THE EXTENT OF DISCHARGE PLANNING BY NURSES FOR PATIENTS WHO HAVE UNDERGONE VALVULAR SURGERY

by

Oriana Verwey

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Supervisor: Ms P Jordan
Co-supervisor: Dr S Carlson

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I would like to express my sincere gratitude to the following people:

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ABSTRACT

Valvular disorders can be corrected by means of surgery, after which very comprehensive discharge planning should be implemented to prevent the occurrence of post-operative complications. Advances in medical technology and intellect instigate earlier discharge for patients after they have undergone valvular surgery. The aim of this research study is to establish the extent of discharge planning by nurses for patients who have undergone valvular surgery, so that practice guidelines in the form of an in-service educational framework can be compiled for nurses in the management of these patients post-operatively. Patients, many of whom are from rural areas, are discharged without an adequate referral system. There are, currently, no set guidelines or referral persons to direct these patients during their rehabilitation period.

Based on the researcher’s personal observations, it is evident that many patients suffer from bacterial endocarditis or clotted valves due to poor post-surgery management. However, both of these conditions could be avoided if proper health education was given to these patients.

The study will take the form of a quantitative, exploratory, descriptive and contextual survey. Data will be collected by means of a structured questionnaire that will be completed by the nurses working in the cardiac general ward and the cardiac clinic.

Findings of the research study will be used to assist the researcher in developing an in-service educational framework for staff that are both nursing and preparing post valvular surgery patients for discharge. The goal is to prevent complications such as clot formation and endocarditis and to enable patients to deal effectively with their rehabilitation period.
Keywords

Nurses
Patients
Knowledge
Valvular Surgery
Discharge Planning
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CHAPTER 1

OVERVIEW OF THE STUDY

1.1 INTRODUCTION

Advances in medical technology and intellect instigate earlier discharge for patients after they have undergone valvular surgery. Valvular heart disease is described as structural and/or functional abnormalities of single or multiple cardiac valves (Thelan, Urden, Lough & Stacy, 1998:510). Valvular disorders can be corrected by means of surgery, after which very comprehensive discharge planning should be implemented to prevent the occurrence of post-operative complications. Abramczyk and Brown (1991:327) state that nurses who care for patients suffering from valvular heart disease can be challenged with regard to their understanding of the complex nature of these illnesses. The aim of this study is, therefore, to enable nursing staff to prepare patients following valvular surgery adequately to take responsibility for their own optimum health status and to educate them regarding when to seek medical assistance.

The World Health Organization has identified cardiovascular disease as one of the most significant health problems worldwide. According to Thelan et al (1998:511), most valvular lesions occurring in patients in the United States of America (USA) were rheumatic in origin. Nowadays, with an aging population, degenerative valve changes are equally important. Rosborough and Lawrence (2003:1) state that, in Boston alone, more than 600 heart valve operations are performed annually.

Mitha (1995:427) states that valvular heart disease occurs commonly in Southern Africa and that rheumatic heart disease is the most prevalent cause. Rapid urbanization, poor housing and extreme overcrowding may account for the high rate of rheumatic heart disease found in developing countries and valvular replacement is often necessary. According to Pauw (2004), treatment of rheumatic
heart disease is expensive and complicated and, in advanced stages, it usually involves replacement of the valve/s by means of valvular heart surgery. She continues that, as the cost of one valve is R50 000.00, state hospitals are restricted regarding the number of valves they can replace. As a result of the tremendously high cost, many South Africans who dependant on the public hospital services, have to endure a long waiting period before a diseased valve can be replaced. Commerford (2005:570) states that the World Health Organization’s reports indicate that rheumatic heart disease remains common in Africa and is responsible for significant premature death and disability compared with the situation in the developed world.

In the Eastern Cape region, patients who have received Onyx valves as a replacement for a diseased valve, are being followed-up and are receiving health education from a volunteer worker. Williams and Williams (2005) states that these superior valves are supplied to the Eastern Cape region at a cost of R7 500.00 per valve, and that statistics are kept on all of the patients who received one. Williams and Williams (2005) have been able to deduce from the statistics that the most frequent reason for valve replacement is rheumatic heart disease and that the majority of these patients are from a lower socio-economic class. An average of 8,3 patients per month undergo valvular surgery in the Nelson Mandela Metropole Complex Hospitals. New and improved valves such as the Onyx valves are being utilized, thus prolonging the life and preventing the need for replacement of the prosthetic valve. According to Williams and Williams (2005), the Onyx bi-leaflet mechanical valve is made from a stronger carbon and has no silicone to strengthen the valve. The design allows for a bigger cardiac output as it channels the blood and prevents tissue overgrowth. The valve design also allows no place for platelet aggregation.
1.2 PROBLEM STATEMENT
Valvular surgery is performed on a weekly basis in the researcher’s place of employment, with an average of 50 patients undergoing this type of surgery within a six-month period. According to the aforementioned unit’s statistics, 12% of these patients are having redo-valvular surgery due to defaulting on their anti-coagulant treatment regime. This suggests to the researcher that these patients may not have received adequate health education prior to discharge from hospital, or during their rehabilitation phase follow-up visit. Many of the patients are from rural areas and do not have any clinic or general practitioner in the vicinity to attend to them. Intern doctors, who may lack knowledge and experience in the management of post-valvular surgery patients, often attend to these patients. Commerford (2005:568) states that most practitioners with experience in the area agree that valvular heart disease remains common and is not managed well. Important warning signs can easily be missed. At follow-up visits, basic post-surgery checks are performed, but no specific guidelines are set out for these patients.

The researcher found that, in her working environment, although provision was made for cardiac bypass surgery patients, very limited information was available for patients who had undergone valvular surgery. An informational pamphlet on the use of warfarin, with side effects and factors affecting warfarin’s working is the only written information given to these patients. There are no policy or process standards available on health education that valvular surgery patients should receive in the cardiac ward or clinic. Resources are limited, for example units appear to be short of staff, with a nurse patient ratio of 1:10.5 and no support personnel like a ward secretary, porters and house keepers. No specific trained person is available to manage all the valvular surgery patients. Only one trained volunteer worker is available, for patients who have had Onyx valve replacements, to deal with any enquiries they may have and assistance and/or education they may require. Patient’s who received any other type of mechanical or tissue valve does not receive a contact person or a information brochure regarding post discharge care in the patient’s rehabilitation stage. Many patients are from remote
rural areas and are only admitted to hospital for the performance of their surgery, after which they are discharged home with instructions to visit the nearest general practitioner for a follow-up visit, where possible. These patients have no referral person whom they can contact should they have any particular health-related needs, nor do they receive comprehensive health education to assist them in their rehabilitation period. The researcher feels strongly that, were these patients better equipped upon discharge, mismanagement and re-do valvular surgery could be avoided. The researcher suspects a knowledge deficit by both nursing staff and patients, leading her to question to which extent the patients are prepared for discharge. This background has motivated the researcher to undertake the research study.

1.3 RESEARCH OBJECTIVES
The objectives of the study can be divided into primary and secondary objectives. The primary objective of this study is to:

- Identify, explore and describe the extent of discharge planning by nurses for patients who have undergone valvular surgery.

The secondary objective of this study is to:

- Develop practice guidelines in the form of an in-service educational framework to assist nurses in developing an effective discharge plan for patients who have undergone valvular surgery.

1.4 CONCEPT CLARIFICATION
The concepts relevant to this study will now be clarified.

1.4.1 Registered nurse
A registered nurse is a person who is registered in terms of section 16 of the Nursing Act, 1978 [Act 50 of 1978] (South African Nursing Council Terminology
The registered nurse is expected to have the necessary expertise related to her field of practice. According to the Nursing Act the registered nurses role entails the prevention of disease and the promotion of health, by teaching of persons.

1.4.2 Enrolled nurse

An enrolled nurse is a person who is enrolled in terms of section 16 of the Nursing Act, 1978 [Act 50 of 1978] (South African Nursing Council, 1994:30). According to the Nursing Act (No 50 of 1978) the role of the enrolled nurse entails the prevention of disease and the promotion of health by means of information to individuals.

1.4.3 Nursing care/management

The process of caring involves looking after someone (Kvale, 1996:99). Management includes the integration of caring and the practical integration of skills in providing holistic care to the patient (Searle & Pera, 1993:880).

1.4.4 Discharge planning

DeLaune and Ladner (1998:1219) define discharge planning as planning that involves critical anticipation of, and planning for, the client’s needs after discharge; the client begins to resume self-care activities before leaving the health care environment. On the release of a patient from hospital care, a schedule is developed containing all the important facts pertaining to that specific patient’s condition to assist him/her during the recovery period.

1.4.5 Health education

Thelan et al (1998:49) describe health education as plans of health care to provide information for life-style changes, thus providing patients with the information they need to make informed decisions and choices about health care alternatives. It includes the teaching instruction that patients receive from knowledgeable
practitioners regarding their health status and how to manage it. It prepares patients for taking an active part in their own health promotion.

1.4.6 Valvular surgery
Rosborough and Lawrence (2003:3) describe valvular surgery as surgery to repair or replace a damaged valve or valves. This involves any repair or replacement of any one of the four valves of the heart. This can be done via a midline stenotomy, thoracotomy or an incision made between the ribs below the breast area.

1.4.7 Intensive care unit (ICU)
An Intensive Care Unit is a department of a hospital that is designed and equipped for the monitoring, care and treatment of critically ill or critically injured patients (Encarta, 2000).

1.4.8 Practice guidelines
Practice guidelines are defined by Encarta (2005) as an official recommendation indicating how something should be done or what sort of action should be taken in a particular circumstance.

1.4.9 Knowledge
Knowledge is defined by Encata (2005) as a general awareness or possession of information, facts, ideas, truths, or principles.

1.5 RESEARCH METHODOLOGY
The research methodology pertaining to this study will now be discussed.
1.5.1 Research design
A research design comprises a plan relating to how a research study is to be conducted. This research study will be quantitative, exploratory, descriptive and contextual in nature.

Quantitative study: According to Polit and Hungler (1991:656), a quantitative research design can be defined as a type of non-experimental research that focuses on obtaining information regarding the status of a situation, often by direct questioning of a sample of respondents. De Vos (2002:79) define a quantitative study as an inquiry into a social or human problem, based on testing a theory composed of variables, measured with numbers and analyzed with statistical procedures in order to determine whether the predictive generalizations of the theory hold true. Characteristics of quantitative research include a philosophy based on logical positivism, with an objective, concise and reductionist focus. Quantitative research employers logic and deductive reasoning and is based on discovering cause-and-effect relationships. Qualitative research’s theoretical focus is to test theory (Research for Nursing Practice, 2004).

The research study will be quantitative in nature because a questionnaire will be used as a data collection instrument. The study will attempt to explore the phenomenon of the apparent lack of adequate discharge planning for patients who have undergone valvular surgery, by the use of a structured questionnaire.

Exploratory: Wilson (1993:11) states that this design’s aim is to gain more knowledge about a phenomenon, as well as to clarify concepts for future research. No research has been conducted on this topic and discharge plans appear to be limited. In this study, all the aspects that need to be covered in the discharge planning of patients who have undergone valvular surgery will be explored. The educational needs such as, when to seek medical assistance, what can be expected after surgery and when complications occur, can be identified.
Descriptive: Mouton (2001:80) states that a major purpose of a descriptive study is to observe and then to describe what has been observed. The author also states that descriptive studies provide the in-depth description of a specific phenomenon, individual, social event or group and the frequency with which specific variables occur in a sample. Within the proposed study, the knowledge regarding discharge planning, as well as health education given, will be described in order to establish and address knowledge deficits on discharge planning amongst nurses caring for patients who had undergone valvular surgery.

Contextual: Richardson (1996:54) states that human behaviour does not occur in a vacuum, thus emphasizing the importance of providing a comprehensive description and analysis of the environment or social context of the participants. In this study, the context will be a general cardiac ward and the cardiac clinic in a public hospital in the Nelson Mandela Metropole area. This is also the only public hospital in the Eastern Cape where cardiac surgery is performed.

1.5.2 Research method
Research methods are the techniques used by researchers to structure a study and to gather and analyze information relevant to the research question (Burns & Grove, 2001:13).

Target population and sample: The target population will comprise nurses working in the general cardiac ward and in the cardiac clinic. The study will be conducted at a public hospital in the Nelson Mandela Metropolitan area.

Sampling method: The sample will consist of all the nurses working in the general cardiac ward and in the cardiac clinic. This study will include all the registered nurses and enrolled nurses available. These are the only persons available and responsible for rendering care to the patients. Purposeful sampling will be utilized. Purposeful sampling is described by De Vos, (2002:334) as a type of sampling method where the parameters of the population can be critically identified by the
researcher. The researcher believes that this group is representative of the nursing staff responsible for the discharge planning of patients who have undergone valvular surgery.

**Data collection:** In this quantitative, explorative, descriptive research study, a structured questionnaire will be used for collecting data. The aim of the questionnaire is to obtain information regarding knowledge about discharge planning and to identify any existing knowledge deficits. The questionnaire will comprise four sections with closed-ended and open-ended questions. The four different sections will consist of:

- Section A: Demographic Data.
- Section B: Discharge Planning.
- Section C: Lifestyle Changes.
- Section D: Medications.

The researcher plans to be present when the questionnaires are completed so as to assist where necessary and clarify any queries. This will also prevent participants from sharing information.

**Data analysis:** Data will be analyzed with the use of a statistician. Conclusions will be drawn by means of deductive reasoning, which is defined as a logical thought process in which hypotheses are derived from theory and where reasoning moves from the general to the particular (LeBiondo-Wood & Haber, 1998:551). Tables, figures and graphs will be used to display findings.

1.6 **PILOT STUDY**

De Vos (2002:211) defines a pilot study as a small-scale trial run of all the aspects planned for use in the main inquiry. A pilot study will be done using a preliminary questionnaire to identify if any questions have been omitted. Any problems can be identified and rectified at this stage without jeopardizing the actual study. A pilot
study will be conducted using one questionnaire only, since the study is limited regarding the number of participants available. If the questionnaire requires no adjusting, the data collected in the pilot study will form part of the actual study.

1.7 QUALITY OF RESEARCH METHODS

1.7.1 Validity and reliability
Validity and reliability can be referred to as the measurement of the research study’s trustworthiness.

1.7.1.1 Validity
Validity refers to the instrument measuring what it is expected to measure (Chinn & Kramer, 1995:44). Face validity refers to the ability of questionnaire to accurately measure what it was supposed to. The researcher will ensure that the participants clearly understand the nature and the reason for the research. Content validity refers to the degree to which the questions asked, adequately represent the phenomenon being studied. In order to ensure and assess the content validity, the questionnaire will be handed to experts who have a good knowledge of valvular surgery and the preparation needed for these patients upon discharge.

1.7.1.2 Reliability
Reliability refers to the extent to which independent administration of the same instrument (or a highly similar instrument) consistently yields the same (or similar) results under comparable conditions (De Vos, 2002:168). In this research, the researcher will strive to obtain all relevant data on a questionnaire. Reliability is an indicator of how consistent the instrument will measure the phenomena of interest. A pilot study will be done to ensure that all aspects of the research have been covered.
The researcher can ensure reliability and validity by ensuring that all participants understand the nature and the reasoning for the research.

1.8 ETHICAL CONSIDERATIONS
The South African Society for Nursing Researchers (1996:74) stipulates that high ethical standards must be maintained at all times when conducting the research.

1.8.1 Confidentiality
Burns and Grove (2001:163) define confidentiality as not sharing information gained from participants without their permission or authority. Confidentiality will be guaranteed in the consent form that each participant will be required to sign prior to completing the questionnaire. The researcher will also inform the participants that all information obtained from them will be kept strictly confidential and private. She will be present during the process of completion of the questionnaires to ensure this.

1.8.2 Anonymity
De Vos (2002:68) states that the concept of anonymity means that nobody, including the researcher, should be able to relate any information gained from any participant. The signed consent forms will be detached from the questionnaires prior to the completion of the latter to ensure that no participant’s anonymity will be compromised. No names will be required on the questionnaire. Only the data obtained from the participants will be used in the research study.

1.8.3 Consent
Informed consent is an ethical requirement in conducting research and implies that the participants should be fully aware of all the facts associated with the research, including the aims and reasons for the study, who will see the questionnaires and what the researcher will do with the information obtained. Written consent will be obtained from all participants who meet the inclusion criteria. They will also be
informed that they may withdraw from the study at any stage without fear of recrimination of any sort. This research study poses no risks for the participants. Permission to conduct the research will be obtained from the:

- Relevant local authorities (see Annexure A).
- Medical superintendent of the state hospital (see Annexure A).
- Unit manager of the unit where the research will be conducted (see Annexure A).
- Individual participants (see Annexure B).
- The Human Ethics Committee and the Advanced Degree Committee of the Nelson Mandela Metropolitan University (see Annexure C).

1.9 DISSEMINATION OF RESULTS

According to Yardley (2000:215), the researcher has an obligation to communicate the results to individuals who can contribute to enhancing patient care. The research results obtained will be disseminated through:

- Seminars and target groups.
- In-service education for nurses.
- Publication in accredited professional journal.

All findings documented by the researcher will be documented and given to the local authorities. An article for publication in an accredited nursing journal will be prepared. An in-service educational framework will be drawn in the form of guidelines. These guidelines can be incorporated in the in-service education programmes in the cardiac units.

1.10 CHAPTER LAYOUT

- Chapter one Overview of Study
- Chapter two Literature Review
- Chapter three Research Design and Method
• Chapter four  Data Analysis and Discussion of Results
• Chapter five  Recommendations, Guidelines, Limitations and Conclusion.

1.11 CONCLUSION
Valvular surgery is performed frequently and effective discharge planning is needed to prevent possible repeat surgery having to be conducted. Patients who have received adequate post-surgery health education and information should be able to take responsibility for their own health maintenance. However, they do require the correct guidance in order to be able to identify potential problems.
CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION
Valvular surgery is performed worldwide and there are many different schools of thought regarding how each different scenario should be treated. First world countries appear to be far more advanced with regard to the procedures and organization of all treatment modalities. When the researcher initiated a literature review with a search using articles from journals, books and the internet, she found no evidence of research conducted on this topic. All findings will be discussed.

2.2 LITERATURE ON VALVULAR SURGERY
Advances in medical technology and intellect instigate earlier discharge for patients who have undergone valvular surgery. Valvular heart disease is described as structural and/or functional abnormalities of single or multiple cardiac valves (Thelan et al., 1998:510). Valvular disorders can be corrected by means of surgery, after which very comprehensive discharge planning should be implemented to prevent the occurrence of post-operative complications. Abramczyk and Brown (1991:327) state that nurses who care for patients suffering from valvular heart disease can be challenged with regard to their understanding of the complex nature of these illnesses. McSherry, Benison, Shaw and Davies (1999:612) state that the success or failure of a cardiac rehabilitation programme can depend on the ability to motivate and educate participants and on a multi-disciplinary, collaborative approach.

The World Health Organization has identified cardiovascular disease as one of the most significant health problems worldwide (Leuner, 2000:410). According to Thelan et al. (1998:511), most valvular lesions occurring in patients in the United
States of America (USA) used to be rheumatic in origin. Nowadays, with an aging population, degenerative valve changes are equally important. Rosborough and Lawrence (2003:1) state that, in Boston alone, more than 600 heart valve operations are performed annually.

Mitha (1995:427) states that valvular heart disease occurs commonly in Southern Africa and that rheumatic heart disease is the most prevalent cause. Rapid urbanization, poor housing and extreme overcrowding may account for the high rate of rheumatic heart disease found in developing countries and valvular replacement is often necessary. According to Pauw (2004), treatment of rheumatic heart disease is expensive and complicated and, in advanced stages, it usually involves replacement of the valve/s by means of valvular heart surgery. Due to the tremendously high cost, many South Africans have to endure a long waiting period before a diseased valve can be replaced.

2.3 ANATOMY OF THE HEART

The human heart is the size of a person’s fist and is located in the mediastinum of the thoracic cavity with two thirds of its mass to the left of the middle. The heart is located between the lungs and rests inferiorly on the diaphragm, anteriorly on the sternum and posteriorly on the vertebral column. It is well protected between these structures and is further protected by a triple layered sac, the pericardium. According to Tortora and Grabrowski (1996:581), the pericardium consists of two principal portions, namely the outer fibrous layer and the inner serous pericardium.

According to Tortora and Grabrowski (1996:581), the outer fibrous pericardium is comprised of tough, inelastic, dense, irregular connective tissue. The fibrous pericardium prevents overstretching of the heart, provides protection and anchors the heart in the mediastinum. The inner serous pericardium is a thinner, more delicate membrane that forms a double layer around the heart: the outer parietal layer and the inner visceral layer. Between the parietal and visceral layers is a
serous fluid known as pericardial fluid that prevents friction between the layers. The pericardial fluid volume totals 15 – 50 ml. If the pericardial fluid volume exceeds 100ml, cardiac tamponade can occur. This is a condition that impairs the functioning of the heart by placing direct pressure on it.

Figure 2. 1:    The heart (Smeltzer & Bare, 2000:533)

2.3.1 The heart wall

The heart wall consists of the following three layers:

- **Epicardium**: the outermost layer that provides a smooth surface for the heart.
- **Myocardium (muscle layer)**: the middle layer that is responsible for the pumping action of the heart.
- **Endocardium**: the innermost layer that provides the smooth lining of the inside of the heart and its valves.
According to Smeltzer and Bare (2000:534), the myocardium (cardiac muscle) is composed of striated muscle tissue that is under conscious control; however, functionally, the myocardial muscle resembles smooth muscle because it is involuntary and is arranged in an interconnected manner that allows for coordinated contraction. The myocardium allows the heart to function as a pump; as it relaxes, blood flows into the heart and as it contracts, blood is expelled from the heart.

2.3.2 Chambers of the heart
The heart's interior is divided into four compartments called chambers:

- **Superiorly**: the left and right atria, separated by the intra-atrial septum.
- **Inferiorly**: the left and right ventricles, separated by the interventricular septum.

The thickness of the walls of the four chambers depends on their functions. The atria have thinner walls than the ventricles, since thin walls are adequate to ensure pumping action and delivery of blood to the ventricles. The walls of the ventricles need to be much thicker to enable the heart to pump blood from the ventricles to the body (compare: Smeltzer & Bare, 2000:535).

2.3.3 Valves of the heart
The heart has four valves: two semilunar and two atrioventricular valves.

- **Semilunar valves**: these are located at the origin of the two arteries exiting the heart and prevent blood from re-entering the heart.
  - **Aortic semilunar valve**: located at the origin of the Aorta in the left ventricle.
  - **Pulmonary semilunar valve**: located at the origin of the Pulmonary Artery (trunk) in the right ventricle.

- **Tricuspid and bicuspid valves**: these are the atrioventricular valves that prevent blood from re-entering the atria.
- **Bicuspid (mitral) valve**: located between the left atrium and ventricle
- **Tricuspid valve**: located between the right atrium and ventricle
  (compare: Smeltzer & Bare, 2000:638)

All valves are responsible for the forward projection of blood and the prevention of backward flow of blood.

- **Mitral (bicuspid) valve**: allows blood to move from the left atrium into the left ventricle.
- **Aortic valve**: allows blood to move out of the left ventricle into the aorta for distribution to the body.
- **Tricuspid valve**: allows blood to move from the right atrium into the right ventricle.
- **Pulmonary valve**: allows blood to move from the right ventricle into the pulmonary artery for distribution to the lungs.
According to Rosborough and Lawrence (2003:2), heart valves can be defective at birth (formed abnormally in the foetus while in utero) or they can be damaged by rheumatic fever, bacterial infection, calcific degeneration or by the normal aging process. These authors describe the two common valve diseases as:

- **Stenosis**: this occurs when a valve does not open completely, causing blood to flow through a narrower opening.
- **Regurgitation**: this occurs when a valve does not close completely, allowing blood to flow backward through the valve.

The most prevalent valvular diseases are mitral valve stenosis and aortic valve stenosis. Todd and Higgins (2005:58) describe aortic valve stenosis as the most common valve dysfunction in the United States of America, which could be related...
to the fact that one percent of the population are born with an aortic valve that has just two leaflets instead of the normal three leaflet structure. Over time, turbulent blood flow through the abnormal valve causes it to become thickened and calcified, leading to aortic stenosis as the patient ages. In patients with normal aortic valves, causes of aortic valve stenosis include age-related degenerative calcification and rheumatic disease.

A stenotic mitral valve impedes blood flow from the left atrium to the left ventricle during diastole, increasing left atrial pressure. Without treatment, mitral stenosis can cause pulmonary congestion, pulmonary hypertension and right sided heart failure. Mitral valve stenosis develops slowly over 10 to 20 years and usually does not affect left ventricular function. The most common cause of mitral stenosis is rheumatic fever, calcification, congenital abnormalities and infective endocarditis (Todd & Higgins, 2005:62).

In order to compensate for these disorders, the heart pumps harder; the excess work can weaken it, causing it to enlarge. An enlarged heart can result in signs and symptoms like increased shortness of breath, fatigue, chest pain, dizziness and fainting. Valvular surgery, in combination with an enlarged heart, may result in many complications and prolong the patient’s recovery phase.

2.3.4 Physiology of the heart valves

Blood flows in one direction through the cardiovascular system, allowing for oxygenation of tissues. In the heart, the four valves are responsible for the forward flow of blood. According to Nowak and Handford (1994:228), when the pressure is greater on the one side of the valve than the other, the valve moves passively (depending on the position) to: allow the valve leaflet to move into the flow tract where it will contract other valve leaflets, thus blocking the flow or to be pushed out of the way to permit forward flow. All of the valves are encircled by tough fibrous rings (annuli) that anchor the leaflets and prevent outlets from becoming dilated, but that also make effective valve closure possible when the heart is relaxing. The
chordae tendineae are the other structures that assist the atrio-ventricular valves when blood flows at high pressures by acting as restraints against the high ventricular pressure.

2.3.5 Pathophysiology of the heart valves
Wiegand (2005) states that valvular heart disease may develop acutely, but more commonly is a chronic process, evolving over many years. Severe valvular heart disease eventually leads to heart failure and dysrhythmias unless the course of the disease is interrupted. Valvular heart disease affects persons of all ages who have valvular dysfunction due to congenital or acquired causes. Most valve repairs for congenital valvular disorders are performed immediately after birth or during childhood. Common causes of acquired valvular heart disease include degenerative heart disease, rheumatic heart disease and infective endocarditis. Less common causes include trauma, lupus erythematosus, tumors, syphilis, cancer and arthritic disease. Commerford (2005:570) states that the World Health Organisation has indicated that rheumatic heart disease remains common in Africa.

According to Sweningen and Keen (2001:309), valvular heart disease involves either obstruction to forward blood flow (stenosis) or regurgitation of blood (backward blood flow due to insufficiency of the valve). One or more valves may be affected by one or both processes. When the effectiveness of a valve is compromised, symptoms of valvular incompetence may develop or the heart may begin to show signs of failure. Wiegand (2005:2) states that valvular dysfunction is a gradual process where the valve or valves affected become stenotic or insufficient. A stenotic valve does not open entirely, resulting in a decreased amount of forward blood flow. An insufficient or regurgitant valve does not close completely, so some blood flows backwards instead of forwards.

Usually, stenosis of a valve is caused by sclerosing, thickening and calcification of the valve leaflets. A stenotic valve obstructs blood flow from the affected atrium or
ventricle, which leads to hypertrophy of the chamber with fluid overload. With a stenotic aortic or pulmonic valve, intramyocardial wall tension increases; this increase enables the heart to compensate by pumping more blood through the highly resistant valve opening. If the stenosis is unrelieved, the ventricle eventually fails. When the left ventricle fails, blood backs up into the left atrium and pulmonary capillary bed. Congestion of the left side of the heart, can lead to congestion of the right heart thus affecting the lungs. This will lead to pulmonary congestion or peripheral oedema, depending on the side of the heart that is involved. Moreover, with ventricular hypertrophy and high intramyocardial wall tension, blood flow to the endocardium may be diminished. These patients may, therefore, have angina pectoris and ventricular dysrhythmias. Both mitral and tricuspid stenosis can be severely debilitating, causing easy fatigability and limited activity. Regurgitation of a valve may be caused by rheumatic heart disease, dilation of the valve ring or damage to the nearby valve structures. Regurgitation results in increased volume into the affected chamber (Sweningen & Keen 2001:309). See figure 2.3.
Figure 2.3: Disease progression of valvular disorders (Sweningan & Keen 2001:310)
2.3.6 Significance of the heart valves

The four valves within the base of the heart are designed to maintain forward blood flow and prevent regurgitation into the originating chamber. Essentially this is a passive process that depends on the changing pressure gradients. As blood accumulates behind the valve, the pressure increases to a point where it becomes greater than the pressure in front of the valve. The valve then opens to allow transvalvular flow. Increasing pressure beyond the valve forces the leaflets to close (Seifert, 2002:194). According to Todd and Higgins (2005:58), complex and sophisticated heart valves are critical to efficient cardiac function; if they don’t open and close at precisely the right time, or if the valve cusps don’t align perfectly, the patient may experience left ventricular dysfunction, infective endocarditis and other complications. The complications associated with valvular dysfunction should be weighed against the risks associated with valvular surgery:

Butchart (1991:6) states that, as the long-term risks of valve replacement exceed the risk of mild valve disease, only patients with valve disease of a moderate or severe degree are usually considered for surgical treatment. A successful repair or valvotomy carries a lower long-term risk than a valve replacement, but often the decision to either repair or replace a valve can be taken only during surgery. See Box 1 for the comparison of risks associated with the history of disease and valve replacement.

<table>
<thead>
<tr>
<th>Risks associated with natural history</th>
<th>Risks associated with valve replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>-continuing symptoms</td>
<td>-peri-operative risks</td>
</tr>
<tr>
<td>-decreased exercise capacity</td>
<td>*hemorrhage</td>
</tr>
<tr>
<td>-need for multiple drug therapy</td>
<td>*myocardial damage</td>
</tr>
<tr>
<td>-possible need for anticoagulation</td>
<td>*arrhythmias and/or conduction problems</td>
</tr>
<tr>
<td>-arrhythmias and/or conduction problems</td>
<td>*air or particulate embolism</td>
</tr>
<tr>
<td>-right / left ventricular failure</td>
<td>*infection</td>
</tr>
<tr>
<td>-pulmonary complications</td>
<td>*other organ failure</td>
</tr>
<tr>
<td>*pulmonary hypertension</td>
<td>*long-term risks of valve replacement</td>
</tr>
<tr>
<td>*pulmonary embolism</td>
<td>*valve thrombosis</td>
</tr>
</tbody>
</table>
*pulmonary infections*  
*systemic embolism*  
-systemic infection  
-*infective endocarditis*  
-infective endocarditis  
*-mechanical or tissue failure*  
-other organ failure  
*-detachment/dehiscence*  
-sudden death  
*-haemolysis*  
*-incomplete relief of stenosis*  
*-possible need for anticoagulation*

**Box 1: Comparison of risks associated with the natural history of valve disease and valve replacement (Butchart 1991:6)**

### 2.4 DIAGNOSTIC TESTS

Swearingen and Keen (2001:309) describe the following diagnostic tests that can be performed with regard to assessing valvular function:

- **Cardiac catheterization**: A ventriculogram may assist in the visualization of blood flow. Measurement of chamber pressures assists in determining the type of disorder present and the degree of severity.

- **Echocardiography**: This test uses ultrasound to examine and measure the structure of the heart. It is done to determine ventricular function, chamber size and valve function.

- **Electrocardiogram (ECG)**: This test records the changes of electrical activity occurring during the heart beat and can indicate possible atrial or ventricular enlargement.

- **Doppler flow studies**: These are continuous wave or pulsed wave frequencies used to determine blood flow.

- **Trans-oesophageal echocardiography (TEE)**: This entails using an endoscope that produces an image unimpeded by the chest wall. Because the oesophagus is close to the heart, the images are clear and undistorted.
2.5 VALVULAR TREATMENT MODALITIES

Advances in medical technology have made many treatment modalities possible for patients with valvular disease or defects. Problems can be managed medically if the condition is not severe and the patient is experiencing minimal complications. Pharmacologically, cardiac glycosides can be prescribed to strengthen contractility, a six week prophylactic antibiotic course can be given to treat endocarditis and diuretics can be administered for a fluid volume excess. Wiegand (2005) also states that nitrates, anticoagulants, calcium channel blockers, phosphodiesterase inhibitors and antiarrythmics have improved the medical management of valvular heart disease. Surgical intervention is the next option should complications be more severe and symptoms affecting the patient’s lifestyle be experienced. Valvular repair, according to Smeltzer and Bare (2000:641), is always the first choice when surgery is needed so as to minimize lifestyle implications of long-term anti-coagulation. Millner (1996:88) supports this view by maintaining that, although repair takes longer than replacement, preservation of the native valve provides the patient with the best available valve.

Chikwe, Walter and Pepper (2003) state that, without intervention, all valvular heart disease eventually leads to the common end point of biventricular overload and the associated clinical features of congestive heart failure and an increased risk of sudden death. These authors feel that, for any operation, the key question is whether the predicted mortality and morbidity of surgery is less than that of the untreated lesion. The following surgical interventions are available:

- **Valvuloplasty:** According to Smeltzer and Bare (2000:641), valvuloplasty is performed to repair the:
  - Commissures between the leaflets in a procedure known as commurotomy.
  - Annulus of the valve by annuloplasty.
  - Leaflets.
  - Chordae by chordoplasty.
These authors state further that most valvuloplasty procedures require general anesthesia or cardiopulmonary bypass and that the patients are managed post-operatively in an intensive care unit to maintain haemodynamic stabilization. Repair of a damaged valve is done according to the discretion of the surgeon, that is if he/she feels it is repairable and functioning won’t be negatively affected.

- **Commissurotomy**: Smeltzer and Bare (2000:642) consider this to be the most common form of valvuloplasty. The commissure is the area where valve leaflets meet. A narrowing of the commissure due to adhesion of the leaflets can be repaired by means of separating the leaflets during an open or closed commissurotomy.
  - Closed commissurotomy: This involves a small mid-sternal incision. A small hole is then made into the heart and the surgeon uses his/her finger or a dilator to tear the stenosed area open. This procedure is performed without any direct visualization of the area.
  - Open commissurotomy: This involves direct visualization of the operative field by means of a thoracotomy incision. Smeltzer and Bare (2000:642) state that the advantages of this procedure include being able to remove any thrombi seen and to repair any calcifications noted.

Wiegand (2005) describes the goals of a commissurotomy as the improvement of leaflet mobility and increase in the size of the valve orifice. The procedure is most effective when the leaflets are thin and pliable.

- **Annuloplasty**: Smeltzer and Bare (2000:642) describe this as the repair of a valve annulus (junction of the valve leaflets and the muscular heart wall) by means of sutureing the leaflets of a valve to a ring to ensure proper closing of the leaflets or by means of the use of tension sutures.
The procedure is done under general anaesthesia and with the use of cardiopulmonary bypass. The procedure is performed to prevent regurgitation.

Figure 2.4: Annuloplasty (Smeltzer and Bare, 2000:643)

- **Leaflet repair**: Cardiac valve leaflets may be damaged through being stretched out of shape, being shortened or by developing holes. Leaflets that are elongated, ballooning or have other excess tissue are repaired by means of removing the extra tissue. The elongated tissue may be folded over onto itself (tucked) and sutured (leaflet plication). A wedge of tissue may be cut from the middle of the leaflet and the gap sutured closed. Most commonly, a pericardial patch is used to repair holes. Short leaflets are most often repaired by chordoplasty (Smeltzer & Bare, 2000:643).
• **Chordoplasty:** Wiegand (2005) explains that elongated or detached chordae contribute to prolapse of the anterior or posterior valve leaflets resulting in insufficiency. In chordoplasty, the chordae tendinae can be surgically repaired as follows: if stretched, they can be surgically shortened; if torn, they can be reattached.

• **Papillary muscle repair:** Wiegand (2005) states that papillary muscles may become torn or detached during periods of myocardial ischemia. The damaged papillary muscle can be surgically reattached.

• **Valve replacement:** According to Smeltzer and Bare (2000:643), prosthetic valve replacement began in the 1960’s. During the procedure general anaesthesia and a cardiopulmonary bypass machine (CPB) are used. The cardiopulmonary bypass machine oxygenates and circulates blood to the body and brain. A midline sternotomy is performed and the heart is opened until the faulty valve can be seen. The old valve is surgically removed and the new valve is then sutured in.

• **Types of valves:** There are four types of valves that can be utilized for valvular replacement surgery: autografts, homografts, xenografts and mechanical valves. Each patient is unique and there are a number of factors that influence the selection of a valve for each specific patient, for example:
  - Age: If the patient is likely to live longer than 10 years, a mechanical valve would be the better choice since it is more durable and the same pathophysiology will not occur again.
  - Compliancy: If the patient is non-compliant and unlikely to adhere to the anti-coagulation regime, a biological valve may be needed.
  - Gender: If it is a female patient who still wants to have children, a biological valve should be used to prevent complications that may arise during pregnancy and the birthing process.
Other characteristics that Williams and Williams (2005) and Jordan (2005) suggest considering when selecting a valve include:

- Durability: Tissue valves only have a life expectancy of 7-10 years (Compare: Smeltzer & Bare, 2000:644), whilst mechanical valves have a much longer life expectancy. Accordingly, a tissue valve might be sufficient in an elderly person with a life expectancy of only three years.

- Optimal haemodynamics: The outlet of the valve should preferably be big enough to allow adequate outflow of blood.

- Minimal haemolysis and anti-thrombogenic properties: The more segments there are in a manufactured valve, the greater the incidence of thrombi formation.

- Resistance to infection.

- Cost: Some of the mechanical valves are very expensive.

- Availability: the selected valve should be easily obtainable.

- Easiness regarding insertion: surgeons prefer valves that are not difficult to insert.

- Provision of good blood flow: the valve should have a big outlet, channel blood and ensure adequate cardiac output.

- Non-reactivity: valves that do not cause a physiological reaction are preferred.

- Silent: all tissue valves are silent and the more modern mechanical valves are quieter than the older designs.

According to Bloomfield (2005:586), mechanical prostheses have better durability. Modern bileaflet valves have good long term durability and can be managed safely with low intensity warfarin. They appear to be the optimal choice.

Smeltzer and Bare (2000:644) describe a xenograft as a tissue valve originating from either a pig (porcine) or a cow (bovine) with a viability of seven (7) to ten (10) years. Homografts are described by the same authors as human valves harvested
from cadaver tissue donations with a viability of 10 to 15 years. Autografts are valves created from the patient’s own tissue, for example a portion of the pulmonary artery is used to create a pulmonic valve.

According to Kinney, Packa, Andreoli and Zipes (1991:331), mechanical valves include the ball-and-cage, the tilting disk and the central flow disk. Although mechanical valves are durable, they are also thrombogenic and long term anticoagulation is required. Bioprostheses are made from pig, calf or human tissue. Advantages of bioprostheses include the low risk of thrombogenic complications without anticoagulation, but these valves are degenerative and may require a replacement within seven (7) years.

2.6 COMPLICATIONS OF VALVULAR SURGERY

Most complications of valvular surgery are associated with cardiopulmonary bypass and include the following (compare: Jordan: 2005 and Thelan et al 1998:546):

2.6.1 Haemodilution

Haemodilution refers to the dilution of autologous (patient's own) blood with the isotonic crystalloid solution used to prime the pump. This process dilutes the patient's blood, decreasing the number of red blood cells in a larger volume of fluid. This leads to the patient having a low hemoglobin level and the potential to develop oedema (Thelan et al, 1998:545).

2.6.2 Arrhythmias

Arrhythmias may occur due to: manipulation of the heart during surgery; working in the area where the heart’s pace-makers are situated; uneven re-warming of the heart; hypoxemia; hypotension; irritation; and metabolic disturbances. The most frequent arrhythmias that occur are first degree heart block and atrial fibrillation. Arrhythmias cause incomplete emptying of the atria and decreased cardiac output,
which may lead to complications such as emboli formation and tachycardia to compensate for decreased oxygen delivery.

2.6.3 Ventricular dysfunction
Preoperative ventricular dysfunction might have existed. Uneven re-warming or premature re-warming of the heart might also cause ventricular dysfunction.

2.6.4 Hyper- or hypotension
Hypertension can be caused by catecholamine release and systemic hypothermia causing vasoconstriction. Hypertension can also be caused by fluid overload during surgery or in aftercare. Hypertension can cause graft dislodgement and leakage of blood causing major complications.

Hypotension can be caused by blood loss and vasodilatation resulting in decreased tissue perfusion, which may lead to decreased oxygen delivery. This will cause a tachycardia as the body’s attempt to compensate to ensure adequate oxygen delivery.

2.6.5 Coronary artery spasm
Catecholamine release and hypotension can cause coronary artery spasm, leading to ST elevations indicating damage to the myocardium.

2.6.6 Hematological changes
As blood passes through the cardiopulmonary bypass (CPB) machine cells are sheared and damaged leading to a low haemoglobin level with a resultant diminished oxygen carrying capacity of the blood. Platelets are also damaged, affecting clotting and, thus, increasing the patient’s susceptibility to bleeding.

2.6.7 Pulmonary changes
Pulmonary changes occur as result of decreased tissue perfusion during the prolonged surgical procedure. Decreased surfactant production, alveolar collapse
and lower lobe atelectasis may result. These factors may lead to ventilation perfusion mismatches resulting in altered tissue perfusion. The heart may attempt to compensate for the reduced oxygen delivery to the tissues by beating faster.

2.6.8 Renal Impairment
Acute renal tubular necrosis can occur as result of decreased perfusion to the kidneys due to haemolysis (associated with the shearing of red blood cells in the cardiopulmonary bypass machine), hypoperfusion or as a result of emboli. Renal tissue damage is irreparable (as are myocardial and brain tissue damage).

2.6.9 Emboli
Pre-operative emboli may exist due to arrhythmias, where the insufficient myocardial contractions preclude emptying of the atria, leading to stasis of blood that might allow formation of blood clots. Emboli that dislodge may cause a cessation of blood flow by blocking off blood supply to an area. This leads to ischemic tissue damage that can manifest as a cerebrovascular accident or in acute renal failure, depending on where the obstruction occurs.

2.6.10 Ischaemia
Tissue ischemia may occur as the result of hypoperfusion to an area, resulting in decreased oxygen delivery to the tissues. Complications that may result include myocardial infarction, neurological deficits and ischemia of renal tissue.

2.6.11 Cerebrovascular accident
Cerebrovascular accident can occur due to micro-emboli in the brain caused by air, fat globules, plaque fragments and small blood clots that may dislodge during or after surgical intervention.
2.6.12 Infection
Wound infection can occur postoperatively and patients can also develop endocarditis. Vonpatanasin, Hillis and Lange (1996:412) differentiate between the two types of endocarditis:

- Early endocarditis: This occurs less than 60 days after valve replacement and usually results from perioperative bacteraemia arising from skin or wound infections or contaminated intravascular devices.
- Late prosthetic valve endocarditis: This occurs more than 60 days post-operatively and is usually caused by the organisms responsible for native valve endocarditis, most often streptococci.

2.6.13 Dysfunctional valve
The valve defect could have been inadequately repaired leaving the valve dysfunctional. This can manifest in the patient experiencing the same signs and symptoms as he/she did pre-operatively.

2.6.14 Cardiac tamponade
Cardiac tamponade occurs as a result of blood accumulating in the pericardial space, compressing the heart and, thus, decreasing the heart’s ability to pump.

2.6.15 Haemodynamic instability and bleeding
One of the most serious complications postoperatively is haemodynamic instability and bleeding. Patients should be monitored for shock and hyperglycemia as the body’s response to a major insult. All variables need to be carefully monitored in an intensive care setting to ensure attainment and maintenance of haemodynamic stability. Patients are usually on inotrope therapy to support cardiac functioning for the first 24 hours and are holistically nursed by trained personnel monitoring the patient for any complications that may arise to ensure prompt treatment and prevention thereof.
Pain management is of vital importance to these patients immediately postoperatively, as well as in the following days, as this will assist in the rehabilitation of the patient. Inadequate pain management can compromise the ability to breathe adequately with resultant complications, for example shallow breathing can result in pneumonia. The patient will not clear secretions and will avoid coughing to minimize pain. Pain may also make the patient uncooperative and hinder physical mobility, thus prolonging rehabilitation and increasing the patient’s chances of developing thrombi / emboli.

2.7 DISCHARGE PLANNING
Discharge planning is very important with regard to preventing complications. Long term management of patients with prosthetic heart valves should include the prevention, recognition and prompt treatment of valve related complications. Stokes (2000:411) states that cardiac rehabilitation is a multifactorial, multidisciplinary activity, in which nurses play a significant role and are the co-coordinators of these services to patients.

According to Seifert (2002:182), the goal of cardiac rehabilitation is to assist the patient to take responsibility for maximizing his or her own physical and emotional wellness. On discharge, patients should receive a follow-up date (six weeks later) for a surgical check-up. Thereafter, patients should be seen twice yearly for one year, then annually. All patients should receive guidelines to enable them to take care of themselves. These guidelines could be in the form of pamphlets to assist patients in identifying potential problems and how to deal with them.

Unfortunately, when staff shortages exist, patients may not receive either the time or the health education to which they are entitled. This could result in many complications occurring that could have been prevented had the patients been adequately prepared. Language barriers also play a role with regard to some patients not receiving the information needed. Most of the patients using public
facilities in the Eastern Cape are Xhosa speaking and not all nursing staff members are able to speak Xhosa. Due to staff shortages and the high workload, the time required to ensure that patients receive and understand health education is not available. Health education given should contain all the information a patient could possibly need. Seifert (2002:182) describes cardiac rehabilitation as having four phases:

- **Phase one:** Begins early after surgery and includes light supervised exercise and education about cardiovascular disease, risk factors, diet, sexual activity, exercise and other activities.
- **Phase two:** Occurs early after discharge (two to six weeks) from the hospital and builds on phase one. It focuses on exercising to improving functional capacity and endurance, reducing fear and anxiety about increased exercise and providing education about lifestyle changes.
- **Phase three:** Provides an ongoing exercise programme, offers support for making lifestyle changes and assists in retarding the progression of heart disease.
- **Phase four:** Includes a wellness programme for any individuals who have completed the other phases. Exercise is performed three (3) to four (4) times a week.

All patients progress differently and all rehabilitation programmes should be individualized to each patient’s specific needs. Should the patient’s pace of recovery be too slow, the patient can be referred for additional assistance to prevent prolonged recovery.

### 2.8 LIFESTYLE CHANGES

The National Heart, Lung and Blood Institute Centre (2003:16) advises patients not to lift, pull or push anything heavier than five (5) to seven (7) pounds (2.5 to 3 kilogram) postoperatively. Patients should avoid activities such as shoveling snow, swimming and playing tennis or golf until after being checked by their physician.
Walking is described as an excellent exercise, starting with five-minute walks, three times a day for the first week and increasing this by five minutes each week. Canobbio (1990:281) recommends walking to help control the blood pressure or reduce the chances of cardiovascular disease. Sexual activity may be resumed as soon as the patient feels ready but will be restricted by the limits of ability to bear weight on the upper arms and chest (Seifert, 2002:150). Patients may only drive after four (4) to six (6) weeks. Follow up visit dates should be given to the patient so as to monitor progress and obtain the go-ahead to resume normal activities.

Dietary changes for general good health should be discussed with the patient, for example low fat, high vitamin intake and a balanced low salt diet. According to Rosborough and Lawrence (2004:7), it is important to keep body weight within the normal range for age and body frame, reduce salt intake to prevent fluid retention and monitor for fluid retention by means of daily weighing. One kilogram body weight gained can equal one liter fluid retained. Canobbio (1990:279) describes a low cholesterol diet as a diet limiting cholesterol to less than 300 mg per day, of which most fat should come from polyunsaturated fats (mostly liquid fats such as those that come from vegetables, corn, sunflower and soybean) or the neutral mono-saturated fats (such as peanut, canola and olive oil). Saturated fats that harden at room temperature and are found in meat and dairy products should be avoided. She gives the following tips on how to avoid too much saturated fat:

- Eat less meat.
- Avoid prime grade or heavily marbled meats; trim the skin off chicken.
- Avoid fried meat, chicken and fish; allow fat to drain off by using a drip rack
- Eat no more than 2 whole eggs per week.
- Avoid dairy products containing more than 1% fat; use polyunsaturated margarine.
- Avoid packaged foods and bakery items that contain egg yolks, whole milk, saturated fat and cream.
- Avoid cashews, coconut and macadamia nuts.
Canobbio (1990:280) describes body requirements for sodium as 0.5 gram of salt per day and states that, since animal foodstuffs are naturally high in sodium, the body’s requirements are met without any additional salt added. Too much sodium causes water retention, which can raise blood pressure. Spices and herbs can be utilized to replace salt. “Hidden” sodium can be eliminated from the diet by means of the following:

- Avoid cured or smoked meat, poultry or fish (ham, bacon, sausage, canned fish packed in oil or brine).
- Avoid frozen, canned and dehydrated main dish foods such as pizza, TV dinners, spaghetti, stews and soups.
- Avoid canned vegetables and vegetable juices.
- Avoid cheese, buttermilk and cocoa mixes.
- Avoid commercial sauces.

A low cholesterol diet is an important part of controlling blood pressure and reducing blood cholesterol levels and causes gradual weight loss. Canobbio (1990:280) gives the following weight loss tips:

- Divide your daily calorie/kilojoule allowance into several small meals a day instead of eating one or two big meals a day.
- For between meal snacks, eat high-fiber, low calorie foods such as apples that will make your stomach feel fuller quicker.
- For between meal hunger, a glass of ice water, hot tea or calorie free soda will make you feel fuller.
- If you tend to eat when bored, rather resort to walking.
- Regular exercise burns calories/kilojoules.

Complications or problems that need to be referred can also be identified. According to the National Heart, Lung and Blood Institute Centre (2003:20), the medical practitioner needs to be notified if any of the following danger signs are present:

- Fever over 38°C.
• Changes in the incision including:
  - Redness.
  - Swelling.
  - Drainage that is yellow or foul-smelling.
  - Separation of edges of incision.
• Pain not relieved by usual pain medication.
• Unusual fatigue not relieved by rest.
• Shortness of breath.
• Return of symptoms present before surgery such as chest pain, shortness of breath, etcetera.
• Sudden weight gain.
• Swelling of feet.

Nasef, Marshall and Bain (1992:248) describe prosthetic valve endocarditis as a life threatening complication that is easier to prevent than to cure. Early prosthetic endocarditis occurs within six (6) months of surgery and could be caused by a skin organism introduced at the time of surgery. Late prosthetic valve endocarditis occurs later than six (6) months postoperatively. Thelan et al (1998:510) list manifestations as:
  • Fever.
  • Splenomegaly.
  • Haematuria.
  • Petechiae.
  • Cardiac murmurs.
  • Easy fatigability.
  • Osler's nodes (small raised tender areas, most commonly found in pads of fingers and toes).
  • Splenic haemorrhages.
  • Roth's spots (round or oval spots consisting of coagulated fibrin; seen in the retina and lead to haemorrhage).
Nowak and Handford (1994:236) describe the pathophysiology of endocarditis as a basic lesion built up of a large, easily fragmented infective mass called a vegetation. This is essentially a thrombus of tangled fibrin, platelets and blood cell debris containing masses of bacteria and other organisms. Vegetations have a tendency to break up, seeding the blood with infective and potentially occlusive emboli. Embolization can produce petechiae, abscesses and infarcts.

Early recognition and prompt treatment is vital to the patient, who must then complete prolonged parenteral therapy with adequate doses of bacterial antibiotics. Nasef et al (1992:248) state that adequate prophylactic antibiotic cover should be given before any dental or surgical procedures. In addition, aggressive treatment should be given for any suspected bacterial infections. It is very important that patients are educated regarding the importance of informing all practitioners about their valvular surgery.

Patients should be educated about when sutures should be removed and the importance of not leaving sutures or clips in for more than ten days, as this could result in infection. Signs and symptoms of infection, such as redness, swelling, oozing, pain at the site and pyrexia, should be clearly conveyed to the patient. If noted, the patient should return to a medical officer promptly for treatment. Good oral hygiene and regular dental check ups are essential for maintaining good health and prevention of systemic infections.

2.9 MEDICATIONS
Rosborough and Lawrence (2003:8) state that all patients with a mechanical valve, irregular heart beat and an enlarged heart should be treated with warfarin to thin the blood and prevent blood clots (warfarin works by prolonging the time it takes for blood to clot). Regular monitoring by a physician is necessary to ensure that INR (international normalized ratio) remains within the therapeutic level. In order to control the level in the body, it is important to take the tablet at the same time each
day. Should a dose be skipped, the patient must not double up since it may cause severe complications. It is important that all doctors and pharmacists be made aware when a patient is taking warfarin as some medications may alter its functioning. Aspirin may not be taken concurrently as it may interfere with the clotting profile. Patients’ should inform their doctors immediately if they suddenly develop nose bleeds, bleeding gums, purplish or reddish spots on the skin, unusual vaginal bleeding, excessive menstrual flow or bleeding haemorrhoids. Patients should monitor their stools and urine for occult bleeding.

Canobbio(1990:282) specifies the following safety measures for patients on warfarin:

- Use only soft bristled tooth brushes.
- Avoid using tooth picks or any sharp objects in the mouth.
- Always wear soft, well fitting shoes.
- Protect feet from injury.
- Avoid rough sports.
- Protect self from falling, for example place non-slip stickers on the floor / in the bathtub.

If injury should occur, apply pressure for ten minutes to stop bleeding or draw lines around the bruise margins. Should these enlarge, notify a doctor immediately. Patients should wear a medic alert bracelet indicating their warfarin use. Patients need to know that alcohol can affect the working of warfarin.

Dietary considerations when taking warfarin, as set out in Patient Care (1998:129), include eating the same amount of Vitamin K containing food daily:

- **Foods high in Vitamin K:** Brussel sprouts, broccoli, cabbage, chickpeas, green tea, lettuce, liver, spinach and turnip greens.
- **Foods that have a moderate amount of Vitamin K:** Asparagus, avocado pear, cauliflower, cheese, coffee and peas.
• **Foods with little Vitamin K**: Bacon, beef, bread, butter, carrots, celery, chicken, corn, eggs, green beans, onions, peanuts, peppers, potatoes, pork, pumpkin, rice and tomatoes.

### 2.10 SUMMARY
This chapter presented a thorough literature review on valvular surgery, including postoperative complications and management of these patients. In chapter three, the research methodology will be discussed.
CHAPTER 3

RESEARCH DESIGN AND METHOD

3.1 INTRODUCTION
In the previous chapter an orientation was given into the purpose of the study and the objectives were introduced. The purpose of this chapter is to describe the research design and method of the research study.

3.2 PURPOSE AND OBJECTIVES OF THE STUDY
The goal of the study is to determine the knowledge of nurses on the discharge planning for patients who have undergone valvular surgery, to decrease the incidence of complications and to ensure patients receive optimum preparation for their rehabilitation.

In order to reach this goal the following objectives have been set:

The primary objective is to:
- Identify, explore and describe the extent of discharge planning by nurses for patients who have undergone valvular surgery.

The secondary objective is to:
- Develop practice guidelines in the form of an inservice educational framework to assist nurses in effective discharge planning for patients who have undergone valvular surgery.

3.3 RESEARCH DESIGN
Mouton (2001:55) defines a research design as a plan or blueprint of how one intends on conducting the research. Parahoo (1997:142) states that the term
‘research design’ simply means a plan that describes how, when and where data are to be collected and analyzed. The author further states that the design should describe how the respondents are approached, informed, recruited, how ethical approval was obtained, what guarantees of confidentiality and anonymity was given, and how these was achieved. This research study is a quantitative, exploratory, descriptive and contextual study reflecting the knowledge of nurses regarding discharge planning for patients who have undergone valvular surgery. The research design is discussed as follows:

### 3.3.1 Quantitative study

According to Pilot & Hungler (1991:656), a quantitative research design can be defined as a type of non-experimental research that focuses on obtaining information regarding the status of a situation. De Vos (2002:79) supports this in defining that a quantitative study is an inquiry into a social or human problem, based on testing a theory composed of variables, measured with numbers and analyzed with statistical procedures in order to determine whether the predictive generalizations of the story hold true. In a quantitative research design the topic is well known and the researcher wishes to explore a topic further by means of the use of surveys, experiments or content analysis. Parahoo (1997:54) states that quantitative research was believed to be the only scientific method capable of advancing nursing knowledge, because it proves hard, objective facts that can be statistically analyzed and interpreted. Horsfall, in Parahoo (1997:58) further states that quantitative research may be appropriate for the study of issues related to the technical – clinical aspects of nursing, such as ‘tube feeding, pre-operative preparation of patients, cannula changing and catheterization’, where the abstract phenomena is being studied.

The characteristics of a quantitative approach include the following:

- It focuses on a relatively small number of specific concepts.
- Begins with preconceived ideas about how the concepts are interrelated.
- Uses structural procedures and formal instruments to collect information.
• Analyzes numeric information through statistical procedures.
• Emphasizing objectively in the collection and analysis of information.

(Polit & Hungler, 1993:19)

Brink (1996:13) states the following distinguishing features of a quantitative research:
• It is concise and narrow.
• It begins with pre-conceived ideas about how the concepts are interrelated.
• It uses structured procedures and formal instruments to collect information.
• It collects information under conditions of control.
• It emphasizes objectively in the collection and analysis of information.
• It analysis numerical information through statistical procedures.
• It incorporates logistic, deductive reasoning.

In this research study, the aim of the study is to determine the knowledge of nurses on discharge planning of patients, following valvular surgery. A structured questionnaire will be completed by participants to obtain data. Data will be analyzed by means of statistical procedures. Data obtained in this study can be used to address knowledge deficits.

3.3.2 Explorative research

Wilson (1993:11) states that the aim of this design is to gain more knowledge about a phenomenon, as well as to clarify concepts for future research. Politt and Hungler (1991:14) further states that it also explores the manner in which the phenomenon is manifested, and other factors to which it is related. Burns & Grove (2001:374) states that explorative studies are not intended for generalization to large populations, but are designed to increase knowledge in the field of study.

This research study will explore the knowledge of nurses responsible for the care and discharge planning of patients who have undergone valvular surgery. This approach will assist in the identification of any knowledge deficits that might be
present amongst nurses regarding discharge planning for patients who had valvular surgery.

### 3.3.3 Descriptive research

Parahoo (1997:143) states that at a descriptive level, the research is aimed at describing the phenomena about which little is known. Mouton (2001:80) states that the major purpose of a descriptive study is to observe and then to describe what has been observed. It provides in-depth description of a specific phenomenon, individual, social event or group and the frequency with which specific variables occur in a sample.

Within the proposed research study, the knowledge of nurses on the discharge planning of a patient who has undergone valvular surgery will be described. An understanding of stumbling blocks to comprehensive health education and discharge planning can be identified and practitioners and policy makers can be informed. Guidelines can then be formulated, to assist nurses in effective discharge planning for patients who have undergone valvular surgery.

### 3.3.4 Contextual research

Richardson (1996:54) states that human behavior does not occur in a vacuum, thus emphasizing the importance of providing a comprehensive description and analysis of the environment or social context of the participants. Holloway & Wheeler (1996:196) further defines by defining context as the immediate environment and physical location of the study.

The research study will be contextual as it will be conducted in a specific context, namely the general cardiac ward and/or clinic in a public hospital in the Nelson Mandela Metropole. This hospital is even more significant as it is the only public hospital in the Nelson Mandela Metropole that performs valvular and open-heart surgery.
3.4 RESEARCH METHOD

Research methods are the techniques used by researchers to structure a study and to gather and analyze information relevant to the research question (Burns & Grove, 2001:13). De Vos (2002:166) states that to obtain valid and reliable data one must ensure, before implementing the study, that measurement procedures and measurement instruments to be used have acceptable levels of reliability and validity.

The research methods will include the following sections:

3.4.1 Target population and sample

A population is the entire aggregation of cases that meets a designated set of criteria (Polit & Hungler, 1993:173). Parahoo (1997:218) defines ‘a sample’ as a proportion or subset of the population whilst Arkava & Lane in De Vos (2002:199) further specifies by stating that sampling comprises the elements of the population considered for actual inclusion in the study.

The target population will comprise of registered and enrolled nurses working in the general cardiac ward and the cardiac clinic. Both registered and enrolled nurse’s scope of practice includes providing patients with health education, to prevent disease and promote health. Registered nurses are expected to teach and council patients whilst enrolled nurses are merely expected to give information. The registered nurse’s role is bigger due to the fact that a registered nurse acquires much more knowledge in their training. They are expected to give health education on a higher level. In this hospital where the research study was conducted, there is limited staff available to ‘nurse’ patients. The study will be conducted at a public hospital in the Nelson Mandela Metropole. These are the only nurses responsible for giving education on discharge planning of patients who have undergone valvular surgery.
Patients are admitted to the general cardiac ward pre- and post-surgery. They attend cardiac clinic for their follow-up care. These wards are thus the only sectors where the research population can be selected.

### 3.4.2 Sampling method

Brink (2000:37) states that sampling is the process of selecting the sample from the population in order to obtain information regarding a phenomenon, in a way that represents the population of interest. The sample will consist of all the nurses working in the general cardiac ward and in the cardiac clinic. This study will include all the nurses available. In this public hospital, many nursing staff has resigned, are on permanent sick leave – awaiting boarding and losses in staff numbers are not replaced by government. Thus, it can be stated that the hospital is functioning with below minimum staff levels. The nursing staff in the cardiac clinic and cardiac ward is the only persons available and responsible for rendering care to the patients.

Non-probability, purposeful sampling will be utilized. Purposeful sampling is described by De Vos, (2002:334) as a type of sampling method where the parameters of the population can be critically identified by the researcher. De Vos (2002:207) also states that purposive samples is based entirely on the judgment of the researcher, in that a sample is composed of elements that contain the most characteristic, representative or typical attributes of a population. Parahoo (1997:232) states that purposive sampling involves the researcher deliberately choosing who to include in the study on the basis that those selected can provide the necessary data.

The sample will be non-probability, purposive sampling, thus the researcher is not selecting a random target group. The researcher believes that this group is representative of the nursing staff responsible for the discharge planning of patients who have undergone valvular surgery.
3.4.2.1 Sample size and selection criteria

De Vos (2002:199) states that if a population is relatively small, the sample should comprise a reasonably large percentage of the population. Larger samples enable researchers to draw more representative and more accurate conclusions, although this is more costly. The more persons in a population are used in a study the more representative the study will be.

In this study, all the nurses that fit the selection criteria, was included in the study. Criteria for selection of the target population include:

- Registered and enrolled nurse working in a cardiac ward
- Registered and enrolled nurse working in a cardiac clinic
- Nurses must be employed at the public hospital where the research study will be conducted
- Participants must be able to read and understand English, since the research study will be conducted in English – the international accepted medium
- Participants must not be on long sick leave
- Participants must be working in these areas for longer than one month
- Participants must be willing to participate.

The population consisted of seven registered nurses and three enrolled nurses, totaling ten nurses. The sample consisted of all ten nurses available for the study.

3.4.3 Data collection method

In this quantitative, explorative, descriptive research study, a structured questionnaire will be used for collecting data. A questionnaire is a method that seeks written or verbal responses from people, to a written set of questions or statements. It is a research method that is designed and administered solely for the purpose of collecting data as part of a research study. It is a quantitative approach since it is predetermined (constructed in advance), standardized (the same
questions in the same order are asked to all of the respondents) and structured (respondents are mainly required to choose from the list of responses offered by the researcher) (Parahoo 1997:247).

De Vos (2002:172) defines a questionnaire as ‘a set of questions on a form which is completed by the respondent in respect of a research project’. A personal questionnaire is described by De Vos (2002:173) as a questionnaire handed to the respondent who completes it on his own, but the researcher is available in case problems are experienced. The researcher’s contribution of the completion of the questionnaire should be kept to a minimum, only if a participant feels he may need clarity, the researcher will step in.

A well designed questionnaire should:
- Be easy for respondents to fill out.
- Be easy for the researcher to administer.
- Be easy for the researcher to score.
- Meet the objectives and goals of the enquiry.
- Obtain the most complete and accurate information possible and do so within reasonable limits of time and resources.

(Brink, 1996:154)

The aim of the questionnaire is to obtain information regarding nurse’s knowledge on discharge planning. Data collecting might aid in identifying any existing knowledge deficits regarding discharge planning following valvular surgery. Through the use of a questionnaire data can be generated from which concepts can be formulated. The questionnaire will comprise of four sections with closed-ended, open-ended and multiple choice questions. Closed ended questions are used to assist respondents to choose only the applicable answer, open ended question are used where the researcher would like to obtain the respondents view on a subject. Multiple choice questions are used where the researcher wants to
test the knowledge of the participants. The four different sections of the questionnaire will consist of:

**Section A: Demographic Data of the person completing the questionnaire.**
This section contains 3 closed-ended questions to establish the categories of participants.

**Section B: Discharge Planning**
This section comprises open, closed ended and multiple choice questions, including:
- Numbers of patients undergoing valvular surgery per week
- Availability of resources such as pamphlets and/or newsletters and the need for these.
- Factors influencing nurses concerning giving health education.
- Communication barriers

**Section C: Lifestyle Changes**
This section includes open, closed ended and multiple choice questions:
- Health education topics given to the patient
- Exercise programmes
- Follow up dates
- Involvement of other health practitioners
- Anti-coagulation therapy
- Bacterial endocarditis
- Fluid volume excess

**Section D: Medications**
This section include the following closed ended and multiple choice questions:
- warfarinization
- prophylactic anti-biotics
The researcher obtained all the necessary consent from the relevant managerial structures before research was conducted. Questionnaires were handed out to all the relevant participants with the assistance of the unit manager. Participants were given 48 hours to complete the questionnaires due to time constraints and commitments of the unit. The questionnaires were handed back to the unit manager and collected by the researcher from the unit manager, by hand. A detailed consent form was handed out with the questionnaire to ensure all participants are aware that participation is voluntary, that they may withdraw at any time, and that the researcher is available should there be any further questions, uncertainties or queries. The consent form was not attached to the questionnaire to ensure confidentiality and participants were reassured in their consent form regarding the option to withdraw at any time during the study, since their participation is voluntary.

3.4.3.1 Principles of questionnaire construction

According to De Vos (2002:175) there are a number of basic principles to be taken into consideration when a questionnaire is developed. It will be discussed as follows:

- **Information needed**
  Before a researcher can set up a questionnaire, there should be specific information he/she wishes to gather. The questionnaire should be brief, but long enough to obtain all the questions needed. Questions should be well structured to aid in obtaining as much as possible information in the shortest time possible (De Vos, 2002:175). Specific information was gathered with the questionnaire. It consisted of four sections acquiring the participant’s demographic data, knowledge on discharge planning, lifestyle changes and medications for patients who have undergone valve surgery.
Format of the questionnaire

The format of the questionnaire will depend on whether it will be mailed, telephonically answered, or handed out personally to participants. In the research study the questionnaire was typed and personally handed to the participants. Should the person conducting the research not be present, a covering letter, stating the purpose or importance of the study and motivating participants be present. Anonymity should be guaranteed to the participants, and they should be made aware that their participation in the research study is voluntary. Participants should also be aware that they may withdraw from the research at any given time. The researcher should be available to clarify any misconception or uncertainties. (De Vos, 2002:175) All these factors where adhered to in constructing the questionnaire and consent form.

Writing the questions

According to the author there are certain basic principles that can be applied for the formulation of questions in a questionnaire. These principles include the following:

- Sentences should be brief and clear, with a vocabulary understandable to respondents
- Questions and response alternatives must be clear and not reflect the bias of the researcher
- Every question must contain only one thought
- Every question must be relevant to the purpose of the questionnaire
- Abstract questions not applicable to the milieu of the respondents should rather be avoided
- The sequence in which the questions are presented must be aimed at general non-thinking questions first, then more sensitive, or personal questions later
The researcher must determine the usefulness of every question and questions should only be applicable to the study intended (De Vos, 2002: 175). All these principles were adhered to in constructing the questionnaire.

Ways to ensure completion of the questionnaire
De Vos (2002:177) states that questionnaires can be given to a captive audience or handed out to the participants. The researcher can wait for respondents to complete the questionnaires, which will ensure that there is a clear understanding of questionnaires, or he/she can give a collection date where the questionnaires can then be collected from the participants. In this study, questionnaires were handed out by the researcher and participants were given 48 hours to complete them. The researcher ensured that there was no uncertainties by returning and being available should any clarification be needed.

3.4.4 Data analysis
De Vos (2002:177) states that in the view of comprehensive work involved in classifying and analyzing data collected in large investigations, mechanical and electronic facilities are utilized as far as possible.

Data will be analyzed with the use of a statistician. Conclusions will be drawn by means of deductive reasoning, which is defined as a logical thought process in which hypotheses are derived from theory and where reasoning moves from the general to the particular (LeBiondo-Wood and Haber; 1998:551).

In the classifying and analysis of data, a computer can be utilized. De Vos (2002:177) states that in order to use a computer, in the analysis of data, the questionnaire must be compiled in a certain manor, e.g. item numbers that can be used in a data set must be incorporated into the questionnaire, the questionnaire can be divided onto different sections. De Vos (2002:179) notes that most questionnaires contain both open and closed ended questions , and that
researchers must aim at using as many closed ended questions as possible, although there will always be information that is difficult to generate by closed ended questions. Open ended questions are unavoidable in such instances.

Multiple choice questions, open and closed ended questions was used in this study. Tables, figures and graphs (pie, column and donut) will be used to display findings. McBurney (2001:139) defines a table as a display of data in numerical form in the rows and columns of a matrix, and defines a graph as a representation of data by spatial relationships in a diagram.

3.5 PILOT STUDY
De Vos (2002:211) defines a pilot study as a small-scale trial run of all the aspects planned for use in the main inquiry. Kvale (1996:44) further states that a pilot study is a small scale version of the major study that tests a part or parts of the study, before the actual study begins. A small scale pilot/test can be administered to people similar to those specified in the characteristics. A pilot study will be done using a preliminary questionnaire to identify if any questions have been omitted. McBurney (2001:228) states that once a protocol has been developed, a pilot study should be done to find any ‘bugs’ in the procedure. Any problems can be identified and rectified at this stage without jeopardizing the actual study.

A pilot study was conducted using one questionnaire only, since the study is limited regarding the number of participants available. Parahoo (1997:275) feels that a pilot study is necessary to determine just how good it is, if the length and the structure of the questionnaire are likely to affect responses. If the questionnaire requires no adjusting, the data collected in the pilot study will form part of the actual study. The participant completed the questionnaire without any difficulties, and knowledge deficits were identified. Since the questionnaire measured what it was supposed to and needed no adjusting, the pilot questionnaire was included in the actual study. See Report on pilot study.
3.6 QUALITY OF THE RESEARCH METHODS

3.6.1 Validity and reliability

Validity and reliability are key concepts in research. It determines how credible and trustworthy the research study and findings are (Brockopp & Hastings-Tolsma, 2003:210).

3.6.1.1 Validity

Richardson (1996:14) states that validity is concerned with the accuracy and truthfulness of scientific findings whilst to Chinn and Kramer (1995:44) validity refers to the instrument measuring what it is expected to measure. In this research study the questionnaire will be presented in a user friendly format with easy to use and understandable written instructions.

The following two types of validity were used to ensure the accuracy of the instrument in conducting research:

- **Face validity**
  
  Face validity refers to the ability of questionnaire to accurately measure what it was supposed to. It is essentially based on an intuitive judgment by experts in the field, Brink (1996:168). The researcher will ensure that the participants clearly understand the nature and the reason for the research.

In this research the face validity of the instrument was ensured by scrutiny of the instrument by the researcher and experts in the field, to ensure all data was included and that the format of the questionnaire was acceptable. Consensus was reached between the researcher and experts about the face validity, the appropriateness and acceptable, clear presentation of all questions.
**Content validity**

Brink (2000:168) states that content validity is concerned with how well the instrument represents all the different components of the variable to be measured. Parahoo (1997:270) states that content validity refers to the degree, to which the questions asked, adequately represent the phenomenon being studied.

To ensure and assess the content validity, a thorough literature research was done on the topic of interest. The questionnaire was handed to experts in the field of research, as well as in the area of valvular surgery. These methods reflect on the content validity. The questionnaire is divided into four sections covering aspects identified by the researchers to gather data appropriate to the study, and all sections were assessed to ensure that the questionnaire measured what it was supposed to measure.

3.6.5.2 **Reliability**

Burns & Grove (2001:305) states that reliability is concerned with how consistently an instrument measures the phenomenon of interest, or the accuracy of the data in the sense of their stability or repeatability. The underlying issue is whether the process of the study is consistent, reasonably stable over time, as well as across researchers. Burns, Grove & Hegstad (1993:181) simplifies this definition as that reliability is concerned with how consistently the measurement technique measures the concept of interest.

De Vos (2002:168) states that reliability refers to the extend to which independent administration of the same instrument (or a highly similar instrument) consistently yields the same (or similar) results under comparable conditions.

In this research, the researcher will strive to obtain all relevant data on a questionnaire. Reliability is an indicator of how consistent the instrument will measure the phenomena of interest. A pilot study will be done, to ensure that all
aspects of the research are covered. The researcher can ensure reliability and validity by ensuring that all participants understand the nature and the reasoning for the research after the questionnaire has been revised by experts in the field.

3.7 ETHICAL CONSIDERATIONS
The South African Society for Nursing Researchers (1996:740) stipulates that high ethical standards must be maintained at all times when conducting the research. Ethical considerations are identified by De Vos (2002:64) as: harm to experimental subjects and/or respondents, informed consent, deception of subjects and/or respondents, violation of privacy/anonymity/confidentiality, actions and competency of researchers, co-operation with contributors, release or publication of findings, and debriefing of respondents.

In this quantitative study the following ethical considerations were implemented:
- informed consent
- confidentiality
- anonymity
- privacy

3.7.1 Informed consent
Babbie (2001:471) states that informed consent means that participants must base their voluntary participation in research projects on understanding the possible risks and advantages involved.

Informed consent is an ethical requirement in conducting research and implies that the participants should be fully aware of all the facts associated with the research, including the aims and reasons for the study, who will see the questionnaires and what the researcher will do with the information obtained. De Vos (2002:65) states that informed consent implies that all possible information on the goal of the
investigation, the procedures that will be followed during the investigation, the possible advantages, disadvantages and dangers to which the respondents may be exposed, as well as the credibility of the researcher, be rendered to potential subjects or their legal representatives.

Mouton (2001:244) states that informed consent can be ensured step by step:

- Obtain approval for the research
- State clearly what institution you represent
- Explain to the subjects what the research is about, the benefit of the research, and who will benefit
- Reassure the subjects that they will be protected from any physical and physiological harm
- Get their informed consent
- Explain any risks
- Explain that they may opt out at any stage
- Debrief them if you had to employ deception to avoid bias
- Ask for suggestions to improve the research process
- Assure them of your respect for their confidentiality
- Thank them for their participation and possibly give them a small reward
- Offer them a summary of the research results

Written consent will be obtained from all participants who meet the inclusion criteria. They will also be informed that they may withdraw from the study at any stage without fear of recrimination of any sort. This research study poses no risks for the participants. Permission to conduct the research will be obtained from the:

- Relevant local authorities.
- Medical superintendent of the state hospital.
- Unit manager of the unit where the research will be conducted.
- Individual participants.
- The Human Ethics Committee and the Advanced degree committee of the Nelson Mandela Metropolitan University.
3.7.2 Confidentiality
Burns and Grove (2001:163) define confidentiality as not sharing information gained from participants without their permission or authority. Mouton (2001:24) states that confidentiality refers to the information gathered in the research will be kept secret. Confidentiality will be guaranteed in the consent form that each participant will be required to sign prior to completing the questionnaire. The researcher will also inform the participants that all information obtained from them will be kept strictly confidential and private. No person, except for the researchers and the statistician will have access to the questionnaires (to which no names can be attached), and all questionnaires will be destroyed after research is completed.

3.7.3 Anonymity
De Vos (2002:68) states that the concept of anonymity means that nobody, including the researcher, should be able to relate any information gained from any participant.
Mouton (2001:244) states that anonymity refers to the principle that the identity of the individual is kept secret. This implies that all information obtained in this research, should not be linked to any one of the participants. The signed consent forms will be detached from the questionnaires prior to the completion of the latter to ensure that no participant’s anonymity will be compromised. No names or numbering will be required on the questionnaire. Only the data obtained from the participants will be used in the research study.

3.7.4 Privacy
Violation of privacy, the right to self-determination and confidentiality can be viewed as synonymous. Privacy can be defined as that which is not intended for others to observe or analyze. (De Vos;2002:67). The right to privacy is expressed by Mouton (2001:243) as the participant having the right to refuse to answer a questionnaire.
In this study privacy will be ensured by confidentiality of participants responses: the researcher and two experts are the only persons who will have access to the responses and all questionnaires will be destroyed after use.

3.7 CONCLUSION
This chapter described the research methods that were used in this study. A quantitative, explorative, descriptive design was used to gather information on the knowledge of nurses on the discharge planning of patients who have undergone valvular surgery. A questionnaire was used as a research instrument and was tested by means of a pilot study.

Data analysis will be done be a statistician, and the results will be discussed in chapter four.
CHAPTER 4

DATA ANALYSIS AND DISCUSSION

4.1 INTRODUCTION

The objectives of this study were twofold. The first objective was to identify, explore and describe the knowledge of nurses regarding discharge planning for patients who have undergone valvular surgery. The second objective was to develop practice guidelines in the form of an in-service educational framework to assist nurses in effective discharge planning for patients who have undergone valvular surgery.

In this chapter, the results of the study will be outlined and discussed in terms of available literature. Data were collected using a questionnaire and statistics were used to determine the results of the questionnaire. Data were analyzed by a statistician and will be discussed by way of percentages, tables and graphic presentations. The analysis and discussion of the items will be set out according to the presentation in the questionnaire. The questionnaire was divided into four sections:

- Section A: Consisted of three questions regarding the demographic data of the participants.
- Section B: Consisted of ten questions to establish the knowledge of nurses on the discharge planning of patients who have undergone valvular surgery.
- Section C: Consisted of 18 questions to establish the knowledge of nurses regarding the lifestyle changes for patients who have undergone valvular surgery.
- Section D: Consisted of six questions to establish the knowledge of nurses on medications used for patients who have undergone valvular surgery.
Each question will be analyzed separately using graphs where possible for visual representation of the findings.

4.2 RESULTS OF THE QUESTIONNAIRE
The plan was to give questionnaires to registered and enrolled nurses working in the cardiac ward and clinic at the only public hospital in the Nelson Mandela Metropole where valvular surgery is conducted. Only ten (10) participants were available in the cardiac ward, and no participants that met the inclusion criteria, were available in the cardiac clinic. At the time of data collection, only nursing assistants were available in the cardiac clinic.

These ten (10) nurses were the only registered and enrolled nursing staff available to cover the cardiac ward, during day and night time. They are also responsible for the care and education of these patients.

4.3 SECTION A: DEMOGRAPHIC DATA
The aim of the demographic data was to establish:
- The years of experience of the participants.
- The professional category of the participants.
- If the participants held any post-basic qualifications; participants were also requested to indicate the type of post-basic qualifications obtained, if applicable.

4.3.1 Years of Experience
The number of years of experience of the participants was reflected as follows:
Of the ten (100%) participants available to complete the questionnaire, seven (70%) had less than five years of experience in the cardiac unit/clinic; one participant (10%) indicated five to ten years of experience in the cardiac unit/clinic;
one participant (10%) indicated more than 20 years of experience in the cardiac unit/clinic; and one participant (10%) did not respond.

![Pie chart showing the distribution of experience years among participants.](image)

**Figure 4.1: Number Of years working experience in the cardiac unit**

As illustrated in figure 4.1, the majority (70%) of the nursing staff had less than five years experience in a cardiac unit. Based on these findings, the assumption could be made that the majority of the participants could not be classified as highly experienced practitioners.

### 4.3.2 Professional category

The professional categories of the available participants were reflected as follows: Of the ten (100%) participants, six (60%) were registered nurses and four (40%) were enrolled nurses, as illustrated in figure 4.2.
4.3.3 Post-basic qualifications

Post-basic qualifications held by the participants were reflected as follows: Of the ten (100%) participants, only two (20%) indicated that they held post-basic qualifications (see table 4.1).

<table>
<thead>
<tr>
<th>Do participants hold post-basic qualifications</th>
<th>Number of participants</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>2</td>
<td>20%</td>
</tr>
<tr>
<td>No</td>
<td>8</td>
<td>80%</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>100%</td>
</tr>
</tbody>
</table>

The two participants (20%) with post-basic qualifications indicated that the qualifications held were in midwifery and psychiatric nursing science respectively. Neither of these qualifications would affect the quality of health education given to patients who have undergone valvular surgery.

4.4 SECTION B: DISCHARGE PLANNING

The aim of this section of the questionnaire was to ascertain the knowledge of nurses regarding the discharge planning of patients who have undergone valvular
surgery. This section also identified any factors that might hinder participants from rendering adequate health education. In order to ensure optimal rehabilitation of patients, ongoing health education needs to be given during their in-hospital stay. The ideal would be to provide patients with guidelines on how to assist effectively in their own rehabilitation.

4.4.1 Average number of valvular surgery patients nursed per week

In response to the question regarding how many valvular surgery patients the participants nursed per week, eight (80%) of the ten (100%) participants indicated that they nursed five to ten valvular surgery patients per week, while the remaining two (20%) participants indicated that they nursed ten to twenty valvular surgery patients per week (see figure 4.3).

![Figure 4.3: Number of valvular surgery patients nursed per week](image)

From the data gathered, and the fact that valvular surgery patients have an in-hospital stay in the cardiac ward of at least five days, the conclusion could be drawn that at least five to ten valvular surgery patients on average are in the cardiac ward at any given time. The ward also caters for other cardiac surgery patients, as well as pacemaker patients.
4.4.2 Pamphlets/newsletters from employer regarding health education to be given to patients who have undergone valvular surgery

When asked if they received pamphlets/newsletters regularly from their employers regarding health education to be given to patients who have undergone valvular surgery, five (50%) of the ten (100%) participants indicated they did receive these regularly, while the remaining five (50%) indicated that they did not receive them regularly (see table 4.2).

Table 4.2: Participants receiving regular pamphlets/newsletter regarding health education for patients who have undergone valvular surgery

<table>
<thead>
<tr>
<th>Participants regularly receive pamphlets/newsletters</th>
<th>Number of participants</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>5</td>
<td>50%</td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>50%</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>100%</td>
</tr>
</tbody>
</table>

Based on the findings of the data collected, no conclusions could be drawn on whether or not the participants received pamphlets/newsletters regularly. When asked on which topics they would like to receive information, three (30%) of the participants indicated that they would like to receive information on ‘cardiac surgery’, whilst one (10%) of the participants indicated that he/she would like to receive information on ‘diets, exercise and the usage of medication’.

4.4.3 Benefit of information regarding discharge planning

The participants were asked if they felt that they would benefit from receiving information regarding the discharge planning of patients who have undergone valvular surgery. Of the 10 (100%) participants, nine (90%) indicated that they would benefit from receiving information on discharge planning, whilst one (10%) participant indicated that he/she would not benefit from receiving information (see figure 4.4).
4.4.4 Effect of handouts for patients on participants’ workload

Participants were asked if they felt that handouts for patients who have undergone valvular surgery would decrease their workload. Of the ten (100%) participants, nine (90%) felt that handouts would decrease their workload, while only one (10%) felt that handouts would not decrease the workload (see figure 4.5).
The researcher gathered from this result that the majority of the participants felt that handouts on discharge planning for patients who have undergone valvular surgery would decrease their workload. Handouts would also ensure that all patients received comprehensive health education and had guidelines available should any situation occur. When asked how they felt that handouts would decrease their workload, four (40%) participants indicated that it would save time, three (30%) felt that it would increase the patients’ compliance regarding rehabilitation and one (10%) felt that it was vitally important that handouts be available in Afrikaans, English and Xhosa in order to save time on translation and to be effective.

4.4.5 Do nurse: Patient ratios allow participants to render adequate health education to patients?

The participants were asked if they felt that the nurse: patient ratio in their unit allowed them to give adequate health education to the patients. Of the ten (100%) participants, four (40%) felt that the ratio allowed them to give adequate health education, five (50%) felt that the ratio did not allow them to give adequate health education, whilst one (10%) participant did not respond (see table 4.3).

Table 4.3: Do participants feel that the nurse: Patient ratio allows them to render adequate health education to the patients?

<table>
<thead>
<tr>
<th>Does nurse: Patient ratios allow participants to give adequate health education?</th>
<th>Number of participants</th>
<th>Percentages %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>4</td>
<td>40%</td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>50%</td>
</tr>
<tr>
<td>No response</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>100%</td>
</tr>
</tbody>
</table>

It is apparent that the majority of the participants felt that the nurse: patient ratio did not allow them to render adequate health education to patients who had undergone valvular heart surgery. When asked the reason why they felt that they could not give adequate health education, six participants (60%) indicated that it was due to
staff shortages and one (10%) participant also indicated that “the workload keeps on increasing”. Three (30%) participants had no response.

4.4.6 Do participants feel that patients could have received more health education in the past?
Participants were asked if they felt that patients could have received better health education in the past. Of the ten participants (100%), seven (70%) felt that patients could have received more health education in the past, while two (20%) felt that patients could not have received more health education, thus the assumption could be made that they felt that the health education that the patients received was adequate. One participant (10%) did not respond. See table 4.4.

Table 4.4: Do nurses believe that patients could have received more health education in the past

<table>
<thead>
<tr>
<th>Do nurses believe that patients could have received more health education in the past</th>
<th>Number of participants</th>
<th>Percentages %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>7</td>
<td>70%</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>20%</td>
</tr>
<tr>
<td>No response</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>100%</td>
</tr>
</tbody>
</table>

Most of the participants indicated that they gave the patients health education on wound care and medication use, while others indicated that they gave health education about diet and exercise. The conclusion could be drawn from data gathered that patients did not always receive adequate health education. Some participants may have educated patients on certain aspects only, while omitting other aspects. One of the participants indicated that a language barrier hinders her from giving adequate health education.

4.4.7 Informational pamphlets on discharge
The participants were asked if they felt that an informational pamphlet on valvular surgery aftercare would be beneficial on discharge of the patient. All of the ten participants (100%) indicated that this would be beneficial (see table 4.5).
Table 4.5: Would pamphlets on valvular surgery aftercare be beneficial on discharge?

<table>
<thead>
<tr>
<th>Would pamphlets on valvular surgery aftercare be beneficial for patients on discharge?</th>
<th>Number of participants</th>
<th>Percent %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

4.4.8 Language

Participants were asked to identify the language spoken by the majority of the patients. Of the ten participants (100%), six (60%) indicated that the languages spoken by the majority of the patients were English, Xhosa and Afrikaans, while the remaining four (40%) indicated that English was the language spoken by the majority of the patients (see figure 4.6).

![Figure 4.6: Languages spoken by the majority of the patients](image)

4.4.9 Translators

The participants were asked if they made use of translators. Of the ten participants (100%), nine (90%) indicated that they did use translators, whilst the remaining participant (10%) did not respond (see table 4.6).
Table 4.6: Use of translators

<table>
<thead>
<tr>
<th>Do participants make use of translators?</th>
<th>Number of participants</th>
<th>Percentages %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>9</td>
<td>90%</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>No response</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

This data indicated that patients admitted to the cardiac unit came from all over the Eastern Cape and spoke the languages common to this region. All of these patients need to be catered for, as not all of the participants spoke all three languages. Translations were often done by general assistants who were available for this process. This could pose problems as important data could be lost during the translation process.

4.4.10 Communication barriers

Participants were asked if they felt that there were any communication barriers that hindered them from rendering health education to patients who had undergone valvular surgery. Of the ten participants (100%), five (50%) said that there were, four (40%) indicated that there were none and one participant (10%) did not respond (see table 4.5).

Table 4.7: Do participants feel that there are communication barriers that hinder them from giving health education?

<table>
<thead>
<tr>
<th>Do participants feel that there are communication barriers hindering them from giving health education?</th>
<th>Number of participants</th>
<th>Percentages %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>5</td>
<td>50%</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>40%</td>
</tr>
<tr>
<td>No response</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
Data gathered indicated that the majority of the participants felt that there were communication barriers hindering them from giving health education to patients who had undergone valvular surgery. In response to a question regarding what they felt those barriers were, two participants (20%) indicated that Xhosa was a barrier, one participant (10%) indicated that Afrikaans was a barrier and another one (10%) indicated that ‘misunderstandings’ were a communication barrier to her.

4.5 SECTION C: LIFESTYLE CHANGES

The aim of this section was to establish the knowledge participants had concerning the lifestyle changes that need to be made by a patient who has undergone valvular surgery. It also covered some of the most important health education that these patients need to equip them for discharge.

4.5.1 Health education

Participants were asked to indicate what health education they gave to patients on discharge. Of the ten participants (100%), six (60%) indicated that they gave health education on removal of clips/sutures, six (60%) indicated that they gave health education on the identification of wound infection, seven (70%) indicated that they gave health education of the importance of a low salt diet, seven (70%) indicated that they gave health education on the identification of infection and all ten participants (100%) indicated that they gave health education about the patients’ follow-up dates (see figure 4.7).
Figure 4.7: Health education given to patients following valvular surgery

Based on data collected, the researcher could make the assumption that all patients do not receive important health education on discharge following valvular surgery, for example health education pertaining to removal of sutures, wound infections, follow-up visit dates and low salt diet. Consequently, the deduction could be made that not all patients were adequately equipped for their rehabilitation period after discharge.
4.5.1.1 **Signs of infection**

Participants were asked to identify which signs and symptoms they emphasized when educating their patients. All of the ten participants (100%) identified redness, swelling, pain, oozing and pyrexia as signs and symptoms of infection (see figure 4.8).

![Figure 4.8: Signs and symptoms of infection identified by the participants when giving health education](image)

The deduction could be made from data gathered that all participants were aware of the signs and symptoms of infection but, according to responses reflected in figure 4.7, the researcher could identify that only sixty percent (60%) of the participants actually conveyed these facts to their patients.

4.5.2 **Activity and exercise programmes**

An exercise programme is important both to prevent patients from prolonging their rehabilitation and also to prevent them from injuring themselves with too early exercise. The participants were asked if they supplied their patients with guidelines regarding exercise and activity programmes. Of the ten participants (100%), nine (90%) indicated that they did supply the patients with exercise and activity programmes (see table 4.6).
Table 4.8: Participants supplying patients with exercise/activity programmes

<table>
<thead>
<tr>
<th>Do supply patients with exercise/activity programmes</th>
<th>Number of participants</th>
<th>Percentages %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>9</td>
<td>90%</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

4.5.2.1 *Information given regarding exercise programmes*

Participants were asked to indicate when they advised patients to resume normal activities post-operatively. Of the ten participants (100%), one (10%) indicated that he/she educated patients incorrectly to commence normal activities one week post operatively, eight (80%) correctly indicated that they educated their patients to commence an exercise programme four to six weeks post operatively and one participant (10%) gave no response (see figure 4.9).

![Figure 4.9: When to resume normal activities](image)

The participants were asked to indicate whether they educated patients about when to commence an exercise programme. Of the ten participants (100%), nine (90%) indicated that they did educate their patients about when to commence with an exercise programme following valvular surgery, while one (10%) indicated that he/she did not do so (see table 4.7).
Table 4.9: Do participants educate patients on when to commence with an exercise programme?

<table>
<thead>
<tr>
<th>Do participants educate patients on when to commence with an exercise programme?</th>
<th>Number of participants</th>
<th>Percentages %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>9</td>
<td>90%</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>100%</td>
</tr>
</tbody>
</table>

4.5.3 Follow-up care
Participants were asked whether they supplied patients with information regarding the dates for follow-up care. Follow-up visits are very important, since all queries and misconceptions or uncertainties can be dealt with on these occasions and the patient’s progress/regress can also be monitored. All of the ten participants (100%) indicated that they did supply the patients with information regarding dates for their follow-up visits (see table 4.8).

Table 4.10: Participants do supply patients with a follow-up visit date

<table>
<thead>
<tr>
<th>Do supply follow-up date</th>
<th>Number of participants</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

4.5.3.1 Follow-up date
Participants were asked to indicate the time interval after discharge for which the follow-up visit should be scheduled. Of the ten participants (100%), three (30%) indicated incorrectly that the follow-up visit should be scheduled two to four weeks after surgery, eight (80%) indicated correctly that it should be scheduled four to six weeks post surgery, while one (10%) indicated both of the aforementioned time intervals. This explains why the total equals 110% (see figure 4.10).
4.5.3.2 Importance of informing healthcare practitioners regarding warfarinization and rheumatic fever

Participants were asked whether they educate their patients regarding the importance of informing their healthcare providers about the use of warfarin and the incidence of rheumatic fever. These are very important aspects, as prophylactic antibiotics may be needed before certain procedures or with any signs of infection. Patients may need to stop warfarin before having a procedure done in order to prevent massive blood loss. All ten participants (100%) indicated that they educated their patients about informing their dentist and general practitioner. Of the ten participants (100%), four (40%) indicated that they educated their patients to inform their gynaecologist and two (20%) also indicated as ‘other’ that they educated their patients to inform the cardiac clinic and local clinic that they attended (see figure 4.11). It is important that all the relevant practitioners be informed regarding the patient’s medication and health status, as invasive procedures may precipitate infections and bleeding episodes. These practitioners might also prescribe other medication that could interfere with the pharmacokinetics of warfarin.
Figure 4.11: Do participants educate patients to inform health care givers regarding the use of warfarin and the incidence of rheumatic fever?

4.5.3.3 Seeking medical assistance

Participants were asked if they educated their patients concerning when to seek medical assistance. This is important for the early detection of complications, as well as the prompting of treatment to avoid re-admittance to hospital and to ensure adequate functioning of the valve. Of the ten participants (100%), nine (90%) indicated that they educated their patients on when to seek medical assistance, while one (10%) did not respond (see table 4.9).

Table 4.11: Do participants educate patients on when to seek medical assistance?

<table>
<thead>
<tr>
<th>Do participants educate patients on when to seek medical assistance?</th>
<th>Number of participants</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>9</td>
<td>90%</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

4.5.3.3.1 Which signs are important in seeking medical assistance?

Participants were asked to identify which of the listed signs they would convey to their patients as important indicators of when to seek medical assistance. Of the
ten participants (100%), all ten (100%) indicated that they would convey easy bruising, swelling of the feet, infections, shortness of breath and bleeding tendencies as important indicators to seek medical assistance. Eight of these participants (80%) indicated that they would convey signs and symptoms of bacterial endocarditis (SBE) as an indicator to seek medical assistance. Two participants (20%) did not indicate that they would educate their patients to seek medical assistance with the signs and symptoms of bacterial endocarditis (see figure 4.12).

![Figure 4.12: Signs conveyed to patients as important indicators in when to seek medical assistance](image)

4.5.4 Functioning of a valve

Participants were asked if they supplied patients with information on the functioning of a valve. An understanding of the functioning of the valve will increase compliance with the rehabilitation programme and create a better understanding regarding when to seek medical assistance. Eight (80%) of the ten participants (100%) indicated that they did supply their patients with information about the functioning of a valve, while the remaining two participants (20%) indicated that they did not (see table 4.10).
Table 4.12: Do participants supply patients with information regarding the functioning of a valve?

<table>
<thead>
<tr>
<th>Information regarding the functioning of a valve</th>
<th>Number of participants</th>
<th>Percentages %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>8</td>
<td>80%</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>100%</td>
</tr>
</tbody>
</table>

If participants indicated yes, they were asked what information they provided. Three participants (30%) indicated that they supplied information regarding warfarin and other cardiac medications used, another three (30%) indicated that the Onyx valve volunteer worker usually educated the patients regarding the functioning of a valve and another participant (10%) responded that she educated the patients that ‘with the signs of cyanosis to report to a doctor.’

Participants who indicated that they did not educate their patients regarding the functioning of a valve, stated that this was due to the assistance of the Onyx valve volunteer worker in educating patients, while another participant stated ‘I am not learning what to do/say for that patient yet’.

4.5.5 Importance of anticoagulation therapy with a mechanical valve in situ

Participants were asked if they educated their patients about the importance of anticoagulation therapy when they have a mechanical valve in situ. Of the ten participants (100%), nine (90%) indicated that they did educate their patients on the importance of anticoagulation therapy and one participant (10%) indicated that he/she did not (see table 4.11).
Table 4.13: Do participants educate their patients on the importance of anti-coagulation therapy with mechanical valves in situ?

<table>
<thead>
<tr>
<th>Educate patients on the importance of anti-coagulation therapy with mechanical valves</th>
<th>Number of participants</th>
<th>Percentages %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>9</td>
<td>90%</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Although the correct response rate was good, those patients who do not receive this vitally important information could have to undergo a redo-valve replacement due to defaulting on their anti-coagulation therapy.

4.5.6 Importance of anticoagulation therapy with arrhythmias

Participants were asked whether they educated their patients diagnosed with arrhythmias on the importance of anticoagulation therapy. Of the ten participants (100%), nine (90%) indicated that they did educate patients on the importance of anti-coagulation therapy and one participant (10%) indicated that he/she did not (see table 4.12).

Table 4.14: Do participants educate their patients with arrhythmias on the importance of anti-coagulation therapy?

<table>
<thead>
<tr>
<th>Educate patients with arrhythmias on the importance of anti-coagulation therapy</th>
<th>Number of participants</th>
<th>Percentages %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>9</td>
<td>90%</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Although 90% of participants indicated that they did educate their patients with arrhythmias on the importance of anti-coagulation therapy, one participant responded that she did not do so. The implications are that those patients not educated could develop complications that could have been prevented had they
been educated about the importance of anti-coagulation therapy and of adhering to the treatment.

4.5.7 Signs of bacterial endocarditis

Participants were asked to identify possible signs of bacterial endocarditis they would convey to their patients. Fever, wheezing, oedema, splenomegaly, haematuria, easy fatigability and Roth’s spots were included on the selection list. All ten of the ten participants (100%) correctly identified fever, five (50%) correctly identified splenomegaly, one (10%) correctly indicated heamaturia and one (10%) correctly identified Roth’s spots as signs of bacterial endocarditis.

All ten participants (100%) incorrectly identified oedema as a sign, nine (90%) incorrectly indicated easy fatigability as a sign and two (20%) incorrectly identified wheezing as a sign (see figure 4.13).

Figure 4.13: Signs of bacterial endocarditis identified by participants

From the data collected, the researcher could deduce that an educational need existed among participants regarding the identification of signs of bacterial endocarditis.
4.5.8 Fluid volume excess

Participants were asked whether they educated their patients concerning fluid volume excess. All ten (100%) participants indicated that they did (see table 4.13).

Table 4.15: Do participants educate their patients on fluid volume excess?

<table>
<thead>
<tr>
<th>Do participants educate on fluid volume excess</th>
<th>Number of participants</th>
<th>Percentages %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Participants were also asked to indicate the signs of oedema they convey to their patients. Of the ten participants (100%), ten (100%) indicated oedema, dyspnoea and weight gain, while only one participant (10%) indicated increased jugular vein pressure. The researcher could deduce from the data gathered that participants were knowledgeable about signs of fluid volume excess (see table 4.14).

Table 4.16: Signs of fluid volume excess identified by participants

<table>
<thead>
<tr>
<th>Signs of fluid volume excess identified by the participant</th>
<th>Number of participants</th>
<th>Percentages %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oedema</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>Increased jugular vein pressure</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td>Dyspnoea</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>Weight gain</td>
<td>10</td>
<td>100%</td>
</tr>
</tbody>
</table>
4.5.9 Fluid retention
Participants were asked if they informed their patients that 1kg weight gain equals 1 liter of fluid retention. Of the ten participants (100%), only four (40%) indicated that they did convey to their patients that fluid retention equals weight gain. Five participants (50%) indicated that they did not and one participant (10%) did not respond (see figure 4.14).

![Pie chart showing responses to question: Do participants educate their patients that 1kg weight gain equals 1 liter fluid retention?]

Figure 4.14: Do participants educate their patients that 1kg weight gain equals 1 liter fluid retention?

This information could assist in the early detection of complications such as right ventricular failure, pulmonary edema and generalized edema.

4.6 SECTION D: MEDICATIONS
The aim of this section of the questionnaire was to establish the knowledge of registered and enrolled nurses about medications for patients who have undergone valvular surgery. This is important in the management of patients and the prevention of complications.
4.6.1 Warfarin regime

Participants were asked if they educated their patients on the importance of adhering to their warfarin regime. All of the ten participants (100%) indicated that they did (see table 4.15)

Table 4.17: Do participants educate their patients on the importance of adhering to their warfarin regime

<table>
<thead>
<tr>
<th>Educate on the importance of adhering to warfarin regime</th>
<th>Number of participants</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The participants were also asked to indicate the information they conveyed to their patients from the following selection given: the importance of not skipping doses; treatment entails one dose daily; if the dose was skipped the previous day, not to take the dose with the following day's; and to go for regular follow-up blood checks. Of the ten participants (100%), nine (90%) indicated that they did educate their patients on the importance of not skipping doses, that treatment entails one dose daily and to go for regular follow-up blood checks. Eight participants (80%) indicated that they did convey to their patients that, should they skip a dose, they should not take a double dose the following day. This is vitally important health education that all patients should receive to maintain blood warfarin levels within therapeutic range. If blood warfarin levels are too high, the patient could experience complications such as bleeding tendencies. If the blood warfarin level is too low, the patient could suffer complications such as emboli formation which could lead to clotting of the valve (see figure 4.15).
4.6.2 Side effects of too much anticoagulation

This is a major consideration with all patients on anticoagulation therapy. It is important that patients identify problems promptly and seek medical assistance. Participants were asked whether they educated their patients regarding the side effects of too much anticoagulation therapy. All of the ten participants (100%) indicated that they did educate their patients concerning this important factor (see table 4.16).

Table 4.18: Side effects of too much anti-coagulation therapy

<table>
<thead>
<tr>
<th>Do educate regarding the side effects of too much anti-coagulation therapy</th>
<th>Number of participants</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Participants were also asked to indicate which side-effects they conveyed to their patients from a selection that included easy bruising, prolonged bleeding, haemoptysis, blood in the urine and blood in the stools. Of the ten participants
(100%), nine (90%) indicated that they educated their patients about prolonged bleeding, haemoptysis, blood in the urine and blood in the stools. All of the participants (100%) indicated that they educated their patients about easy bruising (see figure 4.16).

![Figure 4. 16: Side effects of too much anti-coagulation therapy](image)

Although the researcher could deduce from the data gathered that the majority of participants were well informed, she could also identify shortcomings in the health education provided to patients. All patients on warfarin therapy should be made aware of all of the complications they could experience, as all of the aforementioned signs are of equal importance.

4.6.3 Six week prophylactic antibiotic course for the prevention of bacterial endocarditis

Bacterial endocarditis is a major destructive disease with many coagulative side effects. This disease should be prevented in order to avert regression in the patient’s general health condition. Participants were asked whether they educated their patients about the six week prophylactic antibiotic course they would have to take, if needed, for the prevention of bacterial endocarditis. Of the ten participants (100%), nine (90%) indicated that they did, while one participant (10%) did not respond (see table 4.17).
Table 4.19: Do participants educate their patients on the six week prophylactic course, if needed, to prevent bacterial endocarditis?

<table>
<thead>
<tr>
<th>Educate patients re six week prophylactic antibiotics</th>
<th>Number of participants</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>9</td>
<td>90%</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No response</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

4.6.4 Foods that interact with warfarin

Warfarin can cause many complications, including bleeding tendencies, and certain food types can aggravate the functioning of this drug. Participants were asked to identify foods that interact with warfarin from a selection including: green leaves; spinach; cranberry juice; broccoli; and cabbage (all correct answers). Of the ten participants (100%), seven (70%) indicated green leaves, broccoli and cabbage, eight (80%) indicated spinach and nine (90%) indicated cranberry juice (see figure 4.17).

Figure 4.17: Foods that interact with warfarin
3.7 SUMMARY
From the data gathered, the researcher could deduce that knowledge deficits exist among some of the participants, hindering the quality of the health education given by them. This could lead to mismanagement of the rehabilitation phase of a patient's recovery. A discussion will follow in chapter five.
CHAPTER 5

RECOMMENDATIONS, GUIDELINES, LIMITATIONS
AND CONCLUSION

5.1 INTRODUCTION
In the previous chapter, the findings of the research study were discussed and presented in the form of percentages, tables and graphs. This chapter aims to draw conclusions so that an in-service education framework can be developed for registered and enrolled nurses caring for patients who have undergone valvular surgery. Limitations experienced in conducting the study will also be discussed.

The objectives of the study were divided into a primary and a secondary objective. The primary objective of this study was to:

- Identify, explore and describe the extent of discharge planning by nurses for patients who have undergone valvular surgery.

The secondary objective of this study was to:

- Develop practice guidelines in the form of an in-service educational framework to assist nurses in developing an effective discharge plan for patients who have undergone valvular surgery.

5.2 RECOMMENDATIONS
The following recommendations are related to nursing practice, education and research.

5.2.1 Recommendations for nursing practice
The following recommendations are made for nursing practice:
• The findings of this study, and the recommendations made, should be brought to the attention of nursing service managers. The functions of a nurse include rendering health education to his/her patient. In order to be able to do this, he/she needs to be knowledgeable and in possession of the necessary information.

• Nursing service managers should be made aware that instituting an in-service framework to improve the knowledge of registered and enrolled nurses on the discharge planning of patients who have undergone valvular surgery could be cost saving, as it will decrease the incidence of prolonged rehabilitation and re-admission of patients who experience complications.

• Knowledge gained, should be implemented and used to carefully plan discharge.

• The in-service education framework developed in this study could be implemented in the hospital were the study was conducted.

5.2.2 Recommendations for education

Regular in-service training should be given to nurses to increase their knowledge concerning the discharge planning for patients who have undergone valvular surgery. Recommendations include:

• Daily health education can be given to groups of patients who have undergone valvular surgery.

• Educational pamphlets can be given to patients to ensure comprehensive, consistent health education.

Based on data gathered in the previous chapter, the researcher could deduce that, although most of the participants had a generally good knowledge base, specific areas still exist that need defining. The researcher could also deduce that patients do not receive comprehensive ongoing health education due to staff shortages and the high work load of participants. Some of the participants omitted to include all essential health education that patients who have undergone valvular surgery
should receive in order to expedite rehabilitation and be able to identify and prevent complications.

Stokes (2000:417) states that the necessity for continuing education and training is recognized and documented, and is multifaceted; it is needed:

- Firstly, as a quality initiative to have a direct impact on improving clinical area and cost-effectiveness.
- Secondly, in specialist practice within a particular field, as illustrated by the specific requirements for the knowledge and skills outlined by a specific areas needs.
- Thirdly, in a multi-professional setting, in order to improve role function and as a boundary crossover.

Furthermore, Stokes (2000:411) maintains that cardiac rehabilitation is a multi-factorial, multi-disciplinary activity, in which nurses play a significant role. The author states that the majority of cardiac rehabilitation services are coordinated and delivered by nurses.

Parker, O'Connor-Flemming, Tooth and Humphries (2001:16) support this by stating that comprehensive cardiac rehabilitation has been reported to reduce cardiovascular mortality significantly, has been advocated for its effect in improving psychological status and quality of life and in reducing cardiac risk factor profiles, and is suggested to be cost-effective. For cardiac rehabilitation to be effective, an appropriate method of information provision and patient education is required. The following section aims to describe the different teaching strategies in nursing education.

### 5.2.2.1 Factors facilitating learning

The successes of an in-service training programme depend on the active participation and involvement of the participants. Perrie (2003:754) states that merely listening or reading about the topic underpins effective learning. Factors
most commonly listed as ingredients in successful learning are practise and feedback, which allow us to make mistakes and learn from them. The author lists motivation as another ingredient of successful learning – it is difficult to teach someone who does not want to learn. However, the need to learn something we are not interested in can serve as the driving force to learn something if there is no desire to learn something. Factors that motivate learning are listed by the author as:

- Encouragement.
- Need (for example, to be found competent in educating patients).
- Positive feedback.
- Enjoyment of the topic.
- Achievement of goals.
- A good group atmosphere.
- A competitive environment.

Other ingredients recognized include attention and concentration, which can be influenced by factors such as the style of information delivery, the time of day and the interest of the learners concerning the topic. In implementing any in-service education programme, the ward routine should be kept in mind so that participants are free to give all their attention to the information delivered to them.

5.2.2.2 Teaching strategies in nursing education

Mellish, Brink and Paton (1998:101) describe many different teaching strategies in nursing education. These include lectures, lecture-demonstrations, group discussions, seminars, programmed learning, the use of a teachable moment, the nursing round, ward rounds, peer group teaching and workshops. Each of these strategies will be discussed:

- **Lectures**: If used with care, a lecture can be extremely efficient as a cost- and time-effective method of summarizing, up-dating, assimilating and correlating large bodies of knowledge in a particular content area. When
well-organized and developed, a lecture can disseminate the expertise and insight of a single instructor to an audience size limited only by seating capacity and the adequacy of acoustics (Alspach, 1995:72). In the institution where the researcher is working, monthly in-service training programmes have been introduced. The suggested in-service education framework could be incorporated into this programme and presented by one of the cardio-thoracic surgeons available.

- **Lecture–demonstrations**: This method entails the combination of a lecture and a demonstration and is ideal for lectures on the anatomy, physiology and pathophysiology of the heart and its valves. The lecture-demonstration could also provide participants with an explanation on a procedure and why it is carried out. Many models and posters are available at the institution where the researcher is working, all of which could be utilized in the education of staff.

- **Group discussions**: Mellish *et al* (1995:117) describe a group discussion as a valuable teaching strategy, especially when dealing with more senior students. The emphasis is on participation, which means that the group must not be too large (average size suggested to facilitate learning being between ten and fifteen persons). The aim of this method is to encourage exchanging of views. This method could be implemented in the ward situation where all the multi-disciplinary team members could give their input on the chosen topic, thus broadening the views of the participants.

- **Seminars**: Mellish *et al* (1995:127) explain that a seminar entails a group of students working on a specific subject of study, under the guidance of a teacher. This allows for guided discussion on a specific topic or a problem. Each student can be given a section to prepare thoroughly, after which free discussion is allowed. The educator in charge can add any aspect that might have been omitted or needs further clarification and explanation. Facilities,
such as a clinical teaching department, are available at the institution where the researcher is working. Senior registered nurses, specialized practitioners, such as intensive care trained practitioners, could aid in educating their subordinates through guided educational seminars.

- **Programmed learning:** Programmed learning is a method of helping or guiding the student to learn by providing material that the learner goes through him-/herself, according to a specific study guide. This method may be presented by means of book form, tapes, slides and study guides. Programmed learning is based on the following principles:
  - It is better to learn something correctly the first time than to make mistakes that have to be corrected later.
  - Immediate knowledge of results is conducive to learning.
  - Every student should be able to respond to each point and, thus, be an active participant in the learning event (Mellish *et al*, 1995:134).

Facilities and equipment are available such as video’s, books and a library.

- **The use of a teachable moment:** Mellish *et al* (2005:140) describe a teachable moment as a moment during nursing care when something occurs to make immediate intervention desirable and which can be used to impart knowledge to those involved in the particular caring incident. These moments occur in the real life situation, without planning, and need to be used by alert, competent and interested professional nurses/doctors. It is the responsibility of all nursing staff to identify such moments when managing patients, where they could impart information concerning a specific aspect of a patient’s condition or treatment.

- **The nursing round:** Mellish *et al* (2005:140) state that this is a planned, organized visit to the patient, in order to assess the nursing care he is receiving, discuss his progress, and make the necessary adjustments to his care. A great deal of information can be conveyed during the nursing round,
including pathophysiology and treatment modalities of each patient. Nursing rounds are done at the changing of shifts at the institution where the researcher is working. Senior nursing staff should set an example by encouraging those working in the unit to obtain more knowledge regarding each specific patient and his/her treatment modalities.

- **Ward round:** This method can incorporate the various ward rounds for teaching processes and includes nurses’ and doctors’ rounds. Ward rounds can also include other multi-disciplinary team members such as pharmacists, social workers and physiotherapists. A comprehensive, holistic approach could be utilized to manage patients. All these practitioners are available at the institution where the researcher is working.

- **Peer group teaching:** Peer group teaching is one of the most important strategies in the nursing care practice situation. Through this method, students learn to pay particular attention to observing, assessing and exercising judgment. Students gain greater independence, thoughtfulness and pride in their work and develop a greater practical approach to their work (Mellish et al, 1995:160). At the institution where the researcher is working many teaching moments occur in the practical working situation that staff could utilize to educate their peers.

- **Workshops:** Mellish et al (1995:171) describe these as an application for more senior levels in in-service education and one of the most effective methods ever devised for group learning. Participants can be given educational handouts and group work to facilitate learning. Workshops are considered to be longer and may run over a period of days with a schedule of subjects to be covered. Workshops could be incorporated into the in-service education programme of the institution where the researcher is working.
5.2.2.3 Teaching aids

Various teaching aids can be used in different settings to assist in the education of both nursing staff and patients. Where staff shortages are present, aids can be utilized. The following can be used as teaching aids to educate both patients and nursing staff:

- Notice boards.
- Overhead projectors.
- Video’s and films.
- Charts, flip-charts and diagrams.
- Posters.
- Bulletin boards and teaching displays.
- Models.
- Auditory materials.
- Printed texts.
- Journals.
- Pamphlets and booklets.
- Mock-ups.
- Scrap books.
- Learning resource centers.

At the institution where the researcher is working, all of the aforementioned facilities and materials are available for use in assisting to educate staff. They could also be incorporated into the in-service training programme.

5.2.3 Recommendations for further research

The following recommendations are made for further research:

- Repeating this study using a larger sample group should be considered.
- As only nurses from the public sector were used, the study could be repeated using both public and private sector nurses.
• Similar research studies could be conducted in other provinces and comparisons drawn to determine transferability with a wider perspective.
• Research on the development of tools or instruments to evaluate in-service training programmes that may be implemented.

5.3 GUIDELINES
Based on the data collected and analyzed, practice guidelines were formulated for the purpose of this study. These were formulated in the form of an in-service educational framework. The institution where the researcher is working does offer an in-service education programme on a micro and macro level. This in-service educational framework could be recommended for incorporation into their in-service education programme.

5.3.1 In-service education programme
Healthcare professionals need to be informed to be able to give health education to their patients, as giving health education is the responsibility of all healthcare workers. For the purpose of this study, an in-service education framework regarding the management of patients who have undergone valvular surgery was developed. Clinical facilitators could use these guidelines to develop their own in-service programme framework.

5.3.2 In-service education framework for registered and enrolled nurses regarding patients who have undergone valvular surgery
In-service education should include the following aspects:

The heart
• Anatomy of the heart
• The heart wall
• Chambers of the heart
• Valves of the heart
• Physiology of the valves

Disease processes
• Pathophysiology of the valves
• Signs and symptoms of valvular heart disease
• Bacterial endocarditis
• Disease progression of valvular disorders

Diagnostic tests
• Cardiac catheterization
• Echocardiography
• ECG
• Doppler flow studies
• Trans oesophageal echocardiography

Valvular treatment modalities
• Medical
• Pharmacological
• Surgical:
  - Valvuloplasty
  - Commisurotomy
  - Annuloplasty
  - Leaflet repair
  - Chordoplasty
  - Papillary muscle repair
  - Valve replacement

Types of valves
• Autographs
• Homographs
• Xenographs
- Mechanical valves
- Characteristics with valve selection

Complications of valvular surgery

Discharge planning
- Multi-disciplinary team member involvement
- Follow up visits

Lifestyle changes
- Health education given on discharge
  - Removal of clips/sutures
  - Wound infection
  - Low salt diet
  - Follow up activities
  - Follow up visit dates
  - Signs of infection
- Exercise programmes
- Resuming activities
- Identification of symptoms that need medical assistance
- Fluid volume excess

Medications
- Warfarin
- Six week prophylactic antibiotics

5.3.3 Guideline for practical implementation of health education
To ensure successful health education on discharge planning for patients who have undergone valvular surgery certain factors are essential:
A knowledgeable person is needed to implement health education, to be able to provide information, explanations, and to be able to answer multiple questions.

The person presenting the health education needs to have good communication skills to facilitate interaction between self and the patients.

The immediate environment should be conducive to learning with no disturbances or distractions e.g. people entering and exiting room, noise pollution e.t.c.

Patients attending the lecture should be comfortable e.g. sitting on chair, to ensure their full attention span is on the knowledge presented.

Timing for the presentation is very important, to ensure full participation e.g. not during visiting hour - then patients would rather visit with their families, rather at a quieter time during the day, when no other activities is planned e.g. 11H00 – nurses have had their tea break, patients was seen by the doctors, received their medications, and all other routine ward work is completed.

A suitable teaching strategy should be selected as discussed in 5.2.2.2: e.g a lecture, demonstration, group discussion, spot teaching or an amalgamation of these strategies. Teaching strategies can be used to educate both patients and personnel. Lectures can be given by the various cardiologists, cardio-thoracic surgeons or anesthetists. They are willing and available for in-service education. At the institution where the research was conducted there is a demonstration room with a model of the heart, posters, a video machine and television. All these aids can be used to facilitate in giving in-service education. The researcher would encourage the in-service education co-ordinators to utilize the available teaching aids in rendering in-service education, not only to personnel but also to patients. At the institution there is macro (monthly) and micro (weekly) in-service educational programmes. The researcher suggests incorporation of education into these programmes.

There are certain needs to ensure that health education are successful:
Notice boards can be used to place pamphlets and posters to continuously educate patients. Notice boards are available in all the hallways of the hospital as well as in the wards.

Overhead projectors can be used to facilitate a lecture for the viewing of educational material and to visualize the anatomy of the heart and its valves. These are available at the institution where the research was conducted.

Video's and films is beneficial where staff is not available for the presentation and can convey large quantities of information.

Charts, flip-charts and diagrams can be used to demonstrate the anatomy of the heart with its valves.

Posters can be placed in the rooms, hallways and is self explanatory. It serves to continuously educate patients and visitors. The various companies supplying the institution with medical equipment, can be approached to provide posters.

Bulletin boards and teaching displays can be left for patient viewing, where many facts can be conveyed.

Models of the heart and its valves can be used to explain the anatomy and physiological processes. Visualization can assist patient understanding. Various models are available at the institution.

Auditory materials such as tapes can assist staff to educate patients without their presence, enabling them to carry on with their work.

Printed texts can be used for self study by the patients.

Journals are highly educational in educating the educator as to new trends and procedures of valvular surgery and management, thus improving the quality of health education given to the patients.

Pamphlets and booklets can be given to patients in hospital and with discharge as a guideline for self management to ensure optimal recovery.

Where possible translators should be available to assist patients, and it would be advisable to have all educational materials e.g. posters available in at least the three most frequently spoken languages.
5.4 LIMITATIONS OF THE STUDY
The following limitations were identified by the researcher with regard to this study:

- The study had a limited number of respondents. This was due to the fact that there were only a limited number of registered and enrolled nurses available in the cardiac ward due to staff shortages. During the time of data collection, there were no registered or enrolled nurses available in the cardiac clinic.
- The study was conducted at one hospital, as this was the only public sector hospital catering for these patients.
- Due to unforeseen circumstances, the researcher could not be present at the time of data collection, affecting the studies reliability and validity.
- On completion of the study, the researcher noticed that some questions are ambiguous, e.g. question C2.1, but at that stage of the research study, it could not be changed.
- Due to the fact that there was such a small target population, it was suggested that numbers should have been used in stead of percentages. Unfortunately, this was discovered at a late stage of the research study, and this could not be changed.

5.5 CONCLUSION
This research study was conducted using a quantitative, explorative, descriptive and contextual design, which made use of a structured questionnaire to gather data. Data were analyzed and knowledge deficits as well as needs identified. The information gained was used to compile an in-service educational framework for nurses focusing on educational requirements associated with discharge planning of patients who have undergone valvular surgery. The in-service educational framework can be given to nursing service managers to assist in developing in-service training programmes.
Perrie (2003:756) reminds us of an old Chinese proverb: *Tell me and I forget. Show me and I remember. Involve me and I'll understand.*


BLOOMFIELD, P. 2005. Choice of heart valve prosthesis. 23-03-2005 @ 12:00pm. http://heart.bmjjournals.com/cgi/content/full/87/6/583


CANOBBIO, MM. 1990. Cardiovascular disorders. Missouri: Mosby


The Medical Superintendent
Provincial Hospital
Buckingham Road
Port Elizabeth
6001

Dear Ms. Mtshake

**Requesting permission to do research**

I am currently undertaking the second year of the Masters Curationis Degree at the Nelson Mandela Metropolitan University. One of the requirements for completion of this programme is that I should complete a research study. Title of the study is as follows: “Discharge planning for patients undergoing valvular surgery.”

On completion of the research, I am planning on developing practice guidelines to assist the staff with discharge planning of patients who have undergone valvular surgery. I feel that discharge planning is very important to prevent complications in the recovery period of these patients. This will save time and resources (staff) in the ward with discharge planning. Data will be collected by means of a structured questionnaire which will be completed by the staff members working in the applicable areas. There will thus be no patient involvement. Also All ethical principles will be adhered to throughout the research study. A copy of the completed research study will be submitted to your office and practice guidelines will be distributed amongst nursing staff involved.

Yours faithfully

Sr. O Verwey
APPENDIX B
**TITLE OF THE RESEARCH PROJECT:** Nurses knowledge of discharge planning for patients following valvular surgery.

**PRINCIPAL INVESTIGATOR:** Ms Oriana Verwey

**ADDRESS:** Nelson Mandela Metropolitan University

**CONTACT TELEPHONE NO.:** 083 984 9236

<table>
<thead>
<tr>
<th>DECLARATION BY OR ON BEHALF OF PARTICIPANT:</th>
<th>Initial</th>
</tr>
</thead>
<tbody>
<tr>
<td>I, THE UNDERSIGNED……………………………………………..(name)</td>
<td></td>
</tr>
<tr>
<td>[I.D. No:…………………………] the participant in my capacity as Registered / Enrolled nurse………………………… of</td>
<td></td>
</tr>
<tr>
<td>…………………………………………………………………………….</td>
<td></td>
</tr>
<tr>
<td>…………………………………………………………………………….(address).</td>
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</tbody>
</table>

**A. HEREBY CONFIRM AS FOLLOWS:**

I the participant was invited to participate in the abovementioned research project which is being undertaken by Ms Oriana Verwey of the Department of Nursing Science in the Faculty of Health Sciences at the Nelson Mandela Metropolitan University.

<table>
<thead>
<tr>
<th>The following aspects have been explained to me, the participant:</th>
<th>Initial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aim: The researcher is studying: The knowledge of registered and enrolled nurses on discharge planning for patients following valvular surgery</td>
<td></td>
</tr>
<tr>
<td>The information will be used to develop guidelines to assist registered and enrolled nurses in the management of patients following valvular surgery</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Procedures: I understand that all information given by me will be kept strictly confidential</th>
<th>Initial</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Risks: I understand that there are no risks associated with this research study…………………………………………………………………………</th>
<th>Initial</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Possible benefits: As a result of my participation in this study registered and enrolled nurses may be assisted in caring more effectively for patients following valvular surgery</th>
<th>Initial</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Confidentiality: My identity will not be revealed in any discussion, description or scientific publications by the investigators.</th>
<th>Initial</th>
</tr>
</thead>
</table>

| Access to findings: Any new information / or benefit that develops during the course of the study will be shared with me. | Initial |
My participation is voluntary. My decision whether or not to participate will in no way affect my present or future medical care/ employment / lifestyle.

1. The information above was explained to me / the participant by Ms Oriana Verwey in English and/or Afrikaans. I was given the opportunity to ask questions and all these questions were answered satisfactorily.

4. No pressure was exerted on me to consent to participation and I understand that I may withdraw at any stage without penalization.

5. Participation in this study will not result in any additional cost to myself.

<table>
<thead>
<tr>
<th>B. I HEREBY CONSENT VOLUNTARILY TO PARTICIPATE IN THE ABOVEMENTIONED PROJECT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signed / confirmed at Port Elizabeth on ......................... 2005…</td>
</tr>
<tr>
<td>(place) (date)</td>
</tr>
<tr>
<td>………………………… …………………………………</td>
</tr>
<tr>
<td>Signature of witness Signature of participant</td>
</tr>
</tbody>
</table>
Ref: 199208201

Contact person: Ms G Ehbel

Date: 20 June 2005

Address:

Ms O Verwey
242 Great West Way
Kabega Park
PORT ELIZABETH
6025

Dear Ms Verwey

FINAL RESEARCH PROPOSAL

Congratulations on a well prepared final research proposal.

Your final research proposal was approved by Faculty Management subject to the following amendments being made to the satisfaction of your Supervisor:

(i) That the candidate be congratulated on a well prepared research proposal;
(ii) that on page 3 under Research Objectives, the objectives be divided into Primary Objective and Secondary Objective.

Yours sincerely

[Signature]

OFFICE OF THE DEAN
FACULTY OF HEALTH SCIENCES

[Signature]
APPENDIX D
EASTERN CAPE DEPARTMENT OF HEALTH

PORT ELIZABETH HOSPITAL COMPLEX

MEMORANDUM

TO: SR VERWEY

FROM: TRAINING AND DEVELOPMENT – NURSING

DATE: 2005 AUGUST 15

SUBJECT: RESEARCH

THIS SERVES TO INFORM YOU THAT PERMISSION HAS BEEN GRANTED FOR YOU TO CONDUCT RESEARCH ON NURSES KNOWLEDGE ON DISCHARGE PLANNING POST VALVULAR SURGERY.

THIS SHOULD BE CONDUCTED AT PORT ELIZABETH PROVINCIAL HOSPITAL AS REQUESTED.

KINDLY INFORM US OF THE FINDINGS AS WE TAKE THIS AS A LEARNING CURVE SO THAT WE CAN ALSO IMPROVE WHERE NECESSARY.

HOPING THAT YOU WILL FIND THIS IN ORDER.

KIND REGARDS

N.G.MITSHAKE TRAINING AND DEVELOPMENT – NURSING

DATE: 2005 AUGUST 15
APPENDIX E
Nurses knowledge of discharge planning for patients following valvular surgery

Instructions
Complete by ticking the appropriate response by means of a cross (x)

QUESTIONNAIRE

Section A: Demographic Data

1. How many years that you have been working in this unit
   - Less than 5 years
   - 5 – 10 years
   - 10 – 20 years
   - More than 20 years

2. Indicate your professional category
   - Registered nurse
   - Enrolled nurse

3. Do you hold any post-basic qualification?
   - Yes
   - No

3.1 If yes, please state the qualification
   
   ...................................................................................................................................................
   
   ...................................................................................................................................................

Section B: Discharge Planning

1. How many patients having valvular surgery do you nurse on average per week?
   - Less than 5 patients
   - 5 – 10 patients
   - 10 – 20 patients
   - 20 or more patients

2. Do you regularly receive pamphlets/newsletters from your employer regarding health education to be given to patients who have undergone valvular surgery?
   - Yes
   - No
2.1 If no, indicate the topics on which you would like to receive information on
___________________________________________________________________
___________________________________________________________________

3. Do you feel that you could benefit from information regarding the discharge planning of a patient who has undergone valvular surgery?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

4. Do you believe that handouts for such patients would assist you and decrease your workload?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

4.1 If yes, how will it assist you?
___________________________________________________________________
___________________________________________________________________

5. Does the nurse:patient ratio in your unit allow you to render adequate health education to the patient?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

5.1 If no, state the reasons
___________________________________________________________________
___________________________________________________________________

6. Do you believe that patients could have received more health education regarding post valvular surgery on discharge in the past?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

6.1 If yes, what health education did they receive?
___________________________________________________________________
___________________________________________________________________
6.2 If no, why not?________________________________________________________
_______________________________________________________________

7. Do you think that giving an informational pamphlet on valvular surgery aftercare, to the patient on discharge, would be beneficial?

Yes  No

8. What is the language spoken by the majority of the patients?

English  Afrikaans  Xhosa  Other

8.1 If other, please state the language________________________________

9. Do you make use of translators when giving health education to the patients?

Yes  No

10. Are there any communication barriers that can hamper you in rendering health education to patients following valvular surgery?

Yes  No

10.1 If yes, please state what these communication barriers are.

Section C: Lifestyle Changes
1. What information is being given, in your unit, to patients following valvular surgery?

Removal of clips/suture  Wound infection  Low salt diet  Follow up visit dates  Signs of infection
1.1 If signs of infection are conveyed to patients, which of the following signs and symptoms are emphasized in educating the patient?

- Redness
- Swelling
- Pain
- Oozing
- Pyrexia

2. Do you supply valvular surgical patients with guidelines regarding activity and exercise programmes prior to discharge?

- Yes
- No

2.1 If yes, please indicate which of the following information is given

- When to resume normal activities
  - 1 week post-operatively
  - 2 weeks post-operatively
  - 4 - 6 weeks post-operatively

- When to commence with an exercise programme
  - Yes
  - No

2.1 If no, why not?-

________________________________________________________________________

3. Follow up care:

3.1 Do you supply the patients with information regarding dates for follow up care?

- Yes
- No

3.1.1 If yes, when is the follow up date?

- In 2 weeks time post surgery
- In 2 – 4 weeks time post surgery
3.1.2 If no, why not?___________________________________________________________________
________________________________________________________________________

3.2. Do you educate your patients on the importance of informing the following health care practitioners regarding incidence of rheumatic fever and warfarization?

<table>
<thead>
<tr>
<th>Dentist</th>
<th>General practitioner</th>
<th>Gynecologist</th>
<th>Other</th>
</tr>
</thead>
</table>

3.2.1 If others, specify who________________________________________________________________________

3.3. Do you educate your patients about when to seek medical assistance?

Yes  No

3.3.1. If yes, what do you regard as important?

<table>
<thead>
<tr>
<th>Signs and symptoms of SBE</th>
<th>Bleeding tendencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy bruising</td>
<td>Infections</td>
</tr>
<tr>
<td>Swelling of feet</td>
<td>Shortness of breath</td>
</tr>
</tbody>
</table>

3.2 If no, state the reason(s)
________________________________________________________________________

3.4. Do you supply the patient with information regarding the functioning of a valve?

Yes  No

3.4.1 If yes, what information do you provide?
________________________________________________________________________
3.4.2 If no, why not

3.5 Do you educate your patient about the importance of anti–coagulation therapy when patient has a mechanical valve in situ?

Yes  No

3.6 Do you educate your patients on the importance of anti-coagulation therapy, when a patient has been diagnosed with arrhythmias, regardless of the type of valve?

Yes  No

3.7. Which of the following signs and symptoms would you convey to your patients as signs of bacterial endocarditis?

Fever  Wheezing  Edema

Splenomegaly  Heamaturia  Easy fatigability  Roth’s spots

3.8. Do you educate your patients about fluid volume excess?

Yes  No

3.8.1 If yes, which signs do you educate your patient on?

Edema  Increased JVP  Dyspnia  Weight gain

3.8.2 If no, why not?

3.9. Do you inform your patient that 1kg increase in weight equals a 1litre fluid retention?

Yes  No
Section D: Medications

1. Do you educate your patients about the importance of adhering to their warfarin regime?
   - Yes
   - No

1.1 If yes, which of the information do you give them?

- The importance of not skipping doses
- That treatment entails one dose daily
- If dose was skipped the previous day, not to take dose with the following days dose
- To go for regular follow-up blood checks

2. Do you educate your patients regarding side effects associated with too much anticoagulation therapy?
   - Yes
   - No

2.1. If yes, which side-effects

- easy bruising
- prolonged bleeding
- hemoptisis
- Blood in the urine
- Blood in stools
3. Do you educate your patients regarding the 6 week prophylactic antibiotic he/she would have to take post-surgery, if needed, for the prevention of bacterial endocarditis?

Yes  No

3.1 Foods that interact with warfarin:

- green leaves
- spinach
- cranberry juice
- broccoli
- cabbage

Thank you for your time and for completing this questionnaire honestly.

Oriana Verwey
Report on pilot study

A pilot study was conducted in P1 ward, the only government institution in the Nelson Mandela Metropole complex hospitals, responsible for cardio-thorasic surgery. The participant was a registered nurse working in the unit, responsible for daily care of patients, who has had valvular surgery. The participant has indicated that she has no additional educational qualifications other than her basic training.

Discharge planning

On asking the participant how many valvular surgery patients they nurse per week, she picked the most corrected answer- 5-10 patients. She indicated that in the rendering nursing care to these patients, her employer did not provide her with pamphlets/newsletters regarding health education for these patients, and stated that she would like to receive information on ‘cardiac surgery’.

The participant further indicated that she could benefit from receiving information on the discharge planning of a patient who have undergone valvular surgery, and that educational handouts for the patients would assist and decrease her workload, but also be beneficial to the patient. She indicated that she believed that patients could have received better health education regarding post valvular discharge in the past. She also stated that: ‘It will help the patient to comply’. The participant indicated that the nurse patient ratio, does not allow her to render adequate health education to these patients,
Language spoken by the majority of the patients was indicated as Afrikaans, English and Xhosa. The participant indicated that she does make use of translators and that Afrikaans is a definite communication barrier to her hampering her in giving health education.

**Lifestyle changes**

In the lifestyle changes section the participant indicated that she only gives health education on a low salt diet and on follow up visit dates, but did not indicate that health education was given on removal of clips and sutures, or on wound infection, or on the signs of infection. When asked: if any signs of infection were conveyed to the patient, the participant marked all the correct signs of infection.

According to the participant, guidelines is given to the patient w.r.t. activity and exercise programmes, and she correctly indicated that she educates the patient to resume normal activities 4-6 weeks post operatively. She also indicated that the follow up visit date is given as 4-6 weeks post surgery.

In the pilot study the participant indicated that she educates the patients on the importance of informing only his dentist and general practitioner of warfarization and rheumatic fever, but did not feel it was important to notify gynecologist and all other multi-disciplinary team members e.g. pharmacist. The participant indicated that she does educate the patient on when to seek medical assistance and indicated correctly indicated as important: signs and symptoms of SBE, easy
bruising, swelling of the feet, bleeding tendencies, infections and shortness of breath.

When asked if the participant supplies the patient with information on the functioning of a valve, she indicated yes, but then stated that she gives information on warfarin and other cardiac medication, no mention was made on anatomy/physiology of a valve nor the types of valves. The participant indicated that she does educate the patients on the importance of anti-coagulation therapy when having a mechanical valve in situ as well as when being diagnosed with arrhythmia’s. Signs and symptoms of bacterial endocarditis is incorrectly identified by the participant as edema, and easy fatigability. She correctly indicated fever and splenomegaly, but omitted heamaturia and Roth’s spots. Fluid volume excess education is being given, according to the participant although she omitted to educate her patients on increased/raised jugular vein pressure, and also indicated that she does not educate her patient that 1kg increase in weight is equal to 1 liter of fluid retention.

Medication
The participant did indicate that she did educate her patients on the importance of adhering to their warfarin regime, but did not indicate that she will educate them on the importance of not skipping doses, or that treatment is once daily, or that if a dose was skipped not to take the dose with the next day’s dose or to go for regular follow up blood checks. The participant did indicate that she does educate her patients on the side effects of too much anti-coagulation therapy, but only indicated
that she educated her patients on easy bruising. She omitted to indicate that she educates her patients on prolonged bleeding, hemoptisis, blood in the urine and blood in the stools. The participant did not indicate that she educates her patient on the 6 week prophylactic antibiotic she would have to receive for the prevention of bacterial endocarditis nor did she indicate any food that interact with warfarin.

**Conclusion**

In the pilot study the participant clearly indicated that patients could have received better health education in the past, and that staff shortages does not allow her to comprehensively educate the patient. She also indicated that pamphlets would be beneficial to both her and the patient.