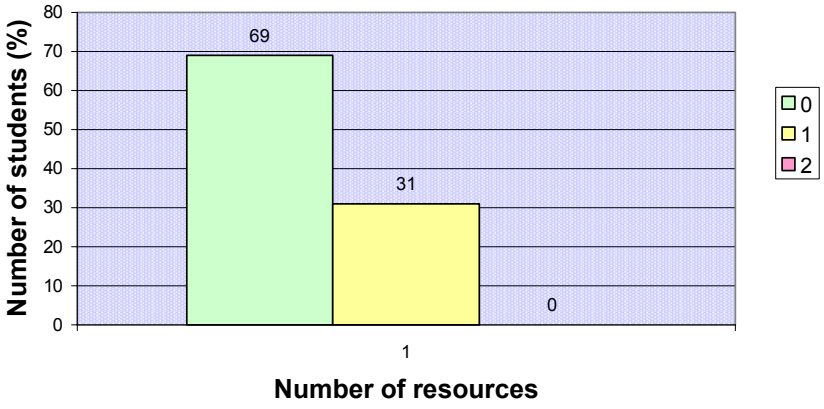

Figure 4.8: Students' identification of community resources (n=62)

Pearson's product-moment correlation (r) was calculated to determine the strength of the relationship between students' perceptions regarding their preparedness to educate clients on breast self-examinations (discussed earlier), and the overall score for knowledge regarding breast cancer screening practices. The value showed a relatively weak correlation (r=0,18). The probability value (p) is also not statistically significant (p=0,17). Therefore, the students' perceptions relating to their preparation to educate clients on breast self-examinations and their actual score for breast cancer screening practices are not statistically significantly correlated at the 5% level of significance.

4.3.5 Psychomotor skill competence in clinical breast examination

The students were assessed for competence in examining a breast using a breast model having strategically placed lumps. The nursing students were directly observed by the researcher and marked according to a checklist. The mean score for this practical skill was 45%. The standard deviation was 16. The median of the scores for the skill was 43% and the mode was 39%. The minimum score obtained was 17% and the maximum was 91%. The distribution of the scores was positively skewed, as the skewness value was 0,66. The relative scores for the practical component of the data collection is graphically represented in Figure 4.9.

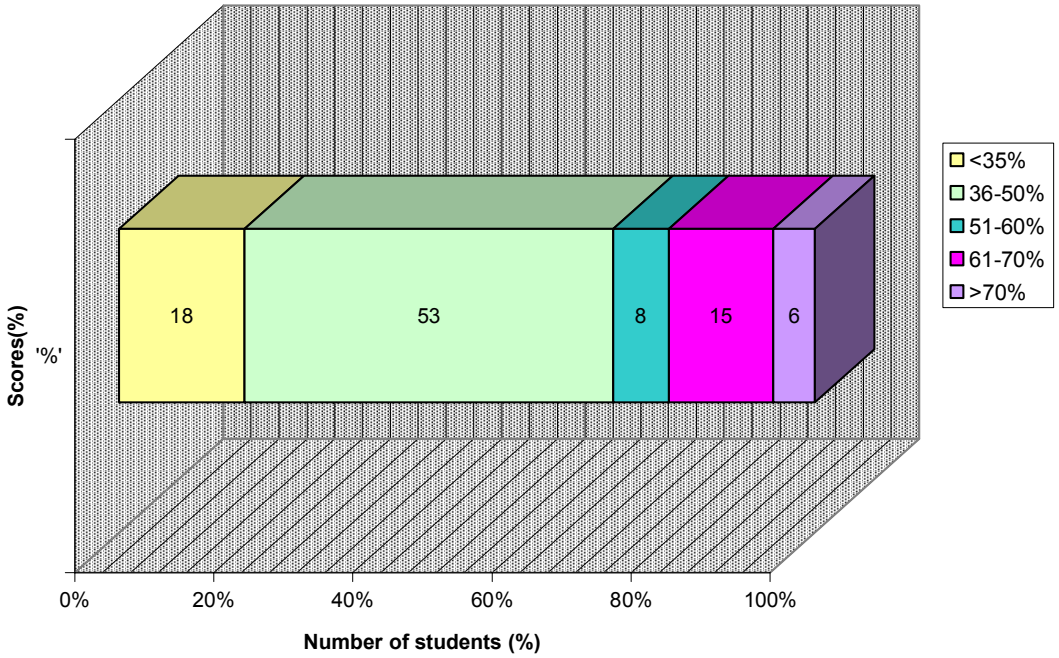

Figure 4.9: Distribution of scores for clinical breast examination (n=62)

A clinical breast examination should be done in a systematic fashion, and the students were assessed in this regard. More than half the students, 55% (n=34), did not carry

out the examination of the breast model in a systematic way. Forty-four percent (n=27) complied with this criterion.

Critical points for the palpation of the breast, essential in a clinical breast examination, were observed and recorded as to whether the behaviour occurred or not. The results for the students' palpation of the breast model was as follows:

- Eighty-five percent (n=53) used the correct part of the hand, namely the volar surface of the first three fingers, while examining the breast.
- Sixty-eight percent (n=42) used the correct amount of pressure while examining the breast model.
- Fifty-three percent (n=33) palpated all the regions of the breast itself.
- Ten percent (n=6) of the students remembered to palpate the axillary tail of Spence as part of the breast examination.
- Thirty-five percent (n=22) remembered to palpate the axilla during the clinical breast examination.
- Nineteen percent (n=12) of the students carried out all of the five critical points of palpation for a clinical breast examination.

These results are graphically presented in Figures 4.10 to 4.15.

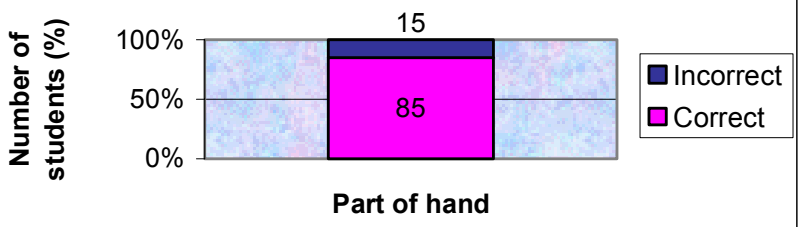

Figure 4.10: Part of hand used in breast examination (n=62)

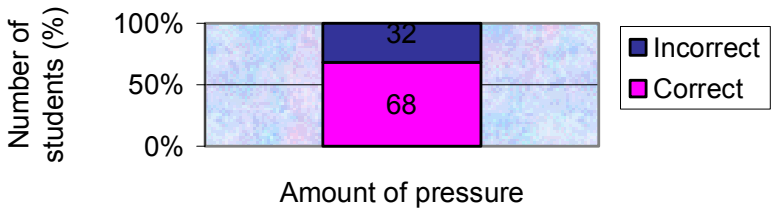

Figure 4.11: Amount of pressure used in breast examination (n=62)

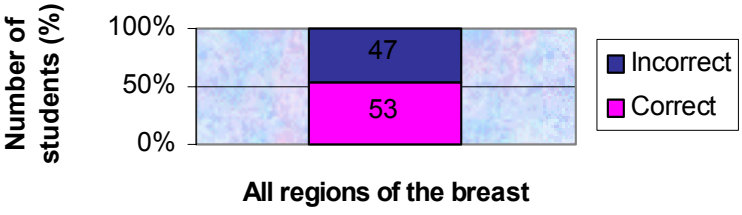

Figure 4.12: Palpation of all regions of the breast (n=62)

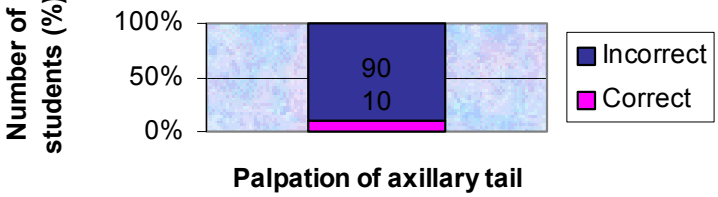

Figure 4.13: Palpation of axillary tail of breast (n=62)

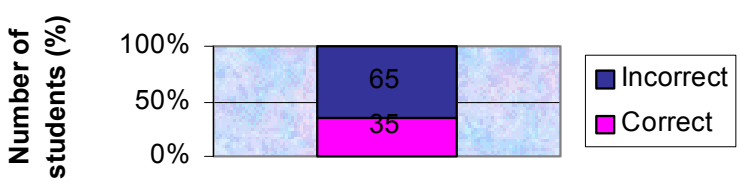

Figure 4.14: Palpation of axilla during breast examination (n=62)

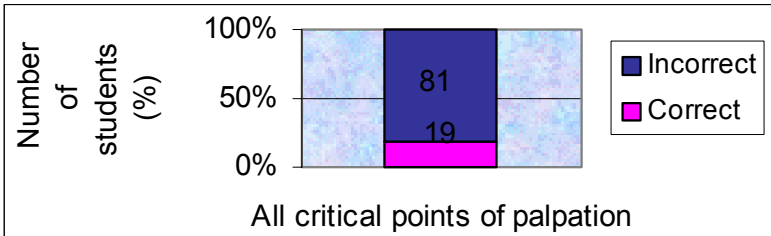

Figure 4.15: Compliance with all critical points of palpation of breast (n=62)

The breast model used to assess the students' skills in performing a clinical breast examination has five strategically placed lumps within it. Only two percent (n=2) of the students were able to detect all five lumps. Fifteen percent (n=9) did not feel any of the lumps. The number lumps detected by the students is graphically represented in Figure 4.16.

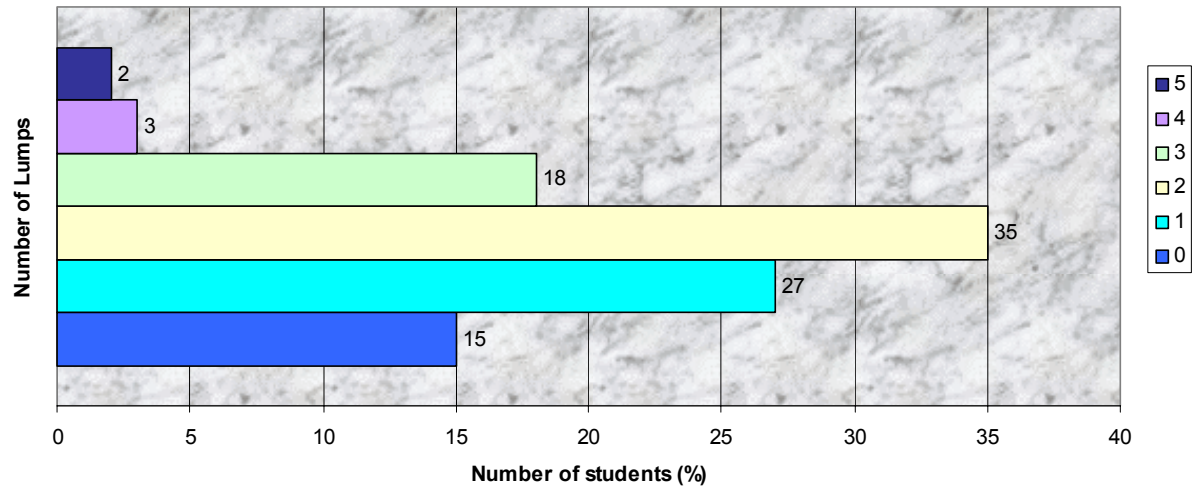

Figure 4.16: Number of lumps detected by students

Pearson's product-moment correlation (r) was calculated to determine the strength of the relationship between students' opinions of their preparation to correctly carry out a clinical breast examination (discussed earlier), and their actual scores for assessment of this skill. The value obtained for r is 0,01, which is a weak correlation. The probability value (p) is 0,95, which means that the correlation is not statistically significant. Therefore, the students' perceptions regarding their level of competence and their actual level of competence are not statistically significantly correlated at the 5% level (r=0,01; p=0,95).

4.3.6 Correlation of scores for theoretical knowledge and psychomotor skill performance

The strength of the relationship between students' scores for theoretical knowledge relating to breast cancer prevention, and for their psychomotor skill performance in examining a breast, was calculated using Pearson's product-moment correlation (r). The value of r is 0,31. This can be considered a weak correlation. The probability (p) is 0,016, which means that the correlation is statistically significant. Therefore, there is a significant difference between the students' scores in theory and practice at the 5% level of significance.

4.4 Summary

The analysis of the data for this study revealed that, although the majority of the nursing students were positively orientated towards the issue of breast cancer prevention, their knowledge and psychomotor skills were not of an adequate standard. For the purposes of this study, a score over 60% was deemed minimum to predict student competency. Yet, just 35% (n=22) of the nursing students scored above 60% for the theoretical component of the study, and 21% (n=13) scored over 60% in the practical component.

The next chapter will present a detailed discussion of the results of the study and will include implications for future practice and further research in the area of breast cancer prevention.

CHAPTER FIVE

DISCUSSION OF RESULTS

5.1 Introduction

The previous chapter presented the results of this study. The data presented provided a great degree of insight into the knowledge and skills of breast cancer prevention of final-year undergraduate nursing students. This chapter discusses the findings of this study in light of their implications for nursing practice and in the context of the reviewed literature.

5.2 Discussion

5.2.1 Demographics of the sample

Nursing represents a significant professional resource for facilitating positive changes in breast cancer prevention strategies in South Africa. The sample for this study consisted of only final-year undergraduate nursing students. The sample was chosen in accordance with the requirements to meet the research objectives. It is assumed that the Baccalaureate-prepared nurse possesses the scientific knowledge base and appropriate skills with regard to a common, life-threatening disease such as breast cancer. As the nursing students who participated in this study were merely months away from registering as professional nurses, their knowledge should have been easily retrievable from memory. In addition, a substantial amount of time during the

final year of study comprises nursing practice in a variety of settings. These students are therefore generally exposed to a diversity of illnesses and cultures. In light of this fact, and because nurses are advocates for preventive and promotive health care practices, their knowledge and skills with regard to breast cancer prevention should be optimum by fourth-year level.

The ages of the students in this study ranged between 20 and 35 years of age with a mean age of 23 years. The majority of the students (92%) were female. By virtue of the fact that breast cancer is the most frequently occurring cancer among women, this group of female-dominated students should ideally have a strong awareness of the disease for their own benefit, as well as for the benefit of their communities. Although breast cancer mostly affects females over 50 years of age, it can occur in younger women and is therefore an issue that all women should be aware of. Younger women, such as those in the study sample, also need to be aware of breast cancer risk factors and prevention strategies. Ideally, these issues should be well understood by all women, regardless of age or profession. In addition, all women from the onset of puberty should incorporate breast cancer screening practices, particularly breast self-examinations, as routine practice. A good knowledge base of breast cancer prevention was thus reasonably expected from the female-dominated sample of nursing students.

5.2.2 Student nurses' orientation towards breast cancer prevention

Breast cancer awareness and prevention has evolved as a leading issue in women's health in the last three decades. The affective domain of educational objectives has particular significance for nursing as it deals with the issues of feelings and attitudes.

Both of these constructs cannot be observed directly, but can be inferred from a person's own account of their behaviour. The first objective of this study aimed to assess the orientation of the nursing students towards the issue of breast cancer prevention. 'Attitudes' and 'orientations' are positive or negative feelings about certain things and consist of both cognitive and affective aspects (Quinn, 2001).

Breast cancer accounts for over 30% of new cancer cases in women and is the leading cause of death in South African women (Pantanowitz & Benn, 2002). Nearly all the students (97%) in this study showed a positive orientation towards the issue of breast cancer prevention. These students indicated that it was an issue that was important to them as individuals and to the nursing profession. The high percentage of positively-orientated students are encouraging from a nurse educator's point of view, as it could imply a greater receptiveness to learning about the issues relating to breast cancer prevention. Breast cancer is currently a rapidly evolving field and a positive orientation may also possibly lead to a greater awareness of, and participation in, breast cancer research issues by nurses.

More than half the nursing students (63%) agreed that breast cancer education had been comprehensively covered in their respective curricula. From this, the researcher expected an adequate level of knowledge and skill relating to breast cancer prevention from the students. Otherwise, it could be assumed that the students did not correctly perceive the extent or quality of their education, specific to breast cancer.

Most of the students (80%) expressed confidence in their own ability to carry out a clinical breast examination. It was thus also expected that the majority of the students

would perform well in the practical component of this study. Incompetence in this area would be a reflection on what they deemed to be 'prepared' in terms of carrying out a breast examination. In this study, a score of over 60% for the student's skill in examining the breast model would have reflected an adequate level of preparedness in carrying out a clinical breast examination. However, only 29% of the sample scored over 60% and were deemed to be competent in the skill of examining a breast.

Introducing a programme of breast self-examination to the many communities within South Africa that do not have easy access to mammography, may result in the presentation of breast cancer at an earlier stage with a consequent improvement in survival. In terms of whether or not the nursing students' education had prepared them to educate clients on breast self-examinations, most of the students (83%) expressed the view that it had. As patient education is a professional requirement and a legal duty for a nurse, these students should, prior to educating clients, have a solid foundation of breast cancer knowledge, with reference to the guidelines, techniques and abnormalities to look for when carrying out a breast self-examination. Nurses should be experts on the process of a common illness such as breast cancer, from their own experience and from their knowledge of what is in the literature.

5.2.3 Theoretical knowledge

Nurses can combine their knowledge of the health of their clients and the available health services to educate women about breast cancer risk factors and available breast cancer screening services and practices. However, this assumes that they are aware of breast cancer risk factors and recommended screening guidelines. The questionnaire

aimed to assess the students' knowledge in these areas. In order to be able to educate women about breast cancer prevention, the nurse needs to be aware of the risk factors for the disease, which increase a woman's relative risk for developing breast cancer. These include a strong family history of breast cancer, exposure to carcinogens, nulliparity, late child bearing and a long menstrual life. The biggest risk factor for breast cancer is increasing age. Nurses need to be well aquainted with current breast cancer screening guidelines from the Cancer Association of South Africa (CANSA), in order to contribute to the early detection of the disease. They also need to know what advice to give to a woman who detects an abnormality on self-examination, and appropriate resources for referral.

For the purposes of this study, a score above 60% for the theoretical and practical components was considered acceptable to deem the student competent in these areas of knowledge. According to the Further Education Curriculum Unit in the UK, competence is defined as 'the possession and development of sufficient skills, knowledge, appropriate attitudes and experience for successful performance' (Quinn, 2001:231). This study explored only the knowledge and skill dimensions of competence. A binary scale was put to operation to determine the students' competence in breast cancer preventive issues. In other words, the student was either competent or not competent (Eraut, 1998; cited in Quinn, 2001).

The mean score for theory was 56%, below the accepted score. The standard deviation is a measure of dispersal; it reflects the amount of spread that the scores exhibit around the mean. With regards to the students' theoretical knowledge of breast cancer prevention, the standard deviation was 11, which indicates a great

degree of spread around the mean. There was a difference of just one- percent between the mean and the median (55%), which leads the researcher to the conclusion that there were few scores, which were extreme in relation to the mean. Also, the fact that the median was smaller than the mean, leads to the conclusion that most of the scores were smaller than the mean (56%), while few were larger than the mean. A score over 60%, and therefore larger than the mean would be deemed competent in theoretical knowledge of breast cancer prevention. Thirty-five percent of the students were found to be competent in the theory of breast cancer prevention in this study.

Of the two modes calculated for theoretical knowledge, only one value (62%) was within the range of scores indicating competence. A skewness value is an indication of whether the distribution of scores is symmetrical or not. With regards to the students' theoretical knowledge, the scores were negatively skewed (the skewness was –0,18).

It must be noted that over half the students (65%) scored below the minimum acceptable score for theoretical knowledge regarding breast cancer prevention. Previous studies have shown that knowledge is directly associated with prevention efforts. For example, lack of breast cancer screening knowledge has been found to be an obstacle in encouraging patients to obtain screening (Madanat and Merrill, 2002). A discussion of the scores for the subsections of knowledge assessed in the questionnaire follows.

5.2.3.1 Knowledge regarding risk factors for breast cancer

Since 1994, the Primary Health Care (PHC) approach has been the underlying philosophy for the restructuring of the health care system in South Africa. This approach has led to changes in the nursing curriculum, with a greater emphasis on promotive and preventive health care activities. For breast cancer, primary prevention includes educating women about breast cancer risk factors and influencing behaviour change. A comprehensive understanding about breast cancer risk factors is a prerequisite to being able to do this. A risk factor intensifies the relative risk for developing the disease. The combined health educator-screener role of the nurse therefore means that the nurse should be able to evaluate clients for risk factors and teach them ways of altering or improving these risks.

The cause of breast cancer is not known, but is thought to be mutifactorial (Ziegfield et al., 1998). All women are at risk for developing breast cancer. The scores for the part of the questionnaire assessing the students' knowledge of breast cancer risk factors were generally low. The mean score was 45%, significantly below the acceptable level of knowledge that would indicate competence. The median of 44% indicates few extreme scores and also that most of the students' scores were below the mean.

Both modal values were also below the competency level (44% and 56%). The standard deviation of 18,08 indicates a large degree of spread of scores around the mean. More than two-thirds of the students scored below the accepted competency level in this section. This possibly means that only approximately one-third of the

nursing students in the sample know an adequate amount about breast cancer risk factors. The distribution of scores for this section was negatively skewed with a skewness of –0,07.

The majority of the students did not know what a South African woman's lifetime risk for developing breast cancer is. Thirty-one percent largely underestimated the risk. This indicates an inaccurate perception of the risk and extent of the disease in South African women. It may also be an indication of ignorance with regard to the increasing incidence of breast cancer. Breast cancer is not only one of the most frequently occurring cancers among women, but the incidence of breast cancer is rising by one to two percent per year (Pantanowitz & Benn, 2002). Studies have revealed that cancer is generally not perceived as a serious health problem in developing countries. This is despite the fact that cancer deaths in developing countries exceed those in developed countries (Ali & Khalil, 1996; Boffet & Parkin, 1994; cited in Rajaram & Rashidi, 1999).

Only one student out of the sample of 62 students was able to list correctly, five risk factors for breast cancer. Knowledge of these risk factors is essential to enable identification of women at risk who could benefit from education about the disease and about prevention strategies. Most students were only able to list between one and three risk factors for breast cancer.

5.2.3.2 Knowledge regarding breast cancer screening practices

Secondary prevention of breast cancer includes screening for the early detection of the disease. Since the prognosis of breast cancer is much better if it is detected at an early stage, screening is essential. Screening takes advantage of the early pathogenic state of breast cancer (Edelman & Mandle, 1994). With early detection, the cancer is often localized and responds better to treatment. The questionnaire elicited information about the students' level of knowledge with regard to current screening guidelines and breast cancer education for clients. It included the advice to give a woman upon detection of any abnormality as well as resources to which she may be referred. The mean score for the students' knowledge regarding breast cancer screening practices was 61%, which was within the range of competence. The standard deviation of 13,22 shows a large degree of dispersion of scores around the mean. The median of 63% and the mode of 65% are both within the competency range of scores. The median indicates that the majority of the students' scores were above the mean, while few were below the mean. The distribution of scores was negatively skewed, as the skewness was –0,34.

Nearly all the students (92%) were correct in indicating on the questionnaire that they would refer any woman who detects a breast abnormality to a physician for further investigation. This is a sensible option, and one that shows insight and foresight on behalf of the nursing students. It is essential that all women know to seek advice from a professional upon detection of any abnormalities during breast self-examination (Pantanowitz & Benn, 2002). A correct referral system leads to continuity of care and ensures compliance with the recommended referral. In addition, a definitive diagnosis

of breast cancer can only be made based on triple assessment, which mostly lies outside of the nurses' scope of practice. Thus a team approach is essential in the prevention and management of breast cancer.

The students performed generally well in this section of the questionnaire, which focused on knowledge regarding breast cancer screening practices. This is a positive indication that the nursing students are essentially aware of the current screening guidelines and practices relating to breast cancer prevention.

Patient education is a professional requirement and a legal duty of a professional nurse (Edelman & Mandle, 1994). Possessing high levels of knowledge in any given field increases one's confidence in educating others in that field. The nursing students expressed confidence in their preparedness to educate clients on breast self-examinations. Possessing comprehensive knowledge of breast cancer screening practices is an essential prerequisite to educating clients on breast self-examinations. This is because regular breast self-examinations are essential factors in the early detection of breast disorders. However, a weak correlation (r=0,18) exists between the students' scores for knowledge regarding breast cancer screening practices, and students' perceptions regarding their preparedness to educate clients on breast self-examinations. As breast self-examination is included as an essential component of current breast cancer screening guidelines, a comprehensive knowledge of screening practices is a prerequisite to educating clients in this respect. This knowledge is also required to effectively integrate theory and practice in breast examinations. Hence, the students may be unaware of their own knowledge deficits, or they may be over-estimating their ability to educate clients on breast self-examinations, while

disregarding the prerequisite knowledge to do so. The probability value of 0,17 between the two scores discussed is not statistically significant at the 5% level.

5.2.3.3 Awareness of available community resources

Part of the PHC approach in South Africa is promoting health and well being. To accomplish this in breast cancer patients, referral to appropriate community resources is vital, as women have a need for both adequate information and for social and emotional support (Bailey, 2000). In addition, most women who present with breast symptoms are emotionally distressed, some to the point of clinical depression. Various organisations exist in South Africa that provide support services to breast cancer sufferers; awareness of available community resources, to which a client with breast cancer may be referred, is obligatory for nurses to know. However, from an option of several available resources, not one of the students was able to identify two (which was what was required from them). The majority of the students (69%) were unable to identify a single community resource for breast cancer sufferers. Few were able to identify just one resource. These results are alarming and they highlight the issue as one that requires much attention within nursing education programs in South Africa.

As 92% of the nursing students expressed that they would refer a client with a breast abnormality, it would be expected that more students were also aware of community resources as an option for referral. This would be in keeping with the PHC principles of promotion of health and prevention of disease. Community nursing encompasses

community assessment, primary care, health promotion, and disease prevention, all of which are essential in breast cancer prevention.

5.2.4 Psychomotor competence in clinical breast examination

There is clear evidence from the literature that nurses are effective in detecting breast cancer by clinical examination (Leinster et al., 2000). The clinical breast examination is a vital part breast cancer screening and surveillance because up to ten percent of breast cancers may be clinically evident while mammographically occult. The screening role of the nurse should be part of accepted nursing practice as screening is a valuable preventive tool. In general, the earlier a breast cancer is detected the better the prognosis. If breast cancer is detected early enough, and before it has metastasized, it has a survival rate of more than 90% (Pantanowitz & Benn, 2002). Although the incidence of breast cancer is rising, mortality from the disease is decreasing. This can largely be attributed to the increased use of routine screening strategies which has led to the early diagnosis of breast cancer, and which in turn has led to a much higher cure rate.

A clinical breast examination is a critical element of screening for breast cancer and aids in the early detection and subsequent improved prognosis of the disease. Competence in this skill was an indication of the students' practiced ability to adequately perform a complete clinical breast examination. Current guidelines (Pantanowitz & Benn, 2002) suggest that a woman have her breasts examined by a health care professional at least every three years from the age of forty years. Nurses are often the health care providers who pick up early breast changes in patients. In

this component of the study, which assessed the nursing students' psychomotor skills in carrying out a clinical breast examination, the scores were generally low.

The mean score was 45%, much lower than the score indicating adequate competence (which was over 60%). The standard deviation was 16, which indicates a great degree of dispersal of scores around the mean. The median was 43% and the mode was 39%. Both these values indicate that the majority of the students scored poorly and that there were a few who scored in the upper and lower extremities within the range of scores. It also shows that most of the students' scores were below the mean and that few were above the mean. The distribution of scores was positively skewed, as the skewness was 0,66.

During the clinical breast examination, which was carried out by each student on the breast model, 85% of the students used the correct part of the hand for palpating the model, namely the volar surface of the first three fingers. This is considered good practice from a comfort point of view for the patient and, due to the fact that the pads of the fingers are most sensitive, it optimizes the chances of the nurse detecting a lump.

The correct amount of pressure required for a breast examination to be effective in detecting a lump, as well as comfortable for the patient, was decided to be a depth of not more than two centimetres into the breast tissue. The researcher estimated this by self-experimentation, collaboration with female peers and practice on the breast model. Sixty-eight percent of the students used the correct amount of pressure while examining the breast model. Incorrect pressure usage was not distinguished as too

hard or too light on the checklist, but merely recorded as incorrect. Some pressed too hard, which would prove to be very uncomfortable to the patient in a real-life situation, and some palpated too lightly, which decreased their chances of feeling the lumps in the breast model. The exact numbers of these students were not determined. The correct amount of pressure, which is firm enough to palpate the breast adequately, yet not too hard, was demonstrated to each student by the researcher, upon completion of the breast examination.

Just over half of the students (53%) were observed to palpate all the regions of the breast model. All nurses should ideally practice this critical point of examination as neglecting to palpate any of the regions of the breast could potentially lead to missing a lump. Only ten percent of the students palpated the axillary tail of the breast. This area is of clinical significance due to the fact that the majority of tumours are located within the lymphatic drainage system in this region (Pantanowitz & Benn, 2002). Therefore, most, if not all, of the nursing students should have remembered to carry out a palpation of the axillary tail. Another area of clinical significance, where palpable lymph nodes are frequently detected, is the axilla, which only 35% of the students remembered to include as part of the clinical breast examination. When breast cancer spreads, it is frequently to the axillary and internal mammary nodes. By not detecting these palpable nodes, the students would be missing signs of early metastases, thereby negatively affecting the patient's prognosis.

Only 19% of the students carried out all five points of the clinical breast examination required on the checklist. This indicates that the students are largely lacking in the technique, process, sequence and critical points of a breast examination. In addition,

most of the students (62%) detected only one or two lumps out of five in the breast model. Although the manufacturer's guidelines accompanying the model suggest that only four lumps are actually palpable, the researcher found that this was not the case. The researcher, together with several random nurse colleagues were able to easily detect all five lumps when employing the correct technique and pressure specified for a breast examination. Several of the nursing students in this study were also able to detect the lump that was specified to be nonpalpable by the manufacturer of the breast model. Just two percent of the nursing students were able to detect all five lumps located within the breast model. This poor figure is alarming as it reinforces the previous assumptions that the students are greatly lacking in the correct practice of clinical breast examinations. Thus the primary objective of screening, which is to detect the breast cancer in its early stages in order to treat it and deter its progression, would be defeated. The lumps in the breast model are quite easily palpable if the correct technique is employed when carrying out the examination. Another conclusion that may be drawn is that the students who are compliant with the correct technique of clinical breast examinations have not had enough practice in this regard and therefore found it difficult to detect a lump in the breast.

Due to the fact that most of the students (80%) expressed that they felt prepared to adequately carry out a clinical breast examination, it was assumed that they would perform well in the practical component of the study. However, a weak correlation exists between the students' perceptions regarding their preparedness to carry out a clinical breast examination and their actual scores for this component. The two values are not statistically significantly correlated ($r=0,01$; $p=0,95$). The students need to be made aware of their proven lack of skill so that they may recognise their need for

training in this crucial area, and also so that they can develop accurate perceptions about their specific abilities and shortcomings.

5.2.5 Correlation of scores for theoretical knowledge and psychomotor skill performance

In the last two decades, women have begun being included in research studies and the knowledge base regarding disease prevention and treatment has grown dramatically (Beatty, 2000). However, the incorporation of this knowledge into practice has been much slower. This holds true for breast cancer prevention strategies.

A fair correlation (r=0,66) was observed between the scores analysed for the two major components of this study, namely for theoretical knowledge regarding breast cancer prevention and for psychomotor skill competence in carrying out a clinical breast examination. The two scores are statistically significantly correlated at the 5% level (p=0,016). This indicates a degree of consistency in the students' performances in the two components. It may be interpreted as the students having a moderate degree of integration of theory and practice. However, judging from the relatively poor performance of the students in both these components, it may also mean that neither their theory nor practice relating to breast cancer prevention issues is at a standard that would deem them competent in the area of breast cancer prevention.

5.3 Summary

This chapter provided a discussion of the findings of this study in terms of their implications for nursing practice as well as in relation to the relevant literature concerning breast cancer prevention. The results of the study and the discussion thereof provide important baseline information about breast cancer awareness among nurses. Such information may be used to develop tailored breast cancer education programs, increase nurses' primary and secondary prevention efforts, and evaluate the effectiveness of prevention programs for nursing students.

The next chapter, which concludes this research report, includes a discussion of the main findings of the study, conclusions and recommendations for future practice of, and further research into, breast cancer prevention.

CHAPTER SIX

SUMMARY, MAIN FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter presents a summary of the study, as well as the main findings and conclusions of the study. It also includes recommendations for further research and future nursing practice and education in the field of breast cancer prevention, and discusses the limitations of the study.

6.2 Summary

At present, breast cancer is the leading cause of death in South African women (Pantanowitz & Benn, 2002). Early detection and accurate diagnosis are essential to survival, as early intervention can prevent the spread of breast cancer, which is often the cause of death in breast cancer patients.

Secondary prevention in the form of breast screening has been introduced in an attempt to decrease the mortality from breast cancer (Leinster et al., 2000). Due to the fact that mammography, the most reliable form of breast screening, is fairly expensive in monetary terms, it remains not easily accessible to women in developing countries. Therefore, the introduction of a programme of breast self-examinations in these countries may result in the presentation of the disease at an earlier stage with a

consequent improvement in survival. Breast cancer prevention needs to be viewed as a health priority and nurses' health promotion activities in the area of breast cancer awareness can have a substantial impact on the uptake of breast screening initiatives among women in South Africa. The nurses' role of empowering and educating women about breast cancer prevention remains dependent on the fact that they have the adequate knowledge and skills to do so. Nursing students also need to become well-aquainted with the theory and practice surrounding breast cancer as they are then better able to provide relevant education and support to the many patients with whom they have contact (McGinn & Moore, 2001). More specifically, it is essential for nursing students to possess the necessary knowledge and psychomotor skills to perform breast examinations, and to educate the community on breast cancer preventative issues.

This study questioned whether or not the knowledge and skills of final-year undergraduate nursing students, with regard to breast cancer prevention, is of a competent standard. The aim of the study was therefore to determine their level of knowledge and skills relating to breast cancer prevention.

The objectives of the study were to:

- Determine the awareness of, and orientation toward breast cancer preventative measures of final-year undergraduate nursing students.
- Determine the level of knowledge regarding breast cancer prevention of final-year undergraduate nursing students.
- Assess their psychomotor skills in performing a clinical breast examination.

- To identify critical knowledge and skill deficits, with regard to breast cancer prevention, of final-year undergraduate nursing students.

A descriptive survey was used to gather data relevant for this research. Data were collected from a sample of final-year undergraduate nursing students (n=62). Data were collected by means of a written questionnaire and by direct, structured observation using a checklist and a breast model that had strategically placed lumps within. Both written instruments were compiled by the researcher and the entire process of data collection, as well as the tools, were pre-tested in a pilot study prior to the onset of the research.

The collected data were analysed using descriptive statistics and bivariable analyses. The analyses provided objective information about the nursing students' knowledge and skills of breast prevention. All ethical principles were adhered to at all times during this study. Ethical approval was granted by the University of the Witwatersrand's Committee for Research on Human Subjects, prior to the onset of the research.

Nursing represents a significant professional resource that can help facilitate positive changes in breast cancer prevention strategies. By determining the current level of knowledge and skills of breast cancer prevention of final-year undergraduate nursing students, this research enabled the identification of major knowledge deficits in this area. This in turn enabled recommendations to be made to optimize nursing education in the field of breast cancer prevention. The main findings of the study will now be

discussed and this will follow with the recommendation arising from the findings as well as the limitations of the study.

6.3 Main findings of the research

The detection of early-stage breast cancer requires knowledge, skill, dedication, and commitment. These factors were considered in a group of undergraduate nursing students, as nurses are in an ideal position to pick up early breast changes in patients. This early detection can prompt effective treatment of breast cancer before its progression.

With regards to the nursing students' orientation towards the issue of breast cancer prevention, nearly all the students expressed a positive orientation. The findings of the study led the researcher to the conclusion that the students are aware of breast cancer as a health issue, but not as a major health concern in South Africa. Almost one-third of the students (31%) largely underestimated a South African woman's lifetime risk of developing breast cancer.

The mean score for the theoretical component of the research (56%) was below that which was considered acceptable for the study sample. This was indicative of the nursing students' theoretical knowledge regarding breast cancer prevention not being optimal. Nurses need to be aware of breast cancer risk factors and recommended screening guidelines. The students' knowledge of breast cancer risk factors indicated a less than adequate knowledge base and a decreased awareness of the extent of the disease in South Africa. Their theoretical knowledge regarding breast cancer

screening guidelines and practices was better in comparison to the other components of the collected data, but was not ideal.

The fact that none of the nursing students in this study were able to correctly identify just two available community resources, to which breast cancer sufferers could be referred, is unacceptable. This needs to be addressed by nurse educators in South Africa.

The nursing students' psychomotor skills in carrying out a clinical breast examination proved to be below the level of competence. The score for competence was over 60%. The mean score for the practical skill was 45%. However, the students scored well in some of the sub-skills of the breast examination. For example, 85% used the correct part of the hand when examining the breast model, and 68% of the students used the correct amount of pressure during the breast examination. The students' scored particularly poorly in the following relevant sub-skills observed during their examination of the breast model: Ten percent of the students remembered to palpate the axillary tail of Spence; 35% remembered that palpation of the axilla is included as part of a clinical breast examination; and only 19% of the students carried out all of the five identified critical points of palpation for a clinical breast examination.

Overall, the results of this study highlighted a general deficiency in the overall knowledge and skills of final-year undergraduate nursing students, with regards to breast cancer prevention. The data analysed for this study can be effectively utilised to develop appropriate recommendations with a view to improving the current state of theoretical and practical knowledge of breast cancer prevention of nursing

students. The recommendations of the researcher and the limitations of this study follow in the remainder of this chapter.

6.4 Recommendations

The frequency of breast cancer makes it an important health issue. From an economic perspective, breast cancer is ranked as the number one health care cost in several countries. Nursing represents a significant professional resource that can help facilitate positive changes through health education strategies. The findings of this study provided the researcher with baseline information about the level of breast cancer awareness among final-year undergraduate nursing students. This information may assist nurse educators to target and tailor education programs to equip nursing students with the knowledge and skills that will make them effective advocates in the crusade against breast cancer. It can also serve as a reference for evaluating future breast education efforts. In light of this, the following list of appropriate recommendations, specific to nursing practice, education and research, were developed by the researcher:

6.4.1 Recommendations for Nursing Practice

- Nursing students should be encouraged to get involved in breast cancer preventative activities in underserved communities, as part of their community health practice, if this practice is not already in place. There exists a need for ongoing education and breast cancer screening in the low-income and culturally

diverse communities to which many of the nursing students are exposed. Prevention programmes can positively affect both cost control and mortality rates.

- Professional nurses and nursing students should be regularly assessed for knowledge and skills relating to breast cancer prevention. Thus this study should be replicated in the future and should include a greater sample of nurses from different institutions. This is because all nurses can play a role in preventing breast cancer.

6.4.2 Recommendations for Nursing Education

- Educational efforts are vital avenues through which nurses can learn more about the primary and secondary prevention of breast cancer. A comprehensive module dedicated to breast cancer prevention should be included in the current curricula of women's health courses in undergraduate nursing programs. If it is already in place, it may need refinement or greater emphasis within the curriculum. Thus, an evaluation of the current curricula with regard to breast cancer prevention is first needed. This should be done prior to the final year of study.

- Based on the low level of competence in breast cancer prevention knowledge and skills among the nursing students surveyed in this study, the promotion of future health policies, such as mandatory continuing education, which involves breast cancer screening guidelines and general breast cancer awareness, may be justified. In general, professional nurses and nursing students should be

encouraged by educators to be more 'breast aware'. This raised awareness may increase their value as advocates for breast cancer prevention in the community.

- Nursing education in breast cancer should be considered from a Primary Health Care (PHC) approach. It should place emphasis on the preventive and promotive aspects of breast cancer. PHC offers the only viable alternative for sustainable and equitable health development in South Africa.

- When planning an education program for nursing students, breast cancer risk factors should be emphasised, and should be assessed formatively and summatively.

- Nursing students should be given the opportunity to integrate theory with practice in the education of breast examinations. The correct technique of a clinical breast examination should ideally be taught by demonstration and observed practice using a breast model like the one used in this study. A simulation is an imitation of some facet, in this case of a clinical breast examination. It is a valuable, effective way to allow the student the opportunity to internalise the sequence of procedures required to correctly carry out a clinical breast examination in a real-life setting (Quinn, 2001).

6.4.3 Recommendations for Nursing Research

- Nurses and nursing students must play an active role in ongoing research regarding breast cancer and its prevention. This may increase the awareness of the

disease amongst nurses, and may also highlight the important role that nurses can play in decreasing the mortality from breast cancer.

- Further studies similar to this one may assess nursing students from different regions and different schools, and then evaluate the similarities and differences between the groups. This may provide a great deal of insight into what education strategies work and which need to be reviewed. These may then be tailored for different nursing education programmes.

- It would be beneficial if nursing students could be assessed before and after the implementation of education efforts relating to breast cancer prevention. This may serve as a means of evaluating the students' level of knowledge and competence as well as the effectiveness of breast cancer education.

6.5 Limitations of the study

The following is a list of identified limitations of this study:

- The study sample was small and limited to just one province in South Africa. The generalisability of the study should therefore be limited to this region only.

- The conclusions drawn from the findings of this study cannot be generalised for all nursing students as only undergraduates studying at universities were assessed.

- Breast cancer affects one to two percent of males, and presents as a more aggressive disease. However, experts do not recommend routine screening for men as it has been proved to be of little value (National Cancer Institute, USA). For this reason, this study focused solely on breast cancer prevention in females.

6.6 Conclusion

The high economic and social costs of breast cancer mean that reducing deaths, and increasing the numbers of women, who receive early intervention and treatment, have become important goals at national level. The role of the nurse in reducing breast cancer mortality focuses largely on educating and empowering women. This, however, remains dependent on the fact that they have the knowledge and skills to do so.

The findings of this research indicate that the knowledge and skills of final-year undergraduate nursing students with regard to breast cancer prevention, was generally not of a standard that could deem them competent in this regard. This has important implications for nursing education and practice. As nurses are in an ideal position to play a positive role in increasing the awareness of the disease and encouraging prevention strategies among women, they should possess a thorough knowledge base of breast cancer prevention. Educational efforts need to be tailored for optimum training of nurses in breast cancer preventive issues. In addition, nursing students should become more involved in communities who would benefit from breast education efforts. There exists a need too for nurses and nursing students to become involved in ongoing research in breast cancer prevention.

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Annexure 1: Visual aid for teaching breast self-examinations

Annexure 2: Questionnaire

PART A:

Please tick one response to the following items:

1. The issue of breast cancer prevention is important to me.
   - ❑ Strongly agree
   - ❑ Agree
   - ❑ Uncertain
   - ❑ Disagree
   - ❑ Strongly disagree

2. The issue of breast cancer prevention is important to the nursing profession.
   - ❑ Strongly agree
   - ❑ Agree
   - ❑ Uncertain
   - ❑ Disagree
   - ❑ Strongly disagree

3. Breast cancer education has been comprehensively covered in my curriculum.
   - ❑ Strongly agree
   - ❑ Agree
   - ❑ Uncertain
   - ❑ Disagree
   - ❑ Strongly disagree

4. I feel adequately prepared to perform a clinical breast examination.
   - ❑ Strongly agree
   - ❑ Agree
   - ❑ Uncertain
   - ❑ Disagree
   - ❑ Strongly disagree

5. My education has adequately prepared me to educate clients on breast self-examinations.
   - ❑ Strongly agree
   - ❑ Agree
   - ❑ Uncertain
   - ❑ Disagree
   - ❑ Strongly disagree

6. Do you agree that all women on a regular basis should perform breast self-examinations?
   - ❑ Strongly agree
   - ❑ Agree
   - ❑ Uncertain
   - ❑ Disagree
   - ❑ Strongly disagree

PART B:

1. Please circle one option. A South African woman's lifetime risk for developing breast cancer is:
    a) 1 in 3
    b) 1 in 9
    c) 1 in 20
    d) 1 in 50

2. Please circle one option: The biggest risk factor for breast cancer is increasing age.
    a) True
    b) False

3. List five (5) risk factors for breast cancer.
    1) ----------
    2) ----------
    3) ----------
    4) ----------
    5) ----------

4. What do you understand by metastasis in breast cancer?

    ----

5. Please circle one option: The majority of women who develop breast cancer have no known risk factors.
    a) True
    b) False

PART C:

1. Name three (3) screening methods used to detect breast cancer.
    1) _____
    2) _____
    3) _____

2. How often should <u>each</u> of the above be performed, according to current guidelines?
    1) _____
    2) _____
    3) _____

3. Circle one option: When is the ideal time of the month for a women to perform a breast self-examination?
    a) Just before menstruation
    b) Mid-cycle
    c) Any time during the month
    d) During menstruation

4. Identify three (3) positions in which a woman should examine her breasts.

    _____
    _____
    _____

5. What would you educate a woman to look for on inspection of the breasts? Name five (5) factors.
    1) _____
    2) _____
    3) _____
    4) _____
    5) _____

6. What part of the hand should be used when palpating a breast?

_____

7. Which quadrant of the breast do breast masses occur in most frequently?

_____

8. What would you advise a woman to do upon detection of any abnormality?

_____

9. Name two (2) community resources to which you can refer a woman with breast cancer.

    - _____
    - _____

PART D

For statistical purposes, please answer the following questions.

1. Please tick the correct option. What is your gender?
    - Male
    - Female

2. What is your age in years?

    _____

THANK YOU FOR TAKING TIME TO COMPLETE THIS QUESTIONNAIRE!

Annexure 3: Checklist

	YES	NO
The student:		
1. Mentioned the 6 different positions in which a woman should inspect her breast:		
• Standing		
• Sitting		
• Lying down		
• With hands on her hips		
• With hands above her head		
• Leaning forward		
2. Inspected the breast model for:		
• Enlargement		
• Skin changes		
• Nipple retraction or inversion		
• Nipple discharge		
3. Was systematic in the examination of the breast model.		
4. Palpated the breast model:		
• Using the volar surface of the first three fingers		
• On each of the five regions of the breast		
• On the axillary tail of Spence		
• On the area of the axilla		
• Using the correct amount of pressure		
5. Detected the lumps (A-E) in the breast model:		
A.		
B.		
C.		
D.		
E.		
6. Arbitrarily divided the breast model into four quadrants and a sub-areolar region.		
7. Completed the breast examination in 5-10 minutes.		

TOTAL: **/23**

COMMENTS:

Annexure 4: Diagram showing placement of lumps in breast model

Annexure 5: Letter requesting permission to conduct research

University of the Witwatersrand
Faculty of Health Sciences
Department of Nursing Education
7 York Road
Parktown
2193
26 November 2003

Dear Sir/Madam

I, Zakeeya Mayet, am a Master of Science in Nursing Student. My speciality is Nursing Education. I am interested in conducting a research project on the knowledge and skills of breast cancer prevention of final-year undergraduate nursing students. Data will be collected by means of a written questionnaire and direct, structured observation.

After reviewing the literature and considering recent statistics, I have concluded that nurses have a vital role to play in the early detection and secondary prevention of breast cancer. I would like to explore this further by determining the current knowledge and skills of final-year nursing students. From this, recommendations may be developed that are aimed at optimising breast care education for nurses.

I hereby request your permission to invite the final-year nursing students of 2004 to participate in this study between March and October 2004. I wish to assure you that fundamental ethical principles will be strictly adhered to during this project.

Attached, please find a copy of my research proposal.

Yours faithfully

Zakeeya Mayet, RN
082-611-4199

Annexure 6: Subject information letter

Dear student

I am a Master of Science in Nursing student at the University of the Witwatersrand. My specialty is in Nursing Education. I am interested in conducting a research project on Breast Cancer Prevention by looking at the knowledge and skills of final-year undergraduate students.

I would like to invite you to participate in my study, which will take place between July and October 2004. Participation will require you to complete a written questionnaire and a skill under observation by myself. The questionnaire should take less than half an hour to complete. The observed skill should take between five and ten minutes.

Your anonymity will be guaranteed as no identifying data will be recorded. All the collected data will be kept safe by myself alone. All ethical principles will be strictly adhered to at all times.

Participation in this study is entirely voluntary. You may exercise your right not to participate, or to withdraw at any time, with no consequence to yourself or to your university.

If you do wish to participate in this study, please complete the attached questionnaire and return it to me upon completion. Time will be allocated to complete it. I will collect the completed questionnaires and arrange a time in which you may perform the observed skill.

Thank you for taking the time to read this information letter.

Yours faithfully

Zakeeya Mayet, RN

Annexure 7: Letter of approval from the Committee for Research on Human Subjects

Annexure 8: Approval of protocol from the University of the Witwatersrand's Postgraduate Committee