CHAPTER 1

Orientation to the research

1.1   INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by a micro-organism, a bacilli called M*ycobacterium Tuberculosis* which usually enters the body by inhalation through the lungs (Department of Health 2000d:11). Although TB can be extra pulmonary as a result of the spread of infection to other organs — mostly the pleura, lymph nodes, spine, joints, genito-urinary tract, nervous system and abdomen, pulmonary TB is the most infectious and common form of the disease, occurring in over 80 percent of cases (Department of Health 2000d:11). It is for this reason that this research will focus on pulmonary TB.

TB is a preventable and curable disease and can relatively easily be controlled **if patients take their treatment regularly as prescribed**. It has been estimated that each uncured case infects about ten other people.

Another critical problem resulting from poor TB treatment is the development of multi-drug resistance (MDR) strain of TB bacilli, many of which are untreatable. This poses a threat to the community and is of great cost to the health service and the country (Department of Health 1996a:2).

The morbidity and mortality rates caused by TB continued to escalate and seemed to stay high irrespective of preventative measures and treatment in many countries of the world — particularly in the third world countries (Matsha 1997-1998:3; Ntsaluba 1999:6).

World-wide there are about nine million new cases of TB with three million deaths annually. It has been estimated that TB kills almost 1 000 people every month, that about two thirds of the population of South Africa might be infected with TB and that about 86 221 people were ill with active TB infection in 1996 in South Africa.

South Africa realised that its TB control efforts which have been in place for some time have been ineffective and joined its international counterparts, by adopting the *Directly Observed Treatment Short Course* (DOTS) strategy to fight the spread of TB (Matsha 1997-1998:3). The DOTS strategy is a patient centred approach which provides support to TB patients, by observing them as they swallow their TB drugs to ensure that they complete their six months course of treatment (Matsha 1997-1998:3).

In this chapter an overview of the research is presented in the form of the background and motivation of the research, the statement of the problem, significance of the research, research design, methodology, ethical considerations of the research, as well as an exposition of the chapters.

1.2   BACKGROUND OF THE RESEARCH

The background of the research problem which covers the impact of TB as a health problem, its impact on communities and the success rate of measures implemented by governments in some countries to combat the disease or prevent TB from occurring will be briefly outlined in this section.

About one third of the world's population is infected by *Mycobacterium Tuberculosis*. Deaths from TB comprise 25 percent of all preventable deaths in developing countries (Department of Health 2000d:7). TB has a particularly devastating effect in the developing world, where a reported 95 percent of all TB cases occur (Bloom 1994:7).

Numerous studies, as mentioned below, have been published from industrial and developing countries, documenting high rates of patients with TB (Peter & Adams 1994:36).

- **United States of America**

San Francisco has 4,5 times the national rate of infection of the United States of America and women seem to be more at risk of dying of TB here (Department of Health 2000b:4).

- **Indonesia**

In Indonesia, TB remains a major killer, as it ranked third in recent years on mortality lists. In the year 2000, the government of Indonesia pledged to reduce the prevalence of TB by 50 percent in the next five years with an integrated anti-TB programme (Department of Health 2000b:4).

- **Germany and Denmark**

In Germany and Denmark, TB is also known as a killer disease.

- **Nepal**

In Nepal, one of the world's poorest nations, TB is a major problem. The authorities of Nepal estimate that out of Nepal's total population of 22,26 million, 45 percent is infected by TB.

- **The African countries**

United Nations health experts reported that TB in Africa is likely to double over the next ten years, because of the rapid spread of HIV/AIDS. The number is increasing by ten percent per year and it has been estimated that it will reach 3,3 million per year by 2005 (BBC News Africa 2001:1).

♦ **Zambia**

TB is on the increase in Zambia. It is believed that if TB patients were not identified and the disease controlled it would permeate to every sector of the society (Zambia Aids and TB News 1999:2). Everyone in Zambia is therefore at risk of contracting TB because TB patients delay to get TB treatment and TB is not diagnosed early and drugs are not readily available. TB in Zambia is one of the neglected diseases. Even diagnosed TB patients do not take TB drugs. TB in Zambia is therefore clearly not under control (Zambia Aids and TB News 1999:2).

♦ **Nigeria**

TB used to be known in Nigeria as a disease of middle age and of old age, but is now on the increase in the younger generation, because of HIV/AIDS. In 1997, 3 924 cases of TB have been reported. This number rose to 4 251 in 1998. Research has found that in 1997, 1 210 people were suffering from TB, which constituted 30,8 percent of notified cases were cured, 163 individuals died and 274 individual defaulted. In 1998 there had been a greater success rate as 1 327 individuals which constituted 31,2 percent of the population were cured, 142 died and 198 individuals defaulted (TB Strategies for Africa 2000:6).

♦ **Ghana**

Although statistics on TB in Ghana were incomplete, TB seemed to be a major health problem in this country and is escalating (TB Strategies for Africa 2000:3).

♦ **South Africa**

Unlike Ghana, South Africa's health statistics of TB are reliable because TB is a notifiable disease in South Africa (SA). TB is also one of the leading infectious killers of the youth as well as adults in South Africa. It is estimated that TB killed almost 1 000 people every month in 1996, and that TB killed more people in SA than any other infectious disease. SA had 86 221 TB patients in 1996. Eighteen percent of these TB cases interrupted treatment and therefore 15 520 TB patients were still out in the community potentially spreading the disease as they were still infectious. Overall the current TB programmes in SA had a cure rate of 56 percent leaving about 37 937 TB cases without documented cure (Matsha 1997-1998:1). In November 1995, the Department of Health in South Africa declared TB the number one National Health priority.

South Africa is currently facing one of the worst TB epidemics in the world as the morbidity rate is 60 times higher than those currently seen in the United States of America or Western Europe. If current trends continue, 3,5 million people will become ill with TB in the next ten years and at least 90 000 patients will die. TB in SA can therefore be regarded as both an emergency and a disaster (Fourie & Weyer 1997:239).

Although TB is seen as one of South Africa's most pressing health problems, the higher incidence rate of TB should be seen in the in context of the increase in population growth as well as the growth in legal and illegal immigrants from neighbouring countries. The South African population has grown to 46 million people and there are an estimate of between 4 – 8 million illegal immigrants within the South African borders (Du Toit 2004:4).

Patients who fail to complete the required course of treatment, which normally renders TB completely curable, have an increased risk of developing MDR TB. This type of TB is also serious although it has

been estimated that less than 30% of patients have MDR TB. From these MDR TB patients, it has been estimated that only 1 in 3 are ultimately cured.

The financial implications of the TB epidemic are staggering. In SA alone approximately R5 000 000 million was spent on TB in 1995. It is estimated that SA will require R18 million over the next ten years if current TB control strategies are not altered (Fourie & Weyer 1997:239). This is, however, only the impact on the macro economy — the impact is even worse on personal suffering, absenteeism from work, loss of income of the worker, poverty which again contributes to the lowering of resistance of the TB patient and other infectious diseases — a vicious circle!

◆ **KwaZulu-Natal province**

KwaZulu-Natal province is one of the nine provinces of SA. This province is battling with the worst TB problem in the country. It is estimated that over 30 000 new cases of TB occur in KwaZulu-Natal annually. This province has the highest rate of TB/HIV infection with nearly one half of TB patients dually infected with HIV and TB (Department of Health, KwaZulu-Natal 1997:3). The number of TB notifications in KwaZulu-Natal was 204 per 100 000 of the population in 1994. In 1995, 21 222 cases were notified. Many smear positive cases are not cured.

Certain factors have been identified which influence the incidence and mortality rates of TB. This is also applicable for the TB situation in SA and in the North South Central Health district of KwaZulu-Natal where this research was conducted.

1.2.1 Factors which influence the tuberculosis rates

The factors which influence the incidence and mortality rates of TB, are listed below:

- increased rate of HIV/AIDS

- unemployment and overcrowding

- non-availability of TB treatment in the health services

- decentralisation of health services

- nurses' negative attitude to patients which leads to patients defaulting TB treatment

- TB patients' failure to accept the condition

- TB patients who rather consult herbalists for treatment

- failure of old method of treatment because of inavailability of health services

- poor nutrition due to financial problems

- poor patient compliance

- lack of tools such as better drugs and vaccines

- patients' lack of knowledge on aspects of the disease and treatment such as the impact of drug resistance on treatment

These factors will be discussed in more depth in chapter 2.

Measures used in the past to combat TB appeared not to be sufficient, these measures are listed below.

1.2.2 Measures used to combat tuberculosis in the past

The following measures were implemented to combat TB in SA before the implementation of the DOTS strategy:

- improved ventilation
- chemoprophylaxis
- improved light — also sunlight

- BCG vaccination to children

- hospitalisation of TB patients

- anti-TB drugs given to confirmed TB patients

- accurate recording and reporting system — TB register

- TB control programmes

- screening of selected groups such as school children, teachers, workers, travellers and immigrants

- TB treatment given for three months

- sputum collection

- confirmation of diagnosis done by x-ray of the chest

These measures will be discussed in more depth in chapter 2.

These measures did not seem to be efficient to combat TB in many countries of the world, or in South Africa and the North South Central Health district of KwaZulu-Natal in particular, therefore another strategy was needed to solve this health problem.

1.2.3 Implementation of the directly observed treatment short course strategy

Despite all measures taken in the past to treat TB, it remained a major problem in many countries of the world and SA in particular — for this reason another strategy had to be followed to solve this devastating health problem.

The DOTS strategy is globally recognised as an effective strategy for effective TB control has been implemented in many countries to help curb the TB problem. The DOTS strategy is a patient centered approach which provides support to TB patients, by observing them as they swallow their TB drugs to ensure that they complete their six months course of treatment (Matsha 1997-1998:3).

The DOTS strategy has proven to be a powerful solution to many TB epidemics in countries such as Tanzania, Botswana, India, Nepal and the USA. It is more than a curative strategy, it is also preventive because it concentrates on curing infectious patients and thus preventing the patients of spreading the disease (Matsha 1997-1998:3). It has been estimated that the implementation of the DOTS strategy in SA can prevent 1,7 million new TB cases and at least 50 000 deaths and save the country up to R2 billion in health care costs over the next 10 years (Whittaker & Muthullingam 1997:3).   The DOTS strategy will be discussed in more detail in chapter 2.

1.3   RATIONALE OF THE RESEARCH

The reasons why this research has been conducted are outlined below.

- SA and the North South Central Health district of KwaZulu-Natal in particular has high TB morbidity and mortality rates.
- The high TB morbidity and mortality rates in SA and in the North South Central Health district of KwaZulu-Natal has been aggravated by the incidence of HIV/AIDS.
- TB is a curable and preventable disease if treatment is taken regularly and correctly as prescribed.
- Research has indicated that the strategies used in the past to treat TB were not successful as more and more cases were reported every year.
- The strategies used in the past did not include close supervision of patients when taking their treatment.
- The DOTS strategy was considered by the WHO as a way to make an impact in the high morbidity and mortality rates in countries where TB is a health problem.
- Other countries have reported success in the control of TB after the implementation of the DOTS strategy.
- No research findings could be found on the impact of the DOTS strategy on the control of TB in KwaZulu-Natal or in the North South Central Health district of KwaZulu-Natal in particular.

- It is therefore important to determine the effectiveness of the DOTS strategy in the control of pulmonary TB in the North South Central Health district of KwaZulu-Natal.

The importance of the research will be outlined below.

1.4   SIGNIFICANCE OF THE RESEARCH

The significance of this research was that any programme need to be evaluated to establish its real effectiveness. The patients as the consumers of the health services of the North South Central Health district who have had TB in the past before the DOTS strategy was implemented and are now being treated according to the DOTS strategy were considered to be the best people to include as respondents in a study of this nature. They have experienced both systems of treatment and were the best people to judge whether the DOTS strategy is effective or not. The findings of this research can be used to identify any problems in the DOTS strategy and the necessary adjustments could be made in policies and patient care to ensure effective control of TB.

The aim of the research will be stated below.

1.5   AIM OF THE RESEARCH

The aim of the research was to determine how effective the DOTS strategy is in the North South Central Health district of KwaZulu-Natal.

1.5.1   Research objectives

The objectives of the research were to evaluate the effectiveness of some of the objectives of the DOTS strategy, namely to:

- evaluate whether the level of knowledge of the TB patient in the North South Central Health district of KwaZulu-Natal about TB has improved since the implementation of the DOTS strategy

- determine whether the TB patient on the DOTS strategy was more compliant to the TB treatment in the North South Central Health district of KwaZulu-Natal

- determine whether TB is still stigmatised in the North South Central Health district of KwaZulu-Natal

- explore the opinion of the TB patient in the North South Central Health district of KwaZulu-Natal with regard to the DOTS strategy

- identify any factor which is currently present in the North South Central district of KwaZulu-Natal that could contribute to the ineffectiveness of the DOTS strategy

- make recommendations to improve the DOTS strategy in the North South Central Health district of KwaZulu-Natal

- make recommendations for further research in this field

In the next section the statement of the problem will be provided as well as the research questions.

1.6   STATEMENT OF THE PROBLEM

The TB morbidity and mortality rates have always been high in the North South Central district of KwaZulu-Natal. Due to the success of the DOTS strategy in other parts of the world it was also implemented in South Africa in 1997. It is not clear whether the objectives of the DOTS strategy have been reached in the North South Central Health district of KwaZulu-Natal as no research findings could be found in this respect.

The following research questions can be derived from the research problem:

- Has the level of knowledge of the TB patient in the North South Central Health district of KwaZulu-Natal about TB improved since the implementation of the DOTS strategy?

- Has the level of knowledge of other members of the community according to the TB patient improved since the implementation of the DOTS strategy?

- Has the level of support for the TB patient improved since the implementation of the DOTS strategy?

- Is the TB patient on the DOTS strategy more compliant to the TB treatment in the North South Central Health district of KwaZulu-Natal?

- Is TB still stigmatised in the North South Central Health district of KwaZulu-Natal according to the TB patient?

- What is the opinion of the TB patient in the North South Central Health district of KwaZulu-Natal of the DOTS strategy?

- Is there any factor which is currently present in the North South Central district of KwaZulu-Natal that could contribute to the ineffectiveness of the DOTS strategy?

1.7   OPERATIONAL DEFINITIONS

Operational definitions which have been used in the research are the following:

♦ **Directly observed treatment short course**

The DOTS is the abbreviation for **D**irectly **O**bserved **T**reatment **S**hort course strategy.   The DOTS strategy is the procedure whereby a person is observed directly by another person while taking TB treatment (Hanks, Mc Leod & Makins 1988:317).

For the purpose of this study, the DOTS strategy has been defined as a patient centred approach which provides support to TB patients, in the North South Central district of KwaZulu-Natal, by observing them as they swallowed their TB drugs to ensure that each patient completed the six months course of treatment (Matsha 1997-1998:3).

♦ **Treatment supporter**

A treatment supporter is a responsible person, not necessarily a health worker chosen by the patient to assist him when taking their TB treatment (Hanks et al 1988:1262).

For the purposes of this study, a treatment supporter has been defined as any responsible member of the community chosen by a TB patient, in the North South Central district of KwaZulu-Natal, to observe the patient daily when swallowing anti-TB drugs to ensure that s/he takes the medication regularly and correctly as prescribed (Matsha 1997-1998:3).

♦ **Tuberculosis**

Tuberculosis is a communicable disease caused by infection with tubercle bacilllus — M*ycobacterium Tuberculosis*, which affects many structures of the body, such as the pleura, lymph nodes, spine, joints, genito-urinary tract, nervous system, abdomen and lungs (Hanks et al 1988:1273).

For the purpose of this study, TB has been defined as a chronic notifiable, infectious bacterial disease caused by the *Mycobacterium Tuberculosis* and which infects the lungs (Porter & McAdams 1994:1).

♦ **Evaluation**

Evaluation means assessment of the continuity of work (Hanks et al 1988:385). Evaluation can also involve research, which investigates how well a programme, practice or policy is working (Polit & Hungler 1995:64).

For the purpose of this study, evaluation means assessment of the effectiveness of the DOTS strategy by evaluating the attainment of some of the *objectives of the DOTS strategy* in the North South Central Health district in KwaZulu-Natal Province such as the

- improvement of the level of knowledge of the TB patient in the North South Central Health district in KwaZulu-Natal province
- improvement of the compliance of the patients to the TB treatment in the North South Central Health district in KwaZulu-Natal province
- eradication of the stigma attached to TB in the North South Central Health district in KwaZulu-Natal province
- improvement of support received by the TB patient in the North South Central Health district in KwaZulu-Natal province

♦ **Effectiveness**

Effectiveness means the end results, which may be reflected by decrease in numbers (Hanks et al 1988:356). This could involve the decrease in the incidence rate, mortality rate and cure rate of TB. For the purpose of this study the DOTS strategy will be regarded as being effective if the majority of the objectives of the DOTS strategy have been achieved.

1.8   RESEARCH METHODOLOGY

This study used the quantitative method.

1.8.1 Research approach: quantitative research

Quantitative research involves the systematic collection of numerical information, often under conditions of considerable control and the analysis of that information using statistical procedures (Polit & Hungler 1991:24). The quantitative research approach has been used because this study wanted to quantify data.

1.8.2 Research design

Research design refers to the research overall plan for obtaining answers to the research questions and testing the research hypothesis (Polit & Hungler 1991:225). A *cross-sectional design* was used for this research because it is flexible and a lot of information can be gathered during the course of the research (Polit & Hungler 1991:195). This design is discussed in more detail in chapter 3.

1.8.3 Research population

Population can be defined as **the entire set of individuals having some common characteristics** (Polit & Hungler 1991:651). The research population was the TB patients who were treated before the DOTS implementation, using self-administered therapy in 1994-1995 and who have been under the DOTS strategy supervision in 1998-1999 in the North South Central Health district of KwaZulu-Natal. The research population is discussed in more detail in chapter 3.

1.8.4 Research sample and sampling method

A sample is a **subset of a population** selected to participate in a research study (Polit & Hungler 1991:654). A sample have been obtained from TB patients who have been using self-administered

therapy from 1994-1995 and who have been under the DOTS strategy supervision from 1998-1999 as reflected in the TB register for the North South Central Health district of KwaZulu-Natal.

Sampling method is the **process** of selecting a portion of the population (Polit & Hungler 1991:654). In this research the **purposive sampling** method was used to select the sample from the study population as it is believed that the information sought could be obtained from this sample. The criteria for selecting the research sample as well as the sample and sampling method is discussed in more detail in chapter 3.

1.8.5 Data collection

Data collection is the gathering of information needed to address a research problem. A pre-established plan is needed before data can be collected to avoid confusion, delays and mistakes (Polit & Hungler 1991:643).

A research instrument in the form of an interview schedule has been compiled to collect data which was done during an interview with TB patients (see annexure A for a copy of the interview schedule). The interview schedule was chosen as instrument because by collecting data personally the interviewer was able to clarify any possible misunderstandings and could also expect a higher rate of return than posting questionnaires to respondents. The sample could also include illiterate individuals (Polit & Hungler 1991:653).

The specific procedure followed to compile the interview schedule, to conduct the interviews, and to study clinic records is discussed in more detail in chapter 3.

1.9 RELIABILITY AND VALIDITY OF THE STUDY

Reliability is concerned with the consistency, stability and repeatability of the informer's accounts as well as the investigator's ability to collect and record information accurately (Brink 1996:124). Validity means the degree to which the instrument measures what it is supposed to measure (Polit & Hungler 1995:657).

To ensure the reliability and validity of this research the researcher took certain steps which are discussed in more detail in chapter 3.

The steps which were taken to ensure reliability of the research and the research instrument were briefly:

- The interview schedule was pre-tested and questions which were not interpreted correctly were corrected.
- The questions in the interview schedule were clearly worded.
- The interviews were conducted in the mother tongue of the respondents.
- The interviews were only conducted by the researcher herself.
- The respondents who took part in the pre-test of the instrument responded in the same manner as those who formed the sample of the research.

Validity of the research and research instrument were ensured through the following:

- literature study
- organisation of loose standing constructs into a framework
- operational definitions
- sample size – considered large enough to be representative of the phenomenon being studied
- congruence between research questions, objectives, investigation, findings and recommendations (Polit & Hungler 1991:246)

1.10   AN OVERVIEW OF THE ETHICAL CONSIDERATIONS OF THIS RESEARCH

A nurse researcher has the responsibility of conducting nursing research in an ethical manner. Failure to meet this responsibility undermines the scientific process and may lead to many unfortunate and problematic consequences. To conduct research in an ethical manner means that the nurse researcher must carry out the research competently, manage resources honestly, acknowledge those who contributed guidance and communicate results accurately and ensure the protection of the rights of human subjects (Brink 1996:38).

Various steps were taken to ensure that the ethical aspects of the research were taken into account, such as

- written permission obtained from the medical superintendent of the institution concerned (see annexure B)
- informed consent obtained from each participant (see annexure B)

The ethical considerations of this research are discussed in more detail in chapter 3.

1.11   LIMITATIONS OF THIS RESEARCH

This research was concerned with the investigation of the effectiveness of the DOTS strategy in the North South Central Health district of KwaZulu-Natal only. The findings therefore might not be relevant to other provinces in SA. The findings might also differ from a study done using a different paradigm such as qualitative research method. Other limitations identified as the research progressed are outlined in chapter 5.

1.12 LAYOUT OF THE DISSERTATION

Chapter 2:   Literature review

Chapter 3:   Research methodology

Chapter 4:   Data analysis, interpretation and presentation of findings

Chapter 5:   Summary, conclusions and recommendation of the research

1.13 SUMMARY

This chapter focused on the overview of the research, which included the background of the study, rationale, and the methodology followed. The objectives of the DOTS strategy have been used as objectives for this research. The research questions, together with the research objectives, form the conceptual framework of the research and have been outlined in this chapter. Concepts relevant to the research have been defined. A brief summary of the ethical considerations of this research was provided and will be discussed in more detail in chapter 3. In the next chapter a literature review on various aspects pertaining TB and the DOTS strategy have been discussed.